UPPER BERLOWITZ REGULATED DRAIN
TIPPECANOE COUNTY, INDIANA

2014 MASTER PLAN REPORT

Prepared for:

City of Lafayette
20 North Sixth Street
Lafayette, Indiana 47901

and

Tippecanoe County Drainage Board
20 North Third Street
Lafayette, Indiana 47901

November 2014

Prepared by:

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CBBEL Project Nos. 19.R12-0065.00000 and 19.R12-0065.00001

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1.0 Introduction

The Julius Berlowitz Regulated Drain watershed is located on the east side of Lafayette, Tippecanoe County, Indiana. The approximately 4 square mile watershed drains from southwest to northeast and is tributary to the South Fork of Wildcat Creek (see Exhibit 1.1). This Master Plan report specifically addresses the “Upper” Berlowitz Regulated Drain watershed, an approximately 600-acre area located in the southwest portion of the overall watershed (see Exhibit 1.2).

1.1 History of the Watershed

In 1992, the Julius Berlowitz Regulated Drain watershed was beginning to experience heavy development pressure. However, there was no positive stormwater drainage outlet for this watershed. The Tippecanoe County Surveyor’s Office and the Tippecanoe County Drainage Board hired Christopher B. Burke Engineering, LLC (CBBEL) to complete an overall stormwater drainage masterplan for this watershed. The resultant plan included a positive stormwater drainage outlet for the watershed and four regional stormwater detention ponds to be used by future development in the watershed. At this time, three of the originally planned regional stormwater detention ponds have been constructed. However, the exact location and shape of the fourth pond, to be generally located in the upstream (southwest) portion of the watershed, was not determined as part of the overall stormwater drainage masterplan.

1.2 “Upper” Berlowitz Regulated Drain Master Plan

This Master Plan report details the anticipated location and shape of the stormwater detention necessary within the “Upper” Berlowitz Regulated Drain area and replaces the originally planned fourth pond with a series of four regional stormwater detention ponds. Other sections of this report detail the hydrologic and hydraulic analysis and wetland assessment completed, and summarize the various master plan elements. A set of preliminary design plans that include preliminary grading, typical sections, and structure details for various master plan elements are provided under separate cover as Appendix 3.

2.0 Hydrologic & Hydraulic Analysis

The hydrologic and hydraulic analysis included an assessment of the entire contributing watershed area for the Berlowitz Regulated Drain. A hydrologic and hydraulic model was developed using XP Solutions Storm Water Management Model (xpswmm) and was used to determine the response of the watershed during the Existing Condition (circa 1992) and the Proposed Condition. The following paragraphs provide an overview of the hydrologic and hydraulic analysis.

2.1 Hydrologic Methodology

The following paragraphs describe each component of the hydrologic analysis.

2.11 Watershed Delineation

The drainage area contributing to the Berlowitz Regulated Drain was delineated and subdivided into 10 different subbasins for the Existing Condition analysis using countywide contour mapping (circa 1992). The 2011 IndianaMap LiDAR Digital Elevation Model (DEM) was used to redelineate the watershed for the fully-developed (Proposed Condition), which included a total of 32 subbasins. The local topography and drainage basin delineations for the Existing and Proposed Condition analyses are shown in Exhibit 2.1 and Exhibit 2.2, respectively. The drainage areas for the basins used in both analyses are shown in Table 1.

2.12 Infiltration

The SCS Curve Number method was used to calculate the amount of rainfall that can be expected to be intercepted by the tree canopy, infiltrated into the soil, or stored in surface depressions.

Curve numbers were calculated using GIS tools that intersect soil information from the Soil Survey Geographic (SSURGO) dataset and land use parameters. Landcover characteristics were determined from visual observation of aerial photography from 1998 for the Existing Condition analysis; land use parameters for the Proposed Condition were defined for currently undeveloped areas based on the Perry and Fairfield Zoning Maps and the development standards in the Tippecanoe County Unified Zoning Ordinance. The various combinations of hydrologic soil group and land use type were converted to curve numbers using values published in the National Resource Conservation Service's (NRCS, formerly SCS) TR-55 publication. Exhibits showing the soil types and land cover characteristics, as well as curve number computation sheets for each subbasin are provided in Appendix 1.

2.13 Runoff Transform

The SCS Dimensionless Unit Hydrograph was used to transform the excess rainfall into runoff.

The time of concentration (T_c) for each subbasin was calculated using TR-55 methodologies. For the Existing Condition analysis, the locations of transitions from shallow concentrated flow to open channel flow were established where the flow entered a channel clearly discernable in the 1998 aerial photography, or where a clearly defined channel could be observed using the 1992 county contour mapping. The Proposed Condition analysis made use of the 2011 IndianaMap Orthophotography and the 2011 IndianaMap DEM, as well as the preliminary grading plan for the Upper Berlowitz drainage area.

The 2-year, 24-hour rainfall depth for the computations was taken from the NOAA Atlas 14 publication. Computation sheets for each subbasin and an exhibit depicting the flow paths are provided in Appendix 1.

Table 1: Hydrologic Parameters by Subbasin

Basin Name	Area (ac)	1992 CN (-)	1992 T_C (min)
TR1	302.9	76	169
TR1A	169.0	76	138
TR2	236.4	74	90
TR3	118.8	75	55
TR4	70.7	78	29
TR5	458.1	76	241
TR5A	155.0	77	161
TR6	175.2	78	67
TR7	79.0	75	30
TR8	266.8	67	74

Basin Name	Area (ac)	Future CN (-)	Future T_C (min)
TR1A-1	59.3	89	27
TR1A-2	89.1	89	69
TR1B	40.0	90	50
TR1C	33.3	90	54
TR1D-1	64.5	90	32
TR1D-2	21.3	90	51
TR1D-3	12.3	90	48
TR1E	70.2	90	88
TR1F-1	42.1	90	70
TR1F-2	31.9	90	28
TR1F-3	27.7	90	55
TR1G-1	55.1	90	29
TR1G-2	25.9	90	38
TR2-1	62.9	90	40
TR2-2	28.3	90	26
TR2-3	32.8	90	54
TR3	138.5	86	72
TR4	80.7	84	40
TR5	254.2	76	89
TR5A	151.3	80	77
TR6-1	88.1	86	64
TR6-2	8.4	86	19
TR6-3	3.0	86	8
TR7	86.2	81	56
TR7A	18.5	85	14
TR8	182.6	79	57
TR9	51.3	78	28
TR9A	98.4	79	64
TR9B	14.8	78	34
TR10	51.7	77	106
TR10A	12.9	80	23
TR11	202.2	70	72

2.14 Rainfall Parameters

The analysis considered the 100-year, 12-hour and 100-year, 6-hour rainfall events. The rainfall was applied evenly over the contributing drainage area, using the Huff 12-hour and 6-hour, 50-percent exceedance rainfall hyetographs to distribute the rain temporally.

2.2 Hydraulic Model Components

Hydrologic routing of flow through channel segments was performed automatically, as the flow was routed through an unsteady-state hydraulic model. Runoff hydrographs were applied to the hydraulic model at the end-point of the time of concentration flowpaths. Several different types of flow conveyance and storage components were used to produce a representative hydraulic system, including culverts, storm sewers, open channels, and detention ponds. Schematics depicting the Existing Condition and Proposed Condition hydraulic model components are provided in Exhibit 2.3 and Exhibit 2.4.

2.21 Culverts & Storm Sewers

The culverts and storm sewers included in the Existing Condition analysis were modeled according to data used in the original model developed in 1992.

The Proposed Condition culverts and storm sewers were defined using the Geographic Information System (GIS) information provided by the Tippecanoe County Surveyor’s Office. The culverts and outlet structures included in the Upper Berlowitz drainage area were modeled according to the proposed structures.

2.22 Open Channels

The open channels included in the Existing Condition analysis were also modeled using the data from the original model.

Open channel geometry information used in the Proposed Condition model was determined based off of the 2011 IndianaMap DEM and visual observation of the 2011 IndianaMap Orthophotography.

2.23 Detention Ponds

The Existing Condition analysis did not include any detention ponds, as no ponds existed in the watershed area at that time.

Several regional detention facilities were included in the Proposed Condition analysis. Ponds that were constructed prior to 2011 were modeled using the apparent storage capacities derived from the 2011 IndianaMap DEM. Pond 3 was partially constructed at this time; as a result, the original design plans for this detention facility were used to describe the pond’s storage capacity. All future ponds in the Upper Berlowitz drainage area were modeled using proposed grading information.

2.3 Existing Condition Analysis Summary

The Existing Condition analysis was used as a baseline for consideration of current and future stormwater infrastructure needs to prevent the potential detrimental effects of development in the Julius Berlowitz Regulated Drain watershed. The primary baseline result used to determine infrastructure needs was the peak outflow from the Julius Berlowitz Regulated Drain at State Road 26. Table 2 contains the peak flow rate at several locations along the regulated drain. Additional hydrologic and hydraulic results are provided in Appendix 1.

Table 2: Peak Flow Rates at Key Locations

Drainage Area	Huff 100yr, 6hr Peak Flow Rate (cfs)	Huff 100yr, 12hr Peak Flow Rate (cfs)
State Road 26	454	450
County Road 50 S	138	138
County Road 550 E	87	87
US Interstate 65	30	32
Veterans Memorial Pkwy / McCarty Ln	15	15

2.4 Proposed Condition Analysis Summary

The Proposed Condition analysis was used to determine the infrastructure needs for the Julius Berlowitz Regulated Drain when the watershed becomes fully-developed. The hydraulic components were proposed in accordance with the Tippecanoe County Stormwater Technical Standards and were subsequently adjusted and optimized until the following project requirements were met:

- The flow rate at State Road 26 must not increase
- No roadways may flood during the 100-year storm event
- Detention ponds must provide the required storage within defined banks

The following tables provide a summary of the model results that demonstrate the effectiveness of the proposed infrastructure to meet the stated requirements:

Table 3: Peak Flow Rates at Key Locations

Drainage Area	Huff 100yr, 6hr Peak Flow Rate (cfs)	Huff 100yr, 12hr Peak Flow Rate (cfs)
State Road 26	504	460
County Road 50 S	405	429
County Road 550 E	229	227
US Interstate 65	180	180
Veterans Memorial Pkwy / McCarty Ln	141	132

Table 4: Detention Pond Maximum Water Surface Elevation Summary

Pond Name	100yr, 6hr Maximum WSE (ft, NAVD88)	100yr, 12hr Maximum WSE (ft, NAVD88)	Minimum Bank Elevation (ft, NAVD88)	Minimum Road Elevation (ft, NAVD88)
Pond 1 (US of CR 50 S)	640.5	639.9	642.0	643.0
Pond 2 (US of CR 550 E)	642.1	641.7	644.0	645.1
Pond 3 (US of I-65)	645.7	645.4	645.7	652.4
Pond 4 (US of McCarty (East))	646.8	647.1	648.0	647.6
Pond 5 (US of Pond 4)	647.5	647.5	649.0	647.6
Pond 6 (US of Pond 5)	648.1	647.8	650.0	647.9
Pond 7 (US of McCarty (West))	652.2	652.4	653.0	652.8

As stated in Section 2.12, the future land use characteristics were derived from the current zoning maps for the study area. It was noted that the development within subbasin TR5 is anticipated to be of a higher intensity than indicated by the zoning plan. The analysis and preliminary design described by this report do not account for the increased development intensity, as the extent and details of the development are not yet known. Additional stormwater detention and mitigation measures will likely be necessary in this area to offset the negative impacts of the increased quantity of impervious area.

2.5 Post Construction Stormwater Quality

The stormwater infrastructure planned for the Upper Berlowitz drainage area was designed in such a way that the components would qualify for Post Construction Stormwater Quality BMPs. The drainage swales between development sites have been designed to function as vegetated swales and the detention ponds have been designed to function as wet ponds / retention ponds, as described in Appendix D of the Tippecanoe County Stormwater Technical Standards.

The vegetated swales for the sites have been sized to have flow velocities below 2 feet-per-second during the 100-year event to promote sediment removal and pollutant uptake by the vegetation. These swales will serve as sediment removal measures for the stormwater runoff prior to the flow entering the detention ponds.

The detention ponds designed for the Upper Berlowitz drainage area provide for detention of the runoff from a 1-inch rainfall (Water Quality Volume), 2-year rainfall (Channel Protection Volume), and peak flow control of the runoff from the 100-year storm event (Wet Pond / Retention Basin BMP), allowing the structures to serve as the second Post Construction Stormwater Quality BMP for each of the development sites supported by the ponds. Each of the four ponds in the Upper Berlowitz drainage area retains approximately 60-percent of the peak detention storage for 12 hours after the time of the peak storage; 36 hours after the time of the peak detention storage, 90-percent of the storage volume is available for subsequent stormwater runoff storage.

Documentation of the effectiveness of the designed Post Construction Stormwater BMPs is provided in Appendix 1.

3.0 Wetland Assessment

Christopher B. Burke Engineering, LLC (CBBEL) staff conducted an onsite field investigation of the Berlowitz Masterplan project area, Tippecanoe County, Indiana. Field work was conducted on May 22nd and 23rd, 2013 during which time (9) wetlands and one unnamed tributary were identified and delineated (Exhibit 3.1).

Wetland delineations were conducted using methods identified in the Regional Supplement to the Corps of Engineers Delineation Manual: Midwest Region (Version 2.0) (August 2010), and wetland boundaries were mapped using current aerial photography (c. 2005) and a sub-meter accurate GPS unit.

The majority of the project area is being actively farmed. No wetlands were identified in these areas. Two (2) depressional wetland areas (Wetlands 1 and 2) were delineated within an open field in the southwest portion of the property. The remainder of the delineated wetlands (Wetlands 3 – 9) were grouped near a private residence and woodlot abutting Veteran's Memorial Parkway, in the north eastern portion of the site. The complete wetland/"waters" delineation report can be found in Appendix 2.

Impacts to the delineated wetlands and "waters" should be avoided and/or minimized to the greatest extent possible. If there are no impacts to these aquatic resources, permitting through the U.S. Army Corps of Engineers (USACE) and the Indiana Department of Environmental Management (IDEM) will not be required.

4.0 Master Plan

4.1 Master Plan Goals

The following goals guided the development of this master plan:

- Plan a regional detention facility that is consistent with the 1992 master plan for the entire Julius Berlowitz Watershed drainage area
- Incorporate post-construction stormwater quality measures at the regional scale so that future development does not have to address it on each individual lot
- Plan for stormwater collection system, roads, sanitary sewer, and water
- Utilize low impact development principles and green infrastructure practices to manage stormwater

Exhibit 4.1 illustrates the Upper Berlowitz Regulated Drain Master Plan. The following sections summarize various Master Plan elements.

4.2 Stormwater Management

A goal of this master plan is to manage stormwater using low impact development (LID) principles and green infrastructure practices. LID is defined as an approach to land development that works with nature to manage stormwater as close to its source as possible. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treats stormwater as a resource rather than a waste product. There are many green infrastructure practices that have been used to adhere to these principles such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. By implementing LID principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. Applied on a regional scale, LID can maintain or restore a watershed's hydrologic and ecological functions.

LID principles were integrated into the site design by conserving the existing natural and topographical features of the site. Woodlands and wetlands were identified and preserved as well.

Stormwater runoff from the roads is directed to the vegetated median and to vegetated swales on either side of the road then on to the ponds. Strategic curb breaks in the median and edge of the road will direct runoff to the vegetated stormwater conveyance (see typical road sections in Appendix 3). Overflow structures in the median and underdrains to the vegetated swales will prevent the median from overtopping and road from flooding. Stormwater pollutants carried by the road runoff will be filtered and trapped by the vegetation in the median and swales.

Each development site will be graded to drain into one or more of the vegetated stormwater conveyances that eventually discharge into the ponds. The regional ponds and network of vegetated conveyance system have been designed to meet the water quality and water quantity requirements of the shown development and no additional on-site stormwater measures are needed. However, if the density of development is greater than what is anticipated, this may require individual on-site detention to manage the additional stormwater runoff and pollutant loading. Section 4.3 includes a discussion on the anticipated land use.

Additional water quality treatment is provided by the proposed regional stormwater detention ponds. Any sediments carried by stormwater that are not trapped in the vegetated stormwater conveyances should be treated by the proposed ponds. Preliminary grading and typical details for the vegetated stormwater conveyances are included in the preliminary design plan set.

4.3 Land Use

The anticipated land use for this master plan area is a combination of the existing zoning and modifications made by the project team based on existing adjoining development and anticipated needs. Exhibit 4.1 illustrates the desired land uses. Overall there are 450 acres of previously undevelopable land that are now slated for 360 acres of industrial, 60 acres of medical related, 16 acres of neighborhood business, and 10 acres of general business. Of the remaining 150 acres of the site, there are 48 acres for the ponds, 6 acres for an open space or park, and 100 acres for road right-of-way and setbacks.

To buffer the existing residential land uses adjacent and within the site, a dense vegetative buffer will be planted along the western edge of the property and around the residential development that cuts into the east side of the property.

4.4 Transportation Plan

The transportation plan is based on the complete street policy adopted in the Area Plan Commission’s 2040 Metropolitan Transportation Plan. The intent is to promote multimodal transportation system to accommodate all types of users safely and comfortably. To achieve this, all streets have been designed to accommodate vehicular, bicycle, and pedestrian traffic. CBBEL expanded the complete street concept to include the efficient movement of stormwater as well. As discussed in Section 4.2, vegetated stormwater conveyances line either side of the roads to filter and trap pollutants carried by stormwater runoff and to move the volume of stormwater to the ponds to be stored. To maximize the movement of people and stormwater, the intersections have been replaced with roundabouts, streets have one way traffic in either direction divided by a center median, and left turns are prohibited.

There are two types of streets. The major north-south street, Park East Boulevard and all other streets. The preliminary design plan set includes a typical detail of a roundabout to illustrate the movement of people and stormwater. Park East Boulevard has a bike lane in each direction and sidewalks separated from road by vegetated stormwater conveyance. It is anticipated that the city will provide bus service on this road and bumpouts for buses are shown. All other streets have multi-use trails on either side of the street, separated from the road by vegetated stormwater conveyance.

To facilitate the safe passage of stormwater runoff during extreme rainfall events, emergency road overtopping has been included at key locations. The preliminary design plan set details the location, extent, and elevations of these critical areas. Safe building pad elevations throughout the proposed development area should be based on these road overtopping elevations.

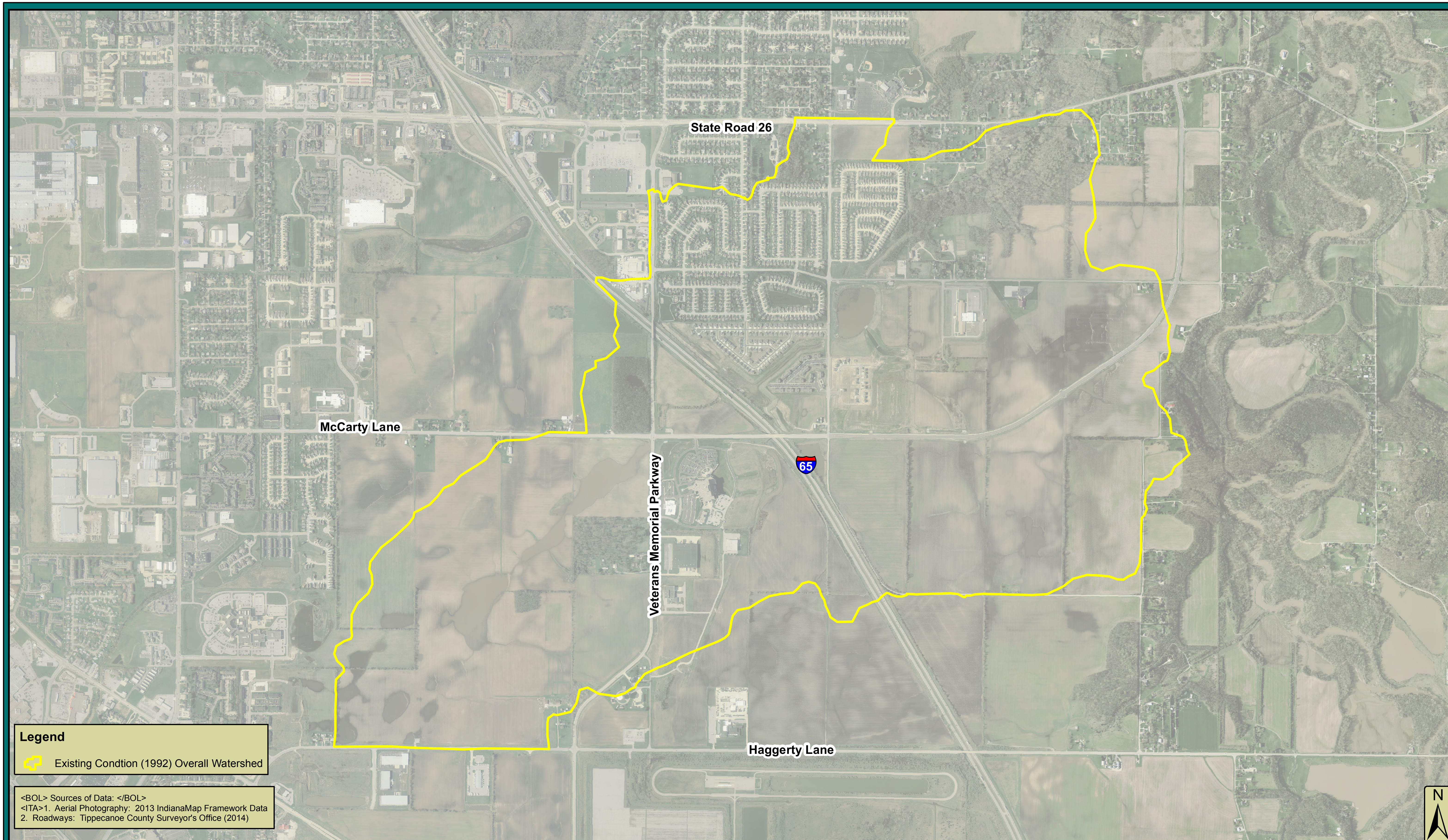
Multi-use trails are integrated into the street network as well to traverse the site to provide non-motorized connectivity between two hospitals and a recreational amenity around ponds. The trail network is consistent with the City of Lafayette Trail Master Plan.

4.5 Utility Plan

The layout of utilities of both sanitary and water were taken into account in the Upper Berlowitz Master Plan. Both the sanitary sewers and the water lines are to be located within the right-of-way of each of the street sections. These are typically located outside the main roadway near the location of the multi-use trails or the sidewalks. The sanitary sewer layout is detailed in the preliminary design plan set, and shows that most sanitary sewer flow is connected to the north and ties into existing sanitary sewer stubs that were constructed across McCarty Lane as part of the McCarty Lane Gravity Sewer and Lift Station project in 2002. Elevations and layout of new sanitary sewer took into account a variety of conditions. One of these conditions included the objective of reducing the amount of disturbance to existing roads in order to construct the sanitary sewer. In addition, the elevation of the constructed laterals for the McCarty Lane Gravity Sewer was also considered. Due to the constraints of the site grade, the majority of the sanitary sewer flow heads to the north and connects to the McCarty Lane connection; however, the remaining sanitary sewer (southeast area) discharges to the southeast corner of the site to the SIA Interceptor Sewer. The sizes of the sanitary sewer were estimated based on potential loading for each of the different types of development proposed; however, a detailed design/model for sanitary sewer loading was not completed as part of this plan.

In regards to water connections, the site is surrounded by developed areas including the hospital to the east of Veterans Memorial Parkway, several warehouses to the south, and homes and Medical buildings to the west. The site is surrounded by potable water connections and a layout of the routing of the water utility that complies with existing City Standards and attempts to reduce the amount of disturbance to existing roads is provided in Appendix 3.

Exhibits



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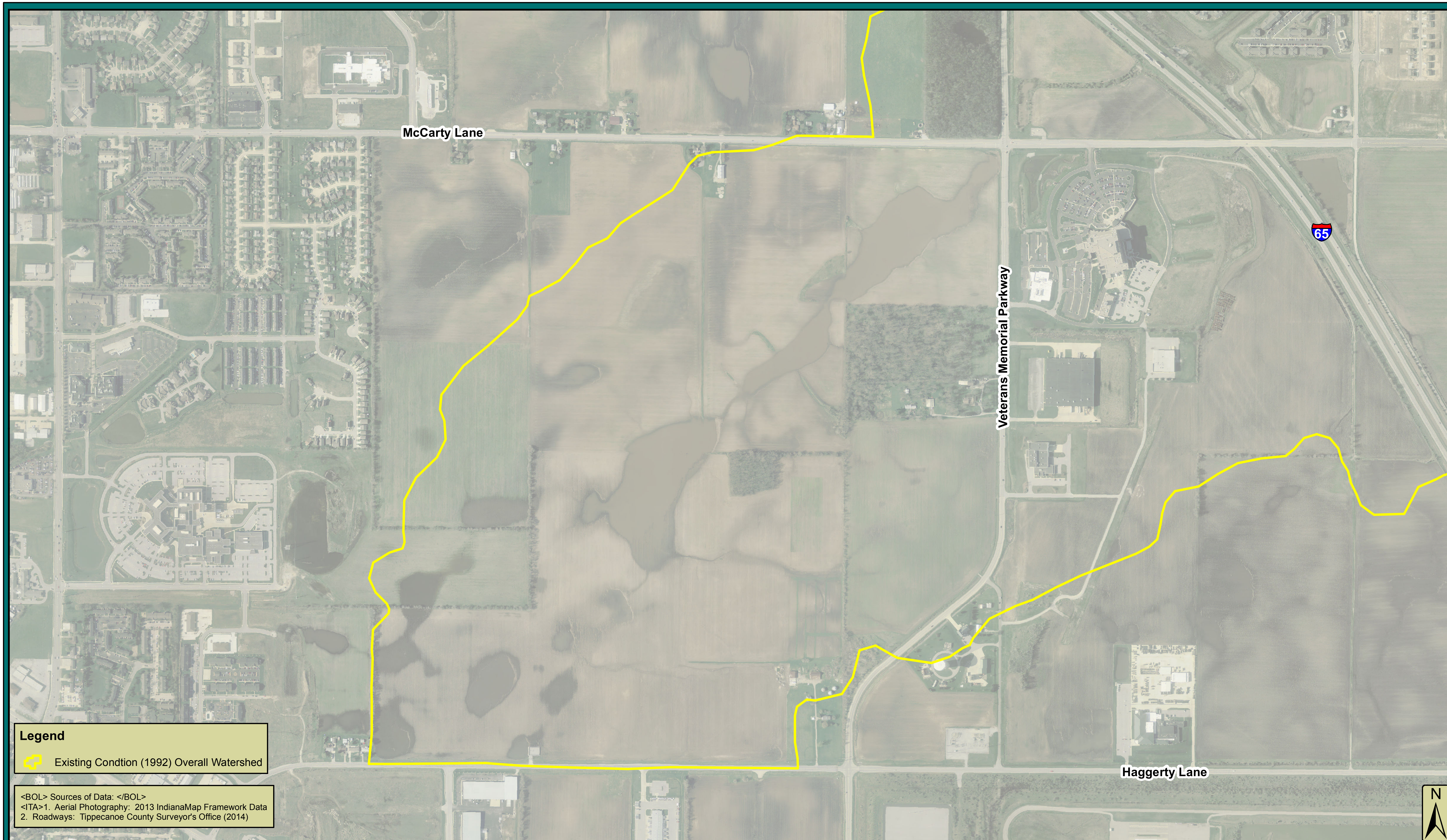
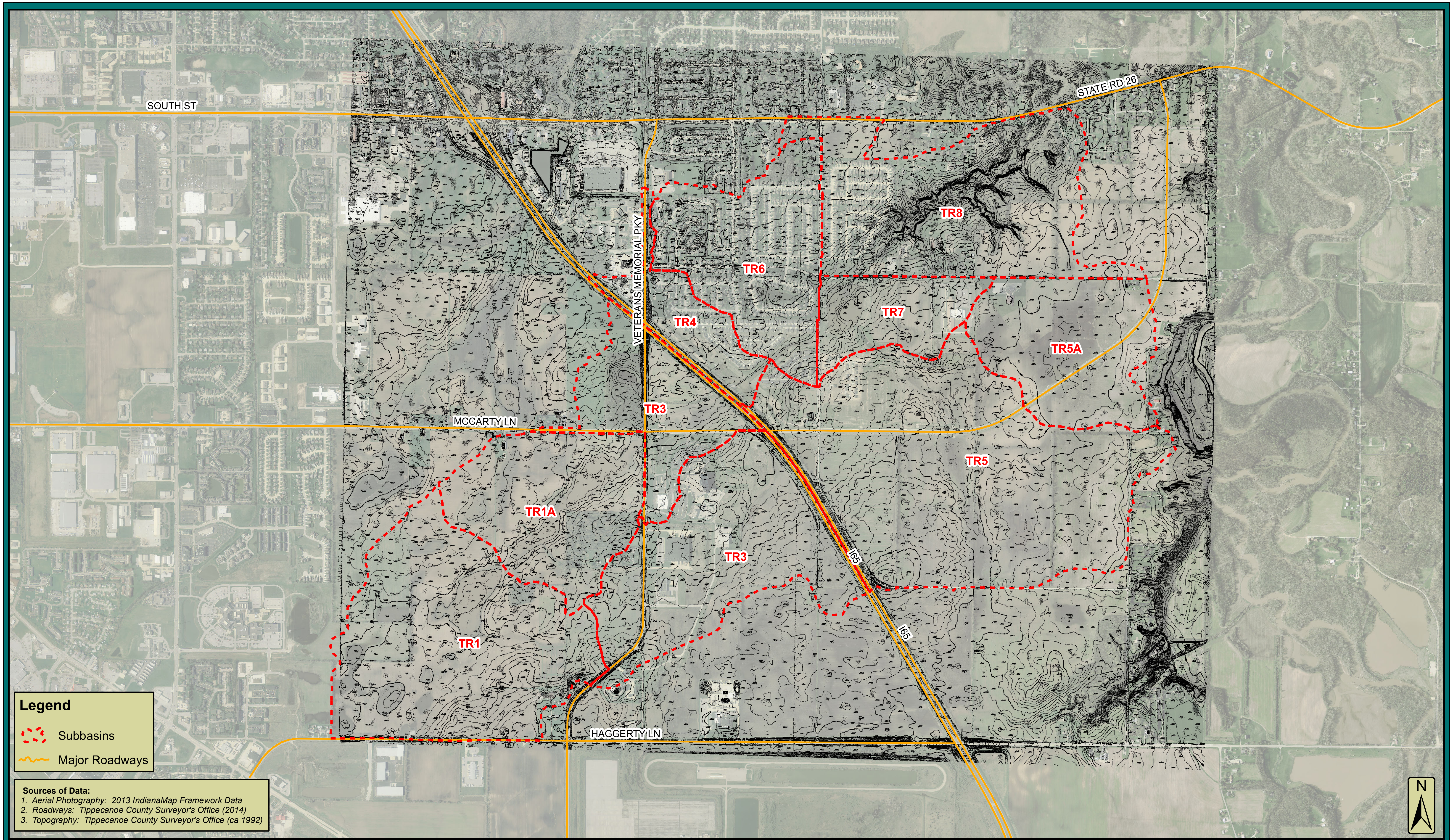
PROJECT: Upper Berlowitz Master Plan	PROJECT NO. 12-0065	APPROX. SCALE 1 " = 1,500 ft
TITLE: Overall Watershed Location		DATE: 11/2014
		EXHIBIT 1.1



Christopher B. Burke Engineering, LLC PNC Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 (t) 317.266.8000 (f) 317.632.3306	PROJECT: **Upper Berlowitz Master Plan**	PROJECT NO. **12-0065**	APPROX. SCALE **1 " = 750 ft** DATE: **11/2014**
	TITLE: **Project Watershed Location**		EXHIBIT **1.2**



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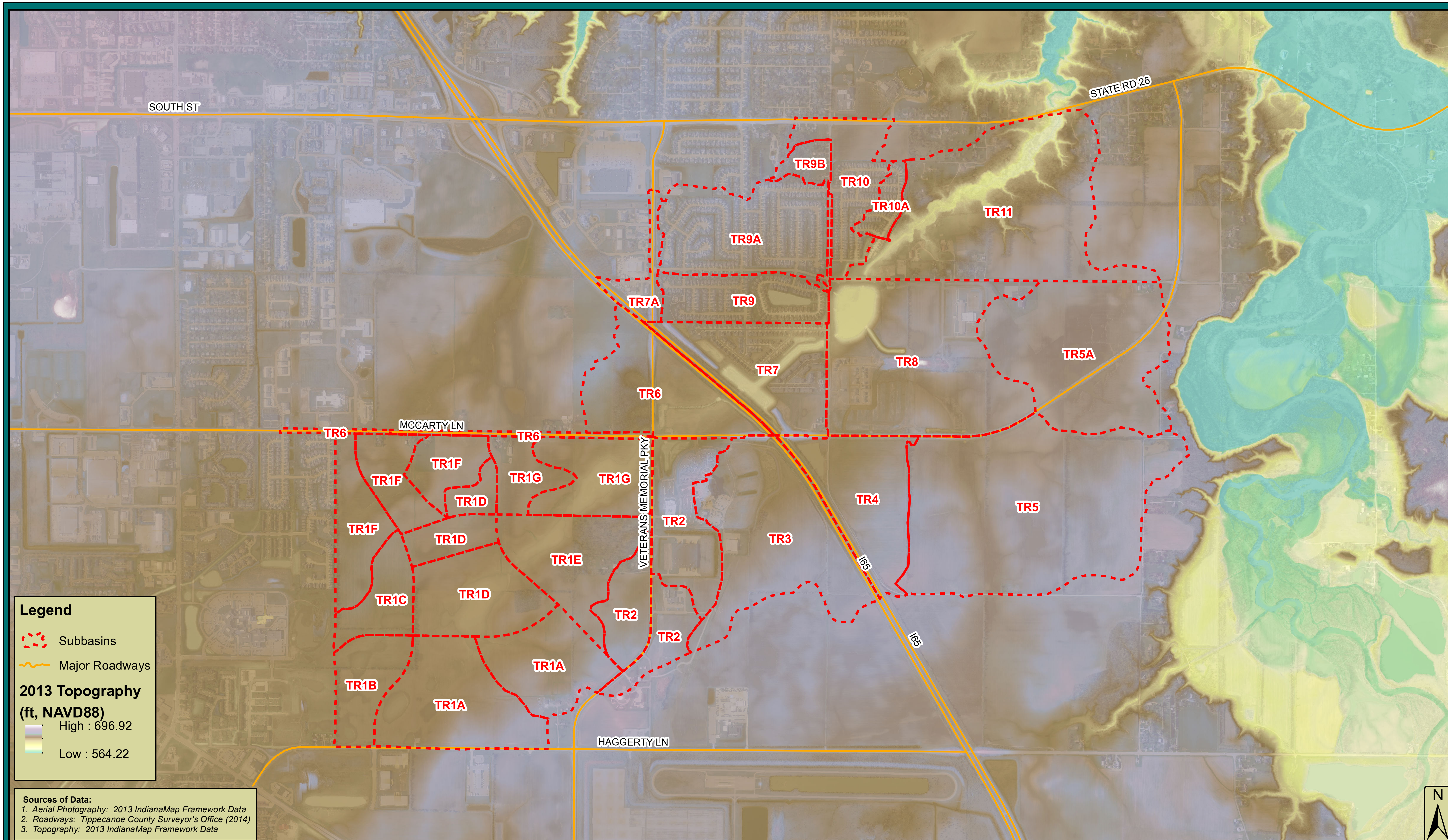
PROJECT:	PROJECT NO.	APPROX. SCALE
Upper Berlowitz Master Plan	12-0065	1 " = 1,500 ft
TITLE: Existing Condition (1992) Topography & Drainage Area		DATE: 11/2014
		EXHIBIT 2.1



