

TERRA TECHNOLOGIES

Prospectus Mitigation Banking Instrument

For the
**Upper Osage River
Wetland and Stream
Umbrella Mitigation Bank**



November 2014

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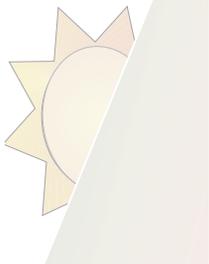


I. INTRODUCTION

Swallow Tail, LLC (the Sponsor) is proposing to establish and operate the Upper Osage River Wetland and Stream Umbrella Mitigation Bank (the Bank) which will govern the development of individual wetland and/or stream mitigation sites (mitigation sites) within the watershed service area in east-central Kansas. The Final Umbrella Mitigation Banking Instrument will define general guidelines applicable to all mitigation sites authorized as part of the Bank but certain site-specific details will be included in the mitigation plan for each mitigation site. These mitigation plans will become attachments to this umbrella mitigation banking instrument upon approval. The establishment of this umbrella mitigation bank will streamline the production of the Sponsor’s mitigation plans and reduce regulatory workloads in the watershed service area in comparison to the establishment of multiple separate mitigation banking instruments. Consequently, mitigation sites will be more rapidly developed which will be beneficial to water quality and wildlife habitat, as well as being of service to the regulated public.

II. OBJECTIVES

The objectives of this proposed umbrella mitigation bank are: 1) to provide appropriate compensatory mitigation for impacts to jurisdictional aquatic habitats such as streams and wetlands authorized under Sections 404 and 401 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899 within the watershed service area and, 2) to improve the water quality and wildlife habitat functions provided by the mitigation sites in a manner that would simultaneously address the specific mitigation needs of the mitigation sites and the larger aquatic needs of the watershed. This would be done by re-establishing the native habitats that would have likely existed on the mitigation sites before agricultural conversion and by increasing the quantity and quality of stream, wetland, buffer and upland habitats and their associated ecosystem functions. Typical anticipated mitigation activities include addressing stream bed and bank instability; reversing past stream channelization efforts by restoring natural stream channel alignment and/or cross section; riparian buffer restoration and enhancement; wetland restoration, rehabilitation, establishment and enhancement; and buffer and upland establishment and enhancement. The Sponsor shall then legally protect the mitigation sites as natural habitat in perpetuity.



III. ESTABLISHMENT AND OPERATION

A. *Umbrella Mitigation Bank Operation & Document Organization*

The Final Umbrella Mitigation Banking Instrument will serve as a binding agreement regarding the establishment, use, operation and maintenance of the Bank and will be made and entered into, by, and among the Sponsor and the members of the Interagency Review Team (the IRT). The IRT is chaired by the Kansas City District of the U.S. Army Corps of Engineers (the Corps) and will also include as members the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS) and the Kansas Department of Wildlife, Parks and Tourism.

The Final Umbrella Mitigation Banking Instrument will become valid on the date of the last signatory's signature. The Final Umbrella Mitigation Banking Instrument may be amended or modified with the written approval of all signatory parties as described in the Corps' and EPA's joint regulation for *Compensatory Mitigation for Losses of Aquatic Resources* (the Mitigation Rule) at 33 CFR Part 332.8(d). The addition and approval of mitigation sites and the expansion of previously approved mitigation sites will be included as modifications (*i.e.*, attachments) to the Final Umbrella Mitigation Banking Instrument using the procedures described in the Mitigation Rule at 33 CFR Part 332.8(g)(1). Any of the IRT members may terminate their participation 30 days after providing written notification to all signatory parties.

After Corps and IRT approval of mitigation sites the Sponsor shall perform the mitigation activities described in the mitigation plan of each mitigation site or as shown in any subsequent As-Built Figures and shall operate all mitigation sites in accordance with the provisions of the Final Umbrella Mitigation Banking Instrument and the corresponding mitigation plan. The Sponsor shall receive wetland credits and/or stream credits upon satisfaction of the ecological performance standards outlined in the Final Umbrella Mitigation Banking Instrument and/or the mitigation plan of each mitigation site. These credits will be used as compensatory mitigation for impacts to waters of the U.S., including wetlands, authorized by Sections 404 and 401 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899. The amount of stream credits granted to the Sponsor will be determined by the Corps and IRT and will be proportionate to the amount of functional lift accomplished at the site which will be calculated through the use of the Kansas Stream Mitigation Guidance or any subsequently approved method of credit assessment. Wetland credit amounts will be determined by the Corps and IRT on an acreage basis depending on the type of mitigation activity (restoration, establishment, rehabilitation, enhancement or preservation) unless a new method of wetland credit assessment is adopted after the approval of the Final Umbrella Mitigation Banking Instrument. Credits will be sold to third parties at appropriate market rates to be



determined by the Sponsor. The sale of these wetland credits and stream credits available at the mitigation sites only pertain to the mitigation requirements of the Department of the Army permit issued under the authorities of Section 404 of the Clean Water Act and/or under Section 10 of the Rivers and Harbors Act of 1899 and any associated Section 401 water quality certification as administered by the State of Kansas. Additional mitigation requirements may be necessary to comply with other federal, state, and/or local statutes and regulations. Per the Mitigation Rule at 33 CFR 332.3(j)(1)(ii), proposed mitigation activities may address requirements of multiple regulatory programs and authorities for the same activity.

This Prospectus addresses all requirements of a complete Prospectus as described in the Corps' *Mitigation Banking Instrument Outline for Proposed Mitigation Banks within the State of Kansas* (U.S. Army Corps of Engineers, 2013) in addition to some supplemental information provided by the Sponsor. After this Prospectus has been placed on Public Notice and the public comments have been submitted to the Sponsor, the Sponsor will address those comments and submit the Draft Umbrella Mitigation Banking Instrument which will contain the necessary information required by the *Mitigation Banking Instrument Outline for Proposed Mitigation Banks within the State of Kansas*, including but not limited to baseline information, determination of credits, mitigation work plan, ecological performance standards, monitoring requirements, management plans, financial assurances, credit release schedule and default and closure provisions. The Draft Umbrella Mitigation Banking Instrument will also include a draft mitigation plan for the Pottawatomie Creek Wetland and Stream Mitigation Site. An example letter of credit that would be used as financial assurances is included in Appendix A. The Corps and IRT will then have the opportunity to comment on the Draft Umbrella Mitigation Banking Instrument. The Sponsor will then incorporate those comments into the document and submit the Final Umbrella Banking Instrument for Corps and IRT review.

The main body of the Final Umbrella Banking Instrument will discuss how the Bank will be established and operated and will include the following:

- Location
- Establishment and Operation
- Current and Long-Term Ownership Arrangements and Long-Term Management Strategy
- Sponsor Qualifications
- Legal Responsibility for Compensatory Mitigation
- Watershed Approach
- Service Area
- Mitigation Plan Guidelines
 - Objectives
 - Site Selection (General Discussion of Prioritization Criteria)



- Site Protection Instrument
- Determination of Credits (Methodology)
- Operation and Maintenance Plan Guidelines
- Common Ecological Performance Standards (Wetland Hydrology, Hydrophytic Vegetation, Hydric Soils, Desirable Vegetative Cover, Tree and Shrub Survival, Invasive Species, *etc.*)
- Monitoring Requirement Guidelines
- Long-Term Management Plan Guidelines
- Adaptive Management Plan Guidelines
- Financial Assurance Guidelines
- Credit Release Schedule Guidelines
- Accounting Procedures
- Reporting
- Default and Closure

The mitigation plans for each mitigation site will be attachments to the Final Umbrella Banking Instrument. These mitigation plans will include the following:

- Location (Including Map[s] and Shapefile)
- Objectives
- Site Selection (Including Descriptions of Existing Easements and Documentation of Acquisition and Protection of Water Rights)
- Site Protection Instrument (If Different Than Instrument Main Body)
- Baseline Information
- Determination of Credits
- Mitigation Work Plan
- Operation and Maintenance Plan
- Site-Specific Ecological Performance Standards (If Different Than Instrument Main Body)
- Site-Specific Monitoring Requirements (If Different Than Instrument Main Body)
- Site-Specific Long-term Management Plan (Including Legal Mechanism and Responsible Party)
- Site-Specific Adaptive Management Plan
- Financial Assurances
- Credit Release Schedule
- Other Information Required by the Corps

