Sheboygan River Area of Concern (AOC) Habitat Restoration Projects

Grant Project ID: GL-00E00876 sub 2, 3, and 5

Quality Assurance Project Plan

Prepared for:

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Quality Assurance Project Plan (QAPP) Identification and Approval Form

Sheboygan River AOC Habitat Restoration Projects QAPP

Approval:

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SEH Project Manager — Date

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SEH Quality Control Coordinator — Date

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Grant Project GL-00E00876 sub 2, 3, and 5

Quality Assurance Project Plan (QAPP) Identification and Approval Form

Sheboygan River AOC Habitat Restoration Projects QAPP

Approval:

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A. Project Background

The Sheboygan River Area of Concern (AOC) encompasses the lower 14 miles of the Sheboygan River including the harbor, and has experienced a variety of disturbances including hydrologic modifications, damage due to flood and storm water flows, bank erosion, deposition of industrial pollution and toxins within the river, and a variety of other disturbances common to urban watersheds. This repeated disturbance has resulted in significant negative impacts to native species and introduction of non-native, invasive plant and animal species into the watershed. As a result, nine beneficial use impairments (BUI) have been identified within the AOC, including:

1. Restrictions on fish and wildlife consumption
2. Degradation of fish and wildlife populations
3. Fish tumors or other deformities
4. Bird or animal deformities or reproductive problems
5. Degradation of benthos
6. Restrictions on dredging activities
7. Eutrophication or undesirable algae
8. Degradation of phytoplankton and zooplankton populations
9. Loss of fish and wildlife habitat

B. Purpose and Need

To partially address habitat-related aspects of these identified BUIs and move towards the delisting of the Sheboygan River AOC, a group of local government entities (Client Project Team) including the City of Sheboygan, Sheboygan County and the Wisconsin Department of Natural Resources (WDNR) is undertaking three habitat restoration projects along the Sheboygan River, which are located at Kiwanis Park, Taylor Drive and Indiana Avenue, and Wildwood Island, as shown on Figures 5, 9 and 13, respectively.

Within these habitat restoration project areas, the beneficial use impairment causes have been identified as shoreline/streambank erosion, excessive flows, sedimentation, fragmentation, invasion by non-native plants, urban land use and storm water runoff, vegetation removal and introduction of pollutants. Some of these impairment causes can be linked to the degraded condition of plant communities within each of the three project areas. The character of the river corridor ranges from an established mature wooded riparian margin with an ecologically functional channel-floodplain connection to margins consisting of concrete rubble and rock stone lining and severely impaired function and little available habitat value caused mainly by urban impacts.

Thus, the overall purpose of the Sheboygan River AOC Habitat Restoration (HR) Projects is to:

Restore, enhance or protect the connectivity, quality and quantity of desired fish and wildlife habitat within the three restoration project sites.

C. Primary Goals and Objectives

Preliminary plans and recommendations have been made for each of the three restoration project areas by the Client Project Team, which are based on the objective of addressing the identified BUIs, including:

- Restoration of riparian and shoreline habitat
- Naturalization of the shoreline
- Establishment of emergent riparian habitat and a native vegetation buffer
- Re-grading and reinforcement of slopes for stabilization
- Reduce impacts of storm water input
- Provide / extend connectivity between habitat areas along the river
- Establishment of migratory bird, shorebird, fisheries, and herptile habitat
- Establishment and restoration of riparian wetlands
- Address impacts due to public access

To accomplish these objectives, a variety of bioengineering techniques will be applied to provide stream bank stability and incorporate shoreline habitat improvements for fish, herptiles and birds specific to those species of concern identified for each area. An important component for each of the restoration areas will be development of a native plant community restoration plan focused on reestablishment of wetlands and uplands compatible with the conditions and use of each area.

D. Project Organization and Schedule

1. Project Management and Coordination

a) Team Coordination

The SEH Project Team, as shown on the organizational chart attached as Exhibit A, includes:

Inter-Fluve (IF), Ecological Services of Milwaukee (ESM), Great Lakes Ecological Services (GLES), Oneida Total Integrated Enterprises (OTIE), NES Ecological Services (NES), and Great Lakes Archaeological Research Center (GLARC). The Scope of Services to be performed by the SEH Project Team under the direction of SEH Project Manager Tom Sear includes eight principal tasks (Task A through Task H) and related project team assignments. These tasks and assignments are briefly described below. The tasks are further highlighted on the project schedule provided as Exhibit B and the project budget provided on Table 1.

(1) Task Responsibilities

- Task A - Project Management and Coordination: Task A includes a project kickoff meeting; development of the project QAPP; monthly progress meetings; stakeholder meetings; and public information meetings. Tom Sear (SEH), Marty Melchior (IF) and Rose Chmielewski (ESM) will be the primary attendees at project stakeholder and public information meetings, with occasional support by other team members, as appropriate. Task A activities are scheduled to occur throughout the duration of the project, as provided on Exhibit B. SEH will develop meeting minutes as defined in the scope of work; and take the lead on the development of the project QAPP, with input provided by others.

- Task B - Background / Field Investigations: Task B includes the review of background investigations and assessments developed by others (identified on Exhibit C), and conducting related field investigations for this project that will be completed by: (1) Inter-Fluve staff (fluvial / geomorphic and fish assessments); (2) Gary Casper (GLES) and James Havel (NES) (wildlife assessments); and Rose Chmielewski (ESM) and Scott Horzen (OTIE) (wetland assessments / delineations). Rose and Scott will develop a wetland delineation report for the project sites; and SEH will lead the development of a Task B Technical Memorandum with support from other SEH team members that summarizes Task B results.

- Task C - Field Survey / Base Map Preparation: SEH and Inter-Fluve staff will share in the development of project base maps, with planning / conceptual design level drawings being completed in Geographic Information Systems (GIS) by SEH; and final design base maps being developed in AutoCAD by Inter-Fluve staff, with SEH support. OTIE will provide field survey, as needed, which is limited to 40 hours of a two person survey crew.

- Task D - Hydrologic / Hydraulic (H/H) Evaluations: SEH (Ryan Van Camp) and Inter-Fluve (Andy Selle) staff will share in the completion of the needed H/H evaluations, with Inter-Fluve staff taking the lead on the watercourse evaluations (using HEC-RAS) in partnership with USGS, who is conducting related investigations; and SEH taking the lead on stormwater management evaluations of interior drainage basins. SEH will lead the development of a Task D Technical Memorandum that summarizes the H/H evaluations, with support provided by Inter-Fluve staff.

- Task E - Permitting and Agency Coordination: Rose Chmielewski (ESM) will take the lead on directing the development of necessary environmental permits / assessments, and related agency coordination, with support provided by other members of the SEH Project Team, as appropriate. In support of the project Environmental Assessment (EA), these efforts will include cultural / archaeological / historical investigations to be completed by GLARC, under the direction of Jennifer Haas. Project deliverables will include an EA conforming to the requirements of the Wisconsin Environmental Policy Act (WEPA), and a Joint Permit Application to the WDNR and the U.S. Army Corps of Engineers.

- Task F - Habitat Restoration Design Concepts: The entire SEH Project Team will participate in the development of habitat restoration design concepts at each of the three sites, which will include the creation of design graphics and site restoration schematics that will be presented to the Client Project Team for review and comment. SEH will lead the development of a Task F Technical Memorandum, with support provided by SEH Project Team Members, which summarizes these design concepts.

- Task G - Preliminary Design (60% completion): For each of the three Sheboygan River sites, the SEH Project Team will develop a preliminary (60% complete) restoration design using the habitat restoration design concepts documented in Task F, and the unique features and opportunities offered at each site. The preliminary design for each site will include 60% complete construction drawings and a preliminary design Opinion of Probable Cost (OPC). SEH and Inter-Fluve staff will take the lead on developing these documents, with support provided by other team members.

- Task H - Final Construction Documents (90% and 100%): Following the receipt of 60% complete review comments from the Client Project Team, 90% complete drawing sets and specifications will be developed for each of the three project sites, which will include

supplemental design details and cross-sections. The 90% design drawings and specifications will be provided to the Client Project Team for a final review and comment prior to development of the 100% complete (biddable) construction documents. The Opinion of Probable Cost will be updated and finalized. SEH and Inter-Fluve staff again will take the lead on developing these documents, with support provided by other team members.

(2) Schedule of Deliverables

As provided on Exhibit B, Tasks B, C, D and F will essentially be completed by early 2012, and the remaining tasks, including development of final plans and specifications (Task G), are to be completed by the end of April 2012. Dates associated with the provision of key project deliverables are provided below:

- Task B (Background / Field Investigations
  - Draft Technical Memorandum (TM) – due 01/06/12
  - Final TM – due 01/20/12
- Task D (Hydrologic / Hydraulic Evaluations)
  - Draft TM – due 01/13/12
  - Final TM – due 01/27/12
- Task F (Habitat Restoration Design Concepts)
  - Draft TM – due 01/20/12
  - Final TM – due 02/03/12
- Task G (Preliminary Design)
  - Draft Documents – due 02/17/12
  - Final Documents – due 03/09/12
- Task H (Final Design Documents)
  - 90% Plans and Specifications – 04/13/12
  - 100% Plans and Specifications – 04/27/12

b) Stakeholder / Public Information Meetings

Two advisory groups have been established for the Sheboygan River AOC to provide input on AOC issues and planning. They include the Fish and Wildlife Technical Advisory Committee (TAC) and the Community Advisory Committee (CAC). Progress meetings associated with these committees will be attended by SEH Project Team members, and will be scheduled by the Client Project Team. Meeting support will be provided by the SEH Project Team in development of related graphics and technical presentations. Additional detail is provided below.

(1) Technical Advisory Team (TAC) Meetings

The Sheboygan River AOC Fish and Wildlife Technical Advisory Committee (F&W TAC) is made up of representatives from the WDNR, the Sheboygan River Basin Partnership, National Oceanic and Atmospheric Administration (NOAA), U.S. Fish and Wildlife Service (FWS), U.S. Bureau of Land Management (BLM), City of Sheboygan, Sheboygan County and University of Wisconsin – Extension (UWEX). The F&W TAC provides technical input regarding two fish and wildlife related BUI's in the Sheboygan AOC (degradation of fish and wildlife populations and loss of fish and wildlife habitat). This Committee developed the fish and wildlife assessment project (in progress) that is being funded through the 2010 Great Lakes Restoration Initiative (GLRI); and was instrumental in developing and prioritizing fish and wildlife habitat conservation and restoration projects. The F&W TAC will also provide input on plans requested by EPA, such as the Stage II RAP and the Fish and Wildlife Habitat Restoration and Management Plan.

F&W TAC meetings are typically held on the first Wednesday of every month. Stacy Hron (WDNR) will coordinate the involvement of the SEH Project Team at these meetings.

(2) Community Advisory Committee (CAC) Meetings

The Sheboygan River AOC Community Advisory Committee (CAC) met for the first time on August 4, 2011. This newly formed CAC is intended to be a larger and have a more diverse representation of the community as compared to similar committees that have met in the past. CAC members include: stakeholder groups, citizens, adjacent landowners, businesses and local government representatives. The purpose of the CAC is to provide feedback on projects, proposals, plans and educational materials. CAC members also have opportunities to learn about the Sheboygan River AOC and the work being done to eliminate beneficial use impairments. CAC members also serve as ambassadors to the community at large on Sheboygan River issues.

CAC meetings will occur once per month and are open to the public. As such, the CAC meetings will serve as the public information meetings for the Sheboygan River AOC Habitat Restoration Project. The Client Project Team will be responsible for advertising these meetings, which will typically occur during the first week of each month.

2. Quality Control

a) Quality Control Procedures

To understand the role of Quality Control in the overall Quality Assurance/Quality Control (QA/QC) process, it is important to distinguish the terms Quality Control and Quality Assurance.

Establishing Quality Assurance for this project is the overall purpose of this QAPP. Quality Assurance defines the successful project outcome based on the project's objectives, data inputs, available resources, and required technical skills. In contrast, Quality Control is the set of procedures used to check that the QA process is being followed and that the end product meets the standards established by the Quality Assurance Project Plan.

As is appropriate for most design projects, Quality Control will be accomplished primarily through reviews of draft deliverables within designated subject areas by experienced and well qualified professionals. Project deliverables, grouped by task, and associated technical reviewers are identified on Table 2.

Designated reviewers will be instructed to review draft deliverables for:

- Adherence to the QAPP and professional standards
- Accuracy
- Completeness
- Appropriateness for the intended audience

In addition to expert reviews, deliverables will be presented to the TAC for review and comment, providing another layer of QC for the project.

b) Procedures for Corrective Actions

Preparers of deliverables will submit a draft version to the designated reviewer for comment. The reviewer will provide comments and edits to the preparer for incorporation into the deliverable and will discuss the comments as necessary to ensure clarity. The reviewer will be given an opportunity

to view the document again after revisions are incorporated. Comments from the TAC will be addressed in the same manner.

