CONSERVATION PLAN FOR

THE EMBARRAS RIVER BANK STABILIZATION PROJECT

FORMER INDIAN REFINERY, LAWRENCEVILLE, IL

STATE ENDANGERED SMOOTH SOFTSHELL TURTLE (*APALONE MUTICA*), EASTERN RIBBON SNAKE (*THAMNOPHIS SAURITUS*), AND EASTERN SAND DARTER (*AMMOCRYPTA PELLUCIDA*)

August 10, 2017

Project #: 339-020-017

SUBMITTED BY: Trihydro Corporation

1252 Commerce Drive, Laramie, WY 82070

Illinois Department of Natural Resources
CONSERVATION PLAN
(Application for an Incidental Take Authorization)
Per 520 ILCS 10/5.5 and 17 Ill. Adm. Code 1080

PROJECT APPLICANT: Chevron Environmental Management Company

PROJECT NAME: Former Indian Refinery Embarras River Bank Stabilization Project

OFFICE OF WATER RESOURCES PERMIT APPLICATION: S20170008

COUNTY: Lawrence

AREA OF IMPACT: The Embarras River Bank Stabilization Project (Project) spans approximately 1,520 linear feet of riverbank along the western bank of the Embarras River and includes approximately 0.7 acres of the adjacent forested wetlands. Engineering specifications can be found in the Project Plan (Attachment A). All impacts are expected to be constrained to this area.

This Conservation Plan was developed for the Incidental Take Authorization (ITA) of three State of Illinois threatened and endangered (T&E) species that may be impacted during construction activities associated with the proposed Project. These species include the endangered Smooth Softshell Turtle (*Apalone mutica*), endangered Eastern Ribbon Snake (*Thamnophis sauritus*), and threatened Eastern Sand Darter (*Ammocrypta pellucida*). In a letter dated April 11, 2017, the Illinois Department of Natural Resources (IDNR) provided a summary of their review of the proposed Project, along with recommendations for avoiding impacts to these species during Project-related activities. Additional follow-up conversations occurred between Chevron Environmental Management Company (CEMC) and IDNR to insure that this plan adequately addresses potential impacts to state-listed species. This Conservation Plan was based on IDNR's recommendations and also includes aquatic habitat enhancement measures along an approximate 1,520 foot segment of the Embarras River.

The following sections have been written to be aligned with the requirements of a State of Illinois Conservation Plan and an ITA.

1. A description of the impact likely to result from the proposed taking of the species that would be covered by the authorization

A) Identification of the area to be affected by the proposed action

The proposed action is a riverbank stabilization project along an approximately 1,520 linear foot section of the Embarras River that adjoins the former Indian Refinery in Lawrenceville, Illinois (Project Area;

Township 3 North, Range 1 West Section 7 [Figure 1]). The former Indian Refinery property is currently owned by CEMC and undergoing a remedial investigation and feasibility study (RI/FS) under the oversight of the Illinois Environmental Protection Agency (IEPA). The area to be affected by the proposed action (Project Area) includes the riverbank itself and the directly adjacent forested wetlands. This amounts to a disturbance footprint of approximately 0.7 acres. A temporary access road for construction will be created within the forested wetlands for the purpose of servicing equipment during the bank stabilization. All construction work for the proposed action will be completed from the riverbank and adjacent forested wetlands. Once construction is complete, the sloped bank will be rock armored to stabilize it and prevent erosion in the future, and the forested wetland will be restored. Photos of the forested wetland and existing riverbank conditions can be found in Attachment B.

B) Biological data on the affected species including life history needs and habitat characteristics.

The Smooth Softshell Turtle, Eastern Ribbon Snake, and Eastern Sand Darter could potentially be impacted during Project construction and restoration activities. A brief life history description and habitat characteristics for each species are provided below. Similar information is also provided for the Copperbelly Water Snake (*Nerodia erythrogaster neglecta*), which is an IDNR species of conservation concern with potential habitat within the Project Area.

Smooth Softshell Turtle

The Smooth Softshell Turtle is a medium-sized (approximately an 11 inch carapace length) turtle that inhabits streams and rivers throughout Illinois that contain sandy substrates (The Illinois Natural History Survey [INHS] 2017a). The sand provides basking habitat for males and juveniles and nesting habitat for females. During the nesting season (May-June), females can lay multiple clutches in a sandbar, and clutches range in size from 6-26 eggs. The eggs incubate in the sand for approximately 50-60 days, before hatchlings emerge and traverse the sandbar to reach the river or stream (Plummer 2007). The diet of the Smooth Softshell Turtles consists primarily of aquatic insects but may be supplemented with other aquatic species. Hatchlings and juveniles may be subject to predation by avian predators or riparian foragers, but the adults have no natural predators. As such, management concerns for the Smooth Softshell Turtle derive mostly from anthropogenic habitat disturbance. In 2015, the INHS conducted an Aquatic Turtle Survey in the Embarras River Bottoms State Habitat Area (ERBSHA). The ERBSHA consists of the river channel and wetlands immediately below the Project Area (IDNR 2014). During the 2015 Aquatic Turtle Survey, a total of 18 Smooth Softshell Turtles were captured and released within the Embarras River channel, demonstrating that this section of the Embarras River currently provides habitat for this species. The Aquatic Turtle Survey can be found in Attachment C.

Eastern Ribbon Snake

The Eastern Ribbon Snake is a medium-sized snake (approximately 30 inch total length) that can be found in southern Illinois counties, amongst riparian shrubs that provide foraging opportunities (INHS

2017b). The Eastern Ribbon Snake preys mostly on amphibians, but has been known to forage for fish species and insects as well (Wisconsin Department of Natural Resources [WDNR] 2017). In the summer months (June-August), Eastern Ribbon Snakes remain close to waterways, where they can be found basking in the mud or floating in the water amongst vegetation. Breeding occurs in the spring (March-May) and results in summer to fall hatching of 10-15 neonates. As an ovoviviparous species, females carry the eggs until they hatch. During the fall, Eastern Ribbon Snakes move further from waterways, and eventually seek a hibernaculum, such as a crayfish burrow or similar habitat (WDNR 2017). Predators of the Eastern Ribbon Snake include avian predators and riparian foragers. Management concerns for the Eastern Ribbon Snake derive mostly from habitat hydrology alterations induced by humans and other species such as beavers (*Castor canadensis*) (WNDR 2017).

Biological surveys were not completed specifically for this Project; however, the Embarras River has been sampled extensively by INHS and IDNR personnel over the past 30 years, and the aquatic fauna has been well-documented. Andrew Kuhns, the author of the Aquatic Turtle Survey Report, suggests that the Eastern Ribbon Snake is known to occur near the Project Area (Personal communication, March, 2017).

Eastern Sand Darter

The Eastern Sand Darter is a small-sized (approximately 3 inch total length) fish that inhabits streams and rivers throughout Illinois that contain sandy substrates (Ohio Department of Natural Resources [ODNR] 2012). This species relies heavily on sand substrates with minimal silt or mud, as Eastern Sand Darters utilize the sand to bury themselves until only the tip of their snout and eyes are exposed. While this behavior is advantageous for ambush predation, Robert Daniels (1989) concluded that burying into the sand reduces the energy expenditure associated with maintaining position in turbulent water. Eastern Sand Darters typically spawn in June-July, when eggs are deposited into the sand and no further parental care occurs (ODNR 2012). A single female may spawn several times during a spawning season, depositing 22-829 eggs into the substrate (Drake et al 2008). The diet of the Eastern Sand Darter consists primarily of aquatic insects but may be supplemented with small crustaceans (IDNR 2017b). The primary management concerns for the Eastern Sand Darter are decreased water quality and habitat resulting from impoundments and siltation (IDNR 2017b). This species was historically observed in the Little Wabash, Wabash, Vermilion, and Embarras Rivers, but recent observations are limited to the Embarras River (Adams and Burr 2004). Locality data obtained from the INHS indicate a single recorded observation of the Eastern Sand Darter within Lawrence County, Illinois. Specifically, the Eastern Sand Darter was observed approximately four miles upriver of the Project Area.

Copperbelly Water Snake

The Copperbelly Water Snake has two recognized populations that are distinguishable by their geographic range. The northern population, which inhabits northeastern Indiana and northwestern Ohio, is listed as federally-threatened. The Project is within the geographic range of the southern population

that inhabits southern Indiana, southern Illinois, and northwestern Kentucky, and is not officially listed at this time. While no special permits are required for the Copperbelly Water Snake in Illinois, IDNR recommends conservation measures for this species of concern. A brief life history of this species is provided below.

The Copperbelly Water Snake is a large-sized snake that can grow up to 50 inches in length. Adult Copperbelly Water Snakes can be distinguished from the Eastern Ribbon Snake by their size and distinct orange dorsal coloration. The Copperbelly Water Snake requires a mosaic of wetlands and often travels between wetlands foraging for amphibians (United States Fish and Wildlife Service [USFWS] 2015). In the summer months (June-August), Copperbelly Water Snakes are most active and will move between wetlands with variations in food availability. Breeding occurs in the spring and results in fall hatching of an unknown number of neonates. During the fall, Copperbelly Water Snakes seek a hibernaculum, such as a crayfish burrow or similar habitat, where they will remain from late October to April (USFWS 2015). Predators of the Copperbelly Water Snake include avian predators and riparian foragers. Management concerns for the Copperbelly Water Snake derive mostly from habitat fragmentation, as they require a mosaic of wetlands for foraging. Other management concerns include pet trade, as their unique color and large size increases their value (USFWS 2015).

C) Description of project activities that will result in taking of an endangered or threatened species, including practices to be used, a timeline of proposed activities, and any permitting reviews, such as a USFWS biological opinion or USACE wetland review

The southern Copperbelly Water Snake population that may inhabit the Project Area is not a state-listed T&E species. As such, this species does not require an ITA. However, the IDNR recognizes this species as one of concern and recommended that measures be taken to avoid the taking of this species. As such, avoidance and minimization measures developed for the Eastern Ribbon Snake will also effectively protect the Copperbelly Water Snake.

Numerous avoidance and minimization measures will be implemented to reduce the likelihood of an incidental take of the Smooth Softshell Turtle, Eastern Ribbon Snake, and Eastern Sand Darter. A general timeline for the major activities associated with the Project is provided below. Note, actual time frames for Project tasks are subject to environmental conditions and construction progress and therefore subject to change. Project activities that could potentially result in the taking of a state-listed T&E species are listed below:

- Developing a level access road to service heavy machinery for the Project (July/August 2017)
- Cutting back the Embarras River riverbank adjacent to the Former Indian Refinery (August/September - December 2017)

- Placing geotextile fabric and rock along the constructed riverbank in order to stabilize it (August/September - December 2017)
- Placing bendway weirs and concrete culverts below the water line and at the foot of the bank to enhance aquatic species habitat (August/September - December 2017)
- Retracting the temporary access road and restoring the forested wetlands by re-creating the pre-development contours, planting tree saplings, and seeding herbaceous cover species (Spring 2018)

All of the above activities will result in increased noise, traffic/use of heavy machinery, and people within the Project Area, which individually or collectively may disturb the Smooth Softshell Turtle or the Eastern Ribbon Snake. Because of this disturbance, these species are expected to avoid or move out of the general area. Measures (described in detail below) will be implemented to minimize the potential for a direct incidental take of a Smooth Softshell Turtle, Eastern Ribbon Snake, or Eastern Sand Darter; however, disturbance created by activities associated with the Project may result in an indirect incidental take.

The construction phase associated with stabilization of the bank yields the greatest potential for an incidental taking of the Smooth Softshell Turtle or the Eastern Sand Darter. The bank has eroded to a vertical or over-steepened condition in the work area, so the bank will be cut back to a 1.5:1 slope. Geotextile fabric and rock armoring will then be placed from the top of the bank, to below the normal river low water mark. Excess self-launching rock will be placed at the toe so that it naturally settles to the river bed with future erosion. Per IDNR recommendation to include measures to enhance habitat diversity, small weirs will be constructed every 200 feet, and 1-2 feet diameter concrete culvert sections that are 4-8 feet in length will be placed every approximately every 100 feet. After the bank is cut back, the placement of rock to armor the bank, and/or the placement of weirs and culverts to enhance habitat could result in incidental take if material inadvertently came in direct contact with a Smooth Softshell Turtle or Eastern Sand Darter at the foot of the bank.

The use of heavy machinery within the Project Area presents the greatest opportunity for direct incidental take of an Eastern Ribbon Snake. The creation of a clean, level space for heavy machinery may result in the removal of scattered forest debris and cray fish burrows. In the absence of natural cover, the Eastern Ribbon Snake may seek alternative cover within the Project Area (e.g. construction equipment). The Eastern Ribbon Snake may also utilize the access road during cool periods to facilitate thermoregulation (i.e. basking), as the forested area may receive limited sun exposure. The initial movement of equipment that has been stationary for some time, and general construction traffic on the access road may result in an incidental take.

On January 23, 2017, CEMC submitted a joint permit application to the USACE, IEPA, and IDNR that described the proposed bank stabilization project. The forested wetlands that are adjacent to the Embarras

River and within the proposed Project Area were determined by the USACE to be jurisdictional and are therefore protected under Section 404 of the Clean Water Act. As a result, ongoing correspondence has occurred between CEMC and the USACE to provide supporting documents for several Nationwide Permits. As part of the Nationwide Permit, CEMC developed a Wetland Mitigation Plan (Attachment D), which describes the restoration of 0.7 acres of forested wetlands that will begin immediately following stabilization of the riverbank. The restoration of the forested wetlands will occur within the area that includes the temporary access road for construction.

As part of the Nationwide Permitting process, USACE consulted with USFWS to identify federally listed T&E species that may occur within the proposed Project Area. The USFWS identified the state and federally listed Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*) as species that may potentially occur within the Project Area. To prevent potential adverse impacts to bats, USFWS recommended to the USACE that any tree clearing that was necessary for the Project be completed between October 15th and March 31st. This information was subsequently relayed to CEMC. The USFWS's concerns for potential impacts to T&E species were limited to bats and clearing trees before April 1 was effective in avoiding potential impacts to bats. Therefore, no take permit is needed for these federally listed species.

In IDNR's review of the Project, several other state-listed T&E species were identified as potential concerns based on prior records; however, each of these species was dismissed from further consideration because of limited concerns for adverse impacts.

D) Explanation of the anticipated adverse effects on listed species

The construction phase of the river bank stabilization may result in an indirect incidental taking of the Smooth Softshell Turtle, as the noise of heavy machinery may deter mature turtles from using potentially suitable nesting habitat on the opposite riverbank. In-river incidental take is not anticipated for the Smooth Softshell Turtle, as equipment will have limited entry into the river during construction. All construction will be conducted from the bank. Limited water entry includes the potential for equipment arms to enter the river during the placement of rip rap and culverts (e.g. backhoe bucket). Additionally, the Smooth Softshell Turtle is vagile in the warm waters of mid-summer, and is likely to relocate in the event that construction activities prove to be a deterrent.

The construction phase of the river bank stabilization may also result in a direct incidental take of the Eastern Sand Darter, as the placement of the rock rip rap will extend into the toe of the slope where this species may forage. Incidental take of the Eastern Sand Darter is anticipated to be minimal, as equipment will have limited entry into the river during construction. All construction will be conducted from the bank. Limited water entry includes the potential for equipment arms to enter the river during the

placement of rip rap and culverts (e.g. backhoe bucket). Additionally, the most suitable habitat for the Eastern Sand Darter to bury (i.e. sand) is located on the adjacent bank, where construction will not occur.

Moving heavy construction equipment to and from the Project Area may result in an incidental taking of the Eastern Ribbon Snake. The Eastern Ribbon Snake is ovoviviparous, meaning that adult females in the Project Area may be carrying neonates internally throughout the summer, until they hatch in the fall. Construction is proposed to begin in late summer to fall, so incidental taking of a female and associated neonates is not anticipated. In addition, hatching may have already occurred, and individuals may be moving farther from the Project Area to seek inland winter hibernacula. Construction will likely remove crayfish burrows, and the Project Area will not contain preferable hibernacula for the Eastern Ribbon Snake in the fall of 2017. In addition, this species is known to migrate further from water during the fall. As such, construction will likely reduce incentive for this species to linger near the Project Area, and will coincide with the snakes' seasonal shift inland, farther from the Project Area.

2) Measures the applicant will take to minimize and mitigate that impact and the funding that will be available to undertake those measures

A) Plans to minimize the area affected by the proposed action, the estimated number of individuals of each endangered or threatened species that will be taken, and the amount of habitat affected (please provide an estimate of area by habitat type for each species).

The Project was designed to impact the minimum footprint required to achieve the objective of adequately stabilizing a riverbank that is eroding toward an area that contains buried historic refinery materials. Through several design iterations, the Project footprint has already been reduced to the smallest size feasible. As such, there are no additional ways to reduce the linear stretch (1,520 feet) of riverbank that will be impacted or the adjacent area needed to execute the Project.

The 2015 INHS Aquatic Turtle Survey resulted in the identification of 18 Smooth Softshell Turtles, including eight mature females, within approximately 5 miles of the Project Area within the Embarras River (Attachment C). All of the traps were set near sandbars, which are the preferred nesting habitat for this species. Eighteen Smooth Softshell Turtles were collected within four of the six traps. The Project Area is adjacent to one sandbar that is potentially suitable for nesting; however, this sandbar will not be physically disturbed during construction activities. Smooth Softshell Turtles could also be swimming in the water adjacent to the bank; however, they are likely to avoid the area because of noise and disturbance. While a barge was considered for instream construction to eliminate the need for an access road, this alternative construction method was not pursued, due to the shallow depth during the majority of the year under normal conditions.

Based on the numerous avoidance and minimization measures that will be implemented, the estimated incidental take is no more than three individuals.

Data obtained from the INHS indicate that a single sighting of the Eastern Sand Darter has been recorded within the general vicinity of the Project Area; this observation was recorded in 2012. A desktop assessment of the available habitat, in conjunction with personal communications with the IDNR, suggest that the Project Area may be suitable for the Eastern Sand Darter. However, the most suitable habitat identified within the Project Area is the bank adjacent to construction, which will not come into contact with construction equipment or associated construction materials that may result in the incidental taking of this species. Due to the avoidance and minimization measures that will be implemented, the estimated take is no more than three individuals.

According to INHS Collections Data, there were two observations of the Eastern Ribbon Snake documented near the Project Area in spring of 2003 (INHS 2017a). The occurrences were isolated to the inland portion of the refinery but suggest that this species may be in the general area. No additional surveys for this species have been conducted in this area, but the INHS data coupled with personal communication with Andrew Kuhns, a local herpetologist, suggest that this species may still be present (Personal Communication, March, 2017). Due to the avoidance and minimization measures that will be implemented, the estimated take is no more than three individuals.

B) Plans for management of the area affected by the proposed action that will enable continued use of the area by endangered or threatened species by maintaining/re-establishing suitable habitat

Stabilization of the riverbank will prevent future erosion to the riverbank and loss of adjacent forested wetlands. During the last several years, an estimated five to seven feet of riverbank per year has been lost to erosion. Further inland is an area that contains historically disposed refinery material, and stabilizing the riverbank will prevent erosion into this area.

The Project will result in increased habitat for aquatic species. The increase in surface area provided by the rock armoring along the riverbank and bendway weirs will provide habitat for aquatic invertebrates, and the inclusion of weirs will also provide more diverse habitat for various fish species (Anderson et al 1978). Numerous benefits have been observed from the placement of bendway weirs, and include enhanced habitat diversity through the creation of pools; increased fish density, size, diversity, and overall aquatic biomass; and erosion control (Kinzli and Myrick 2009). The Eastern Sand Darter may benefit from the reduced sedimentation resulting from the bank stabilization and the backwater eddies created by weirs, where breaks in velocity could provide resting and foraging habitat.

After stabilization of the bank is complete and the access road is no longer needed, the disturbed forested wetland will be returned to original contours so that hydrology within the area will be returned to pre-disturbance levels. Finally, the disturbed forested wetland will be revegetated with native, hard-mast

tree species that promote wildlife habitat and provide forage. The Mitigation Plan (Attachment D) for this area limits invasive plant species and/or noxious weeds to < 5% cover to promote the recovery of a native forested wetland plant community. As such, the restored forested wetland should continue to provide habitat for the Eastern Ribbon Snake and Copperbelly Water Snake.

C) Description of all measures to be implemented to avoid, minimize, and mitigate the effects of the proposed action on endangered or threatened species

The following measures will be implemented to avoid, minimize and mitigate any potential effects to the endangered Smooth Softshell Turtle and endangered Eastern Ribbon Snake, threatened Eastern Sand Darter, and the Illinois species of Concern Copperbelly Water Snake:

1. During the project scoping and development stage, the use of a barge was considered to eliminate the need for creating a temporary access road. However, this alternative construction method was not pursued, due to the shallow depth of water during the majority of the year under normal conditions. By not using a barge, incidental take associated with it is avoided.
2. Exclusionary fencing will be erected prior to beginning the Project to prevent snakes from entering the construction area. Fencing will be frequently inspected to ensure that snakes are excluded from potential hazards associated with the construction activities.
3. Construction of the access road will not begin until late summer. This time period is outside of the nesting/egg-laying period for Smooth Softshell Turtles, thus preventing disturbance that might result in reduced reproductive success of female turtles.
4. The area will be cleared of any apparent wildlife prior to beginning work each day.
5. Activities will exclusively occur during daylight hours. Emergence of juvenile turtles is typically synchronized with the local sunset, at which time disturbance from construction will be at a minimum.
6. Sedimentation and erosion controls will be implemented as necessary during the construction phase to avoid runoff into the Embarras River.
7. Education, in the form of pre-construction worker awareness, will be conducted prior to the initial construction date, and will be included as a component of daily safety briefings. Awareness briefings will include the appropriate steps to take in the event of an encounter with a species identified in this conservation plan. Sample educational material is available in Attachment E.
8. Project Area Rock armoring will stabilize the riverbank, while providing structure and rock surface area to a typically muddy river bank. These changes are expected to result in increased habitat for aquatic invertebrates.

9. Bendway weirs and concrete culverts will be placed along the 1,520 feet stretch of stabilized riverbank to enhance aquatic habitat. IDNR recommended this habitat enhancement approach, and CEMC will be covering the cost of implementation, which is estimated to be greater than $63,000.
10. The Project itself will prevent further loss of the adjacent forested wetlands that provide habitat for the Eastern Ribbon Snake, Copperbelly Water Snake, and other native terrestrial species.
11. Post-construction monitoring will be conducted to determine the presence or absence of the Smooth Softshell Turtle, Easter Ribbon Snake, and Eastern Sand Darter within the general Project Area.

D) Plans for monitoring the effects of the proposed actions on endangered or threatened species

The Project is not anticipated to physically disturb the potential Smooth Softshell Turtle nesting habitat on the opposite riverbank, and there will be limited in-river work associated with the heavy machinery during any phase of this Project. In addition, due to the timing of the construction phase, it is likely that nesting will have already occurred, and that any Smooth Softshell Turtles in the area may relocate without compromising reproductive success. CEMC has been in communication with IDNR and INHS in regards to future conservation efforts within the ERBSHA to determine whether species monitoring for this Project could be included within the scope of work for other IDNR and INHS projects and monitoring in the general area. At the time in which this conservation plan was submitted, there were no specific IDNR and/or INHS projects in need of additional monitoring funds for the Smooth Softshell Turtle. CEMC will continue to communicate with the IDNR and INHS to coordinate and contribute to monitoring events if a project/monitoring effort is identified in the future; however, in the event that an opportunity to complete the monitoring in conjunction with other IDNR and/or INHS monitoring does not arise, CEMC will contract biological consultants, as necessary, to ensure post-construction monitoring is conducted for the Smooth Softshell Turtle. Results of the monitoring survey will be submitted to the IDNR.

Pre- and post-construction monitoring of the Eastern Sand Darter will be monitored by the INHS. The INHS conducts aquatic habitat and sportfish surveys throughout mid-sized rivers in Illinois, including the Embarras River. The annual Embarras River survey conducted by the INHS will be expanded to include monitoring of the Eastern Sand Darter, with funds contributed by CEMC. Results of the surveys will be submitted to the IDNR.