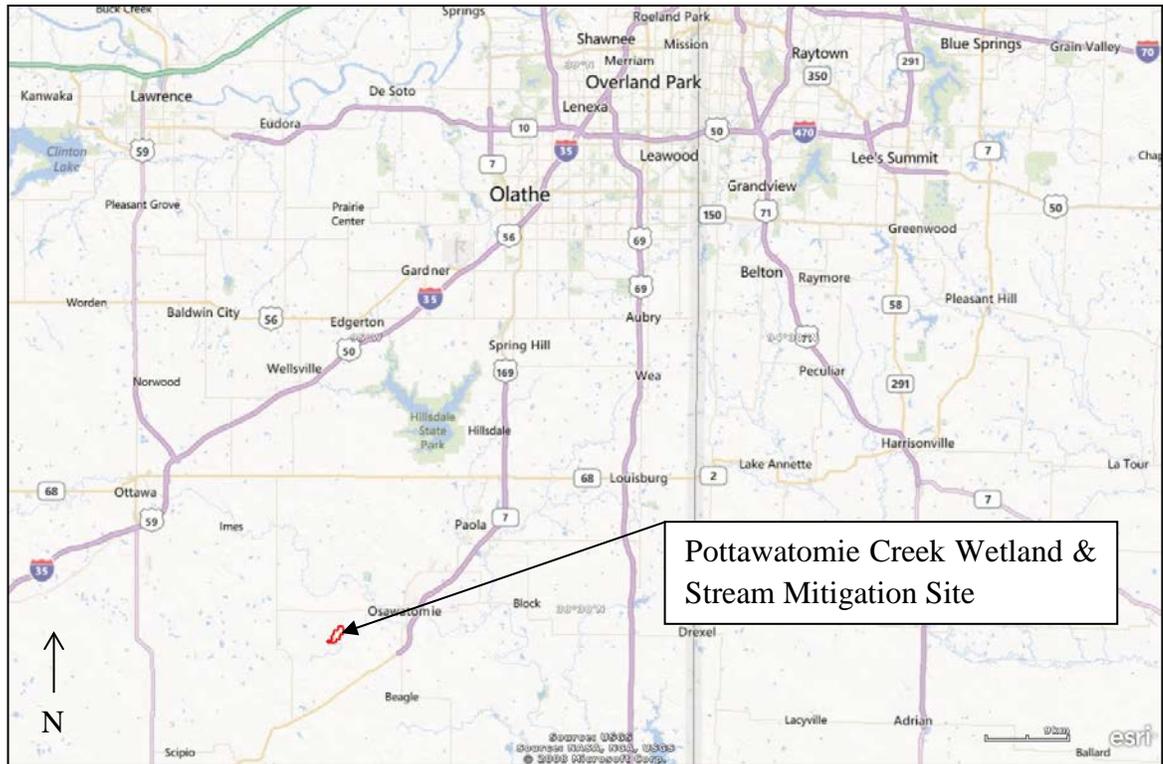
B. Initial Mitigation Site

Within the service area the Sponsor owns the Pottawatomie Creek Wetland and Stream Mitigation Site which it intends to propose as the initial mitigation site for this umbrella

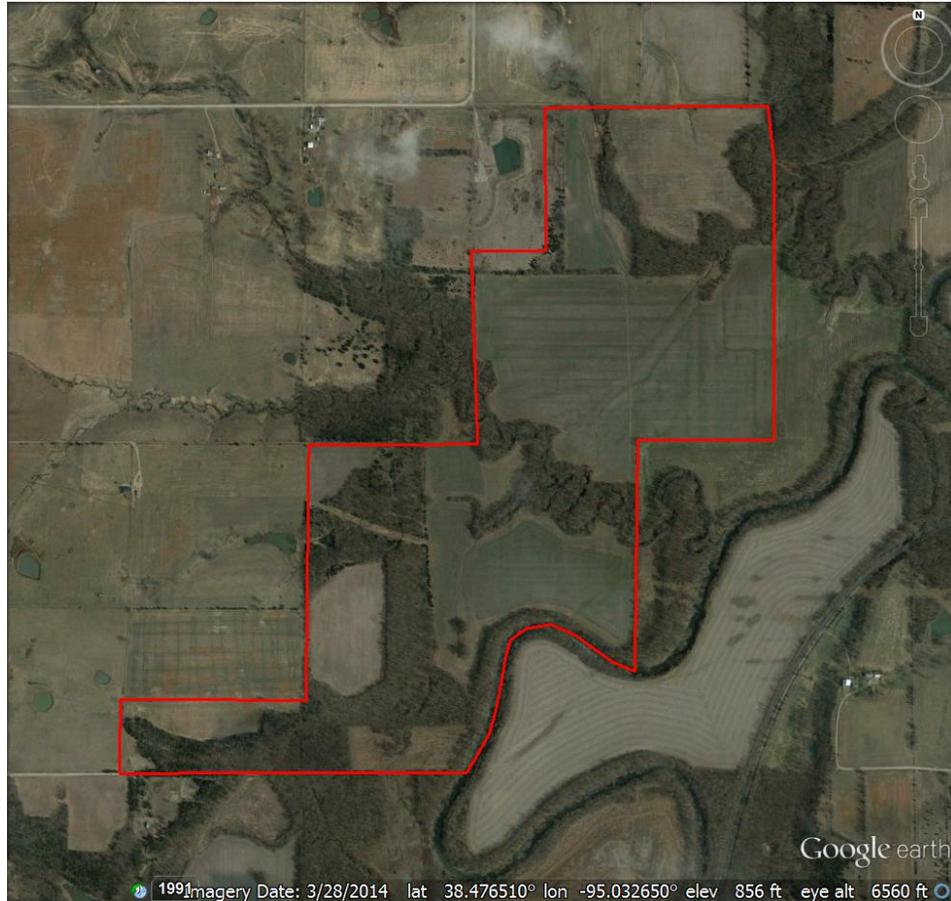


instrument. The Pottawatomie Creek Wetland and Stream Mitigation Site has already been proposed to the Corps and IRT. It is approximately 280 acres in size and is located rural Miami County, Kansas within Sections 13 & 24 of Township 18 South Range 21 East and Section 18 of Township 18 South Range 22 East with an approximate center at latitude 38.476485° North longitude 95.031231° West. As shown in Figure 1, the proposed Bank site is located approximately four miles to the west of the City of Osawatomi (ESRI, 2014). Figure 2 shows an aerial photograph of the proposed Pottawatomie Creek Wetland and Stream Mitigation Site along with its proposed boundaries (Google, Inc., 2013).

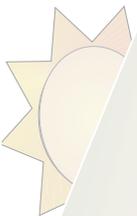
Figure 1. Pottawatomie Creek Wetland and Stream Mitigation Site Location



**Figure 2. Pottawatomie Creek Wetland and Stream Mitigation Site
Aerial Photograph with Approximate Boundaries**



The Pottawatomie Creek Wetland and Stream Mitigation Site's position within the broad Pottawatomie Creek floodplain at a location containing multiple tributary streams meant that the site's pre-settlement morphology and ecology were largely shaped by the alluvial processes of these numerous streams, the foremost being Pottawatomie Creek itself. Frequent flooding created poorly drained hydric soils throughout the bottomlands and wetland, riparian and prairie habitats likely dominated the site historically. Agricultural conversion lessened the strong hydrologic influences on the mitigation site through habitat replacement, the creation of drainage swales in the large fields and the channelization of some of the tributary streams. Changes in the surrounding land use from prairie and woodlands to agriculture altered the watershed hydrology of the onsite streams so that they received flows of greater magnitudes and shorter durations. This change caused dramatic stream base incision and bank erosion which in turn undoubtedly decreased these streams' natural connection with their floodplains and sent large quantities of eroded sediments into downstream waters. Today, these stream channels are deeply incised and the tops of the steep stream banks are held by the exposed roots of the streamside trees, the eventual toppling of which will further highly destabilize these stream systems. The Sponsor is proposing to address the needs of this property and of the



watershed through wetland establishment, restoration and enhancement; stream grade control and habitat enhancement; riparian habitat restoration and enhancement; and stream bank stability.

Because of the clear mitigation need, abundant streams and sizeable potential wetland restoration locations, the Pottawatomie Creek Wetland and Stream Mitigation Site has significant potential for wetland and stream mitigation. Additional details will be provided as a mitigation plan attachment to the Bank's Draft Mitigation Banking Instrument.

IV. SERVICE AREA

The proposed service area of the Bank is entirely within Kansas and consists of the 10290101, 10290102, 10290103, 10290108 and 10300101 8-digit Hydrologic Unit Code (HUC) drainage areas within Kansas. The boundaries of the service area are shown below in Figure 3 along with the location of the Pottawatomie Creek Wetland and Stream Mitigation Site. The proposed service area of the Bank is also referred to as the Bank's watershed elsewhere in this document as these terms are synonymous.