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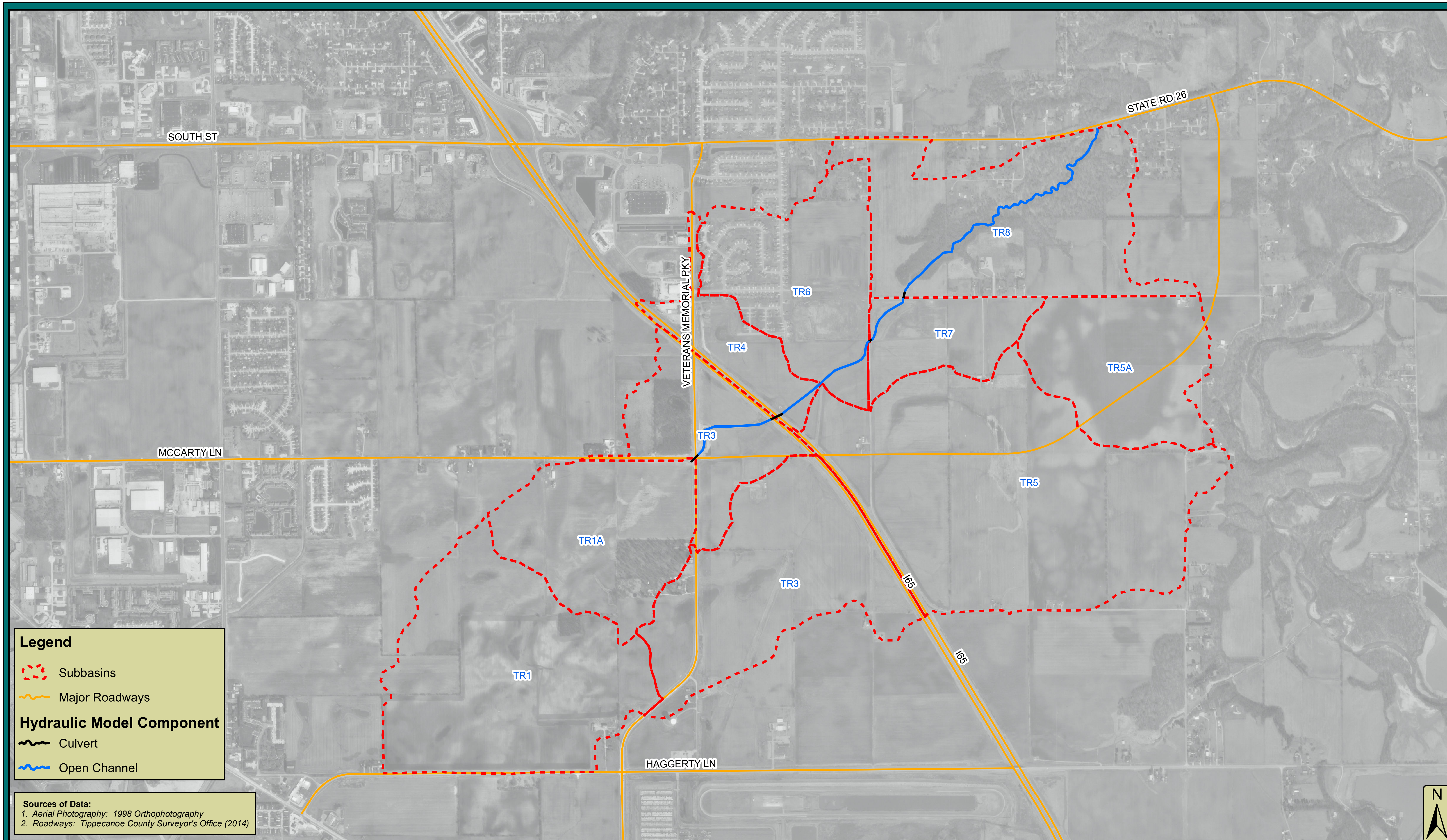
PROJECT:	Upper Berlowitz Master Plan	PROJECT NO. 12-0065	APPROX. SCALE 1 " = 1,500 ft
TITLE:	Proposed Condition Topography & Drainage Area		DATE: 11/2014
			EXHIBIT 2.2



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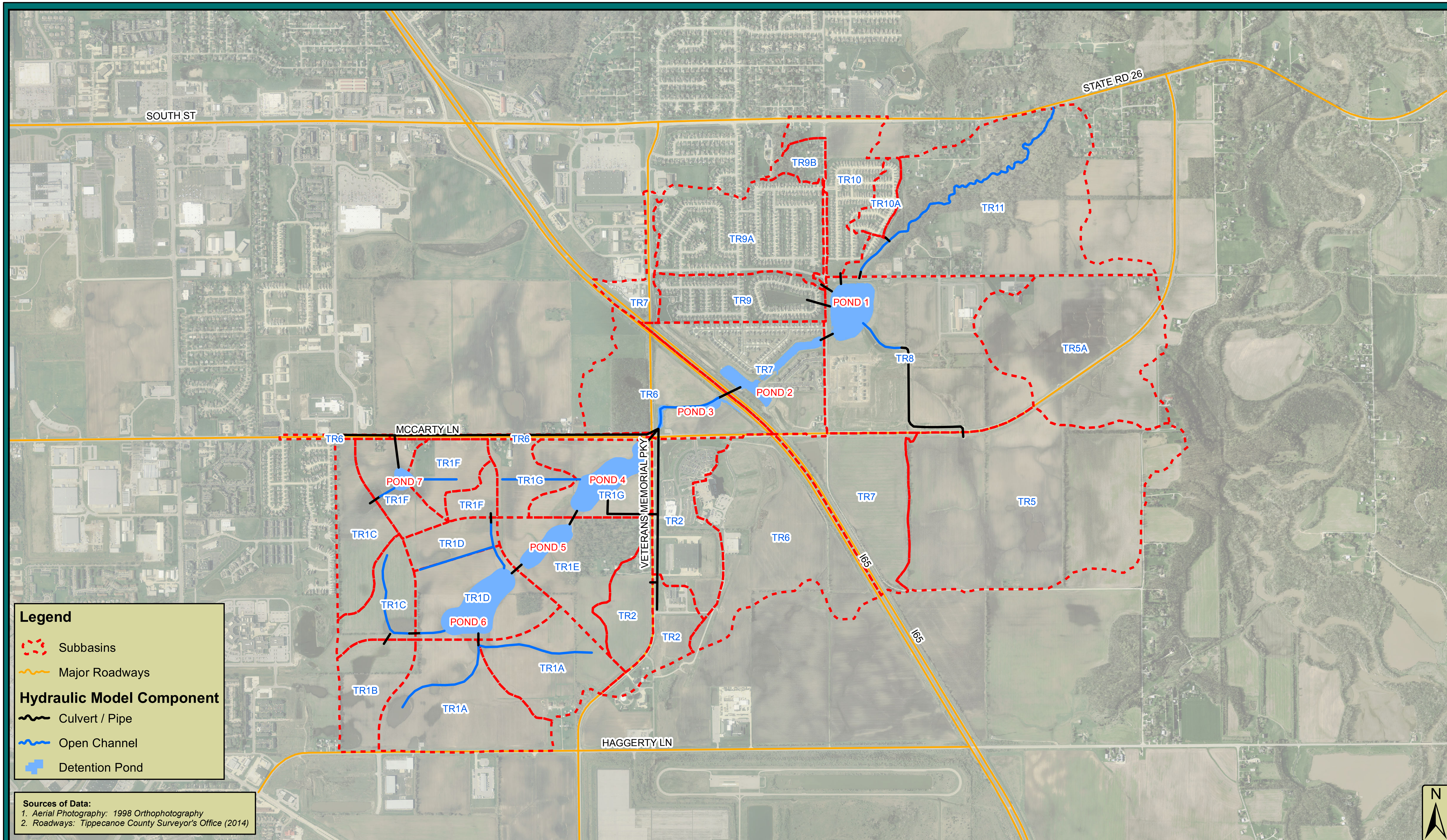
PROJECT:	Upper Berlowitz Master Plan	PROJECT NO. 12-0065	APPROX. SCALE 1 " = 1,500 ft
TITLE:	Existing Condition (1992) Hydraulic Model Components		DATE: 11/2014
			EXHIBIT 2.3



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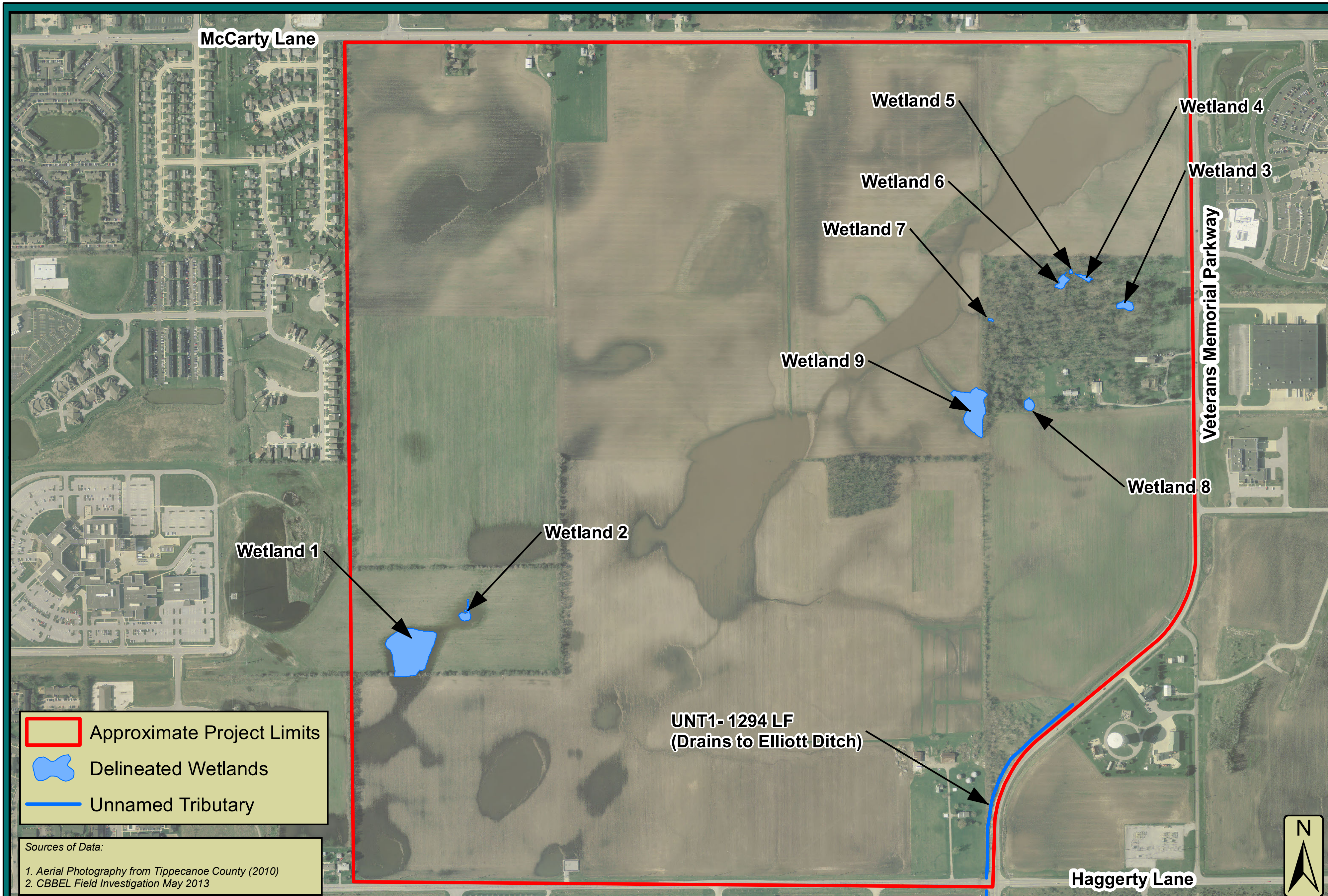
PROJECT: **Upper Berlowitz Master Plan**		PROJECT NO. **12-0065**	APPROX. SCALE **1 " = 1,500 ft**
			DATE: **11/2014**
TITLE: **Proposed Condition Hydraulic Model Components**			EXHIBIT **2.4**



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PROJECT:	Tippecanoe County Berlowitz Masterplan	PROJECT NO. 12-0065	APPROX. SCALE 1 " = 800 '
TITLE:	Delineated Wetlands/"Waters"		DATE: 07/2013
			EXHIBIT 3.1

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PROJECT: Upper Berlowitz Master Plan	PROJECT NO. 12-0065	APPROX. SCALE n/a
TITLE: Upper Berlowitz Regional Drain Master Plan		DATE: 11/2014
		EXHIBIT 4.1

Appendix 1
(Hydrologic and Hydraulic Analysis)

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Existing Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR1**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	78.6	Open Water	100			
		Developed, Open Space	68	1	1.0	64.8
		Developed, Low Intensity	75	2	1.3	98.0
		Developed, Medium Intensity	84	0	0.0	1.1
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55	1	0.5	28.0
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58	2	1.7	96.6
		Pasture / Hay	61			
		Cultivated Crops	75	94	74.1	5557.7
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	21.4	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83			
		Developed, Medium Intensity	89			
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70	1	0.2	15.2
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82	99	21.2	1741.0
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7602.5
					CN =	76.0
					Use CN	**76**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Existing Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR1A**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	62.9	Open Water	100			
		Developed, Open Space	68	1	0.6	38.1
		Developed, Low Intensity	75	1	0.4	28.7
		Developed, Medium Intensity	84	1	0.4	30.8
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55	6	3.7	201.9
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58	2	1.2	71.4
		Pasture / Hay	61			
		Cultivated Crops	75	90	56.6	4248.3
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	37.1	Open Water	100			
		Developed, Open Space	79	2	0.7	54.3
		Developed, Low Intensity	83	0	0.0	3.6
		Developed, Medium Intensity	89	0	0.1	6.1
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70	15	5.5	386.9
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71	6	2.2	157.9
		Pasture / Hay	74			
		Cultivated Crops	82	77	28.6	2344.7
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7572.7
					CN =	75.7
					Use CN	**76**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Existing Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR2**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	96.5	Open Water	100			
		Developed, Open Space	68	12	11.5	780.3
		Developed, Low Intensity	75	8	7.4	556.8
		Developed, Medium Intensity	84	0	0.1	8.0
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55	0	0.0	0.5
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58	2	1.8	106.9
		Pasture / Hay	61			
		Cultivated Crops	75	78	75.7	5675.2
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	3.5	Open Water	100			
		Developed, Open Space	79	0	0.0	1.0
		Developed, Low Intensity	83	3	0.1	9.1
		Developed, Medium Intensity	89			
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70	3	0.1	7.3
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71	36	1.2	88.4
		Pasture / Hay	74			
		Cultivated Crops	82	58	2.0	164.9
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7398.5
					CN =	74.0
					Use CN	**74**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Existing Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR3**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	59.8	Open Water	100			
		Developed, Open Space	68	10	6.1	411.9
		Developed, Low Intensity	75	14	8.4	630.6
		Developed, Medium Intensity	84	3	1.6	134.3
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55	9	5.3	291.2
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58	3	1.6	95.3
		Pasture / Hay	61			
		Cultivated Crops	75	62	36.8	2761.6
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	40.2	Open Water	100			
		Developed, Open Space	79	18	7.2	569.1
		Developed, Low Intensity	83	15	6.1	503.6
		Developed, Medium Intensity	89	1	0.3	25.2
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70	19	7.6	533.3
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71	0	0.0	2.9
		Pasture / Hay	74			
		Cultivated Crops	82	47	19.0	1554.9
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7513.9
					CN =	75.1
					Use CN	**75**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Existing Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR4**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	53.2	Open Water	100			
		Developed, Open Space	68	5	2.8	187.6
		Developed, Low Intensity	75	22	11.7	875.0
		Developed, Medium Intensity	84	8	4.5	379.4
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58	2	0.8	46.5
		Pasture / Hay	61			
		Cultivated Crops	75	63	33.4	2508.2
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	46.8	Open Water	100			
		Developed, Open Space	79	6	3.0	240.0
		Developed, Low Intensity	83	42	19.7	1639.1
		Developed, Medium Intensity	89	14	6.5	577.6
		Developed, High Intensity	94	1	0.6	53.9
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71	14	6.7	479.0
		Pasture / Hay	74			
		Cultivated Crops	82	22	10.2	838.0
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7824.1
					CN =	78.2
					Use CN	**78**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Existing Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR5**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	82.1	Open Water	100			
		Developed, Open Space	68	4	3.3	221.1
		Developed, Low Intensity	75	2	1.8	137.9
		Developed, Medium Intensity	84	0	0.2	17.7
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55	0	0.1	4.8
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58	0	0.1	6.6
		Pasture / Hay	61			
		Cultivated Crops	75	93	76.6	5747.6
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	17.9	Open Water	100			
		Developed, Open Space	79	5	0.8	64.6
		Developed, Low Intensity	83			
		Developed, Medium Intensity	89			
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70	0	0.1	5.1
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82	95	17.0	1391.7
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7597.2
					CN =	76.0
					Use CN	**76**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Existing Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR5A**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	71.3	Open Water	100			
		Developed, Open Space	68	1	0.5	37.2
		Developed, Low Intensity	75			
		Developed, Medium Intensity	84			
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61			
		Cultivated Crops	75	99	70.7	5304.6
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	28.7	Open Water	100			
		Developed, Open Space	79	9	2.7	215.4
		Developed, Low Intensity	83			
		Developed, Medium Intensity	89			
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70	1	0.3	20.8
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82	89	25.7	2107.5
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7685.5
					CN =	76.9
					Use CN	**77**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Existing Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR6**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	58.2	Open Water	100			
		Developed, Open Space	68	10	5.9	403.1
		Developed, Low Intensity	75	18	10.5	785.3
		Developed, Medium Intensity	84	9	5.1	427.7
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55	0	0.2	11.7
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61	0	0.1	4.7
		Cultivated Crops	75	63	36.4	2732.8
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	41.8	Open Water	100			
		Developed, Open Space	79	8	3.3	264.1
		Developed, Low Intensity	83	27	11.2	931.4
		Developed, Medium Intensity	89	14	5.9	526.6
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70	3	1.2	86.9
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82	48	20.1	1644.9
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7819.2
					CN =	78.2
					Use CN	**78**

Composite Curve Number Calculation Worksheet

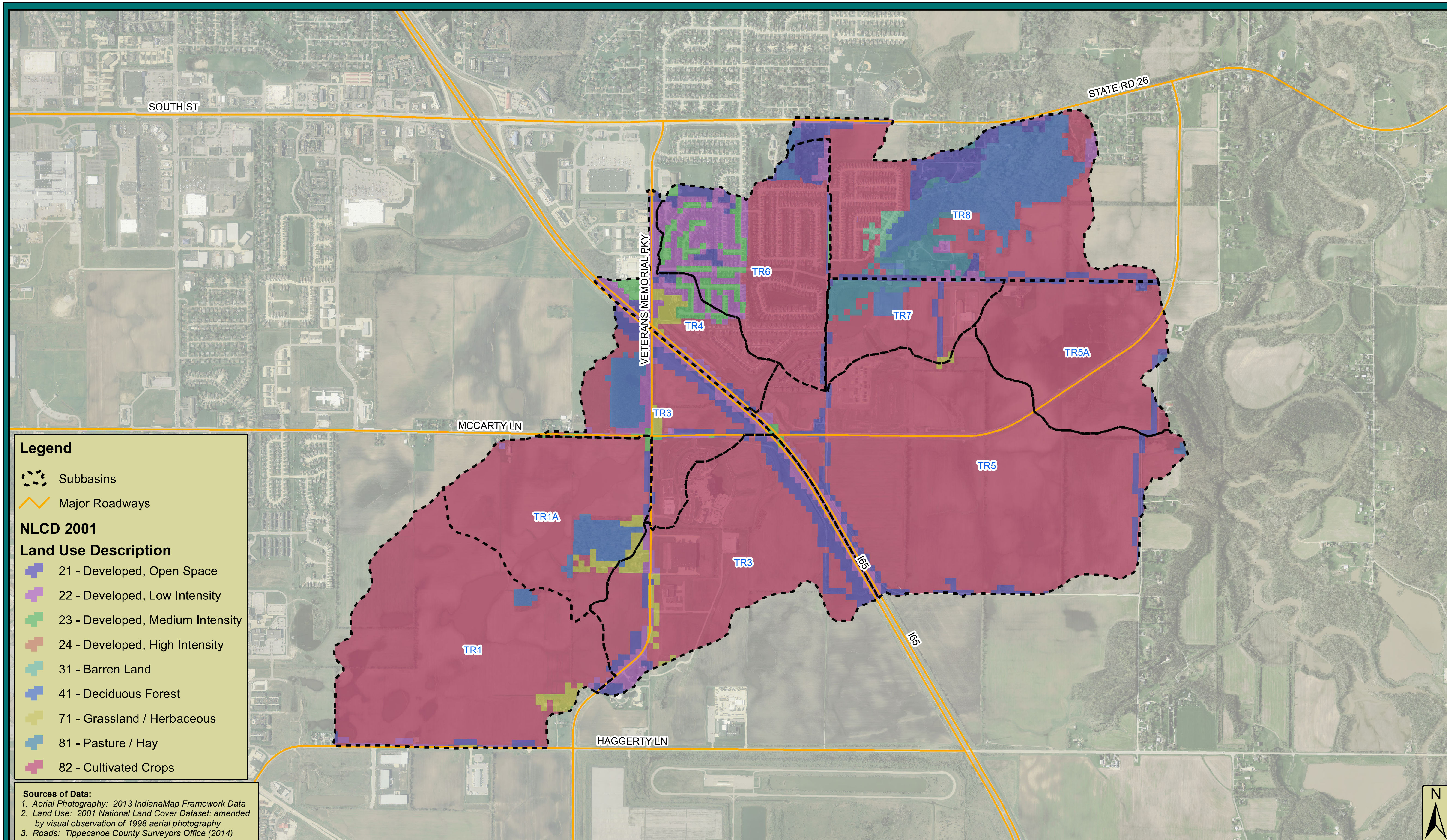
CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Existing Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR7**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	54.9	Open Water	100			
		Developed, Open Space	68	6	3.1	207.4
		Developed, Low Intensity	75	1	0.5	37.2
		Developed, Medium Intensity	84			
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55	8	4.6	254.2
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58	1	0.7	43.3
		Pasture / Hay	61	20	11.3	686.9
		Cultivated Crops	75	63	34.8	2607.9
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	45.1	Open Water	100			
		Developed, Open Space	79	8	3.4	271.8
		Developed, Low Intensity	83	1	0.4	36.1
		Developed, Medium Intensity	89			
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70	3	1.3	90.2
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74	8	3.6	265.7
		Cultivated Crops	82	81	36.3	2976.6
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7477.2
					CN =	74.8
					Use CN	**75**

Composite Curve Number Calculation Worksheet

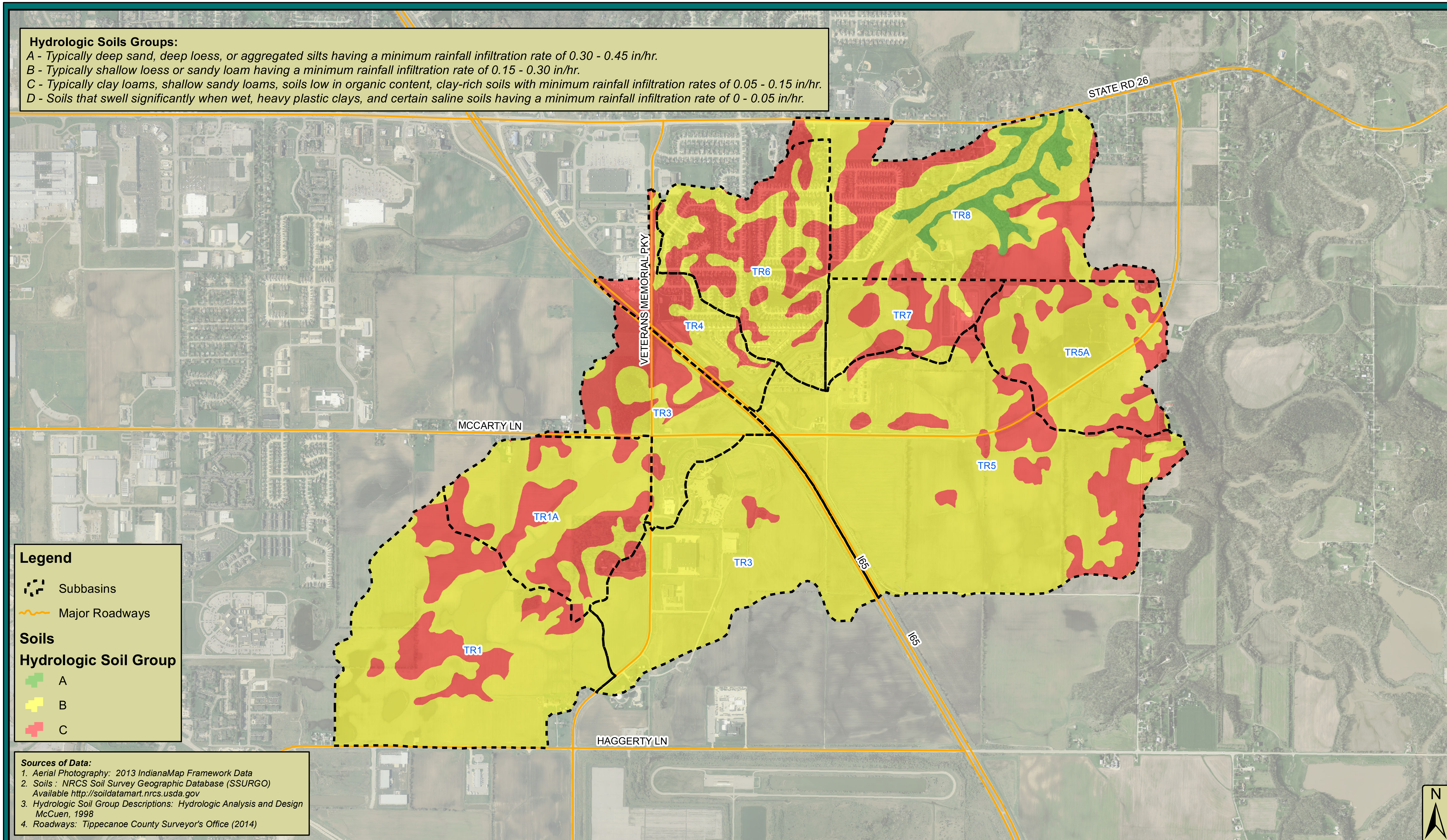
CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Existing Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR8**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A	12.1	Open Water	100			
		Developed, Open Space	51	2	0.3	12.8
		Developed, Low Intensity	61	1	0.1	4.1
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77	1	0.2	13.2
		Deciduous Forest	25	84	10.2	254.4
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39	6	0.8	30.0
		Cultivated Crops	64	6	0.7	43.8
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =	100		
B	51.2	Open Water	100			
		Developed, Open Space	68	11	5.8	395.2
		Developed, Low Intensity	75	4	2.0	153.0
		Developed, Medium Intensity	84	0	0.0	0.2
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86	3	1.6	136.1
		Deciduous Forest	55	33	17.1	938.5
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61	11	5.5	332.5
		Cultivated Crops	75	38	19.3	1444.7
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	36.7	Open Water	100			
		Developed, Open Space	79	16	5.8	460.1
		Developed, Low Intensity	83	3	1.1	92.0
		Developed, Medium Intensity	89	0	0.0	0.6
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91	0	0.2	14.9
		Deciduous Forest	70	4	1.5	107.7
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74	2	0.9	66.0
		Cultivated Crops	82	74	27.1	2224.8
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	6724.7
					CN =	67.2
					Use CN	**67**



Christopher B. Burke Engineering, LLC
PNC Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
(t) 317.266.8000 (f) 317.632.3306

PROJECT: Upper Berlowitz Master Plan	PROJECT NO. 12-0065	APPROX. SCALE 1 " = 1,500 ft
TITLE: Existing Condition (1992) Land Use		DATE: 11/2014
		EXHIBIT A1.1



Christopher B. Burke Engineering, LLC PNC Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 (t) 317.266.8000 (f) 317.632.3306	PROJECT: **Upper Berlowitz Master Plan**	PROJECT NO. **12-0065**	APPROX. SCALE **1 " = 1,500 ft**
	TITLE: **Existing Condition (1992) Soil Properties**		DATE: **11/2014** EXHIBIT **A1.2**

Christopher B. Burke Engineering, LLC
115 W. Washington St., Suite 1368 S
Indianapolis, IN 46204
(317) 266-8000

Project No.:	12-0065		
Project Name:	Upper Berlowitz - Existing Condition		
Calcs. By:	BJM	Date:	9/3/2013
Check By:	HLF	Date:	9/9/2013

Time of Concentration

Basin: TR1

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	651.6	650	0.016	2.83	0.15	0.19

TOTAL T_t (hr) 0.19

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
4525	650	646	0.0009	n	y =	20.33	16.135	0.48	2.62
					n =	16.13			

TOTAL T_t (hr) 2.62

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)

TOTAL T_t (hr) 0.00

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 2.81 hours = 169 minutes **T_{lag} = 1.69 hours = 101 minutes**

Adjusted Indiana-Specific T_c = 4.68 hours = 281 minutes (If applicable)

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Project No.:	12-0065		
Project Name:	Upper Berlowitz - Existing Condition		
Calcs. By:	BJM	Date:	9/3/2013
Check By:	HLF	Date:	9/9/2013

Time of Concentration

Basin: TR1A

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	660.1	660	0.001	2.83	0.4	1.26

TOTAL T_t (hr) 1.26

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
3673.2	660	646.3	0.0037	n	y =	20.33	16.135	0.99	1.04
					n =	16.13			

TOTAL T_t (hr) 1.04

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)

TOTAL T_t (hr) 0.00

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 2.30 hours = 138 minutes **T_{lag} = 1.38 hours = 82.7 minutes**

Adjusted Indiana-Specific T_c = 3.83 hours = 230 minutes (If applicable)

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Project No.: 12-0065
Project Name: Upper Berlowitz - Existing Condition
Calcs. By: BJM Date: 9/3/2013
Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR2

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	681.1	680.2	0.009	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr)
0.24

TOTAL T_t (hr) 0.24

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
5555	680.2	648	0.0058	n	y =	20.33	16.135	1.23
					n =	16.13		

Tt (hr)
1.26

TOTAL T_t (hr) 1.26

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
96.858	3

Tt (hr)
0.01

TOTAL T_t (hr) 0.01

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 1.50 hours = 90 minutes

T_{lag} = 0.90 hours = 54.1 minutes

Adjusted Indiana-Specific T_c = 2.51 hours = 150 minutes (If applicable)

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Project No.:	12-0065		
Project Name:	Upper Berlowitz - Existing Condition		
Calcs. By:	BJM	Date:	9/3/2013
Check By:	HLF	Date:	9/9/2013

Time of Concentration

Basin: TR3

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	662.2	662.1	0.001	2.83	0.13	0.51

TOTAL T_t (hr) 0.51

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
1126.1	662.1	652	0.009	n	y =	20.33	16.135	1.53	0.20
					n =	16.13			

TOTAL T_t (hr) 0.20

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
2177.5	3	0.20

TOTAL T_t (hr) 0.20

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.92 hours = 55 minutes

T_{lag} = 0.55 hours = 33.1 minutes

Adjusted Indiana-Specific T_c = 1.53 hours = 92 minutes (If applicable)

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Project No.: 12-0065
Project Name: Upper Berlowitz - Existing Condition
Calcs. By: BJM Date: 9/3/2013
Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR4

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	664	662.9	0.011	2.83	0.011	0.03

TOTAL T_t (hr) 0.03

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)		Coef.	Velocity	Tt (hr)
	662.9				y =	20.33		
					n =	16.13		

TOTAL T_t (hr) 0.00

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
4888.8	3	0.45

TOTAL T_t (hr) 0.45

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.48 hours = 29 minutes

T_{lag} = 0.29 hours = 17.3 minutes

Adjusted Indiana-Specific T_c = 0.80 hours = 48 minutes (If applicable)

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Project No.: 12-0065
Project Name: Upper Berlowitz - Existing Condition
Calcs. By: BJM Date: 9/3/2013
Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR5

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	664.1	664	0.001	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr)
0.58

TOTAL T_t (hr) 0.58

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
7889.5	664	650.3	0.0017	n	y =	20.33	16.135	0.67
					n =	16.13		

Tt (hr)
3.26

TOTAL T_t (hr) 3.26

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
1986.2	3

Tt (hr)
0.18

TOTAL T_t (hr) 0.18

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 4.02 hours = 241 minutes

T_{lag} = 2.41 hours = 145 minutes

Adjusted Indiana-Specific T_c = 6.70 hours = 402 minutes (If applicable)

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(317) 266-8000

Project No.: 12-0065
Project Name: Upper Berlowitz - Existing Condition
Calcs. By: BJM Date: 9/3/2013
Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR5A

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	662.1	662	0.001	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr): 0.58

TOTAL T_t (hr): 0.58

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
3103.4	662	660	0.0006	n	y =	20.33	16.135	0.41
					n =	16.13		

Tt (hr): 2.10

TOTAL T_t (hr): 2.10

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)

Tt (hr):

TOTAL T_t (hr): 0.00

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity

Tt (hr):

TOTAL T_t (hr): 0.00

Total T_c = 2.68 hours = 161 minutes

T_{lag} = 1.61 hours = 96.5 minutes

Adjusted Indiana-Specific T_c = 4.47 hours = 268 minutes (If applicable)

Christopher B. Burke Engineering, LLC
115 W. Washington St., Suite 1368 S
Indianapolis, IN 46204
(317) 266-8000