The review process will be documented by maintaining edited copies and comments in the project file. Final deliverables will clearly indicate the name of reviewers (for reports) or initials (for drawings and plan sets).

If changes in conditions require corrective action after the deliverable has been finalized, the Project Manager will convene a meeting of the preparer, reviewer and other stakeholders in the need for corrective action. This team will identify the necessary actions and prepare an amended deliverable or addendum as appropriate.

E. Data Collection

1. Data Types

The SEH Project Team Members will review background data collected and provided by others, as summarized on Exhibit C. The SEH team will also examine other pertinent existing data, including USGS data, soils, surficial geology, stream flow and hydrology (USGS gauge data), hydraulics (eg. USACE HEC data), historical (eg. GLO survey notes, photos), orthophotography, underground utilities (fiber optic, gas, water, electric), recreational use, Superfund and other contaminant investigations, invasive species mapping, and other existing data, as appropriate.

a) Fluvial / Geomorphic Investigation

Project geomorphologists and engineers will conduct a forensic geomorphic reconnaissance (3 days) to determine the current state of channel stability, influence of vegetation, manipulation of channel and floodplain morphology, and to field test potential restoration ideas. This sub-task (to be performed by Inter-Fluve staff) will include walking and canoe based surveying, probing and coring of sediments, excavation of test pits, bed material sampling for grain size analysis, examination of soils and sedimentation, data collection for bank stability modeling (Simon model, BEHI), and/or examination of erosion, scour and deposition patterns. These activities will be performed in coordination with the USGS.

Inter-Fluve staff will accompany USGS staff during floodplain coring and the USGS geomorphic reconnaissance (Fitzpatrick and Knox – approximately 2 days out of the total of 3 field days); and assist the USGS in collecting data. To the extent possible, Inter-Fluve staff will limit their data collection (as described above) to minimize overlap and maximize USGS input and collaboration.

The extent of the on-the-ground geomorphic investigation will assume that USGS work does not extend upstream of the Taylor Avenue site. Inter-Fluve will examine river erosion and sediment transport upstream of Taylor through kayak or windshield surveying.

b) Fish and Wildlife Assessments

The SEH Project Team will review and analyze the fish and wildlife and related habitat inventory information collected by others (as described on Exhibit C) for Type I and Type II errors, and collaborate with the Client Project Team in identification of appropriate habitat restoration measures, given existing and potential wildlife habitats and species observed or expected at the three restoration sites. Also:

- Limited site inspections, with a focus on observing wildlife habitat and species, will be conducted by the SEH Project Team (Gary Casper and James Havel) to facilitate an

understanding of wildlife assessments conducted by others and to advance habitat restoration design discussions with the Client Project Team.

- Limited site inspections, with a focus on observing fish habitat and species, will be conducted by the SEH Project Team (Inter-Fluve staff) in conjunction with the fluvial / geomorphic investigation described above. These limited observations will be conducted to facilitate an understanding of fish assessments conducted by others and to advance fish habitat restoration design discussions with the Client Project Team.
- Habitat restoration goals pertaining to avian species will be driven by data gathered during the breeding bird, wintering bird and kingfisher nest surveys (conducted by others) in conjunction with the natural community/rare plant/invasive plant survey. Analysis of these data will dictate specific wildlife community needs.

c) Wetland Assessments and Delineations

Wetland assessments and delineations (to be performed by ESM and OTIE) will be conducted at each of the three project sites, and include an initial data review, field delineation, and report preparation, as described below.

(1) Initial Data Review

This effort consists of background data review of information available from government agency documents and private sources. Information collected and reviewed will be used to determine the approach for fieldwork. The following records/documents will be reviewed to establish the previous and current conditions that exist within the proposed project area.

- U.S.G.S. 7.5-Minute topographic Quadrangle
- Plat Map
- Natural Resources Conservation Service (NRCS) Wetland Inventory Maps
- Wisconsin Wetland Inventory Maps (WWI Maps)
- Soil Survey of Sheboygan County, WI
- Sheboygan County Hydric Soils List
- Hydric Soils of the United States List
- National List of Plant Species that Occur in Wetlands: Wisconsin
- National List of Plant Species that Occur in Wetlands: North Central Region 3

(2) Field Delineation

Vegetation will be assessed through on-site identification of plant species in wetland and upland plant communities. The vegetation survey will determine the dominant plant species for each vegetative stratum: tree, shrub and herbaceous layers at the sample point. A wetland indicator status will be assigned to each of the dominant species using the National List of Plant Species that Occur in Wetlands: Wisconsin 1988 list by the U.S. Fish and Wildlife Service. Vegetation information collected at wetland and upland sample points will be recorded on data forms from the 1987 Corps of Engineers Wetland Delineation Manual (Manual; Environmental Laboratory 1987) and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual - Northcentral and Northeast Region Supplement (Supplement; Environmental Laboratory 2009).

The Routine On-site Determination Method will be employed. The Atypical Situations Method may be used if one or more of the three indicators is affected due to recent human activities or natural events. The wetland type will be classified according to the categories provided in Classification of

Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1978) and the Wisconsin Wetland Inventory Classification System.

Hydric soils will be assessed by excavating a shallow soil pit and recording evidence of anaerobic conditions. Soil development will be described using the U.S. Department of Agriculture (USDA) Soil Classification System. Soils will be described by soil color (Munsell soil color chart), soil texture, organic content, consistency, and moisture content. A list of hydric soil indicators present according to the guidance provided in The National Technical Committee for Hydric Soils publication Field Indicators of Hydric Soils in the United States, such as mottling and gleying, will be recorded at wetland and upland sample point data forms.

Hydrology will be assessed by observing surface hydrologic indicators as described in the Manual and Supplement. This information will be compared with background data to estimate the long-term and seasonal hydrology.

The wetland boundary will be located where the wetland criteria meet the requirements for wetlands as provided in the Manual and Supplement. If requested, the boundaries of the wetlands will be marked in the field with flags and ribbon at intervals necessary to accurately depict the limits and shape of the each wetland boundary. The boundary(s) will be surveyed using a Trimble GeoXH hand held surveying unit with sub-foot accuracy. In addition, the location of all sample data points will be collected with GPS.

d) Survey / Base Map Preparation

Existing LIDAR and FIS survey data will be provided by the Client Project Team, and evaluated by the SEH Project Team for accuracy. In coordination with the Client Project Team, the SEH Project Team will develop appropriate survey instructions and perform supplemental field surveys (assumed maximum field survey effort: 40 hours of a two-person survey crew). These supplemental field survey activities will be coordinated with the fluvial geomorphic investigations that also require collection of field survey data. The following will also be performed:

- Hydraulic sections: Given the above assumptions, the SEH Project Team will survey near bank and floodplain areas to augment USGS hydraulic survey cross-sections and ensure capture of the 100-year flood elevation boundary. USGS data will be reviewed to minimize overlap.
- Topography: Ground shots will be collected sufficient to create a 1-foot contour base map of the three project areas. LIDAR data will be reviewed and cross-referenced with USGS survey data to identify data gaps. Surveying will be conducted using GPS-RTK and total station.
- Bathymetric Data: It is assumed that USGS bathymetric data will be usable in CAD format and can be applied to the overall base map.
- Control Points: City control points and/or USGS bathymetric survey control points will be surveyed to ensure data continuity.

e) Hydrologic / Hydraulic (H/H) Investigations

(1) Sheboygan River H/H Investigations

It is assumed that USGS, in coordination with the SEH Project Team, will develop hydrologic / hydraulic data for the Sheboygan River that is relevant to the design of the three project areas, as defined below.

- HEC-RAS data collection: USGS, in collaboration with the SEH Project Team, will develop design survey guidelines and obtain hydraulic cross-section information that includes: frequency (reach length), location, important slope breaks, data for energy loss coefficients, and floodplain flow lines.
- 2-D modeling: The SEH Project Team will provide supplemental hydraulic and topographic survey data to the USGS for incorporation into their 2-D hydraulic models. Design linework and elevation data will be submitted by the SEH Project Team to the USGS for model iterations to be run by the USGS. Model runs are assumed to include scenarios in FAST MECH or MD_SWMs (note this model is now known as iRIC).
- Hydrology: It is assumed that the USGS will be developing Sheboygan River design discharge values (flood frequencies) as part of the 2-D hydraulic model work. The SEH Project Team will coordinate with the USGS and the Client Project Team to obtain concurrence on flood frequency analysis and develop a set of design flood flows. Climate change impacts to the hydrograph (e.g. stationarity) will be considered and incorporated into flood frequency estimates.

(2) Stormwater Design Discharges

A range of design event stormwater discharges associated with the interior drainage areas adjacent to the Kiwanis Park and Taylor Drive / Indiana Avenue restoration sites will be developed as provided below:

- The SEH Project Team will develop stormwater design discharges for Kiwanis Park.
- USGS will develop interior drainage area stormwater discharges for the Taylor Drive / Indiana Avenue restoration site, in coordination with the SEH Project Team. The SEH Project Team will supplement the USGS design discharge data, as needed, to develop an appropriate level of detail for the final design of stormwater facility improvements.

f) Cultural / Archaeological / Historical Investigations

(1) Cultural Investigation

The objective of cultural resource investigations, to be completed by GLARC staff, is to identify all historic properties, inclusive of archaeological sites (prehistoric and historic) and above-ground buildings/structures (historic "built" environment) located within the area of potential effect (APE).

(2) Archaeological Investigations

The archaeological study will consist of archives and literature research and field investigations. The archival research will identify previously reported archaeological sites both within the APE (i.e. all areas of proposed ground disturbing activities) and within a one mile radius of the APE. The archival research will document locales within the APE that have already been subjected to archaeological survey. Also,

- The APE has been designated at 100 feet from the water's edge along the river banks, four acres (two acres each) of proposed ground disturbance (exact location to be determined later) in the Taylor Drive/Indiana Avenue and the Kiwanis Park project areas, and 3.4 acres (the entire island) within the Wildwood Park project area.
- Field investigations will consist of a Phase I archaeological survey of the APE using surface collection and/or shovel probe testing. Preliminary research indicates that previously

recorded archaeological and burial sites are partially coincident with the Kiwanis Park and Taylor Drive/Indiana Avenue project areas.

(3) Historical Investigations

The architectural/historical investigations will consist of archives/literature research and field inventory. The APE will include all areas of proposed ground disturbing activity as well as a contextual "zone" around the study area. The archival research will document above ground structures/buildings that have been surveyed (i. e. survey cards have been prepared) within the APE and which buildings/structures are listed on the National or State Registers of Historic Places. Also,

The field inventory will identify those buildings/structures within the APE that are at least 40 years old, retain good or better integrity, and show potential for architectural and/or historical significance.

Inventory cards will be prepared for those buildings/structures that meet the aforementioned criteria. An assessment of the effect of the project on historic properties will be provided.

2. Applicable Standards

a) Fluvial / Geomorphic Investigation

The fluvial geomorphic investigation will focus on quantifying the rate of bank erosion through a combination of field methods and aerial photograph analysis. The project team will use Inter-Fluve internal standards for measuring bank stability, which incorporate soil type, stratification, vegetation cues and long-term trend analysis. Methods for analysis of long-term trends generally follow those in The National Cooperative Highway Research Program Report 533 – Handbook for Predicting Stream Meander Migration.

b) Fish and Wildlife Assessments

Standard surveying protocols such as point counts (breeding birds) were utilized by others to generate lists of wildlife species found within the Sheboygan River AOC. Since wildlife species are typically associated with specific vegetation communities and structure (e.g., vertical banks, snags, etc.), SEH Project Team members familiar with local flora and fauna will conduct a general habitat evaluation. Information gathered during the habitat assessment along with natural history data, including data from the Natural Heritage Inventory (NHI) will be utilized to determine wildlife species that have been observed previously or may be potentially found within the three project areas.

c) Wetland Assessments and Delineations

The wetland identification will be conducted by wetland ecologists to assess the condition of wetland indicators (vegetation, soils and hydrology) outlined in the Corps of Engineers Wetlands Delineation Manual (Manual; Environmental Laboratory, 1987) and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Supplement; Environmental Laboratory 2009).

The wetland delineation will be conducted to determine the presence / absence of the three wetland indicators outlined in the Manual and the Supplement.