The urban and suburban nature and current high development pressures within HUC 10300101 have significantly reduced the amount of land suitable for wetland and stream habitat improvements within this HUC. The lack of ecologically appropriate land is not the only factor that has begun to make mitigation within this HUC impracticable as there is also the impact of public infrastructure special assessments and capital improvement levies as well the fact that the remaining open space parcels are subject to local ordinances that restrict land owner activities that would affect public safety issues such as flood conveyance and fire protection. This infeasibility creates a need for centralized mitigation to service this area which will be satisfied by the Bank. While HUC 10300101 is within a different 6-digit HUC than the Bank, both 6-digit HUCs drain to the Missouri River and the stream types and ecology within these areas are very similar as the Level IV Ecoregions in HUC 10300101 are the same as in the rest of the Bank's service area (Chapman *et al.*, 2001). Including HUC 10300101 within the service area will provide a much needed and practicable mitigation option for that area and will provide similar ecological benefits which will help to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.

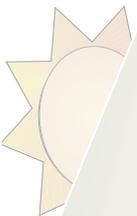
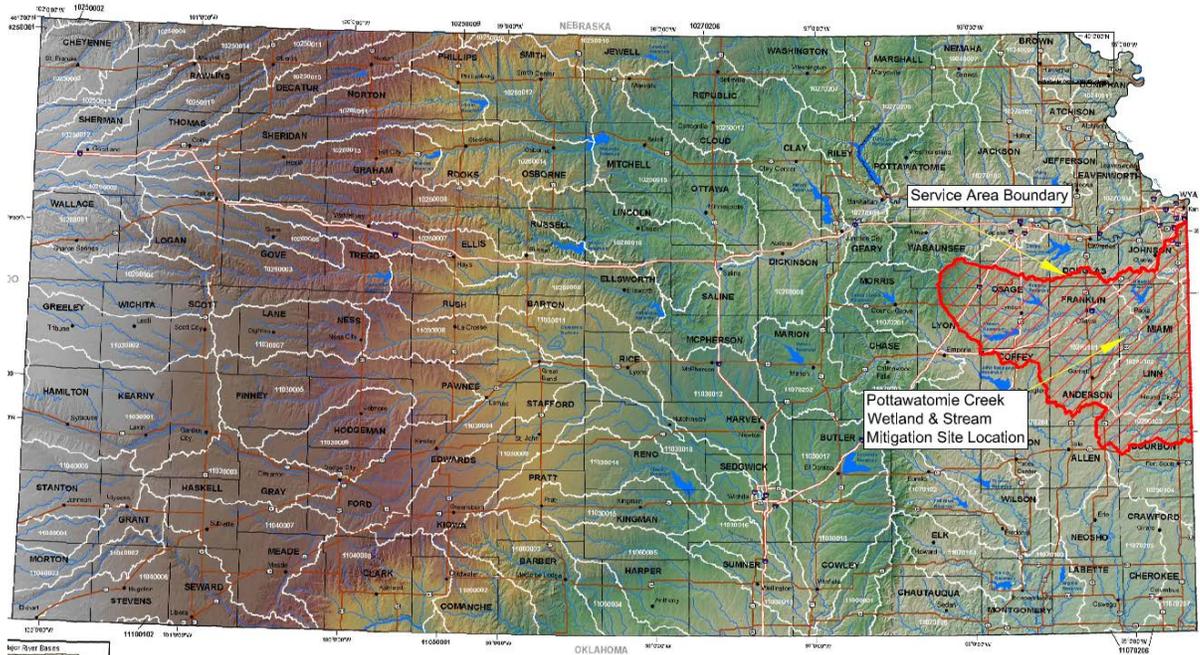


Figure 3. Service Area Boundaries



On a case-by-case basis the Corps, in consultation with the IRT, may approve mitigation credits to be sold to offset impacts from Department of the Army permit impacts that occur outside this service area. If deemed appropriate, the Corps will determine the number of credits needed to be purchased in order to adequately replace the aquatic resources lost at the Department of the Army permit site.

V. GENERAL NEED AND TECHNICAL FEASIBILITY

With European American settlement, native habitats were displaced by human-focused land uses which now dominate the landscape. The most common of these in the Bank's watershed are row crop agriculture and grassland managed for livestock, interspersed with woodlands. Conversion to these human land uses has caused significant and widespread alteration and destruction of tallgrass prairie, wetland, and stream habitats. A conservative estimate of 96% of all tallgrass prairie has been lost, much of it when the land was cultivated by steel plows in the late 19th and early 20th centuries. Beyond the overt destruction of tallgrass prairie by such practices as plowing, the absence of fire and natural grazing patterns on the landscape favors the establishment of poor quality early successional forest species or low diversity grasses on fallow land where tallgrass prairie may have recovered (Helzer, 2009). Additionally, approximately 48% of wetlands in Kansas have been lost over the past 200 years as a result of conversion to agriculture, a drop in groundwater levels due to irrigation, levee construction, river management and navigation programs, urban development activities and other actions (Dahl, 1990).

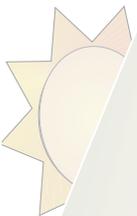


In recent decades, rapid urbanization and suburbanization have become prevalent in the watershed. The Bank watershed includes part of the southern Kansas City metropolitan area, including portions of the cities of Mission, Overland Park, Leawood, Lenexa, and Olathe. The urban development in the watershed has destroyed wetlands and wildlife habitat and these land uses exclude the possibility of successful mitigation in these areas, increasing the importance of mitigation in other parts of the watershed.

The Kansas Unified Watershed Assessment categorized all of the 8-digit subbasins within the watershed boundary – Upper Marais des Cygnes (10290101), Lower Marais des Cygnes (10290102), Little Osage (10290103), South Grand (10290108), and Lower Missouri-Crooked (10300101) – as Category 1 Watersheds, or Watersheds in Need of Restoration. In the same report, the Upper Marais des Cygnes 8-digit HUC was ranked the fifth highest priority watershed for restoration in the state of Kansas and the Lower Marais de Cygnes, Little Osage, Lower Missouri-Crooked and South Grand were ranked 12th, 21st, 32nd and 67th out of 71, respectively (Kansas Department of Health and Environment & U.S. Department of Agriculture Natural Resources Conservation Service, 1998).

A Watershed Restoration and Protection Strategy (WRAPS) Plan has been developed for the Middle Marais des Cygnes River – a subset of the Upper Marais des Cygnes (10290101) Subbasin consisting of the Appanoose Creek-Marais des Cygnes River (1029010104), Middle Creek-Marais des Cygnes River (1029010107), Lower Pottawatomie Creek (1029010106), and Headwaters Pottawatomie Creek (1029010105) catchments. WRAPS Plans have also been developed for the three reservoirs in the watershed (Hillsdale, Melvern, and Pomona Lakes) along with surrounding subcatchments to address eutrophication and other water quality issues in those lakes. The Hillsdale Lake WRAPS area includes the Bull Creek (102901020101), Little Bull Creek (102901020102), and Rock Creek (102901020103) subcatchments (Hillsdale Lake WRAPS, 2012). The Soldier Creek-Pomona Lake (1029010102) catchment is the boundary for the Pomona Lake WRAPS plan and the Melvern Lake WRAPS project area is the Marais des Cygnes River-Melvern Lake (1029010101) catchment (Pomona Lake WRAPS, 2011; Melvern Lake WRAPS, 2011).

The WRAPS plans covering the Upper Marais des Cygnes (10290101) Subbasin are Middle Marais des Cygnes, Pomona Lake, and Melvern Lake. The primary water quality impairment in the Middle Marais des Cygnes WRAPS project area is low dissolved oxygen and three waterbodies were identified as high priority Total Maximum Daily Loads (TMDLs): Ottawa Creek for dissolved oxygen, Pottawatomie Creek for dissolved oxygen, and the Marais des Cygnes River for bacteria (Lake Region Resource Conservation and Development Council, 2012). In the Pomona Lake WRAPS plan the following were all identified as high priority TMDLs: Dragoon Creek for dissolved



oxygen, One Hundred Ten Mile Creek for dissolved oxygen, Switzler Creek for dissolved oxygen and Pomona Lake for eutrophication and siltation (Pomona Lake WRAPS, 2011). The Melvern Lake WRAPS identified One Hundred Forty Two Mile Creek/Upper Marais des Cygnes River and tributary creeks as high priority TMDLs for both dissolved oxygen and bacteria (Melvern Lake WRAPS, 2011). Pottawatomie Creek was given a designation of 4c in the biology TMDL development process because the creek at times lacks adequate flow to support aquatic life (Kansas Department of Health and Environment, 2008). The Pottawatomie Creek drainage is designated a priority area for the implementation of Best Management Practices (BMPs), which includes restoring riparian vegetation and installing buffers and basins, to alleviate the load of pollutants leading to low dissolved oxygen in the creek, with reduction goals of 2,520 pounds/year for phosphorous and 130 tons/year for sediment (Lake Region Resource Conservation and Development Council, 2012).