Project No.: 12-0065
Project Name: Upper Berlowitz - Existing Condition
Calcs. By: BJM Date: 9/3/2013
Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR6

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	662.1	662	0.001	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr) 0.58

TOTAL T_t (hr) 0.58

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
226.29	662	661.774	0.001	n	y =	20.33	16.135	0.51
					n =	16.13		

Tt (hr) 0.12

TOTAL T_t (hr) 0.12

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
4490.8	3

Tt (hr) 0.42

TOTAL T_t (hr) 0.42

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 1.11 hours = 67 minutes

T_{lag} = 0.67 hours = 40.1 minutes

Adjusted Indiana-Specific T_c = 1.86 hours = 111 minutes (If applicable)

Christopher B. Burke Engineering, LLC
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Indianapolis, IN 46204
(317) 266-8000

Project No.: 12-0065
Project Name: Upper Berlowitz - Existing Condition
Calcs. By: BJM Date: 9/3/2013
Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR7

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	674	666.9	0.071	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr)
0.10

TOTAL T_t (hr) 0.10

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
1341.3	666.9	656	0.0081	n	y =	20.33	16.135	1.45
					n =	16.13		

Tt (hr)
0.26

TOTAL T_t (hr) 0.26

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
1432.3	3

Tt (hr)
0.13

TOTAL T_t (hr) 0.13

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.49 hours = 30 minutes

T_{lag} = 0.30 hours = 17.8 minutes

Adjusted Indiana-Specific T_c = 0.82 hours = 49 minutes (If applicable)

Christopher B. Burke Engineering, LLC
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(317) 266-8000

Project No.: 12-0065
Project Name: Upper Berlowitz - Existing Condition
Calcs. By: BJM Date: 9/3/2013
Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR8

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	663.2	662.6	0.006	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr): 0.28

TOTAL T_t (hr): 0.28

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
2501.5	662.6	650.6	0.0048	n	y =	20.33	16.135	1.12
					n =	16.13		

Tt (hr): 0.62

TOTAL T_t (hr): 0.62

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
3497.5	3

Tt (hr): 0.32

TOTAL T_t (hr): 0.32

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

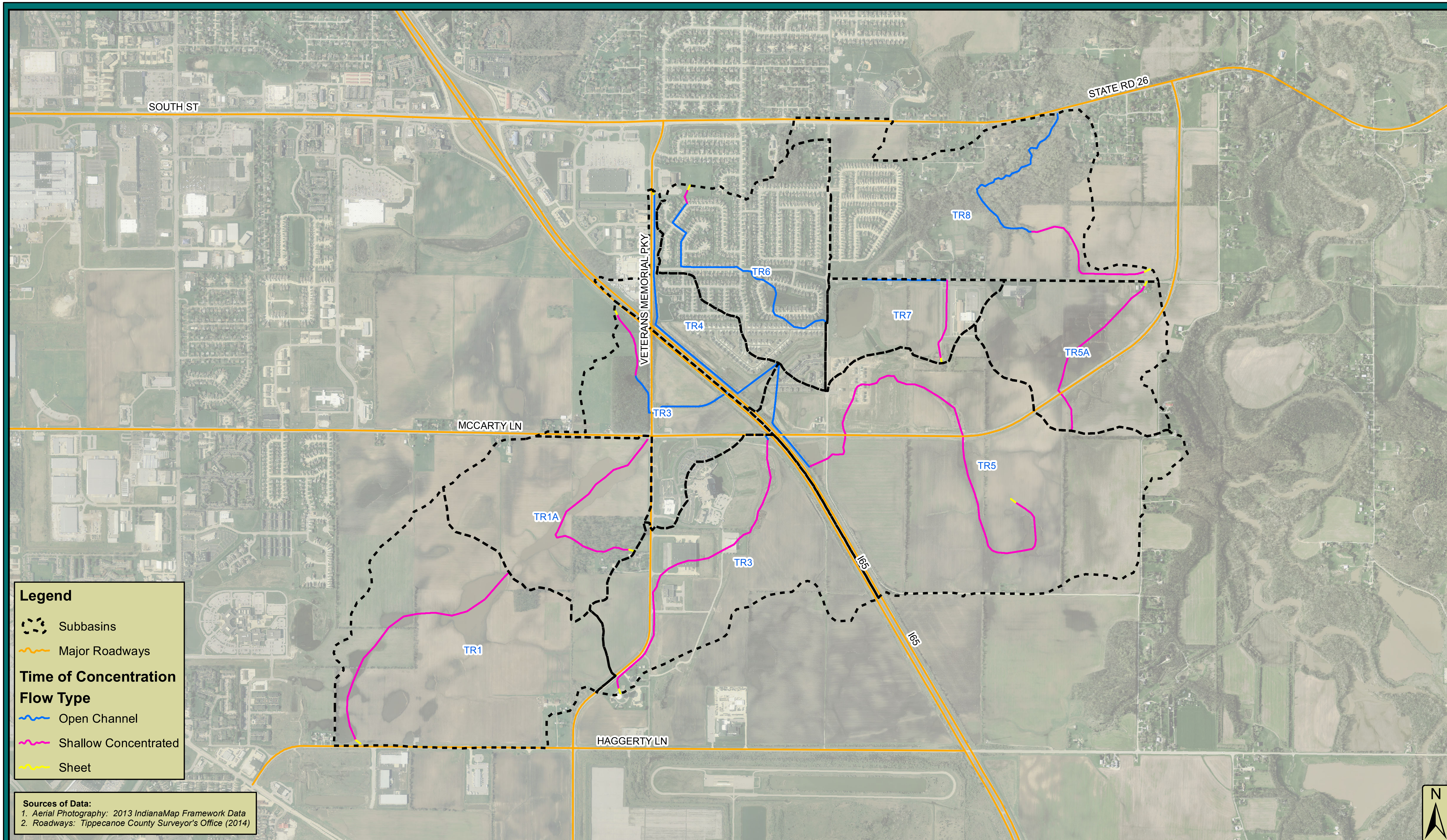
Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr): 0.00

Total T_c = 1.23 hours = 74 minutes

T_{lag} = 0.74 hours = 44.2 minutes

Adjusted Indiana-Specific T_c = 2.04 hours = 123 minutes (If applicable)



Christopher B. Burke Engineering, LLC
PNC Center, Suite 1368 South
115 West Washington Street
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(t) 317.266.8000 (f) 317.632.3306

PROJECT:	Upper Berlowitz Master Plan	PROJECT NO. 14-0318	APPROX. SCALE 1 " = 1,500 ft
TITLE:	Existing Condition (1992) Time of Concentration		DATE: 11/2014
			EXHIBIT A1.3

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR1**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	78.6	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	13	10.5	788.6
		Developed, Medium Intensity	84	6	4.4	372.0
		Developed, High Intensity	92	81	63.5	5838.9
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61	0	0.1	8.7
		Cultivated Crops	75			
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	21.4	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	1	0.1	10.4
		Developed, Medium Intensity	89	7	1.5	134.7
		Developed, High Intensity	94	92	19.8	1862.1
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82			
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	9015.3
					CN =	90.2
					Use CN	**90**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR1A**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	62.9	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75			
		Developed, Medium Intensity	84	39	24.4	2052.8
		Developed, High Intensity	92	59	37.0	3399.9
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61	2	1.5	89.9
		Cultivated Crops	75			
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	37.1	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83			
		Developed, Medium Intensity	89	33	12.1	1078.6
		Developed, High Intensity	94	62	23.0	2163.0
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74	5	2.0	148.2
		Cultivated Crops	82			
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	8932.4
					CN =	89.3
					Use CN	**89**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR2**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	94.6	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75			
		Developed, Medium Intensity	84	29	27.0	2270.0
		Developed, High Intensity	92	71	67.5	6207.7
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61	0	0.1	8.9
		Cultivated Crops	75			
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	5.4	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83			
		Developed, Medium Intensity	89	42	2.2	199.9
		Developed, High Intensity	94	35	1.9	177.4
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74	23	1.2	90.4
		Cultivated Crops	82			
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	8954.3
					CN =	89.5
					Use CN	**90**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR3**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	97.4	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75			
		Developed, Medium Intensity	84	77	74.8	6285.7
		Developed, High Intensity	92	23	22.6	2077.7
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61			
		Cultivated Crops	75			
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	2.6	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83			
		Developed, Medium Intensity	89	100	2.6	230.3
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82			
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	8593.6
					CN =	85.9
					Use CN	**86**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR4**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	100.0	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	1	0.9	65.8
		Developed, Medium Intensity	84	97	96.9	8137.5
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61			
		Cultivated Crops	75	2	2.2	168.6
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C		Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83			
		Developed, Medium Intensity	89			
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82			
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =			
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	8371.9
					CN =	83.7
					Use CN	**84**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR5**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	76.3	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	37	28.5	2139.7
		Developed, Medium Intensity	84	1	0.9	79.4
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61	4	2.7	164.8
		Cultivated Crops	75	58	44.1	3307.5
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	23.7	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	26	6.3	521.6
		Developed, Medium Intensity	89	6	1.3	117.5
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74	11	2.7	198.9
		Cultivated Crops	82	57	13.4	1101.4
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7630.8
					CN =	76.3
					Use CN	**76**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR5A**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	72.2	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	18	13.1	985.5
		Developed, Medium Intensity	84	36	25.9	2174.4
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61	0	0.3	16.5
		Cultivated Crops	75	46	32.9	2467.1
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	27.8	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	31	8.6	711.4
		Developed, Medium Intensity	89	21	5.8	517.0
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74	5	1.3	98.9
		Cultivated Crops	82	43	12.1	991.6
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7962.4
					CN =	79.6
					Use CN	**80**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR6**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	52.8	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75			
		Developed, Medium Intensity	84	100	52.8	4436.3
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61			
		Cultivated Crops	75			
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	47.2	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83			
		Developed, Medium Intensity	89	100	47.2	4199.6
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82			
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	8635.9
					CN =	86.4
					Use CN	**86**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR7**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	84.1	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	42	35.6	2672.8
		Developed, Medium Intensity	84	58	48.5	4070.0
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61			
		Cultivated Crops	75			
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	15.9	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	96	15.2	1263.2
		Developed, Medium Intensity	89	4	0.7	61.4
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82			
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	8067.5
					CN =	80.7
					Use CN	**81**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR7A**				

Soil Name and Hydrologic Group	**% Area for Each Soil Type**	**Cover Description**	**CN**	**% Land Use Area per Soil Type**	**% Total Area**	**CN X % Total Area**
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	15.6	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	90	14.0	1053.7
		Developed, Medium Intensity	84	8	1.3	107.3
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61			
		Cultivated Crops	75	2	0.3	23.7
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	84.4	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	30	25.0	2078.5
		Developed, Medium Intensity	89	70	58.8	5234.6
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82	1	0.5	40.9
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	8538.8
					CN =	85.4
					Use CN	**85**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR8**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	67.4	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	83	56.0	4201.3
		Developed, Medium Intensity	84	16	10.7	895.7
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61			
		Cultivated Crops	75	1	0.7	53.7
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	32.6	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	72	23.4	1939.5
		Developed, Medium Intensity	89	22	7.2	637.2
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82	6	2.1	170.3
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7897.7
					CN =	79.0
					Use CN	**79**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR9**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	59.9	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	100	59.9	4490.8
		Developed, Medium Intensity	84			
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61			
		Cultivated Crops	75			
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	40.1	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	100	40.1	3330.1
		Developed, Medium Intensity	89			
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82			
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7821.0
					CN =	78.2
					Use CN	**78**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR9A**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	50.0	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	96	48.0	3603.4
		Developed, Medium Intensity	84			
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61			
		Cultivated Crops	75	4	1.9	143.8
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	50.0	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	99	49.6	4117.5
		Developed, Medium Intensity	89			
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82	1	0.4	35.2
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7899.9
					CN =	79.0
					Use CN	**79**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR9B**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	51.8	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	26	13.5	1014.5
		Developed, Medium Intensity	84	0	0.0	0.0
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61	2	1.1	65.8
		Cultivated Crops	75	72	37.2	2789.8
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	48.2	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	20	9.8	810.9
		Developed, Medium Intensity	89	1	0.4	35.4
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82	79	38.0	3118.5
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7834.8
					CN =	78.3
					Use CN	**78**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR10**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A		Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61			
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =			
B	41.3	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	46	19.1	1432.9
		Developed, Medium Intensity	84	9	3.5	297.3
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61	33	13.5	823.3
		Cultivated Crops	75	12	5.2	387.2
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	58.7	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	65	38.3	3179.3
		Developed, Medium Intensity	89	3	2.0	181.8
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74	21	12.5	922.3
		Cultivated Crops	82	10	5.9	482.5
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7706.7
					CN =	77.1
					Use CN	**77**

Composite Curve Number Calculation Worksheet

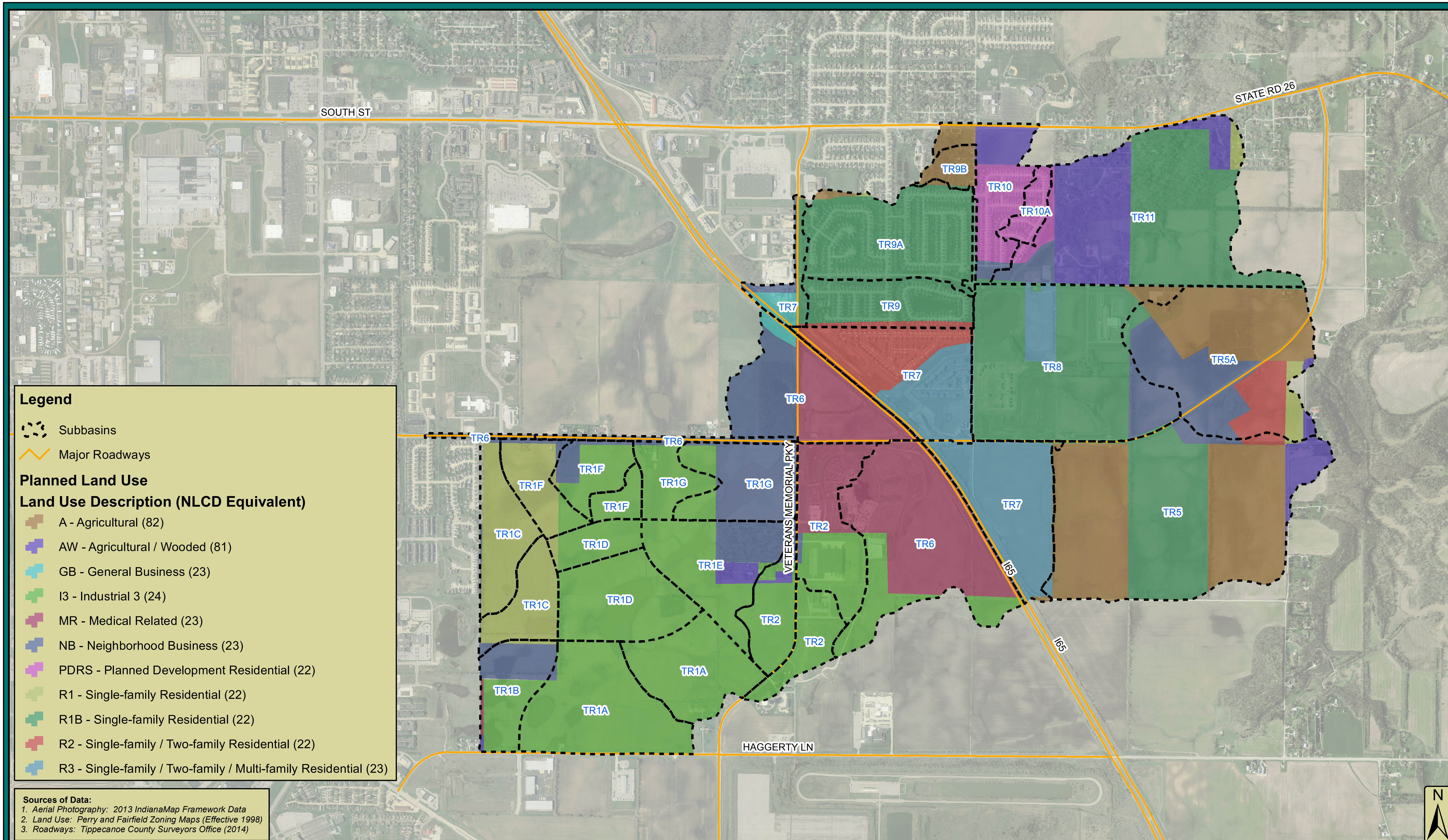
CBBEL Project No.	12-0065	Calcs. By	BJM	Date	7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By	HLF	Date	9/9/2013
Basin Name	**TR10A**				

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A	1.8	Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61	100	1.8	111.4
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39			
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =	100		
B	33.0	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	100	33.0	2474.9
		Developed, Medium Intensity	84			
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61			
		Cultivated Crops	75			
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	65.2	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	100	65.2	5409.5
		Developed, Medium Intensity	89			
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74			
		Cultivated Crops	82			
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7995.8
					CN =	80.0
					Use CN	**80**

Composite Curve Number Calculation Worksheet

CBBEL Project No.	12-0065	Calcs. By BJM	Date 7/31/2013
CBBEL Project Name	Upper Berlowitz - Proposed Condition	Check By HLF	Date 9/9/2013
Basin Name	**TR11**		

Soil Name and Hydrologic Group	% Area for Each Soil Type	Cover Description	CN	% Land Use Area per Soil Type	% Total Area	CN X % Total Area
A	15.9	Open Water	100			
		Developed, Open Space	51			
		Developed, Low Intensity	61	68	10.8	657.2
		Developed, Medium Intensity	75			
		Developed, High Intensity	89			
		Barren Land (Rock / Sand / Clay)	77			
		Deciduous Forest	25			
		Evergreen Forest	25			
		Mixed Forest	25			
		Shrub / Scrub	39			
		Grasslands / Herbaceous	30			
		Pasture / Hay	39	32	5.1	199.1
		Cultivated Crops	64			
		Small Grains	39			
		Urban/Recreational Grasses	39			
		Woody Wetlands	30			
		Emergent Herbaceous Wetlands	49			
			Total =	100		
B	54.9	Open Water	100			
		Developed, Open Space	68			
		Developed, Low Intensity	75	48	26.2	1966.1
		Developed, Medium Intensity	84	6	3.3	279.1
		Developed, High Intensity	92			
		Barren Land (Rock / Sand / Clay)	86			
		Deciduous Forest	55			
		Evergreen Forest	55			
		Mixed Forest	55			
		Shrub / Scrub	61			
		Grasslands / Herbaceous	58			
		Pasture / Hay	61	46	25.4	1547.7
		Cultivated Crops	75			
		Small Grains	61			
		Urban/Recreational Grasses	61			
		Woody Wetlands	55			
		Emergent Herbaceous Wetlands	69			
			Total =	100		
C	29.2	Open Water	100			
		Developed, Open Space	79			
		Developed, Low Intensity	83	75	21.8	1809.5
		Developed, Medium Intensity	89	5	1.4	125.7
		Developed, High Intensity	94			
		Barren Land (Rock / Sand / Clay)	91			
		Deciduous Forest	70			
		Evergreen Forest	70			
		Mixed Forest	70			
		Shrub / Scrub	74			
		Grasslands / Herbaceous	71			
		Pasture / Hay	74	21	6.0	444.0
		Cultivated Crops	82			
		Small Grains	74			
		Urban/Recreational Grasses	74			
		Woody Wetlands	70			
		Emergent Herbaceous Wetlands	79			
			Total =	100		
D		Open Water	100			
		Developed, Open Space	84			
		Developed, Low Intensity	87			
		Developed, Medium Intensity	91			
		Developed, High Intensity	95			
		Barren Land (Rock / Sand / Clay)	94			
		Deciduous Forest	77			
		Evergreen Forest	77			
		Mixed Forest	77			
		Shrub / Scrub	80			
		Grasslands / Herbaceous	78			
		Pasture / Hay	80			
		Cultivated Crops	85			
		Small Grains	80			
		Urban/Recreational Grasses	80			
		Woody Wetlands	77			
		Emergent Herbaceous Wetlands	84			
			Total =			
Water		Open Water	100			
Totals	100				100	7028.3
					CN =	70.3
					Use CN	**70**



Legend

Subbasins

Major Roadways

Planned Land Use

Land Use Description (NLCD Equivalent)

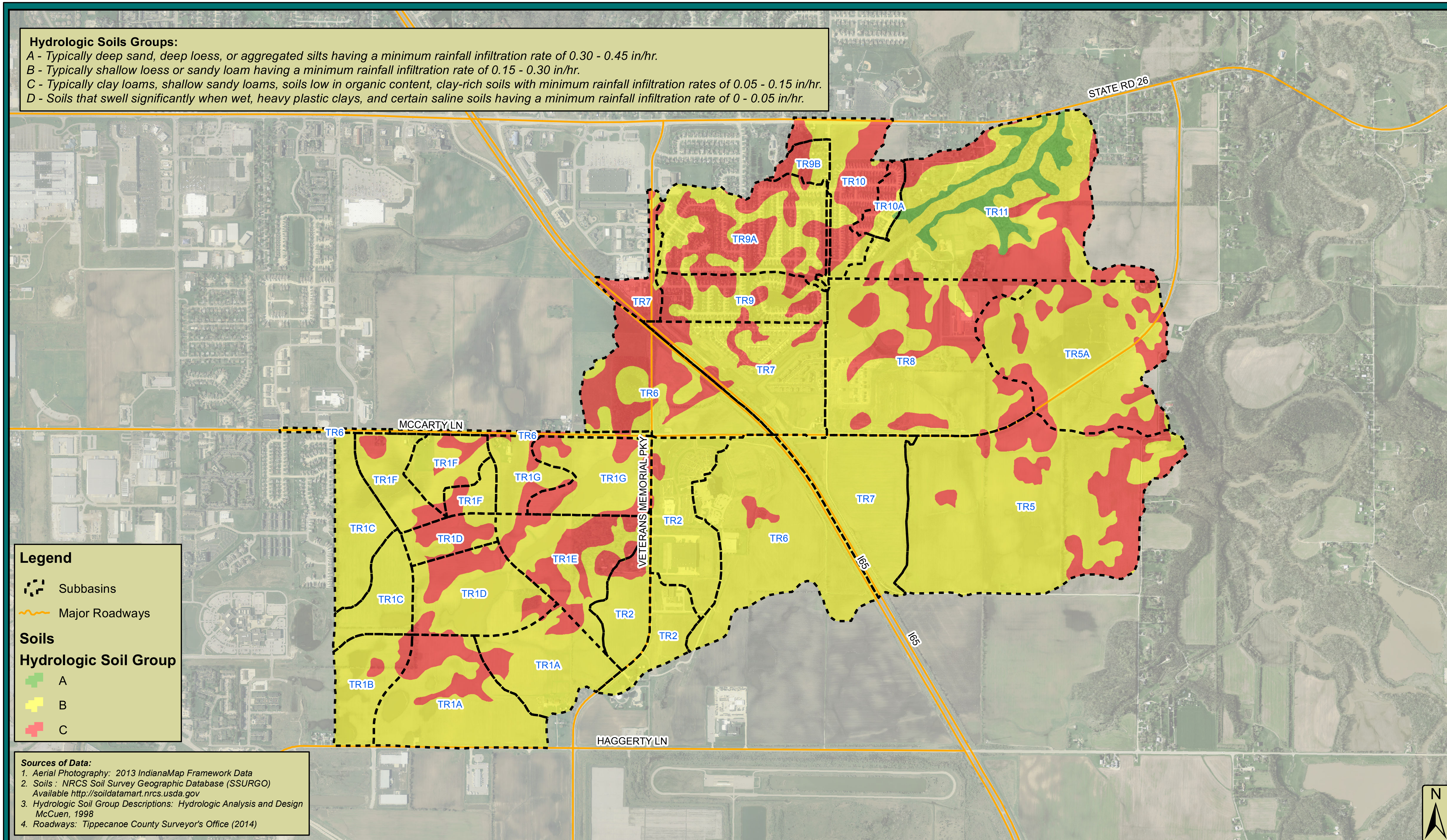
- A - Agricultural (82)
- AW - Agricultural / Wooded (81)
- GB - General Business (23)
- I3 - Industrial 3 (24)
- MR - Medical Related (23)
- NB - Neighborhood Business (23)
- PDRS - Planned Development Residential (22)
- R1 - Single-family Residential (22)
- R1B - Single-family Residential (22)
- R2 - Single-family / Two-family Residential (22)
- R3 - Single-family / Two-family / Multi-family Residential (23)

Sources of Data:
1. *Aerial Photography: 2013 IndianaMap Framework Data*
2. *Land Use: Perry and Fairfield Zoning Maps (Effective 1998)*
3. *Roadways: Tippecanoe County Surveyors Office (2014)*

CBB
Christopher B. Burke Engineering, LLC
PNC Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
(t) 317.266.8000 (f) 317.632.3306

PROJECT: Upper Berlowitz Master Plan	PROJECT NO. 12-0065	APPROX. SCALE 1 " = 1,500 ft	
TITLE: Proposed Condition Land Use		DATE: 11/2014	EXHIBIT A1.4

Hydrologic Soils Groups:
A - Typically deep sand, deep loess, or aggregated silts having a minimum rainfall infiltration rate of 0.30 - 0.45 in/hr.
B - Typically shallow loess or sandy loam having a minimum rainfall infiltration rate of 0.15 - 0.30 in/hr.
C - Typically clay loams, shallow sandy loams, soils low in organic content, clay-rich soils with minimum rainfall infiltration rates of 0.05 - 0.15 in/hr.
D - Soils that swell significantly when wet, heavy plastic clays, and certain saline soils having a minimum rainfall infiltration rate of 0 - 0.05 in/hr.



Legend

Subbasins

Major Roadways

Soils

Hydrologic Soil Group

A

B

C

Sources of Data:
1. Aerial Photography: 2013 IndianaMap Framework Data
2. Soils : NRCS Soil Survey Geographic Database (SSURGO) Available http://soildatamart.nrcs.usda.gov
3. Hydrologic Soil Group Descriptions: Hydrologic Analysis and Design McCuen, 1998
4. Roadways: Tippecanoe County Surveyor's Office (2014)

Christopher B. Burke Engineering, LLC PNC Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 (t) 317.266.8000 (f) 317.632.3306	PROJECT: **Upper Berlowitz Master Plan**	PROJECT NO. **12-0065**	APPROX. SCALE **1 " = 1,500 ft**
	TITLE: **Proposed Condition Soil Properties**		DATE: **11/2014** EXHIBIT **A1.5**

Christopher B. Burke Engineering, LLC
115 W. Washington St., Suite 1368 S
Indianapolis, IN 46204
(317) 266-8000

Project No.:	12-0065
Project Name:	Upper Berlowitz - Proposed Condition
Calcs. By:	BJM
Date:	11/26/2013
Check By:	
Date:	

Time of Concentration

Basin: TR1A-1

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	674	672.8	0.012	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr)
0.21

TOTAL T_t (hr) 0.21

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
484.41	672.8	661.9	0.0225	n	y =	20.33	16.135	2.42
					n =	16.13		

Tt (hr)
0.06

TOTAL T_t (hr) 0.06

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
1935.7	3

Tt (hr)
0.18

TOTAL T_t (hr) 0.18

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.45 hours = 27 minutes **T_{lag} = 0.27 hours = 16.1 minutes**

Adjusted Indiana-Specific T_c = 0.75 hours = 45 minutes (If applicable)

Christopher B. Burke Engineering, LLC
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Indianapolis, IN 46204
(317) 266-8000

Project No.: 12-0065
Project Name: Upper Berlowitz - Proposed Condition
Calcs. By: BJM Date: 11/26/2013
Check By: Date:

Time of Concentration

Basin: TR1A-2

SHEET FLOW

$Tt(hr) = (0.007(n\ L)^{0.8})/(P2^{0.5}\ s^{0.4})$

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	668.1	668	0.001	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr): 0.58

TOTAL T_t (hr): 0.58

SHALLOW CONCENTRATED FLOW

$Tt(hr) = L/(3600\ V)$

$V(paved) = 20.3282\ S^{0.5}$

$V(unpaved) = 16.1345\ S^{0.5}$

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
2205.1	668	648	0.0091	n	y =	20.33	16.135	1.54
					n =	16.13		

Tt (hr): 0.40

TOTAL T_t (hr): 0.40

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

$Tt(hr) = L/(3600\ V)$

Length (ft)	Velocity (ft/s)
1924.6	3

Tt (hr): 0.18

TOTAL T_t (hr): 0.18

(w/o assuming a velocity)

$Tt(hr) = L/(3600\ V)$

$V(ft/s) = (1.49\ R^{2/3}\ S^{1/2})/n$

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr): 0.00

Total T_c = 1.15 hours = 69 minutes

T_{lag} = 0.69 hours = 41.5 minutes

Adjusted Indiana-Specific T_c = 1.92 hours = 115 minutes (If applicable)

Christopher B. Burke Engineering, LLC
115 W. Washington St., Suite 1368 S
Indianapolis, IN 46204
(317) 266-8000

Project No.: 12-0065
Project Name: Upper Berlowitz - Proposed Condition
Calcs. By: BJM Date: 11/26/2013
Check By: Date:

Time of Concentration

Basin: TR1B

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	651.6	650	0.016	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr)
0.19

TOTAL T_t (hr) 0.19

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
1004	650	648.996	0.001	n	y =	20.33	16.135	0.51
					n =	16.13		

Tt (hr)
0.55

TOTAL T_t (hr) 0.55

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
1004	3

Tt (hr)
0.09

TOTAL T_t (hr) 0.09

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.83 hours = 50 minutes

T_{lag} = 0.50 hours = 29.9 minutes

Adjusted Indiana-Specific T_c = 1.38 hours = 83 minutes (If applicable)

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Project No.: 12-0065
Project Name: Upper Berlowitz - Proposed Condition
Calcs. By: BJM   Date: 11/26/2013
Check By: Date:

Time of Concentration

Basin: TR1C

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	656.1	656	0.001	2.83	0.15	0.58

TOTAL T_t (hr) 0.58

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)   V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
308.91	656	655.691	0.001	n	y =	20.33	16.135	0.51	0.17
					n =	16.13			

TOTAL T_t (hr) 0.17

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
1638.3	3	0.15

TOTAL T_t (hr) 0.15

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)   V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.90 hours = 54 minutes   **T_{lag} = 0.54 hours = 32.2 minutes**

Adjusted Indiana-Specific T_c = 1.49 hours = 90 minutes (If applicable)

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Project No.: 12-0065
Project Name: Upper Berlowitz - Proposed Condition
Calcs. By: BJM Date: 11/26/2013
Check By: Date:

Time of Concentration

Basin: TR1D-1

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	655.7	654.6	0.011	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr): 0.22

TOTAL T_t (hr) 0.22

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V) V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
1254.8	654.6	648.5	0.0049	N	y =	20.33	16.135	1.12
					n =	16.13		

Tt (hr): 0.31

TOTAL T_t (hr) 0.31

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)

Tt (hr)

TOTAL T_t (hr) 0.00

(w/o assuming a velocity)

Tt(hr) = L/(3600 V) V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.53 hours = 32 minutes **T_{lag} = 0.32 hours = 19.1 minutes**

Adjusted Indiana-Specific T_c = 0.88 hours = 53 minutes (If applicable)

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Project No.: 12-0065
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Calcs. By: BJM Date: 11/26/2013
Check By: Date:

Time of Concentration

Basin: TR1D-2

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	656	655.9	0.001	2.83	0.15	0.58

TOTAL T_t (hr) 0.58

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
563.07	655.9	654	0.0034	N	y =	20.33	16.135	0.94	0.17
					n =	16.13			

TOTAL T_t (hr) 0.17

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
1229.3	3	0.11

TOTAL T_t (hr) 0.11

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.86 hours = 51 minutes **T_{lag} = 0.51 hours = 30.8 minutes**

Adjusted Indiana-Specific T_c = 1.43 hours = 86 minutes (If applicable)

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Check By: Date:

Time of Concentration

Basin: TR1D-3

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	658.1	658	0.001	2.83	0.15	0.58

TOTAL T_t (hr) 0.58

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
880.61	658	654	0.0045	N	y =	20.33	16.135	1.09	0.22
					n =	16.13			

TOTAL T_t (hr) 0.22

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)

TOTAL T_t (hr) 0.00

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.80 hours = 48 minutes

T_{lag} = 0.48 hours = 28.8 minutes

Adjusted Indiana-Specific T_c = 1.33 hours = 80 minutes (If applicable)

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Project No.:	12-0065		
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Check By:		Date:	

Time of Concentration

Basin: TR1E

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	660.1	660	0.001	2.83	0.4

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr): 1.26

TOTAL T_t (hr): 1.26

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
1099.1	660	649.9	0.0092	n	y =	20.33	16.135	1.55
					n =	16.13		

Tt (hr): 0.20

TOTAL T_t (hr): 0.20

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)

Tt (hr):

TOTAL T_t (hr): 0.00

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr): 0.00

Total T_c = 1.46 hours = 88 minutes

T_{lag} = 0.88 hours = 52.5 minutes

Adjusted Indiana-Specific T_c = 2.43 hours = 146 minutes (If applicable)

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Check By: Date:

Time of Concentration   Basin: TR1F-1

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	652.1	652	0.001	2.83	0.15	0.58

TOTAL T_t (hr) 0.58

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)   V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
1327.9	652	650	0.0015	N	y =	20.33	16.135	0.63	0.59
					n =	16.13			

TOTAL T_t (hr) 0.59

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)

TOTAL T_t (hr) 0.00

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)   V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 1.16 hours = 70 minutes   **T_{lag} = 0.70 hours = 41.9 minutes**

Adjusted Indiana-Specific T_c = 1.94 hours = 116 minutes (If applicable)

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Project No.: 12-0065
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Check By: Date:

Time of Concentration

Basin: TR1F-2

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	656	655.3	0.007	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr)
0.26

TOTAL T_t (hr) 0.26

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
835.98	655.3	651.1	0.005	N	y =	20.33	16.135	1.14
					n =	16.13		

Tt (hr)
0.20

TOTAL T_t (hr) 0.20

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)

Tt (hr)

TOTAL T_t (hr) 0.00

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.47 hours = 28 minutes

T_{lag} = 0.28 hours = 16.8 minutes

Adjusted Indiana-Specific T_c = 0.78 hours = 47 minutes (If applicable)

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Check By: Date:

Time of Concentration

Basin: TR1F-3

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	658	657.8	0.002	2.83	0.15	0.44

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

TOTAL T_t (hr) 0.44

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
777.62	657.8	657.022	0.001	N	y =	20.33	16.135	0.51	0.42
					n =	16.13			

TOTAL T_t (hr) 0.42

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
647.02	3	0.06

TOTAL T_t (hr) 0.06

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.92 hours = 55 minutes

T_{lag} = 0.55 hours = 33.1 minutes

Adjusted Indiana-Specific T_c = 1.53 hours = 92 minutes (If applicable)