Consistent with the requirements of the Manual, scientific nomenclature for vegetation will follow the U.S. Fish & Wildlife Service publication, *National list of Plant Species That Occur in Wetlands: North Central Region (Region 3)* (Reed 1988). Wetland classification will be made

according to the Cowardin Classification System, which is described in the U.S. Fish and Wildlife Service *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin 1979) and cross-referenced to the Wisconsin DNR *Wisconsin Wetlands Inventory* classification system as well as the locally utilized system developed by Eggers and Reed (1997) in *Wetland Plants and Plant Communities of Minnesota and Wisconsin*.

d) Survey / Base Map Preparation

The following is noted regarding project survey and map information:

- The field survey of physical features will be performed using the Wisconsin State Plane South coordinate system and the NAD 27 datum, with U.S. survey feet as the unit of measure.
- Data collected previously by USGS was obtained using the Universal Transverse Mercator (UTM) Zone 16 coordinate system, with meters as the unit of measure.
- The data layers provided by Sheboygan County are in the Sheboygan County coordinate system, using the NAD88/96 datum in U.S. survey feet.
- All of the project data collected will be transformed to the Wisconsin State Plane South coordinate system, using the NAD 27 datum, with U.S. survey feet as the units of measurement.
- The final base map used for design will include all of the collected data layers, converted from geographic information systems (GIS) to CAD.
- GIS base maps are being created using ArcGIS 9.3.
- As necessary, the GIS data will be converted to AutoCAD files in order to development preliminary and final project construction drawings.

e) Hydrologic / Hydraulic (H/H) Investigations

As provided in Section E.1.e (Data Collection, Hydrologic / Hydraulic (H/H) Investigations), the H/H evaluations to be performed by the SEH Project Team will be conducted in coordination with USGS staff, who are conducting a parallel investigation of the Sheboygan River. As such, USGS protocols related to data collection and model development will be adopted.

f) Cultural / Archaeological / Historical Investigations

(1) Cultural Resources Investigations

The cultural resources investigations will be conducted in compliance with Sections 1066 and 110 of the National Historic Preservation Act of 1966, Chapters 44.40 and 1557.70 of the Wisconsin Statutes, and the National Environmental Policy Act of 1969.

The methods and techniques used during the cultural resources study will follow those standards promulgated in the Secretary of Interior's Standards and Guidelines for Archeology and Historic Preservation, the Architecture-History Survey Manual, and the Guidelines for Public Archaeology in Wisconsin, as revised (1997). These documents are endorsed by the Wisconsin State Historic Preservation Office.

(2) Archaeological Investigations

Within the Taylor Drive/Indiana Avenue project area there is a previously recorded American Indian village site that is also an uncatalogued burial site. As a burial site, 47SB0081 (BSB 0029) is protected under Wisconsin statute 157.70, and will require permission from the Wisconsin Historical Society prior to disturbance by archaeological field work or any construction-related activities.

(3) Historical Investigations

The SEH Project Team will seek concurrence fromthe Wisconsin Historical Society, addressing necessary permissions for both the archaeological studies and construction activities.

3. Necessary Data / Information Sources and Gaps

a) Fluvial / Geomorphic Investigation

The following is noted:

- Following the geomorphic field reconnaissance, maps will be marked up field observations and a report will be developed documenting site conditions
- Information regarding sub-reach based geomorphic stability is largely gained from field investigation.
- Long-term trend data is gathered from aerial photography and topographic maps.
- Sediment transport and grain size information is available from previous hydraulic modeling efforts related to contaminated site cleanup.
- Surficial geologic information is available through the Wisconsin Geological Survey and the USGS.

b) Fish and Wildlife Assessments

Following an on-site habitat evaluation and review of available wildlife information, including quality assurance for minimizing false absences and false positives of species occurrences, a list of wildlife species that are either present or may be potentially found within the three project areas will be generated. SEH Project Team ecologists will then identify species of local conservation interest. Species will be recommended as *focal species* for habitat restoration measures. This designation will be made due to the ability of the project to support viable populations; their utility as umbrella species whose habitat requirements are commensurate with functional ecosystem services capable of supporting a wider variety of native species; public interest; and/or designation as a Species of Greatest Conservation Need in the Wildlife Action Plan. Habitat restorations benefiting these species will have extra value beyond strictly physical benefits such as water quality abatement and recreational green space.

Data collected during field work conducted by the WDNR, Jeff Baughman and the Western Great Lakes Bird and Bat Observatory (WGLBBO) will be reviewed along with information previously collected during the Wisconsin Breeding Bird project. Seasonal observations of bird species submitted to the Wisconsin Society of Ornithology, the Natural Heritage Working List, and the Wisconsin Wildlife Action Plan will also be examined. Based on these reviews and an on-site habitat evaluation to determine available nesting, shelter and food sources, a list of species found or potentially found within the Area of Concern (AOC) and project sites during the migration, breeding and wintering seasons will be generated.

The focal species concept is useful in informing the design process in that it identifies a key group of species to concentrate on when incorporating habitat features and enhancements into the design for each project area. Unrelated to the design of the project, but relevant to evaluation of the long-term post-restoration success is development of measures of success for a group of species known to exist within each project area. To develop the measures of success, the WDNR is in the process of identifying key species and metrics to be met for each species to assess whether or not suitable habitat has been created or enhanced as a result of the project implementation. Data collection for and evaluation of measures of success is part of the long-term monitoring that will be implemented by the WDNR subsequent to and separate from the habitat restoration projects.

c) Wetland Assessments and Delineations

Data needed for wetland assessments and delineations includes the following:

1. **References:**
    - Wisconsin Department of Natural Resources (WDNR). 2010. Wisconsin Wetlands Inventory, available on line at: http://dnrmaps.wisconsin.gov/imf/imf.jsp?site=SurfaceWaterViewer
    - U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). 2005. *Hydric Soils of the United States* (list).
2. **Field Data:**
    - Botanical Inventory
    - Hydric Soils Inventory
    - Wetland Boundary Coordinates (as surveyed in the field)
    - Wetland and Upland Sample Points
    - Photographic Record
    - Hydrologic Indicators

d) Survey / Base Map Preparation

The following is noted:

- Data provided by USGS includes bathymetric data, LiDAR data (ground and surface elevations) and water layer information. This info is in the UTM Zone 16 coordinate system using meters for unit of measure.
- Additional field data will be collected by the SEH Project Team using GPS and survey equipment. Data will be collected using the Wisconsin State Plane South coordinate system, the NAD 27 datum, and U.S. survey feet as the unit of measure.
- Map data was provided by the City of Sheboygan and Sheboygan County. This data is in the Sheboygan County coordinate system, using the NAD88/96 datum and U.S. survey feet.
- Project maps will be prepared for the project using the Wisconsin State Plane South coordinate system, the NAD 27 datum, and U.S. survey feet as the unit of measurement.
- The data not conforming to the base map coordinate system was projected on the fly inside of ArcGIS 9.3 to overlay and create the mapping files.

- Existing utility data (presence, horizontal and vertical alignment) will be obtained from the City of Sheboygan Public Works Department, Sheboygan County, and Digger's Hotline information requests.

e) Hydrologic / Hydraulic (H/H) Investigations

An existing condition hydraulic model will be developed by the SEH Project Team using HEC-RAS and/or GEO-RAS, with cross-section data provided by USGS. Downstream boundary conditions will be established for each project site location.

The HEC-RAS model for each project site will be modified to represent proposed rehabilitated conditions. Shear stresses under reach averaged conditions will be plotted versus flow, and two dimensional shear along bank vertical profiles will be examined under bend shear conditions and also maximum scour depth scenarios. This information will be used to size materials and develop alternatives for bioengineering.

Restoration options will be examined for each site that will include the following:

- Buried or hidden toe practices
- Bioengineering using coir fabric placement, soil lifts or geocell treatments
- Incipient floodplain benches or wet terraces
- Depositional bar forming roughness elements (eg. vanes or large wood)
- Simple grading and shaping
- Tree saving landscaping measures
- Exclusive vegetation (eg. thorny bushes to limit pedestrian traffic)
- Floodplain inundation frequency will be examined and the site will be evaluated for native vegetation restoration potential.

For the Taylor Drive and Indiana Avenue Restoration Site, decisions will be made with Client Project Team input regarding the approaches to be used to enhance hydrologic / hydraulic connectivity, including the potential development of stormwater best management practices (BMPs).

f) Archaeological / Cultural / Historical Investigations

Within the Taylor Drive and Indiana Avenue Project Area there is a previously recorded American Indian village site that is also an uncatalogued burial site. As a burial site, this area (site 47SB0081 - BSB0029) is protected under Wisconsin Statute 157.70 and will require permission from the Wisconsin Historical Society prior to commencement of archaeological field work, as well as any construction-related activities. GLARC will facilitate compliance with the Wisconsin Historical Society and secure the necessary permissions for both the archaeological studies and construction activities.

4. Data Management and Sharing

A SEH Project Team file transfer protocol (ftp) site has been established that will be used by members of the SEH and Client Project Teams to share background information and work in progress, including base map information, inventories and assessments, model data, draft task technical memorandums and conceptual design details. As described previously, draft technical

memorandums will be developed for Tasks B (Background / Field Investigations), Task D (Hydrologic / Hydraulic Evaluations), and Task F (Habitat Restoration Design Concepts), which will summarize related background investigations and assessments, corresponding observations and recommendations, and proposed restoration designs. Following review and comment by senior reviewers (see Table 2) and the Client Project Team, these memorandums will be finalized and posted on the ftp site.

As provided previously and shown on the project schedule (Exhibit B), TAC meetings will take place throughout the project, which will allow the SEH and Client Project Teams to discuss and exchange information (verbally and via hard copy).

SEH and Client Project team members will also participate in progress conference calls that will be held every other Tuesday (at 2:00 PM). The first progress call occurred on December 6, 2011.

There are also several CAC meetings scheduled that will allow the SEH and Client Project Teams to present conceptual, preliminary and final restoration designs to the public.

5. Deliverables

Project deliverables and associated senior reviewers are identified on Table 2. Also, the project schedule is provided on Exhibit B, which identifies the anticipated dates that project deliverables will be provided to the Client Project Team. These deliverables will summarize background information, and document work completed and associated recommendations and design approaches for each of the three restoration sites. Timely delivery and review of draft documents will allow the project to remain on schedule, which requires final plans and specifications to be prepared by April 27, 2012.

Additional detail regarding project deliverables is provided below.

a) Fluvial / Geomorphic Investigation

A Fluvial / Geomorphic Investigation TM, describing the methodology and results of the field reconnaissance, will be provided as an appendix to the Task B (Background / Field Investigation) TM. Detail will include field notes and map markups, as well as figures documenting aerial photographic analysis.

b) Fish and Wildlife Assessments

A Fish and Wildlife TM, describing field methodologies and reviewed data sources, will also be provided as an appendix to the Task B (Background / Field Investigation) TM. SEH Project Team ecologists will identify species of local conservation interest, and certain species will be recommended as *focal species* for habitat restoration measures, due to: (1) the ability of the project to support viable populations, (2) their utility as umbrella species whose habitat requirements are commensurate with functional ecosystem services capable of supporting a wider variety of native species, (3) public interest, and/or (4) designation as a Species of Greatest Conservation Need.

Habitat restorations benefiting these species will have extra value beyond strictly physical benefits such as water quality abatement and recreational green space. Specific habitat restoration concepts will be included within the report, which will be used to develop habitat improvements and native planting designs for each project area.

c) Wetland Assessments and Delineations

A Wetland Delineation Report will be developed, and attached to the Task B TM, which describes the methodology and results of the field delineation, and documents the presence of hydrophytic vegetation, hydric soils and wetland hydrology. The report will include data collected to support the field delineation and provide information on physical characteristics of the upland and wetland plant communities. The report is required by regulatory agencies responsible for the review and concurrence of the wetland delineation and jurisdictional determination. Five (5) copies of the Wetland Delineation Report will be prepared for distribution to regulatory agencies for purposes of completing the wetland concurrence and jurisdictional determination. An official request will be submitted to the St. Paul District of the USACE and the WDNR Water Management Specialist for a written concurrence and jurisdictional determination for the wetlands flagged within the project area. The delineation report will contain:

- Plant lists
- Data sheets
- Project boundary overlaid on:
- USGS map
- Soils map
- Wisconsin Wetland Inventory map
- Surveyed wetland boundary overlaid on an aerial photo
- Site photo log
- A discussion pertaining to the existing condition of vegetation, soils and hydrology, wetland delineation methods, and the findings of the wetland investigation.

d) Survey / Base Map Preparation

Base maps (GIS and AutoCAD formats) will be created for each of the three project restoration sites, which will include (at a minimum) two foot contour intervals, as provided by Sheboygan County. The AutoCAD base maps will include one foot topographic contours in areas of potential grading.

Point data will be submitted electronically. Hydraulic data will be incorporated into a working HEC-RAS/GEO-RAS format. Maps will be developed using the coordinate and datum systems described previously.

e) Hydrologic / Hydraulic (H/H) Investigations

A Task D (Hydrologic / Hydraulic Evaluations) TM documenting Task D evaluations and results will be developed and presented for review and comment. Included will be appropriate tabular and graphical summaries for existing and proposed conditions.

f) Cultural / Archaeological / Historical Investigations

Deliverables for the cultural resource investigations will include:

- Technical memo summarizing results of the archaeological and architecture/history studies with recommendations for further work (if needed)
- Archaeological technical report for submittal to the Wisconsin State Historic Preservation Office (SHPO);

- Permission request for construction related activities near burial sites coincident with the project APE that will be submitted to the Wisconsin Historical Society; and
- Architecture/History technical report that will be submitted to the SHPO.