Hillsdale Lake is the only WRAPS project in the Lower Marais des Cygnes (10290102) Subbasin and the eutrophication of Hillsdale Lake was identified as the high priority TMDL for that area (Hillsdale Lake WRAPS, 2012). The approved TMDLs for the Lower Marais des Cygnes are for Big Sugar Creek and Middle Creek, both for dissolved oxygen, and for a number of lakes (Kansas Department of Health and Environment, 2014b). The Lower Marais des Cygnes Subbasin has water quality impairments for Arsenic, Atrazine, Copper, *E. coli*, Eutrophication, Lead, Suspended Solids, and Zinc on the 303(d) List (Kansas Department of Health and Environment, 2014a).

The Little Osage River (10290103) Subbasin does not have a WRAPS plan but there is a TMDL for the Little Osage River for fecal coliform bacteria (Kansas Department of Health and Environment, 2014b). There are 303(d) listings in the Subbasin for Biology and Dissolved Oxygen (Kansas Department of Health and Environment, 2014a).

In the Lower Missouri-Crooked (10300101) Subbasin, where 56% of stream segments were impaired, fecal coliform bacteria, ammonia, nutrients, and the pesticide chlordane were the predominate impairments (Kansas Department of Health and Environment, 2001). The 303(d) impairments in this Subbasin are, in order of number of impaired waterbodies, *E. coli*, eutrophication, diazinon, dissolved oxygen, total phosphorus, chloride, mercury, biology, nitrate, and lead (Kansas Department of Health and Environment, 2014a). The approved TMDLs in this subbasin are for the Blue River (fecal coliform bacteria, chlordane, and nutrients and biological oxygen demand impact on aquatic life) and Indian Creek (fecal coliform bacteria and nitrate) (Kansas Department of Health and Environment, 2014c).

The most common Clean Water Act Section 303(d) List impairments in the watershed are, in order of the number of waterbodies impaired, the following: biology, dissolved



oxygen, *E. coli*, atrazine, and copper. More TMDLs have been written for eutrophication and dissolved oxygen than for any other pollutants. This group of water quality impairments is typical of watersheds dominated by agriculture land uses where nonpoint source pollution is more significant than pollution from point sources. While the compilation of 303(d) lists and formulation of TMDLs has focused on riverine ecosystems, the same water quality impairments act very similarly on abutting and adjacent wetlands because these habitats share the same surrounding landscape as their nearby streams or lakes and because of the close hydrological and ecological relationships between a stream or lake and its neighboring wetlands.

The primary water quality needs at the watershed level are thus the implementation of strategies which will reduce the amount of chemical, nutrient, bacterial and sediment inputs from agriculture to the watershed. These strategies include:

- Widen insufficient riparian buffers
- Reduce concentrations of nutrients, sediment, herbicides and pesticides
- Expand vegetated treatment BMPs including wetlands, vegetated waterways and filter strips
- Reverse past stream channelization efforts
- Restore the hydrologic relationship between stream channels and their floodplains
- Address stream bank erosion and grade instability
- Decrease livestock interaction with streams in order to reduce inputs of sediment, nutrient and fecal bacteria to streams

The long-term water quality needs of the watershed are management of the watershed with techniques that intercept and mitigate sources of water-quality impairment before they reach the receiving waters. Stabilizing streambanks and the installation of grade control structures will prevent erosion and thus reduce suspended sediment loads. Establishing and widening riparian buffers between areas of agricultural production and surface waters for the purpose of intercepting stormwater flows will remove bacteria, nutrients, and sediments. Among their many other benefits, the net positive benefit on water quality from the natural filtering properties of wetlands and riparian areas supports their establishment and restoration in this watershed.

At this time there are no approved mitigation banks within the service area. Mitigation banks are the preferred type of mitigation according to the Mitigation Rule because, when compared to other methods of mitigation, they typically involve larger, more ecologically valuable parcels, more rigorous scientific and technical analysis, planning and implementation, as well as site identification in advance, project-specific planning, and significant investment of financial resources. The establishment of the Bank will be ecologically beneficial because its site selection, construction of mitigation assets in advance of the vast majority of impacts, and its large size and scope allow for greater



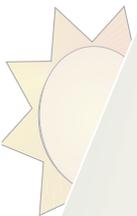
habitat and water quality benefits. It will also be societally valuable because it will help decrease regulatory timeframes for the Corps and the regulated public, reduce mitigation costs because of economy of scale, and simplify monitoring of mitigation projects in the service area which increases the likelihood of mitigation success.

The proposed wetland and stream mitigation activities are technically feasible. As described later in this document, the Sponsor has a history of selecting mitigation sites that are ecologically suitable for stream and riparian buffer restoration. These locations have contained stretches of perennial, intermittent and ephemeral streams that have denuded and/or degraded riparian buffers and required in-stream restoration to re-establish proper channel cross section, remedy bank instability or reverse past channelization efforts which presented great potential for restoring in-stream and riparian buffer habitat. In addition, the Sponsor's previously approved mitigation sites have had topography, soils and hydrology amenable to wetland restoration, establishment, rehabilitation and enhancement.

VI. CURRENT AND LONG-TERM OWNERSHIP ARRANGEMENTS AND LONG-TERM MANAGEMENT STRATEGY

The Sponsor will own the real estate containing each mitigation site, including the water rights and mineral rights, and the Sponsor will develop mitigation plans to establish, restore, rehabilitate, and enhance onsite streams, riparian buffers, wetlands, buffers and/or uplands at each mitigation site. It is the intention of the Sponsor to legally preserve the property as open space habitat in accordance with the terms of the long-term management plan included in the Final Umbrella Mitigation Banking Instrument and each mitigation site's conservation easement. Conservation easements will be the legal means to ensure that each mitigation site remains as natural habitat in perpetuity. The conservation easements shall prohibit any land development to occur on mitigation sites and shall stay with the mitigation site property in the instance that the title to the property is transferred to another party. A draft conservation easement is included in Appendix B. The terms of the easement will be enforceable by the Corps and the Midwest Mitigation Oversight Association, a non-profit group that will hold the conservation easement and will monitor the Sponsor's compliance with the conditions of the easement. After the mitigation site is approved, copies of the finalized and recorded conservation easement shall be provided to the Corps.

The Midwest Mitigation Oversight Association is a conservation-based non-profit corporation established in 2007 with the sole purpose of holding and monitoring natural resource mitigation conservation easements. The Midwest Mitigation Oversight



Association has been approved by the Kansas City, St. Louis and Little Rock Districts of the U.S. Army Corps of Engineers as a legally-binding recipient of conservation easements for mitigation sites and currently holds easements on thousands of acres of federal mitigation parcels in Missouri and Kansas. The board of directors consists of professionals whom all meet stringent requirements in order to be on the board, including the possession of a broad scientific background related to natural resources, conservation science or applied ecology. These board members have more than fifty combined years of professional natural resource experience in wetland and stream regulations, habitat maintenance and construction.

The long-term management strategy for each mitigation site is to provide limited maintenance and management of the mitigation site as needed after all parties have determined that the mitigation site is successful and that more intensive monitoring and management is no longer necessary. Active management of each mitigation site will continue for a minimum of fifteen (15) years after approval of the mitigation site or until all credits from the mitigation site have been sold (unless the remaining credits are indefinitely suspended or removed), whichever is later. At that point, the ecosystems within the mitigation site will not require active management. Long-term management will commence at the end of the active management phase of mitigation site operation and will include continued maintenance of the mitigation site for purposes of such activities as controlling invasive species, maintaining water control berms, prevention of trespassing and removal of litter, as necessary. Costs associated with these activities will be paid for by the revenues from credit sales. It is the intent of the Sponsor to oversee the long-term management of each mitigation site in perpetuity, but should the Sponsor for any reason decide to transfer the long-term management of a mitigation site to a currently unknown entity, the Sponsor will notify the Corps prior to the transfer of the long-term management responsibilities. At that time the appropriate funding mechanism for a mitigation site, as outlined in the Mitigation Rule at 33 CFR 332.7(d), will be determined.