The Eastern Ribbon Snake will primarily be impacted by the temporary disturbance of the forested wetland. As such, monitoring of the Eastern Ribbon Snake will be performed as part of the annual monitoring that will be conducted in accordance with the Project Area Mitigation Plan that was submitted to the USACE as part of Clean Water Act Section 404 permitting process (Attachment D). Subsequently, results of the Eastern Ribbon Snake monitoring will be submitted to the IDNR. The Mitigation Plan specifies that a post-construction report including a description of construction operations, an as-built

figure, photos, and any amendments to the proposed plan be submitted to the USACE within 90 days of project completion and restoration within the mitigation area. The mitigation area will be monitored annually for a minimum of three years and a maximum of five years after final grading, seeding, and tree planting is complete to track progress towards successful restoration of the forested wetland. If success is not achieved within five years, CEMC will work with the USACE to identify and correct deficiencies within the mitigation area, and monitoring requirements will be extended for an additional period to be determined at that time.

E) Adaptive management practices that will be used to deal with changed or unforeseen circumstances that may have an effect on endangered or threatened species

The following adaptive management practices will be used to deal with changed or unforeseen circumstances that may have an effect on endangered or threatened species

Unlikely encounters with individual members of species covered within this Conservation Plan
In the event that personnel encounter a Smooth Softshell Turtle, the personnel will implement the following:

1. If the Smooth Softshell Turtle is identified where construction is proposed, trained personnel will:
    a. Halt work within the Project Area.
    b. Inform appropriate on-site personnel so that the encounter can be documented.
    c. Approach the turtle to flush it from the bank to a safer location.
    d. If necessary, consult with an IDNR biologist to determine whether relocation by an IDNR biologist is required.
2. If the Eastern Ribbon Snake or the Copperbelly Water Snake are found within the exclusion fence or the temporary access road, personnel will:
    a. Approach the snake from the construction area, guiding it away and out of the exclosure or off the road.
    b. Inform appropriate on-site personnel so that the encounter can be documented.
    c. Inspect integrity of the exclusion fence (i.e. gaps, imperfections, etc.).

Flooding
Periodic flooding is a natural component of the hydrology with the floodplain of the Embarras River. Permanent access to the bank for maintenance equipment is provided by a minimum footprint gravel road at the top of the bank. The bank will be frequently inspected so that maintenance can be provided on an as-needed basis to ensure the objectives of the Project are fulfilled. If significant flooding leads to the need for maintenance, it will be provided in a timely manner.

Successful restoration of the forested wetland

Ecological performance standards will be used to determine if the disturbed forested wetland is developing wetland characteristics and contains a desirable vegetation community. Annual inspections will include monitoring topsoil erosion, vegetation establishment, invasive/noxious weed control, and tree trunk fence maintenance. If success is not achieved within a five year monitoring period, CEMC will work with the USACE to identify and correct deficiencies within the mitigation area, and monitoring requirements will be extended for an additional period to be determined at that time.

F) Verification that adequate funding exists to support and implement all mitigation activities described in the conservation plan

CEMC owns and is responsible for long-term management of the property. The Site is covered under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and as such, CEMC is responsible for the environmental stewardship of this area (EPA Site ID: ILD042671248) into the future.

3) A description of alternative actions the applicant considered that would reduce take, and the reasons that each of those alternatives was not selected

The no action alternative would allow erosion of the bank to continue, reducing bank stability, increasing sedimentation, and potential influxes of historically disposed refinery material. As such, the no action alternative is not preferred.

Another alternative action considered for this Project included stabilization of the riverbank by barge. This alternative would likely yield the same results as the preferred alternative, but may increase the chance for incidental take during the construction phase, due to in-river work. This alternative was not preferred, due to the shallow flow of the Embarras River during normal conditions.

4) Data and information to indicate that the proposed taking will not reduce the likelihood of the survival of the endangered or threatened species in the wild within the state of Illinois, the biotic community of which the species is a part, or the habitat essential to the species existence in Illinois

The Smooth Softshell Turtle is recognized as a vagile species, provided summer water temperatures promote movement. The proposed Project would not physically inhibit turtles from utilizing the adjacent sandbar; similarly, the Project will not prevent turtles from relocating to another sandbar if the construction noise proved to be a deterrent. Anecdotal observations that suggest declining populations of the Smooth Softshell Turtle indicate that the main cause is associated with flooding potential nesting habitat (Van Dijk 2011). The construction associated with this Project is temporary, and will not physically disrupt the adjacent sandbar that may be suitable for nesting. Smooth Softshell Turtle hatchlings are not anticipated to be affected by this Project, as research

suggests that sandbar hatchlings for this species synchronize their emergence with the local sunset, likely after construction has ceased for the day (Plummer 2007). Additionally, this species is widespread throughout the state, as approximately 30 counties throughout Illinois have documented occurrences of the Smooth Softshell Turtle (INHS 2017b). The Smooth Softshell Turtle is known to occur in an additional 21 states, so the incidental taking is not expected to jeopardize the survivability of local or national populations (Van Dijk 2011).

Eastern Sand Darter populations are found throughout extents of Illinois, Kentucky, Indiana, Michigan, Ohio, West Virginia, Pennsylvania, Vermont, and New York (Adams and Burr 2004). While populations vary in state status (i.e. species of concern, threatened, and endangered), the population as a whole seems to be stable (Adams and Burr 2004). As such, the incidental taking is not anticipated to jeopardize the national population. While no population studies have been conducted for this species, historical observations of the Eastern Sand Darter have been recorded in several rivers in Illinois. Data obtained from the INHS indicate that the Sand Darter has been observed in Lawrence County, Illinois; however, local population estimates cannot be derived from these data. This Project will not impact the adjacent river bank, where potential habitat for the Eastern Sand Darter may be present. Additionally, this Project will reduce stream sedimentation, which is recognized by the IDNR as one of the major management concerns regarding this species (IDNR 2017b). In addition to reducing sedimentation, the Project will create habitat for aquatic invertebrates, which are dietary staple of the Eastern Sand Darter. A reduction in sedimentation, increased forage, and avoidance of suitable habitat disturbance suggest that the Project will not negatively impact the local Eastern Sand Darter population.

The Eastern Ribbon Snake is known to occur throughout the eastern U.S, as well as some Canadian provinces. Within Illinois, this species has been documented in approximately 10 counties in the southern portion of the state (INHS 2017c). Only two occurrences have been documented near the Project Area in approximately 15 years (INHS 2017a). Incidental take of the Eastern Ribbon Snake is anticipated to be minimal, due to the avoidance and minimization measures outlined in this application. No impact to the local or national population is anticipated.

A copy of the implementing agreement can be found in Attachment F.

References

Adams, G.L., and Burr, B.M. 2004. Conservation Assessment for the Eastern Sand Darter (*Ammocrypta pellucida*). Department of Zoology, Southern Illinois University. Available from: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm91_054382.pdf.

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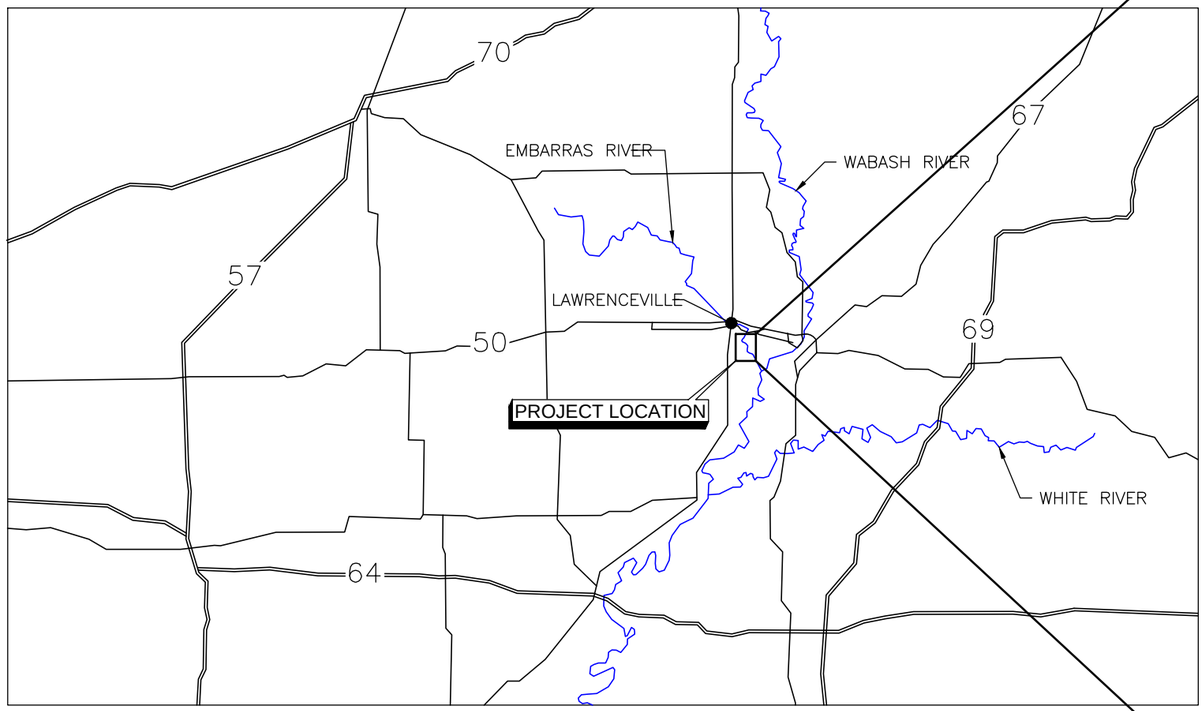
Attachments

Figure 1.	Project Site, Former Indian Refinery, Lawrence County, Illinois
Attachment A.	Project Plan, Embarras Riverbank Stabilization Project, Former Indian Refinery, Lawrence County, Illinois
Attachment B.	Pre-Construction Riverbank and Forested Wetlands Photos
Attachment C.	Aquatic Turtle Surveys of the Embarras River Bottoms State Habitat Area (ERBSHA) in Lawrence County, Illinois
Attachment D.	Wetland Mitigation Plan, Former Indian Refinery – Embarras River Bank Stabilization Project, Lawrenceville, Illinois
Attachment E.	Sample Education Materials for Project Personnel
Attachment F.	Implementing Agreement

Addendum

FIGURE



1 **PROJECT VICINITY MAP**
NOT TO SCALE

N

Image Cite: Orthoimagry provided by client, May 2003

2 **PROJECT LOCATION MAP**
SCALE: 1" = 1,000'

0 1,000'

N

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FIGURE 1

GENERAL PROJECT AREA

FORMER INDIAN REFINERY
LAWRENCEVILLE, ILLINOIS

Drawn By: JLP	Checked By: SJ	Scale: AS SHOWN	Date: 7/6/2017	File: 339_RESTPLNSITELOC-201702

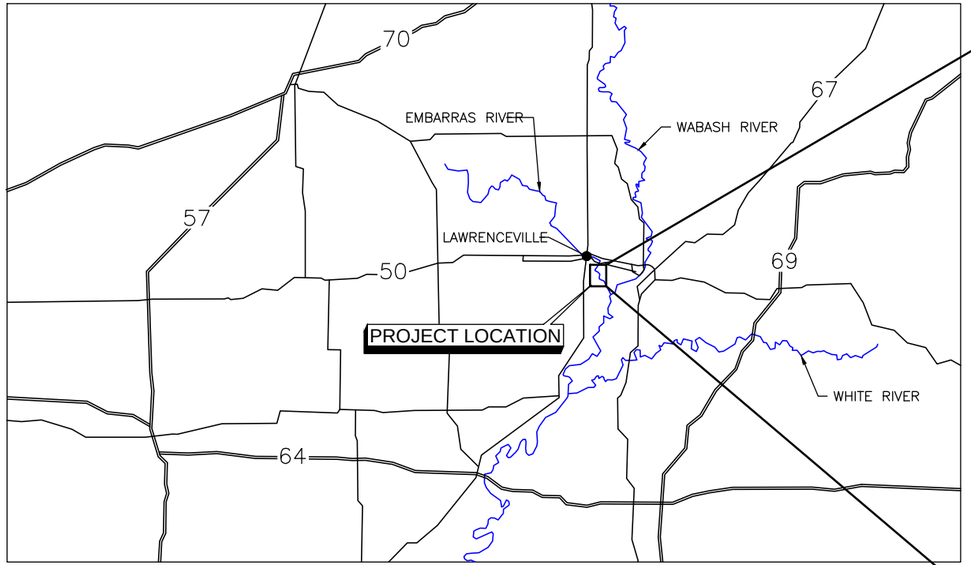
ATTACHMENT A

PROJECT PLAN, EMBARRAS RIVERBANK STABILIZATION PROJECT
FORMER INDIAN REFINERY, LAWRENCE COUNTY, ILLINOIS

EMBARRAS RIVER
BANK STABILIZATION PROJECT

LAWRENCE COUNTY, ILLINOIS

DECEMBER 2016



1 PROJECT VICINITY MAP
NOT TO SCALE

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Image Cite: Orthoimagry provided by client, May 2003

2 PROJECT LOCATION MAP
SCALE: 1" = 1,500'

SHEET NUMBER	TITLE	REV
1 OF 5	TITLE SHEET	0
2 OF 5	PROJECT PLAN	0
3 OF 5	BANK STABILIZATION DETAILS	0
4 OF 5	TYPICAL CROSS SECTION	0
5 OF 5	TYPICAL CROSS SECTION	0

3 INDEX OF SHEETS

NOT FOR CONSTRUCTION

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DRAWN BY: JLP
CHECKED BY: TH
DATE: 3/1/2017
SCALE: AS SHOWN
FILE: 339_SBS-COVER-201702

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TITLE SHEET

EMBARRAS RIVER
BANK STABILIZATION PROJECT
FORMER INDIAN REFINERY
LAWRENCE COUNTY, ILLINOIS

SHEET 1
1 OF 5
REV: 0

START OF BACK STABILIZATION 294+67

END OF BACK STABILIZATION 309+75

TYPICAL CROSS SECTION

RIPRAP TRENCH (END TREATMENT)

RIPRAP TRENCH (END TREATMENT)

PROPOSED CHANNEL STABILIZATION

PROPOSED ACCESS ROAD TURN AROUND

BENDWAY WIER (TYPICAL)

PROPOSED ACCESS ROAD

PROPOSED RIPRAP SLOPE STABILIZATION

PROPOSED ACCESS ROAD

TEMPORARY DISTURBANCE BOUNDARY

WETLANDS (APPROXIMATE BOUNDARY)

EXPLANATION

- 1/4 — VIEW NUMBER / SHEET NUMBER
- WATER FLOW DIRECTION
- SURFACE CONTOURS (1' INTERVAL)

N

0 130'

NOT FOR CONSTRUCTION

REV.	DATE	DESCRIPTION	BY	CHK'D
		REVISIONS		

DRAWN BY: JLP
CHECKED BY: TH
DATE: 2/28/2017
SCALE: 1" = 130'
FILE: 339_SBS-SITEPLNS-201702

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PROJECT PLAN

EMBARRAS RIVER
BANK STABILIZATION PROJECT
FORMER INDIAN REFINERY
LAWRENCE COUNTY, ILLINOIS

SHEET 2 2 OF 5

REV: 0

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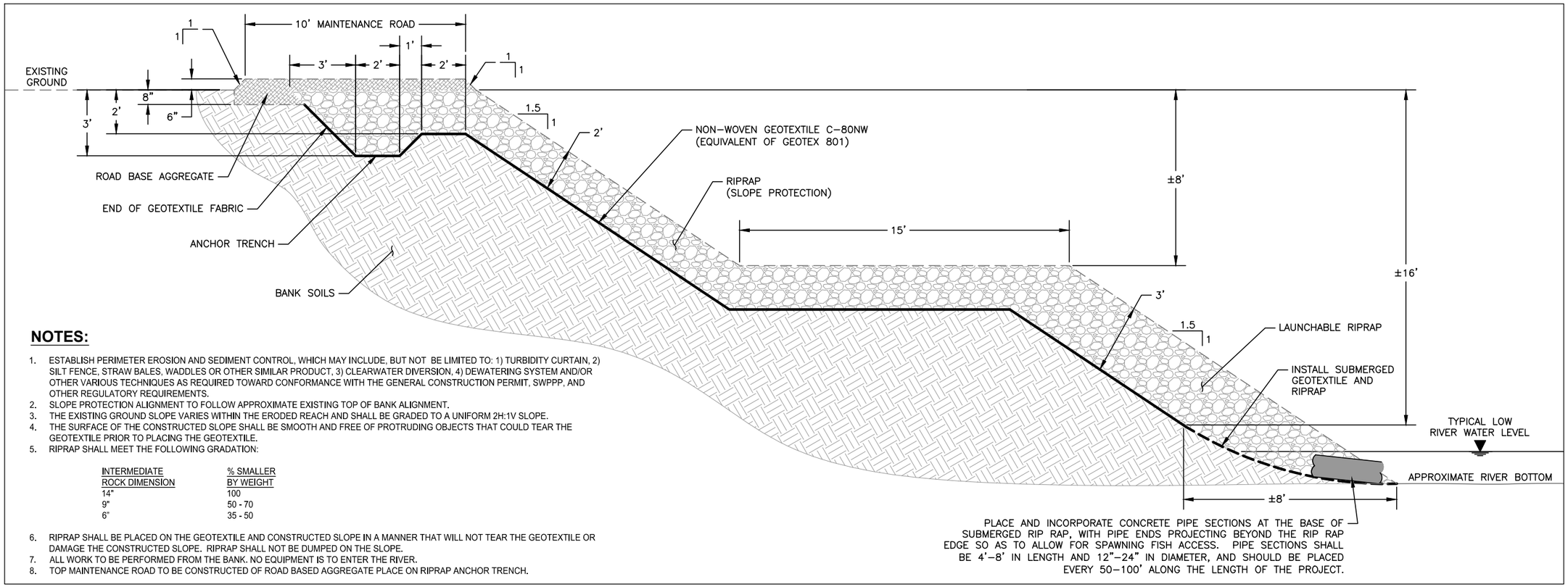


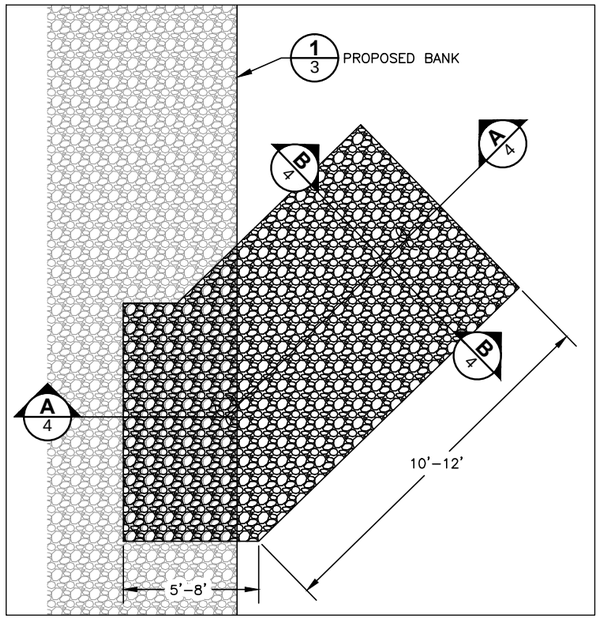
NOTES:

1. ESTABLISH PERIMETER EROSION AND SEDIMENT CONTROL, WHICH MAY INCLUDE, BUT NOT BE LIMITED TO: 1) TURBIDITY CURTAIN, 2) SILT FENCE, STRAW BALES, WADDLES OR OTHER SIMILAR PRODUCT, 3) CLEARWATER DIVERSION, 4) DEWATERING SYSTEM AND/OR OTHER VARIOUS TECHNIQUES AS REQUIRED TOWARD CONFORMANCE WITH THE GENERAL CONSTRUCTION PERMIT, SWPPP, AND OTHER REGULATORY REQUIREMENTS.
2. SLOPE PROTECTION ALIGNMENT TO FOLLOW APPROXIMATE EXISTING TOP OF BANK ALIGNMENT.
3. THE EXISTING GROUND SLOPE VARIES WITHIN THE ERODED REACH AND SHALL BE GRADED TO A UNIFORM 2H:1V SLOPE.
4. THE SURFACE OF THE CONSTRUCTED SLOPE SHALL BE SMOOTH AND FREE OF PROTRUDING OBJECTS THAT COULD TEAR THE GEOTEXTILE PRIOR TO PLACING THE GEOTEXTILE.
5. RIPRAP SHALL MEET THE FOLLOWING GRADATION:

INTERMEDIATE ROCK DIMENSION	% SMALLER BY WEIGHT
14"	100
9"	50 - 70
6"	35 - 50

6. RIPRAP SHALL BE PLACED ON THE GEOTEXTILE AND CONSTRUCTED SLOPE IN A MANNER THAT WILL NOT TEAR THE GEOTEXTILE OR DAMAGE THE CONSTRUCTED SLOPE. RIPRAP SHALL NOT BE DUMPED ON THE SLOPE.
7. ALL WORK TO BE PERFORMED FROM THE BANK. NO EQUIPMENT IS TO ENTER THE RIVER.
8. TOP MAINTENANCE ROAD TO BE CONSTRUCTED OF ROAD BASED AGGREGATE PLACE ON RIPRAP ANCHOR TRENCH.