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Check By: Date:

Time of Concentration

Basin: TR1G-1

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	655.4	655	0.004	2.83	0.15	0.33

TOTAL T_t (hr) 0.33

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)
V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
835.36	655	648.3	0.008	N	y =	20.33	16.135	1.44	0.16
					n =	16.13			

TOTAL T_t (hr) 0.16

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)

TOTAL T_t (hr) 0.00

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)
V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.49 hours = 29 minutes   **T_{lag} = 0.29 hours = 17.7 minutes**

Adjusted Indiana-Specific T_c = 0.82 hours = 49 minutes (If applicable)

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Check By: Date:

Time of Concentration

Basin: TR1G-2

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	660	659.7	0.003	2.83	0.15	0.37

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

TOTAL T_t (hr) 0.37

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)
V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
856.48	659.7	654	0.0067	N	y =	20.33	16.135	1.32	0.18
					n =	16.13			

TOTAL T_t (hr) 0.18

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
895.36	3	0.08

TOTAL T_t (hr) 0.08

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)
V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.63 hours = 38 minutes **T_{lag} = 0.38 hours = 22.8 minutes**

Adjusted Indiana-Specific T_c = 1.06 hours = 63 minutes (If applicable)

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Check By: Date:

Time of Concentration

Basin: TR2-1

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	663.3	662.4	0.009	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr)
0.24

TOTAL T_t (hr) 0.24

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
630.73	662.4	654.3	0.0128	N	y =	20.33	16.135	1.83	0.10
					n =	16.13			

TOTAL T_t (hr) 0.10

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
3546.5	3	0.33

TOTAL T_t (hr) 0.33

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.66 hours = 40 minutes

T_{lag} = 0.40 hours = 23.9 minutes

Adjusted Indiana-Specific T_c = 1.11 hours = 66 minutes (If applicable)

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Project No.:	12-0065		
Project Name:	Upper Berlowitz - Proposed Condition		
Calcs. By:	BJM	Date:	11/26/2013
Check By:		Date:	

Time of Concentration

Basin: TR2-2

SHEET FLOW

$Tt(hr) = (0.007(n\ L)^{0.8})/(P2^{0.5}\ s^{0.4})$

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	681.1	680.2	0.009	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr)
0.24

TOTAL T_t (hr) 0.24

SHALLOW CONCENTRATED FLOW

$Tt(hr) = L/(3600\ V)$

$V(paved) = 20.3282\ S^{0.5}$

$V(unpaved) = 16.1345\ S^{0.5}$

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
170.28	680.2	670	0.0599	n	y =	20.33	16.135	3.95
					n =	16.13		

Tt (hr)
0.01

TOTAL T_t (hr) 0.01

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

$Tt(hr) = L/(3600\ V)$

Length (ft)	Velocity (ft/s)
2036.3	3

Tt (hr)
0.19

TOTAL T_t (hr) 0.19

(w/o assuming a velocity)

$Tt(hr) = L/(3600\ V)$

$V(ft/s) = (1.49\ R^{2/3}\ S^{1/2})/n$

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.44 hours = 26 minutes

T_{lag} = 0.26 hours = 15.8 minutes

Adjusted Indiana-Specific T_c = 0.73 hours = 44 minutes (If applicable)

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Project No.: 12-0065
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Calcs. By: BJM   Date: 11/26/2013
Check By: Date:

Time of Concentration

Basin: TR2-3

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	660.1	660	0.001	2.83	0.15	0.58

TOTAL T_t (hr) 0.58

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)   V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
1118.4	660	656	0.0036	n	y =	20.33	16.135	0.96	0.32
					n =	16.13			

TOTAL T_t (hr) 0.32

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)

TOTAL T_t (hr) 0.00

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)   V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.90 hours = 54 minutes   **T_{lag} = 0.54 hours = 32.3 minutes**

Adjusted Indiana-Specific T_c = 1.50 hours = 90 minutes (If applicable)

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Project No.: 12-0065
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Calcs. By: BJM Date: 9/3/2013
Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR2

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	681.1	680.2	0.009	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr): 0.24

TOTAL T_t (hr): 0.24

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
170.28	680.2	670	0.0599	n	y =	20.33	16.135	3.95
					n =	16.13		

Tt (hr): 0.01

TOTAL T_t (hr): 0.01

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
4324.1	3

Tt (hr): 0.40

TOTAL T_t (hr): 0.40

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr): 0.00

Total T_c = 0.65 hours = 39 minutes

T_{lag} = 0.39 hours = 23.4 minutes

Adjusted Indiana-Specific T_c = 1.09 hours = 65 minutes (If applicable)

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Calcs. By:	BJM	Date:	9/3/2013
Check By:	HLF	Date:	9/9/2013

Time of Concentration

Basin: TR3

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	664.1	664	0.001	2.83	0.15	0.58

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

TOTAL T_t (hr) 0.58

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
1474.5	664	657.1	0.0047	n	y =	20.33	16.135	1.10	0.37
					n =	16.13			

TOTAL T_t (hr) 0.37

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
2741.7	3	0.25

TOTAL T_t (hr) 0.25

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 1.20 hours = 72 minutes

T_{lag} = 0.72 hours = 43.2 minutes

Adjusted Indiana-Specific T_c = 2.00 hours = 120 minutes (If applicable)

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Time of Concentration

Basin: TR4

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	678	676.5	0.015	2.83	0.15

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr)
0.19

TOTAL T_t (hr) 0.19

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
1793.1	676.5	656	0.0114	n	y =	20.33	16.135	1.73
					n =	16.13		

Tt (hr)
0.29

TOTAL T_t (hr) 0.29

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
1905.5	3

Tt (hr)
0.18

TOTAL T_t (hr) 0.18

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.66 hours = 40 minutes

T_{lag} = 0.40 hours = 23.8 minutes

Adjusted Indiana-Specific T_c = 1.10 hours = 66 minutes (If applicable)

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Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR5

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	664.1	664	0.001	2.83	0.15	0.58

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

TOTAL T_t (hr) 0.58

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V) V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
1839.5	664	658.2	0.0032	n	y =	20.33	16.135	0.91	0.56
					n =	16.13			

TOTAL T_t (hr) 0.56

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
1839.5	3	0.17

TOTAL T_t (hr) 0.17

(w/o assuming a velocity)

Tt(hr) = L/(3600 V) V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 1.31 hours = 79 minutes **T_{lag} = 0.79 hours = 47.2 minutes**

Adjusted Indiana-Specific T_c = 2.18 hours = 131 minutes (If applicable)

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Project No.: 12-0065
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Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR5A

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	662.1	662	0.001	2.83	0.15	0.58

TOTAL T_t (hr) 0.58

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
1554	662	658.6	0.0022	n	y =	20.33	16.135	0.75	0.57
					n =	16.13			

TOTAL T_t (hr) 0.57

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
1554	3	0.14

TOTAL T_t (hr) 0.14

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 1.29 hours = 77 minutes

T_{lag} = 0.77 hours = 46.5 minutes

Adjusted Indiana-Specific T_c = 2.15 hours = 129 minutes (If applicable)

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Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR6

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	662.2	662.1	0.001	2.83	0.13

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr): 0.51

TOTAL T_t (hr): 0.51

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
563.06	662.1	661.537	0.001	n	y =	20.33	16.135	0.51
					n =	16.13		

Tt (hr): 0.31

TOTAL T_t (hr): 0.31

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
2740.5	3

Tt (hr): 0.25

TOTAL T_t (hr): 0.25

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr): 0.00

Total T_c = 1.07 hours = 64 minutes

T_{lag} = 0.64 hours = 38.6 minutes

Adjusted Indiana-Specific T_c = 1.79 hours = 107 minutes (If applicable)

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Check By: Date:

Time of Concentration

Basin: TR6-2

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	658	657.8	0.002	2.83	0.011

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr): 0.05

TOTAL T_t (hr): 0.05

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
215.18	657.8	656	0.0084	Y	y =	20.33	20.328	1.86
					n =	16.13		

Tt (hr): 0.03

TOTAL T_t (hr): 0.03

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
4230.3	5

Tt (hr): 0.24

TOTAL T_t (hr): 0.24

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr): 0.00

Total T_c = 0.32 hours = 19 minutes

T_{lag} = 0.19 hours = 11.6 minutes

Adjusted Indiana-Specific T_c = 0.54 hours = 32 minutes (If applicable)

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Check By: Date:

Time of Concentration

Basin: TR6-3

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	659.5	658.2	0.013	2.83	0.011

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr): 0.03

TOTAL T_t (hr): 0.03

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
36.694	658.2	658	0.0055	Y	y =	20.33	20.328	1.50
					n =	16.13		

Tt (hr): 0.01

TOTAL T_t (hr): 0.01

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
1675	5

Tt (hr): 0.09

TOTAL T_t (hr): 0.09

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr): 0.00

Total T_c = 0.13 hours = 8 minutes

T_{lag} = 0.08 hours = 4.51 minutes

Adjusted Indiana-Specific T_c = 0.21 hours = 13 minutes (If applicable)

Christopher B. Burke Engineering, LLC
115 W. Washington St., Suite 1368 S
Indianapolis, IN 46204
(317) 266-8000

Project No.: 12-0065
Project Name: Upper Berlowitz - Proposed Condition
Calcs. By: BJM   Date: 9/3/2013
Check By: HLF   Date: 9/9/2013

Time of Concentration

Basin: TR7

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	662.1	662	0.001	2.83	0.15	0.58

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

TOTAL T_t (hr) 0.58

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)   V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)		Coef.	Velocity	Tt (hr)
	662				y =	20.33		
					n =	16.13		

TOTAL T_t (hr) 0.00

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
3782.9	3	0.35

TOTAL T_t (hr) 0.35

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)   V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.93 hours = 56 minutes   **T_{lag} = 0.56 hours = 33.3 minutes**

Adjusted Indiana-Specific T_c = 1.54 hours = 93 minutes (If applicable)

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Project No.:	12-0065		
Project Name:	Upper Berlowitz - Proposed Condition		
Calcs. By:	BJM	Date:	9/3/2013
Check By:	HLF	Date:	9/9/2013

Time of Concentration

Basin: TR7A

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	664	662.9	0.011	2.83	0.011	0.03

TOTAL T_t (hr) 0.03

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)		Coef.	Velocity	Tt (hr)
	662.9				y =	20.33		
					n =	16.13		

TOTAL T_t (hr) 0.00

OPEN CHANNEL/PIPE FLOW
(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
2164.3	3	0.20

TOTAL T_t (hr) 0.20

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.23 hours = 14 minutes **T_{lag} = 0.14 hours = 8.2 minutes**

Adjusted Indiana-Specific T_c = 0.38 hours = 23 minutes (If applicable)

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Project No.: 12-0065
Project Name: Upper Berlowitz - Proposed Condition
Calcs. By: BJM Date: 9/3/2013
Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR8

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	662	661.6	0.004	2.83	0.15	0.33

TOTAL T_t (hr) 0.33

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
782.52	661.6	658	0.0046	n	y =	20.33	16.135	1.09	0.20
					n =	16.13			

TOTAL T_t (hr) 0.20

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
4555.8	3	0.42

TOTAL T_t (hr) 0.42

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.95 hours = 57 minutes

T_{lag} = 0.57 hours = 34.2 minutes

Adjusted Indiana-Specific T_c = 1.59 hours = 95 minutes (If applicable)

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Project Name:	Upper Berlowitz - Proposed Condition		
Calcs. By:	BJM	Date:	9/3/2013
Check By:	HLF	Date:	9/9/2013

Time of Concentration

Basin: TR9

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	662	660	0.02	2.83	0.15	0.17
					TOTAL T_t (hr)	0.17

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
370.8	660	659.4	0.0016	y	y =	20.33	20.328	0.82	0.13
					n =	16.13			
								TOTAL T_t (hr)	0.13

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
1716.1	3	0.16
	TOTAL T_t (hr)	0.16

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)
											TOTAL T_t (hr)	0.00

Total T_c = 0.46 hours = 28 minutes

T_{lag} = 0.28 hours = 16.5 minutes

Adjusted Indiana-Specific T_c = 0.76 hours = 46 minutes (If applicable)

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Project No.:	12-0065		
Project Name:	Upper Berlowitz - Proposed Condition		
Calcs. By:	BJM	Date:	9/3/2013
Check By:	HLF	Date:	9/9/2013

Time of Concentration

Basin: TR9A

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	662.1	662	0.001	2.83	0.15	0.58

TOTAL T_t (hr) 0.58

Surface Description	**n-value**
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
226.29	662	661.774	0.001	n	y =	20.33	16.135	0.51	0.12
					n =	16.13			

TOTAL T_t (hr) 0.12

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
4055.9	3	0.38

TOTAL T_t (hr) 0.38

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 1.07 hours = 64 minutes

T_{lag} = 0.64 hours = 38.7 minutes

Adjusted Indiana-Specific T_c = 1.79 hours = 107 minutes (If applicable)

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Project No.: 12-0065
Project Name: Upper Berlowitz - Proposed Condition
Calcs. By: BJM Date: 9/3/2013
Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR9B

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	667.9	664	0.039	2.83	0.15	0.13

TOTAL T_t (hr) 0.13

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
1007.7	664	658.9	0.0051	n	y =	20.33	16.135	1.15	0.24
					n =	16.13			

TOTAL T_t (hr) 0.24

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
1997.7	3	0.18

TOTAL T_t (hr) 0.18

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.56 hours = 34 minutes

T_{lag} = 0.34 hours = 20.2 minutes

Adjusted Indiana-Specific T_c = 0.94 hours = 56 minutes (If applicable)

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Project No.: 12-0065
Project Name: Upper Berlowitz - Proposed Condition
Calcs. By: BJM Date: 9/3/2013
Check By: HLF Date: 9/9/2013

Time of Concentration

Basin: TR10

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n
100	664.1	664	0.001	2.83	0.4

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

Tt (hr): **1.26**

TOTAL T_t (hr): **1.26**

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity
1506.3	664	656	0.0053	n	y =	20.33	16.135	1.18
					n =	16.13		

Tt (hr): **0.36**

TOTAL T_t (hr): **0.36**

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)
1537	3

Tt (hr): **0.14**

TOTAL T_t (hr): **0.14**

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr): **0.00**

Total T_c = 1.76 hours = 106 minutes

T_{lag} = 1.06 hours = 63.3 minutes

Adjusted Indiana-Specific T_c = 2.93 hours = 176 minutes (If applicable)

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Project No.:	12-0065		
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Calcs. By:	BJM	Date:	9/3/2013
Check By:	HLF	Date:	9/9/2013

Time of Concentration

Basin: TR10A

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	661.9	660	0.019	2.83	0.15	0.18

TOTAL T_t (hr) 0.18

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
355.45	660	658	0.0056	n	y =	20.33	16.135	1.21	0.08
					n =	16.13			

TOTAL T_t (hr) 0.08

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
1256.3	3	0.12

TOTAL T_t (hr) 0.12

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 0.38 hours = 23 minutes

T_{lag} = 0.23 hours = 13.5 minutes

Adjusted Indiana-Specific T_c = 0.63 hours = 38 minutes (If applicable)

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Project No.:	12-0065		
Project Name:	Upper Berlowitz - Proposed Condition		
Calcs. By:	BJM	Date:	9/3/2013
Check By:	HLF	Date:	9/9/2013

Time of Concentration

Basin: TR11

SHEET FLOW

Tt(hr) = (0.007(n L)^0.8)/(P2^0.5 s^0.4)

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	P2 (in)	n	Tt (hr)
100	663.2	662.6	0.006	2.83	0.15	0.28

TOTAL T_t (hr) 0.28

Surface Description	n-value
Smooth surfaces	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover<20%	0.06
Residue cover>20%	0.17
Average	0.15
Grass:	
Short grass	0.15
Lawn grasses	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:	
Light underbrush	0.4
Dense underbrush	0.8

SHALLOW CONCENTRATED FLOW

Tt(hr) = L/(3600 V)

V(paved) = 20.3282 S^0.5
V(unpaved) = 16.1345 S^0.5

Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	Pave(y/n)			Coef.	Velocity	Tt (hr)
1250.8	662.6	660	0.0021	n	y =	20.33	16.135	0.74	0.47
					n =	16.13			

TOTAL T_t (hr) 0.47

OPEN CHANNEL/PIPE FLOW

(assuming a velocity)

Tt(hr) = L/(3600 V)

Length (ft)	Velocity (ft/s)	Tt (hr)
4748.3	3	0.44

TOTAL T_t (hr) 0.44

(w/o assuming a velocity)

Tt(hr) = L/(3600 V)

V(ft/s) = (1.49 R^2/3 S^1/2)/n

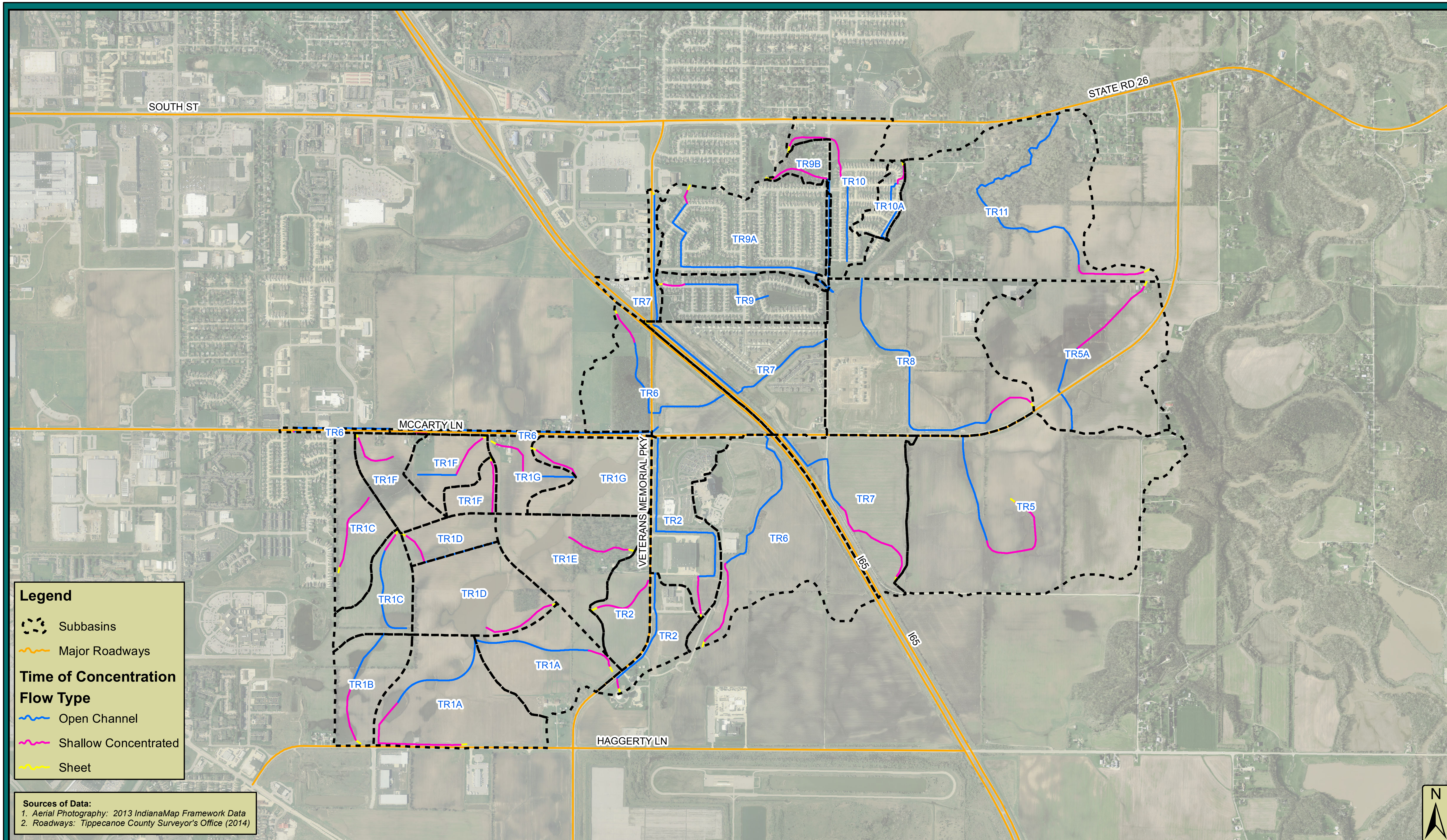
Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope	n-value	Open Channel Bottom (ft)	Open Channel SS (ft)	Pipe DIA (ft)	Depth (ft)	Area	R	Velocity	Tt (hr)

TOTAL T_t (hr) 0.00

Total T_c = 1.19 hours = 72 minutes

T_{lag} = 0.72 hours = 42.9 minutes

Adjusted Indiana-Specific T_c = 1.99 hours = 119 minutes (If applicable)



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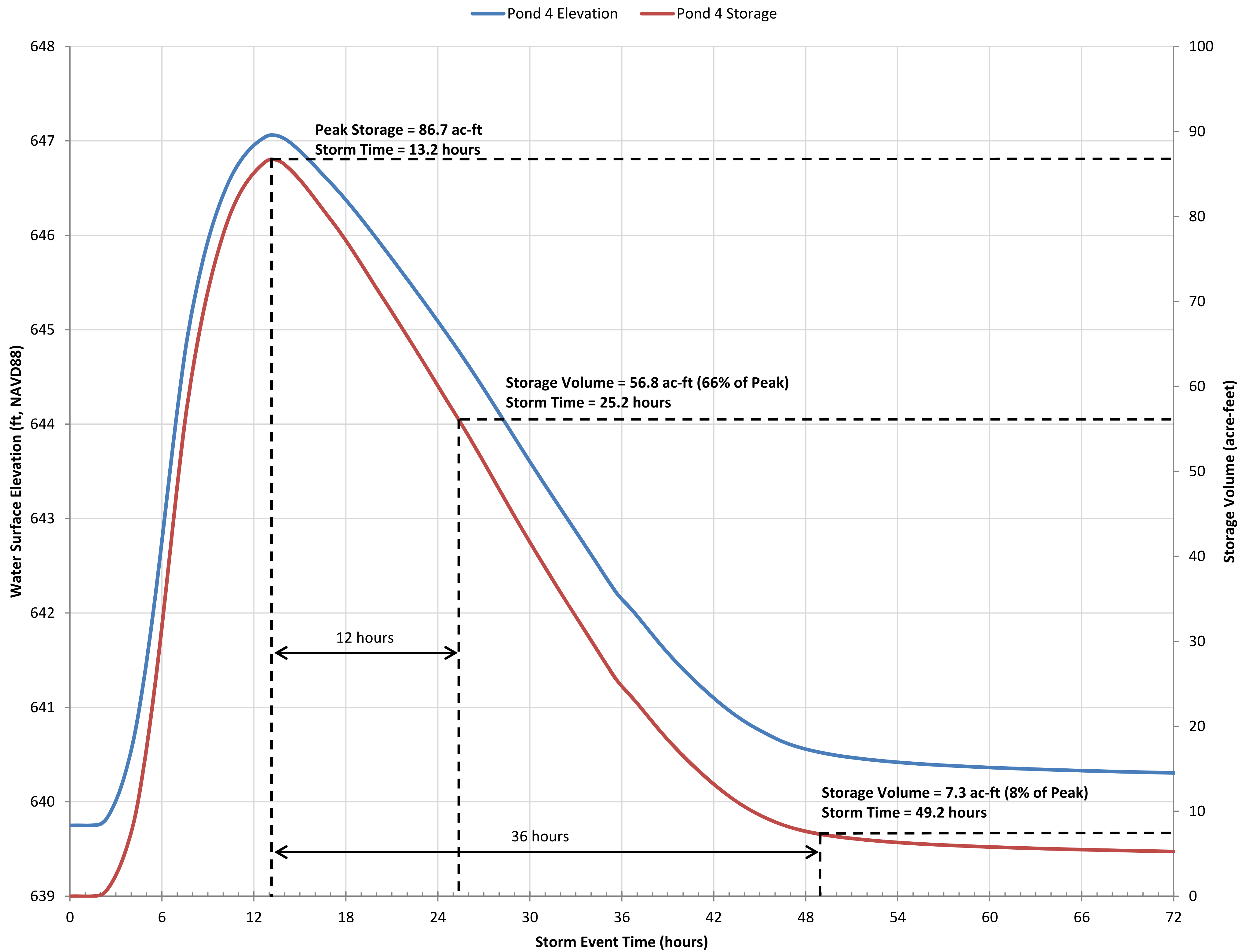
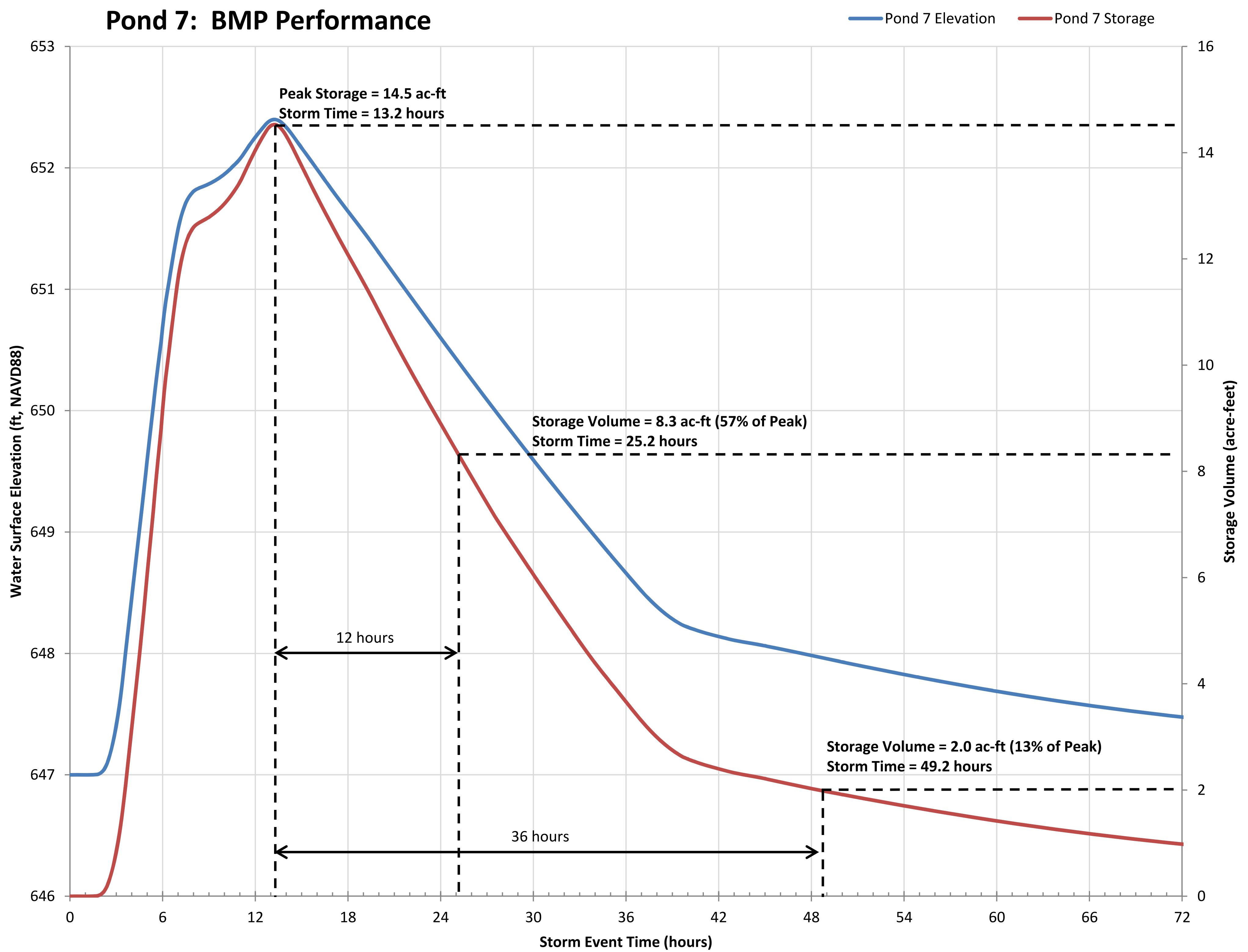
PROJECT: Upper Berlowitz Master Plan	PROJECT NO. 14-0318	APPROX. SCALE 1 " = 1,500 ft	
TITLE: Proposed Condition Time of Concentration		DATE: 11/2014	EXHIBIT A1.6


Pond 4 Elevation
Pond 4 Storage
Peak Storage = 86.7 ac-ft
Storm Time = 13.2 hours
Storage Volume = 56.8 ac-ft (66% of Peak)
Storm Time = 25.2 hours
Storage Volume = 7.3 ac-ft (8% of Peak)
Storm Time = 49.2 hours
12 hours
36 hours
Water Surface Elevation (ft, NAVD88)
Storage Volume (acre-feet)
Storm Event Time (hours)
648
647
646
645
644
643
642
641
640
639
100
90
80
70
60
50
40
30
20
10
0
0
6
12
18
24
30
36
42
48
54
60
66
72