VII. SPONSOR QUALIFICATIONS

The Sponsor operates five existing approved wetland and stream mitigation banks within the Kansas City District of the Corps. Project descriptions of these mitigation banks are included in Appendix C. These approved wetland and stream mitigation banks together encompass roughly 474 acres and include more than 150 acres of floodplain wetland establishment, restoration and enhancement as well as many acres of wetlands established within riparian buffers that function solely as stream mitigation. These approved mitigation banks have also legally protected both sides of almost 4.7 miles of streams and more than 3.25 miles of streams on one side and have expanded riparian buffers on these streams with more than 223 acres of new riparian buffer plantings. The Sponsor also has four proposed wetland and stream mitigation banks in the Corps' Kansas City District and



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two proposed wetland and stream mitigation banks in the Corps' Little Rock District under current review that are either entirely or partially constructed. The design, construction, management and monitoring of these proposed mitigation banks further demonstrates the Sponsor's qualifications to perform mitigation related to wetland, riparian, stream and upland habitats.

Specific to the design and construction of stream channel restoration projects, the Sponsor's approved Stranger Creek Wetland and Stream Mitigation Bank included the restoration of more than a half mile of two highly degraded farm ditches to their natural condition as intermittent stream channels with appropriate channel morphology and riparian buffers. Also as part of that project, a longitudinal peak stone toe bank stabilization was engineered and constructed along about 300 feet of Stranger Creek to address an area experiencing extreme erosion. In addition, willow plantings along perennial stream banks have been utilized at two of the Sponsor's approved mitigation banks in order to stabilize eroding stream banks utilizing natural methods.

Services related to project planning and design as well as construction oversight and monitoring of the Bank will be contracted to the scientists and engineers at Terra Technologies, Inc. (Terra Technologies). Terra Technologies is an environmental engineering company with offices in Leawood, Kansas and St. Louis, Missouri. The firm has significant experience with compensatory mitigation projects with approximately 600 successful mitigation sites in Kansas and Missouri since the company's founding in 1992. Additionally, Terra Technologies has extensive expertise in the planning, design and construction of large-scale wetland and stream mitigation projects as the firm has designed and overseen construction of all of the Sponsor's approved and proposed mitigation banks.

The licensed professional engineers and biologists at Terra Technologies have significant experience in stream design, restoration, stabilization and enhancement as they have designed stream improvements for many waterways throughout Missouri and Kansas including projects for the City of Leawood, Kansas; the City of Overland Park, Kansas; the City of Merriam, Kansas; the City of Shawnee, Kansas; the City of Lawrence, Kansas; the City of Independence, Missouri; the City of Blue Springs, Missouri; the City of St. Charles, Missouri; the Metropolitan St. Louis Sewer District; and the U.S. Army Corps of Engineers Kansas City District among many others. In addition, Terra Technologies was also awarded the Conservation Award in 1999 from the Kansas Department of Wildlife and Parks Environmental Services Section for their work with municipalities and private entities.



VIII. ECOLOGICAL SUITABILITY

Each mitigation site will be ecologically suitable as a large-scale wetland and/or stream mitigation site because of its location, baseline conditions and mitigation opportunities. All of these aspects will be discussed in the mitigation plan for each mitigation site. Each of the Sponsor's approved mitigation banks have been ecologically suitable for wetland and stream mitigation based upon an assessment of such characteristics as each site's stream mitigation priority status, proximity to existing protected natural areas, topography, floodplain limits, soils, existing wetland and stream locations and boundaries, degree of ecological degradation and resulting mitigation opportunities. The same factors will be evaluated for each of the Bank's mitigation sites.

IX. WATER RIGHTS, MINERAL RIGHTS & EXISTING REAL ESTATE ENCUMBRANCES

The Kansas Water Appropriation Act protects both the individual's right to use water and the state's supplies of groundwater and surface water. The law is administered by the Kansas Department of Agriculture's Division of Water Resources, which issues permits to appropriate water, regulates usage and keeps records of all water rights within the state (Kansas Department of Agriculture Division of Water Resources, 2009). The Sponsor will own the mitigation sites, including the water rights. There is no plan for irrigation or mechanized distribution of water at any mitigation site. All water necessary for wetland and/or stream mitigation will be attained by stream flows, precipitation, overland sheet flow and overbank flood flows based on the Sponsor's water rights. In addition, the plant species proposed for each mitigation site will be native species and therefore generally drought resistant.

The Sponsor will also own all mineral rights on each mitigation site. Consequently, the potential for future mineral exploration or extraction will not threaten the long-term sustainability of mitigation sites as the mitigation sites' conservation easements will prohibit mineral extraction. Additionally, any existing real estate encumbrances on each mitigation site will be disclosed to the Corps and IRT.

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APPENDIX A

**FINANCIAL ASSURANCES:
LETTER OF CREDIT EXAMPLE**

EXAMPLE



December 4, 2013

Midwest Mitigation Oversight Association
21301 Shelby Lane
Belton, Missouri 64012

Gentlemen:

We hereby open our irrevocable credit in favor of the Midwest Mitigation Oversight Association for the sum or sums not to exceed a total of EIGHTY THREE THOUSAND EIGHT HUNDRED FIFTY AND NO/100 DOLLARS (\$83,850.00), to be made available by the request of the United States Army Corps of Engineers for payment at sight upon the presentation of a draft accompanied by the following statement:

"The undersigned certifies that a claim is presented against Swallow Tail, L.L.C., as it has been determined by the United States Army Corps of Engineers that Swallow Tail, L.L.C. has defaulted on some or all of the obligations, covenants, terms, and conditions of the Clear Fork Stream and Wetland Stream Mitigation Bank Instrument, and the amount of the drawing will be used to implement corrective measures for the mitigation bank. Under Letter of Credit No. 75201211-75010, we are providing this documentation instructing Country Club Bank to pay proceeds in the amount of \$83,850.00 (or a lesser amount determined by the United States Army Corps of Engineers to be sufficient to bring the mitigation bank back into compliance with its Mitigation Banking Instrument) to the Midwest Mitigation Oversight Association to direct the activities requested by the United States Army Corps of Engineers. Please wire said proceeds to the Midwest Mitigation Oversight Association's current account at the financial institution of its choice."

This Letter of Credit must remain valid until Swallow Tail, L.L.C. receives a letter of notification from the United States Army Corps of Engineers stating that Swallow Tail, L.L.C. has met all of the success criteria as well as all of the terms and conditions contained within the Clear Fork Stream and Wetland Stream Mitigation Bank Instrument and Bank Development Plan or until all compensatory mitigation credits have been sold at the bank, whichever is later.

The annual expiration date for this Letter of Credit is August 2014. However, this Letter of Credit is automatically renewed for each subsequent year, following annual expiration, until such time that the United States Army Corps of Engineers provides the letter of notification releasing Swallow Tail, L.L.C. from its requirement to maintain this Letter of Credit at Country Club Bank. Country Club Bank and Swallow Tail, L.L.C. will notify the United States Army Corps

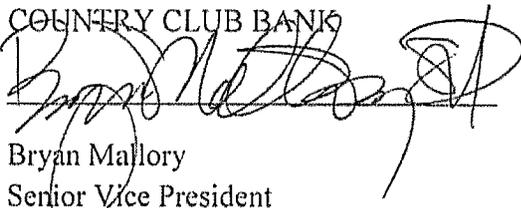
of Engineers, annually, that the value of the required Letter of Credit is in full force and effect for the annual renewal period. Swallow Tail, L.L.C. and/or Country Club Bank must notify the United States Army Corps of Engineers immediately upon the commencement of any bankruptcy proceedings. This notification must be sent to United States Army Corps of Engineers, 635 Federal Building, 601 East 12th Street, Kansas City, Missouri 64106-2824 (Attn: OD-R, Suite 402).

If Country Club Bank can no longer provide a valid Letter of Credit, the Corps of Engineers and Swallow Tail, L.L.C. must be notified at least 120-days prior to the annual, or any other, expiration date of the current Letter of Credit.

This Letter of Credit is subject to the Uniform Customs and Practice for Documentary Credits, 2007 Revision, ICC Publication No. 600.

Any notice required hereunder will be deemed to have been given when received by you.

COUNTRY CLUB BANK


Bryan Mallory
Senior Vice President

APPENDIX B

SITE PROTECTION INSTRUMENT EXAMPLE

CONSERVATION EASEMENT

THIS DEED OF CONSERVATION EASEMENT is given this ____ day of _____, 20____, by _____, having an address of _____ ("Grantor") to _____, having an address of _____ ("Grantee").

As used herein, the term "Grantor" shall include any and all heirs, successors, or assigns of the Grantor, and all subsequent owners of the Property (as hereinafter defined), and the term "Grantee" shall include any successor or assignee of Grantee.