1 TYPICAL BANK DETAIL
SCALE: 1" = 5'



2 TYPICAL BENDWAY WEIR PLAN VIEW
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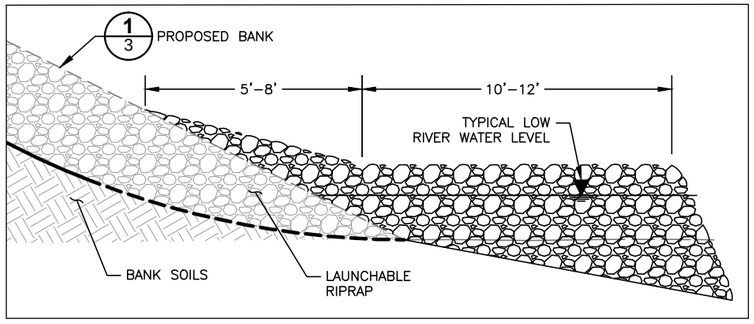
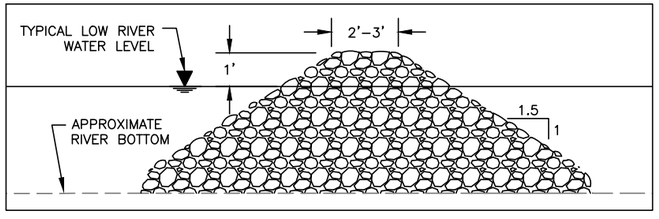


A TYPICAL BENDWAY WEIR PROFILE VIEW
SCALE: 1" = 5'



B TYPICAL BENDWAY WEIR PROFILE VIEW
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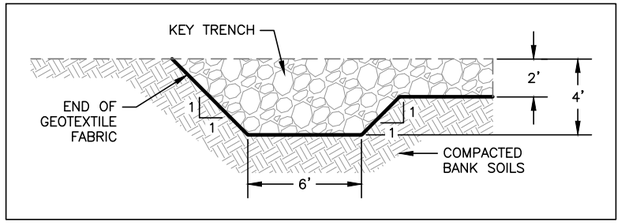

3 BANK END TREATMENT DETAIL
SCALE: 1" = 8'

NOT FOR CONSTRUCTION

REV.	DATE	DESCRIPTION	BY	CHK'D
		REVISIONS		

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TYPICAL BANK DETAIL

EMBARRAS RIVER
BANK STABILIZATION PROJECT
FORMER INDIAN REFINERY
LAWRENCE COUNTY, ILLINOIS

SHEET 3 3 OF 5
REV: 0

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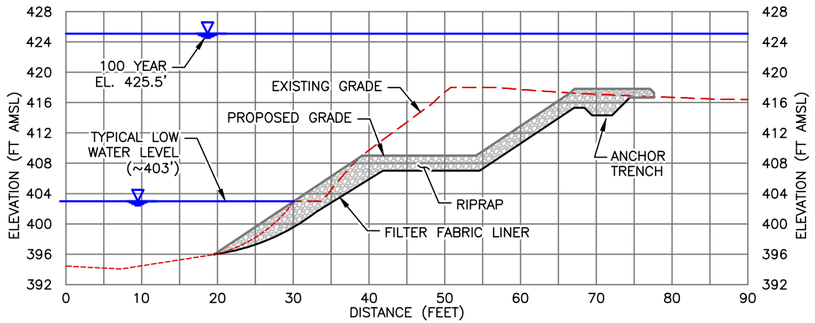

A **BANK SECTION STA. 296+59**
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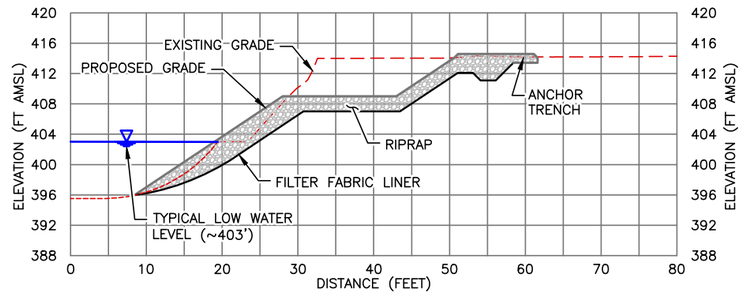

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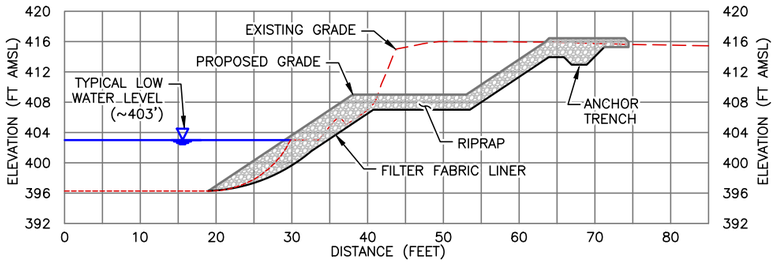

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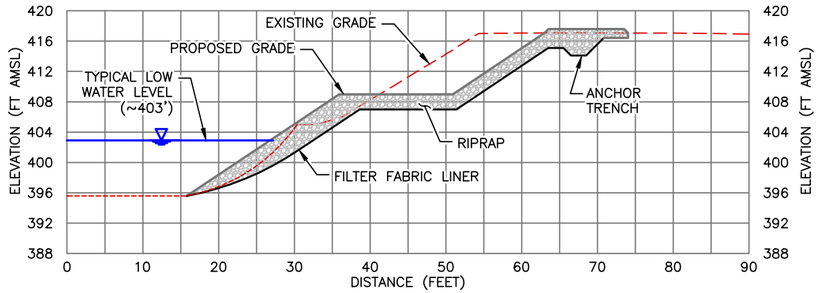

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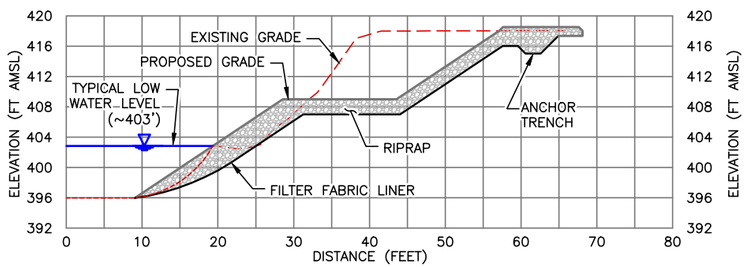

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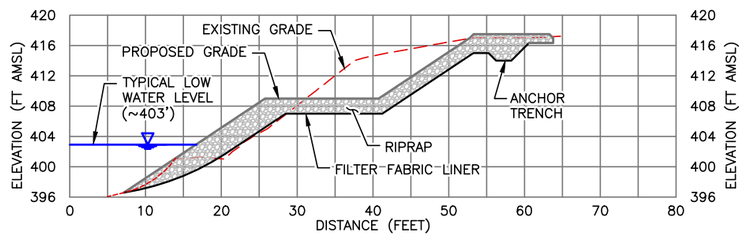

F **BANK SECTION STA. 309+70**
SCALE: H: 1" = 10' V: 1" = 10'

NOTE:

FT AMSL = FEET ABOVE MEAN SEA LEVEL

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REV.	DATE	DESCRIPTION	BY	CHK'D

REVISIONS

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TYPICAL CROSS SECTIONS

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SHEET 4
4 OF 5
REV: 0

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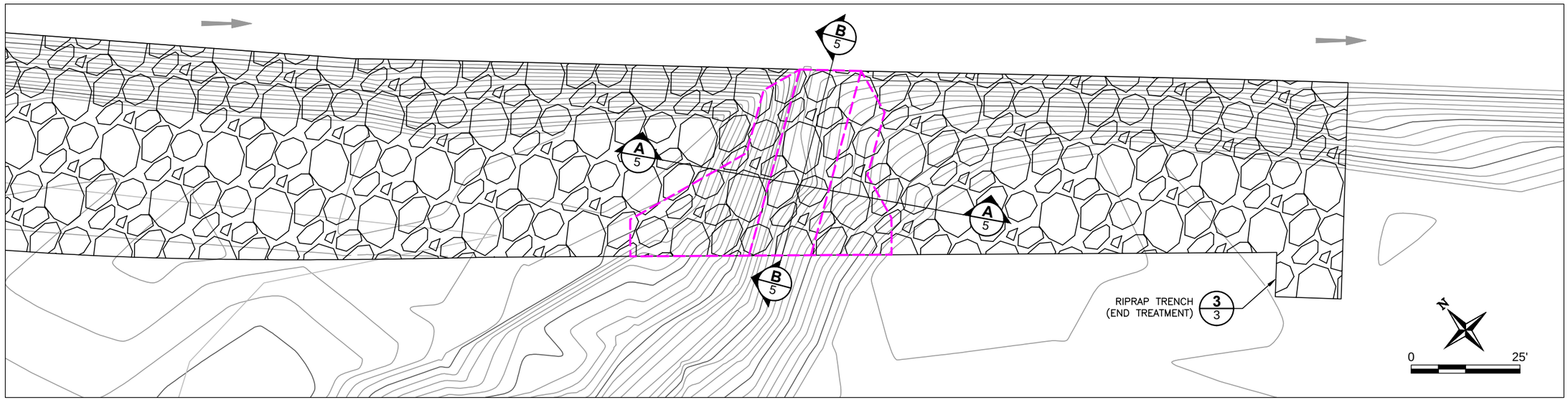
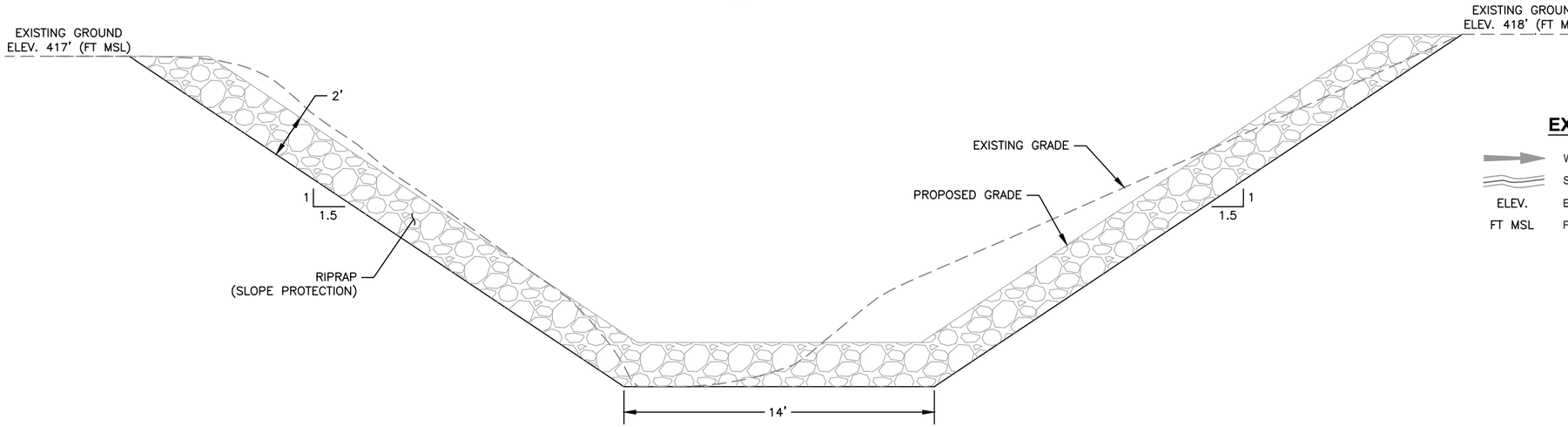
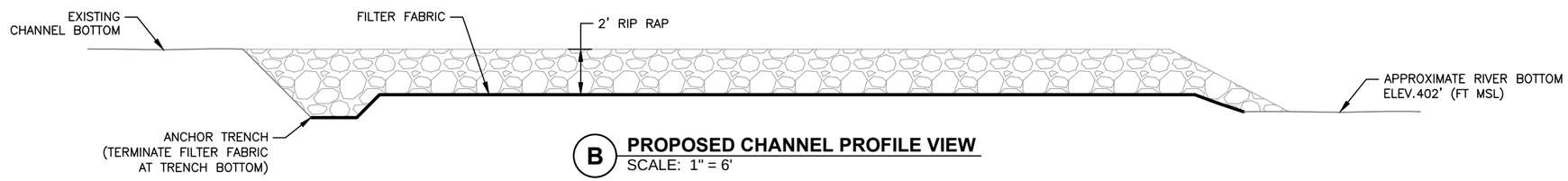


1 PROPOSED CHANNEL PLAN VIEW
SCALE: 1" = 25'



A PROPOSED CHANNEL PROFILE VIEW
SCALE: 1" = 6'



B PROPOSED CHANNEL PROFILE VIEW
SCALE: 1" = 6'

EXPLANATION

- WATER FLOW DIRECTION
- SURFACE CONTOURS (1' INTERVAL)
- ELEV. — ELEVATION
- FT MSL — FEET RELATIVE TO MEAN SEA LEVEL

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REV.	DATE	DESCRIPTION	BY	CHK'D
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PROPOSED CHANNEL DETAIL

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LAWRENCE COUNTY, ILLINOIS

SHEET 5
5 OF 5
REV: 0

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ATTACHMENT B

PRE-CONSTRUCTION RIVERBANK AND FORESTED WETLANDS PHOTOS

ATTACHMENT B. PRE-CONSTRUCTION RIVERBANK AND FORESTED WETLAND PHOTOS

Representative Photos of the Project Area
March, 2016

Photo 1. Forested Wetland

Photo 2. Forested Wetland/Upland Boundary

ATTACHMENT B. PRE-CONSTRUCTION RIVERBANK AND FORESTED WETLAND PHOTOS

Photo 3. Riverbank Erosion

Photo 4. Riverbank Erosion

ATTACHMENT C

AQUATIC TURTLE SURVEYS OF THE EMBARRAS RIVER BOTTOMS STATE HABITAT AREA (ERBSHA) IN LAWRENCE COUNTY, ILLINOIS

INHS TECHNICAL REPORT

Aquatic Turtle Surveys of the Embarras River Bottoms State Habitat Area (ERBSHA) in Lawrence County, Illinois

IDNR Project No.: NRDA1503

Prepared by:
Andrew R. Kuhns, INHS

Prepared For:
Office of Land Management
Containment Assessment Section
Illinois Department of Natural Resources
One Natural Resource Way
Springfield IL 62702-1271

INHS Technical Report 2015 (43)
31 December 2015

PRAIRIE RESEARCH INSTITUTE
Mark R. Ryan, Executive Director

ILLINOIS NATURAL HISTORY SURVEY
Geoff Levin, Interim Director

PROJECT SUMMARY

This report details results of herpetological surveys with an emphasis on aquatic turtles in Embarras River Bottoms State Habitat Area (ERBSHA) in Lawrence County Illinois. Four sampling sessions each consisting of four day and three night were conducted by INHS aquatic ecologist / herpetologist A.R. Kuhns from June through October 2015. Sampling in June and early August focused on lentic wetlands and trap locations were paired to other long term monitoring stations within the property (**Figure 2**). September and October sampling sessions focused on the Embarras River proper that flows through the ERBSHA property. Seven freshwater turtle species were documented during the surveys. Additionally, six frog species and six snake species were encountered during the surveys. Notable captures include the Northern Musk Turtle, *Sternotherus odoratus*, and Spiny Softshell, *Apalone spinifera*, which represents the first documentations of the species in Lawrence County, Illinois; 18 Smooth Softshell, *Apalone mutica*, which is and endangered species in Illinois; and Eastern Ribbon Snake, *Thamnophis sauritus*, which is protected as a threatened species in Illinois. All sampling was conducted under an Illinois Department of Natural Resources (IDNR) Scientific collecting permit and IDNR Public Lands Research Permit to A.R. Kuhns and an IDNR State Threatened and Endangered Species Permit 05-11S (sub-permittee). Survey methods are approved under University of Illinois IACUC protocol 14000.

Surveys Conducted By: Andrew R. Kuhns, Ecologist / Herpetologist

University of Illinois
Prairie Research Institute
Illinois Natural History Survey
Statewide Biological Survey and Assessment Program
1816 South Oak Street
Champaign, Illinois 61820

TABLE OF CONTENTS

Cover Photo: Smooth Softshell, *Apalone mutica*, captured in a single-throated, baited hoop trap set in the Embarras River, within the Embarras River Bottoms State Habitat Area in September 2015.

List of Figures and Tables

INTRODUCTION

The Embarras River Bottoms State Habitat Area (ERBSHA; **Figure 1**) was created as mitigation for the contamination of the old Indian Refinery south of Lawrenceville, IL and is managed by the Illinois Department of Natural Resources (IDNR). The habitat area currently consists of approximately 2,200 acres of bottomland forest and wetland habitat. In addition to the acreage, funds were provided to restore and enhance the quality of the habitat area. A four phase management and monitoring plan for the site was drafted by the IDNR and approved as a roadmap for restoration. Phase I of the plan includes 1) securing the site with boundary markers and gates, 2) baseline management such as brush cutting, mowing, bank stabilization, and oil-well management; and 3) baseline monitoring of flora and fauna within the property.

As one of the first steps towards capturing baseline data about the site, monitoring stations (**Figure 2**) were installed in the various habitat types throughout the site to 1) monitor vegetative succession, 2) as sites for point count bird surveys, and 3) camera traps for other wildlife. An initial effort to determine freshwater turtle species composition was conducted in 2013. Among other sampling efforts, the survey documented three species, Painted Turtles, *Chrysemys* picta, Snapping Turtle, *Chelydra serpentina*, and Sliders, *Trachemys scripta* from 20 traps set throughout the property.

This report builds upon the work done by IDNR to establish monitoring stations and set baseline information about the herpetological fauna of the ERBSHA site. The objective of this report is to increase the knowledge base of the amphibians and reptiles of the ERBSHA site with a special emphasis on freshwater turtle species. Additionally, results will aid in setting a baseline of turtle species composition to assess the effects of ongoing habitat restoration on the herpetofaunal community at the site.

PROJECT AREA

The 2,200 acre site consists of lowland floodplains along approximately 8 km of the Embarras River. It encompasses parts of Sections 7, 8, 17, 18, 20, 21, 22, 26, 27, 28, and 34 of Township 3 N, Section 11 W of the USGS 7.5' Quadrangle Map (**Figure 1**). The habitat within the conservation area includes: mesic floodplain forest, old field habitat (both sand prairie and wet savanna), upland forest, and wetlands. The majority of the property has been disturbed by either agricultural use or oil reclamation.

METHODS

Four rounds of trapping occurred in 2015: 02 through 05 June; 04 through 07 August; 25 through 28 August; 30 September through 02 October. Traps were set the first day, checked the next three days and pulled on the fourth day. Thus, each trapping session resulted in three separate samples of turtles per round. The predominant trap type used was collapsible hoop traps of various diameters (12", 20", and 26"). Utilizing different diameter of traps allowed for trapping

in various depths of water while still allowing the top of the trap to remain out of water and prevent turtles from drowning. Additionally, a two chambered, un-baited fyke net with a single lead was deployed in one wetland during the June and August sampling sessions.

Hoop traps were baited with invasive Asian carp, sourced from throughout the state. To prepare the bait, the fish was frozen whole and then sliced into approximately 1" cross sections (or steaks) using a reciprocating saw. Bait was hung from the center of the trap using either drainage tile sock, or suet bird feeders. With few exceptions, bait was changed daily.

During the June and early August sampling sessions I focused on wetlands within ERBSHA. In an effort to have trapping locations coincide with long term monitoring stations, traps were set at wetlands closest to the stations that were holding water (Table 2). In addition to setting turtle traps, transects were set and surveyed, and cover-boards were checked at each long-term monitoring location. Transects starting points were set as the pole denoting the long term monitoring station location and extended 50 m in a random direction with the stipulation that transects could not terminate on a vehicle path or regularly mowed area. The end of each transect was marked with a 6' narrow steel stake and flagged with orange flagging tape. Also at each long term monitoring station a pair of tin cover-boards (installed by IDNR in the spring of 2015) was flipped each time the traps were checked. The identity of all herptiles was recorded for all trap, cover-board, and transect samples. During the 04 through 07 August sampling session, only stations north of Billet Rd were sampled. The section south of Billet Road was inaccessible due to wet conditions. One trap location was replaced during the second sampling session because the traps at the original location were stolen. The new sampling station was set in an area that would receive less visitation and decrease the odds of trap theft. In addition to the set sampling that occurred at stations, I recorded all incidentally encountered amphibians and reptiles observed while travelling to the different locations. All species encountered are noted as such in **Appendix A**

The late August and September sessions were restricted to the Embarras River channel. Traps were set and checked via canoe and kayak. Traps placed in the Embarras River were 26" diameter single-throated hoop traps, also baited with invasive Asian carp. Traps were set with the entrance facing downstream and were selectively set along exposed sandbars in the Embarras River in an effort to document the state endangered Smooth Softshell, *Apalone mutica*. During these trapping sessions the long term monitoring stations were not checked as it was not logistically possible to sample both the wetlands and the river in a day.

All trap captures are reported as Catch Per Unit Effort (CPUE). For turtle surveys, the unit of effort is typically a trap night. As an example, if four traps are set for 3 nights in a sampling session, the total effort for that sample is 4x3 or 12 trap nights. The total number of captures per species is then divided by the total trap nights to generate the CPUE score. Thus, in the example above, if 6 individuals of a species were captured in those 12 trap nights, the CPUE for that species would be 0.5. CPUE is a means of standardizing results when effort is not equal between or among sites and more robust estimators are not warranted due to lack of robustness of the data.

RESULTS

Wetland Surveys

Turtle Trapping: Four of the monitoring stations were inaccessible for the duration of this study. Station R15-2P, the farthest south of the stations, is accessible only by crossing an old oxbow slough of the Embarras River. During both rounds of sampling in 2015 the water was too high to safely cross. In the northern unit of the site, a beaver dam has created a large pond that made R4-1P, R5-2P, and R6-1P inaccessible. Additionally, stations R13-1P and R13-2P were sampled in round one but were inaccessible for the second round of sampling.

The six long term monitoring stations I had access to were sampled for 144 trap nights and yielded five species of freshwater turtle (**Table 1**). Hoop traps never captured more than 3 species at any of the wetlands sampled and no turtles were captured at station R13-1P. Slider turtles were the most numerous species encountered (CPUE: Round 1= 0.77; Round 2 = 0.91), followed by Painted Turtle (CPUE: Round 1 = 0.28; Round 2 = 0.12) and Snapping Turtle (CPUE: Round 1 = 0.22; Round 2 = 0.17). Two species, Northern Musk Turtle, *Sternotherus odoratus*, and Spiny Softshell, *Apalone spinifera*, were represented by a single individual. Additionally, the lone Northern Musk Turtle encountered was captured in the fyke net.

Cover-boards and Transects: Nothing was detected under the cover-boards or transects during the June round of sampling. The second round of sampling, in early August, produced 3 frog species and 2 snake species (**Table 2**).

River Surveys

Three species of freshwater turtle were captured in 58 trap nights of sampling the Embarras River (**Table 3**). Slider Turtles were again the most frequently captured species (CPUE: Round 1 = 0.74; Round 2 = 0.49), but two species, Smooth Softshell, and Ouachita Map Turtle, were detected in the river that were absent from the wetland samples.

DISCUSSION

Sampling at ERBSHA proved to be challenging due to hydrologic conditions of the site. Initial plans were to sample the site once each in May, June, July and August. However, as shown above, this proved impossible in 2015. I was unable to initiate any sampling at the site until June due to flooded conditions at the site. During that initial sampling session, the water rose over 3 feet in some wetlands, making it difficult to set traps in such a way to keep captured animals from drowning. Two additional sampling sessions were cancelled in July due to wet conditions at the site and during the early August sampling round I was still unable to access the southern portion of the site. Further, one sampling location had to be changed when traps set overnight were stolen. These factors have precluded an in depth analysis of occupancy and detection that I was hoping to provide with this study.

Despite these difficulties, sampling remained productive in determining species composition of the site. Cover boards set at the long term monitoring stations were probably set too late to be of great value in 2015. Heyer (1994) suggests setting cover-boards the year before sampling begins to have the greatest

odds of their success. Regardless, cover-boards did start to become productive by August, with Northern Watersnake, Common Gartersnakes, and Southern Leopard Frogs, all being found underneath them (**Table 2**). Transects were run with minimal success during 2015 although they did document four species (**Table 2**). By time the site was accessible in June, the vegetation was already well established along most transects, making observations of herpetofauna difficult. Regardless, these two sampling methods will be of value in the long term monitoring of the site. As repeated visits to the monitoring stations continue, and observations are recorded, a wealth of data should come from them.

The initial turtle survey in 2014 detected three species in ERBSHA. In 2015, those three species and three additional species of freshwater turtle were captured. In fact, every species of freshwater turtle currently known to occur in Lawrence County, Illinois was detected during this study (**Appendix D**). As is the norm in southern Illinois, the turtle community was dominated by the Slider Turtle, *Trachemys scripta*. This is also the case farther south in Gallatin County, IL (Dreslik et al. 2005) and in the backwaters of the Mississippi River (Dreslik and Phillips 2005). The Common Snapping Turtle, *Chelydra serpentina*, and Painted Turtle, *Chrysemys picta*, are also common species that inhabit many of the states wetlands and the two species were captured with equal regularity in this study. In the northern parts of the state, the Painted Turtle often replaces the Slider as the most numerous species.

The fourth most frequently encountered species the Smooth Softshell, *Apalone mutica,* was only encountered in the Embarras River channel. This is not surprising as it is considered a specialist species that prefers flowing currents over sandy substrates. Because the Smooth Softshell is afforded protection as an endangered species in Illinois (IESPB 2015), the 18 individuals, including 8 mature females, captured is promising. The lack of recaptures of this species prevents even a rudimentary estimate of population size. However, all individuals were marked (triangular notch at 5:00), so long term monitoring at the site may result in re-capture of these individuals and allow for a preliminary population estimate. Additionally, blood samples were taken from all Smooth Softshell captures and were accessioned into the INHS tissue collection.

The fifth most encountered species Ouachita Map Turtle, *Graptemys ouachitensis*, was also only captured in traps set in the Embarras River. All three individuals were males and were captured on the same day of sampling. While, map turtles typically inhabit riverine systems, they can also be found in backwater lakes and sloughs adjacent to rivers. While not captured, one Ouachita Map Turtle was tentatively identified basking on top a hoop traps set at R7-4P North during the first sampling session. Certainly, map turtles may be more abundant in the wetlands of ERBSHA than indicated from this study. This species is not often captured in hoop traps as they are typically not attracted to the cut fish used as bait.

The Spiny Softshell, *Apalone spinifera*, was represented by a single individual during this study. Spiny Softshell are not as catholic in their habitat requirements as are Smooth Softshell, therefore, it is somewhat surprising that only one individual was captured. Little is known about the interactions of the two softshell species. By sampling only sand bars in the river, I may have reduced the likelihood of capturing Spiny Softshell. While canoeing the Embarras River between sandbars a great number of softshell turtles were observed but identifying characteristics could not be discerned before they dove off their basking perches. Thus it is possible that the lack of Spiny Softshell in this sample is a result of sampling bias. The lone individual captured was from R7-4P South which does have discernable flow during the sampling sessions. Conversely, the fact that none were captured in the 2013 sample may indicate that they truly are uncommon in ERBSHA. Of note, this individual is the first documented record of the Spiny Softshell in Lawrence County, IL.

The other least encountered species Northern Musk Turtle, *Sternotherus odoratus*, was not captured in baited hoop traps at all. The lone individual, a female, was captured in the fyke net set west of R7-2P in the wetland colloquially known as Fishtail. *Sternotherus* are poor swimmers and generally frequent shallow waters where they can extend their heads to the surface while resting on the bottom. This may have some role in why none were captured in hoop traps as the water where traps were set was typically 18" or deeper. The lead of the fyke net in which the individual was captured extended nearly to shore (**Plate 3**) and may have intercepted the individual as it was walking the shallows of the wetland. Of note, this individual is the first documented record of the Northern Musk Turtle in Lawrence County, IL.