F. Habitat Restoration Design Concepts (Project Alternatives)

1. Task Goals and Objectives

Primary goals and objectives for the project were presented previously in Section C. More specific habitat restoration design concepts will be developed for each of the three restoration sites, with the goal of providing an appropriate uniformity of design solutions. Restoration design concepts will result from collaborative discussions among the Client Project Team and SEH Project Team Members. Habitat restoration solutions will focus on targeted fish, wildlife and bird species, which will be confirmed with the Client Project Team. Variations in approaches, as defined by the unique conditions at each site, will be noted.

2. Alternative Development Process

Both the Environmental Assessment and the Section 404 Permit Application (described later) require a discussion of the project background and alternatives development. Information relative to alternatives will be recorded during the preliminary and final design phases of the project.

The alternative selection process involves: (1) describing the specifics of each alternative; (2) determination of whether or not the alternative meets the project purpose and need; (3) assessing the potential impacts to known resources that would be created by each alternative; (4) presentation of the feasible alternatives to stakeholders and the public; and (5) selection of a feasible alternative that is acceptable to project stakeholders that meets the project purpose and need while avoiding, minimizing and compensating for resource impacts.

3. Design Considerations

Hydrologic and hydraulic conditions and evaluations documented in the Task D TM will define the periods and durations of high water inundation along the Sheboygan River, providing key input in the development of proposed grading, and vegetation and habitat restoration plans. Also key to the development of habitat restoration plans is: (1) the identification of desirable fish and wildlife species, as documented in the Task B TM; (2) the presence and management of invasive plant species; and (3) the provision of appropriate stormwater management features that can detain and/or treat stormwater runoff.

A site restoration schematic will be developed for each of the three project sites that will approximately delineate the location of the proposed restoration design solutions. Design concepts will be defined in graphical form, applying an appropriate level of detail, which will be documented in the Task F (Habitat Restoration Design Concepts) TM.

Once accepted by the SEH and Client Project Teams, the intent is to include the design concepts, as appropriate, within the preliminary designs being created for each project site to be performed in Task G (Preliminary Design).

4. Data / Information Sources and Gaps

Task B (Background / Field Investigations) and Task D (Hydrologic / Hydraulic Evaluations) TM's will present much of the background information and assessment information needed to develop the

habitat design concepts at each of the three restoration sites. In support of this effort, the SEH Project Team will also develop plant lists to be incorporated into the contract documents.

Because bioengineering is an important aspect of this project, the grading, habitat features and planting plans will be melded together as one. The conceptual plans for each site will include consideration of project area soils, hydrology, soil-stabilization features, and non-native and / or invasive species plans.

Review of the conceptual habitat restoration design concepts by the TAC, and incorporation of related feedback, will be essential to meeting the overall project goals, as summarized in Section C (Primary Goals and Objectives). Final direction regarding the acceptance and/or modification of the habitat restoration design concepts will be provided by the City of Sheboygancollaborately with the WDNR and Sheboygan County.

5. Deliverables

A draft Task F (Habitat Restoration Design Concepts) TM documenting these habitat restoration design concepts will be developed and presented to the TAC and Client Project Team for review and comment. Following receipt of review comments, a final TM will be prepared and distributed to the Client Project Team. Design concept graphics and site restoration schematics will be included in the TM.

G. Design Documents

1. Preliminary Design (60% Completion)

a) Task Goals and Objectives

Following the development of the Task F (Habitat Restoration Design Concepts) TM, and related inputs and approvals from the TAC and the Client Project Team, the SEH Project Team will initiate Task G (Preliminary Design) which will include the development of a 60% complete restoration design for each of the three restoration sites. These preliminary restoration designs will incorporate the unique features and opportunities offered at each site, and result in the development of plan views (grading and vegetation drawings), typical restoration cross-sections and details, and a preliminary design Opinion of Probable Cost (OPC). SEH and Inter-Fluve staff will take the lead on developing these preliminary design documents, with support provided by other team members.

b) Applicable Standards

The City of Sheboygan Department of Public Works has requested that construction drawings be developed using AutoCAD. Otherwise, the SEH Project Team has been given the flexibility to adopt standards and formats successfully used on past projects in the development of construction drawings and specifications. As such, project drawings will be developed using AutoCAD and Civil 3D, a grading design support package, and a SEH standard drawing template.

Specifications will be developed using standards and technical specifications prepared by the Engineers Joint Contract Documents Committee (EJCDC), which is supported jointly by the American Council of Engineering Companies (ACEC), the American Society of Civil Engineers (ASCE), the Association of General Contractors of America (AGCA), and the National Society of Professional Engineers (NSPE). EJCDC specifications are endorsed by the Construction Specifications Institute (CSI).

Standards adopted for the development of the project base maps were previously reported in Section E.2.d (Data Collection, Applicable Standards, Survey/Base Map Preparation).

c) Necessary Data / Information Inputs

Base maps developed as part of Task C (Field Survey / Base Map Preparation) will be used in development of the restoration base maps.

The presence and horizontal alignment of existing utilities will be illustrated on the plan view construction drawings, and considered when designing habitat restoration improvements.

Technical specifications and design details associated with specific habitat restoration concepts will be offered by SEH Project Team members, who have considerable experience in development of related improvements. The results and recommendations documented in Task B (Background / Field Investigations), Task D (Hydrologic / Hydraulic Evaluations) and Task F (Habitat Restoration Design Concepts) will be integral to the development of preliminary habitat restoration design details.

d) Data / Information Sources and Gaps

The preliminary design OPC for the three sites will be compared to the available Great Lakes Restoration Initiative (GLRI) funding, which represents the upper limit of project implementation costs currently available for these restoration improvements, given that there is no other funding currently available. As a result of this comparison, proposed improvements at the three restoration sites may be enhanced or diminished, such that the anticipated implementation costs more closely match the available GLRI funding.

Review of the preliminary engineering (60% complete) site restoration designs by the TAC, and incorporating related feedback, will be essential to meeting the overall project goals, as summarized in Section C (Primary Goals and Objectives). Final direction regarding the acceptance and/or modification of the preliminary site designs will be provided by the City of Sheboygan, who will be in close cooperation with the WDNR and Sheboygan County.

e) Deliverables

Task G (Preliminary Design) deliverables (hard copies) will include the following:

- Preliminary design OPC
- Specification outline
- 60% complete construction drawings, which will likely include the following drawings for each of the three restoration sites (approximately 16 drawings per site, 48 drawings total). [*Note: The final drawing list is dependent on the recommended restoration improvements, and funding limits associated with the design and construction budgets.*]
    - Cover / Drawing Index (1 sheet)
    - Project Vicinity and Location Maps (1 sheet)
    - Project Overview – Plan View (1 sheet)
    - Existing Conditions - Plan View (3 sheet)
    - Proposed Grading - Plan View(3 sheets)
    - Proposed Plantings – Plan View (3 sheets)

- Planting Details (2 sheets)
- Typical Details (2 sheet)

2. Final Design

a) Task Goals and Objectives

Following the review of the preliminary (60% complete) site designs by the TAC and the Client Project Team, and the receipt of related review comments, 90% complete drawing sets and specifications will be developed for each of the three project sites. The 90% complete drawings will include supplemental design details and cross-sections. The 90% complete construction documents will be provided to the Client Project Team for a final review and comment, prior to the development of the 100% complete (biddable) construction documents.

b) Applicable Standards

Final construction documents (drawings and specifications) will be signed and sealed by the SEH Project Manager (Tom Sear, PE), and provided to the City of Sheboygan Department of Public Works in electronic (Word and AutoCAD) and hard copy form. It is assumed that the City will arrange for the production of hard copies to be distributed to potential bidders.

c) Necessary Data / Information Inputs

The 90% complete construction documents will be included in the Environmental Assessment (EA) document described in the Section H (Permitting and Agency Coordination).

Final review comments offered by the Client Project Team in response to the 90% complete review documents will be incorporated into the 100% complete s (biddable) construction documents.

d) Data / Information Sources and Gaps

The preliminary design OPC for the three sites will be compared to the available Great Lakes Restoration Initiative (GLRI) funding, which represents the upper limit of project implementation costs currently available for these restoration improvements, given that there is no other funding currently available. As a result of this comparison, proposed improvements at the three restoration sites may be enhanced or diminished, such that the anticipated implementation costs more closely match the available GLRI funding.

Review of the preliminary engineering (60% complete) site restoration designs by the TAC and incorporation of related feedback will be essential to meeting the overall project goals, as summarized in Section C (Primary Goals and Objectives). Final direction regarding the acceptance and/or modification of the preliminary site designs will be provided by the City of Sheboygan, who will be in close collaboration with the WDNR and Sheboygan County.

e) Deliverables

With the addition of supplemental design details and cross-sections, it is anticipated that eight additional drawings will be added to each of the drawing sets described in Section G.1.e, resulting in a total of 24 drawings to be developed for each of the restoration project sites.

The 90% design drawings and specifications will be provided to the Client Project Team for a final review and comment prior to the development of the 100% complete (biddable) construction documents. The Opinion of Probable Cost will be updated and finalized.

H. Permitting and Agency Coordination

1. Task Goals and Objectives

a) Applicable Standards

An Environmental Assessment (EA) conforming to the requirements of the Wisconsin Environmental Policy Act (WEPA) will be developed for the project. In addition, permit applications for impacts to wetlands and waterways are needed for the project to fulfill the requirements of Sections 401 and 404 of the Federal Clean Water Act for Water Quality Certification and Discharge of fill in a wetland.

Proposed project improvements must also comply with the requirements stated in NR 116 (Wisconsin's Floodplain Management Program), NR 151 (Runoff Management) and NR 216 (Stormwater Discharge Permits).

b) Necessary Data / Information Inputs

The Environmental Assessment will include a detailed analysis of feasible project alternatives and will provide the following information for the project.

- Brief overview of the proposal including the DNR action –
- Purpose and need
- Authorities and approvals
- Proposed Physical Changes
- Manipulation of terrestrial resources
- Manipulation of aquatic resources
- Buildings, Treatment Units, Roads and Other Structures
- Emissions and discharges
- Other changes
- Physical environment
- Biological environment
- Cultural environmental
- Environmental Consequences
- Summaries
    - Summary of adverse impacts discussion
    - DNR Evaluation of Project Significance
    - Environmental effects and their significance
    - Primary and secondary effects that are long-term or short-term
    - Significance of controversy over environmental effects

- Impacts of no action and alternatives that decrease or eliminate adverse environmental effects
- Summary of Issue Identification Activities
- List of agencies, citizen groups, and individuals contacted regarding project
- Bibliography

The Joint Permit Application will contain the following:

- Project description
- Project purpose and need
- Wetland delineation report for the project corridor
- Maps and figures needed to describe wetland impacts
- Completed WDNR Form 3500-053
- *Practicable Alternatives Analysis* - The practicable alternatives section of the 404(b)(1) guidelines assumes that, if a project is non-water dependent, alternative sites that do not involve disturbance of special aquatic sites (including wetlands) are available unless clearly demonstrated otherwise (40 CFR Section 230.10(a)(3)). To satisfy the practicable alternatives test, a discussion with details will be provided to explain why alternative sites or actions would not be feasible or achieve the purpose and need of the project.
- *Avoidance, Minimization and Mitigation* - Once it has been determined that a project is water-dependent and/or that no other practicable alternatives exist, impact avoidance must be considered. If it has been determined that wetlands have been avoided to the maximum extent possible, then impacts must be minimized through alignment adjustments and other design modifications.

- Attachments will include:
  - 90% Plan and Specifications (to be prepared in Tasks F and G)
  - Environmental Assessment

c) Data / Information Sources and Gaps

Both the Environmental Assessment and the Section 404 Permit Application require a discussion of the project background and alternatives development. Information relative to alternatives will be recorded during the preliminary and final design phases of the project. The alternative selection process involves 1) describing the specifics of each alternative; 2) determination of whether or not the alternative meets the project purpose and need; 3) assessing the potential impacts to known resources that would be created by each alternative; 4) presentation of the feasible alternatives to stakeholders and the public; and 5) selection of a feasible alternative that is acceptable to project stakeholders that meets the project purpose and need while avoiding, minimizing and compensating for resource impacts.

The project purpose and need has been well established through the process of identifying Beneficial Use Impairments (BUIs) and in developing a Remedial Action Plan (RAP) to address the BUIs. Background information will be gleaned from this effort as well as other publically available information developed for the Sheboygan River AOC and watershed.