WITNESSETH:

WHEREAS, Grantor is the sole owner in fee simple title of certain lands situated in _____ County, Kansas, more particularly described in Exhibit A, attached hereto and incorporated herein ("Property"); and

WHEREAS, Department Permit No. _____ of the U.S. Army Corps of Engineers ("Corps") (hereinafter referred to as the "Permit") authorizes certain activities which affect waters of the United States; and

WHEREAS, the Permit requires that Grantor preserve, enhance, restore, or mitigate wetlands or uplands located on the Property; and

WHEREAS, Grantor, in consideration of the issuance of the Permit to construct and operate the permitted activity, and as an inducement to the issuance of the Permit, is willing to grant a perpetual Conservation Easement over the Property; and

NOW THEREFORE, in consideration of the above and mutual covenants, terms conditions, and restrictions contained herein, together with other good and valuable consideration, the adequacy and receipt of which is hereby acknowledged, Grantor hereby voluntarily grants and conveys a perpetual Conservation Easement for and in favor of Grantee upon the property, which shall run with the land and be binding upon the Grantor, and shall remain in full force and effect forever.

The scope, nature, and character of this Conservation Easement shall be as follows:

1. **Purpose:** The purpose of this Conservation Easement is to retain and maintain land or water areas on the Property in their natural, vegetative, hydrologic, scenic, open, or wooded condition and to retain such areas as suitable habitat for fish, plants, or wildlife. Those wetland or upland areas that are to be restored, enhanced, created, or preserved on the Property shall be retained and maintained in the restored, enhanced, created, or preserved condition as described in the Permit and/or in the associated compensatory mitigation plan for the Property.

2. **Rights of Grantee:** The following rights are conveyed to the Grantee and to the Corps by this easement:

a. The right to take action to preserve and protect the environmental value of the Property; and

b. The right to prevent any activity on or use of the Property that is inconsistent with the purpose of this Conservation Easement, and to require the restoration of areas or features of the Property that may be damaged by any inconsistent activity or use;

c. The right to enter upon and inspect the Property in a reasonable manner and at reasonable times to determine if Grantor is complying with the covenants and prohibitions contained in this Conservation Easement; and

d. The right to proceed at law or in equity to enforce the provisions of this Conservation Easement, and to prevent the occurrence of any of the prohibited activities hereinafter set forth.

3. **Prohibited Uses:** Except for restoration, creation, enhancement, preservation, maintenance, and monitoring activities, or surface water management improvements, required by the Permit, or required by the compensatory mitigation plan, or are otherwise approved by the Corps, the following activities are prohibited on the Property:

a. Construction of any structure or object (i.e., buildings, roads, above or below ground utilities, signs, billboards etc.) without written approval from the Corps of Engineers prior to construction;

b. Dumping or placing of soil or other substance or material as landfill, or dumping or placing of trash, waste, or unsightly or offensive materials;

c. Removal or destruction of trees, shrubs, or other vegetation, except for the removal of nuisance, exotic, or non-native vegetation in accordance with a maintenance plan approved by Corps;

d. Planting of nuisance, exotic, or non-native plants as listed by the State of Kansas;

e. Exploration for, or extraction of, oil or gas in such a manner as to affect the surface, or excavation, dredging, or removal of coal, loam, peat, gravel, soil, rock, or other material substance;

f. Use of motorized and non-motorized vehicles, the keeping or riding of horses, grazing, livestock confinement, or other surface use that may affect the natural condition of the Property, except for vehicle use for purposes of maintenance and upkeep;

g. Tilling, plowing, planting of crops, digging, mining, or other activities that are or may be detrimental to drainage, flood control, water conservation, water quality, erosion control, soil conservation, or fish and wildlife habitat preservation, including but not limited to ditching, diking, and fencing;

h. The extraction of water from the Property or the impoundment of water on the Property so as to affect the hydrology of the Property;

i. Acts or uses detrimental to the aforementioned retention and maintenance of land or water areas;

j. Acts or uses detrimental to the preservation of the structural integrity or physical appearance of sites or properties of historical, architectural, archaeological, or cultural significance.

4. **Reserved Rights:** Grantor reserves all rights as owner of the Property, including the right to engage in uses of the Property that are not prohibited herein, and that are not inconsistent with the intent and purposes of this Conservation Easement.

5. **Taxes:** Grantor shall pay any and all applicable real property taxes and assessments levied by competent taxing authority on the Property.

6. **Maintenance:** Grantor shall, at Grantor's sole expense, operate, maintain and keep up the Property consistent with the purpose of this Conservation Easement. Grantor shall remove from the Property any nuisance, exotic, or non-native plants as listed by the State of Kansas and shall maintain the hydrology of the Property as it currently exists or as otherwise required by the Permit or as required by the compensatory mitigation plan or as required by the Corps approved final mitigation banking instrument.

7. **Hazardous Waste:** Grantor covenants that if any hazardous substances or toxic waste exist or has been generated, treated, stored, used, disposed of, or deposited in or on the Property, or there are or have been any underground storage tanks on the Property, Grantor shall be responsible for any and all necessary costs of remediation.

8. **Public Access:** No right of access by the general public to any portion of the Property is conveyed by this Conservation Easement.

9. **Liability:** Grantor shall continue to retain all liability for any injury or damage to the person or property of third parties that may occur on the Property arising from ownership of the Property. Neither Grantor, nor any person claiming by or through Grantor, shall hold Grantee liable for any damage or injury that may occur on the Property.

10. **Recording Requirements:** Grantor must record this Conservation Easement in the official records of _____ County, Kansas, and shall re-record it at any time Grantee or the Corps may require to preserve their rights. Grantor shall pay all recording costs, fees and taxes necessary at any time to record this Conservation Easement in the public records. Grantor shall thereafter insert the terms and restrictions of this Conservation Easement in any subsequent deed or other legal instrument by which Grantor divests himself/herself/itself of any interest in the Property, and shall provide a photocopy of the recorded Conservation Easement to the new owner(s).

11. **Enforcement:** The terms and conditions of this Conservation Easement may be enforced in an action at law or equity by the Grantee or the Corps against the Grantor violating or attempting to violate these Restrictions. Venue for any such action shall be in _____ County, Kansas. Enforcement of this Conservation Easement shall be at the reasonable discretion of the Grantee or the Corps, and any forbearance on behalf of Grantee or the Corps to exercise its or their rights hereunder in the event of any breach by Grantor shall not be deemed or construed to be a waiver of rights. Any costs incurred in enforcing, judicially or otherwise, the terms, provisions, and restrictions of this Conservation Easement, including without limitation, the costs of suit, and attorney's fees, shall be borne by and recoverable against the non-prevailing party in such proceedings, except that such costs shall not be recoverable against the Corps. In addition, if the Grantee or the Corps shall prevail in an enforcement action, such party shall also be entitled to recover that party's cost of restoring the land to the natural vegetative and hydrologic condition existing at the time of execution of these Restrictions or to the vegetative and hydrologic condition required by the Permit and/or as required by the associated compensatory mitigation plan.

12. **Assignment of Rights:** Grantee shall hold this Conservation Easement exclusively for conservation purposes. Grantee will not assign its rights and obligations under this Conservation Easement, except to another legal entity qualified to hold such interests under applicable state and federal laws and committed to holding this Conservation Easement exclusively for the purposes stated herein. Grantee shall notify the Corps in writing of any intention to reassign this Conservation Easement to a new grantee at least sixty (60) days in advance thereof, and the Corps must accept the assignment in writing. The new grantee shall then deliver a written acceptance to the Corps. The assignment instrument must then be recorded and indexed in the same manner as any other instrument affecting title to real property and a copy of the assignment instrument shall be furnished to the Corps. Failure to comply with the assignment procedure herein stated shall result in invalidity of the assignment. In the event of dissolution of the Grantee or any successor, or failure for 60 days or more to execute the obligations of this Conservation Easement, the Grantee shall transfer this Conservation Easement to a qualified and willing grantee. Upon failure of the Grantee or any successor to so transfer the Conservation Easement, the Corps shall have the right to sue to force such an assignment to a grantee to be identified by the Court.

13. **Successors:** The covenants, terms, conditions, and restrictions of this Conservation Easement shall be binding upon, and inure to the benefit of the parties hereto and their respective personal representatives, heirs, successors, and assigns, and shall continue as a servitude running in perpetuity with the Property.

14. **Notices:** All notices, consents, approvals, or other communications hereunder shall be in writing and shall be deemed properly given if sent by United States certified mail, return receipt requested, addressed to the appropriate party or successor-in-interest.