In conclusion, this study has produced a baseline for the freshwater turtle fauna and provided proof of concept for continued monitoring of other herpetofauna via cover-boards and transect sampling. This study detected three species of conservation concern in the state of Illinois (**Appendices A & C**) and suggests that there may be a sizeable population of the state endangered Smooth Softshell in the Embarras River within the site. Additionally, the captures of Northern Musk Turtle and Spiny Softshell, are the first records of the species from Lawrence County, Illinois. Long term monitoring of the herpetofaunal population at ERBSHA will be challenging. Floodplain dynamics are fluid and thus it is difficult to set regimented schedules for sampling. Although set scheduling of sampling may prove difficult, the long term monitoring stations should provide valuable information on the inhabitants of the site. Through repeated visits to the stations when and if conditions allow, it should be possible to continue to gain a better understanding of the inhabitants of the site and to detect trends in species composition as the site undergoes restoration.

ACKNOWLEDGEMENTS

Thanks to Doug Brown, Terry Esker, John Bunnell, Chris Phillips, and John Crawford for assistance in the field. Thanks to T.J. Benson, Geoff Levin, Jessica Riney, and Beth Whetsell for institutional support and insight into the site. Thanks to Jessica Riney and Beth Whetsell for reviewing a draft of this manuscript.

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Table 1. Trap locations, Captures per Unit Effort* (CPUE), and turtle captures by sex/stage class (Female: Male: Juvenile) during surveys of wetlands in the Embarras River Bottoms State Habitat Area near Billett in Lawrence County, Illinois.

	03-05 June 2015					05-07 August 2015				
Hoop Trap Site	**Trap Nights**	**C. picta**	**C. serpentina**	**T. scripta**	**S. odoratus**	**Trap Nights**	**C. picta**	**C. serpentina**	**T. scripta**	**A. spinifera**
R13-1P	12	0:0:0	0:0:0	0:0:0	0:0:0	0	---	---	---	---
R13-2P	12	0:0:0	0:2:0	5:13:0	0:0:0	0	---	---	---	---
R07-4P_N	6	1:2:0	0:0:0	9:9:0	0:0:0	6	0:1:0	0:1:0	0:7:2	0:0:0
R07-4P_S	6	0:0:0	0:0:0	0:1:0	0:0:0	6	0:0:0	1:1:0	3:4:0	1:0:0
R07-2P_W	12	6:4:0	5:5:0	6:8:4	0:0:0	12	0:0:0	0:2:0	6:7:0	0:0:0
R07-2P_E	12	1:5:0	0:0:0	0:1:0	0:0:0	12	1:4:0	0:0:0	0:3:1	0:0:0
R1-1P	12	0:0:0	3:2:0	0:0:0	0:0:0	12	1:1:0	0:2:0	5:6:0	0:0:0
R16-01T_S	6	1:2:0	0:0:0	3:0:1	0:0:0	6	0:0:0	0:0:1	0:0:0	0:0:0
R16-01T_N	0	---	---	---	---	12	0:0:0	3:0:0	6:10:0	0:0:0
Totals	78	9:13:0	8:9:0	23:32:5	0:0:0	66	2:6:0	4:6:1	20:37:3	1:0:0
Hoop Trap CPUE		0.28	0.22	0.77	0		0.12	0.17	0.91	0.02
Fyke Net	3	0:0:0	0:0:0	0:1:1	1:0:0	3	5:7:0	1:0:1	1:0:0	0:0:0
Fyke Net CPUE		0	0	0.67	0.33		4	0.66	0.33	0

* CPUE is Catch Per Unit Effort. In this case the unit of effort is Trap Night. One Trap Night equals one trap in the water for one night. Thus two traps set for 3 nights results in 6 trap nights.

Table 2. Coordinates of wetlands that were paired with the long term monitoring stations within the Embarras River Bottoms State Habitat Area.

Station	Latitude	Longitude
R13-1P	38.65798	-87.6263
R13-2P	38.65508	-87.6237
R07-4P_N	38.67738	-87.6267
R07-4P_S	38.67698	-87.6265
R07-2P_W	38.68526	-87.633
R07-2P_E	38.68513	-87.6325
R1-1P	38.70077	-87.677
R16-01T_S	38.66378	-87.6335
R16-01T_N	38.6704	-87.6332
Fyke	38.68484	-87.6372

Table 3. Encounters along transects and under cover-boards at the ERBSHA long term monitoring stations in June and August 2015. All stations were checked in June but no observations were made. In August, only the stations North of Billet Road were checked.

Station	Method	L. sphenocephalus	A. fowleri	A. blanchardi	N. sipedon	T. sirtalis
R7-4P	Cover-boards	4	2	0	1	0
	Transects	2	0	0	1	0
R7-2P	Cover-boards	0	0	0	4	2
	Transects	0	0	5	0	0
R1-1P	Cover-boards	0	0	0	0	0
	Transects	0	0	0	0	0
R16-1T	Cover-boards	0	0	0	0	0
	Transects	0	0	0	0	0
R13-01P	Cover-boards	0	0	0	0	0
	Transects	0	0	0	0	0
R13-2P	Cover-boards	0	0	0	0	0
	Transects	0	0	0	0	0
R1-1P	Cover-boards	0	0	0	0	0
	Transects	0	0	0	0	0

Table 4. Trap locations, Captures per Unit Effort* (CPUE), and turtle captures by sex/stage class (Female: Male: Juvenile) during surveys of the Embarras River reach that passes through Embarras River Bottoms State Habitat Area near Billett in Lawrence County, Illinois.

			Round 1 (25 -28 August 2015)				Round 2 (30 Sept -02 October 2015)			
Trap Site	**Latitude**	**Longitude**	**Trap Nights**	***G. ouachitensis***	***T. scripta***	***A. mutica***	**Trap Nights**	***G. ouachitensis***	***T. scripta***	***A. mutica***
SB1	38.71204	-87.67159	4	0:0:3	3:7:0	0:0:0	8	0:0:0	4:5:0	1:1:0
SB2	38.70805	-87.66841	6	0:0:0	1:2:0	0:0:0	6	0:0:0	2:3:0	1:3:0
SB3	38.70329	-87.66678	7	0:0:0	1:0:0	4:3:0	6	0:0:0	1:2:0	0:3:0
SB4	38.69565	-87.65722	0	---	---	---	3	0:0:0	0:0:0	0:0:0
SB5	38.693698	-87.65473	6	0:0:0	1:2:0	2:0:0	6	0:0:0	0:0:0	0:0:0
SB6	38.677515	-87.63622	0	---	---	---	6	0:0:0	0:0:0	0:0:0
Totals			**23**	**0:0:3**	**6:11:0**	**6:3:0**	**35**	**0:0:0**	**7:10:0**	**2:7:0**
CPUE				**0.13**	**0.74**	**0.39**		**0**	**0.49**	**0.26**

* CPUE is Catch Per Unit Effort. In this case the unit of effort is Trap Night. One Trap Night equals one trap in the water for one night. Thus two traps set for 3 nights results in 6 trap nights.

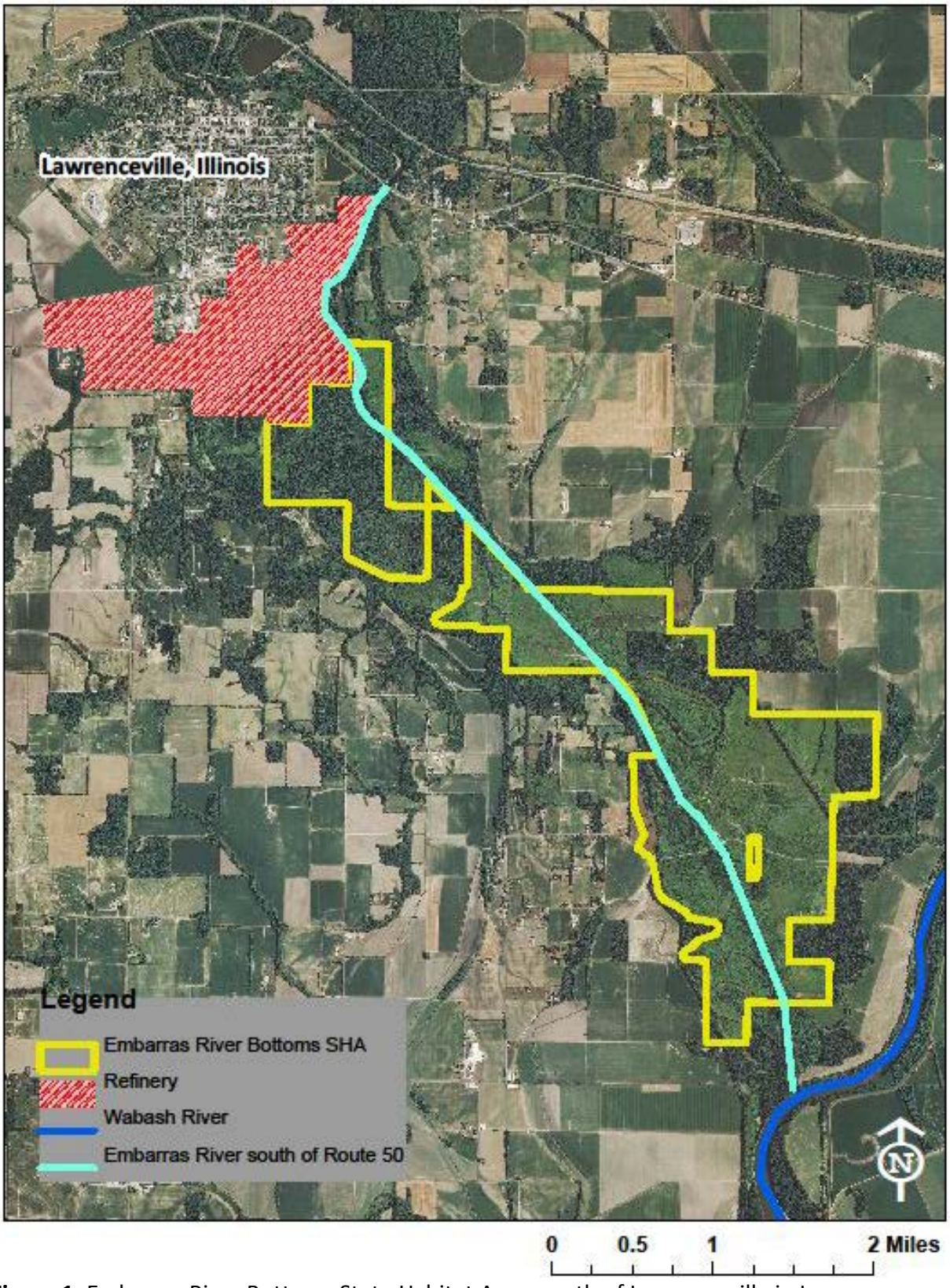


Figure 1. Embarras River Bottoms State Habitat Area, south of Lawrenceville in Lawrence County, Illinois

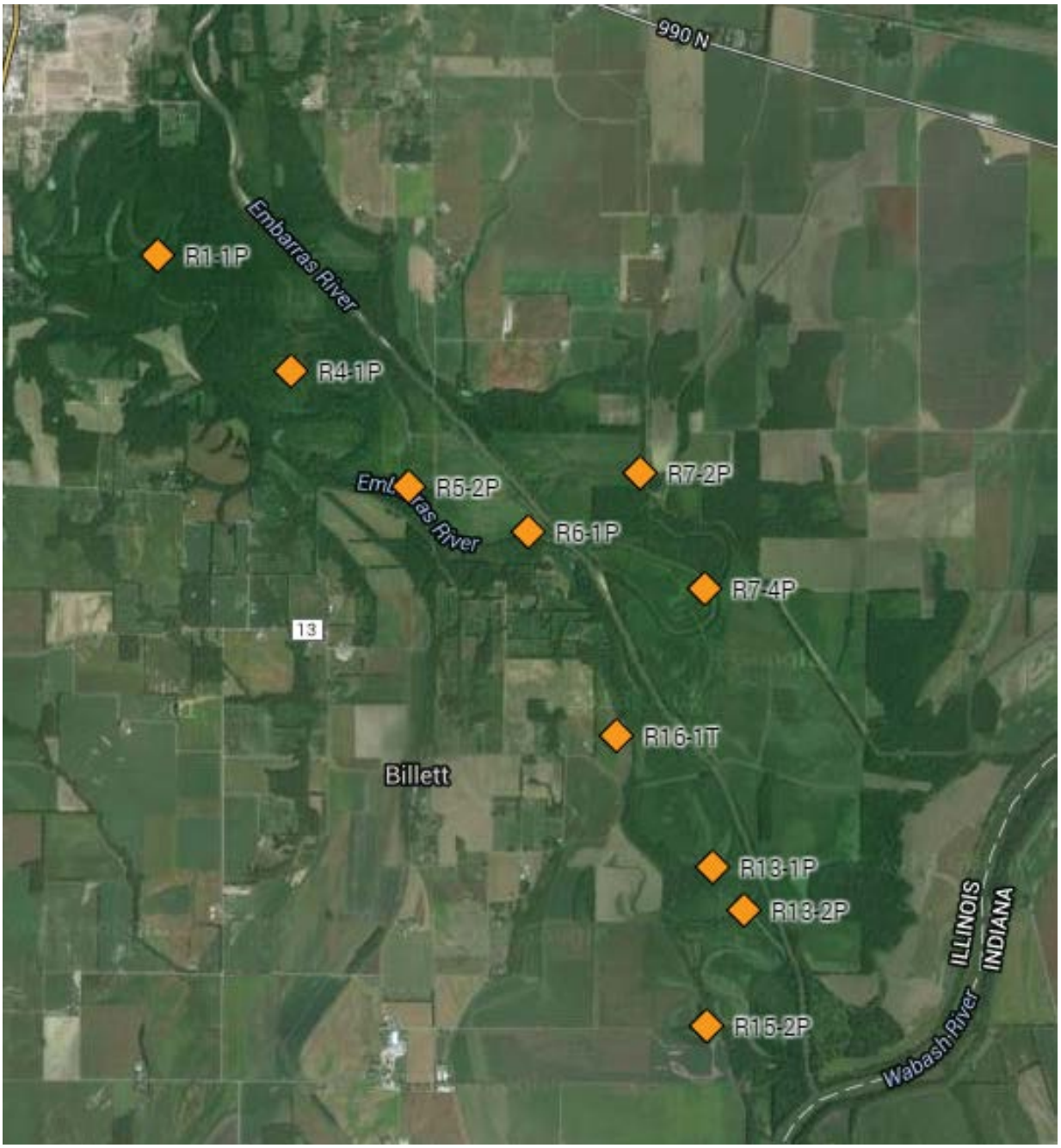


Figure 2. Location of long term monitoring stations in ERBSHA.

Appendix A

Herpetofaunal species recorded from Lawrence County, Illinois

* Denotes species documented in this survey
+ denotes new observation of the species in the county

Amphibians

Salamanders
Ambystoma maculatum
Ambystoma opacum
Ambystoma texanum
Ambystoma tigrinum
Plethodon cinereus
Plethodon glutinosus
Siren intermedia
Hemidactylium scutatum
Notophthalmus viridescens
Cryptobranchus alleganiensis

Frogs
Acris blanchardi *****
Pseudacris crucifer
Pseudacris triseriata
Hyla versicolor- chrysoscelis *****
Anaxyrus fowleri *****
Scaphiopus holbrookii
Lithobates areolatus
Lithobates catesbeianus
Lithobates clamitans *****
Lithobates sphenocephalus *****
Lithobates sylvaticus

Reptiles

Turtles
Apalone mutica *****
Apalone spinifera ***, +**
Chelydra serpentina *****
Chrysemys picta *****
Graptemys ouachitensis *****
Trachemys scripta *****
Terrapene carolina *****
Sternotherus odoratus ***, +**

Lizards
Plestiodon fasciatus
Plestiodon laticeps

Snakes
Coluber constrictor *****
Heterodon platirhinos
Lampropeltis calligaster
Nerodia erythrogaster *****
Nerodia sipedon *****
Pantherophis spiloides *****
Storeria dekayi
Thamnophis sauritus *****
Thamnophis sirtalis *****

Appendix B
Plates of stations sampled at ERBSHA in 2015

Plate 1. Wetland at station 07-2P West in ERBSHA

Plate 2. Wetland at 07-2P East in ERBSHA.

Plate 3. Fyke net set in same wetlands as station 07-2P West at ERBSHA.

Plate 4. Wetland sampled as 07-4P North at ERBSHA. Note one of the coverboards is visible in the foreground of the image

Plate 5. Station 07-4P South. This was the only location where a Spiny Softshell was captured.

Plate 6. Original location of sampling station R16-1T. It is denoted as R16-1T South in Table 1. The traps were stolen from this location so the site was changed to that depicted in Plate 7.

Plate 7. Replacement location for monitoring station R16-1T. Denoted as R16-1T North in Table 1.

Plate 8. One of the five sand bar sampled on the Embarras River during the second two rounds of sampling at ERBSHA in 2015. Numerous Smooth Softshell turtles were captured at this sandbar.

Appendix C

Element Occurrence Records submitted from this study

Illinois Natural Heritage Database
Endangered /Threatened Species Occurrence and Sighting Report Form

Name of Species:	Thamnophis sauritus			**Date Observed:**	06/02/2015		
New Sighting		**or Update**	x	Entire extent of occurrence is:		**known** OR	x **not known**
Naturally Occurring	x	or	**Introduced** Location		**When?**	**From Where?**	

Location: (For more accurate mapping, please provide a map showing the exact location)

County: Lawrence	**Latitude** 38.69946	**Longitude** -87.67763		
Direction from Nearest Landmark: 3.3 km S of Lawrenceville, Embarras River Bottoms State Habitat Area				
Natural Division and Section:				
Legal Description: Township	Range	Section	Quad name	
INAI Site Name:	**Survey Site Name (alias)** ERSHA			

Observations : (evidence of breeding or # of ♂,♀& juvenile animals or # fruiting/flowering/seedling plants, etc.): fruiting/flowering/seedling plants

Description of Area: was found along a trail foraging in a puddle full of tadpoles

Comments: not in great condition. skinny even for a ribbon snake

Specimen/voucher #(s):	INHS Unvouchered	**Where deposited?**	released immediately

Name of Observer:	Andrew Kuhns, Dan Brown
Observer's Phone Number	(217) 265 - 6707

Return to: Illinois Natural Heritage Database Program Manager, Illinois Department of Natural Resources, One Natural Resources Way, Springfield IL 62702-1271

Rev 11/07

Illinois Natural Heritage Database
Endangered /Threatened Species Occurrence and Sighting Report Form

Name of Species:	Apalone mutica			**Date Observed:**	8/27&28/2015		
New Sighting		**or Update**	x	Entire extent of occurrence is:		**known** OR	x	**not known**
Naturally Occurring	x	or	**Introduced** Location		**When?**		**From Where?**	

Location: (For more accurate mapping, please provide a map showing the exact location)
map attached

County:	Lawrence	**Latitude**	38.69364 & .70323	**Longitude**	-87.65457 & -87.66708

Direction from Nearest Landmark:	3.3 km N of Billett, IL & 4.5 km NxNW of Billett, IL
Natural Division and Section:	Wabash Borders

Legal Description:	Township		Range		Section		Quad name	

INAI Site Name:		**Survey Site Name (alias)**	Embarras River

Observations : (evidence of breeding or # of ♂,♀& juvenile animals or # fruiting/flowering/seedling plants, etc.):
fruiting/flowering/seedling plants

2 adult females at the first coordinates, 6 females & 2 males at second location.

Description of Area:	Sand bars in the Embarras River within the Embarras River Bottoms State Habitat Area.
Comments:	23 trap nights, single throated collapsible hoop traps baited with invasive asian carp resulted in 10 captures

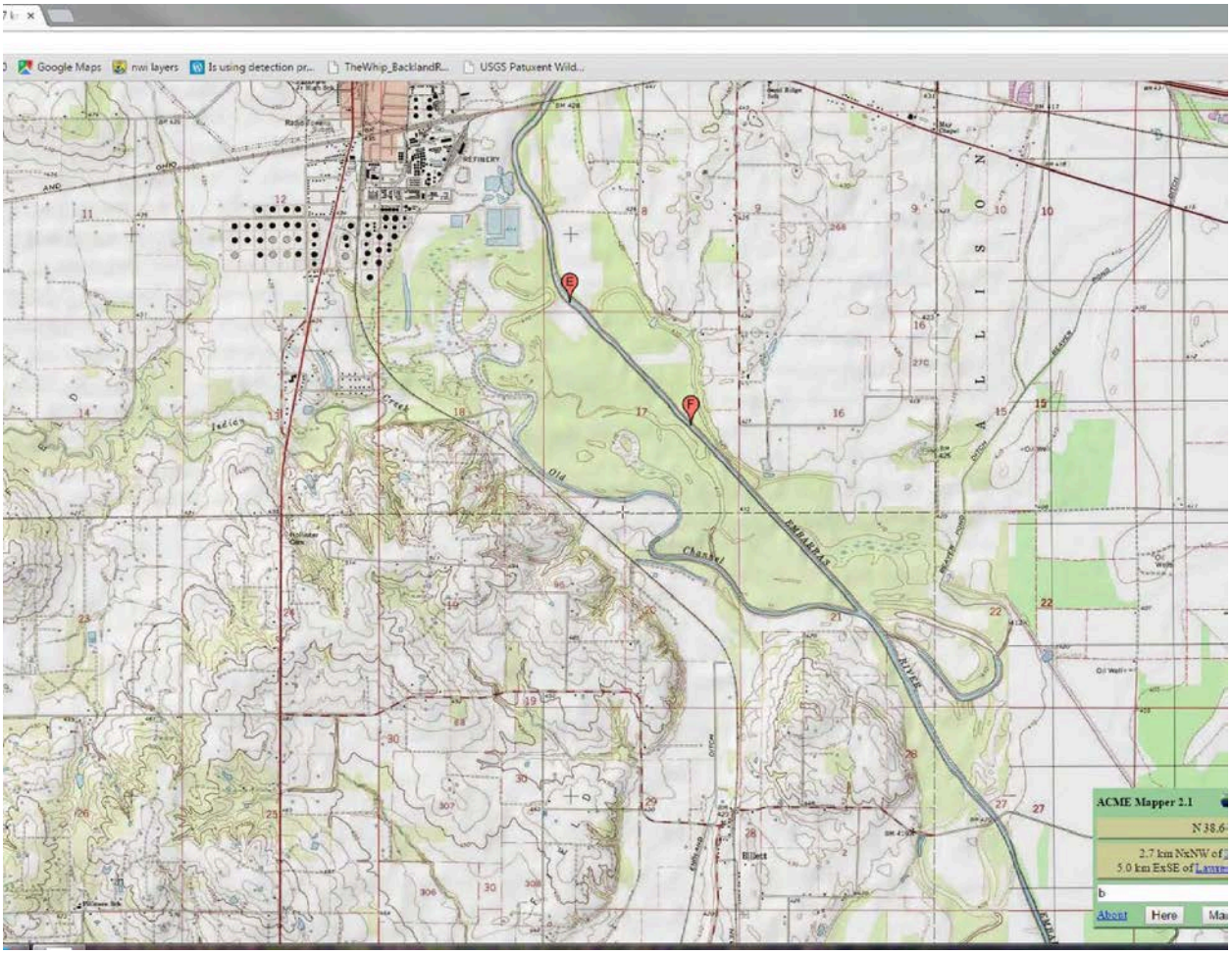
Specimen/voucher #(s):	INHS Photo and tissue	**Where deposited?**	turtles released, tissue INHS

Name of Observer:	Andrew R Kuhns & John A Crawford

Observer's Phone Number	(	217	)	265	-	6707	

Return to: Illinois Natural Heritage Database Program Manager, Illinois Department of Natural Resources,
One Natural Resources Way, Springfield IL 62702-1271

Rev 11/07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TheWhip_BacklandR...
USGS Patuxent Wild...
REFINERY
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Old
Channel
RIVER
ACME Mapper 2.1
Here

Illinois Natural Heritage Database
Endangered /Threatened Species Occurrence and Sighting Report Form

Name of Species:	Apalone mutica				**Date Observed:**	9/30/15 - 10/02/15			
New Sighting		**or Update**	x	Entire extent of occurrence is:		**known** OR	x	**not known**	
Naturally Occurring	x	or	**Introduced** Location		**When?**		**From Where?**		

Location: (For more accurate mapping, please provide a map showing the exact location)
map attached

County:	Lawrence	**Latitude**	37.71204	**Longitude**	-87.67159

Direction from Nearest Landmark: 1.9 km to 3.2 km SxSE Lawrenceville, IL to

Natural Division and Section:

Legal Description:	Township		Range		Section		Quad name

INAI Site Name:		**Survey Site Name (alias)**	

Observations : (evidence of breeding or # of ♂,♀& juvenile animals or # fruiting/flowering/seedling plants, etc.):
fruiting/flowering/seedling plants

2 Females, 7 males

Description of Area: Sand bars along the Embarras River

Comments: Captured with single throated hoop traps baited with asian carp; 38 trap nights of effort

Specimen/voucher #(s):	INHS Unvouchered	**Where deposited?**	released immediately

Name of Observer: Andrew Kuhns, J.A. Crawford, C.A. Phillips

Observer's Phone Number	(	217	)	265	-	6707	

Return to: Illinois Natural Heritage Database Program Manager, Illinois Department of Natural Resources,
One Natural Resources Way, Springfield IL 62702-1271

Rev 11/07

ATTACHMENT D

WETLAND MITIGATION PLAN FORMER INDIAN REFINERY – EMBARRAS RIVER BANK STABILIZATION PROJECT, LAWRENCEVILLE, ILLINOIS

WETLAND MITIGATION PLAN

FORMER INDIAN REFINERY – EMBARRAS RIVER BANK STABILIZATION PROJECT

LAWRENCEVILLE, ILLINOIS

May 18, 2017

Project #: 339-020-017

SUBMITTED BY: Trihydro Corporation

1252 Commerce Drive, Laramie, WY 82070

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1.0 INTRODUCTION

Chevron Environmental Management Company (CEMC) is conducting a bank stabilization project (Project) along a section of the Embarras River that adjoins the former Indian Refinery (Site) in Lawrenceville, Illinois (Figure 1). The Site is currently undergoing a remedial investigation and feasibility study (RI/FS) under the oversight of the Illinois Environmental Protection Agency (IEPA). Over time, the river channel has been migrating westward and significant erosion has occurred to the bank towards an area of historical refinery material disposal. In its current state, the bank is over-steepened, and the purpose of the Project is to cut back the bank to reduce the slope and subsequently stabilize it through the placement of geotextile fabric and rock armoring. Successful stabilization of the bank requires the construction of a temporary access road within an existing wetland, which will allow access of heavy construction machinery during the stabilization process. Once the Project has been completed, the temporary access road will be retracted, and the disturbed wetland (mitigation area) will be restored. This document outlines the Wetland Mitigation Plan, which was developed to efficiently and effectively restore the ecological function of the area. The mitigation area consists of approximately 0.7 acres of forested wetland, which is located on the western bank of the Embarras River and adjacent to the former Indian Refinery (Township 3 North, Range 1 West Section 7, see Figure 2).