Pond 7: BMP Performance
Pond 7 Elevation
Pond 7 Storage
Peak Storage = 14.5 ac-ft
Storm Time = 13.2 hours
Storage Volume = 8.3 ac-ft (57% of Peak)
Storm Time = 25.2 hours
Storage Volume = 2.0 ac-ft (13% of Peak)
Storm Time = 49.2 hours
12 hours
36 hours
Water Surface Elevation (ft, NAVD88)
Storage Volume (acre-feet)
Storm Event Time (hours)
653
652
651
650
649
648
647
646
16
14
12
10
8
6
4
2
0
0
6
12
18
24
30
36
42
48
54
60
66
72

```
 Current Directory:   C:\XPS\XPSWMM~2
 Engine Name: c:\xps\XPSWMM~2\SWMMEN~1.EXE




 Input File : 2\12-0065\Models\XPSWMM\Upper Berlowitz_Design_100yr 12hr Huff.XP

          *================================================*
          |                    xpswmm                      |
          |     Storm and Wastewater Management Model      |
          |        Developed by XP Solutions Inc.          |
          |================================================|
          |                                                |
          | Last Update      : Oct., 2011                  |
          | Interface Version: 2012 SP1                    |
          | Engine Version   : 12.0                        |
          | Data File Version: 12.4                        |
          |                                                |
          |                                                |
          *================================================*

Engine Name: c:\xps\XPSWMM~2\SWMMEN~1.EXE




*=====================================================*
|       Input and Output file names by Layer          |
*=====================================================*

 Input File  to Layer #     1 JOT.US


 Output File to Layer #     1 JOT.US


 Input File  to Layer #     2 JOT.US


 Output File to Layer #     2 JOT.US



*============================================================*
|   Special command line arguments in XP-SWMM2000. This      |
|   now includes program defaults. $Keywords are the program|
|   defaults.  Other Keywords are from the SWMMCOM.CFG file.|
|   or the command line or any cfg file on the command line.|
|   Examples include these in the file xpswm.bat under the  |
|   section :solve or in the windows version XPSWMM32 in the|
|   file solve.bat                                          |
|                                                           |
|   Note: the cfg file should be in the subdirectory swmxp  |
|         or defined by the set variable in the xpswm.bat   |
|         file.  Some examples of the command lines possible|
```

```
|         are shown below:                                    |
|                                                             |
|   swmmd swmmcom.cfg                                         |
|   swmmd my.cfg                                              |
|   swmmd nokeys nconv5 perv extranwq                         |
*=============================================================*

 $powerstation                        0.0000         1         2
 $perv                                0.0000         0         4
 $oldegg                              0.0000         0         7
 $as                                  0.0000         0        11
 $noflat                              0.0000         0        21
 $oldomega                            0.0000         0        24
 $oldvol                              0.0000         1        28
 $implicit                            0.0000         1        29
 $oldhot                              0.0000         1        31
 $oldscs                              0.0000         0        33
 $flood                               0.0000         1        40
 $nokeys                              0.0000         0        42
 $pzero                               0.0000         0        55
 $oldvol2                             0.0000         2        59
 $storage2                            0.0000         3        62
 $oldhot1                             0.0000         1        63
 $pumpwt                              0.0000         1        70
 WSLOT3                               0.0000         3        71
 $ecloss                              0.0000         1        77
 $exout                               0.0000         0        97
 $spatial = 0.90                      0.9000         5       124
 $djref = -1.0                       -0.1000         3       143
 $weirlen = 50                       50.0000         1       153
 $oldbnd                              0.0000         1       154
 $nogrelev                            0.0000         1       161
 $ncmid                               0.0000         0       164
 $new_nl_97                           0.0000         2       290
 SCSIADEPTH=ON                        0.0000         1       293
 $best97                              0.0000         1       294
 $newbound                            0.0000         1       295
 $q_tol = 0.01                        0.0001         1       316
 $new_storage                         0.0000         1       322
 $old_iteration                       0.0000         1       333
 MINLEN=20                           20.0000         1       346
 $review_elevation                    0.0000         1       383
 $use_half_volume                     0.0000         1       385
 VERT_WALLS=ON                        0.0000         1       389
 $min_ts = 1.0                        1.0000         1       407
 $design_restart = on                 0.0000         1       412
 $zero_value=1.e-05                   0.0000         1       415
 SUBCATCHMENT_RES=ON                  0.0000         1       419
 $relax_depth = on                    0.0000         1       427
 $saveallpts = on                     0.0000         1       434

 *============================================================*
 | Parameter Values on the Tapes Common Block.These are the |
 | values read from the data file and dynamically allocated |
 | by the model for this simulation.                         |
 *============================================================*

  Number of Subcatchments in the Runoff Block (NW)....    33
  Number of Channel/Pipes in the Runoff Block (NG)....     0
  Runoff Water quality constituents (NRQ).............     0
  Runoff Land Uses per Subcatchment (NLU).............     0
  Number of Elements in the Transport Block (NET).....     0
  Number of Storage Junctions in Transport (NTSE).....     0
```

```
 Number of Input Hydrographs in Transport (NTH)......     0
 Number of Elements in the Extran Block (NEE)........    56
 Number of Groundwater Subcatchments in Runoff (NGW).     0
 Number of Interface locations for all Blocks (NIE)..    56
 Number of Pumps in Extran (NEP).....................     0
 Number of Orifices in Extran (NEO)..................     4
 Number of Tide Gates/Free Outfalls in Extran (NTG)..     1
 Number of Extran Weirs (NEW)........................     3
 Number of scs hydrograph points.....................  2961
 Number of Extran printout locations (NPO)...........     3
 Number of Tide elements in Extran (NTE).............     1
 Number of Natural channels (NNC)....................    10
 Number of Storage junctions in Extran (NVSE)........    11
 Number of Time history data points in Extran(NTVAL).     0
 Number of Variable storage elements in Extran (NVST)    14
 Number of Input Hydrographs in Extran (NEH).........     0
 Number of Particle sizes in Transport Block (NPS)...     0
 Number of User defined conduits (NHW)...............    33
 Number of Connecting conduits in Extran (NECC)......    20
 Number of Upstream elements in Transport (NTCC).....    10
 Number of Storage/treatment plants (NSTU)...........     1
 Number of Values for R1 lines in Transport (NR1)....     0
 Number of Nodes to be allowed for (NNOD)............    56
 Number of Plugs in a Storage Treatment Unit.........     1

########################################################
#    Entry made to the Runoff Layer(Block) of SWMM    #
#    Last Updated Oct., 2011 by XP Solutions          #

*===========================================================*
|          RUNOFF TABLES IN THE OUTPUT FILE.                |
|  These are the more important tables in the output file. |
|  You can use your editor to find the table numbers,      |
|  for example: search for Table R3 to check continuity.   |
|  This output file can be imported into a Word Processor  |
|  and printed on US letter or A4 paper using portrait     |
|  mode, courier font, a size of 8 pt. and margins of 0.75 |
|                                                           |
| Table R1  - Physical Hydrology Data                       |
| Table R2  - Infiltration data                             |
| Table R3  - Raingage and Infiltration Database Names      |
| Table R4  - Groundwater Data                              |
| Table R5  - Continuity Check for Surface Water            |
| Table R6  - Continuity Check for Channels/Pipes           |
| Table R7  - Continuity Check for Subsurface Water         |
| Table R8  - Infiltration/Inflow Continuity Check          |
| Table R9  - Summary Statistics for Subcatchments          |
| Table R10 - Sensitivity anlysis for Subcatchments         |
*===========================================================*

                  A1


###########################################
#             RUNOFF JOB CONTROL          #
###########################################

 Snowmelt parameter - ISNOW......................            0
 Number of rain gages - NRGAG....................            1
 Quality is not simulated - KWALTY...............            0
 Default evaporation rate used - IVAP............            0
```

```
 Hour of day at start of storm - NHR.............            0
 Minute of hour at start of storm - NMN..........            0
 Time TZERO at start of storm (hours)............        0.000
 Use U.S. Customary units for most I/O - METRIC...           0
 Runoff input print control...                               0
 Runoff graph plot control....                               0
 Runoff output print control..                               0
 Limit number of groundwater convergence messages to     10000

 Print headers every 50 lines - NOHEAD (0=yes, 1=no)         0

 Print land use load percentages -LANDUPR (0=no, 1=yes)      0
 Month, day, year of start of storm is:             1/ 1/2013
 Wet time step length (seconds).......                    60.0
 Dry time step length (seconds).......                 86400.0
 Wet/Dry time step length (seconds)...                    60.0
 Simulation length is......                               48.0 Hours

 If Horton infiltration model is being used
 A mixture of infiltration options may be used in
 XP-SWMM2000 as a watershed specific option.
 Rate for regeneration of infiltration = REGEN * DECAY
 Decay is read in for each subcatchment
 REGEN = .............................................  0.01000


 Raingage #...............................          1
 KTYPE  - Rainfall input type.............          0
 NHISTO - Total number of rainfall values..        21
 KINC   - Rainfall values(pairs) per line..        10
 KPRINT - Print rainfall(0-Yes,1-No).......         0
 KTIME  - Precipitation time units
 0 --> Minutes  1 --> Hours...............          0
 KPREP  - Precipitation unit type
 0 --> Intensity  1 --> Volume............          1
 KTHIS - Variable rainfall intervals
 0 --> No, > 1 --> Yes....................          0
 THISTO - Rainfall time interval..........      36.00
 TZRAIN - Starting time(KTIME units).......      0.00


######################################
# Rainfall input summary from Runoff #
######################################

 Total rainfall for gage #     1 is    5.5100 inches

   #############################
   #       Data Group F1       #
   # Evaporation Rate (in/day) #
   #############################

  JAN.  FEB.  MAR.  APR.  MAY   JUN.  JUL.  AUG.  SEP.  OCT.  NOV  DEC.
  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ---- ----
 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100


  ###################################################
  #  Table R1.  S U B C A T C H M E N T  D A T A    #
  #            Physical Hydrology Data              #
  ###################################################
```

```
    Deprs Deprs Prcnt
                                                                            Per-
   -sion -sion  Zero
       Subcatchment           Channel      Width    Area      cent  Slope  "n"
"n"  Storge Strge Deten
  Number         Name         or inlet      (ft)    (ac)     Imperv ft/ft Imprv
Perv Imprv  Perv -tion
  ====== ============== =============== ======== ========   ====== ===== =====
===== ===== ===== =====

 ###> Warning !! One of more of the infiltration parameters have not been set to
non-zero values
      1          TR2-3#1            TR2-3 1.0000    32.770      0.00 1.000 0.020
0.020 0.000 0.000  0.00

 ###> Warning !! One of more of the infiltration parameters have not been set to
non-zero values
      2          TR2-2#1            TR2-2 1.0000    28.310      0.00 1.000 0.020
0.020 0.000 0.000  0.00

 ###> Warning !! One of more of the infiltration parameters have not been set to
non-zero values
      3        TR2-2.1#1          TR2-2.1 1.0000    62.900      0.00 1.000 0.020
0.020 0.000 0.000  0.00
      4          TR6-3#1            TR6-3 1.0000    3.0400      0.00 1.000 0.020
0.020 0.000 0.000  0.00
      5          TR6-3#2            TR6-3 1.0000    40.000      0.00 1.000 0.020
0.020 0.000 0.000  0.00
      6         TR1F-3#1           TR1F-3 1.0000    27.660      0.00 1.000 0.020
0.020 0.000 0.000  0.00
      7         TR1F-1#1           TR1F-1 1.0000    42.070      0.00 1.000 0.020
0.020 0.000 0.000  0.00
      8         TR1F-2#1           TR1F-2 1.0000    31.880      0.00 1.000 0.020
0.020 0.000 0.000  0.00
      9          TR6-2#1            TR6-2 1.0000    8.4200      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     10          TR6-1#1            TR6-1 1.0000    88.080      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     11          TR6-1#2            TR6-1 1.0000    138.49      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     12            TR7#1              TR7 1.0000    86.150      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     13            TR7#2              TR7 1.0000    18.530      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     14            TR7#3              TR7 1.0000    80.660      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     15           TR5A#1             TR5A 1.0000    151.27      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     16            TR5#1              TR5 1.0000    254.24      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     17            TR9#1              TR9 1.0000    51.340      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     18           TR10#1             TR10 1.0000    51.650      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     19          TR10A#1            TR10A 1.0000    12.920      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     20           TR11#1             TR11 1.0000    202.23      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     21           TR9A#1             TR9A 1.0000    98.410      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     22           TR9B#1             TR9B 1.0000    14.760      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     23            TR8#1              TR8 1.0000    182.60      0.00 1.000 0.020
```

```
0.020 0.000 0.000  0.00
     24         TR1G-2#1           TR1G-2 1.0000    25.850      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     25         TR1D-2#1           TR1D-2 1.0000    21.320      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     26         TR1D-3#1           TR1D-3 1.0000    12.330      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     27           TR1B#1             TR1B 1.0000    39.950      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     28           TR1C#1             TR1C 1.0000    33.260      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     29         TR1A-2#1           TR1A-2 1.0000    89.100      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     30         TR1A-1#1           TR1A-1 1.0000    59.260      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     31         TR1D-1#1           TR1D-1 1.0000    64.450     19.00 1.000 0.020
0.020 0.000 0.000  0.00
     32           TR1E#1             TR1E 1.0000    70.210     11.00 1.000 0.020
0.020 0.000 0.000  0.00
     33         TR1G-1#1           TR1G-1 1.0000    55.050     25.00 1.000 0.020
0.020 0.000 0.000  0.00


###################################################################################
####################
#         Table R2.  SUBCATCHMENT  DATA
                  #
#                    Infiltration or Time of Concentration Data
                  #
#
                  #
# Infiltration Type      Infl #1(#5)       Infl #2(#6)          Infl #3(#7)
     Infl #4(#8)  #
# SCS                 ->   Comp CN          Time Conc         Shape Factor
Depth or Fraction  #
# SBUH                ->   Comp CN          Time Conc                  N/A
             N/A  #
# Green Ampt          ->   Suction          Hydr Cond           Initial MD
             N/A  #
# Horton              ->  Max Rate           Min Rate   Decay Rate (1/sec)
Max. Infilt. Volume  #
# Proportional        ->  Constant                N/A                  N/A
             N/A  #
# Initial/Cont Loss   ->   Initial         Continuing                  N/A
             N/A  #
# Initial/Proportional ->   Initial           Constant                  N/A
             N/A  #
# Laurenson Parameters ->   B Value       Pervious "n"      Impervious Cont
        Exponent  #
# Rational Formula     -> Tc Method   Flow Path Length      Flow Path Slope
Roughness or Retardance  #
#                               (#1 - #4 is Impervious Data / #5 - #8 is Pervious
Data)              #
#                      Rational Formula Tc Method: 1 = Constant
                  #
#                                                  2 = Friend's Equation
                  #
#                                                  3 = Kinematic Wave
                  #
#                                                  4 = Alameda Method
                  #
#                                                  5 = Izzard's Formula
                  #
```

```
#                                               6 = Kerby's Equation
                  #
#                                               7 = Kirpich's Equation
                  #
#                                               8 = Bransby Williams Equation
                  #
#                                               9 = Federal Aviation Authority
Equation            #
####################################################################################
####################
```

Subcatchment Number	Infl Name	Infl # 1	Infl # 2	Infl # 3	Infl # 4	Infl # 5	Infl # 6	Infl # 7	Infl # 8
1	TR2-3#1	90.0000	0.6500	0.0000	0.2000				
2	TR2-2#1	90.0000	0.4333	0.0000	0.2000				
3	TR2-2.1#1	90.0000	0.6667	0.0000	0.2000				
4	TR6-3#1	86.0000	0.1333	484.0000	0.2000				
5	TR6-3#2	90.0000	0.5000	484.0000	0.2000				
6	TR1F-3#1	89.0000	0.9167	484.0000	0.2000				
7	TR1F-1#1	89.0000	1.1667	484.0000	0.2000				
8	TR1F-2#1	89.0000	0.4667	484.0000	0.2000				
9	TR6-2#1	86.0000	0.3167	484.0000	0.2000				
10	TR6-1#1	86.0000	1.0667	484.0000	0.2000				
11	TR6-1#2	86.0000	1.2333	484.0000	0.2000				
12	TR7#1	79.0000	0.9333	484.0000	0.2000				
13	TR7#2	85.0000	0.2333	0.0000	0.2000				
14	TR7#3	84.0000	0.6667	0.0000	0.2000				
15	TR5A#1	80.0000	0.9333	484.0000	0.2000				
16	TR5#1	76.0000	1.4833	484.0000	0.2000				
17	TR9#1	79.0000	0.4667	484.0000	0.2000				
18	TR10#1	80.0000	1.7667	484.0000	0.2000				
19	TR10A#1	82.0000	0.3833	484.0000	0.2000				
20	TR11#1	70.0000	1.0667	484.0000	0.2000				
21	TR9A#1	81.0000	1.0667	484.0000	0.2000				
22	TR9B#1	76.0000	0.5667	484.0000	0.2000				
23	TR8#1	77.0000	0.9500	484.0000	0.2000				

24	TR1G-2#1	89.0000	0.6333	484.0000	0.2000
25	TR1D-2#1	89.0000	0.8500	484.0000	0.2000
26	TR1D-3#1	89.0000	0.8000	484.0000	0.2000
27	TR1B#1	89.0000	0.8333	484.0000	0.2000
28	TR1C#1	89.0000	0.9000	484.0000	0.2000
29	TR1A-2#1	89.0000	1.1500	484.0000	0.2000
30	TR1A-1#1	89.0000	0.4500	484.0000	0.2000
31	TR1D-1#1	90.7100	0.5333	484.0000	0.2000
32	TR1E#1	89.9900	1.4667	484.0000	0.2000
33	TR1G-1#1	91.2500	0.5000	484.0000	0.2000

```
############################################################
#     Table R3.  SUBCATCHMENT  DATA                        #
#                Rainfall and Infiltration Database Names  #
############################################################
```

Subcatchment Number	Name	Gage No	Infiltration Type	Routing Type
1	TR2-3#1	1	SCS Method	SCS curvilinear
2	TR2-2#1	1	SCS Method	SCS curvilinear
3	TR2-2.1#1	1	SCS Method	SCS curvilinear
4	TR6-3#1	1	SCS Method	SCS curvilinear
5	TR6-3#2	1	SCS Method	SCS curvilinear
6	TR1F-3#1	1	SCS Method	SCS curvilinear
7	TR1F-1#1	1	SCS Method	SCS curvilinear
8	TR1F-2#1	1	SCS Method	SCS curvilinear
9	TR6-2#1	1	SCS Method	SCS curvilinear
10	TR6-1#1	1	SCS Method	SCS curvilinear
11	TR6-1#2	1	SCS Method	SCS curvilinear
12	TR7#1	1	SCS Method	SCS curvilinear
13	TR7#2	1	SCS Method	SCS curvilinear
14	TR7#3	1	SCS Method	SCS curvilinear
15	TR5A#1	1	SCS Method	SCS curvilinear
16	TR5#1	1	SCS Method	SCS curvilinear
17	TR9#1	1	SCS Method	SCS curvilinear
18	TR10#1	1	SCS Method	SCS curvilinear
19	TR10A#1	1	SCS Method	SCS curvilinear
20	TR11#1	1	SCS Method	SCS curvilinear
21	TR9A#1	1	SCS Method	SCS curvilinear
22	TR9B#1	1	SCS Method	SCS curvilinear
23	TR8#1	1	SCS Method	SCS curvilinear
24	TR1G-2#1	1	SCS Method	SCS curvilinear
25	TR1D-2#1	1	SCS Method	SCS curvilinear
26	TR1D-3#1	1	SCS Method	SCS curvilinear
27	TR1B#1	1	SCS Method	SCS curvilinear
28	TR1C#1	1	SCS Method	SCS curvilinear
29	TR1A-2#1	1	SCS Method	SCS curvilinear
30	TR1A-1#1	1	SCS Method	SCS curvilinear
31	TR1D-1#1	1	SCS Method	SCS curvilinear
32	TR1E#1	1	SCS Method	SCS curvilinear
33	TR1G-1#1	1	SCS Method	SCS curvilinear

```
 Total Number of Subcatchments...            33
 Total Tributary Area (acres)....       2179.16
 Impervious Area (acres).........         33.73
 Pervious Area (acres)...........       2145.43
 Total Width (feet)..............         33.00
 Impervious Area (%).............          1.55


  ###################################################
  #         S U B C A T C H M E N T   D A T A       #
  #   Default, Ratio values for subcatchment data   #
  #   Used with the calibrate node in the runoff.   #
  # 1 - width     2 - area      3 - impervious %    #
  # 4 - slope     5 - imp "n"    6 - perv "n"       #
  # 7 - imp ds    8 - perv ds    9 - 1st infil      #
  #10 - 2nd infil              11 - 3rd infil       #
  ###################################################

 Column           1         2         3         4         5         6         7
    8         9        10        11
 Default     0.0000    0.0000    0.0000    0.0000    0.0000    0.0000    0.0000
0.0000    0.0000    0.0000    0.0000
 Ratio       1.0000    1.0000    1.0000    1.0000    1.0000    1.0000    1.0000
1.0000    1.0000    1.0000    1.0000

 *********************************************************
 *     Arrangement of Subcatchments and Channel/Pipes    *
 *********************************************************


     Inlet
 TR2-3          No Tributary Channel/Pipes
                Tributary Subareas........ TR2-3#1
 TR2-2          No Tributary Channel/Pipes
                Tributary Subareas........ TR2-2#1
 TR2-2.1        No Tributary Channel/Pipes
                Tributary Subareas........ TR2-2.1#1
 TR6-3          No Tributary Channel/Pipes
                Tributary Subareas........ TR6-3#1    TR6-3#2
 TR1F-3         No Tributary Channel/Pipes
                Tributary Subareas........ TR1F-3#1
 TR1F-1         No Tributary Channel/Pipes
                Tributary Subareas........ TR1F-1#1
 TR1F-2         No Tributary Channel/Pipes
                Tributary Subareas........ TR1F-2#1
 TR6-2          No Tributary Channel/Pipes
                Tributary Subareas........ TR6-2#1
 TR6-1          No Tributary Channel/Pipes
                Tributary Subareas........ TR6-1#1    TR6-1#2
 TR7            No Tributary Channel/Pipes
                Tributary Subareas........ TR7#1      TR7#2      TR7#3
 TR5A           No Tributary Channel/Pipes
                Tributary Subareas........ TR5A#1
 TR5            No Tributary Channel/Pipes
                Tributary Subareas........ TR5#1
 TR9            No Tributary Channel/Pipes
                Tributary Subareas........ TR9#1
 TR10           No Tributary Channel/Pipes
                Tributary Subareas........ TR10#1
 TR10A          No Tributary Channel/Pipes
                Tributary Subareas........ TR10A#1
 TR11           No Tributary Channel/Pipes
```

```
                Tributary Subareas........ TR11#1
TR9A            No Tributary Channel/Pipes
                Tributary Subareas........ TR9A#1
TR9B            No Tributary Channel/Pipes
                Tributary Subareas........ TR9B#1
TR8             No Tributary Channel/Pipes
                Tributary Subareas........ TR8#1
TR1G-2          No Tributary Channel/Pipes
                Tributary Subareas........ TR1G-2#1
TR1D-2          No Tributary Channel/Pipes
                Tributary Subareas........ TR1D-2#1
TR1D-3          No Tributary Channel/Pipes
                Tributary Subareas........ TR1D-3#1
TR1B            No Tributary Channel/Pipes
                Tributary Subareas........ TR1B#1
TR1C            No Tributary Channel/Pipes
                Tributary Subareas........ TR1C#1
TR1A-2          No Tributary Channel/Pipes
                Tributary Subareas........ TR1A-2#1
TR1A-1          No Tributary Channel/Pipes
                Tributary Subareas........ TR1A-1#1
TR1D-1          No Tributary Channel/Pipes
                Tributary Subareas........ TR1D-1#1
TR1E            No Tributary Channel/Pipes
                Tributary Subareas........ TR1E#1
TR1G-1          No Tributary Channel/Pipes
                Tributary Subareas........ TR1G-1#1

***********************************************************
* Hydrographs will be stored for the following  29 INLETS *
***********************************************************
TR2-3     TR2-2     TR2-2.1   TR6-3     TR1F-3    TR1F-1
TR1F-2    TR6-2     TR6-1     TR7       TR5A      TR5
TR9       TR10      TR10A     TR11      TR9A      TR9B
TR8       TR1G-2    TR1D-2    TR1D-3    TR1B      TR1C
TR1A-2    TR1A-1    TR1D-1    TR1E      TR1G-1


************************************************
*  Quality Simulation not included in this run *
************************************************




***************************************************
*  Precipitation Interface File Summary           *
*  Number of precipitation station....        1   *
***************************************************

Location Station Number
-------- --------------
       1.             1

XXX End of Header Section XXX

#######################################################
#    Entry made to the HYDRAULIC Layer of XP-SWMM     #
#    Last Updated in Oct., 2011 by XP Solutions       #

#######################################################
#    Entry made to the Runoff Layer(Block) of SWMM    #
```

```
 #    Last Updated Oct., 2011 by XP Solutions         #

 *===========================================================*
 |          RUNOFF TABLES IN THE OUTPUT FILE.                |
 |   These are the more important tables in the output file. |
 |   You can use your editor to find the table numbers,      |
 |   for example: search for Table R3 to check continuity.   |
 |   This output file can be imported into a Word Processor  |
 |   and printed on US letter or A4 paper using portrait     |
 |   mode, courier font, a size of 8 pt. and margins of 0.75 |
 |                                                           |
 | Table R1  - Physical Hydrology Data                       |
 | Table R2  - Infiltration data                             |
 | Table R3  - Raingage and Infiltration Database Names      |
 | Table R4  - Groundwater Data                              |
 | Table R5  - Continuity Check for Surface Water            |
 | Table R6  - Continuity Check for Channels/Pipes           |
 | Table R7  - Continuity Check for Subsurface Water         |
 | Table R8  - Infiltration/Inflow Continuity Check          |
 | Table R9  - Summary Statistics for Subcatchments          |
 | Table R10 - Sensitivity anlysis for Subcatchments         |
 *===========================================================*

                    A1


 ###########################################
 #             RUNOFF JOB CONTROL          #
 ###########################################

 Snowmelt parameter - ISNOW......................            0
 Number of rain gages - NRGAG....................            1
 Quality is not simulated - KWALTY...............            0
 Default evaporation rate used - IVAP............            0
 Hour of day at start of storm - NHR.............            0
 Minute of hour at start of storm - NMN..........            0
 Time TZERO at start of storm (hours)............        0.000
 Use U.S. Customary units for most I/O - METRIC...           0
 Runoff input print control...                               0
 Runoff graph plot control....                               0
 Runoff output print control..                               0
 Limit number of groundwater convergence messages to     10000

 Print headers every 50 lines - NOHEAD (0=yes, 1=no)         0

 Print land use load percentages -LANDUPR (0=no, 1=yes)      0
 Month, day, year of start of storm is:               1/ 1/2013
 Wet time step length (seconds).......                    60.0
 Dry time step length (seconds).......                 86400.0
 Wet/Dry time step length (seconds)...                    60.0
 Simulation length is......                               48.0 Hours

 If Horton infiltration model is being used
 A mixture of infiltration options may be used in
 XP-SWMM2000 as a watershed specific option.
 Rate for regeneration of infiltration = REGEN * DECAY
 Decay is read in for each subcatchment
 REGEN = .............................................  0.01000


 Raingage #................................          1
 KTYPE  - Rainfall input type..............          0
```

```
 NHISTO - Total number of rainfall values..          21
 KINC   - Rainfall values(pairs) per line..          10
 KPRINT - Print rainfall(0-Yes,1-No).......           0
 KTIME  - Precipitation time units
 0 --> Minutes  1 --> Hours................           0
 KPREP  - Precipitation unit type
 0 --> Intensity  1 --> Volume.............           1
 KTHIS - Variable rainfall intervals
 0 --> No, > 1 --> Yes.....................           0
 THISTO - Rainfall time interval...........       36.00
 TZRAIN - Starting time(KTIME units).......        0.00


######################################
# Rainfall input summary from Runoff #
######################################

 Total rainfall for gage #     1 is    5.5100 inches

   #############################
   #        Data Group F1      #
   # Evaporation Rate (in/day) #
   #############################

  JAN.  FEB.  MAR.  APR.  MAY   JUN.  JUL.  AUG.  SEP.  OCT.  NOV  DEC.
  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ---- ----
 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100


  ###################################################
  #  Table R1.  S U B C A T C H M E N T  D A T A    #
  #             Physical Hydrology Data             #
  ###################################################
```

Subcatchment Number	Name	Channel or inlet	Width (ft)	Area (ac)	Per-cent Imperv	Slope ft/ft	"n" Imprv	"n" Perv	Deprs-sion Storge Imprv	Deprs-sion Strge Perv	Prcnt Zero Deten-tion
1	TR2-3#1	TR2-3	1.0000	32.770	0.00	1.000	0.020	0.020	0.000	0.000	0.00
2	TR2-2#1	TR2-2	1.0000	28.310	0.00	1.000	0.020	0.020	0.000	0.000	0.00
3	TR2-2.1#1	TR2-2.1	1.0000	62.900	0.00	1.000	0.020	0.020	0.000	0.000	0.00
4	TR6-3#1	TR6-3	1.0000	3.0400	0.00	1.000	0.020	0.020	0.000	0.000	0.00
5	TR6-3#2	TR6-3	1.0000	40.000	0.00	1.000	0.020	0.020	0.000	0.000	0.00
6	TR1F-3#1	TR1F-3	1.0000	27.660	0.00	1.000	0.020	0.020	0.000	0.000	0.00
7	TR1F-1#1	TR1F-1	1.0000	42.070	0.00	1.000	0.020	0.020	0.000	0.000	0.00
8	TR1F-2#1	TR1F-2	1.0000	31.880	0.00	1.000	0.020	0.020	0.000	0.000	0.00
9	TR6-2#1	TR6-2	1.0000	8.4200	0.00	1.000	0.020	0.020	0.000	0.000	0.00
10	TR6-1#1	TR6-1	1.0000	88.080	0.00	1.000	0.020				

```
0.020 0.000 0.000  0.00
     11          TR6-1#2            TR6-1 1.0000    138.49      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     12            TR7#1              TR7 1.0000    86.150      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     13            TR7#2              TR7 1.0000    18.530      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     14            TR7#3              TR7 1.0000    80.660      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     15           TR5A#1             TR5A 1.0000    151.27      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     16            TR5#1              TR5 1.0000    254.24      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     17            TR9#1              TR9 1.0000    51.340      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     18           TR10#1             TR10 1.0000    51.650      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     19          TR10A#1            TR10A 1.0000    12.920      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     20           TR11#1             TR11 1.0000    202.23      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     21           TR9A#1             TR9A 1.0000    98.410      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     22           TR9B#1             TR9B 1.0000    14.760      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     23            TR8#1              TR8 1.0000    182.60      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     24         TR1G-2#1           TR1G-2 1.0000    25.850      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     25         TR1D-2#1           TR1D-2 1.0000    21.320      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     26         TR1D-3#1           TR1D-3 1.0000    12.330      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     27           TR1B#1             TR1B 1.0000    39.950      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     28           TR1C#1             TR1C 1.0000    33.260      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     29         TR1A-2#1           TR1A-2 1.0000    89.100      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     30         TR1A-1#1           TR1A-1 1.0000    59.260      0.00 1.000 0.020
0.020 0.000 0.000  0.00
     31         TR1D-1#1           TR1D-1 1.0000    64.450     19.00 1.000 0.020
0.020 0.000 0.000  0.00
     32           TR1E#1             TR1E 1.0000    70.210     11.00 1.000 0.020
0.020 0.000 0.000  0.00
     33         TR1G-1#1           TR1G-1 1.0000    55.050     25.00 1.000 0.020
0.020 0.000 0.000  0.00


##########################################################################################
####################
#          Table R2.  SUBCATCHMENT  DATA
                  #
#                     Infiltration or Time of Concentration Data
                  #
#
                  #
# Infiltration Type      Infl #1(#5)       Infl #2(#6)          Infl #3(#7)
     Infl #4(#8)  #
# SCS                  ->   Comp CN          Time Conc         Shape Factor
Depth or Fraction  #
# SBUH                 ->   Comp CN          Time Conc                  N/A
             N/A  #
```

```
# Green Ampt           ->   Suction          Hydr Cond          Initial MD
             N/A  #
# Horton               ->  Max Rate           Min Rate   Decay Rate (1/sec)
Max. Infilt. Volume  #
# Proportional         ->  Constant                N/A                  N/A
             N/A  #
# Initial/Cont Loss    ->   Initial         Continuing                  N/A
             N/A  #
# Initial/Proportional ->   Initial           Constant                  N/A
             N/A  #
# Laurenson Parameters ->   B Value       Pervious "n"      Impervious Cont
        Exponent  #
# Rational Formula     -> Tc Method   Flow Path Length      Flow Path Slope
Roughness or Retardance  #
#                                (#1 - #4 is Impervious Data / #5 - #8 is Pervious
Data)              #
#                      Rational Formula Tc Method: 1 = Constant
                  #
#                                                  2 = Friend's Equation
                  #
#                                                  3 = Kinematic Wave
                  #
#                                                  4 = Alameda Method
                  #
#                                                  5 = Izzard's Formula
                  #
#                                                  6 = Kerby's Equation
                  #
#                                                  7 = Kirpich's Equation
                  #
#                                                  8 = Bransby Williams Equation
                  #
#                                                  9 = Federal Aviation Authority
Equation           #
###################################################################################
####################
```

Subcatchment Number	Name	Infl # 1	Infl # 2	Infl # 3	Infl # 4	Infl # 5	Infl # 6	Infl # 7	Infl # 8
1	TR2-3#1	90.0000	0.6500	484.0000	0.2000				
2	TR2-2#1	90.0000	0.4333	484.0000	0.2000				
3	TR2-2.1#1	90.0000	0.6667	484.0000	0.2000				
4	TR6-3#1	86.0000	0.1333	484.0000	0.2000				
5	TR6-3#2	90.0000	0.5000	484.0000	0.2000				
6	TR1F-3#1	89.0000	0.9167	484.0000	0.2000				
7	TR1F-1#1	89.0000	1.1667	484.0000	0.2000				
8	TR1F-2#1	89.0000	0.4667	484.0000	0.2000				
9	TR6-2#1	86.0000	0.3167	484.0000	0.2000				
10	TR6-1#1	86.0000	1.0667	484.0000	0.2000				

11	TR6-1#2	86.0000	1.2333	484.0000	0.2000
12	TR7#1	79.0000	0.9333	484.0000	0.2000
13	TR7#2	85.0000	0.2333	0.0000	0.2000
14	TR7#3	84.0000	0.6667	0.0000	0.2000
15	TR5A#1	80.0000	0.9333	484.0000	0.2000
16	TR5#1	76.0000	1.4833	484.0000	0.2000
17	TR9#1	79.0000	0.4667	484.0000	0.2000
18	TR10#1	80.0000	1.7667	484.0000	0.2000
19	TR10A#1	82.0000	0.3833	484.0000	0.2000
20	TR11#1	70.0000	1.0667	484.0000	0.2000
21	TR9A#1	81.0000	1.0667	484.0000	0.2000
22	TR9B#1	76.0000	0.5667	484.0000	0.2000
23	TR8#1	77.0000	0.9500	484.0000	0.2000
24	TR1G-2#1	89.0000	0.6333	484.0000	0.2000
25	TR1D-2#1	89.0000	0.8500	484.0000	0.2000
26	TR1D-3#1	89.0000	0.8000	484.0000	0.2000
27	TR1B#1	89.0000	0.8333	484.0000	0.2000
28	TR1C#1	89.0000	0.9000	484.0000	0.2000
29	TR1A-2#1	89.0000	1.1500	484.0000	0.2000
30	TR1A-1#1	89.0000	0.4500	484.0000	0.2000
31	TR1D-1#1	90.7100	0.5333	484.0000	0.2000
32	TR1E#1	89.9900	1.4667	484.0000	0.2000
33	TR1G-1#1	91.2500	0.5000	484.0000	0.2000

```
############################################################
#     Table R3.  SUBCATCHMENT  DATA                        #
#                Rainfall and Infiltration Database Names  #
############################################################
```