Public and stakeholder input will be obtained through regular public information meetings, to be held jointly as the Community Advisory Committee (CAC) meetings described in Section C of this document. To ensure consideration of public and stakeholder input, the SEH team will review the record of each of the CAC meetings and will meet with the Client Project Team on a regular basis to solicit comments.

Much of the resource information required to describe the biological environment is currently being collected by others. To supplement this information, SEH will delineate and map all project area wetlands to allow for incorporation of impact avoidance and minimization measures, as well as to establish boundaries for wetland management areas. The distribution of non-native / invasive species will also be depicted on maps and discussed in a management plan that is part of the overall plan for each project area. In addition, the SEH Project Team will collect cultural and archaeological data to ensure that potential impacts to these resources are considered during design as well. Finally, the SEH Project Team will meet independently to share data related to hydrology and hydraulics, survey, and all additional information collected relative to the project.

Resource impact avoidance, minimization and compensatory mitigation efforts made as part of the design phase will be documented and described in detail in the EA. A description of these efforts relative to wetlands, waters of the U.S. and cultural / archaeological resources will be summarized as well in the Section 404 Permit Application.

2. Deliverables

a) Environmental Assessment

Five (5) copies of the draft EA will be prepared for distribution to regulatory agencies for review and comment. Following insertion of any necessary editorial changes, up five (5) copies of the final, approved EA will be forwarded to appropriate agencies and stakeholders. The EA will be posted on the project web site as requested by the WDNR.

b) Section 404 Permit Application

The SEH Project Team will develop a Joint Permit Application to the Wisconsin Department of Natural Resources and the U.S. Army Corps of Engineers for the Sheboygan River AOC HR Projects. The NR 216 permit application, and project site erosion control plans, will be prepared as part of Task G (Preliminary Design) and Task H (Final Design). An official request will be submitted along with the permit application to the St. Paul District of the USACE for Section 404 approval for wetland fills and to the WDNR Water Management Specialist for written concurrence and Section 401 Water Quality Certification.

ATTACHMENTS

Exhibits

- Exhibit A – SEH Project Team Organizational Chart
- Exhibit B – Project Schedule
- Exhibit C – Pathway to Delisting Habitat BUI's Survey and Assessment

Tables

- Table 1 - Project Budget
- Table 2 – Project Deliverables and Quality Control Reviews

Figures

- Figure 5 – Kiwanis Park
- Figure 9 – Taylor Drive and Indiana Avenue
- Figure 13 – Wildwood Island

Sheboygan River Area of Concern
Habitat Restoration Projects

EXHIBIT A

Short Elliott Hendrickson Inc.
Project Team

City of Sheboygan Project Manager

SEH Project Manager
Tom Sear, PE, CFM

Stakeholder Coordination and Public Information
Tom Sear, PE (SEH)
Bob Kost, ASLA (SEH)
Marty Melchoir (Inter-Fluve)
Rose Chmielewski (ESM)

Quality Control Review
Doug Bach, PE (SEH)
Joel Asp (SEH)
Bob Kost, ASLA (SEH)
Greg Koonce, CFP (Inter-Fluve)

Background / Field Investigations

Fluvial Geomorphic Investigation
Marty Melchoir (Inter-Fluve)
Andy Selle, PE (Inter-Fluve)
Beth Wentzel, PE (Inter-Fluve)
Ben Lee, EIT(Inter-Fluve)

Resource Assessments

Wildlife Assessments
Gary Casper, Ph.D. (GLES)
James Havel (NES)

Wetland Assessments
Rose Chmielewski (ESM)
Scott Horzen (OTIE)

Cultural / Archaeological / Historical
Jennifer Haas (GLARC)

Field Survey
Jim Haessler, PLS (OTIE)
OTIE Survey Crew
Inter-Fluve Field Staff

Alternative Development and Evaluations

Water Resources Evaluations

Hydrologic / Hydraulic Evaluations
Ryan Van Camp, PE (SEH)
Andy Selle, PE (Inter-Fluve)
Beth Wentzel, PE (Inter-Fluve)

Geomorphic Evaluations
Marty Melchoir (Inter-Fluve)
Andy Selle, PE (Inter-Fluve)

Habitat Restoration and Stormwater Management Design Concepts

Wildlife Habitat Designs
Gary Casper, PhD (GLES)
James Havel (NES)

Habitat Restoration / Vegetation Plans
Rose Chmielewski (ESM)
Scott Horzen (OTIE)
Marty Melchoir (Inter-Fluve)
Veronica Anderson (SEH)

Streambank Restoration
Marty Melchoir (Inter-Fluve)
Andy Selle, PE (Inte-Fluve)

Stormwater Management
Matt Bednarski, PE (SEH)
Ryan Van Camp, PE (SEH)
Beth Wentzel, PE (Inter-Fluve)

Preliminary / Final Design and Permitting

Select Preliminary Design Alternative
Tom Sear, PE ,CFM (SEH)
Marty Melchoir (Inter-Fluve)
Rose Chmielewski (ESM)

Enviornmental Assessment and Permitting
Rose Chmielewski (ESM)
Scott Horzen (OTIE)

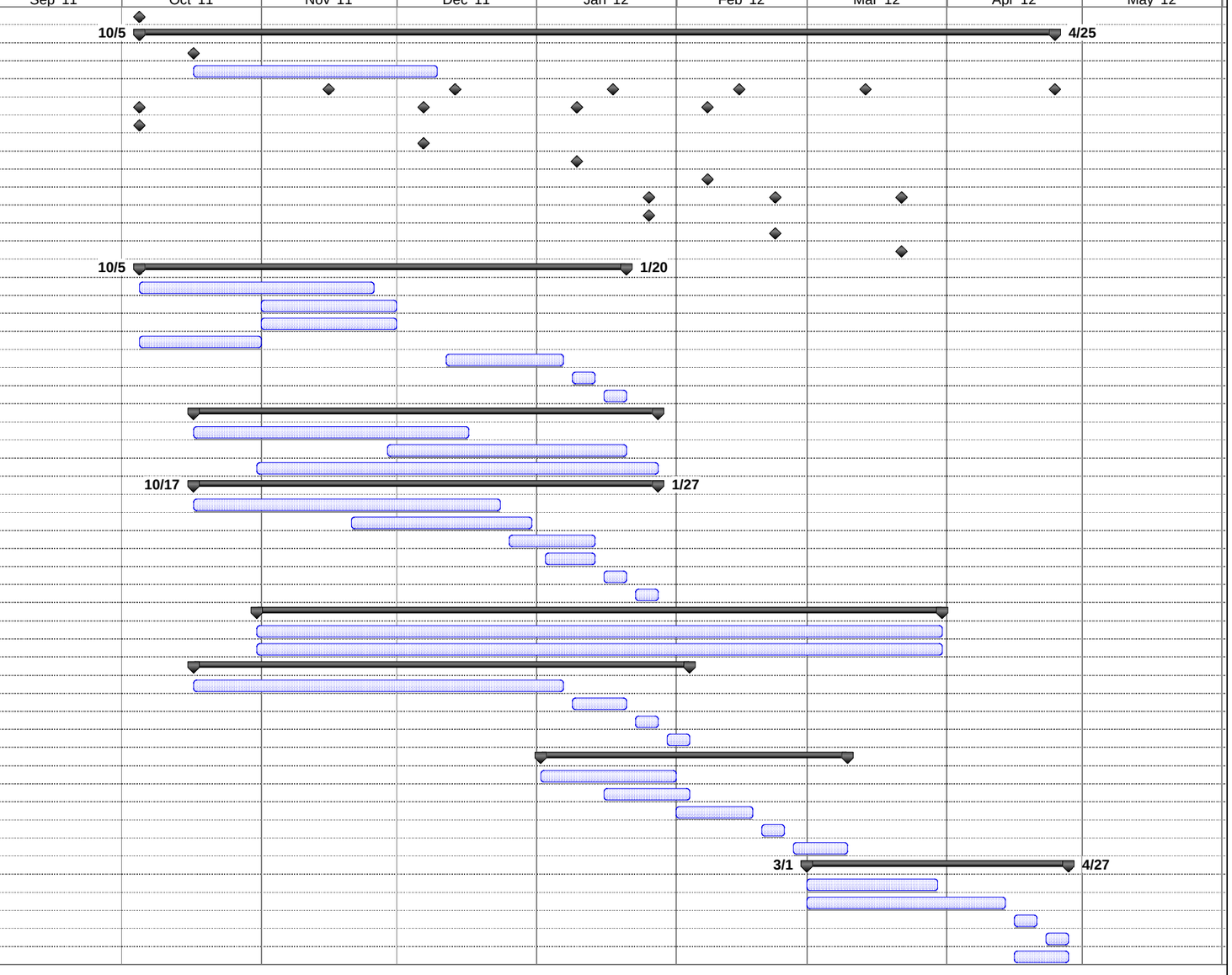
Develop FInal Design and Bidding Documents
Tom Sear, PE, CFM (SEH)
Matt Bednarski, PE (SEH)
Andy Selle, PE (Inter-Fluve)
Rose Chmielewski (ESM)

SEH Project Team Members

Inter-Fluve
Great Lakes Ecological Services (GLES)
Ecological Services of Milwaukee (ESM)
Oneida Tribal Integrated Enterprises (OTIE)
NES Ecological Services (NES)
Great Lakes Archaeological Reserach Center (GLARC)

EXHIBIT B - UPDATED PROJECT SCHEDULE
DECEMBER 2011 PROGRESS REPORT
Sheboygan River Area of Concern (AOC)
Habitat Restoration Projects

ID	Task Name	Start	Finish
1	Notice to Proceed	Wed 10/5/11	Wed 10/5/11
2	**Task A - Project Management and Coordination**	**Wed 10/5/11**	**Wed 4/25/12**
3	Project kick-off meeting	Mon 10/17/11	Mon 10/17/11
4	Work Plan / QAPP Development	Mon 10/17/11	Fri 12/9/11
5	Monthly Progress Meetings	Wed 11/16/11	Wed 4/25/12
12	Stakeholder Meetings	Wed 10/5/11	Wed 2/8/12
13	Meeting 1	Wed 10/5/11	Wed 10/5/11
14	Meeting 2	Wed 12/7/11	Wed 12/7/11
15	Meeting 3	Tue 1/10/12	Tue 1/10/12
16	Meeting 4	Wed 2/8/12	Wed 2/8/12
17	Public Informaiton Meetings	Thu 1/26/12	Thu 3/22/12
18	Meeting 1	Thu 1/26/12	Thu 1/26/12
19	Meeting 2	Thu 2/23/12	Thu 2/23/12
20	Meeting 3	Thu 3/22/12	Thu 3/22/12
21	**Task B - Background / Field Investigations**	**Wed 10/5/11**	**Fri 1/20/12**
22	Literature Review	Wed 10/5/11	Fri 11/25/11
23	Fluvial Geomorphic Investigations	Tue 11/1/11	Wed 11/30/11
24	Wildlife Assessments	Tue 11/1/11	Wed 11/30/11
25	Wetland Assessments / Delineations	Wed 10/5/11	Mon 10/31/11
26	Draft Technical Memorandums	Mon 12/12/11	Fri 1/6/12
27	Client Project Team Review	Mon 1/9/12	Fri 1/13/12
28	Final Technical Memorandums	Mon 1/16/12	Fri 1/20/12
29	**Task C - Field Survey / Base Map Preparation**	**Mon 10/17/11**	**Fri 1/27/12**
30	Obtain Existing Map Information	Mon 10/17/11	Fri 12/16/11
31	Field Survey	Tue 11/29/11	Fri 1/20/12
32	Develop Project Base Maps	Mon 10/31/11	Fri 1/27/12
33	**Task D - Hydrologic / Hydrauilc Evaluations**	**Mon 10/17/11**	**Fri 1/27/12**
34	Access / Develop Hydrauilc Models	Mon 10/17/11	Fri 12/23/11
35	Determine Design Discharges	Mon 11/21/11	Fri 12/30/11
36	Conduct Hydrauilc Simulations	Mon 12/26/11	Fri 1/13/12
37	Draft Technical Memorandum	Tue 1/3/12	Fri 1/13/12
38	Client Project Team Reivew	Mon 1/16/12	Fri 1/20/12
39	Final Technical Memorandum	Mon 1/23/12	Fri 1/27/12
40	**Task E - Enviornmental Permitting and Agency Coordination**	**Mon 10/31/11**	**Fri 3/30/12**
41	Environmental Assessment	Mon 10/31/11	Fri 3/30/12
42	Wetland and Waterway Permitting	Mon 10/31/11	Fri 3/30/12
43	**Task F - Habitat Restoration Design Concepts**	**Mon 10/17/11**	**Fri 2/3/12**
44	Design Concepts	Mon 10/17/11	Fri 1/6/12
45	Draft Summary Technical Memorandums	Mon 1/9/12	Fri 1/20/12
46	Client Project Team Review	Mon 1/23/12	Fri 1/27/12
47	Final Summary Technical Memorandums	Mon 1/30/12	Fri 2/3/12
48	**Task G - Preliminary Design (60% Completion)**	**Mon 1/2/12**	**Fri 3/9/12**
49	Preliminary Design Details	Mon 1/2/12	Tue 1/31/12
50	Preliminary Construction Cost Estimate	Mon 1/16/12	Fri 2/3/12
51	Draft Summary Documents	Wed 2/1/12	Fri 2/17/12
52	Client Project Team Reivew	Mon 2/20/12	Fri 2/24/12
53	Final Summary Documents	Mon 2/27/12	Fri 3/9/12
54	**Task H - Final Design Documents**	**Thu 3/1/12**	**Fri 4/27/12**
55	Final Design Calculations	Thu 3/1/12	Thu 3/29/12
56	90% Plans and Specifications	Thu 3/1/12	Fri 4/13/12
57	Client Project Team Reivew	Mon 4/16/12	Fri 4/20/12
58	100 % Plans and Specifications	Mon 4/23/12	Fri 4/27/12
59	Final Construction Cost Estimate	Mon 4/16/12	Fri 4/27/12



Short Elliott Hendrickson Inc.
May 30, 2007

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

Exhibit C

Pathway to Delisting Habitat BUI's
Survey and Assessment

The following is a list of the 10 sub-projects that comprise the larger Sheboygan AOC Pathway to Delisting Habitat BUIs Survey and Assessment project (see RFP Section II, Information Provided, no. 5). Brief descriptions of the projects are included. Some of this work is completed and some is in progress this field season. Data collected will be available for use in planning the three habitat restoration projects.