2.0 PROJECT DESCRIPTION AND BASELINE INFORMATION

In 2016, Stantec Consulting Services, Inc., requested a Jurisdictional Determination (JD) from the Louisville District Office of the Unites States Army Corps of Engineers (USACE) on behalf of CEMC. The 11.6-acre area delineated in 2016 overlaps the mitigation area and was determined to be a jurisdictional wetland. This JD was used to obtain supplemental information regarding general site characteristics, existing plant community, and soil complexes (Appendix A).

2.1 PROJECT DESCRIPTION

On January 23, 2017, CEMC submitted a joint permit application to the USACE, IEPA, and Illinois Department of Natural Resources (IDNR) that described the proposed bank stabilization project. The Project will require the creation of a temporary access road, which will initially require the removal of mature trees along the bank. The temporary access road will be removed upon completion of the Project, and the resulting disturbance from the retracted road will designate the boundary of the mitigation area. Stabilization of the bank will consist of regrading approximately 1,520 feet of riverbank to a 1.5:1 slope, and stabilizing it with geotextile fabric and rock armoring (Figure 1, Appendix B). Per recommendations from the IDNR, several steps will be taken to improve the quality of the aquatic ecosystem in the Embarras River adjacent to the Project area. These steps include the construction of weirs at approximately 200 feet intervals and the placement of concrete culverts at approximately 50-100 feet intervals along the river bank. A permanent gravel road will be constructed at the top of the bank, allowing future access to vehicles to perform maintenance on the bank on an as needed basis.

2.2 ECOLOGICAL SITE CHARACTERISTICS

The Major Land Resource Area (MLRA) of this region is 113M-Central Feed Grains and Livestock Region, Central Claypan Areas. The Natural Resource Conservation Service (NRCS) web soil survey has a single, predominant soil series mapped within the mitigation area, which is Stockland loam 0 to 2 percent slopes. This soil series is not classified as “hydric” by the NRCS. Surrounding soils include, among others, Beaucoup silty clay loam and Darwin silty clay, which are classified as hydric soil types (NRCS 2016).

The Project area consists of a riparian forest within the Embarras River floodplain and parallels its western bank. The mitigation area will encompass the footprint of the disturbance caused by the temporary access road. Hydrologic features in this area consist largely of the flow of the adjacent river (Figure 1). The Project area is characterized by seasonal flooding, due to flow fluctuations in the Embarras River and/or local precipitation events. Stream flow data for the Embarras River are collected at United States Geologic Survey (USGS) stream gauge 03346500, which is

located at the US-50 BUS bridge in Lawrenceville, Illinois (less than a 0.5 miles north of the Project area). Data have been collected in this location for the past 16 years. Based on the 16-year data collected at this river gauge, the Embarras River monthly average discharge varies from approximately 350 cubic feet per second (cfs) in September to 4,700 cfs in May, and annually fluctuates in height by ten feet or more (USGS 2017). Historic streamflow data are provided in Appendix C and demonstrate the annual variability in water flow through this section of the Embarras River. Average annual precipitation for the past ten years is approximately 45 inches, with the greatest monthly precipitation amounts occurring during the spring (from April to June; MRCC 2017). Growing season flooding events lasting at least 14 days have occurred in four of the past 10 years (40%) (Appendix C). The flooding frequency does not meet the USACE Wetland Delineation Manual Midwest Regional Supplement criteria for hydric soils (≥50%); however, saturation resulting in anaerobic soil conditions may occur more frequently, especially during the days following the retreat of the river water level just below the level classified as flooding. The Project Area was delineated as a wetland in 2016, and the soils were observed to contain hydric soil indicators (Appendix A). As indicated above, the stream gauge data used to identify the number of days exceeding flood stage is upstream and not within the Project area. As such, the data are valuable in characterizing the general flood frequency in the area but may not be entirely representative of Project area conditions.

As part of the Joint Application Process, IDNR reviews the Project description and location to identify any sensitive natural resources within the Project area. In addition, the USACE will consult with both the United States Fish and Wildlife Service (USFWS) and the State Historic Preservation Office (SHPO) to identify any threatened and endangered (T&E) species or cultural resources that may occur within the Project area. Mitigation measures may be required to prevent impacts to T&E species and/or cultural resources. The USFWS Information for Planning and Conservation (IPaC) tool was used to identify critical habitat for T&E species within the Project area. The report results indicate that the Project area does not contain critical habitat for any T&E species. However, as previously indicated by IDNR, this does not eliminate the potential for these species to exist in this area (Appendix D). After consultation with the USFWS, the USACE provided additional information regarding measures to be taken to protect federally-listed T&E species that may occur within the Project area. The endangered Indiana Bat (*Myotis sodalis*) and the threatened Northern Long-eared Bat (*Myotis septentrionalis*) could occur within the Project area and/or general area. As a result, the USFWS required that all tree removal for construction being completed prior to April 1 to prevent potential adverse impacts to bats that could be associated with the Project.

3.0 MITIGATION WORK PLAN

3.1 DESIGN

The wetland mitigation plan was designed to specifically restore ecological functionality, control erosion, and increase wildlife habitat and forage by planting trees that 1) naturally occur within the general area, 2) are favorable for bat nesting and 3) produce high nutrient forage for local wildlife. The USACE provided recommendations of tree species that would help to meet these goals.

3.2 RESTORATION SITE LOCATION

The geographic boundary of the mitigation area will include the footprint of the temporary access road that will be used during the bank stabilization (Figure 2). The perimeter of the mitigation area borders the western bank of the Embarras River and will extend inland to encompass the width of the temporary access road disturbance, which will result in a width of no more than 20 feet.

3.3 CONSTRUCTION METHODS

Construction methods will include the use of heavy machinery to restore the natural, pre-Project contour of the landscape. Machinery will first be used to dig the initial holes for tree saplings. Next, machinery will be utilized to prepare the seed bed, apply herbaceous seed, and crimp hay mulch as an erosion control measure. Hay mulch will be crimped during either the drill seeding process or immediately following seeding, depending on the capabilities of the drill-seeding equipment available. After the mitigation area has been seeded and crimped with mulch, a field crew will be used to further modify the holes for planting tree saplings as necessary, plant the saplings, and backfill the holes. Finally, field crews will apply a tree trunk protection mechanism around each sapling, consisting of a ring of bailing wire anchored by wooden stakes, or similar protective measures. Typical trunk protection fence may be comprised of 12-16 gauge hog fence that will be secured around the perimeter of each tree. The completed fence will be approximately 30 inches in diameter, and 4 feet in height. The fence will be anchored by a t-post, wooden stake, or comparable anchoring mechanism on the north side of the tree. This stake will also serve as the guy-line anchor for the trees, which will be tethered to the stake with bailing twine or comparable material. The trees will be anchored on the north side of the fence to account for the prevailing river currents during flood conditions. Trunk protection fences will remain in place for the duration of the monitoring period, but guy-lines will be adjusted or removed once the tree root systems are well established.

3.4 DESIRED PLANT COMMUNITY

An herbaceous species seed mix will be planted as an erosion control mechanism. The seed mix was developed based on recommendations from the Lawrenceville NRCS office and is similar to the temporary understory vegetation seed mix that they have used in adjacent projects that have occurred along the Embarras River. Immediately following the herbaceous seeding, a mix of native tree species will be planted throughout the expanse of the mitigation area. Trees will be planted with a minimum density of 140 trees grown with the Root Production Method® (RPM) per 0.7 acres. A single tree species will comprise ≤ 20% of the total tree density. Spacing between tree stems will be approximately 10 feet for all species. The tree species list was developed based on recommendations from the UASCE and incorporates trees favorable to summer roosting of local threatened and endangered bat species (USFWS 2007 and 2016). Trees that produce high nutrient fruit (i.e. nuts) were also selected to improve wildlife foraging conditions. All trees will consists of RPM style nursery trees, grown in 3-gallon potting material. The tree species list and the herbaceous seed mix were developed with recommendations from the USACE and the NRCS Field Office in Lawrenceville, IL (Appendix E).

3.5 TIMING AND SEQUENCE

Construction is anticipated to be completed during the months of July-December, as determined by the conditions of the Project area (i.e. considering the timing of project completion and weather conditions). Restoration of the area will occur as soon as practicable following construction.

4.0 ECOLOGICAL PERFORMANCE STANDARDS/MAINTENANCE PLAN

4.1 ECOLOGICAL PERFORMANCE STANDARDS

Performance standards will be used to determine if the mitigation area is developing wetland characteristics and contains a desirable vegetation community. Performance standards for the mitigation area will need to be achieved for two consecutive years and include the following:

- Creation of 0.7 forested wetland acres, with boundaries adhering to the extent of disturbance created by the temporary access road.
- A minimum of 75% planted tree seedling survival at three years post-planting. A minimum of 50% of surviving planted trees must have a height of at least 15 feet and diameter at breast height (DBH) of 3 inches or greater.
- No single, planted, tree species will constitute more than 25% of the final surviving tree stock.
- Invasive/noxious weeds will not exceed 5% of the absolute cover. If necessary, a weed management plan will be developed to eradicate weeds and adhere to the Illinois Noxious Weed Law (Illinois 2002).

4.2 MAINTENANCE PLAN

Maintenance items that may arise during the monitoring period will be addressed on an individual basis to ensure the continued viability of the area once initial restoration is complete. These items include, but are not limited to, the following:

- Topsoil erosion
- Vegetation establishment
- Trunk protection fence maintenance
- Volunteer soft mass tree species establishment
- Invasive/noxious weed control

Routine monitoring within the mitigation area will include inspections of the items listed above. Restoration will be considered successful when the performance criteria described in Section 4.1 have been achieved.

5.0 MONITORING PLAN

During active construction, the Project area will be monitored continuously. Construction inspections will include an evaluation of erosion control. A post-construction report including a description of construction operations, an as-built figure, photos, and any amendments to the proposed plan will be submitted to the USACE within 90 days of Project completion and restoration within the mitigation area. Prior to release, the mitigation area will be delineated as a wetland in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual.

The mitigation area will be monitored annually for a minimum of three years and a maximum of five years after final grading, seeding, and tree planting is complete. If success is not achieved within five years, CEMC will work with the USACE to identify and correct deficiencies within the mitigation area, and monitoring requirements will be extended for an additional period to be determined at that time. Annual tree monitoring will consist of surveying each tree to calculate total survival of trees within the mitigation area to ensure that the hard mass tree ecological performance standards are achieved. Tree heights will be measured using appropriate forestry equipment, such as a tree scale stick, clinometer, or laser hypsometer (Keane 2006). Additionally, DBH will be recorded for any tree that exceeds the height required to conduct DBH measurements (i.e. 4.5 feet) (NRCS 2004). Annual monitoring will also recognize the voluntary establishment of soft mass tree species within the mitigation area. Cutting, thinning, or mowing soft mass tree species that establish within the mitigation area may be necessary to reduce competition, and promote the continued success of the planted hard mass tree species. Annual monitoring of invasive and noxious weeds will ensure their establishment adheres to the ecological performance standard outlined in Section 4.1.

Annual monitoring reports documenting any maintenance activity and restoration progress will be submitted to the USACE's Louisville District Office. The first report will be due by January 31 of the first full year after construction completion, which is projected to be January 31, 2019 for this Project. Reports will be submitted for a period not to exceed five years or until the restoration is determined by the USACE to be successful, whichever is less. Because the mitigation area is within the Embarras River floodplain, hydrologic and soil monitoring will not be conducted. Photographs of the area will be taken during the annual monitoring event at standardized locations to track visual progress.

6.0 ADAPTIVE MANAGEMENT

Per the monitoring plan described in section 5.0, if success is not achieved within five years, CEMC will work with the USACE to identify and correct deficiencies within the mitigation area. Additional slope grading and tree planting may be necessary to achieve success. If success is not achieved within the five-year period, monitoring requirements may be extended, or an alternative mitigation area may sought.

7.0 REFERENCES

Keane, Robert E. 2006. Tree Data Sampling Method. United States Forest Service. Available at: https://www.fs.fed.us/rm/pubs/rmrs_gtr164/rmrs_gtr164_05_tree_data.pdf.

Midwestern Regional Climate Center (MRCC). 2017. Monthly Output of Precipitation Data for Climate Division IL07: Midwest Climate Information System: Illinois State Water Survey, Champaign, IL, available online at http://mrcc.isws.illinois.edu/.

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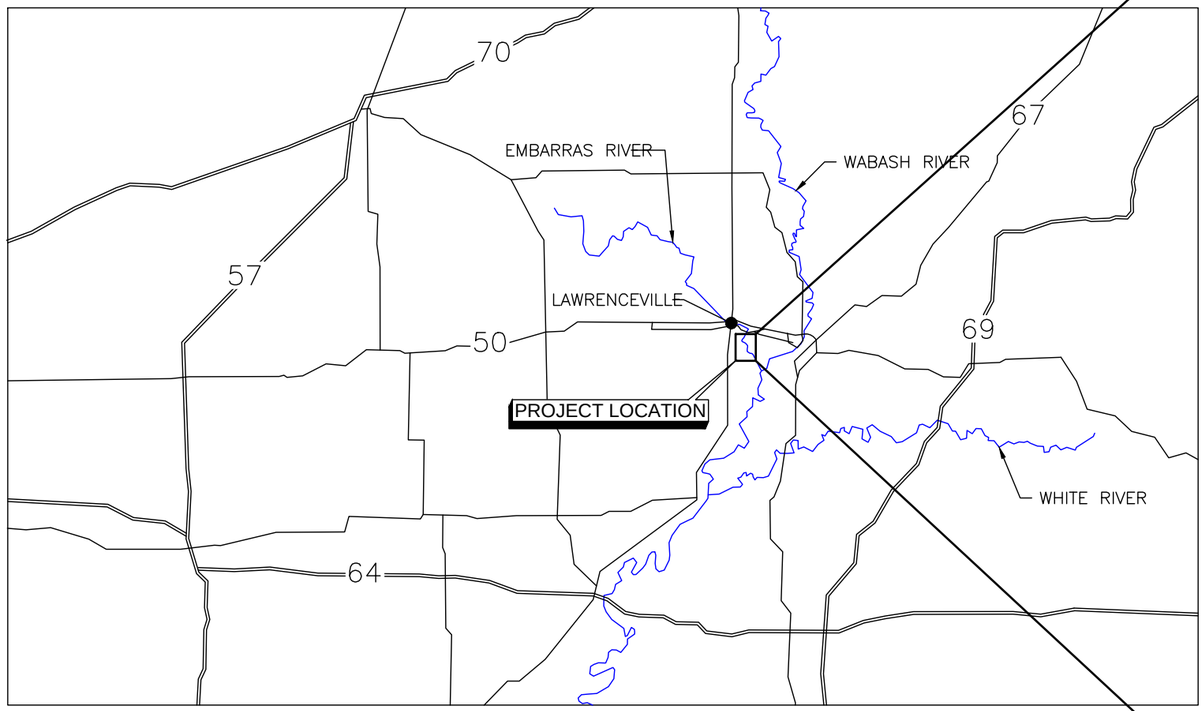
FIGURES



1 **PROJECT VICINITY MAP**
NOT TO SCALE

N

Image Cite: Orthoimagry provided by client, May 2003

2 **PROJECT LOCATION MAP**
SCALE: 1" = 1,000'

0 1,000'

N

FIGURE 1

PROJECT SITE

FORMER INDIAN REFINERY
LAWRENCEVILLE, ILLINOIS

Trihydro CORPORATION
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

Drawn By: JLP	Checked By: SJ	Scale: AS SHOWN	Date: 4/19/2017	File: 339_RESTPLNSITELOC-201702

Image Cite: Orthoimagry provided by client, May 2003

N

0 100'

Trihydro CORPORATION
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 2

MITIGATION AREA

FORMER INDIAN REFINERY
LAWRENCEVILLE, ILLINOIS

Drawn By: JLP	Checked By: SJ	Scale: 1" = 100'	Date: 4/19/2017	File: 339_RESTPLNSITEMAP-201702

APPENDIX A

LOUISVILLE DISTRICT REQUEST FOR A JURISDICTIONAL DETERMINATION FORM

Print Form

Louisville District Request for a Jurisdictional Determination Form

This format can be used when you want to determine if areas on your property fall under regulatory requirements of the U.S. Army Corps of Engineers (Corps). Please supply the following information and supporting documents described below. This form can be filled out online and then printed. **It must be signed by the property owner** to be considered a formal request. We require original signatures; faxes are not acceptable. Submitting this request authorizes the Corps to field inspect the property site, if necessary, to help in the determination process. The Corps may also request a delineation of water resources on a property to be submitted. The printed form and supporting documents should be mailed to:

U.S. Army Corps of Engineers, Louisville District
CELRL-OP-F, Room 752
P.O. Box 59
Louisville, KY 40201-0059
Main Phone: (502) 315-6733

Property Owner Contact Information

Name: Texaco Downstream Properties, Inc.
Address: 1 Illinois Street
Lawrenceville, IL. 62439
Attn: Gene Choquette
Telephone: 713-432-2631
Fax:
Email: gchoquette@chevron.com

Owner Representative Contact Information

Name and Company: Stantec Consulting Services, Inc
Address: Pam Ferral
2127 Ayrsley Town Blvd. Suite 300
Charlotte, NC. 28273
Telephone: 803-669-1886
Fax:
Email: pam.ferral@stantec.com

SUBJECT PROPERTY INFORMATION

Address: Former Indian Refinery Site
1 Illinois St.
Lawrenceville, IL. 62439
County: Lawrence State: Illinois
Lat/Long in Decimal Degrees: 38.713014 °N 87.672801 °W
Approximate size of property in acres: 11.6

The subject property is: (check as many as applicable)

☒ cleared (if checked, how long?) +100 years ☒ wooded ☐ pasture ☐ agricultural field

The water resources on the subject property include: (check as many as applicable)

☒ Streams How many? 3 Estimated lengths 1671 LF, 182 LF, 66 LF.
☐ Ponds How many? Estimated acres
☒ Wetlands How many? 1 Estimated acres 2.209
☐ Other Water Resources (ditches, swales, etc.) How many?

Is the property in an incorporated area? ☒ Yes or ☐ No
If it is in an incorporated area, please provide the name of the city/town Lawrenceville

Is the property subject to a conservation easement or deed restriction? ☒ Yes or ☐ No

Was the property used as mitigation for a previously permitted project by the Corps? ☐ Yes or ☒ No

Is the property neighboring, adjacent to and/or bordering a project previously permitted by the Corps? ☒ Yes or ☐ No or ☐ Unknown

For the previous 3 questions, where answered Yes, please explain and provide the name of the project, permit number, permittee name, or permitted property address, if available:
Permit #: LRL 2013 894 tmb

Applicant: Chevron Environmental Management Company

Site Name & Address: Former Indian Refinery, 1 Illinois St., Lawrenceville, IL. 62439

Project: Removal of water intake structure from former pump house

MAPS: Please provide a map or plat (aerial photo, city or county map, soil survey photo, USGS Quad map, etc.) that accurately identifies the physical boundaries of the property. If the property is farmland, it may be necessary for you to contact the Natural Resources Conservation Service for a wetland delineation before you can request a jurisdictional determination.

If you are considering doing work on the property, please identify on a map or in a separate drawing the footprint, location, type of potential work, and water resources. This information will assist us in the determination process and reduce unnecessary delays of processing subsequent permits, if required.

OPTIONAL DOCUMENTATION: Photographs can greatly assist in the review process and often make a field visit unnecessary. We must see complete coverage of the property and/or the water resource in question, including the grass and trees.

If the property and/or the water resource in question are to be surveyed or delineated, we suggest waiting for the survey or delineation to be completed and include a copy with your request. Any other data you can include may help, such as land use or cropping history for the past five years, drainage improvements, etc.

PROCEDURE: We will review all available data within our office and attempt to provide a quick, accurate response to your request. Many determinations require a field site visit, which always takes more time to complete.

Signature of Owner _____ Date _____

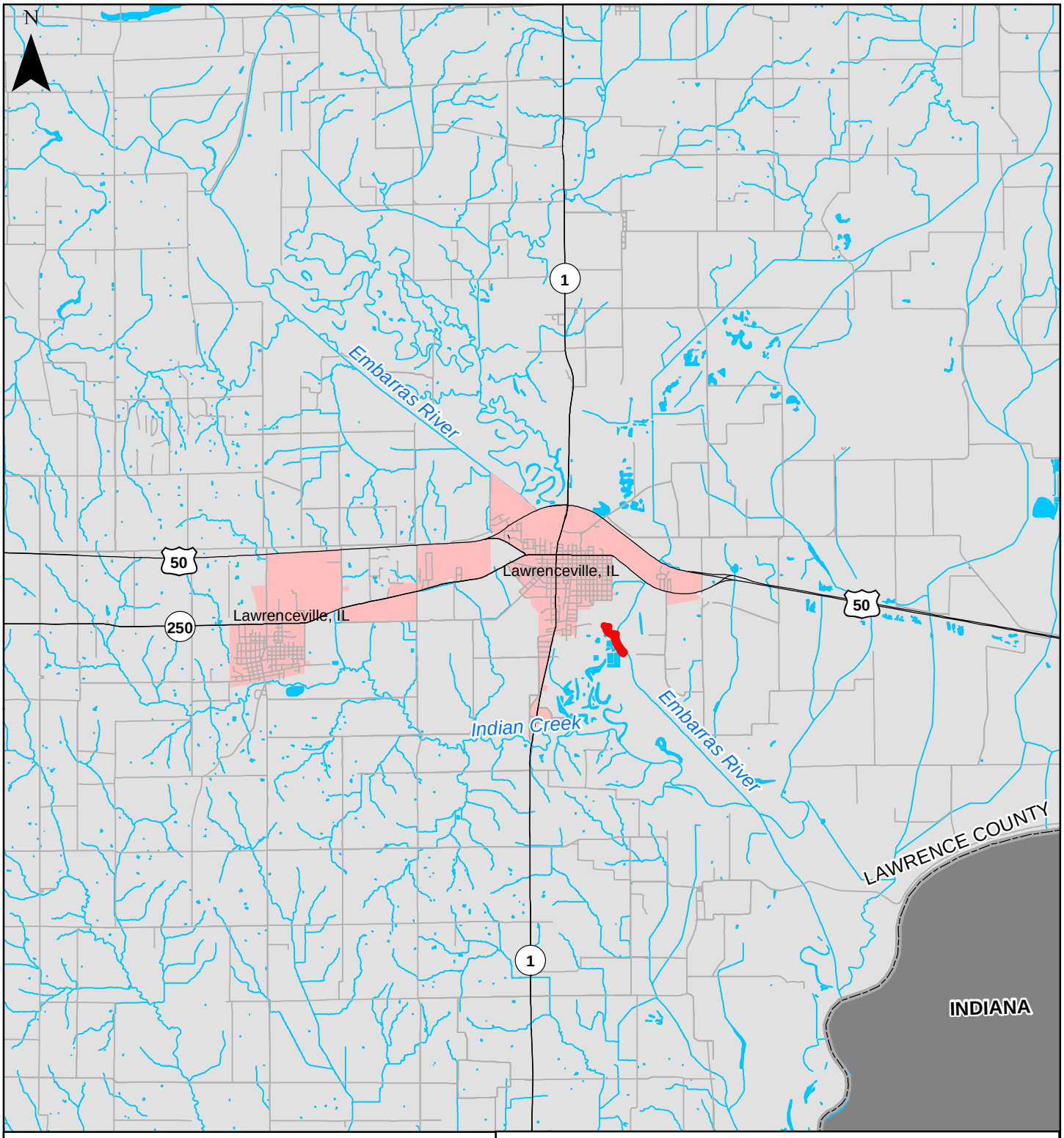
Disclaimer: The information requirement for a jurisdictional determination as presented in this form is not an exhaustive list. The U.S. Army Corps of Engineers may request additional information not described in this request form.