15. **Severability:** If any provision of this Conservation Easement or the application thereof to any person or circumstances is found to be invalid, the remainder of the provisions of this Conservation Easement shall not be affected thereby, as long as the purpose of the Conservation Easement is preserved.

16. **Alteration or Revocation:** This Conservation Easement, granted in perpetuity, may be amended, altered, released, canceled, or revoked only by written agreement between the parties hereto or their heirs, assigns, or successors in interest, which shall be filed in the public records of _____ County, Kansas. No action shall be taken, however, without advance written approval thereof by the Corps. Corps approval shall be by letter attached as an exhibit to the document amending, altering, canceling, or revoking the Conservation Easement, and said letter shall be informal and shall not require notarization. It is understood and agreed that Corps approval requires a minimum of sixty (60) days written notice, and that the Corps may require substitute or additional mitigation, a separate conservation easement or alternate deed restrictions, or other requirements as a condition of approval. Any amendment, alteration, release, cancellation, or revocation together with written Corps approval thereof shall then be filed in the public records of _____ County, Kansas, within 30 days thereafter.

17. **Controlling Law:** The interpretation and performance of this Conservation Easement shall be governed by the laws of the State of Kansas.

GRANTOR FURTHER COVENANTS that Grantor is lawfully seised of said Property in fee simple; that the Property is free and clear of all encumbrances that are inconsistent with the terms of this Conservation Easement and that no mortgages or other liens exist; that Grantor has good right and lawful authority to convey this Conservation Easement, and that it hereby fully warrants and defends the title to the Conservation Easement hereby conveyed against the lawful claims of all persons whomsoever.

Under the authority of Kansas conservation easement law, the conservation easement must be conveyed to a "holder", defined as a governmental body empowered to hold an interest in real property, or a charitable corporation, charitable association or charitable trust whose purposes or powers include retaining or protecting the natural, scenic, or open-space values of real property. In addition, the holder must sign the conservation easement to accept the conveyance. See Kansas St. 58.3810 *et seq.* If the conservation easement is not made under the Kansas conservation easement law, add the following clause due to uncertainties regarding legality of the transfer:

If the grantee named herein is, for any reason, determined not to be authorized or entitled to hold the interest granted herein, the Grantor shall within 60 days after notification thereof execute a substitute conservation easement to a new grantee containing terms and conditions similar to this conservation easement. The determination of lack of authority or entitlement may be made by either (a) a court of competent jurisdiction, (b) the precedential authority of a ruling by a court of competent jurisdiction, (c) a title insurance company's written refusal to insure the real property interest of the grantee named herein, or (d) a title opinion issued by an attorney at law licensed in the State of Kansas. Notification of lack of authority or entitlement of the grantee named herein may be made to the grantor by any person, including persons not privy to this easement. The substitute grantee shall be properly qualified as a "holder" under the Kansas conservation easement law, Kansas St. 58-3810 *et seq.* or successor statute.

TO HAVE AND TO HOLD, the Grantor covenants that he, she, or they are vested with good title to the easement area and will warrant and defend the same on behalf of the Grantee against all claims and demands. The Grantor covenants to comply with the terms and conditions enumerated in this document for the use of the easement area and adjacent lands for access, and to refrain from any activity not specifically allowed or that is inconsistent with the purposes of this easement deed. The covenants, terms, conditions, restrictions, and purpose imposed with this Conservation Easement shall be binding upon Grantor, and shall continue as a servitude running in perpetuity with the Property.

Dated this _____ day of _____, 20_____

Grantor(s): _____

Print Name

Signature

Print Name

Signature

ACKNOWLEDGEMENT

STATE OF KANSAS

COUNTY OF _____

On this ____ day of _____ in the year 20____, before me, the undersigned notary public, personally appeared _____, known to me to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged that he/she/they executed the same for the purposes therein contained. In witness whereof, I hereunto set my hand and official seal.

Notary Public

Residing at _____

My Commission
Expires _____

ACCEPTANCE BY GRANTEE:

I _____ (print name), _____ (title), being the duly authorized representative of the Grantee, do hereby accept this Conservation Easement Deed with respect to the rights and duties of the, Grantee.

Dated this _____ day of _____, 20____.

Signature

Title

APPENDIX C

SPONSOR QUALIFICATIONS

SWALLOW TAIL, LLC

Clear Fork Wetland & Stream Mitigation Bank Johnson County, Missouri

Swallow Tail operates the 212-acre Clear Fork Wetland & Stream Mitigation Bank which will serve as compensatory mitigation for impacts to wetlands and streams across most of the Missouri portion of the Kansas City metropolitan area as well as much of the west-central part of the state.

This former agricultural property includes over a mile of both sides of the Clear Fork of the Blackwater River and more than a mile and a third of tributary streams. Almost all of these streams were surrounded by row crop fields with only narrow riparian buffers and a stretch of Clear Fork more than 1,000 feet in length was entirely devoid of riparian vegetation along one side. The mitigation activities completed on the site have addressed the needs of the property and the watershed through the planting of 98 acres of new riparian buffers and the establishment of about 60 acres of herbaceous wetlands, 18 acres of forested wetlands and 5 acres of scrub-shrub wetlands. In addition, roughly 19 acres of existing riparian buffers were enhanced and about 10 acres of upland buffers were established or preserved.

These habitat improvements will provide important water quality and wildlife habitat benefits. In particular, agricultural runoff from approximately 570 acres of surrounding farmland is diverted into the roughly 60 acres of contiguous wetlands in the southern portion of the mitigation bank which allows for significant pollutant removal, flood abatement and wildlife habitat creation. Additionally, because this mitigation bank is situated along Clear Fork between Knob Noster State Park and the Ralph and Martha Perry Memorial Conservation Area, it will serve as a valuable stopover point for wildlife traveling between these two important protected areas.



SWALLOW TAIL, LLC

Osage Plains Wetland & Stream Mitigation Bank Cass County, Missouri



Swallow Tail is the Sponsor of the first approved private wetland and stream mitigation bank in western Missouri. The primary restoration activities on this roughly 40-acre property included the widening of the riparian corridor of the East Branch of the South Grand River to 300 feet on one side for more than a half mile and the restoration and enhancement of about 20 acres of wetlands in a diversity of habitats and landscape positions. These improvements to water quality and wildlife habitat are used for compensatory mitigation for impacts to waters of the United States in the Central Plains / Osage / South Grand Ecological Drainage Unit which encompasses the upper portion of the Osage River watershed in Missouri.

Swallow Tail recognized that the site, which had been in row crop production for decades, had a significant amount of local topographic variability and a favorable position in the landscape for wetland development. The enhancement of the site's intricate topography has led to a wide variety of microhabitats along a hydrologic gradient which allowed for the establishment of a high amount of botanical diversity because of Swallow Tail's extensive planting of a wide diversity of appropriate native plant species to match the unique topography, soil and hydrologic conditions of the site.

The site receives almost 400 acres of local runoff from adjacent agricultural properties via several small streams that flow across the property into the East Branch of the South Grand River. By detaining much of that runoff in the site's restored and enhanced floodplain wetlands, the Sponsor was able to decrease the amount of nutrients, sediment and agricultural pollution that flows into the East Branch of the South Grand River and downstream waters, including Truman Lake and Lake of the Ozarks. In addition, the East Branch of the South Grand River floods the site at least annually so the development of a significant amount of floodplain wetlands on the site also provides some level of water quality improvement of those flood waters. Moreover, the excavation of the eastern floodplain areas and the creation of floodplain pools in the western half of the site has significantly increased the flood storage capacity of the property.



Wildlife has responded very favorably to the restoration of the site's riparian, wetland and upland buffer habitats. A variety of frogs and salamanders now inhabit the site along with a diversity of waterfowl, wading birds, turtles and other species adapted to the shallow marsh habitat that is the site's dominant feature.

The Bank has completed its final year of formal monitoring having met all of its performance standards successfully.



SWALLOW TAIL, LLC

Sni-A-Bar Creek Wetland & Stream Mitigation Bank Jackson County, Missouri

Swallow Tail restored this roughly 70-acre mitigation bank adjacent to Sni-A-Bar Creek, which is a primary tributary of the Missouri River. This site previously consisted of two row crop fields and a moderately thin existing riparian corridor along the stream. Some of the attributes of this property that made it a good candidate for restoration included its position in the floodplain, the long length of perennial streams along the periphery of the site and the presence of poorly drained hydric soils. In addition, the observation of several small degraded wetlands existing in shallow depressions was a sign of the potential of this site to support a much greater amount of wetlands under the right conditions.