FISH COMMUNITY ASSESSMENT
This segment of the study is composed of two main parts: 1) Fish community assessments at 16 sites following WDNR stream monitoring protocols; and 2) Spring northern pike spawning survey in the AOC upstream of Taylor Drive. Survey sites are located within the AOC itself and Willow Creek, Weedens Creek, and Onion River below the Hingham Dam.

MACROINVERTEBRATE AND FISH HABITAT ASSESSMENT
This segment of the study is composed of three main parts: 1) Macroinvertebrate assessments at 16 sites following WDNR baseline stream monitoring protocols; 2) Qualitative fish habitat assessments at the same sites following WDNR protocols; and 3) Two aquatic plant surveys, the first near the Wildwood Park Island complex and the second near the storm water detention pond at the entrance to UW-Sheboygan. The two aquatic plant surveys will assess potential northern pike spawning habitat. Survey sites are located within the Sheboygan River AOC, Willow Creek, Weedens Creek, and Onion River below the Hingham Dam.

HERPTILE SURVEY
Herptile surveys will be performed in the Sheboygan River AOC and its riparian corridor. Data generated from these surveys will be used to do the following: 1) Assess the overall health of herptiles in the AOC; 2) Provide baseline herptile population data for completion of an ecological assessment. Herptile surveyors will conduct qualitative herptile surveys at selected locations within the Sheboygan River AOC. At each location, surveyors will compile a list and numbers of all herptile species seen or heard. These surveys will focus on Endangered, Threatened, Special Concern, and regionally rare species (target species), but all species encountered will be noted. GPS coordinates of any herptiles encountered and locations of surveys will be recorded and photo vouchers of target species will be taken.

BREEDING BIRD SURVEY
Breeding bird surveys will be performed in the Sheboygan River AOC and its riparian corridor. Data generated from these surveys will be used to do the following: 1) Assess the overall health of breeding birds in the AOC; 2) Provide baseline bird population data for completion of an ecological assessment. Surveyors will conduct breeding bird surveys at selected locations within the Sheboygan River AOC and its riparian corridor. At each location, they will compile a list of bird species seen or heard, noting uncommon species encountered and high-quality habitats observed. These surveys will focus on Endangered, Threatened, Special Concern, and regionally rare species (target species), but all species encountered will be noted. GPS coordinates of each point count survey location will be recorded.

NATURAL COMMUNITY/RARE PLANT/INVASIVE PLANT SURVEY

Natural community/rare plant/invasive plant surveys will be performed in the Sheboygan River AOC and its riparian corridor. Data generated from these surveys will be used to do the following: 1) Assess the overall health of natural communities and rare plants in the AOC; 2) Provide baseline natural community and plant population data for completion of an ecological assessment. Characteristic, rare, and invasive plant species of suspected high-quality natural communities within the Sheboygan River AOC and its riparian corridor will be surveyed. At each site, the surveyor will identify and describe native natural communities and document rare and invasive plants found, taking notes on apparent health, approximate species abundance, and other relevant factors. He will record the GPS coordinates of the site. The surveyor will also take pictures or samples of each target species as vouchers. Survey objectives include the following:

1. Identify, describe, and assess native natural communities along the Sheboygan River AOC.
2. Survey for and document rare and invasive plants along the Sheboygan River AOC.
3. For each site, provide a rare plant reporting form for each rare plant population; a natural community reporting form for each natural community that is either unique or high quality; the conservation significance and management considerations for rare plants and natural communities; an invasive plant reporting form for each invasive plant population; and future inventory needs and considerations.

Data collected will be used to rank each natural community, following NatureServe's standard ranking methodology.

BAT SURVEY

The Sheboygan River AOC provides critical migrating and breeding habitat for bats. The forests, open wetlands, grasslands, and river corridor provide characteristics which are favorable bat habitat by offering roosting, foraging, and commuting habitat. WDNR will conduct water-based mobile acoustical bat surveys that together will encompass the entire reach of the AOC. They will travel the river downstream in a canoe from Sheboygan Falls to Lake Michigan, collecting bat occurrence data using a mobile bat detection system. The mobile detection system will put a species name, time, date, and location (latitude and longitude) stamp on each bat occurrence. Additional land-based surveys will be conducted from Sheboygan Falls to Taylor Drive, the shallow reach of river that is difficult to canoe at night. The bat surveys will be conducted once in early June, again in early July, and again in late July. Data generated from these surveys will be used to do the following: 1) Determine the bat species present in the AOC during the survey period; and 2) Provide baseline bat population data for completion of an ecological assessment.

MUSSEL SURVEY

Mussel surveys will be performed in the Sheboygan River AOC. Data generated from these surveys will be used to do the following: 1) Provide information on the health and location of any Endangered/Threatened/Special Concern and regionally rare mussel species in the AOC; 2) Provide baseline mussel population data for completion of an ecological assessment. A WDNR-contracted mussel surveyor will conduct qualitative mussel surveys at selected locations within the Sheboygan River AOC. At each location, the surveyor will compile a list of mussel species found, and make notes on the apparent overall health of the mussel community, approximate individual species abundance, evidence of recent recruitment and will record the GPS coordinates of the site. The surveyor will also take pictures of live specimens and empty valves as photo vouchers.

WINTERING BIRD SURVEY

Wintering bird surveys will be performed by DNR staff using methods to expand upon those for the Mid-Winter Waterfowl Surveys, which are performed every January in cooperation with the U.S. Fish & Wildlife Service Division of Migratory Bird Management (see http://www.fws.gov/birddata/databases/mwi/aboutmwi.htm). The methods are similar, but these surveys include non-waterfowl and non-open water sites (when open water is not available), and occur bi-weekly throughout the winter season. The specific survey locations vary and are chosen by the surveyor on the day of the survey. Data recorded at each site includes: bird species and numbers, date, segment, point number, GPS coordinates, GPS error, temperature, wind speed and direction, cloud cover, visibility, time (start and stop), estimate of distance surveyed. This survey, when synthesized with the other bird surveys already being done, will give us a more complete picture of year-round species use of the Sheboygan River AOC.

KINGFISHER NEST SURVEY

Beginning in mid-April, DNR staff will use canoes/kayaks to find and identify belted kingfisher nest burrows along the Sheboygan River AOC. Potential burrow locations will be recorded by GPS, photographed, placed on a field map, and revisited weekly through mid-May, or until eggs are laid, whichever comes first. When eggs are first detected, nests will be visited twice weekly to record information on stage of incubation, clutch size, date and time of nest check, and the age and condition of chicks, if present. This information will be gathered using a video burrow probe system. Nest checking will continue until the young successfully fledge or the nest fails.

SMALL MAMMAL & MINK SURVEY

This segment of the study is composed of two parts, small mammal trapping and mink trapping. The WDNR will collect common small mammals from two floodplain areas in the Sheboygan River AOC and an uncontaminated control site for contaminant analysis. Comparing the AOC sample results to those from the control site will provide information on the current extent of contamination of small mammals in the floodplains of the AOC. Also, a professional mink trapper will be hired to set traps in a selected area of the AOC and in an upstream control area. It is suspected that mink are missing from the area due to the contamination. The results of the contaminant analysis combined with the results of the mink trapping should provide help to answer that question. Specific objectives of the small mammal trapping and analysis include the following:

1) Estimate the concentrations of the various contaminants (PCBs, PBDEs, and organochlorine pesticides) in small mammals inhabiting the floodplain. The primary contaminant of concern is PCBs.
2) Compare contaminant concentrations between the 2 different contaminated floodplains (FIELDS hotspots and Seeley study sites).
3) Compare contaminant concentrations in small mammals inhabiting the contaminated floodplain with concentrations in small mammals from a control or uncontaminated site.
4) Conduct a qualitative comparison between data collected during the current project and historical data from the same area.
5) Compare contaminant results with known toxicity threshold tissue concentrations, if available.