FOR OFFICIAL USE ONLY

Project ID # :	Assigned Project Manager:

CELRL-OP-F, Form JDR-1, 10 March 2009

FIGURES



Project Study Area
Municipalities
County Boundary
Major Roads
Secondary Roads
Hydrography
Waterbodies

0 0.5 1 2 Miles

Vicinity Map
Embarras River
Bank Stabilization

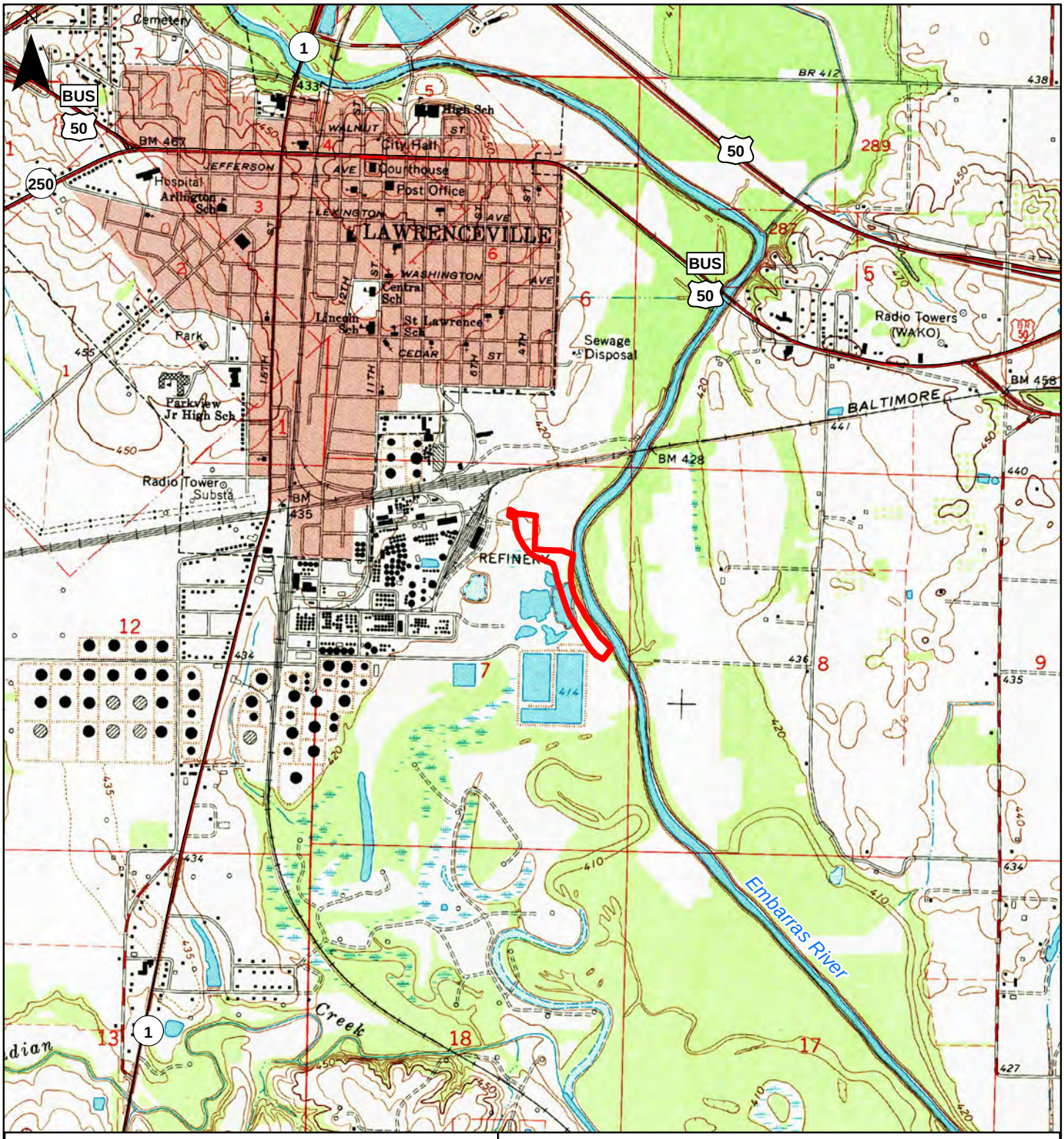
Lawrence County, Illinois

Date
3/2016

Stantec

Stantec prepared for:
Chevron Environmental
Management Company

Figure
1



Project Study Area

Major Roads

USGS 7.5 Min Topoquad:
Lawrenceville

0 0.125 0.25 0.5 Miles

Project Study Area Map
Embarras River
Bank Stabilization

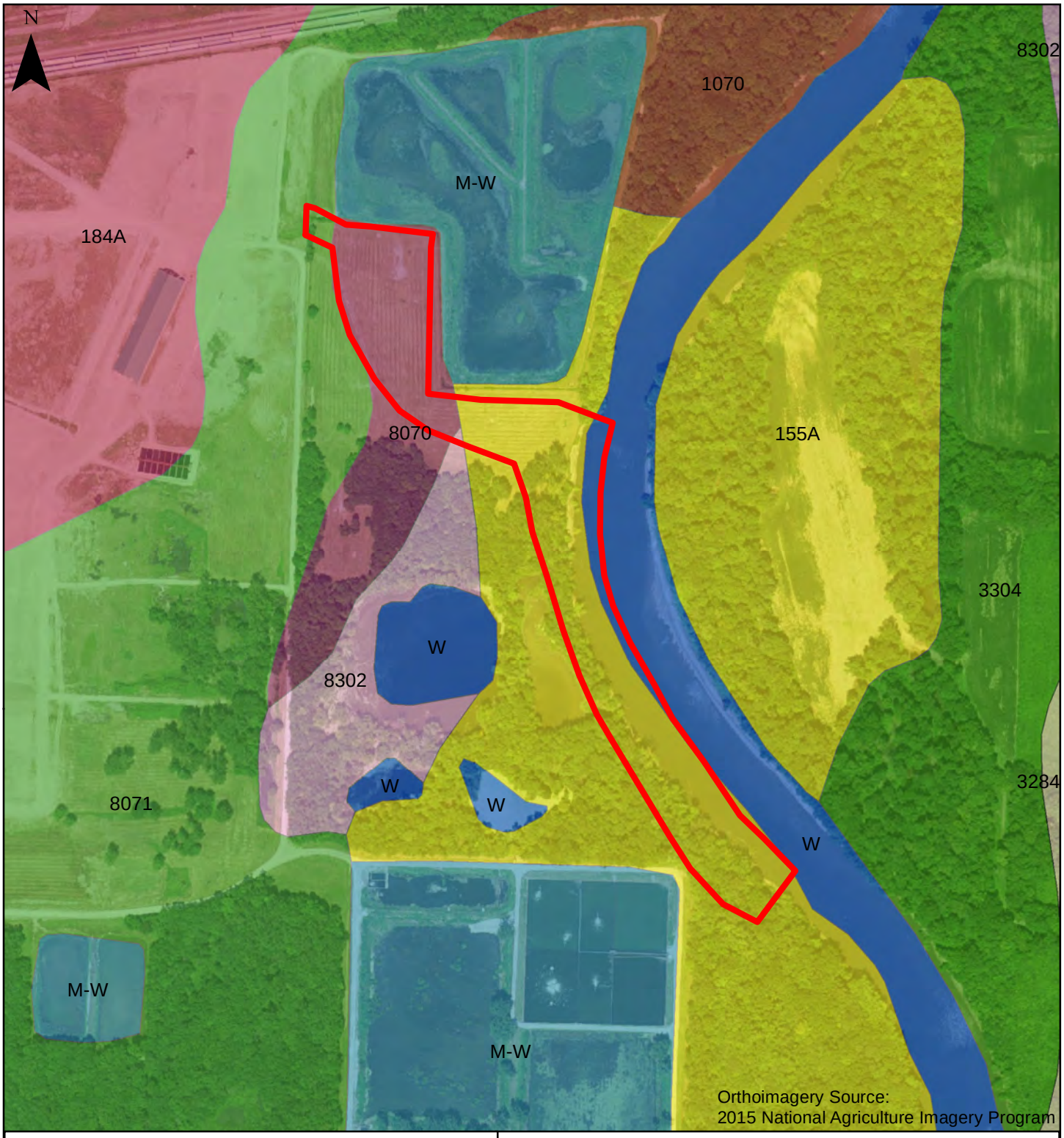
Lawrence County, Illinois

Date
3/2016

Stantec

Stantec prepared for:
Chevron Environmental
Management Company

Figure
2



Project Study Area

Soils in PSA

- 155A - Stockland loam, 0-2%
- 8070 - Beaucoup silty clay loam, occasionally flooded [HYDRIC]
- 8071 - Darwin silty clay, occasionally flooded [HYDRIC]
- 8302 - Ambraw clay loam, occasionally flooded [HYDRIC]
- W - Water

0 125 250 500 Feet

Lawrence County Soil Survey
Embarras River
Bank Stabilization

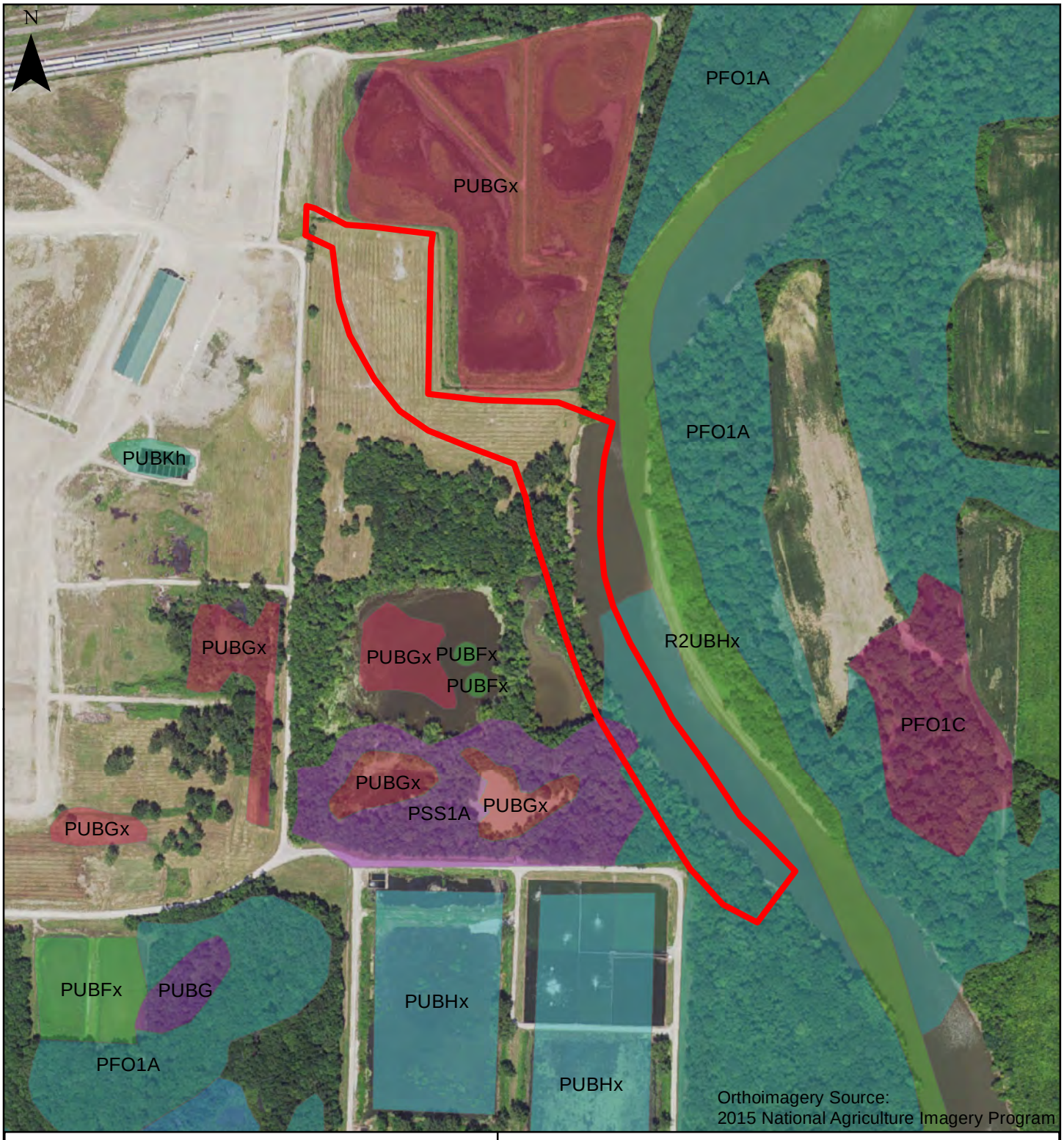
Lawrence County, Illinois

Date
3/2016

Stantec

Stantec prepared for:
Chevron Environmental Management Company

Figure 3



Project Study

Wetlands in the PSA

PFO1A: Palustrine Forested Broad-Leaved Deciduous Temporarily Flooded

PSS1A: Palustrine Scrib-shrub Broad-Leaved Deciduous Temporarily Flooded

Palustrine Unconsolidated Bottom Intermittently Exposed Excavated

0 125 250 500 Feet

Lawrence County National Wetland Inventory Embarras River Bank Stabilization

Lawrence County, Illinois

Date
3/2016

Stantec

Stantec prepared for:
Chevron Environmental Management Company

Figure 4

Stream A, Embarras River - 1671 lf
(Right River Bank)
Lat: 38.711840 N
Long: 87.672202 W

Wetland A - 0.723 ac
Lat: 38.710358 N
Long: 87.670909 W

Stream B - 182 lf
Lat: 38.710644 N
Long: 87.671193 W

Upland Data Point
Lat: 38.710680 N
Long: 87.6714199 W

Wetland Data Point
Lat: 38.710811 N
Long: 87.671566 W

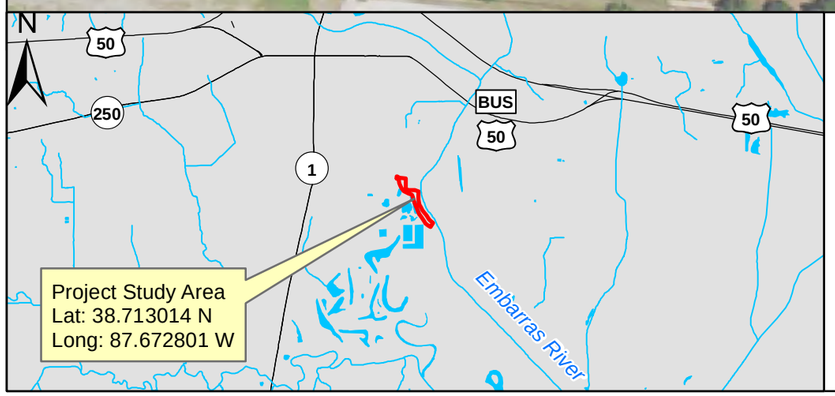
Stream C - 66 lf
Lat: 38.711702 N
Long: 87.672253 W

Wetland A - 1.486 ac
Lat: 38.712194 N
Long: 87.672392 W

N

Orthoimagery Source:
2015 National Agriculture Imagery Program

0 125 250 500 Feet



- Project Study Area (11.612 ac)
- Riverbank (1,671 lf)
- Stream (248 lf)
- Wetlands (2.209 ac)
- Upland Data Point
- Wetland Data Point

Jurisdictional Features
Embarras River
Bank Stabilization

Lawrence County, Illinois

Date		Figure
4/2016	Stantec prepared for: Chevron Environmental Management Company	5

REPRESENTATIVE PHOTOS

Embarras River – Bank Stabilization
Lawrenceville, Illinois

Applicant: Chevron Environmental Management Company
Agent: Stantec Consulting

Date: 3/21/2016

Photo #: 1

Photographer: Pat Ferral

Description: Stable bank of Embarras River at the northern extent of project study area. Photo taken facing north.

Applicant: : Chevron Environmental Management Company
Agent: Stantec Consulting

Date: 3/21/2016

Photo #: 2

Photographer: Pam Ferral

Description: Upland data point adjacent to Wetland A. Photo taken facing southeast.

Prepared by: Pat Ferral
Checked by: Alex Baldwin

Embarras River – Bank Stabilization
Lawrenceville, Illinois

Applicant: Chevron Environmental Management Company
Agent: Stantec Consulting

Date: 3/21/2016

Photo #: 3

Photographer: Pam Ferral

Description: upland soil profile.

Applicant: Chevron Environmental Management Company
Agent: Stantec Consulting

Date: 3/21/2016

Photo #: 4

Photographer: Pam Ferral

Description: Wetland A data point. Photo taken facing northeast.

Prepared by: Pat Ferral
Checked by: Alex Baldwin

Applicant Chevron Environmental Management Company
Agent: Stantec Consulting

Date: 3/21/2016

Photo #: 5

Photographer: Pam Ferral

Description: Wetland soil profile.

Applicant: Chevron Environmental Management Company
Agent: Stantec Consulting

Date: 3/21/2016

Photo #: 6

Photographer: Pam Ferral

Description: Upland/wetland boundary at the northern extent of Wetland A. photo taken facing south.

Applicant: Chevron Environmental Management Company
Agent: Stantec Consulting

Date: 3/21/2016

Photo #: 7

Photographer: Pam Ferral

Description: Unstable bank of the Embarras River near the confluence with stream C. Photo taken facing southeast.

Applicant: Chevron Environmental Management Company
Agent: Stantec Consulting

Date: 3/21/2016

Photo #: 8

Photographer: Pam Ferral

Description: Unstable bank of the Embarras River near the northern extent of the project area. Photo taken facing northeast.

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Embarras River Bank Stabilization City/County: Lawrenceville,Lawrence County Sampling Date: March 21, 2016

Applicant/Owner: Chevron Environmental Mgt. Co./Texaco Downstream Properties State: IL. Sampling Point: Wet A Wet dp

Investigator(s): Pam Ferral, John Collias Section, Township, Range:

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 38.713014 N Long: 87.672801 W Datum: NAD83

Soil Map Unit Name: Stockland Loam NWI classification: na

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ], Soil [X], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [X]	No [ ]	Is the Sampled Area within a Wetland?	Yes [X] No [ ]
Hydric Soil Present?	Yes [X]	No [ ]		
Wetland Hydrology Present?	Yes [X]	No [ ]		

Remarks: Community type: Floodplain forest

Large deposits of sand were present along the riverbank due to recent flooding.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	20	Yes	FAC
2. *Celtis occidentalis*	20	Yes	FAC
3. *Plantanus occidentalis*	20	Yes	FACW
4.			
5.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1. *Celtis occidentalis*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. *none*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		= Total Cover	
Woody Vine Stratum (Plot size: 30 ft radius)			
1. *Toxicodendron radicans*	2	No	FAC
2.			
	2	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [X] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes [X] No [ ]

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Wet A Wet dp

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					Clay loam	
3-7	10YR 3/2	98	10YR 4/6	2	C	P	Clay loam	
7-20	10YR 4/2	95	10YR 4/4	5	C	M	Clay	

[1]Type. C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☒ Sediment Deposits (B2)
- ☒ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Embarras River Bank Stabilization City/County: Lawrenceville,Lawrence County Sampling Date: March 21, 2016

Applicant/Owner: Chevron Environmental Mgt. Co./Texaco Downstream Properties State: IL. Sampling Point: Wet A Upl dp

Investigator(s): Pam Ferral, John Collias Section, Township, Range:

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none

Slope (%): 0 Lat: 38.713014 N Long: 87.672801 W Datum: NAD83

Soil Map Unit Name: Stockland Loam NWI classification: na

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ], Soil [X], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [X]	No [ ]	Is the Sampled Area within a Wetland?	Yes [ ] No [X]
Hydric Soil Present?	Yes [ ]	No [X]		
Wetland Hydrology Present?	Yes [ ]	No [X]		

Remarks: Community type: Floodplain forest

Large deposits of sand were present along the riverbank due to recent flooding.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	20	Yes	FAC
2. *Liriodendron tulipifera*	20	Yes	FACU
3. *Plantanus occidentalis*	10	Yes	FACW
4.			
5.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1. *Rubus argutus*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. *none*			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		= Total Cover	
Woody Vine Stratum (Plot size: 30 ft radius)			
1. *Smilax rotundifolia*	2	No	FAC
2.			
	2	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [X] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes [X] No [ ]

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Wet A Upl dp

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/3	100					Loamy sand	
8-20+	10YR 4/4	100					Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

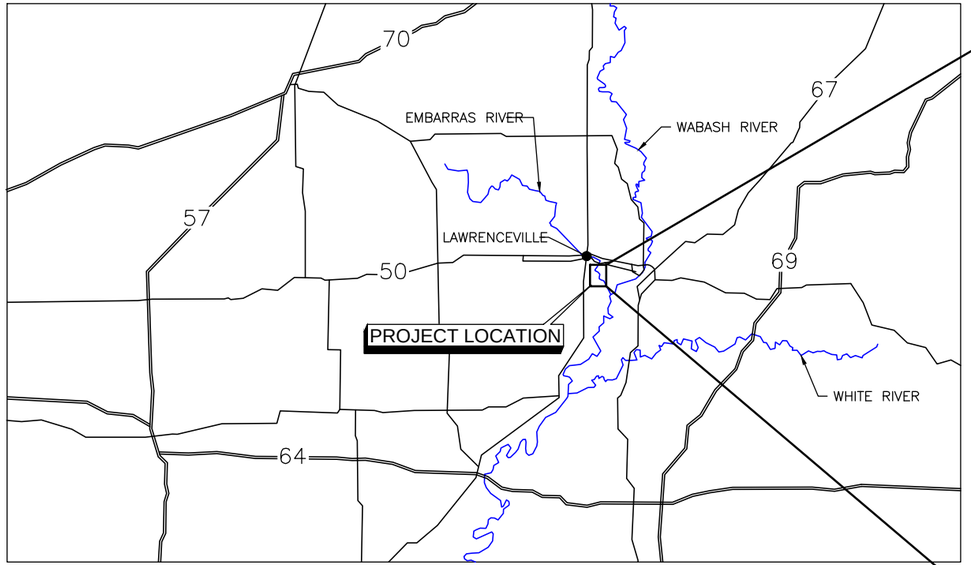
APPENDIX B

EMBARRAS RIVER BANK STABILIZATION PROJECT DESIGN

EMBARRAS RIVER
BANK STABILIZATION PROJECT

LAWRENCE COUNTY, ILLINOIS

DECEMBER 2016



1 PROJECT VICINITY MAP
NOT TO SCALE

N

Image Cite: Orthoimagry provided by client, May 2003

2 PROJECT LOCATION MAP
SCALE: 1" = 1,500'

SHEET NUMBER	TITLE	REV
1 OF 5	TITLE SHEET	0
2 OF 5	PROJECT PLAN	0
3 OF 5	BANK STABILIZATION DETAILS	0
4 OF 5	TYPICAL CROSS SECTION	0
5 OF 5	TYPICAL CROSS SECTION	0