Subcatchment Number	Name	Gage No	Infiltration Type	Routing Type
1	TR2-3#1	1	SCS Method	SCS curvilinear
2	TR2-2#1	1	SCS Method	SCS curvilinear
3	TR2-2.1#1	1	SCS Method	SCS curvilinear
4	TR6-3#1	1	SCS Method	SCS curvilinear
5	TR6-3#2	1	SCS Method	SCS curvilinear
6	TR1F-3#1	1	SCS Method	SCS curvilinear
7	TR1F-1#1	1	SCS Method	SCS curvilinear

```
     8          TR1F-2#1      1   SCS Method       SCS curvilinear
     9           TR6-2#1      1   SCS Method       SCS curvilinear
    10           TR6-1#1      1   SCS Method       SCS curvilinear
    11           TR6-1#2      1   SCS Method       SCS curvilinear
    12             TR7#1      1   SCS Method       SCS curvilinear
    13             TR7#2      1   SCS Method       SCS curvilinear
    14             TR7#3      1   SCS Method       SCS curvilinear
    15            TR5A#1      1   SCS Method       SCS curvilinear
    16             TR5#1      1   SCS Method       SCS curvilinear
    17             TR9#1      1   SCS Method       SCS curvilinear
    18            TR10#1      1   SCS Method       SCS curvilinear
    19           TR10A#1      1   SCS Method       SCS curvilinear
    20            TR11#1      1   SCS Method       SCS curvilinear
    21            TR9A#1      1   SCS Method       SCS curvilinear
    22            TR9B#1      1   SCS Method       SCS curvilinear
    23             TR8#1      1   SCS Method       SCS curvilinear
    24          TR1G-2#1      1   SCS Method       SCS curvilinear
    25          TR1D-2#1      1   SCS Method       SCS curvilinear
    26          TR1D-3#1      1   SCS Method       SCS curvilinear
    27            TR1B#1      1   SCS Method       SCS curvilinear
    28            TR1C#1      1   SCS Method       SCS curvilinear
    29          TR1A-2#1      1   SCS Method       SCS curvilinear
    30          TR1A-1#1      1   SCS Method       SCS curvilinear
    31          TR1D-1#1      1   SCS Method       SCS curvilinear
    32            TR1E#1      1   SCS Method       SCS curvilinear
    33          TR1G-1#1      1   SCS Method       SCS curvilinear

 Total Number of Subcatchments...            33
 Total Tributary Area (acres)....       2179.16
 Impervious Area (acres).........         33.73
 Pervious Area (acres)...........       2145.43
 Total Width (feet)..............         33.00
 Impervious Area (%).............          1.55


  ###################################################
  #         S U B C A T C H M E N T   D A T A       #
  #   Default, Ratio values for subcatchment data   #
  #   Used with the calibrate node in the runoff.   #
  # 1 - width     2 - area      3 - impervious %    #
  # 4 - slope     5 - imp "n"   6 - perv "n"        #
  # 7 - imp ds    8 - perv ds   9 - 1st infil       #
  #10 - 2nd infil              11 - 3rd infil       #
  ###################################################

 Column          1         2         3         4         5         6         7
    8         9         10        11
 Default     0.0000    0.0000    0.0000    0.0000    0.0000    0.0000    0.0000
0.0000    0.0000    0.0000    0.0000
 Ratio       1.0000    1.0000    1.0000    1.0000    1.0000    1.0000    1.0000
1.0000    1.0000    1.0000    1.0000

 *********************************************************
 *     Arrangement of Subcatchments and Channel/Pipes    *
 *********************************************************


     Inlet
 TR2-3          No Tributary Channel/Pipes
                Tributary Subareas........ TR2-3#1
 TR2-2          No Tributary Channel/Pipes
                Tributary Subareas........ TR2-2#1
 TR2-2.1        No Tributary Channel/Pipes
```

```
                 Tributary Subareas........ TR2-2.1#1
TR6-3            No Tributary Channel/Pipes
                 Tributary Subareas........ TR6-3#1    TR6-3#2
TR1F-3           No Tributary Channel/Pipes
                 Tributary Subareas........ TR1F-3#1
TR1F-1           No Tributary Channel/Pipes
                 Tributary Subareas........ TR1F-1#1
TR1F-2           No Tributary Channel/Pipes
                 Tributary Subareas........ TR1F-2#1
TR6-2            No Tributary Channel/Pipes
                 Tributary Subareas........ TR6-2#1
TR6-1            No Tributary Channel/Pipes
                 Tributary Subareas........ TR6-1#1    TR6-1#2
TR7              No Tributary Channel/Pipes
                 Tributary Subareas........ TR7#1      TR7#2      TR7#3
TR5A             No Tributary Channel/Pipes
                 Tributary Subareas........ TR5A#1
TR5              No Tributary Channel/Pipes
                 Tributary Subareas........ TR5#1
TR9              No Tributary Channel/Pipes
                 Tributary Subareas........ TR9#1
TR10             No Tributary Channel/Pipes
                 Tributary Subareas........ TR10#1
TR10A            No Tributary Channel/Pipes
                 Tributary Subareas........ TR10A#1
TR11             No Tributary Channel/Pipes
                 Tributary Subareas........ TR11#1
TR9A             No Tributary Channel/Pipes
                 Tributary Subareas........ TR9A#1
TR9B             No Tributary Channel/Pipes
                 Tributary Subareas........ TR9B#1
TR8              No Tributary Channel/Pipes
                 Tributary Subareas........ TR8#1
TR1G-2           No Tributary Channel/Pipes
                 Tributary Subareas........ TR1G-2#1
TR1D-2           No Tributary Channel/Pipes
                 Tributary Subareas........ TR1D-2#1
TR1D-3           No Tributary Channel/Pipes
                 Tributary Subareas........ TR1D-3#1
TR1B             No Tributary Channel/Pipes
                 Tributary Subareas........ TR1B#1
TR1C             No Tributary Channel/Pipes
                 Tributary Subareas........ TR1C#1
TR1A-2           No Tributary Channel/Pipes
                 Tributary Subareas........ TR1A-2#1
TR1A-1           No Tributary Channel/Pipes
                 Tributary Subareas........ TR1A-1#1
TR1D-1           No Tributary Channel/Pipes
                 Tributary Subareas........ TR1D-1#1
TR1E             No Tributary Channel/Pipes
                 Tributary Subareas........ TR1E#1
TR1G-1           No Tributary Channel/Pipes
                 Tributary Subareas........ TR1G-1#1


***********************************************************
* Hydrographs will be stored for the following  29 INLETS *
***********************************************************
TR2-3     TR2-2     TR2-2.1   TR6-3     TR1F-3    TR1F-1
TR1F-2    TR6-2     TR6-1     TR7       TR5A      TR5
TR9       TR10      TR10A     TR11      TR9A      TR9B
TR8       TR1G-2    TR1D-2    TR1D-3    TR1B      TR1C
TR1A-2    TR1A-1    TR1D-1    TR1E      TR1G-1
```

```
************************************************
*  Quality Simulation not included in this run *
************************************************




***************************************************
*  Precipitation Interface File Summary           *
*  Number of precipitation station....       1   *
***************************************************

Location Station Number
-------- -------------
      1.            1






*=============================================================*
|         HYDRAULICS TABLES IN THE OUTPUT FILE                |
|  These are the more important tables in the output file.    |
|  You can use your editor to find the table numbers,         |
|  for example: search for Table E20 to check continuity.     |
|  This output file can be imported into a Word Processor     |
|  and printed on US letter or A4 paper using portrait        |
|  mode, courier font, a size of 8 pt. and margins of 0.75    |
|                                                             |
| Table E1   - Basic Conduit Data                             |
| Table E2   - Conduit Factor Data                            |
| Table E3a  - Junction Data                                  |
| Table E3b  - Junction Data                                  |
| Table E4   - Conduit Connectivity Data                      |
| Table E4a  - Dry Weather Flow Data                          |
| Table E4b  - Real Time Control Data                         |
| Table E5   - Junction Time Step Limitation Summary          |
| Table E5a  - Conduit Explicit Condition Summary             |
| Table E6   - Final Model Condition                          |
| Table E7   - Iteration Summary                              |
| Table E8   - Junction Time Step Limitation Summary          |
| Table E9   - Junction  Summary  Statistics                  |
| Table E10  - Conduit   Summary  Statistics                  |
| Table E11  - Area assumptions used in the analysis          |
| Table E12  - Mean conduit information                       |
| Table E13  - Channel losses(H) and culvert info             |
| Table E13a - Culvert Analysis Classification                |
| Table E14  - Natural Channel Overbank Flow Information      |
| Table E14a - Natural Channel Encroachment Information       |
| Table E14b - Floodplain Mapping                             |
| Table E15  - Spreadsheet Info List                          |
| Table E15a - Spreadsheet Reach List                         |
| Table E16  - New Conduit Output Section                     |
| Table E17  - Pump Operation                                 |
| Table E18  - Junction Continuity Error                      |
| Table E19  - Junction Inflow & Outflow Listing              |
| Table E20  - Junction Flooding and Volume List              |
| Table E21  - Continuity balance at simulation end           |
```

```
| Table E22  - Model Judgement Section                          |
*==============================================================*

Time Control from Hydraulics Job Control
Year.........    2013 Month.......       1
Day..........       1 Hour........       0
Minute.......       0 Second......       0


Control information for simulation
----------------------------------

Integration cycles.................      2520
Length of integration step is......    120.00 seconds
Simulation length..................     84.00 hours
Do not create equiv. pipes(NEQUAL).         0
Use U.S. customary units for I/O...         0
Printing starts in cycle...........         1
Intermediate printout intervals of.       500 cycles
Intermediate printout intervals of.   1000.00 minutes
Summary printout intervals of......       500 cycles
Summary printout time interval of..   1000.00 minutes
Hot start file parameter (REDO)....         0
Initial time.......................      0.00 hours

Iteration variables: Flow Tolerance.   0.00010
                     Head Tolerance.   0.00050
    Minimum depth (m or ft).........   0.00001
    Underrelaxation parameter.......   0.85000
    Time weighting parameter........   0.85000
    Conduit roughness factor........   1.00000
    Flow adjustment factor..........   1.00000
    Initial Condition Smoothing.....         0
    Courant Time Step Factor........   1.00000
    Default Expansion/Contraction K.   0.00000
    Default Entrance/Exit K.........   0.00000
    Routing Method..................   Dynamic Wave
Default surface area of junctions...     12.57 square feet.
Minimum Junction/Conduit Depth......   0.00001 feet.
Ponding Area Coefficient............   5000.00
Ponding Area Exponent...............    1.0000
Minimum Orifice Length..............   1000.00 feet.
NJSW input hydrograph junctions.....     0
     or user defined hydrographs....

Printed output for the following  3 Junctions

    TR1G-1    TR1D-1    TR1E

Printed output for the following  1 Conduits

    BD-L10

Water surface elevations will be plotted for the following   3 Junctions

    TR1G-1    TR1D-1    TR1E

Flow rate will be plotted for the following   1 Conduits

    BD-L10

*==============================================================*
|               Flap Gate Conduit Information                  |
```

```
|              ----------------------------          |
| Positive Flap Gate - Flow only allowed from the upstream |
|                      to the downstream junction         |
| Negative Flap Gate - Flow only allowed from the         |
|                      downstream to the upstream junction |
*=========================================================*

    Conduit   Type of Flap Gate
    -------   -----------------
 TR5 Link    Positive Flap Gate
 BD-L10      Positive Flap Gate

         Natural Cross-Section information for Channel BD-L1
         =====================================================
          Cross-Section ID (from X1 card) :     1.0 Channel sequence number :     1

   Left Overbank Length   :    264.0 ft                Maximum Elevation        :
647.00 ft.
   Main Channel Length    :    264.0 ft                Maximum Depth            :
 15.00 ft.
   Right Overbank Length  :    264.0 ft                Maximum Section Area     :
2229.421 ft^2
                                                       Maximum hydraulic radius :
  4.19 ft.
   Manning N :      0.080  to Station         233.7    Max topwidth             :
529.87 ft.
     "    "  :      0.050  in main Channel             Maximum Wetted Perimeter :
5.33E+02 ft
     "    "  :      0.080  Beyond station     358.5    Max left bank area       :
560.57 ft^2
                                                       Max right bank area      :
577.47 ft^2
   Allowable Encroachment Depth :    0.00 ft           Max center channel area  :
1091.390 ft^2

         Natural Cross-Section information for Channel BD-L2
         =====================================================
          Cross-Section ID (from X1 card) :     2.0 Channel sequence number :     2

   Left Overbank Length   :    519.0 ft                Maximum Elevation        :
645.00 ft.
   Main Channel Length    :    519.0 ft                Maximum Depth            :
 15.00 ft.
   Right Overbank Length  :    519.0 ft                Maximum Section Area     :
2215.344 ft^2
                                                       Maximum hydraulic radius :
  6.21 ft.
   Manning N :      0.080  to Station         220.0    Max topwidth             :
354.96 ft.
     "    "  :      0.050  in main Channel             Maximum Wetted Perimeter :
3.57E+02 ft
     "    "  :      0.080  Beyond station     329.8    Max left bank area       :
599.22 ft^2
                                                       Max right bank area      :
430.17 ft^2
   Allowable Encroachment Depth :    0.00 ft           Max center channel area  :
1185.952 ft^2

         Natural Cross-Section information for Channel BD-L3
         =====================================================
          Cross-Section ID (from X1 card) :     3.0 Channel sequence number :     3

   Left Overbank Length   :    684.0 ft                Maximum Elevation        :
```

```
643.00 ft.
   Main Channel Length    :    684.0 ft                Maximum Depth           :
 15.00 ft.
   Right Overbank Length  :    684.0 ft                Maximum Section Area    :
2176.963 ft^2
                                                       Maximum hydraulic radius :
  7.87 ft.
   Manning N :      0.080  to Station         225.8    Max topwidth            :
272.75 ft.
     "    "  :      0.050  in main Channel             Maximum Wetted Perimeter :
2.77E+02 ft
     "    "  :      0.080  Beyond station     259.9    Max left bank area      :
1331.48 ft^2
                                                       Max right bank area     :
367.42 ft^2
   Allowable Encroachment Depth :    0.00 ft           Max center channel area  :
478.0622 ft^2

         Natural Cross-Section information for Channel BD-L4
         =====================================================
          Cross-Section ID (from X1 card) :     4.0 Channel sequence number :     4

   Left Overbank Length   :    359.0 ft                Maximum Elevation       :
641.00 ft.
   Main Channel Length    :    359.0 ft                Maximum Depth           :
 15.00 ft.
   Right Overbank Length  :    359.0 ft                Maximum Section Area    :
2715.437 ft^2
                                                       Maximum hydraulic radius :
 11.43 ft.
   Manning N :      0.080  to Station          81.5    Max topwidth            :
232.00 ft.
     "    "  :      0.050  in main Channel             Maximum Wetted Perimeter :
2.38E+02 ft
     "    "  :      0.080  Beyond station     254.3    Max left bank area      :
211.28 ft^2
                                                       Max right bank area     :
145.38 ft^2
   Allowable Encroachment Depth :    0.00 ft           Max center channel area  :
2358.781 ft^2

         Natural Cross-Section information for Channel BD-L5
         =====================================================
          Cross-Section ID (from X1 card) :     5.0 Channel sequence number :     5

   Left Overbank Length   :    693.0 ft                Maximum Elevation       :
635.00 ft.
   Main Channel Length    :    693.0 ft                Maximum Depth           :
 15.00 ft.
   Right Overbank Length  :    693.0 ft                Maximum Section Area    :
2677.986 ft^2
                                                       Maximum hydraulic radius :
  8.20 ft.
   Manning N :      0.080  to Station          99.6    Max topwidth            :
324.17 ft.
     "    "  :      0.050  in main Channel             Maximum Wetted Perimeter :
3.27E+02 ft
     "    "  :      0.080  Beyond station     181.7    Max left bank area      :
238.68 ft^2
                                                       Max right bank area     :
1345.57 ft^2
   Allowable Encroachment Depth :    0.00 ft           Max center channel area  :
1093.734 ft^2
```

```
        Natural Cross-Section information for Channel BD-L6
        =====================================================
         Cross-Section ID (from X1 card) :     6.0 Channel sequence number :     6

   Left Overbank Length   :    493.0 ft                Maximum Elevation       :
631.00 ft.
   Main Channel Length    :    493.0 ft                Maximum Depth           :
 15.00 ft.
   Right Overbank Length  :    493.0 ft                Maximum Section Area    :
2724.012 ft^2
                                                       Maximum hydraulic radius :
  9.27 ft.
   Manning N :      0.080  to Station        225.4    Max topwidth            :
291.18 ft.
     "    "  :      0.050  in main Channel             Maximum Wetted Perimeter :
2.94E+02 ft
     "    "  :      0.080  Beyond station     279.8    Max left bank area      :
1519.65 ft^2
                                                       Max right bank area     :
439.33 ft^2
   Allowable Encroachment Depth :    0.00 ft           Max center channel area  :
765.0312 ft^2

        Natural Cross-Section information for Channel BD-L7
        =====================================================
         Cross-Section ID (from X1 card) :     7.0 Channel sequence number :     7

   Left Overbank Length   :    372.0 ft                Maximum Elevation       :
629.00 ft.
   Main Channel Length    :    372.0 ft                Maximum Depth           :
 15.00 ft.
   Right Overbank Length  :    372.0 ft                Maximum Section Area    :
2250.251 ft^2
                                                       Maximum hydraulic radius :
 10.38 ft.
   Manning N :      0.080  to Station        288.6    Max topwidth            :
210.90 ft.
     "    "  :      0.050  in main Channel             Maximum Wetted Perimeter :
2.17E+02 ft
     "    "  :      0.080  Beyond station     335.9    Max left bank area      :
1431.01 ft^2
                                                       Max right bank area     :
129.50 ft^2
   Allowable Encroachment Depth :    0.00 ft           Max center channel area  :
689.7411 ft^2

        Natural Cross-Section information for Channel BD-L8
        =====================================================
         Cross-Section ID (from X1 card) :     8.0 Channel sequence number :     8

   Left Overbank Length   :    703.0 ft                Maximum Elevation       :
625.00 ft.
   Main Channel Length    :    703.0 ft                Maximum Depth           :
 15.00 ft.
   Right Overbank Length  :    703.0 ft                Maximum Section Area    :
2870.034 ft^2
                                                       Maximum hydraulic radius :
 10.41 ft.
   Manning N :      0.080  to Station        298.8    Max topwidth            :
271.89 ft.
     "    "  :      0.050  in main Channel             Maximum Wetted Perimeter :
2.76E+02 ft
```

```
    "    "  :      0.080  Beyond station     385.6    Max left bank area       :
1379.03 ft^2
                                                      Max right bank area      :
225.17 ft^2
   Allowable Encroachment Depth :    0.00 ft          Max center channel area  :
1265.837 ft^2

         Natural Cross-Section information for Channel BD-L9
         =====================================================
          Cross-Section ID (from X1 card) :     9.0 Channel sequence number :     9

   Left Overbank Length   :    393.0 ft               Maximum Elevation        :
623.00 ft.
   Main Channel Length    :    393.0 ft               Maximum Depth            :
 15.00 ft.
   Right Overbank Length  :    393.0 ft               Maximum Section Area     :
2877.446 ft^2
                                                      Maximum hydraulic radius :
 10.20 ft.
   Manning N :      0.080  to Station         327.4    Max topwidth             :
278.42 ft.
    "    "  :      0.050  in main Channel             Maximum Wetted Perimeter :
2.82E+02 ft
    "    "  :      0.080  Beyond station     377.9    Max left bank area       :
1882.10 ft^2
                                                      Max right bank area      :
264.85 ft^2
   Allowable Encroachment Depth :    0.00 ft          Max center channel area  :
730.4959 ft^2

         Natural Cross-Section information for Channel BD-L10
         =====================================================
          Cross-Section ID (from X1 card) :    10.0 Channel sequence number :    10

   Left Overbank Length   :    465.0 ft               Maximum Elevation        :
619.00 ft.
   Main Channel Length    :    465.0 ft               Maximum Depth            :
 15.00 ft.
   Right Overbank Length  :    465.0 ft               Maximum Section Area     :
1818.155 ft^2
                                                      Maximum hydraulic radius :
  8.62 ft.
   Manning N :      0.080  to Station         129.4    Max topwidth             :
206.92 ft.
    "    "  :      0.050  in main Channel             Maximum Wetted Perimeter :
2.11E+02 ft
    "    "  :      0.080  Beyond station     227.3    Max left bank area       :
 38.74 ft^2
                                                      Max right bank area      :
661.14 ft^2
   Allowable Encroachment Depth :    0.00 ft          Max center channel area  :
1118.276 ft^2

  =====================================================
  Input Information from Internal Weir Weir
  =====================================================
 Point       Data       Data       Data       Data
  No.       Column     Column     Column     Column
              # 1        # 2        # 3        # 4
 -----      ------      -----     -------  ---------
     1      0.100      0.000      1.500      3.600
     2      0.200      0.000      1.500      3.600
     3      0.300      0.000      1.500      3.600
```

4	0.400	0.000	1.500	3.600
5	0.500	0.000	1.500	3.600
6	0.600	0.000	1.500	3.600
7	0.700	0.000	1.500	3.600
8	0.800	0.000	1.500	3.600
9	0.900	0.000	1.500	3.600
10	1.000	0.000	1.500	3.600
11	1.100	0.000	1.500	3.600
12	1.200	0.000	1.500	3.600
13	1.300	0.000	1.500	3.600
14	1.400	0.000	1.500	3.600
15	1.500	0.000	1.500	3.600
16	1.600	0.000	1.500	3.600
17	1.700	0.000	1.500	3.600
18	1.800	0.000	1.500	3.600
19	1.900	0.000	1.500	3.600
20	2.000	4.130	1.500	3.600
21	2.100	4.200	1.500	3.600
22	2.200	4.270	1.500	3.600
23	2.300	4.340	1.500	3.600
24	2.400	4.400	1.500	3.600
25	2.500	4.460	1.500	3.600
26	2.600	4.520	1.500	3.600
27	2.700	4.570	1.500	3.600
28	2.800	4.620	1.500	3.600
29	2.900	4.670	1.500	3.600
30	3.000	4.710	1.500	3.600
31	3.100	4.750	1.500	3.600
32	3.200	4.790	1.500	3.600
33	3.300	4.830	1.500	3.600
34	3.400	4.860	1.500	3.600
35	3.500	4.890	1.500	3.600
36	3.600	4.920	1.500	3.600
37	3.700	4.950	1.500	3.600
38	3.800	4.970	1.500	3.600
39	3.900	4.990	1.500	3.600
40	4.000	5.010	1.500	3.600
41	4.100	5.020	1.500	3.600
42	4.200	5.030	1.500	3.600
43	4.300	5.040	1.500	3.600
44	4.400	5.050	1.500	3.600
45	4.500	5.050	1.500	3.600
46	4.600	5.060	1.500	3.600
47	4.700	5.060	1.500	3.600
48	4.800	5.050	1.500	3.600
49	4.900	5.050	1.500	3.600
50	5.000	5.040	1.500	3.600
51	5.100	5.020	1.500	3.600
52	5.200	5.010	1.500	3.600
53	5.300	4.990	1.500	3.600
54	5.400	4.960	1.500	3.600
55	5.500	4.940	1.500	3.600
56	5.600	4.900	1.500	3.600
57	5.700	4.870	1.500	3.600
58	5.800	4.830	1.500	3.600
59	5.900	4.770	1.500	3.600
60	6.000	4.710	1.500	3.600

```
*==================================================*
|           Table E1 - Conduit Data                |
*==================================================*
```

Inp Num	Conduit Name	Length (ft)	Conduit Class	Area (ft^2)	Manning Coef.	Max Width (ft)	Depth (ft)	Trapezoid Side Slopes	
1	McCarty 1	278.0000	Circular	19.6350	0.0240	5.0000	5.0000		
2	TR5 Link	1613.0000	Circular	28.2743	0.0130	6.0000	6.0000		
3	TR4 Link	468.0000	Circular	9.6211	0.0130	3.5000	3.5000		
4	I-65	365.0000	Circular	19.6350	0.0130	5.0000	5.0000		
5	CR 550	210.8000	Circular	28.2743	0.0130	6.0000	6.0000		
6	McCarty 3	152.0000	Rectangle	35.0000	0.0130	7.0000	5.0000		
7	Link17	167.0000	Circular	4.9087	0.0130	2.5000	2.5000		
8	BD-L1	264.0000	Natural	2229.4207	0.0500	529.8724	15.0000		
9	BD-L2	519.0000	Natural	2215.3444	0.0500	354.9609	15.0000		
10	BD-L3	684.0000	Natural	2176.9627	0.0500	272.7545	15.0000		
11	BD-L4	359.0000	Natural	2715.4371	0.0500	231.9965	15.0000		
12	BD-L5	693.0000	Natural	2677.9858	0.0500	324.1748	15.0000		
13	BD-L6	493.0000	Natural	2724.0124	0.0500	291.1832	15.0000		
14	BD-L7	372.0000	Natural	2250.2508	0.0500	210.9044	15.0000		
15	BD-L8	703.0000	Natural	2870.0340	0.0500	271.8943	15.0000		
16	BD-L9	393.0000	Natural	2877.4462	0.0500	278.4214	15.0000		
17	BD-L10	465.0000	Natural	1818.1549	0.0500	206.9177	15.0000		
18	Link31	259.0000	Trapezoid	227.5000	0.0350	15.0000	7.0000	2.5000	2.5000
19	Link32	401.0000	Circular	7.0686	0.0110	3.0000	3.0000		
20	Link33	170.0000	Circular	19.6350	0.0130	5.0000	5.0000		
21	Link34	191.0000	Circular	3.1416	0.0130	2.0000	2.0000		
22	Link35	106.0000	Circular	12.5664	0.0130	4.0000	4.0000		
23	Link44	120.0000	Circular	12.5664	0.0130	4.0000	4.0000		
24	Link52	1870.0000	Circular	12.5664	0.0130	4.0000	4.0000		
25	Link53	4560.0000	Circular	28.2743	0.0130	6.0000	6.0000		
26	Link54	698.1000	Trapezoid	5.0000	0.0300	2.0000	1.0000	3.0000	3.0000
27	Link55	150.0000	Circular	7.0686	0.0130	3.0000	3.0000		
28	Link56	1182.3000	Trapezoid	5.0000	0.0300	2.0000	1.0000	3.0000	3.0000

```
   29           Link57   120.0000   Circular    7.0686     0.0130     3.0000
3.0000
   30           Link58   540.0000  Trapezoid    5.0000     0.0300     2.0000
1.0000     3.0000     3.0000
   31           Link59  2075.5000  Trapezoid    5.0000     0.0300     2.0000
1.0000     3.0000     3.0000
   32           Link60  1350.0000  Trapezoid    5.0000     0.0300     2.0000
1.0000     3.0000     3.0000
   33           Link61  1310.0000  Trapezoid    5.0000     0.0300     2.0000
1.0000     3.0000     3.0000
   34           Link62  1440.0000  Trapezoid    5.0000     0.0300     2.0000
1.0000     3.0000     3.0000
   35           Link63  1469.4000  Trapezoid    5.0000     0.0300     2.0000
1.0000     3.0000     3.0000
   36           Link65  1350.0000  Trapezoid    5.0000     0.0300     2.0000
1.0000     3.0000     3.0000
   37           Link66  1150.0000   Circular   28.2743     0.0130     6.0000
6.0000
   38           Link68  1000.0000   Circular    7.0686     0.0130     3.0000
3.0000
   39           Link69   263.0000   Circular   28.2743     0.0130     6.0000
6.0000
   40         Link66.1  1150.0000   Circular   28.2743     0.0130     6.0000
6.0000
   41          Primary   209.0000   Circular   19.6350     0.0130     5.0000
5.0000
   42        Emergency   269.0000   Circular    4.9087     0.0130     2.5000
2.5000
   43       TR1B/C Out   120.0000  Rectangle   21.0000     0.0130     7.0000
3.0000
   44         TR1D Out   120.0000  Rectangle   21.0000     0.0130     7.0000
3.0000
   45         TR1E Out   120.0000  Rectangle   21.0000     0.0130     7.0000
3.0000
   46         TR1A Out   120.0000  Rectangle   21.0000     0.0130     7.0000
3.0000
   47         TR1F Out   775.0000   Circular    2.4053     0.0140     1.7500
1.7500
   48             Weir  1000.0000  Closd Cnd    0.0000     0.0140     0.0000
0.0000
 Total length of all conduits ....     33857.1000 feet

 *===================================================*
 |      Table E2 -  Conduit Factor Data              |
 *===================================================*

                                                               Time     Low Flow
Depth at
         Conduit     Number  Entrance      Exit Exp/Contc Weighting Roughness
Which  Sediment    Flow
            Name of Barrels Loss Coef Loss Coef Coefficnt Parameter    Factor n
Changes     Depth Routing
 --------------- ---------- --------- --------- --------- --------- ---------
--------- --------- -------
       McCarty 1     1.0000    0.0000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
        TR5 Link     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
        TR4 Link     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
            I-65     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
          CR 550     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
```

```
0.0000    0.0000 Standard - Dynamic Wave
       McCarty 3     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
          Link17     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
          Link32     1.0000    0.0000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
          Link33     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
          Link34     1.0000    0.0000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
          Link35     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
          Link44     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
          Link55     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
      TR1B/C Out     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
        TR1D Out     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
        TR1E Out     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave
        TR1A Out     1.0000    0.5000    1.0000    0.0000    0.8500    1.0000
0.0000    0.0000 Standard - Dynamic Wave

 *====================================================*
 | If there are messages about (sqrt(g*d)*dt/dx), or |
 | the sqrt(wave celerity)*time step/conduit length  |
 | in the output file all it means is that the       |
 | program will lower the internal time step to      |
 | satisfy this condition (explicit condition).      |
 | You control the actual internal time step by      |
 | using the minimum courant time step factor in the |
 | HYDRAULICS job control.  The message put in words |
 | states that the smallest conduit with the fastest |
 | velocity will control the time step selection.    |
 | You have further control by using the modify      |
 | conduit option in the HYDRAULICS Job Control.     |
 *====================================================*


         Conduit      Courant
            Name        Ratio
 ---------------    ---------
       McCarty 1         5.48  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
        TR5 Link         1.03  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
        TR4 Link         2.72  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
            I-65         4.17  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
          CR 550         7.91  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
       McCarty 3        10.02  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
          Link17         6.45  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
           BD-L1         5.29  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
           BD-L2         3.28  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
```

```
          BD-L3         2.81  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
          BD-L4         6.49  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
          BD-L5         2.82  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
          BD-L6         4.22  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
          BD-L7         5.98  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
          BD-L8         3.15  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
          BD-L9         5.57  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         BD-L10         4.34  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         Link31         5.61  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         Link32         2.94  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         Link33         8.96  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         Link34         5.04  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         Link35        12.85  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         Link44        11.35  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         Link52         0.73
         Link53         0.37
         Link54         0.77
         Link55         7.86  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         Link56         0.46
         Link57         9.83  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         Link58         1.00
         Link59         0.26
         Link60         0.40
         Link61         0.41
         Link62         0.37
         Link63         0.37
         Link65         0.40
         Link66         1.45  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         Link68         1.18  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
         Link69         6.34  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
       Link66.1         1.45  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
        Primary         7.29  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
      Emergency         4.00  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
     TR1B/C Out         9.83  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
       TR1D Out         9.83  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
       TR1E Out         9.83  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
       TR1A Out         9.83  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
```

```
      TR1F Out        1.16  ===> Warning ! (sqrt(wave celerity)*time step/conduit
length)
          Weir        0.00

 *==================*
 |  Conduit Volume  |
 *==================*

 Full pipe or full open conduit volume
 Input full depth volume............    1.2684E+07 cubic feet

 ===> Warning !! The upstream and downstream junctions for the following conduits
                 have been reversed to correspond to the positive flow and
decreasing
                 slope convention.  A negative flow in the output thus means
                 the flow was from your original upstream junction to your original
                 downstream junction.  Any initial flow has been multiplied by -1.

                 1.  Conduit #...McCarty 1   has been changed.


 *=====================================================*
 |           Table E3a - Junction Data                 |
 *=====================================================*
```

Inp Num	Junction Name	Ground Elevation	Crown Elevation	Invert Elevation	Qinst cfs	Initial Depth-ft	Interface Flow (%)
1	TR1A-1/2	657.0000	648.9000	645.9000	0.0000	0.0000	100.0000
2	TR1G-1	649.0000	646.0000	637.0000	0.0000	2.7500	100.0000
3	TR6-1	648.0000	644.4300	637.0800	0.0000	0.0000	100.0000
4	TR7	644.0000	641.8300	633.0600	0.0000	0.0000	100.0000
5	TR8	647.0000	646.1300	631.4400	0.0000	0.0000	100.0000
6	BD-0	651.0000	646.1100	631.1100	0.0000	0.0000	100.0000
7	TR2-1	648.0000	644.5400	638.5400	0.0000	0.9600	100.0000
8	TR5	660.0000	654.0000	649.0000	0.0000	0.0000	100.0000
9	TR5A	662.0000	658.0000	658.0000	0.0000	0.0000	100.0000
10	TR9	646.0000	642.6600	639.1600	0.0000	0.0000	100.0000
11	TR10	649.5600	647.5000	640.5000	0.0000	0.0000	100.0000
12	McCarty DS	659.0000	653.3900	645.6500	0.0000	0.0000	100.0000
13	BD-1	651.0000	645.0000	630.0000	0.0000	0.0000	100.0000
14	BD-2	656.0000	643.0000	628.0000	0.0000	0.0000	100.0000
15	BD-3	649.0000	641.0000	626.0000	0.0000	0.0000	100.0000
16	BD-4	648.0000	635.0000	620.0000	0.0000	0.0000	100.0000
17	TR11	648.0000	631.0000	616.0000	0.0000	0.0000	100.0000
18	BD-6	647.0000	629.0000	614.0000	0.0000	0.0000	100.0000

19	BD-7	644.0000	625.0000	610.0000	0.0000	0.0000	100.0000
20	BD-8	644.0000	623.0000	608.0000	0.0000	0.0000	100.0000
21	BD-9	651.0000	619.0000	604.0000	0.0000	0.0000	100.0000
22	BD-10	651.0000	619.0000	604.0000	0.0000	0.0000	100.0000
23	Node35	647.0000	646.9000	639.9000	0.0000	0.0000	100.0000
24	TR9A	651.2600	647.2200	642.2200	0.0000	0.0000	100.0000
25	TR10A	646.0000	638.9400	636.9400	0.0000	0.0000	100.0000
26	TR9B	649.3200	645.8400	641.8400	0.0000	0.0000	100.0000
27	TR1B	654.0000	652.9000	648.9000	0.0000	0.0000	100.0000
28	TR1B/C	655.0000	652.0000	648.0000	0.0000	0.0000	100.0000
29	TR1D-1	658.0000	650.8000	644.6000	0.0000	0.0000	100.0000
30	TR1F-2	654.0000	651.0200	647.0000	0.0000	0.0000	100.0000
31	TR1E	658.0000	647.0000	644.0000	0.0000	0.0000	100.0000
32	TR6-3	660.0000	652.2700	648.2700	0.0000	0.0000	100.0000
33	TR6-2	652.0000	650.4000	644.4000	0.0000	0.0000	100.0000
34	TR1F-3	660.0000	658.0000	657.0000	0.0000	0.0000	100.0000
35	TR1F-1/2	656.0000	650.9000	647.9000	0.0000	0.0000	100.0000
36	TR1D-2	656.0000	655.0000	654.0000	0.0000	0.0000	100.0000
37	TR1D-2/3	656.0000	655.8000	648.3000	0.0000	0.0000	100.0000
38	TR1D-3	656.0000	656.0000	653.0000	0.0000	0.0000	100.0000
39	TR1A-2	654.0000	651.9000	650.9000	0.0000	0.0000	100.0000
40	TR1A-1	660.0000	655.0000	654.0000	0.0000	0.0000	100.0000
41	TR1G-2	655.0000	654.0000	653.0000	0.0000	0.0000	100.0000
42	TR1F-1	655.0000	652.5000	651.5000	0.0000	0.0000	100.0000
43	TR1C	658.0000	657.0000	656.0000	0.0000	0.0000	100.0000
44	TR2-3	662.0000	661.0000	660.0000	0.0000	0.0000	100.0000
45	TR2-2	658.0000	652.0000	643.6400	0.0000	0.0000	100.0000
46	Outlet	649.0000	642.0300	637.0000	0.0000	0.0000	100.0000
47	TR2-2.1	653.0000	647.0900	641.0900	0.0000	0.0000	100.0000
48	TR1F-2.1	653.0000	647.7500	646.0000	0.0000	0.5000	100.0000
49	Node71	653.0000	647.0900	641.0900	0.0000	0.0000	100.0000

===
| Table E3b - Junction Data |
===

Inp Num	Junction Name	X Coord.	Y Coord.	Type of Manhole	Type of Inlet	Maximum Capacity	Pavement Shape	Slope
1	TR1A-1/2	0.0000	0.0000	F	Normal		0	0.0000
2	TR1G-1	0.0000	0.0000	F	Normal		0	0.0000
3	TR6-1	0.0000	0.0000	F	Normal		0	0.0000
4	TR7	0.0000	0.0000	F	Normal		0	0.0000
5	TR8	0.0000	0.0000	F	Normal		0	0.0000
6	BD-0	0.0000	0.0000	F	Normal		0	0.0000
7	TR2-1	0.0000	0.0000	F	Normal		0	0.0000
8	TR5	0.0000	0.0000	F	Normal		0	0.0000
9	TR5A	0.0000	0.0000	F	Normal		0	0.0000
10	TR9	0.0000	0.0000	F	Normal		0	0.0000
11	TR10	0.0000	0.0000	F	Normal		0	0.0000
12	McCarty DS	0.0000	0.0000	F	Normal		0	0.0000
13	BD-1	0.0000	0.0000	F	Normal		0	0.0000
14	BD-2	0.0000	0.0000	F	Normal		0	0.0000
15	BD-3	0.0000	0.0000	F	Normal		0	0.0000
16	BD-4	0.0000	0.0000	F	Normal		0	0.0000
17	TR11	0.0000	0.0000	F	Normal		0	0.0000
18	BD-6	0.0000	0.0000	F	Normal		0	0.0000
19	BD-7	0.0000	0.0000	F	Normal		0	0.0000
20	BD-8	0.0000	0.0000	F	Normal		0	0.0000
21	BD-9	0.0000	0.0000	F	Normal		0	0.0000
22	BD-10	0.0000	0.0000	F	Normal		0	0.0000
23	Node35	0.0000	0.0000	F	Normal		0	0.0000
24	TR9A	0.0000	0.0000	F	Normal		0	0.0000
25	TR10A	0.0000	0.0000	F	Normal		0	0.0000
26	TR9B	0.0000	0.0000	F	Normal			

```
        0   0.0000
 27             TR1B          0.0000        0.0000          F       Normal
        0   0.0000
 28           TR1B/C          0.0000        0.0000          F       Normal
        0   0.0000
 29           TR1D-1          0.0000        0.0000          F       Normal
        0   0.0000
 30           TR1F-2          0.0000        0.0000          F       Normal
        0   0.0000
 31             TR1E          0.0000        0.0000          F       Normal
        0   0.0000
 32            TR6-3          0.0000        0.0000          F       Normal
        0   0.0000
 33            TR6-2          0.0000        0.0000          F       Normal
        0   0.0000
 34           TR1F-3          0.0000        0.0000          F       Normal
        0   0.0000
 35         TR1F-1/2          0.0000        0.0000          F       Normal
        0   0.0000
 36           TR1D-2          0.0000        0.0000          F       Normal
        0   0.0000
 37         TR1D-2/3          0.0000        0.0000          F       Normal
        0   0.0000
 38           TR1D-3          0.0000        0.0000          F       Normal
        0   0.0000
 39           TR1A-2          0.0000        0.0000          F       Normal
        0   0.0000
 40           TR1A-1          0.0000        0.0000          F       Normal
        0   0.0000
 41           TR1G-2          0.0000        0.0000          F       Normal
        0   0.0000
 42           TR1F-1          0.0000        0.0000          F       Normal
        0   0.0000
 43             TR1C          0.0000        0.0000          F       Normal
        0   0.0000
 44            TR2-3          0.0000        0.0000          F       Normal
        0   0.0000
 45            TR2-2          0.0000        0.0000          F       Normal
        0   0.0000
 46           Outlet          0.0000        0.0000          F       Normal
        0   0.0000
 47          TR2-2.1          0.0000        0.0000       No P       Normal
        0   0.0000
 48         TR1F-2.1          0.0000        0.0000          F       Normal
        0   0.0000
 49           Node71          0.0000        0.0000       No P       Normal
        0   0.0000


 *=====================================================*
 |           Table E4 - Conduit Connectivity           |
 *=====================================================*

 Input           Conduit          Upstream        Downstream     Upstream  Downstream
Number              Name              Node              Node    Elevation   Elevation
====== ================   ==============  ================    =========   =========
     1         McCarty 1             TR6-1            Outlet     637.0800    637.0300
No Design
     2          TR5 Link        McCarty DS               TR8     645.6500    639.4400
No Design
     3          TR4 Link               TR9               TR8     639.1600    637.4300
No Design
     4              I-65             TR6-1               TR7     637.4300    636.8300
```