Table 1 - Project Budget
Sheboygan River AOC HR Projects

Project Task Description	Prime Consultant													Sub-Consultants													
	Short Elliott Hendrickson (SEH)													Inter-Fluve									Ecological Services of Milw.				
	Tom Sear	Doug Bach	Joel Asp	Bob Kost	Ryan Van Camp	Matt Bednarski	Veronica Anderson	CADD technician	Clerical	Total Hours	Total Cost	Percent of Task Budget	Percent of Total Budget	Marty Melchoir	Greg Koonce	Andy Selle	Beth Wentzel	Ben Lee	Total Hours	Total Cost	Percent of Task Budget	Percent of Total Budget	Rose Clmielewski	Total Hours	Total Cost	Percent of Task Budget	Percent of Total Budget
Task A - Project Management and Coordination																											
Project Kickoff Meeting	16	0	0	0	0	0	0	0	4	20	$3,213	11%		8	0	0	0	0	8	$1,134	8%		8	8	$1,008	8%	
Work Plan / QAPP	16	8	0	0	0	0	0	0	0	24	$4,334	14%		16	0	0	0	0	16	$2,249	16%		16	16	$2,016	17%	
Monthly Progress Status Reports	16	0	0	0	0	0	0	0	8	24	$3,486	11%		8	0	0	0	0	8	$1,134	8%		8	8	$1,008	8%	
Monthly Progress Meetings (7 assumed)	24	0	0	0	0	0	0	0	12	36	$5,229	17%		20	0	14	0	0	34	$4,349	31%		24	24	$3,028	25%	
Stakeholder Meetings (4 assumed)	24	8	0	8	0	0	0	0	8	48	$7,870	26%		10	0	10	0	0	20	$2,499	18%		20	20	$2,520	21%	
Public Information Meetings (4 assumed)	24	0	0	8	0	0	0	0	8	40	$6,467	21%		20	0	0	0	0	20	$2,835	20%		20	20	$2,520	21%	
Task A Total	120	16	0	16	0	0	0	0	40	192	$30,600	100%	**17%**	82	0	24	0	0	106	$14,200	100%	**10%**	96	96	$12,100	100%	**22%**
Task B - Background / Field Investigations																											
Literature Review	8	4	4	4	0	0	0	8	8	36	$4,498	43%		8	0	24	16	0	48	$5,460	26%		32	32	$4,044	36%	
Fluvial Geomorphic Investigations	0	0	0	0	0	0	0	0	0	0	$0	0%		16	0	28	8	24	76	$8,486	40%		0	0	$0	0%	
Fish and Wildlife Assessments	0	0	0	0	0	0	0	0	0	0	$0	0%		0	0	8	0	0	8	$865	4%		8	8	$1,008	9%	
Wetland Assessments / Delineations	0	0	0	0	0	0	0	0	0	0	$0	0%		0	0	0	0	0	0	$0	0%		16	16	$2,016	18%	
Technical Memorandum	16	4	4	4	0	0	0	8	8	44	$6,002	57%		4	2	16	4	32	58	$6,189	29%		32	32	$4,032	36%	
Task B Total	24	8	8	8	0	0	0	16	16	80	$10,500	100%	**6%**	28	2	76	28	56	190	$21,000	100%	**15%**	88	88	$11,100	100%	**20%**
Task C - Field Survey / Base Map Preparation																											
Obtain Existing Map Information	8	0	0	0	16	0	0	16	0	40	$4,830	45%		0	0	0	0	0	0	$0	0%		0	0	$0	N.A.	
Field Survey	8	0	0	0	0	0	0	8	0	16	$2,142	20%		0	0	0	0	8	8	$773	16%		0	0	$0	N.A.	
Develop Project Base Maps	8	0	0	0	8	0	0	16	0	32	$3,829	35%		0	0	2	2	36	40	$3,927	84%		0	0	$0	N.A.	
Task C Total	24	0	0	0	24	0	0	40	0	88	$10,800	100%	**6%**	0	0	2	2	44	48	$4,700	100%	**3%**	0	0	$0	N.A.	**0%**
Task D - Hydrologic / Hydraulic Evaluations																											
Access / Develop Hydraulic Models	8	0	0	0	16	0	0	0	0	24	$3,436	19%		0	1	8	0	48	57	$5,686	30%		0	0	$0	N.A.	
Determine Design Discharges	8	0	0	0	24	0	0	0	0	32	$4,418	24%		0	1	2	0	2	5	$593	3%		0	0	$0	N.A.	
Conduct Hydraulic Simulations	16	0	0	0	32	0	0	0	0	48	$6,910	38%		2	0	16	8	60	86	$8,654	46%		0	0	$0	N.A.	
Technical Memorandum	8	0	0	0	16	0	0	0	0	24	$3,436	19%		2	1	8	2	24	37	$3,867	21%		0	0	$0	N.A.	
Task D Total	40	0	0	0	88	0	0	0	0	128	$18,200	100%	**10%**	4	3	34	10	134	185	$18,800	100%	**13%**	0	0	$0	N.A.	**0%**
Task E - Environmental Permitting and Agency Coordination																											
Enviornmental Assessment	16	0	4	0	0	0	0	16	8	44	$5,208	44%		2	0	8	0	0	10	$1,200	100%		80	80	$10,105	53%	
Wetland and Waterway Permitting	24	0	4	0	0	0	0	16	8	52	$6,692	56%		0	0	0	0	0	0	$0	0%		72	72	$9,095	47%	
Task E Total	40	0	8	0	0	0	0	32	16	96	$11,900	100%	**7%**	2	0	8	0	0	10	$1,200	100%	**1%**	152	152	$19,200	100%	**35%**
Task F - Habitat Restoration Design Concepts																											
Design Concepts	24	0	8	8	0	8	8	8	4	68	$9,714	57%		12	4	12	8	16	52	$6,182	63%		16	16	$2,004	67%	
Technical Memorandum	16	0	8	8	0	4	4	8	4	52	$7,186	43%		2	2	4	2	24	34	$3,618	37%		8	8	$996	33%	
Task F Total	40	0	16	16	0	12	12	16	8	120	$16,900	100%	**9%**	14	6	16	10	40	86	$9,800	100%	**7%**	24	24	$3,000	100%	**5%**
Part 1 Budget Sub-Total (Tasks A through F)	**288**	**24**	**32**	**40**	**112**	**12**	**12**	**104**	**80**	**704**	**$98,900**		**55%**	**130**	**11**	**160**	**50**	**274**	**625**	**$69,700**		**49%**	**360**	**360**	**$45,400**		**82%**
Task G - Preliminary Design (60% Completion)																											
Preliminary Design Details	40	0	8	8	0	16	8	40	24	144	$17,867	44%		4	4	24	16	120	168	$17,120	42%		16	16	$1,988	57%	
Preliminary Construction Cost Estimate	8	0	4	0	0	8	4	16	8	48	$5,372	13%		4	0	8	0	8	20	$2,205	5%		8	8	$1,008	29%	
Document Preparation	24	0	4	4	0	8	4	104	24	172	$17,562	43%		8	2	8	8	190	216	$21,475	53%		4	4	$504	14%	
Task G Total	72	0	16	12	0	32	16	160	56	364	$40,800	100%	**23%**	16	6	40	24	318	404	$40,800	100%	**29%**	28	28	$3,500	100%	**6%**
Task H - Final Design Documents																											
Final Design Calculations	16	0	8	4	0	16	4	24	8	80	$9,811	24%		8	2	16	16	40	82	$8,776	28%		4	4	$504	8%	
90% Plans and Specifications	24	0	8	4	0	24	4	64	0	128	$15,336	38%		8	2	4	0	120	134	$13,376	42%		24	24	$3,072	47%	
100% Plans and Specificiations	16	0	4	2	0	16	0	40	0	78	$9,414	23%		4	0	4	0	60	68	$6,776	22%		16	16	$2,016	31%	
Final Construction Cost Estimate	8	0	4	2	0	8	4	16	8	50	$5,739	14%		4	2	8	0	8	22	$2,573	8%		8	8	$1,008	15%	
Task H Total	64	0	24	12	0	64	12	144	16	336	$40,300	100%	**22%**	24	6	32	16	228	306	$31,500	100%	**22%**	52	52	$6,600	100%	**12%**
Part 2 Budget Sub-Total (Tasks G and H)	**136**	**0**	**40**	**24**	**0**	**96**	**28**	**304**	**72**	**700**	**$81,101**		**45%**	**40**	**12**	**72**	**40**	**546**	**710**	**$72,300**		**51%**	**80**	**80**	**$10,100**		**18%**
Total Project Budget	**424**	**24**	**72**	**64**	**112**	**108**	**40**	**408**	**152**	**1,404**	**$180,000**		**100%**	**170**	**23**	**232**	**90**	**820**	**1,335**	**$142,000**		**100%**	**440**	**440**	**$55,500**		**100%**
Total Budget	**$180,000**													**$142,000**									**$55,500**				
Percent of Total Project Budget	**40.0%**													**31.6%**									**12.3%**				

Note: The expense budgets provided herein include: (1) local travel to project sites and meetings, (2) common office material expenditures, (3) approximately ten copies each of project deliverables, (4) computer charges, and (5) other miscellaneous expenses. Equipment purchases are not included.

Table 1 - Project Budget
Sheboygan River AOC HR Projects

Project Task Description	Sub-Consultants (continued)																						Project Team			
	Great Lakes Ecological Services					NES Ecolological Services					OTIE							Great Lakes Archaeological Services									
	Gary Casper	Total Hours	Total Cost	Percent of Task Budget	Percent of Total Budget	James Havel	Total Hours	Total Cost	Percent of Task Budget	Percent of Total Budget	Scott Horzen	Jim Haessler	OTIE Survey Crew (2 person)	Total Hours	Total Cost	Percent of Task Budget	Percent of Total Budget	Jennifer Haas	Archaeological Historian	Total Hours	Total Cost	Percent of Task Budget	Percent of Total Budget	Total Hours	Total Cost	Percent of Task Budget	Percent of Total Budget
Task A - Project Management and Coordination																										
Project Kickoff Meeting	8	8	$870	58%		8	8	$814	58%		8	0	0	8	$900	100%		0	0	0	$0	N.A.		**60**	**$7,939**	**13%**	
Work Plan / QAPP	6	6	$630	42%		6	6	$586	42%		0	0	0	0	$0	0%		0	0	0	$0	N.A.		**68**	**$9,815**	**16%**	
Monthly Progress Status Reports	0	0	$0	0%		0	0	$0	0%		0	0	0	0	$0	0%		0	0	0	$0	N.A.		**40**	**$5,628**	**9%**	
Monthly Progress Meetings (7 assumed)	0	0	$0	0%		0	0	$0	0%		0	0	0	0	$0	0%		0	0	0	$0	N.A.		**94**	**$12,606**	**21%**	
Stakeholder Meetings (4 assumed)	0	0	$0	0%		0	0	$0	0%		0	0	0	0	$0	0%		0	0	0	$0	N.A.		**88**	**$12,889**	**21%**	
Public Information Meetings (4 assumed)	0	0	$0	0%		0	0	$0	0%		0	0	0	0	$0	0%		0	0	0	$0	N.A.		**80**	**$11,822**	**19%**	
Task A Total	14	14	$1,500	100%	**11%**	14	14	$1,400	100%	**11%**	8	0	0	8	$900	100%	**3%**	0	0	0	$0	N.A.	**0%**	**430**	**$60,700**	**100%**	**13.6%**
Task B - Background / Field Investigations																										
Literature Review	8	8	$860	17%		8	8	$781	17%		8	0	0	8	$857	8%		0	0	0	$0	N.A.		**140**	**$16,500**	**26%**	
Fluvial Geomorphic Investigations	0	0	$0	0%		0	0	$0	0%		0	0	0	0	$0	0%		0	0	0	$0	N.A.		**76**	**$8,486**	**13%**	
Fish and Wildlife Assessments	24	24	$2,540	50%		24	24	$2,357	50%		0	0	0	0	$0	0%		0	0	0	$0	N.A.		**64**	**$6,770**	**11%**	
Wetland Assessments / Delineations	0	0	$0	0%		0	0	$0	0%		60	0	0	60	$6,416	60%		0	0	0	$0	N.A.		**76**	**$8,432**	**13%**	
Technical Memorandum	16	16	$1,700	33%		16	16	$1,562	33%		32	0	0	32	$3,427	32%		0	0	0	$0	N.A.		**198**	**$22,913**	**36%**	
Task B Total	48	48	$5,100	100%	**37%**	48	48	$4,700	100%	**36%**	100	0	0	100	$10,700	100%	**30%**	0	0	0	$0	N.A.	**0%**	**554**	**$63,100**	**100%**	**14.0%**
Task C - Field Survey / Base Map Preparation																										
Obtain Existing Map Information	0	0	$0	N.A.		0	0	$0	N.A.		0	0	0	0	$0	0%		0	0	0	$0	N.A.		**40**	**$4,830**	**19%**	
Field Survey	0	0	$0	N.A.		0	0	$0	N.A.		0	10	40	50	$8,410	90%		0	0	0	$0	N.A.		**74**	**$11,325**	**46%**	
Develop Project Base Maps	0	0	$0	N.A.		0	0	$0	N.A.		0	8	0	8	$890	10%		0	0	0	$0	N.A.		**80**	**$8,646**	**35%**	
Task C Total	0	0	$0	N.A.	**0%**	0	0	$0	N.A.	**0%**	0	18	40	58	$9,300	100%	**27%**	0	0	0	$0	N.A.	**0%**	**194**	**$24,800**	**100%**	**5.5%**
Task D - Hydrologic / Hydraulic Evaluations																										
Access / Develop Hydraulic Models	0	0	$0	N.A.		0	0	$0	N.A.		0	0	0	0	$0	N.A.		0	0	0	$0	N.A.		**81**	**$9,121**	**25%**	
Determine Design Discharges	0	0	$0	N.A.		0	0	$0	N.A.		0	0	0	0	$0	N.A.		0	0	0	$0	N.A.		**37**	**$5,012**	**14%**	
Conduct Hydraulic Simulations	0	0	$0	N.A.		0	0	$0	N.A.		0	0	0	0	$0	N.A.		0	0	0	$0	N.A.		**134**	**$15,564**	**42%**	
Technical Memorandum	0	0	$0	N.A.		0	0	$0	N.A.		0	0	0	0	$0	N.A.		0	0	0	$0	N.A.		**61**	**$7,303**	**20%**	
Task D Total	0	0	$0	N.A.	**0%**	0	0	$0	N.A.	**0%**	0	0	0	0	$0	N.A.	**0%**	0	0	0	$0	N.A.	**0%**	**313**	**$37,000**	**100%**	**8.2%**
Task E - Environmental Permitting and Agency Coordinat																										
Enviornmental Assessment	16	16	$1,700	100%		16	16	$1,600	100%		16	0	0	16	$1,715	57%		56	160	216	$10,500	100%		**398**	**$32,028**	**65%**	
Wetland and Waterway Permitting	0	0	$0	0%		0	0	$0	0%		12	0	0	12	$1,285	43%		0	0	0	$0	0%		**136**	**$17,072**	**35%**	
Task E Total	16	16	$1,700	100%	**12%**	16	16	$1,600	100%	**12%**	28	0	0	28	$3,000	100%	**9%**	56	160	216	$10,500	100%	**100%**	**534**	**$49,100**	**100%**	**10.9%**
Task F - Habitat Restoration Design Concepts																										
Design Concepts	16	16	$1,700	50%		16	16	$1,549	50%		16	0	0	16	$1,744	67%		0	0	0	$0	N.A.		**184**	**$22,893**	**59%**	
Technical Memorandum	16	16	$1,700	50%		16	16	$1,550	50%		8	0	0	8	$857	33%		0	0	0	$0	N.A.		**134**	**$15,907**	**41%**	
Task F Total	32	32	$3,400	100%	**24%**	32	32	$3,100	100%	**24%**	24	0	0	24	$2,600	100%	**7%**	0	0	0	$0	N.A.	**0%**	**318**	**$38,800**	**100%**	**8.6%**
Part 1 Budget Sub-Total (Tasks A through F)	**110**	**110**	**$11,700**		**84%**	**110**	**110**	**$10,800**		**83%**	**160**	**18**	**40**	**218**	**$26,500**		**76%**	**56**	**160**	**216**	**$10,500**		**100%**	**2343**	**$273,500**		**60.8%**
Task G - Preliminary Design (60% Completion)																										
Preliminary Design Details	16	16	$1,670	73%		16	16	$1,614	73%		24	0	0	24	$2,550	75%		0	0	0	$0	N.A.		**384**	**$42,809**	**46%**	
Preliminary Construction Cost Estimate	0	0	$0	0%		0	0	$0	0%		8	0	0	8	$850	25%		0	0	0	$0	N.A.		**84**	**$9,435**	**10%**	
Document Preparation	6	6	$630	27%		6	6	$586	27%		0	0	0	0	$0	0%		0	0	0	$0	N.A.		**404**	**$40,757**	**44%**	
Task G Total	22	22	$2,300	100%	**16%**	22	22	$2,200	100%	**17%**	32	0	0	32	$3,400	100%	**10%**	0	0	0	$0	N.A.	**0%**	**872**	**$93,000**	**100%**	**20.7%**
Task H - Final Design Documents																										
Final Design Calculations	0	0	$0	N.A.		0	0	$0	N.A.		4	0	0	4	$428	8%		0	0	0	$0	N.A.		**170**	**$19,520**	**23%**	
90% Plans and Specifications	0	0	$0	N.A.		0	0	$0	N.A.		20	0	0	20	$2,122	42%		0	0	0	$0	N.A.		**306**	**$33,906**	**41%**	
100% Plans and Specificiations	0	0	$0	N.A.		0	0	$0	N.A.		20	0	0	20	$2,121	42%		0	0	0	$0	N.A.		**182**	**$20,327**	**24%**	
Final Construction Cost Estimate	0	0	$0	N.A.		0	0	$0	N.A.		4	0	0	4	$428	8%		0	0	0	$0	N.A.		**84**	**$9,748**	**12%**	
Task H Total	0	0	$0	N.A.	**0%**	0	0	$0	N.A.	**0%**	48	0	0	48	$5,100	100%	**14%**	0	0	0	$0	N.A.	**0%**	**742**	**$83,500**	**100%**	**18.5%**
Part 2 Budget Sub-Total (Tasks G and H)	**22**	**22**	**$2,300**		**16%**	**22**	**22**	**$2,200**		**17%**	**80**	**0**	**0**	**80**	**$8,500**		**24%**	**0**	**0**	**0**	**$0**		**0%**	**1614**	**$176,500**		**39.2%**
Total Project Budget	**132**	**132**	**$14,000**		**100%**	**132**	**132**	**$13,000**		**100%**	**240**	**18**	**40**	**298**	**$35,000**		**100%**	**56**	**160**	**216**	**$10,500**		**100%**	**3,957**	**$450,000**		**100.0%**
Total Budget			**$14,000**					**$13,000**							**$35,000**						**$10,500**				**$450,000**		
Percent of Total Project Budget			**3.1%**					**2.9%**							**7.8%**						**2.3%**				**100.0%**		