3 INDEX OF SHEETS

NOT FOR CONSTRUCTION

REV.	DATE	DESCRIPTION	BY	CHK'D
1	12/16/16	REVISIONS	KR, BK	

DRAWN BY: JLP
CHECKED BY: TH
DATE: 3/1/2017
SCALE: AS SHOWN
FILE: 339_SBS-COVER-201702

Trihydro Corporation
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

TITLE SHEET

EMBARRAS RIVER
BANK STABILIZATION PROJECT
FORMER INDIAN REFINERY
LAWRENCE COUNTY, ILLINOIS

SHEET 1
1 OF 5
REV: 0

START OF BACK STABILIZATION 294+67

END OF BACK STABILIZATION 309+75

TYPICAL CROSS SECTION

RIPRAP TRENCH (END TREATMENT)

RIPRAP TRENCH (END TREATMENT)

PROPOSED CHANNEL STABILIZATION

PROPOSED ACCESS ROAD TURN AROUND

BENDWAY WIER (TYPICAL)

PROPOSED ACCESS ROAD

PROPOSED RIPRAP SLOPE STABILIZATION

PROPOSED ACCESS ROAD

TEMPORARY DISTURBANCE BOUNDARY

WETLANDS (APPROXIMATE BOUNDARY)

EXPLANATION

- 1/4 — VIEW NUMBER / SHEET NUMBER
- WATER FLOW DIRECTION
- SURFACE CONTOURS (1' INTERVAL)

N

0 130'

NOT FOR CONSTRUCTION

REV.	DATE	DESCRIPTION	BY	CHK'D
		REVISIONS		

DRAWN BY: JLP
CHECKED BY: TH
DATE: 2/28/2017
SCALE: 1" = 130'
FILE: 339_SBS-SITEPLNS-201702

Trihydro
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 3077745.7474 (F) 3077745.7729

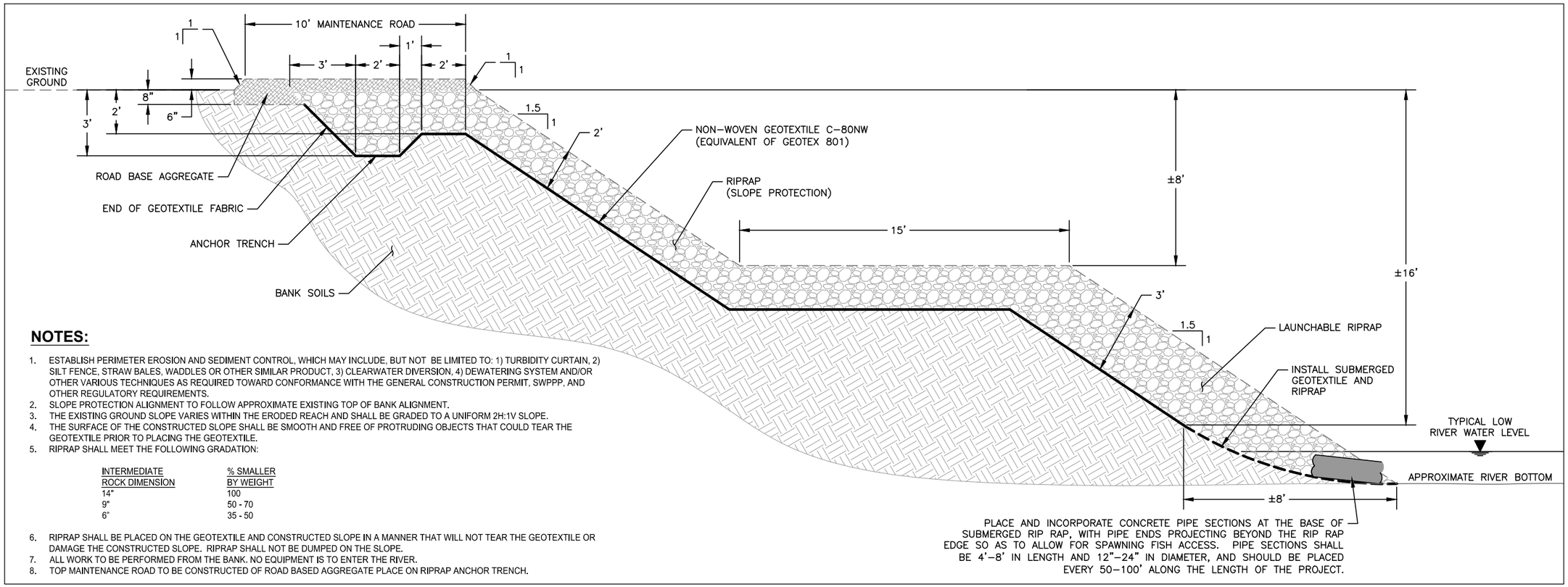
PROJECT PLAN

EMBARRAS RIVER
BANK STABILIZATION PROJECT
FORMER INDIAN REFINERY
LAWRENCE COUNTY, ILLINOIS

SHEET 2 2 OF 5

REV: 0

M:\CHEVRON\LAWRENCEVILLE\CADD\BANKSTABILIZATION\339_SBS--SITEPLNS--201702



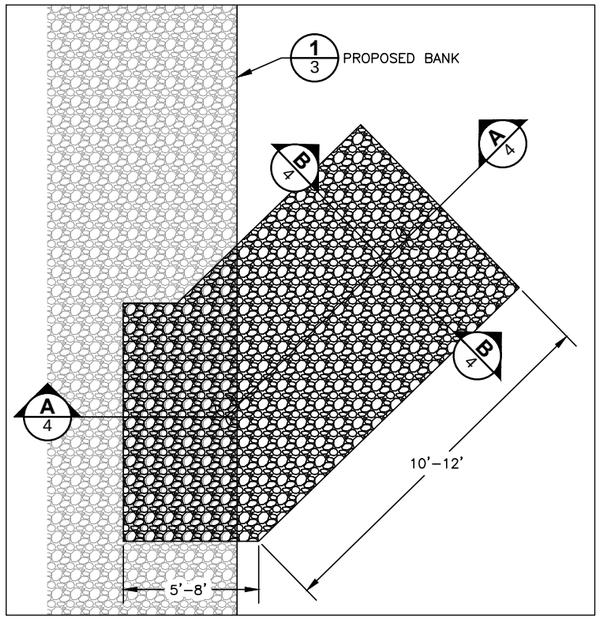
NOTES:

1. ESTABLISH PERIMETER EROSION AND SEDIMENT CONTROL, WHICH MAY INCLUDE, BUT NOT BE LIMITED TO: 1) TURBIDITY CURTAIN, 2) SILT FENCE, STRAW BALES, WADDLES OR OTHER SIMILAR PRODUCT, 3) CLEARWATER DIVERSION, 4) DEWATERING SYSTEM AND/OR OTHER VARIOUS TECHNIQUES AS REQUIRED TOWARD CONFORMANCE WITH THE GENERAL CONSTRUCTION PERMIT, SWPPP, AND OTHER REGULATORY REQUIREMENTS.
2. SLOPE PROTECTION ALIGNMENT TO FOLLOW APPROXIMATE EXISTING TOP OF BANK ALIGNMENT.
3. THE EXISTING GROUND SLOPE VARIES WITHIN THE ERODED REACH AND SHALL BE GRADED TO A UNIFORM 2H:1V SLOPE.
4. THE SURFACE OF THE CONSTRUCTED SLOPE SHALL BE SMOOTH AND FREE OF PROTRUDING OBJECTS THAT COULD TEAR THE GEOTEXTILE PRIOR TO PLACING THE GEOTEXTILE.
5. RIPRAP SHALL MEET THE FOLLOWING GRADATION:

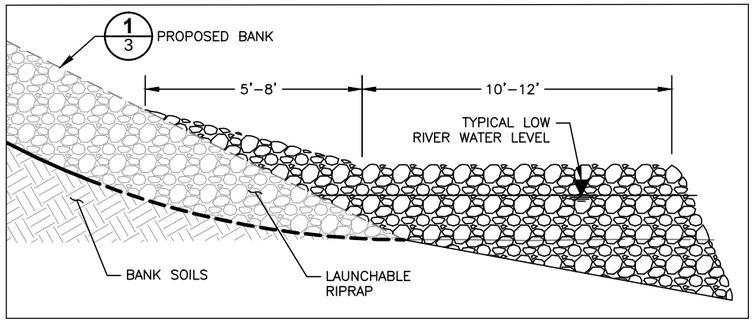
INTERMEDIATE ROCK DIMENSION	% SMALLER BY WEIGHT
14"	100
9"	50 - 70
6"	35 - 50

6. RIPRAP SHALL BE PLACED ON THE GEOTEXTILE AND CONSTRUCTED SLOPE IN A MANNER THAT WILL NOT TEAR THE GEOTEXTILE OR DAMAGE THE CONSTRUCTED SLOPE. RIPRAP SHALL NOT BE DUMPED ON THE SLOPE.
7. ALL WORK TO BE PERFORMED FROM THE BANK. NO EQUIPMENT IS TO ENTER THE RIVER.
8. TOP MAINTENANCE ROAD TO BE CONSTRUCTED OF ROAD BASED AGGREGATE PLACE ON RIPRAP ANCHOR TRENCH.

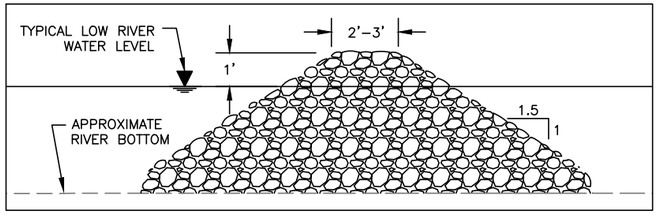
1 TYPICAL BANK DETAIL
SCALE: 1" = 5'



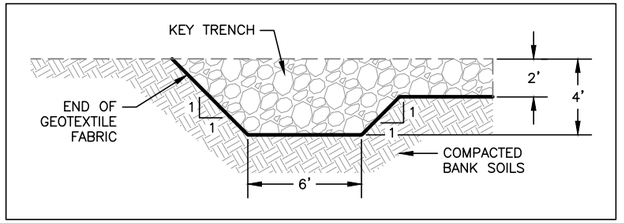
2 TYPICAL BENDWAY WEIR PLAN VIEW
SCALE: 1" = 5'



A TYPICAL BENDWAY WEIR PROFILE VIEW
SCALE: 1" = 5'



B TYPICAL BENDWAY WEIR PROFILE VIEW
SCALE: 1" = 5'



3 BANK END TREATMENT DETAIL
SCALE: 1" = 8'

NOT FOR CONSTRUCTION

REV.	DATE	DESCRIPTION	BY	CHK'D
		REVISIONS		

DRAWN BY: JLP
CHECKED BY: TH
DATE: 2/28/2017
SCALE: AS SHOWN
FILE: 339_SBS-DETAILS-201702

Trihydro Corporation
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307/745-7474 (F) 307/745-7729

TYPICAL BANK DETAIL

EMBARRAS RIVER
BANK STABILIZATION PROJECT
FORMER INDIAN REFINERY
LAWRENCE COUNTY, ILLINOIS

SHEET 3 3 OF 5
REV: 0

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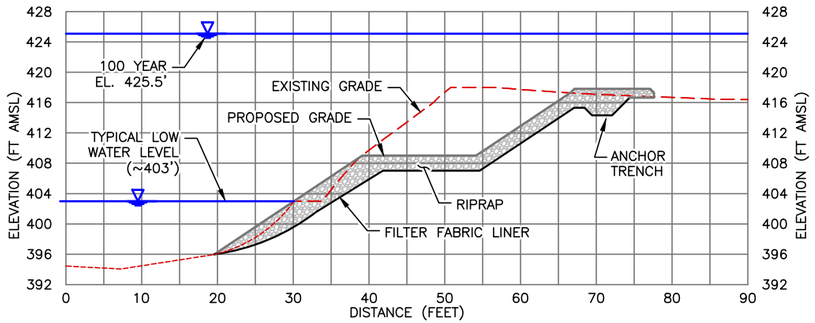
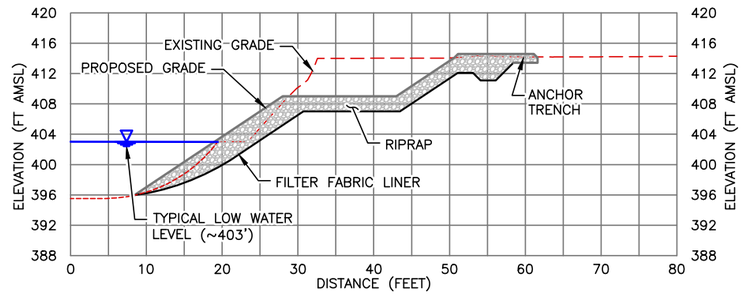
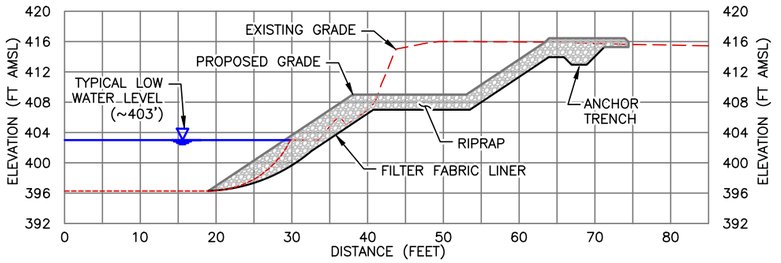


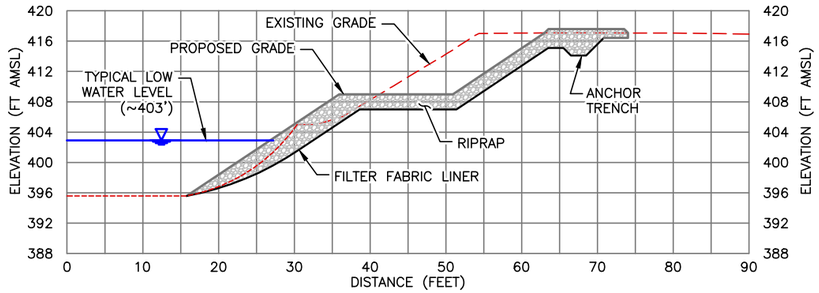
A **BANK SECTION STA. 296+59**
SCALE: H: 1" = 10' V: 1" = 10'



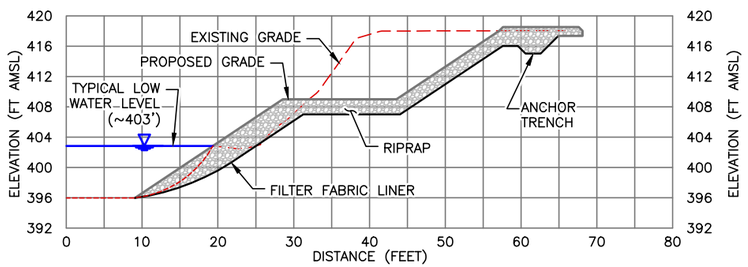
B **BANK SECTION STA. 299+18**
SCALE: H: 1" = 10' V: 1" = 10'



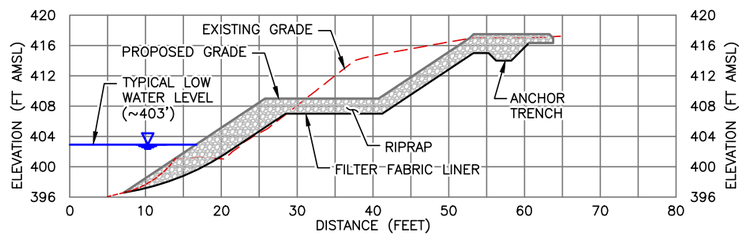
C **BANK SECTION STA. 302+76**
SCALE: H: 1" = 10' V: 1" = 10'



D **BANK SECTION STA. 306+15**
SCALE: H: 1" = 10' V: 1" = 10'



E **BANK SECTION STA. 308+83**
SCALE: H: 1" = 10' V: 1" = 10'



F **BANK SECTION STA. 309+70**
SCALE: H: 1" = 10' V: 1" = 10'

NOTE:

FT AMSL = FEET ABOVE MEAN SEA LEVEL

NOT FOR CONSTRUCTION

REV.	DATE	DESCRIPTION	BY	CHK'D

REVISIONS

DRAWN BY: JLP
CHECKED BY: TH
DATE: 3/1/2017
SCALE: 1" = 10'
FILE: 339_SBS-PROFILES-201702

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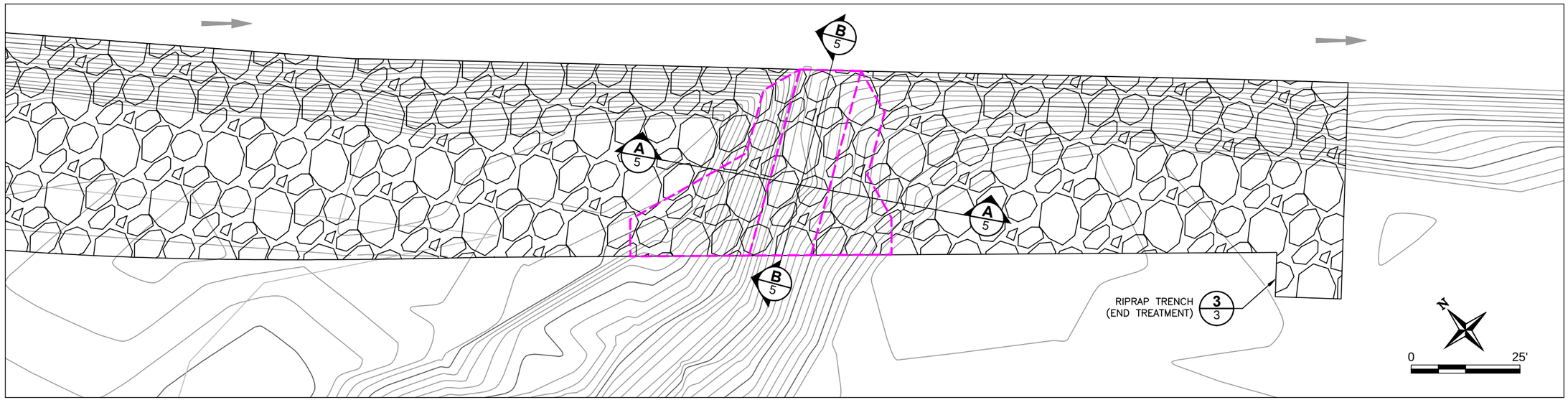
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307.745.7474 / (F) 307.745.7729

TYPICAL CROSS SECTIONS

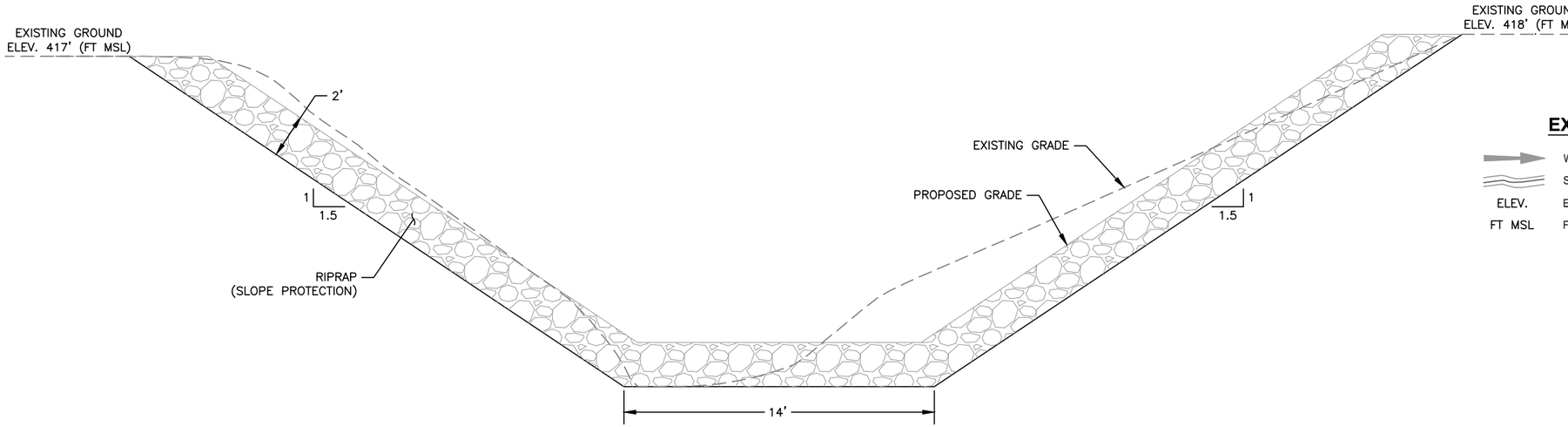
EMBARRAS RIVER
BANK STABILIZATION PROJECT
FORMER INDIAN REFINERY
LAWRENCE COUNTY, ILLINOIS

SHEET 4
4 OF 5
REV: 0

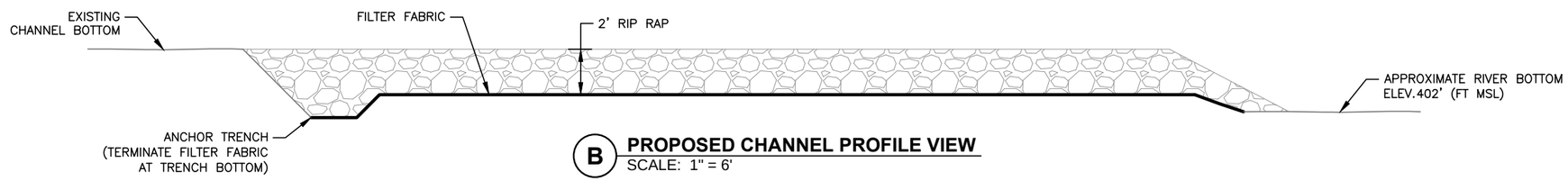
M:\CHEVRON\LAWRENCEVILLE\CADD\BANKSTABILIZATION\339_SBS--PROFILES--201702



1 PROPOSED CHANNEL PLAN VIEW
SCALE: 1" = 25'



A PROPOSED CHANNEL PROFILE VIEW
SCALE: 1" = 6'



B PROPOSED CHANNEL PROFILE VIEW
SCALE: 1" = 6'

EXPLANATION

- WATER FLOW DIRECTION
- SURFACE CONTOURS (1' INTERVAL)
- ELEV. — ELEVATION
- FT MSL — FEET RELATIVE TO MEAN SEA LEVEL

NOT FOR CONSTRUCTION

REV.	DATE	DESCRIPTION	BY	CHK'D
		REVISIONS		

DRAWN BY: JLP
CHECKED BY: TH
DATE: 2/28/2017
SCALE: AS SHOWN
FILE: 339_SBS-DETAILS-201702

Trihydro Corporation
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

PROPOSED CHANNEL DETAIL

EMBARRAS RIVER
BANK STABILIZATION PROJECT
FORMER INDIAN REFINERY
LAWRENCE COUNTY, ILLINOIS

SHEET 5
5 OF 5
REV: 0

M:\CHEVRON\LAWRENCEVILLE\CADD\BANKSTABILIZATION\339_SBS-DETAILS-201702

APPENDIX C

USGA EMBARRAS RIVER STREAM GAUGE DATA

APPENDIX C. 13 YEAR RIVER GAUGE DATA
FORMER INDIAN REFINERY, LAWRENCEVILLE, ILLINOIS

Year	Total Number of Days Exceeding Flood Stage[1]	Number of Days Exceeding Flood Stage During the Growing Season[2]	Consecutive Days of Flooding During the Growing Season[3]
2002	38	33	25
2003	7	7	8
2004	15	7	7
2005	25	0	0
2006	24	18	6
2007	18	4	4
2008	64	48	20
2009	59	39	11
2010	6	6	5
2011	51	39	19
2012	8	0	0
2013	46	37	20
2014	17	10	7
2015	33	28	17
Average	**29**	**20**	NA

Notes:

[1]The flood stage is approximately 30 feet for the Embarras River Gauge 03346500, Lawrenceville, IL.