In order to improve water quality and wildlife habitat on the property, several activities were undertaken to restore the mitigation bank to its likely pre-settlement state. The riparian corridor of Sni-A-Bar Creek was widened to 300 feet on one side for more than a mile and the same was done to roughly 750 linear feet of an unnamed perennial tributary. Additionally, the connection between the stream and its floodplain was enhanced by creating multiple holes in two agricultural levees that regularly protected the farm fields from flooding. Roughly 27.5 acres of forested and herbaceous wetlands were established on the floodplain in order to provide water quality, wildlife habitat and flood abatement benefits.

The increase in quality and quantity of stream, riparian and wetland ecosystems is being used as compensatory mitigation for unavoidable impacts to waters of the United States throughout the Central Plains / Blackwater / Lamine Ecological Drainage Unit which includes the watersheds of the primary tributaries to the Missouri River from Kansas City to mid-Missouri.

Approved in 2009, this site is continuing to mature and progress through the appropriate stages of ecological succession that have been accelerated by Swallow Tail's planting of a diversity of early, mid- and late successional herbaceous and woody species throughout the site.



SWALLOW TAIL, LLC

Stranger Creek Wetland & Stream Mitigation Bank Leavenworth County, Kansas



Swallow Tail owns and operates the 65-acre Stranger Creek Wetland & Stream Mitigation Bank which has been approved as the first stream mitigation bank in Kansas and the first wetland mitigation bank outside of Johnson County.

This property contains one side of a half mile of Stranger Creek, the largest tributary to the Lower Kansas River. Although it is listed by the State of Kansas as a High-Priority Fishery Resource, Stranger Creek is heavily impacted by agriculture in the vicinity of this property. Before the initiation of restoration activities, this parcel was a row crop farm field with relatively thin riparian corridors along Stranger Creek and an intermittent tributary. The Stranger Creek stream bank was highly eroded along a portion of this property and two small intermittent streams that carry runoff from the adjacent agricultural properties across the site had been previously channelized into functionally impaired drainage ditches. As a result of these factors and the presence of similar conditions throughout its watershed, Stranger Creek is listed as being impaired biologically by excess nutrients and/or sediments downstream of this restoration site.



Swallow Tail recognized the restoration potential of this site and initiated several important ecological improvements. These included reducing stream bank erosion along Stranger Creek by constructing a 300-foot long longitudinal peaked stone toe bank stabilization project and planting willow cuttings along 1,800 feet of the Stranger Creek bank, widening the Stranger Creek riparian corridor to 300 feet, creating or restoring more than 18 acres of floodplain wetlands and restoring more than 3,000 linear feet of the channelized intermittent streams to natural stream channels in their likely historic alignment with 200-foot wide riparian corridors.

As a result of these restoration activities, this mitigation bank is reducing the amount of nutrients and sediment flowing to Stranger Creek across the property, is providing additional flood storage capacity and is acting as valuable habitat for wildlife. After only two full growing seasons, the site is supporting a variety of reptiles, amphibians, waterfowl and wading birds. The ecological restoration and enhancement of the wetland and stream habitats on this property are being used as compensation for impacts to those habitats in much of northeastern Kansas, including most of Johnson County.



SWALLOW TAIL, LLC

Camp Branch Wetland & Stream Mitigation Bank Cass County, Missouri

Swallow Tail owns and operates an 87-acre wetland and stream mitigation bank located along more than a mile of the Camp Branch of Big Creek south of the Kansas City metropolitan area. The mitigation activities on this property serve as compensation for impacts to wetlands and streams in the unglaciated portion of the Osage River watershed within Missouri which encompasses the very west-central part of the state.

Before the Sponsor's mitigation activities much of this property existed as a mixture of farm fields, stream corridors and bottomland woods. The landscape position of this site within the floodplain has resulted in the presence of hydric soils throughout almost all of the property and a large number of small wetlands continued to exist despite many years of agricultural activity. All of these qualities along with relatively thin riparian corridors made this site very suitable for wetland and stream restoration and enhancement.

Camp Branch is listed as potentially impaired by habitat degradation because of rural non-point source pollution, which means that there is some indication of impairment but there is not enough data to properly list the stream as officially impaired.



The upper Osage River watershed which includes Camp Branch has been largely converted to agricultural land uses and stream channelization, levee construction, impoundment and the clearing of riparian corridors have been common practices. These activities have resulted in stream incision, loss of floodplain connectivity, loss of stream and wetland habitats and excess sediment and nutrient levels in waterways.

In response to the needs of the watershed, this mitigation bank includes more than ten acres of floodplain wetlands and in excess of forty acres of newly planted riparian buffer. Existing riparian buffers have been enhanced and almost two miles of streams have been protected on both sides with another third of a mile protected on one side. These additional riparian buffers and wetlands will help to absorb and filter sediment and agricultural pollution from more than 350 acres of adjacent agricultural land that drains across the site and from flood flows from Camp Branch. Additionally, the restored habitats which were constructed in 2009 provide high quality habitat to a number of wildlife species.

INTRODUCTION

Terra Technologies Inc. is an innovative consulting firm with a focus on Clean Water Act Section 404 and 401 permitting and compensatory mitigation as well as biotechnical and environmental engineering. This focus requires an extensive amount of horticultural and biological expertise that also has application in a broad range of areas including large and small scale wetland and stream system development, wildlife habitat enhancement projects, ecologically-sensitive stream stabilization design and environmental remediation. The scientists and engineers at Terra Technologies provide a wide array of services including Clean Water Act 404/401/402 permit applications, compensatory mitigation design, rare and endangered species audits, environmental investigations, development of erosion and sediment control plans, and rain garden/natural stream channel design.

Terra Technologies has successfully completed numerous biotechnical design projects across the Midwest. No less than 40 mitigation, constructed wetland, and stream bank stabilization projects are currently in construction or design in the greater St. Louis, Columbia, and Kansas City areas. Our scientists will also perform 100+ wetland delineations, covering approximately 15,000 development acres annually.

Terra Technologies combines the skills and experience of licensed professional engineers with the fields of wetland ecology, horticulture, soil bioengineering, stream geomorphology, agrohistology, botany, wildlife biology and agronomy. This unique combination allows for the consideration and implementation of a broad range of solutions for Clean Water Act permitting, compensatory mitigation and storm water problems in both urban and rural areas. With a professional staff of experienced scientists and engineers, our clients have the advantage of diversified resources and the expertise of the entire firm.

Terra Technologies has been involved with numerous compensatory mitigation projects, including several large wetland and stream mitigation banks. Our design approach considers the existing site topography, hydrology, soils, and vegetation and then increases the amount of surface hydrology





through the manipulation of water inputs and the creation of extensive and varied microtopography. This microtopography creates a variety of hydrologic gradients within the onsite soils which leads to a diversity of microhabitats that support a wide diversity of plant life. All compensatory projects are seeded and planted with a large number of appropriate native herbaceous and woody species.

Our firm also has extensive expertise with stream stabilization and restoration projects. Terra Technologies can specify and implement a variety of materials and techniques including erosion control blankets, turf reinforcing matrices, wire reinforced turf reinforcing matrices, geocellular confinement, biogabions, preplanted coir fiber logs, landscaped open-face modular wall systems, articulated concrete block systems, pool and riffle systems, bonded fiber matrices, and others. Terra Technologies constantly looks at new applications for existing products that can be used for biotechnical solutions. When appropriate, pure vegetative stabilization approaches can also be effective. In all of our compensatory mitigation approaches Terra Technologies strives to provide long term solutions that work with, rather than against, natural environmental processes.

The key to any compensatory mitigation project is the long-term establishment of appropriate site hydrology as well as self-sustaining and low maintenance vegetation that is indigenous to the area. If the vegetation fails to establish, the long-term success of the project is in serious question. Pioneering vegetation often invades the initial establishment phase but is usually considered undesirable over the long term. Many of the initial plant materials mature and die within the first few growing seasons or dominate the environment such that more desirable plant materials cannot become established. A mature restoration project should contain





a balanced mix of desirable riparian vegetation and grasses that do not require extensive maintenance to preserve the balance and control undesirable vegetation. Therefore, a complete understanding of the succession of plant communities is necessary to assure the long-term success of the project. Terra Technologies brings the necessary knowledge of agrostology, horticulture, soil bioengineering, and botany to the project to assure long-term success.

Terra Technologies is comprised of highly qualified professionals with extensive experience and a range of engineering and scientific disciplines. We are recognized by our clients for providing value-added environmental engineering alternatives while responding rapidly to clients' needs. In total, more than 600 mitigation projects have been completed since the Company was founded in 1992.