Table 2

Project Deliverables and Quality Control Reviewers
Sheboygan River AOC HR Projects

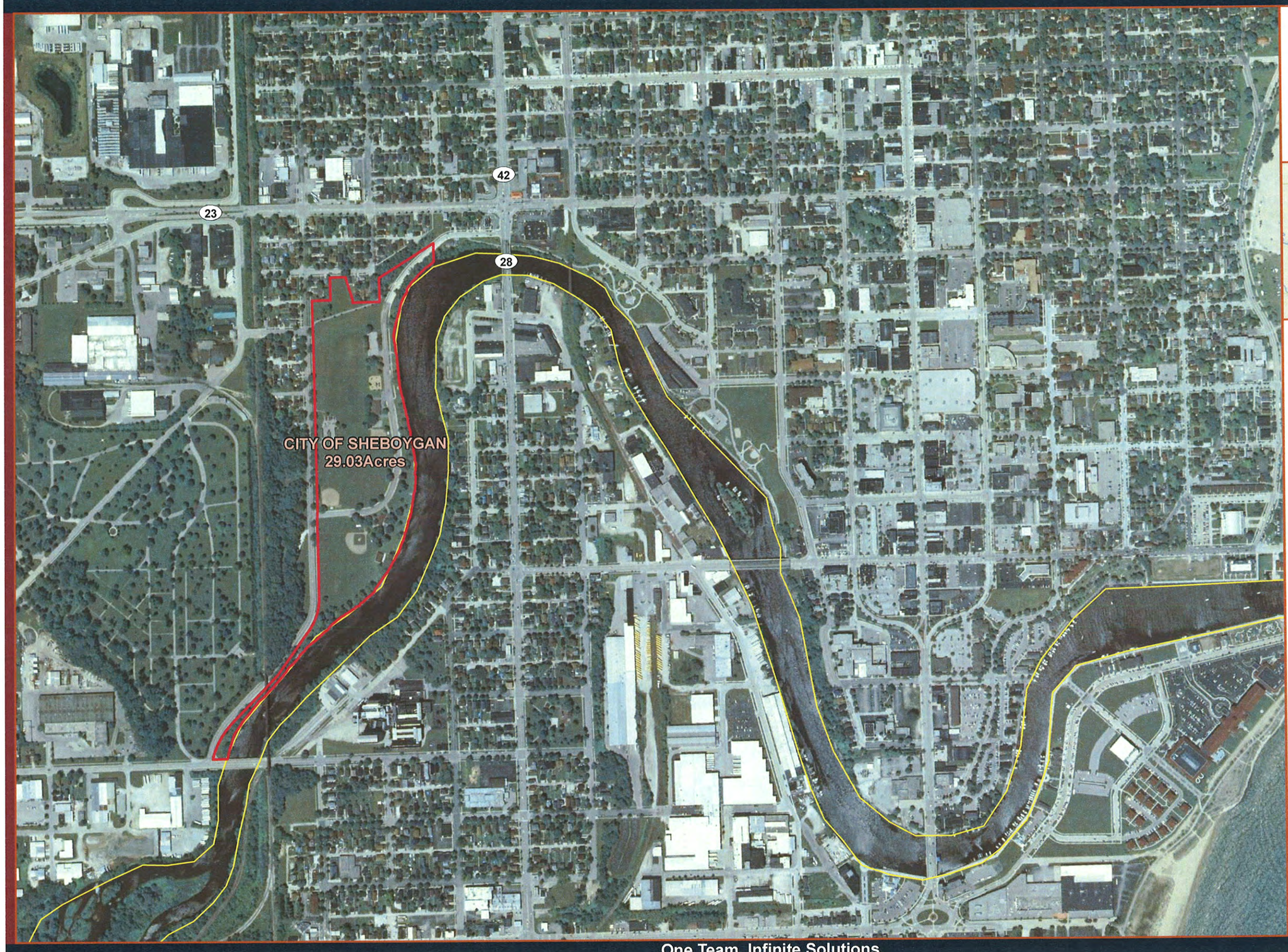
Project Task / Deliverable	Quality Control Reviewer	
	Name	Company
1. Task B - Background / Field Investigations		
a) Wetland Delineation Report	Joel Asp	SEH
b) Task B Technical Memorandum		
(i) Fluvial Geomorphic Assessment	Greg Koonce	Inter-Fluve
(ii) Fish and Wildlife Assessments	Deric Deuschle	SEH
(iii) Vegetation / Invasive Species Assessments	Joel Asp	SEH
2. Task D - Hydrologic / Hydraulic (H/H) Evaluations		
a) Riverine H/H Model Evaluations		
(i) Hydrologic (USGS gage) Evaluation	Matt Bednarski	SEH
(ii) Hydraulic (HEC-RAS) Evaluation	Matt Bednarski	SEH
b) Stormwater Model Evaluations		
(i) Hydrologic Evaluations	Matt Bednarski	SEH
(ii) Hydraulic Evaluations	Matt Bednarski	SEH
c) Task D Technical Memorandum	Matt Bednarski	SEH
3. Task E - Permitting and Agency Coordination		
a) Enviornmental Assessment	Joel Asp	SEH
b) Cultural Resource Investigations	Jennifer Haas	GLARC
c) Environmental Permit Applications	Joel Asp	SEH
4. Task F - Habitat Restoration Design Concepts		
a) Kiwanis Park Site		
(i) Civil Design	Matt Bednarski	SEH
(ii) Landscape Architecture Design	Bob Kost	SEH
(iii) Native Vegetation - Habitat Design	Joel Asp	SEH
(iii) Geomorphic - Habitat Design	Greg Koonce	Inter-Fluve
b) Wildwood Island Site		
(i) Native Vegetation - Habitat Design	Joel Asp	SEH
(ii) Geomorphic - Habitat Design	Greg Koonce	Inter-Fluve
c) Taylor Drive & Indiana Avenue Site		
(i) Civil Design	Matt Bednarski	SEH
(ii) Landscape Architecture Design	Bob Kost	SEH
(iii) Native Vegetation - Habitat Design	Joel Asp	SEH
(iii) Geomorphic - Habitat Design	Greg Koonce	Inter-Fluve
d) Task F Technical Memorandum	Joel Asp	SEH

Table 2

Project Deliverables and Quality Control Reviewers
Sheboygan River AOC HR Projects

Project Task / Deliverable	Quality Control Reviewer	
	Name	Company
5. Task G - Preliminary Design (60% Completion)		
a) Kiwanis Park Site		
(i) Civil Design	Matt Bednarski	SEH
(ii) Landscape Architecture Design	Bob Kost	SEH
(iii) Native Vegetation - Habitat Design	Joel Asp	SEH
(iii) Geomorphic - Habitat Design	Greg Koonce	Inter-Fluve
b) Wildwood Island Site		
(i) Native Vegetation - Habitat Design	Joel Asp	SEH
(ii) Geomorphic - Habitat Design	Greg Koonce	Inter-Fluve
c) Taylor Drive & Indiana Avenue Site		
(i) Civil Design	Matt Bednarski	SEH
(ii) Landscape Architecture Design	Bob Kost	SEH
(iii) Native Vegetation - Habitat Design	Joel Asp	SEH
(iii) Geomorphic - Habitat Design	Greg Koonce	Inter-Fluve
6. Task H - Final Design Documents		
a) Kiwanis Park Site		
(i) Civil Design	Matt Bednarski	SEH
(ii) Landscape Architecture Design	Bob Kost	SEH
(iii) Native Vegetation - Habitat Design	Joel Asp	SEH
(iii) Geomorphic - Habitat Design	Greg Koonce	Inter-Fluve
b) Wildwood Island Site		
(i) Native Vegetation - Habitat Design	Joel Asp	SEH
(ii) Geomorphic - Habitat Design	Greg Koonce	Inter-Fluve
c) Taylor Drive & Indiana Avenue Site		
(i) Civil Design	Matt Bednarski	SEH
(ii) Landscape Architecture Design	Bob Kost	SEH
(iii) Native Vegetation - Habitat Design	Joel Asp	SEH
(iii) Geomorphic - Habitat Design	Greg Koonce	Inter-Fluve

Figure 5. Kiwanis Park Project
Sheboygan River AOC



Location

Sheboygan Co., WI

0 300 600 Feet

N

Project Information

Project Number : 193701112
Modified March 10, 2011

Legend

- AOC WI Sheboygan
- Kiwanis Park Parcel

Stantec Consulting
209 Commerce Parkway
Madison, WI 53527
tel 608.839.1998
www.stantec.com

One Team. Infinite Solutions.

Kiwanis Park Project.mxd Map Author: C. Pekar

Figure 9. Taylor Drive and Indiana Avenue Sitemap Sheboygan River AOC

Location

Sheboygan Co., WI

0 150 300 Feet

N

Project Information

Project Number : 193701112
Modified March 9, 2011

Legend

- AOC WI Sheboygan
- Taylor Drive Project Area Parcels

Stantec Consulting
209 Commerce Parkway
Madison, WI 53527
tel 608.839.1998
www.stantec.com

One Team. Infinite Solutions.

Taylor Drive Project.mxd Map Author: C. Pekar

Figure 13. Wildwood Island Project Area Sheboygan River AOC

Location

Sheboygan Co., WI

0 100 200 Feet

N

Project Information

Project Number : 193701112
Modified March 10, 2011

Legend

- AOC WI Sheboygan
- Wildwood Island Project Area
- Wildwood Project Area Parcels (All owned by City of Sheboygan)

3.37 Acres

2.12 Acres

3.75 Acres

0.44 Acres

PP

Stantec Consulting
209 Commerce Parkway
Madison, WI 53527
tel 608.839.1998
www.stantec.com

One Team. Infinite Solutions.

Wildwood Island Project.mxd Map Author: C. Pekar