No Design					
5	CR 550	TR7	TR8	633.0600	632.5800
No Design					
6	McCarty 3	TR5	McCarty DS	649.0000	648.3900
No Design					
7	Link17	Node35	TR8	639.9000	639.4600
No Design					
8	BD-L1	BD-0	BD-1	631.1100	630.0000
No Design					
9	BD-L2	BD-1	BD-2	630.0000	628.0000
No Design					
10	BD-L3	BD-2	BD-3	628.0000	626.0000
No Design					
11	BD-L4	BD-3	BD-4	626.0000	620.0000
No Design					
12	BD-L5	BD-4	TR11	620.0000	616.0000
No Design					
13	BD-L6	TR11	BD-6	616.0000	614.0000
No Design					
14	BD-L7	BD-6	BD-7	614.0000	610.0000
No Design					
15	BD-L8	BD-7	BD-8	610.0000	608.0000
No Design					
16	BD-L9	BD-8	BD-9	608.0000	604.0000
No Design					
17	BD-L10	BD-9	BD-10	604.0000	604.0000
No Design					
18	Link31	TR10	Node35	640.5000	639.9000
No Design					
19	Link32	TR10	BD-0	640.5600	634.7000
No Design					
20	Link33	TR9A	TR8	642.2200	641.1300
No Design					
21	Link34	TR10A	BD-1	636.9400	633.6100
No Design					
22	Link35	TR9B	TR8	641.8400	641.6300
No Design					
23	Link44	TR1B	TR1B/C	648.9000	648.0000
No Design					
24	Link52	TR6-3	TR6-2	648.2700	644.4000
No Design					
25	Link53	TR6-2	TR6-1	644.4000	637.2000
No Design					
26	Link54	TR1F-3	TR1F-2	657.0000	650.0200
No Design					
27	Link55	TR1F-1/2	TR1F-2	647.9000	647.7000
No Design					
28	Link56	TR1D-2	TR1D-2/3	654.0000	648.3000
No Design					
29	Link57	TR1D-3	TR1D-2/3	653.0000	652.8000
No Design					
30	Link58	TR1D-2/3	TR1D-1	648.3000	645.6000
No Design					
31	Link59	TR1A-2	TR1A-1/2	650.9000	645.9000
No Design					
32	Link60	TR1A-1	TR1A-1/2	654.0000	645.9000
No Design					
33	Link61	TR1G-2	TR1G-1	653.0000	641.6000
No Design					
34	Link62	TR1F-1	TR1F-1/2	651.5000	647.9000
No Design					
35	Link63	TR1C	TR1B/C	656.0000	648.0000
No Design					

```
   36          Link65             TR2-3           TR2-2     660.0000    651.0000
No Design
   37          Link66             TR2-2         TR2-2.1     643.6400    641.0900
No Design
   38          Link68           TR2-2.1          TR1G-1     641.5000    641.0000
No Design
   39          Link69             TR2-1           TR6-1     638.5400    638.4300
No Design
   40        Link66.1            Node71           TR2-1     641.0900    638.5400
No Design
   41         Primary               TR8            BD-0     631.4400    631.1100
No Design
   42       Emergency               TR8            BD-0     634.5900    633.6700
No Design
   43      TR1B/C Out            TR1B/C          TR1D-1     648.0000    647.8000
No Design
   44        TR1D Out            TR1D-1            TR1E     644.6000    644.0000
No Design
   45        TR1E Out              TR1E          TR1G-1     644.0000    643.0000
No Design
   46        TR1A Out          TR1A-1/2          TR1D-1     645.9000    645.6000
No Design
   47        TR1F Out          TR1F-2.1           TR6-2     646.0000    644.4000
No Design
   48            Weir           TR2-2.1          Node71     641.0900    641.0900
No Design


 *===========================================*
 |          Storage Junction Data            |
 *===========================================*

                                 MAXIMUM OR          PEAK OR       CROWN     DEPTH
 STORAGE JUNCTION   JUNCTION  CONSTANT SURFACE   CONSTANT VOLUME  ELEVATION  STARTS
   NUMBER OR NAME       TYPE     AREA (FT2)       (CUBIC FEET)      (FT)       FROM
   --------------   --------  ----------------   ---------------  ---------
-----------
         TR1G-1 Stage/Area      708721.2000      5.401862E+06    649.0000 Node
Invert
          TR6-1 Stage/Area      176418.0000       685948.1272    648.0000 Node
Invert
            TR7 Stage/Area      468487.8000      2.421406E+06    644.0000 Node
Invert
            TR8 Stage/Area      694956.2400      7.875959E+06    647.0000 Node
Invert
          TR2-1 Stage/Area       76491.3600       229235.2329    648.0000 Node
Invert
           TR5A Stage/Area     4.007651E+06     12.086045E+06    662.0000 Node
Invert
            TR9 Stage/Area      115521.1200       227589.8530    646.0000 Node
Invert
         TR1D-1 Stage/Area      747054.0000      9.645753E+06    658.0000 Node
Invert
         TR1F-2 Stage/Area      108900.0000       739466.2746    654.0000 Node
Invert
           TR1E Stage/Area      299257.2000      3.986868E+06    658.0000 Node
Invert
       TR1F-2.1 Stage/Area      135471.6000       825479.7421    653.0000 Node
Invert

       *===================================*
       |   Variable storage data for node | TR1G-1
       *===================================*
```

Data Point	Elevation ft	Depth ft	Area ft^2	Volume ft^3	Area acres	Volume ac-ft
1	637.0000	0.0000	43.5600	0.0000	0.0010	0.0000
2	638.9990	1.9990	43.5600	87.0764	0.0010	0.0020
3	639.0000	2.0000	385070.4000	216.8117	8.8400	0.0050
4	639.7500	2.7500	401187.6000	295039.9625	9.2100	6.7732
5	640.7400	3.7400	422967.6000	702945.2136	9.7100	16.1374
6	640.7500	3.7500	459122.4000	707354.3841	10.5400	16.2386
7	641.0000	4.0000	464785.2000	822840.9561	10.6700	18.8898
8	642.0000	5.0000	487000.8000	1.298686E+06	11.1800	29.8137
9	643.0000	6.0000	509216.4000	1.796748E+06	11.6900	41.2477
10	644.0000	7.0000	531867.6000	2.317244E+06	12.2100	53.1966
11	645.0000	8.0000	554518.8000	2.860392E+06	12.7300	65.6656
12	646.0000	9.0000	585446.4000	3.430299E+06	13.4400	78.7488
13	647.0000	10.0000	616374.0000	4.031137E+06	14.1500	92.5422
14	648.0000	11.0000	708721.2000	4.693141E+06	16.2700	107.7397
15	649.0000	12.0000	708721.2000	5.401862E+06	16.2700	124.0097

===================================
| Variable storage data for node | TR6-1
===================================

Data Point	Elevation ft	Depth ft	Area ft^2	Volume ft^3	Area acres	Volume ac-ft
1	637.0800	0.0000	43.5600	0.0000	0.0010	0.0000
2	638.0800	1.0000	1306.8000	529.6440	0.0300	0.0122
3	639.0800	2.0000	2613.6000	2452.4562	0.0600	0.0563
4	640.0800	3.0000	24829.2000	14285.1566	0.5700	0.3279
5	641.0800	4.0000	30056.4000	41686.1024	0.6900	0.9570
6	642.0800	5.0000	33541.2000	73468.6603	0.7700	1.6866
7	643.0800	6.0000	38768.4000	109591.5686	0.8900	2.5159
8	644.0800	7.0000	47916.0000	152852.6671	1.1000	3.5090
9	645.0800	8.0000	85813.2000	218802.9129	1.9700	

						5.0230
10	646.0800	9.0000	176418.0000	347225.5672	4.0500	7.9712
11	648.0000	10.9200	176418.0000	685948.1272	4.0500	15.7472

==================================
| Variable storage data for node | TR7
==================================

Data Point	Elevation ft	Depth ft	Area ft^2	Volume ft^3	Area acres	Volume ac-ft
1	633.0600	0.0000	43.5600	0.0000	0.0010	0.0000
2	633.9600	0.9000	23565.9600	7386.7361	0.5410	0.1696
3	634.9600	1.9000	36241.9200	37063.9234	0.8320	0.8509
4	635.9600	2.9000	109204.9200	106515.8477	2.5070	2.4453
5	636.9600	3.9000	154768.6800	237840.9925	3.5530	5.4601
6	637.9600	4.9000	236400.1200	431988.0377	5.4270	9.9171
7	638.9600	5.9000	265977.3600	683029.0291	6.1060	15.6802
8	639.9600	6.9000	294204.2400	962998.4275	6.7540	22.1074
9	640.9600	7.9000	321516.3600	1.270755E+06	7.3810	29.1725
10	641.9600	8.9000	350222.4000	1.606518E+06	8.0400	36.8806
11	642.9600	9.9000	387596.8800	1.975266E+06	8.8980	45.3459
12	643.9600	10.9000	468487.8000	2.402666E+06	10.7550	55.1576
13	644.0000	10.9400	468487.8000	2.421406E+06	10.7550	55.5878

==================================
| Variable storage data for node | TR8
==================================

Data Point	Elevation ft	Depth ft	Area ft^2	Volume ft^3	Area acres	Volume ac-ft
1	631.4400	0.0000	43.5600	0.0000	0.0010	0.0000
2	633.9400	2.5000	43.5600	108.9000	0.0010	0.0025
3	634.0400	2.6000	491748.8400	16656.0891	11.2890	0.3824
4	635.0400	3.6000	514138.6800	519553.2840	11.8030	11.9273
5	636.0400	4.6000	528513.4800	1.040858E+06	12.1330	23.8948
6	637.0400	5.6000	543367.4400	1.576776E+06	12.4740	36.1978

7	638.0400	6.6000	558308.5200	2.127591E+06	12.8170	48.8428
8	639.0400	7.6000	573598.0800	2.693522E+06	13.1680	61.8347
9	640.0400	8.6000	589671.7200	3.275132E+06	13.5370	75.1867
10	641.0400	9.6000	610319.1600	3.875092E+06	14.0110	88.9599
11	642.0400	10.6000	632229.8400	4.496328E+06	14.5140	103.2215
12	643.0400	11.6000	659106.3600	5.141943E+06	15.1310	118.0428
13	644.0400	12.6000	694956.2400	5.818889E+06	15.9540	133.5833
14	647.0000	15.5600	694956.2400	7.875959E+06	15.9540	180.8071

==================================
| Variable storage data for node | TR2-1
==================================

Data Point	Elevation ft	Depth ft	Area ft^2	Volume ft^3	Area acres	Volume ac-ft
1	638.5400	0.0000	43.5600	0.0000	0.0010	0.0000
2	643.9400	5.4000	43.5600	235.2240	0.0010	0.0054
3	644.0400	5.5000	26702.2800	1162.6926	0.6130	0.0267
4	645.0400	6.5000	38115.0000	33402.2336	0.8750	0.7668
5	646.0400	7.5000	62029.4400	82991.0762	1.4240	1.9052
6	646.5400	8.0000	76491.3600	117557.8473	1.7560	2.6988
7	648.0000	9.4600	76491.3600	229235.2329	1.7560	5.2625

==================================
| Variable storage data for node | TR5A
==================================

Data Point	Elevation ft	Depth ft	Area ft^2	Volume ft^3	Area acres	Volume ac-ft
1	658.0000	0.0000	799935.8400	0.0000	18.3640	0.0000
2	659.0000	1.0000	1773719.640	1.254926E+06	40.7190	28.8091
3	660.0000	2.0000	4007650.680	4.070744E+06	92.0030	93.4514
4	662.0000	4.0000	4007650.680	12.086045E+06	92.0030	277.4574

==================================
| Variable storage data for node | TR9
==================================

Data	Elevation	Depth	Area	Volume	Area

Point	ft	ft	ft^2	ft^3	acres	Volume ac-ft
1	639.1600	0.0000	43.5600	0.0000	0.0010	0.0000
2	643.8600	4.7000	43.5600	204.7320	0.0010	0.0047
3	643.9600	4.8000	102191.7600	3682.8696	2.3460	0.0845
4	644.9600	5.8000	110468.1600	109984.9143	2.5360	2.5249
5	645.9600	6.8000	115521.1200	222969.0082	2.6520	5.1187
6	646.0000	6.8400	115521.1200	227589.8530	2.6520	5.2247

==================================
| Variable storage data for node | TR1D-1
==================================

Data Point	Elevation ft	Depth ft	Area ft^2	Volume ft^3	Area acres	Volume ac-ft
1	644.6000	0.0000	590238.0000	0.0000	13.5500	0.0000
2	645.0000	0.4000	598514.4000	237746.1817	13.7400	5.4579
3	645.6000	1.0000	611146.8000	600634.3167	14.0300	13.7887
4	645.6000	1.0000	646430.4000	600634.3167	14.8400	13.7887
5	646.0000	1.4000	655142.4000	860944.3298	15.0400	19.7646
6	647.0000	2.4000	680842.8000	1.528889E+06	15.6300	35.0985
7	648.0000	3.4000	702187.2000	2.220370E+06	16.1200	50.9727
8	649.0000	4.4000	724402.8000	2.933629E+06	16.6300	67.3468
9	650.0000	5.4000	747054.0000	3.669321E+06	17.1500	84.2360
10	658.0000	13.4000	747054.0000	9.645753E+06	17.1500	221.4360

==================================
| Variable storage data for node | TR1F-2
==================================

Data Point	Elevation ft	Depth ft	Area ft^2	Volume ft^3	Area acres	Volume ac-ft
1	647.0000	0.0000	87120.0000	0.0000	2.0000	0.0000
2	647.9900	0.9900	92347.2000	88822.8126	2.1200	2.0391
3	648.0000	1.0000	101494.8000	89791.6530	2.3300	2.0613

4	649.0000	2.0000	108900.0000	194966.2746	2.5000	4.4758
5	654.0000	7.0000	108900.0000	739466.2746	2.5000	16.9758

===================================
| Variable storage data for node | TR1E
===================================

Data Point	Elevation ft	Depth ft	Area ft^2	Volume ft^3	Area acres	Volume ac-ft
1	644.0000	0.0000	204732.0000	0.0000	4.7000	0.0000
2	645.0000	1.0000	218671.2000	211661.2310	5.0200	4.8591
3	645.0000	1.0000	241758.0000	211661.2310	5.5500	4.8591
4	646.0000	2.0000	256132.8000	460569.5497	5.8800	10.5732
5	647.0000	3.0000	270507.6000	723854.4137	6.2100	16.6174
6	648.0000	4.0000	284882.4000	1.001516E+06	6.5400	22.9916
7	649.0000	5.0000	299257.2000	1.293553E+06	6.8700	29.6959
8	658.0000	14.0000	299257.2000	3.986868E+06	6.8700	91.5259

===================================
| Variable storage data for node | TR1F-2.1
===================================

Data Point	Elevation ft	Depth ft	Area ft^2	Volume ft^3	Area acres	Volume ac-ft
1	646.0000	0.0000	74052.0000	0.0000	1.7000	0.0000
2	647.0000	1.0000	80586.0000	77295.2097	1.8500	1.7745
3	648.0000	2.0000	87555.6000	161341.0843	2.0100	3.7039
4	649.0000	3.0000	94960.8000	252573.3242	2.1800	5.7983
5	650.0000	4.0000	102366.0000	351212.5713	2.3500	8.0627
6	651.0000	5.0000	110206.8000	457473.7997	2.5300	10.5022
7	652.0000	6.0000	118483.2000	571792.6877	2.7200	13.1266
8	653.0000	7.0000	126759.6000	694389.5793	2.9100	15.9410
9	654.0000	8.0000	135471.6000	825479.7421	3.1100	18.9504

===
| Orifice Data |
===

```
         Conduit           From             To                Area     Depth
 Discharge   Height Above
            Name        Junction        Junction      Type     (ft2)      (ft)
Coefficient  Junction (ft)
 ---------------- -------------- --------------      ----     -----     -----
-----------  -------------
        WQ OUTLET          TR1F-2        TR1F-2.1 Circ Side      0.20      0.00
    0.600         0.000
         STAGE 1           TR1F-2        TR1F-2.1 Rect Side      5.00      0.50
    0.600         1.070
       WQV OUTLET          TR1G-1          Outlet Circ Side      0.20      2.00
    0.600         2.750
        1ST STAGE          TR1G-1          Outlet Rect Side      6.00      0.50
    0.600         3.250

 ====> EQUIVALENT PIPE INFORMATION FOR ORIFICE              1
       CONDUIT NAME...........................       WQ OUTLET
       Upstream node...........................       TR1F-2
       Downstream node.........................     TR1F-2.1
       PIPE DIAMETER.......................           0.50
       PIPE LENGTH.........................         1000.00
       MANNINGS ROUGHNESS...................         0.0024
       INVERT ELEVATION AT UPSTREAM END.....       647.0000
       INVERT ELEVATION AT DOWNSTREAM END...       646.9900

 ====> EQUIVALENT PIPE INFORMATION FOR ORIFICE              2
       CONDUIT NAME...........................         STAGE 1
       Upstream node...........................       TR1F-2
       Downstream node.........................     TR1F-2.1
       PIPE DIAMETER.......................           0.50
       PIPE LENGTH.........................         1000.00
       MANNINGS ROUGHNESS...................         0.0037
       INVERT ELEVATION AT UPSTREAM END.....       648.0700
       INVERT ELEVATION AT DOWNSTREAM END...       648.0600

 ====> EQUIVALENT PIPE INFORMATION FOR ORIFICE              3
       CONDUIT NAME...........................      WQV OUTLET
       Upstream node...........................       TR1G-1
       Downstream node.........................       Outlet
       PIPE DIAMETER.......................           0.50
       PIPE LENGTH.........................         1000.00
       MANNINGS ROUGHNESS...................         0.0024
       INVERT ELEVATION AT UPSTREAM END.....       639.7500
       INVERT ELEVATION AT DOWNSTREAM END...       639.7400

 ====> EQUIVALENT PIPE INFORMATION FOR ORIFICE              4
       CONDUIT NAME...........................       1ST STAGE
       Upstream node...........................       TR1G-1
       Downstream node.........................       Outlet
       PIPE DIAMETER.......................           0.50
       PIPE LENGTH.........................         1000.00
       MANNINGS ROUGHNESS...................         0.0038
       INVERT ELEVATION AT UPSTREAM END.....       640.2500
       INVERT ELEVATION AT DOWNSTREAM END...       640.2400

 Note: For a Bottom-outlet orifice the invert elevation of the downstream node will
be
       adjusted to accomodate the equivalent conduit.  Conduit grades are not
affected.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| Weir Data |
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Weir Name	From Junction	To Junction	Type	Crest Height(ft)	Weir Top(ft)	Weir Length(ft)	Discharge Coefficient	Weir Power
TR5 - TR5A	TR5A	TR5	2	0.00	12.00	259.00	2.8000	1.5000
STAGE 2	TR1F-2	TR1F-2.1	1	4.50	7.00	12.00	3.2000	1.5000
2ND STAGE	TR1G-1	Outlet	1	9.50	11.00	20.00	3.4000	1.5000

==
| FREE OUTFALL DATA (DATA GROUP I1) |
| BOUNDARY CONDITION ON DATA GROUP J1 |
==

Outfall at Junction....BD-10 has boundary condition number... 1

===
| Weir Outfall Data |
| Boundary Condition on data group J1 |
===

==
| INTERNAL CONNECTIVITY INFORMATION |
==

CONDUIT	JUNCTION	JUNCTION
WQ OUTLET	TR1F-2	TR1F-2.1
STAGE 1	TR1F-2	TR1F-2.1
WQV OUTLET	TR1G-1	Outlet
1ST STAGE	TR1G-1	Outlet
TR5 - TR5A	TR5A	TR5
STAGE 2	TR1F-2	TR1F-2.1
2ND STAGE	TR1G-1	Outlet
FREE # 1	BD-10	BOUNDARY

===
| Boundary Condition Information |
| Data Groups J1-J4 |
===

BC NUMBER.. 1 has no control water surface.

===
| XP Note Field Summary |
===

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| Conduit Convergence Criteria |
==================================

Conduit Name	Full Flow	Conduit Slope
McCarty 1	18.9194	0.0002
TR5 Link	262.7790	0.0038
TR4 Link	61.1702	0.0037
I-65	105.5945	0.0016
CR 550	202.0912	0.0023
McCarty 3	325.9301	0.0040
Link17	21.0539	0.0026
BD-L1	11160.2176	0.0042
BD-L2	13803.7691	0.0039
BD-L3	13837.7681	0.0029
BD-L4	52933.4428	0.0167
BD-L5	24588.1071	0.0058
BD-L6	22749.0504	0.0041
BD-L7	32991.6611	0.0108
BD-L8	21695.6790	0.0028
BD-L9	40589.5031	0.0102
BD-L10	718.5285	0.0000
Link31	1232.6116	0.0023
Link32	95.2890	0.0146
Link33	208.5455	0.0064
Link34	29.8706	0.0174
Link35	63.9355	0.0020
Link44	124.3987	0.0075
Link52	65.3461	0.0021
Link53	168.2852	0.0016
Link54	17.6296	0.0100
Link55	24.3548	0.0013
Link56	12.2419	0.0048
Link57	27.2295	0.0017

Link58	12.4669	0.0050
Link59	8.6536	0.0024
Link60	13.6568	0.0060
Link61	16.4471	0.0087
Link62	8.8154	0.0025
Link63	13.0091	0.0054
Link65	14.3955	0.0067
Link66	199.4266	0.0022
Link68	14.9142	0.0005
Link69	86.6125	0.0004
Link66.1	199.4266	0.0022
Primary	103.4894	0.0016
Emergency	23.9874	0.0034
TR1B/C Out	101.2384	0.0017
TR1D Out	175.3501	0.0050
TR1E Out	226.3760	0.0083
TR1A Out	123.9912	0.0025
TR1F Out	6.6853	0.0021
Weir	0.0000	0.0000
WQ OUTLET	0.6670	0.0000
STAGE 1	17.0235	0.0000
WQV OUTLET	0.6670	0.0000
1ST STAGE	20.4282	0.0000

```
*==================================*
|     Initial Model Condition      |
| Initial Time =      0.03 hours   |
*==================================*

       Junction / Depth  / Elevation    ===>  "*" Junction is Surcharged.
        TR1A-1/2/   0.00 /   645.90           TR1G-1/   2.75 /   639.75
TR6-1/   0.00 /   637.08
             TR7/   0.00 /   633.06              TR8/   0.00 /   631.44
BD-0/   0.00 /   631.11
           TR2-1/   0.96 /   639.50              TR5/   0.00 /   649.00
TR5A/   0.00 /   658.00
             TR9/   0.00 /   639.16             TR10/   0.00 /   640.50
McCarty DS/   0.00 /   645.65
            BD-1/   0.00 /   630.00             BD-2/   0.00 /   628.00
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BD-3/   0.00 /   626.00
            BD-4/   0.00 /   620.00            TR11/   0.00 /   616.00
BD-6/   0.00 /   614.00
            BD-7/   0.00 /   610.00            BD-8/   0.00 /   608.00
BD-9/   0.00 /   604.00
           BD-10/   0.00 /   604.00          Node35/   0.00 /   639.90
TR9A/   0.00 /   642.22
           TR10A/   0.00 /   636.94            TR9B/   0.00 /   641.84
TR1B/   0.00 /   648.90
          TR1B/C/   0.00 /   648.00          TR1D-1/   0.00 /   644.60
TR1F-2/   0.00 /   647.00
            TR1E/   0.00 /   644.00           TR6-3/   0.00 /   648.27
TR6-2/   0.00 /   644.40
          TR1F-3/   0.00 /   657.00        TR1F-1/2/   0.00 /   647.90
TR1D-2/   0.00 /   654.00
        TR1D-2/3/   0.00 /   648.30          TR1D-3/   0.00 /   653.00
TR1A-2/   0.00 /   650.90
          TR1A-1/   0.00 /   654.00          TR1G-2/   0.00 /   653.00
TR1F-1/   0.00 /   651.50
            TR1C/   0.00 /   656.00           TR2-3/   0.00 /   660.00
TR2-2/   0.00 /   643.64
          Outlet/   0.00 /   637.00         TR2-2.1/   0.00 /   641.09
TR1F-2.1/   0.50 /   646.50
          Node71/   0.00 /   641.09

         Conduit/       FLOW   ===> "*" Conduit uses the normal flow option.
       McCarty 1/       0.00         TR5 Link/       0.00         TR4 Link/
0.00
            I-65/       0.00           CR 550/       0.00        McCarty 3/
0.00
          Link17/       0.00            BD-L1/       0.00             BD-L2/
0.00
           BD-L3/       0.00            BD-L4/       0.00             BD-L5/
0.00
           BD-L6/       0.00            BD-L7/       0.00             BD-L8/
0.00
           BD-L9/       0.00           BD-L10/       0.00            Link31/
0.00
          Link32/       0.00           Link33/       0.00            Link34/
0.00
          Link35/       0.00           Link44/       0.00            Link52/
0.00
          Link53/       0.00           Link54/       0.00            Link55/
0.00
          Link56/       0.00           Link57/       0.00            Link58/
0.00
          Link59/       0.00           Link60/       0.00            Link61/
0.00
          Link62/       0.00           Link63/       0.00            Link65/
0.00
          Link66/       0.00           Link68/       0.00            Link69/
0.00
        Link66.1/       0.00          Primary/       0.00        Emergency/
0.00
     TR1B/C Out/       0.00         TR1D Out/       0.00         TR1E Out/
0.00
       TR1A Out/       0.00         TR1F Out/       0.00              Weir/
0.00
      WQ OUTLET/       0.00          STAGE 1/       0.00       WQV OUTLET/
0.00
      1ST STAGE/       0.00       TR5 - TR5A/       0.00          STAGE 2/
0.00
      2ND STAGE/       0.00         FREE # 1/       0.00
```

```
        Conduit/   Velocity
      McCarty 1/       0.00          TR5 Link/        0.00          TR4 Link/
0.00
           I-65/       0.00            CR 550/        0.00        McCarty 3/
0.00
         Link17/       0.00             BD-L1/        0.00             BD-L2/
0.00
          BD-L3/       0.00             BD-L4/        0.00             BD-L5/
0.00
          BD-L6/       0.00             BD-L7/        0.00             BD-L8/
0.00
          BD-L9/       0.00            BD-L10/        0.00           Link31/
0.00
         Link32/       0.00            Link33/        0.00           Link34/
0.00
         Link35/       0.00            Link44/        0.00           Link52/
0.00
         Link53/       0.00            Link54/        0.00           Link55/
0.00
         Link56/       0.00            Link57/        0.00           Link58/
0.00
         Link59/       0.00            Link60/        0.00           Link61/
0.00
         Link62/       0.00            Link63/        0.00           Link65/
0.00
         Link66/       0.00            Link68/        0.00           Link69/
0.00
       Link66.1/       0.00           Primary/        0.00        Emergency/
0.00
     TR1B/C Out/       0.00          TR1D Out/        0.00          TR1E Out/
0.00
       TR1A Out/       0.00          TR1F Out/        0.00              Weir/
0.00
      WQ OUTLET/       0.00           STAGE 1/        0.00       WQV OUTLET/
0.00
      1ST STAGE/       0.00

        Conduit/ Cross Sectional Area
      McCarty 1/       0.00          TR5 Link/        0.00          TR4 Link/
0.00
           I-65/       0.00            CR 550/        0.00        McCarty 3/
0.00
         Link17/       0.00             BD-L1/        0.00             BD-L2/
0.00
          BD-L3/       0.00             BD-L4/        0.00             BD-L5/
0.00
          BD-L6/       0.00             BD-L7/        0.00             BD-L8/
0.00
          BD-L9/       0.00            BD-L10/        0.00           Link31/
0.00
         Link32/       0.00            Link33/        0.00           Link34/
0.00
         Link35/       0.00            Link44/        0.00           Link52/
0.00
         Link53/       0.00            Link54/        0.00           Link55/
0.00
         Link56/       0.00            Link57/        0.00           Link58/
0.00
         Link59/       0.00            Link60/        0.00           Link61/
0.00
         Link62/       0.00            Link63/        0.00           Link65/
0.00
```

```
         Link66/       0.00          Link68/       0.00          Link69/
2.63
       Link66.1/       0.29         Primary/       0.00       Emergency/
0.00
     TR1B/C Out/       0.00       TR1D Out/       0.00        TR1E Out/
0.00
       TR1A Out/       0.00       TR1F Out/       0.51            Weir/
0.00
      WQ OUTLET/       0.00         STAGE 1/       0.00      WQV OUTLET/
0.00
      1ST STAGE/       0.00

        Conduit/ Hydraulic Radius
      McCarty 1/       0.00       TR5 Link/       0.00        TR4 Link/
0.00
           I-65/       0.00          CR 550/       0.00       McCarty 3/
0.00
         Link17/       0.00           BD-L1/       0.00           BD-L2/
0.00
          BD-L3/       0.00           BD-L4/       0.00           BD-L5/
0.00
          BD-L6/       0.00           BD-L7/       0.00           BD-L8/
0.00
          BD-L9/       0.00          BD-L10/       0.00          Link31/
0.00
         Link32/       0.00          Link33/       0.00          Link34/
0.00
         Link35/       0.00          Link44/       0.00          Link52/
0.00
         Link53/       0.00          Link54/       0.00          Link55/
0.00
         Link56/       0.00          Link57/       0.00          Link58/
0.00
         Link59/       0.00          Link60/       0.00          Link61/
0.00
         Link62/       0.00          Link63/       0.00          Link65/
0.00
         Link66/       0.00          Link68/       0.00          Link69/
0.53
       Link66.1/       0.07         Primary/       0.00       Emergency/
0.00
     TR1B/C Out/       0.00       TR1D Out/       0.00        TR1E Out/
0.00
       TR1A Out/       0.00       TR1F Out/       0.26            Weir/
0.00
      WQ OUTLET/       0.00         STAGE 1/       0.00      WQV OUTLET/
0.00
      1ST STAGE/       0.00

        Conduit/ Upstream/ Downstream Elevation
      McCarty 1/   637.00/   637.00        TR5 Link/   631.44/   631.44        TR4
Link/   631.44/   631.44
           I-65/   633.06/   633.06          CR 550/   631.44/   631.44
McCarty 3/   645.65/   645.65
         Link17/   631.44/   631.44           BD-L1/   630.00/   630.00
BD-L2/   628.00/   628.00
          BD-L3/   626.00/   626.00           BD-L4/   620.00/   620.00
BD-L5/   616.00/   616.00
          BD-L6/   614.00/   614.00           BD-L7/   610.00/   610.00
BD-L8/   608.00/   608.00
          BD-L9/   604.00/   604.00          BD-L10/   604.00/   604.00
Link31/   639.90/   639.90
         Link32/   631.11/   631.11          Link33/   631.44/   631.44
```

```
Link34/   630.00/   630.00
          Link35/   631.44/   631.44          Link44/   648.00/   648.00
Link52/   644.40/   644.40
          Link53/   637.08/   637.08          Link54/   647.00/   647.00
Link55/   647.00/   647.00
          Link56/   648.30/   648.30          Link57/   648.30/   648.30
Link58/   644.60/   644.60
          Link59/   645.90/   645.90          Link60/   645.90/   645.90
Link61/   639.75/   639.75
          Link62/   647.90/   647.90          Link63/   648.00/   648.00
Link65/   643.64/   643.64
          Link66/   641.09/   641.09          Link68/   639.75/   639.75
Link69/   639.50/   638.43
        Link66.1/   641.09/   639.50         Primary/   631.11/   631.11
Emergency/   631.11/   631.11
      TR1B/C Out/   644.60/   644.60        TR1D Out/   644.00/   644.00
TR1E Out/   639.75/   639.75
        TR1A Out/   644.60/   644.60        TR1F Out/   646.50/   644.40
Weir/   641.09/   641.09
       WQ OUTLET/   646.50/   646.50         STAGE 1/   646.50/   646.50      WQV
OUTLET/   637.00/   637.00
       1ST STAGE/   637.00/   637.00