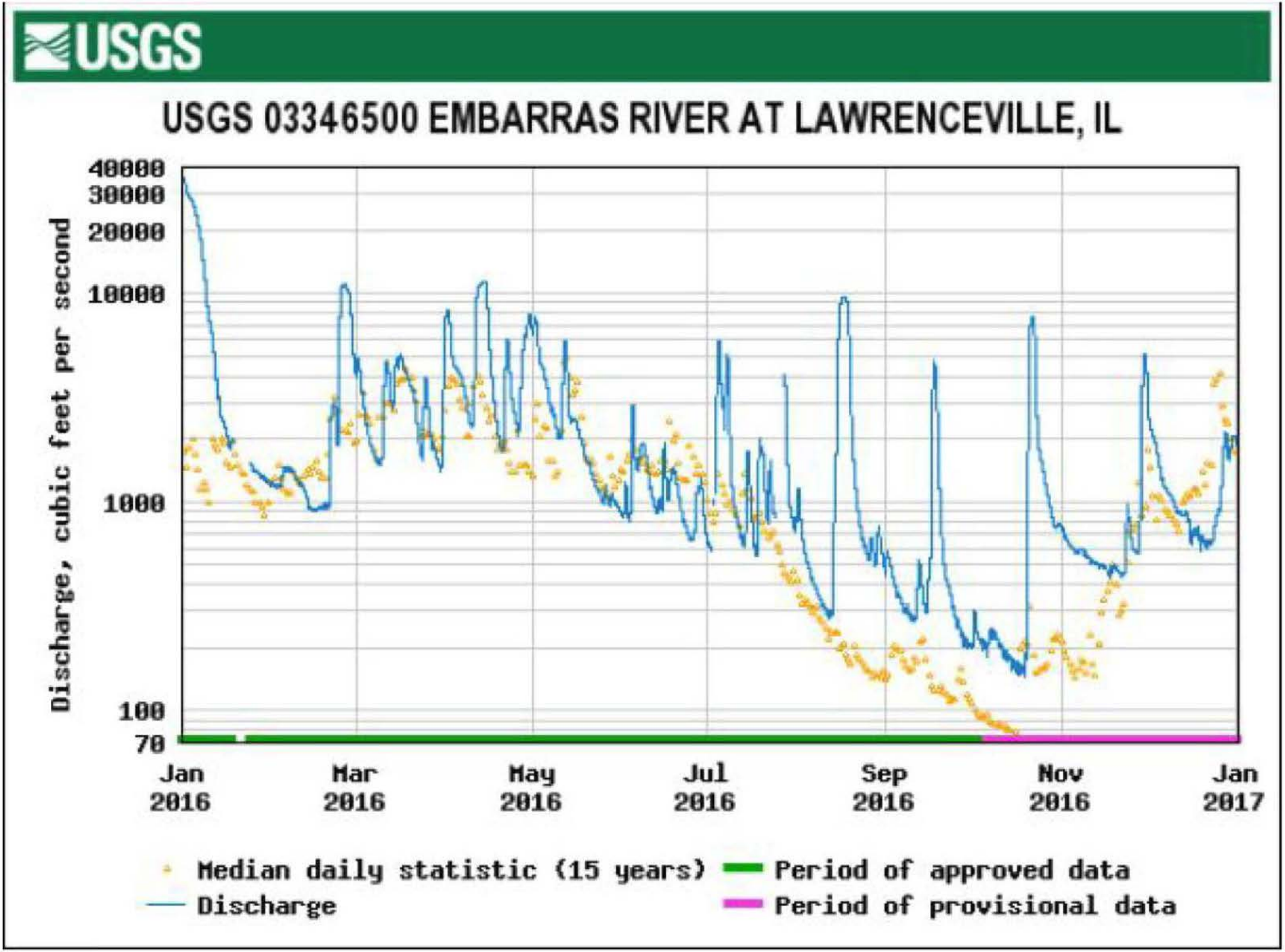
[2]The growing season for this analysis was determined to be March-October, using Illinois climatology data available from the Illinois State Water Survey.

[3]Histroical river gauge data are not available for every day throughout the past 13 years. As such, in the event that a single day during a consecutive flood period lacked data, it was assumed to be flooded.

NA= not applicable

Data obtained from the USGS database. Embarras River Gauge 03346500, Lawrenceville, IL.

More recent (i.e. 2016-2017) data exists, but contains provisional data that is pending approval.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USGS 03346500 EMBARRAS RIVER AT LAWRENCEVILLE, IL
Discharge, cubic feet per second
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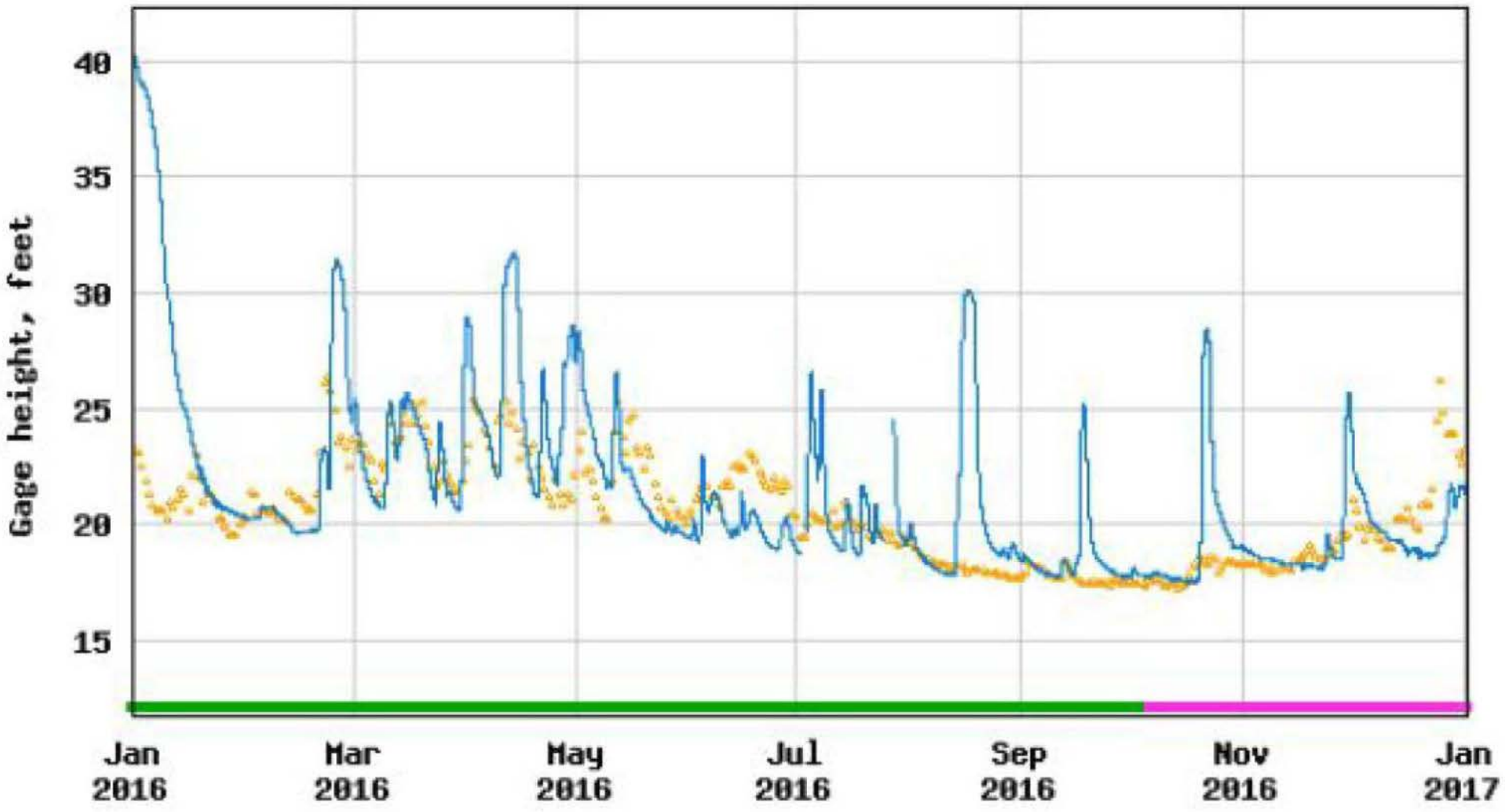
30000
20000
10000
1000
100
70
Jan 2016
Mar 2016
May 2016
Jul 2016
Sep 2016
Nov 2016
Jan 2017
Median daily statistic (15 years)
Discharge
Period of approved data
Period of provisional data

USGS

USGS 03346500 EMBARRAS RIVER AT LAWRENCEVILLE, IL



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# ---------------------------------- WARNING ----------------------------------------
# Some of the data that you have obtained from this U.S. Geological Survey database
# may not have received Director's approval. Any such data values are qualified
# as provisional and are subject to revision. Provisional data are released on the
# condition that neither the USGS nor the United States Government may be held liable
# for any damages resulting from its use.
#
# Additional info: https://help.waterdata.usgs.gov/policies/provisional-data-statement
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# File-format description:  https://help.waterdata.usgs.gov/faq/about-tab-delimited-output
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# Contact:   gs-w_support_nwisweb@usgs.gov
# retrieved: 2017-05-03 14:15:10 EDT       (vaww02)
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# Data for the following 1 site(s) are contained in this file
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# ------------------------------------------------------------------------------------
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# Data provided for site 03346500
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# Data-value qualification codes included in this output:
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#     A  Approved for publication -- Processing and review completed.
#     e  Value has been estimated.
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USGS	03346500	2016-04-18	23.06	A
USGS	03346500	2016-04-19	22.01	A
USGS	03346500	2016-04-20	21.38	A
USGS	03346500	2016-04-21	21.42	A
USGS	03346500	2016-04-22	25.65	A
USGS	03346500	2016-04-23	25.40	A
USGS	03346500	2016-04-24	23.38	A
USGS	03346500	2016-04-25	22.53	A
USGS	03346500	2016-04-26	21.95	A
USGS	03346500	2016-04-27	23.38	A
USGS	03346500	2016-04-28	26.07	A
USGS	03346500	2016-04-29	27.21	A
USGS	03346500	2016-04-30	28.35	A

USGS	03346500	2016-05-01	27.56	A
USGS	03346500	2016-05-02	28.02	A

APPENDIX D

USFWS IPAC REPORT

IPaC U.S. Fish & Wildlife Service

IPaC resource list

Location

Lawrence County, Illinois

Local office

Marion Ecological Services Sub-office

(618) 997-3344
(618) 997-8961

Marion Illinois Sub-office
8588 Route 148
Marion, IL 62959-5822

http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html

Endangered species

This resource list is for informational purposes only and should not be used for

planning or analyzing project level impacts.

Section 7 of the Endangered Species Act requires Federal agencies to *"request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action"* for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Review section in IPaC or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by creating a project and making a request from the Regulatory Review section.

Listed species

[1] are managed by the Endangered Species Program of the U.S. Fish and Wildlife Service.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.

The following species are potentially affected by activities in this location:

Clams

NAME	STATUS
Fat Pocketbook Potamilus capax No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/2780	Endangered
Rabbitsfoot Quadrula cylindrica cylindrica There is a final critical habitat designated for this species. Your location is outside the designated critical habitat. http://ecos.fws.gov/ecp/species/5165	Threatened

Flowering Plants

NAME	STATUS
Eastern Prairie Fringed Orchid Platanthera leucophaea No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/601	Threatened

Mammals

NAME	STATUS
Indiana Bat Myotis sodalis No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Birds are protected under the Migratory Bird Treaty Act

[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service

[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The migratory birds species listed below are species of particular conservation concern (e.g. Birds of Conservation Concern) that may be potentially affected by activities in this location, not a list of every bird species you may find in this location. Although it is important to try to avoid and minimize impacts to all birds, special attention should be made to avoid and minimize impacts to birds of priority concern. To view available data on other bird species that may occur in your project area, please visit the AKN Histogram Tools and Other Bird Data Resources.

NAME	SEASON(S)
Bald Eagle Haliaeetus leucocephalus http://ecos.fws.gov/ecp/species/1626	Year-round
Bell's Vireo Vireo bellii http://ecos.fws.gov/ecp/species/9507	Breeding
Black-billed Cuckoo Coccyzus erythropthalmus http://ecos.fws.gov/ecp/species/9399	Breeding
Blue-winged Warbler Vermivora pinus	Breeding

Dickcissel Spiza americana	Breeding
Fox Sparrow Passerella iliaca	Wintering
Henslow's Sparrow Ammodramus henslowii http://ecos.fws.gov/ecp/species/3941	Breeding
Kentucky Warbler Oporornis formosus	Breeding
Least Bittern Ixobrychus exilis http://ecos.fws.gov/ecp/species/6175	Breeding
Loggerhead Shrike Lanius ludovicianus http://ecos.fws.gov/ecp/species/8833	Year-round
Mississippi Kite Ictinia mississippiensis	Breeding
Peregrine Falcon Falco peregrinus http://ecos.fws.gov/ecp/species/8831	Breeding
Pied-billed Grebe Podilymbus podiceps	Year-round
Prairie Warbler Dendroica discolor	Breeding
Prothonotary Warbler Protonotaria citrea	Breeding
Red-headed Woodpecker Melanerpes erythrocephalus	Year-round
Rusty Blackbird Euphagus carolinus	Wintering
Sedge Wren Cistothorus platensis	Breeding
Short-eared Owl Asio flammeus http://ecos.fws.gov/ecp/species/9295	Wintering

Willow Flycatcher Empidonax traillii http://ecos.fws.gov/ecp/species/3482	Breeding
Wood Thrush Hylocichla mustelina	Breeding
Worm Eating Warbler Helmitheros vermivorum	Breeding

What does IPaC use to generate the list of migratory bird species potentially occurring in my specified location?

Landbirds:

Migratory birds that are displayed on the IPaC species list are based on ranges in the latest edition of the National Geographic Guide, Birds of North America (6th Edition, 2011 by Jon L. Dunn, and Jonathan Alderfer). Although these ranges are coarse in nature, a number of U.S. Fish and Wildlife Service migratory bird biologists agree that these maps are some of the best range maps to date. These ranges were clipped to a specific Bird Conservation Region (BCR) or USFWS Region/Regions, if it was indicated in the 2008 list of Birds of Conservation Concern (BCC) that a species was a BCC species only in a particular Region/Regions. Additional modifications have been made to some ranges based on more local or refined range information and/or information provided by U.S. Fish and Wildlife Service biologists with species expertise. All migratory birds that show in areas on land in IPaC are those that appear in the 2008 Birds of Conservation Concern report.

Atlantic Seabirds:

Ranges in IPaC for birds off the Atlantic coast are derived from species distribution models developed by the National Oceanic and Atmospheric Association (NOAA) National Centers for Coastal Ocean Science (NCCOS) using the best available seabird survey data for the offshore Atlantic Coastal region to date. NOAANCCOS assisted USFWS in developing seasonal species ranges from their models for specific use in IPaC. Some of these birds are not BCC species but were of interest for inclusion because they may occur in high abundance off the coast at different times throughout the year, which potentially makes them more susceptible to certain types of development and activities taking place in that area. For more refined details about the abundance and richness of bird species within your project area off the Atlantic Coast, see the Northeast Ocean Data Portal. The Portal also offers data and information about other types of taxa that may be helpful in your project review.

About the NOAANCCOS models: the models were developed as part of the NOAANCCOS project: Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf. The models resulting from this project are being used in a number of decision-support/mapping products in order to help guide decision-making on activities off the Atlantic Coast with the goal of reducing impacts to migratory birds. One such product is the Northeast Ocean Data Portal, which can be used to explore details about the relative occurrence and abundance of bird species in a particular area off the Atlantic Coast.

All migratory bird range maps within IPaC are continuously being updated as new and better

information becomes available.

Can I get additional information about the levels of occurrence in my project area of specific birds or groups of birds listed in IPaC?

Landbirds:

The Avian Knowledge Network (AKN) provides a tool currently called the "Histogram Tool", which draws from the data within the AKN (latest,survey, point count, citizen science datasets) to create a view of relative abundance of species within a particular location over the course of the year. The results of the tool depict the frequency of detection of a species in survey events, averaged between multiple datasets within AKN in a particular week of the year. You may access the histogram tools through the Migratory Bird Programs AKN Histogram Tools webpage.

The tool is currently available for 4 regions (California, Northeast U.S., Southeast U.S. and Midwest), which encompasses the following 32 states: Alabama, Arkansas, California, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North, Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin.

In the near future, there are plans to expand this tool nationwide within the AKN, and allow the graphs produced to appear with the list of trust resources generated by IPaC, providing you with an additional level of detail about the level of occurrence of the species of particular concern potentially occurring in your project area throughout the course of the year.

Atlantic Seabirds:

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAANCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Facilities

Wildlife refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGES AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX E

HERBACEOUS AND HARD MASS TREE PLANTING MIX

APPENDIX E. HERBACEOUS AND HARD MASS TREE PLANTING MIX

Scientific Name	Common Name	Quantity
Tree Species		
Taxodium distichum	bald cypress	20
**Quercus lyrata*	overcup oak	0
Quercus palustris	pin oak	20
Carya illinoinensis	pecan	15
Quercus bicolor	swamp white oak	20
Quercus macrocarpa	bur oak	15
**Quercus shumardii*	shumard oak	0
Quercus pagoda	cherry bark oak	15
Diospyros virginiana	persimmon	15
Carya laciniosa	shell bark hickory	20
Total		**140**
Herbaceous Species		
Trifolium hybridum	alsike clover	NA
Agrostis gigantea	redtop	NA

Notes:

*Indicates an alternative species that could be used, depending on nursery availability. If a preferred species is not available, it will be substituted with an alternative listed above.

NA= not applicable

Herbaceous species will be planted at a rate of 8 pounds of PLS/acre

ATTACHMENT E

SAMPLE EDUCATION MATERIALS FOR PROJECT PERSONNEL

State-Listed Species Field Guide: Smooth Softshell Turtle and Eastern Ribbon Snake

The following species are endangered species or species of concern within the State of Illinois. Identification of these species within the project area should result in efforts to avoid impact or injury to the species, and the appropriate personnel should be contacted (instructions below).

SMOOTH SOFTSHELL TURTLE

Smooth Softshell Turtle

IDENTIFICATION

This species is medium sized (11 inch carapace [shell] length). It is light tan to brown in color, and prefers sandy reaches of moderate to fast flowing water. This species is distinguishable by its smooth, rubbery-like shell and flat profile.

IF SEEN ON-SITE

1. Halt work within the Project area
2. Inform appropriate on-site personnel so that the encounter can be documented.
3. Approach the turtle to flush it from the bank to a safer location.
4. If necessary, consult with an IDNR biologist to determine whether relocation by an IDNR biologist is required.

SIMILAR SPECIES


Spiny Softshell Turtle

The Spiny Softshell Turtle is very similar in description, but the edges of the shell are coated with rough nodules (i.e. spines) that distinguish these species from one another.

EASTERN RIBBON SNAKE

Eastern Ribbon Snake

IDENTIFICATION

This species is medium sized (30 inches in length). This species is black with three yellow stripes (midback and both sides). This snake is hard to distinguish from similar species from a distance. If possible, locate the parietal scales (top of the head behind the eyes), which may exhibit a pair of spots that never touch.

IF SEEN ON-SITE

1. Approach the snake from the construction area, guiding it away from roads or out of the exclosure.
2. Inform appropriate on-site personnel so that the encounter can be documented.
3. Inspect integrity of the exclusion fence (i.e. gaps, imperfections, etc.).

SIMILAR SPECIES

The Common Garter Snake is similar in size, but may be distinguished by their stripes, that may range from yellow to green to white. Additionally, the head of this species is darker than its body, which may exhibit spots.

COPPERBELLY WATER SNAKE

Copperbelly Water Snake

IDENTIFICATION

This species is large sized (50 inches in length). This species is distinguishable by its dark brown to black body and colorful belly, which may range from red to orange to yellow.

IF SEEN ON-SITE

1. See Eastern Ribbon Snake protocol

SIMILAR SPECIES


Yellowbelly Water Snake

The Yellowbelly Water Snake is a similar species, and is distinguishable by the color of its belly, which tends to be more yellow than the Copperbelly Water Snake.

CONTACT:

Illinois Department of Natural Resources (IDNR)

Region V Office:

Phone: 618-435-8138

ATTACHMENT F

IMPLEMENTING AGREEMENT

IMPLEMENTING AGREEMENT

Responsibilities of participants in the Conservation Plan

Chevron Environmental Management Company (CEMC) is solely responsible for directing their contractors to complete each task described in the Conservation Plan, including the implementation of all avoidance, minimization, and mitigation measures, located at Township 3 North, Range 1 West, Section 7 (the "Project Area"). CEMC hereby certifies that the following CEMC representatives have the necessary legal authority to carry out their respective obligations and responsibilities under the Conservation Plan to complete the project:

Robert Lavorerio - CEMC Area Manager;

Gene Choquette - CEMC Project Manager; and

Randal Earnest - CEMC Construction Representative

Assurances

CEMC owns and is responsible for long-term management of the Project Area. The Project Area is covered under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and CEMC is responsible for the environmental stewardship of this area. As such, project activities will be conducted in accordance with the details described in this document, including the necessary post-completion reports and monitoring information. Furthermore, all activities will comply with Federal, State, and Local regulations and permitting requirements.

Estimated Schedule

All dates are approximate and are subject to change due to the nature of the permit approval process and construction process.

- Submit an Incidental Take Authorization (ITA) Permit Application to the Illinois Department of Natural Resources (IDNR) (June 2017).
- Upon permit approval, publish a public notice, adhering to the requirements of Administrative Code for the Incidental Taking of Endangered and Threatened Species (17 Ill. Adm. Code 1080) (July 2017).
- Following the public notice period and acceptance of the ITA Permit Application, preliminary construction may begin, including the instillation of an exclusion fence and contractor education (August 2017).
- Construction associated with the riverbank stabilization (August – December 2017).
- The temporary access road will be retracted, allowing wetland restoration to begin (March/April 2018).
- Restoration of the forested wetland will be complete (March/April/May 2018).

- The IDNR will be notified of date and location of the pre-construction meeting and the start and end dates of construction. A post-construction report, including an as-built figure, photos, and any amendments to the proposed plan, will be submitted to the IDNR within 90 days of the Project completion. Dates are to be determined according to the above approximate dates.

Chevron Environmental Management Company

Robert Lavorerio - Environmental Compliance Officer

6/28/2017
Date

ADDENDUM

ADDENDUM TO THE CONSERVATION PLAN

The follow clarifications have been developed for the Embarras River Bank Stabilization Project Conservation Plan and Incidental Take Authorization application:

Section (1)(A):

- The total area of impact is approximately 2.15 acres, which includes the forested wetland disturbance, a permanent maintenance access road, riverbank grading and rock armoring, and the inclusion of weirs and culverts. Approximately 60 feet of forested wetlands along the 1520 feet of riverbank have been cleared of trees for construction. Within this recently cleared area, the 30 feet closest to the riverbank (approximately 1.0 acres) will be cut back and regraded to achieve an approximate 1.5:1 slope, which will be armored with rock rip rap. Of the remaining 30 feet of disturbance, 10 feet (approximately 0.35 acres) will be used for the creation of a permanent maintenance access road adjoining the top of the armored riverbank. The 20 feet (approximately 0.70 acres) of disturbance remaining will be restored to a forested wetland.

Section (2)(A):

- The total area of impact for the Eastern Ribbon Snake and the Copper Belly Water Snake is approximately 2.15 acres. This area covers an approximate 60 feet x 1520 feet area of forested wetlands adjacent to the riverbank. The area spans from the current edge of the riverbank to the limit of the area that has been cleared for trees for project construction.
- The total area of impact for the aquatic species (i.e. Smooth Softshell Turtle and Eastern Sand Darter) is approximately 0.34 acres. This area was calculated according to the following Project construction specifications:
    - Aquatic species habitat that could be impacted by the Project is limited to the area at the toe of the slope where rock will be placed. The toe of the slope is estimated to be approximately 8 feet and run the linear distance (1520 feet) of the Project. The estimated area is 0.30 acres.
    - A total of seven weirs and 15 culverts will be placed at the toe of the slope for habitat enhancement. Each weir is estimated to be 12 feet (length) x 20 feet (width) and each culvert is estimated to be 2 feet (length) x 2 feet in (width). The approximate area impacted by placement of weirs and culverts is 0.04 acres.

Section (2)(C)(9):

- A habitat enhancement project is planned as mitigation for the temporary disturbance associated with the Project. Project costs (detailed below) are estimated to be greater than $60,000, which will cover the installation of weirs and culverts.
    - Labor = $10,000
    - Equipment = $10,000
    - Materials = ~$40,000