 Cycle        500      Time         16 Hrs - 40.00 Min

       Junction / Depth  / Elevation    ===>  "*" Junction is Surcharged.
        TR1A-1/2/   1.15 /   647.05           TR1G-1/   9.60 /   646.60
TR6-1/   4.81 /   641.89
             TR7/   5.56 /   638.62              TR8/   5.76 /   637.20
BD-0/   4.22 /   635.33
           TR2-1/   3.38 /   641.92              TR5/   0.37 /   649.37
TR5A/   0.14 /   658.14
             TR9/   0.00 /   639.16             TR10/   0.05 /   640.55
McCarty DS/   0.70 /   646.35
            BD-1/   4.56 /   634.56             BD-2/   3.22 /   631.22
BD-3/   1.52 /   627.52
            BD-4/   2.53 /   622.53             TR11/   2.96 /   618.96
BD-6/   1.93 /   615.93
            BD-7/   2.64 /   612.64             BD-8/   3.98 /   611.98
BD-9/   7.85 /   611.85
           BD-10/   7.80 /   611.80           Node35/   0.20 /   640.10
TR9A/   0.00 /   642.22
           TR10A/   0.00 /   636.94             TR9B/   0.00 /   641.84
TR1B/   0.00 /   648.90
          TR1B/C/   0.01 /   648.01           TR1D-1/   2.45 /   647.05
TR1F-2/   4.90 /   651.90
            TR1E/   2.89 /   646.89            TR6-3/   0.01 /   648.28
TR6-2/   1.10 /   645.50
          TR1F-3/   0.01 /   657.01         TR1F-1/2/   4.00 /   651.90
TR1D-2/   0.01 /   654.01
        TR1D-2/3/   0.01 /   648.31           TR1D-3/   0.00 /   653.00
TR1A-2/   0.09 /   650.99
          TR1A-1/   0.01 /   654.01           TR1G-2/   0.03 /   653.03
TR1F-1/   0.41 /   651.91
            TR1C/   0.02 /   656.02            TR2-3/   0.02 /   660.02
TR2-2/   0.90 /   644.54
          Outlet/   5.53 /   642.53          TR2-2.1/   3.45 /   644.54
TR1F-2.1/   5.89 /   651.89
          Node71/   1.72 /   642.81

         Conduit/       FLOW   ===> "*" Conduit uses the normal flow option.
       McCarty 1/     -62.61        TR5 Link/       7.31         TR4 Link/
0.00            I-65/     108.72
```

```
          CR 550/    168.61       McCarty 3/       7.05           Link17/
0.22           BD-L1/    290.93
           BD-L2/    292.19           BD-L3/     293.98            BD-L4/
294.66*          BD-L5/    296.20
           BD-L6/    297.88           BD-L7/     299.05            BD-L8/
302.02           BD-L9/    306.76
          BD-L10/    311.42          Link31/       0.18*          Link32/
0.00*          Link33/      0.00
          Link34/      0.00*         Link35/       0.00           Link44/
0.00*          Link52/      0.01*
          Link53/     12.46*         Link54/       0.00*          Link55/
1.10           Link56/      0.00*
          Link57/      0.00          Link58/       0.01*          Link59/
0.09*          Link60/      0.01*
          Link61/      0.02*         Link62/       0.37           Link63/
0.01           Link65/      0.01
          Link66/      0.04          Link68/     -30.41           Link69/
30.85         Link66.1/     30.58
         Primary/    258.91       Emergency/      31.60       TR1B/C Out/
0.01         TR1D Out/     46.11
        TR1E Out/     63.90        TR1A Out/       0.32         TR1F Out/
12.41            Weir/      30.49
       WQ OUTLET/      0.12          STAGE 1/       3.11      WQV OUTLET/
1.91        1ST STAGE/     58.33
      TR5 - TR5A/      6.61          STAGE 2/       3.26       2ND STAGE/
2.30         FREE # 1/    311.44

 Cycle       1000      Time         33 Hrs - 20.00 Min

       Junction / Depth  / Elevation    ===>  "*" Junction is Surcharged.
        TR1A-1/2/   0.00 /   645.90          TR1G-1/   5.77 /   642.77
TR6-1/   3.17 /   640.25
             TR7/   2.60 /   635.66              TR8/   2.35 /   633.79
BD-0/   2.06 /   633.17
           TR2-1/   1.71 /   640.25              TR5/   0.06 /   649.06
TR5A/   0.03 /   658.03
             TR9/   0.00 /   639.16             TR10/   0.00 /   640.50
McCarty DS/   0.17 /   645.82
            BD-1/   2.40 /   632.40             BD-2/   1.54 /   629.54
BD-3/   0.67 /   626.67
            BD-4/   1.06 /   621.06             TR11/   1.24 /   617.24
BD-6/   0.70 /   614.70
            BD-7/   0.77 /   610.77             BD-8/   0.89 /   608.89
BD-9/   4.33 /   608.33
           BD-10/   4.29 /   608.29           Node35/   0.00 /   639.90
TR9A/   0.00 /   642.22
           TR10A/   0.00 /   636.94             TR9B/   0.00 /   641.84
TR1B/   0.00 /   648.90
          TR1B/C/   0.00 /   648.00           TR1D-1/   0.29 /   644.89
TR1F-2/   2.09 /   649.09
            TR1E/   0.32 /   644.32            TR6-3/   0.00 /   648.27
TR6-2/   0.94 /   645.34
          TR1F-3/   0.00 /   657.00         TR1F-1/2/   1.19 /   649.09
TR1D-2/   0.00 /   654.00
        TR1D-2/3/   0.00 /   648.30           TR1D-3/   0.00 /   653.00
TR1A-2/   0.00 /   650.90
          TR1A-1/   0.00 /   654.00           TR1G-2/   0.00 /   653.00
TR1F-1/   0.00 /   651.50
            TR1C/   0.00 /   656.00            TR2-3/   0.00 /   660.00
TR2-2/   0.00 /   643.64
          Outlet/   3.73 /   640.73          TR2-2.1/   1.68 /   642.77
TR1F-2.1/   3.06 /   649.06
          Node71/   0.01 /   641.10
```

```
        Conduit/       FLOW   ===> "*" Conduit uses the normal flow option.
      McCarty 1/     -42.81        TR5 Link/       0.37          TR4 Link/
0.00           I-65/      52.31
         CR 550/     53.86       McCarty 3/       0.36            Link17/
0.00          BD-L1/      54.28
          BD-L2/     54.40           BD-L3/      54.69             BD-L4/
54.82*         BD-L5/      55.54*
          BD-L6/     56.47           BD-L7/      56.97*            BD-L8/
58.96          BD-L9/      61.13*
         BD-L10/     65.34          Link31/       0.00            Link32/
0.00*         Link33/      0.00
         Link34/      0.00*         Link35/       0.00            Link44/
0.00*         Link52/      0.00*
         Link53/      8.92*         Link54/       0.00            Link55/
0.11          Link56/      0.00*
         Link57/      0.00          Link58/       0.00            Link59/
0.00          Link60/      0.00*
         Link61/      0.00*         Link62/       0.00*           Link63/
0.00          Link65/      0.00
         Link66/      0.00*         Link68/       0.26            Link69/
0.05        Link66.1/      0.01*
        Primary/     54.24       Emergency/       0.00*      TR1B/C Out/
0.00        TR1D Out/      5.63
       TR1E Out/      7.79        TR1A Out/       0.00          TR1F Out/
8.87           Weir/       0.00
      WQ OUTLET/      0.18          STAGE 1/      4.62       WQV OUTLET/
1.35       1ST STAGE/     41.39
     TR5 - TR5A/      0.35          STAGE 2/      0.00        2ND STAGE/
0.00        FREE # 1/     65.35

 Cycle       1500      Time         50 Hrs -  0.00 Min

       Junction / Depth  / Elevation    ===>  "*" Junction is Surcharged.
        TR1A-1/2/   0.00 /   645.90          TR1G-1/   3.49 /   640.49
TR6-1/   1.22 /   638.30
             TR7/   0.81 /   633.87              TR8/   0.83 /   632.27
BD-0/   0.76 /   631.87
           TR2-1/   0.00 /   638.54              TR5/   0.03 /   649.03
TR5A/   0.02 /   658.02
             TR9/   0.00 /   639.16             TR10/   0.00 /   640.50
McCarty DS/   0.09 /   645.74
            BD-1/   1.03 /   631.03             BD-2/   0.47 /   628.47
BD-3/   0.19 /   626.19
            BD-4/   0.31 /   620.31             TR11/   0.37 /   616.37
BD-6/   0.19 /   614.19
            BD-7/   0.21 /   610.21             BD-8/   0.24 /   608.24
BD-9/   1.77 /   605.77
           BD-10/   1.72 /   605.72           Node35/   0.00 /   639.90
TR9A/   0.00 /   642.22
           TR10A/   0.00 /   636.94             TR9B/   0.00 /   641.84
TR1B/   0.00 /   648.90
          TR1B/C/   0.00 /   648.00           TR1D-1/   0.07 /   644.67
TR1F-2/   0.93 /   647.93
            TR1E/   0.08 /   644.08            TR6-3/   0.00 /   648.27
TR6-2/   0.41 /   644.81
          TR1F-3/   0.00 /   657.00         TR1F-1/2/   0.03 /   647.93
TR1D-2/   0.00 /   654.00
        TR1D-2/3/   0.00 /   648.30           TR1D-3/   0.00 /   653.00
TR1A-2/   0.00 /   650.90
          TR1A-1/   0.00 /   654.00           TR1G-2/   0.00 /   653.00
TR1F-1/   0.00 /   651.50
            TR1C/   0.00 /   656.00            TR2-3/   0.00 /   660.00
```

```
TR2-2/   0.00 /   643.64
          Outlet/   1.41 /   638.41          TR2-2.1/   0.41 /   641.50
TR1F-2.1/   0.62 /   646.62
          Node71/   0.00 /   641.09

         Conduit/       FLOW   ===> "*" Conduit uses the normal flow option.
       McCarty 1/      -4.00          TR5 Link/        0.12          TR4 Link/
0.00             I-65/       5.69
          CR 550/       6.12         McCarty 3/        0.12            Link17/
0.00            BD-L1/       6.29
           BD-L2/       6.40              BD-L3/       6.47             BD-L4/
6.50*           BD-L5/       6.56*
           BD-L6/       6.61              BD-L7/       6.62*            BD-L8/
6.69*           BD-L9/       6.74*
          BD-L10/       7.27             Link31/       0.00            Link32/
0.00*          Link33/       0.00
          Link34/       0.00*            Link35/       0.00            Link44/
0.00*          Link52/       0.00*
          Link53/       1.59*            Link54/       0.00            Link55/
0.00           Link56/       0.00*
          Link57/       0.00             Link58/       0.00            Link59/
0.00           Link60/       0.00*
          Link61/       0.00             Link62/       0.00*           Link63/
0.00           Link65/       0.00
          Link66/       0.00*            Link68/       0.00            Link69/
0.00         Link66.1/       0.00*
         Primary/       6.26         Emergency/        0.00*      TR1B/C Out/
0.00         TR1D Out/       0.69
        TR1E Out/       0.92           TR1A Out/       0.00          TR1F Out/
1.53             Weir/       0.00
       WQ OUTLET/       0.69            STAGE 1/       0.00       WQV OUTLET/
0.58        1ST STAGE/       3.41
      TR5 - TR5A/       0.11            STAGE 2/       0.00         2ND STAGE/
0.00         FREE # 1/       7.27

 Cycle       2000      Time         66 Hrs - 40.00 Min

       Junction / Depth  / Elevation    ===>  "*" Junction is Surcharged.
        TR1A-1/2/   0.00 /   645.90           TR1G-1/   3.33 /   640.33
TR6-1/   0.79 /   637.87
             TR7/   0.39 /   633.45              TR8/   0.43 /   631.87
BD-0/   0.34 /   631.45
           TR2-1/   0.00 /   638.54              TR5/   0.02 /   649.02
TR5A/   0.01 /   658.01
             TR9/   0.00 /   639.16             TR10/   0.00 /   640.50
McCarty DS/   0.05 /   645.70
            BD-1/   0.55 /   630.55             BD-2/   0.20 /   628.20
BD-3/   0.08 /   626.08
            BD-4/   0.13 /   620.13             TR11/   0.16 /   616.16
BD-6/   0.08 /   614.08
            BD-7/   0.09 /   610.09             BD-8/   0.10 /   608.10
BD-9/   0.82 /   604.82
           BD-10/   0.77 /   604.77           Node35/   0.00 /   639.90
TR9A/   0.00 /   642.22
           TR10A/   0.00 /   636.94             TR9B/   0.00 /   641.84
TR1B/   0.00 /   648.90
          TR1B/C/   0.00 /   648.00           TR1D-1/   0.03 /   644.63
TR1F-2/   0.56 /   647.56
            TR1E/   0.04 /   644.04             TR6-3/   0.00 /   648.27
TR6-2/   0.26 /   644.66
          TR1F-3/   0.00 /   657.00         TR1F-1/2/   0.00 /   647.90
TR1D-2/   0.00 /   654.00
        TR1D-2/3/   0.00 /   648.30           TR1D-3/   0.00 /   653.00
```

```
TR1A-2/   0.00 /   650.90
          TR1A-1/   0.00 /   654.00          TR1G-2/   0.00 /   653.00
TR1F-1/   0.00 /   651.50
            TR1C/   0.00 /   656.00           TR2-3/   0.00 /   660.00
TR2-2/   0.00 /   643.64
          Outlet/   0.90 /   637.90         TR2-2.1/   0.41 /   641.50
TR1F-2.1/   0.38 /   646.38
          Node71/   0.00 /   641.09

         Conduit/       FLOW   ===> "*" Conduit uses the normal flow option.
       McCarty 1/      -0.80        TR5 Link/       0.06          TR4 Link/
0.00          I-65/       1.40
          CR 550/       1.41       McCarty 3/       0.06            Link17/
0.00         BD-L1/       1.47
           BD-L2/       1.48           BD-L3/       1.48             BD-L4/
1.48*        BD-L5/       1.49*
           BD-L6/       1.49           BD-L7/       1.49*            BD-L8/
1.49*        BD-L9/       1.49*
          BD-L10/       1.52          Link31/       0.00            Link32/
0.00*       Link33/       0.00
          Link34/       0.00*         Link35/       0.00            Link44/
0.00*       Link52/       0.00*
          Link53/       0.59*         Link54/       0.00            Link55/
0.00        Link56/       0.00*
          Link57/       0.00          Link58/       0.00            Link59/
0.00        Link60/       0.00*
          Link61/       0.00          Link62/       0.00            Link63/
0.00        Link65/       0.00
          Link66/       0.00*         Link68/       0.00            Link69/
0.00      Link66.1/       0.00*
         Primary/       1.47       Emergency/       0.00*      TR1B/C Out/
0.00      TR1D Out/       0.20*
        TR1E Out/       0.28        TR1A Out/       0.00          TR1F Out/
0.58          Weir/       0.00
      WQ OUTLET/       0.44          STAGE 1/       0.00        WQV OUTLET/
0.45     1ST STAGE/       0.35
     TR5 - TR5A/       0.06          STAGE 2/       0.00         2ND STAGE/
0.00      FREE # 1/       1.52

 Cycle       2500      Time         83 Hrs - 20.00 Min

       Junction / Depth  / Elevation    ===>  "*" Junction is Surcharged.
        TR1A-1/2/   0.00 /   645.90          TR1G-1/   3.27 /   640.27
TR6-1/   0.68 /   637.76
             TR7/   0.29 /   633.35              TR8/   0.32 /   631.76
BD-0/   0.23 /   631.34
           TR2-1/   0.00 /   638.54              TR5/   0.02 /   649.02
TR5A/   0.01 /   658.01
             TR9/   0.00 /   639.16             TR10/   0.00 /   640.50
McCarty DS/   0.04 /   645.69
            BD-1/   0.39 /   630.39             BD-2/   0.14 /   628.14
BD-3/   0.06 /   626.06
            BD-4/   0.09 /   620.09             TR11/   0.11 /   616.11
BD-6/   0.05 /   614.05
            BD-7/   0.06 /   610.06             BD-8/   0.07 /   608.07
BD-9/   0.64 /   604.64
           BD-10/   0.60 /   604.60           Node35/   0.00 /   639.90
TR9A/   0.00 /   642.22
           TR10A/   0.00 /   636.94             TR9B/   0.00 /   641.84
TR1B/   0.00 /   648.90
          TR1B/C/   0.00 /   648.00          TR1D-1/   0.02 /   644.62
TR1F-2/   0.35 /   647.35
            TR1E/   0.03 /   644.03            TR6-3/   0.00 /   648.27
```

```
TR6-2/   0.18 /   644.58
          TR1F-3/   0.00 /   657.00         TR1F-1/2/   0.00 /   647.90
TR1D-2/   0.00 /   654.00
        TR1D-2/3/   0.00 /   648.30           TR1D-3/   0.00 /   653.00
TR1A-2/   0.00 /   650.90
          TR1A-1/   0.00 /   654.00           TR1G-2/   0.00 /   653.00
TR1F-1/   0.00 /   651.50
            TR1C/   0.00 /   656.00            TR2-3/   0.00 /   660.00
TR2-2/   0.00 /   643.64
          Outlet/   0.77 /   637.77          TR2-2.1/   0.41 /   641.50
TR1F-2.1/   0.29 /   646.29
          Node71/   0.00 /   641.09

         Conduit/       FLOW   ===> "*" Conduit uses the normal flow option.
       McCarty 1/      -0.43         TR5 Link/       0.03         TR4 Link/
0.00            I-65/       0.76
          CR 550/       0.76       McCarty 3/       0.03            Link17/
0.00           BD-L1/       0.80*
           BD-L2/       0.80           BD-L3/       0.80             BD-L4/
0.80*          BD-L5/       0.80*
           BD-L6/       0.81           BD-L7/       0.81*            BD-L8/
0.81*          BD-L9/       0.81*
          BD-L10/       0.81          Link31/       0.00            Link32/
0.00*         Link33/       0.00
          Link34/       0.00*         Link35/       0.00            Link44/
0.00*         Link52/       0.00*
          Link53/       0.33*         Link54/       0.00            Link55/
0.00          Link56/       0.00*
          Link57/       0.00          Link58/       0.00            Link59/
0.00          Link60/       0.00*
          Link61/       0.00          Link62/       0.00            Link63/
0.00          Link65/       0.00
          Link66/       0.00*         Link68/       0.00            Link69/
0.00        Link66.1/       0.00*
         Primary/       0.80       Emergency/       0.00*      TR1B/C Out/
0.00        TR1D Out/       0.09*
        TR1E Out/       0.12        TR1A Out/       0.00         TR1F Out/
0.32            Weir/       0.00
       WQ OUTLET/       0.22         STAGE 1/       0.00       WQV OUTLET/
0.40       1ST STAGE/       0.03
      TR5 - TR5A/       0.03         STAGE 2/       0.00        2ND STAGE/
0.00        FREE # 1/       0.81


 *====================================================*
 | Table E5 - Junction Time Limitation Summary        |
 |             (0.10 or 0.25)* Depth * Area           |
 | Time step = -----------------------------          |
 |                 Sum of Flow                        |
 *====================================================*
 |  The time this junction was the limiting junction |
 |               is listed in the third column.       |
 *====================================================*

         Junction     Time(.10)  Time(.25)  Time(sec)
-----------------     ---------  ---------  ---------
         TR1A-1/2      308.3042   770.7605   120.0000

           TR1G-1      248.9137   622.2842     0.0000

            TR6-1      127.7502   319.3755     0.0000

              TR7      186.0240   465.0601     0.0000
```

TR8	118.4088	296.0221	183360.000
BD-0	209.7970	524.4924	0.0000
TR2-1	79.4008	198.5020	240.0000
TR5	63.8730	159.6824	1200.0000
TR5A	1200.0000	1200.0000	0.0000
TR9	57.7737	144.4341	4800.0000
TR10	1200.0000	1200.0000	0.0000
McCarty DS	52.3495	130.8738	69000.0000
BD-1	511.1181	1200.0000	0.0000
BD-2	347.6760	869.1899	0.0000
BD-3	726.8395	1200.0000	0.0000
BD-4	392.5999	981.4998	0.0000
TR11	314.0135	785.0337	0.0000
BD-6	829.8687	1200.0000	0.0000
BD-7	457.0561	1142.6403	0.0000
BD-8	338.7700	846.9250	0.0000
BD-9	166.9279	417.3198	0.0000
BD-10	1200.0000	1200.0000	0.0000
Node35	604.2718	1200.0000	0.0000
TR9A	294.8542	737.1355	0.0000
TR10A	390.6517	976.6293	0.0000
TR9B	403.4316	1008.5791	0.0000
TR1B	435.5849	1088.9624	0.0000
TR1B/C	556.1403	1200.0000	0.0000
TR1D-1	447.3339	1118.3348	0.0000
TR1F-2	290.0859	725.2147	0.0000
TR1E	471.2578	1178.1444	0.0000
TR6-3	260.4990	651.2475	0.0000
TR6-2	378.9955	947.4886	0.0000
TR1F-3	607.4047	1200.0000	0.0000
TR1F-1/2	331.1348	827.8369	0.0000

TR1D-2	552.1851	1200.0000	0.0000
TR1D-2/3	413.5308	1033.8270	0.0000
TR1D-3	512.3916	1200.0000	0.0000
TR1A-2	277.8901	694.7252	0.0000
TR1A-1	240.7685	601.9212	0.0000
TR1G-2	506.4155	1200.0000	0.0000
TR1F-1	398.8768	997.1920	0.0000
TR1C	463.3710	1158.4274	0.0000
TR2-3	439.9353	1099.8383	0.0000
TR2-2	335.3477	838.3693	0.0000
Outlet	0.9576	2.3940	43680.0000
TR2-2.1	134.8942	337.2356	0.0000
TR1F-2.1	284.5503	711.3756	0.0000
Node71	129.2860	323.2149	0.0000

The junction requiring the smallest time step was...TR8

```
*===========================================================*
|       Table E5a - Conduit Explicit Condition Summary      |
|       Courant   =         Conduit Length                  |
|       Time step = --------------------------------        |
|                     Velocity + sqrt(g*depth)              |
|                                                           |
|                  Conduit Implicit Condition Summary       |
|       Courant   =         Conduit Length                  |
|       Time step = --------------------------------        |
|                            Velocity                       |
*===========================================================*
|  The 3rd column is the Explicit time step times the       |
|      minimum courant time step factor                     |
|                                                           |
|  Minimum Conduit Time Step in seconds in the 4th column   |
|  in the list. Maximum possible is 10 * maximum time step  |
|                                                           |
|  The 5th column is the maximum change at any time step    |
|  during the simulation. The 6th column is the wobble      |
|  value which is an indicator of the flow stability.       |
|                                                           |
|  You should use this section to find those conduits that  |
|  are slowing your model down.  Use modify conduits to     |
|  alter the length of the slow conduits to make your       |
|  simulation faster, or change the conduit name to         |
|  "CHME?????" where ????? are any characters, this will    |
|  lengthen the conduit based on the model time step,       |
|  not the value listed in modify conduits.                 |
*===========================================================*
```

Conduit Time(exp) Expl*Cmin Time(imp) Time(min) Max Qchange   Wobble
Type of Soln

McCarty 1	13.7808	13.7808	76.4946	6.0000	5.4290	42.5411	Normal Soln
TR5 Link	78.0792	78.0792	228.1153	0.0000	0.4932	1.6462	Normal Soln
TR4 Link	36.2385	36.2385	112.8897	0.0000	0.4034	1.0826	Normal Soln
I-65	14.2595	14.2595	37.2739	0.0000	0.2130	3.6677	Normal Soln
CR 550	8.9287	8.9287	27.2641	2.0000	0.1723	2.2976	Normal Soln
McCarty 3	8.3055	8.3055	25.1082	0.0000	-12.6355	1.3149	Normal Soln
Link17	16.1140	16.1140	49.7263	0.0000	0.0110	1.0167	Normal Soln
BD-L1	20.2823	20.2823	79.3895	0.0000	-0.8967	0.0715	Normal Soln
BD-L2	45.5577	45.5577	158.2533	0.0000	-0.4396	0.0582	Normal Soln
BD-L3	70.0064	70.0064	314.0799	0.0000	0.4177	0.0581	Normal Soln
BD-L4	38.0713	38.0713	106.8495	0.0000	0.4803	0.0152	Normal Soln
BD-L5	62.1594	62.1594	213.5428	0.0000	0.6676	0.0327	Normal Soln
BD-L6	47.3698	47.3698	174.2445	0.0000	0.5257	0.0393	Normal Soln
BD-L7	33.0096	33.0096	91.9272	0.0000	0.4324	0.0271	Normal Soln
BD-L8	71.4392	71.4392	402.1602	0.0000	0.3693	0.0415	Normal Soln
BD-L9	37.3431	37.3431	286.8463	0.0000	1.9353	0.0239	Normal Soln
BD-L10	38.3734	38.3734	687.3646	0.0000	2.2790	2.3023	Normal Soln
Link31	43.5753	43.5753	427.8701	0.0000	0.0110	0.0170	Normal Soln
Link32	26.3658	26.3658	43.0556	0.0000	0.0159	0.3552	Normal Soln
Link33	11.7276	11.7276	32.9870	0.0000	0.5385	0.6146	Normal Soln
Link34	14.5025	14.5025	26.8521	0.0000	-0.0376	0.5431	Normal Soln
Link35	12.1852	12.1852	36.9334	0.0000	-0.0169	0.2364	Normal Soln
Link44	9.4288	9.4288	23.2572	80.0000	0.0408	0.4428	Normal Soln
Link52	137.5433	137.5433	370.4801	0.0000	0.1082	0.9485	Normal Soln
Link53	240.0029	240.0029	1200.0000	0.0000	0.0733	0.4950	Normal Soln
Link54	86.4741	86.4741	196.8012	0.0000	-0.0381	2.2047	Normal Soln
Link55	10.0544	10.0544	38.6436	0.0000	0.0427	2.6746	Normal Soln
Link56	165.2014	165.2014	481.1290	0.0000	0.0361	2.3958	Normal Soln
Link57	12.3846	12.3846	31.6313	0.0000	0.0163	0.6257	Normal Soln
Link58	67.6956	67.6956	185.1154	0.0000	0.0323	3.7792	Normal Soln
Link59	222.8567	222.8567	756.4702	0.0000	0.1312	13.8523	

```
 Normal Soln
           Link60   150.2543   150.2543   419.3405     0.0000       0.1562   6.1529
 Normal Soln
           Link61   163.9970   163.9970   387.2606     0.0000      -0.0454   2.2901
 Normal Soln
           Link62   181.4964   181.4964   700.2658     0.0000       0.0620   6.5279
 Normal Soln
           Link63   185.7691   185.7691   524.0802     0.0000       0.0558   3.5037
 Normal Soln
           Link65   167.9636   167.9636   450.0383     0.0000       0.0467   3.2308
 Normal Soln
           Link66    73.6381    73.6381   288.6356     0.0000       0.0926   0.4419
 Normal Soln
           Link68    54.0919    54.0919   217.6964     0.0000       0.1407   8.5603
 Normal Soln
           Link69    15.8466    15.8466    99.7868     8.0000      -1.2585   2.5254
 Normal Soln
         Link66.1    67.1889    67.1889   244.4722     0.0000       0.1464   0.8848
 Normal Soln
          Primary     6.2079     6.2079    11.9157  4114.0000      -0.8096   6.6640
 Normal Soln
        Emergency    12.0304    12.0304    27.5500     0.0000       0.0628   3.9865
 Normal Soln
       TR1B/C Out    10.2137    10.2137    28.7202     0.0000       0.0667   0.9933
 Normal Soln
         TR1D Out     7.9165     7.9165    22.0505     0.0000       0.1132   1.2970
 Normal Soln
         TR1E Out     7.4492     7.4492    16.9333   646.0000       0.1579   1.1826
 Normal Soln
         TR1A Out     8.1504     8.1504    22.6290   184.0000       0.1291   1.6081
 Normal Soln
         TR1F Out    38.7368    38.7368   135.1914     0.0000       0.0147   4.2150
 Normal Soln
             Weir  1200.0000  1200.0000  1200.0000     0.0000       0.2056   0.0000
 Normal Soln
        WQ OUTLET    52.1774    52.1774   129.6465     0.0000      -0.0198   7.9734
 Normal Soln
          STAGE 1    56.6715    56.6715   127.0423     0.0000       0.1555   5.9943
 Normal Soln
       WQV OUTLET    40.7043    40.7043   102.3915     0.0000       0.0141  11.5963
 Normal Soln
        1ST STAGE    41.6390    41.6390   102.3873     0.0000      -1.6338  22.9917
 Normal Soln
The conduit with the smallest time step limitation was..Primary
The conduit with the largest wobble was.................McCarty 1
The conduit with the largest flow change in any
consecutive time step...................................McCarty 3

 ************************************************
 *      End of time step DO-loop in Runoff      *
 ************************************************

 Final Date (Mo/Day/Year)   =            1/ 3/2013
 Total number of time steps =                 2880
 Final Julian Date          =              2013003
 Final time of day          =                   0. seconds.
 Final time of day          =                 0.00   hours.
 Final running time         =              48.0000   hours.
 Final running time         =               2.0000    days.

 ****************************************************
 *     Extrapolation Summary for Watersheds         *
 * Explains the number of time steps and iterations *
```

```
 * used in the solution of the subcatchments.       *
 * # Steps ==> Total Number of Extrapolated Steps   *
 * # Calls ==> Total Number of OVERLND Calls        *
 ****************************************************

 Subcatchment   # Steps   # Calls Subcatchment   # Steps   # Calls
 -------------  -------  -------- -------------  -------  --------
 TR2-3#1              0         0 TR2-2#1              0         0 TR2-2.1#1
    0         0
 TR6-3#1              0         0 TR6-3#2              0         0 TR1F-3#1
    0         0
 TR1F-1#1             0         0 TR1F-2#1             0         0 TR6-2#1
    0         0
 TR6-1#1              0         0 TR6-1#2              0         0 TR7#1
    0         0
 TR7#2                0         0 TR7#3                0         0 TR5A#1
    0         0
 TR5#1                0         0 TR9#1                0         0 TR10#1
    0         0
 TR10A#1              0         0 TR11#1               0         0 TR9A#1
    0         0
 TR9B#1               0         0 TR8#1                0         0 TR1G-2#1
    0         0
 TR1D-2#1             0         0 TR1D-3#1             0         0 TR1B#1
    0         0
 TR1C#1               0         0 TR1A-2#1             0         0 TR1A-1#1
    0         0
 TR1D-1#1             0         0 TR1E#1               0         0 TR1G-1#1
    0         0


#########################################################
# Rainfall input summary from Runoff Continuity Check   #
#########################################################

 Total rainfall read for gage #         1 is       5.5100 in
 Total rainfall duration for gage #     1 is       720.00 minutes

 ************************************************************
 * Table R5. CONTINUITY CHECK FOR SURFACE WATER             *
 *       Any continuity error can be fixed by lowering the  *
 *       wet and transition time step. The transition time  *
 *       should not be much greater than the wet time step. *
 ************************************************************
                                                                Inches over
                                                  cubic feet    Total Basin
 Total Precipitation (Rain plus Snow)            4.358603E+07      5.510
 Total Infiltration                              1.503854E+07          1.901
 Total Evaporation                               3.955175E+05          0.050
 Surface Runoff from Watersheds                  2.683774E+07          3.393
 Total Water remaining in Surface Storage        0.000000E+00          0.000
 Infiltration over the Pervious Area...          1.503854E+07          1.931
                       --------
 Infiltration + Evaporation +
 Surface Runoff + Snow removal +
 Water remaining in Surface Storage +
 Water remaining in Snow Cover.........          4.227179E+07          5.344
 Total Precipitation + Initial Storage.          4.358603E+07          5.510


 The error in continuity is calculated as
 ***************************************
 * Precipitation + Initial Snow Cover  *
```

```
 *      - Infiltration -                *
 *Evaporation - Snow removal -          *
 *Surface Runoff from Watersheds -      *
 *Water in Surface Storage -            *
 *Water remaining in Snow Cover         *
 *--------------------------------------*
 * Precipitation + Initial Snow Cover   *
 ****************************************
 Percent Continuity Error..............                                 3.0153


 ****************************************************
 * Table R6. Continuity Check for Channel/Pipes     *
 *          You should have zero continuity error  *
 *          if you are not using runoff hydraulics *
 ****************************************************
                                                                         Inches
over
                                                     cubic feet          Total
Basin
 Initial Channel/Pipe Storage................        0.000000E+00          0.000
 Final Channel/Pipe Storage..................        0.000000E+00          0.000
 Surface Runoff from Watersheds..............        2.683774E+07          3.393
 Groundwater Subsurface Inflow or Diversion..        0.000000E+00          0.000
 Evaporation Loss from Channels..............        0.000000E+00          0.000
 Groundwater Flow Diverted Out of Network....        0.000000E+00          0.000
 Channel/Pipe/Inlet Outflow..................        2.683774E+07          3.393
 Initial Storage + Inflow....................        2.683774E+07          3.393
 Final Storage + Outflow + Diverted GW.......        2.683774E+07          3.393
 ********************************************
 * Final Storage + Outflow + Evaporation  - *
 * Watershed Runoff - Groundwater Inflow  - *
 *     Initial Channel/Pipe Storage        *
 *     --------------------------------    *
 *  Final Storage + Outflow  + Evaporation  *
 ********************************************
 Percent Continuity Error....................                         0.0000

         ##################################################
         # Table R9. Summary Statistics for Subcatchments #
         ##################################################

 Note: Total Runoff Depth includes pervious & impervious areas.
       Pervious and Impervious Runoff Depth is only the runoff from those two
areas.
       For catchments receiving redirected flow, this flow will only be shown if
the flow is not
       directed directly to the outlet. Flow that is getting redirected is also
listed with
       the original subcatchment.


 Subcatchment...........          TR2-3#1          TR2-2#1         TR2-2.1#1
 TR6-3#1          TR6-3#2          TR1F-3#1
 Area (acres)...........         32.77000         28.31000          62.90000
 3.04000         40.00000          27.66000
 Percent Impervious.....          0.00000          0.00000           0.00000
 0.00000          0.00000           0.00000
 Total Rainfall (in)....          5.51000          5.51000           5.51000
 5.51000          5.51000           5.51000
 Max Intensity (in/hr)..          0.80033          0.80033           0.80033
 0.80033          0.80033           0.80033
```

```
Pervious Area
-------------
Total Runoff Depth (in)         4.32397          4.32528          4.32460
3.90444          4.31916         4.21726
Peak Runoff Rate (cfs).        23.31389         20.32535         44.75160
2.03274         28.69145        18.96353

Total Impervious Area
---------------------
Total Runoff Depth (in)         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
Peak Runoff Rate (cfs).         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000

Impervious Area with depression storage
---------------------------------------
Total Runoff Depth (in)         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
Peak Runoff Rate (cfs).         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000

Impervious Area without depression storage
------------------------------------------
Total Runoff Depth (in)         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
Peak Runoff Rate (cfs).         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000

Total Area
----------
Total Runoff Depth (in)         4.32397          4.32528          4.32460
3.90444          4.31916         4.21726
Peak Runoff Rate (cfs).        23.31389         20.32535         44.75160
2.03274         28.69145        18.96353

Rational Formula
----------------
Pervious Tc. (mins)....         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
Perv. Intensity (in/hr)         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
Pervious C ............         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
Impervious Tc. (mins)..         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
Imp. Intensity (in/hr).         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
Impervious C ..........         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
Partial Area (Ha)......         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
Partial Area Tc........         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
Partial Area Intensity.         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000


Subcatchment...........        TR1F-1#1         TR1F-2#1          TR6-2#1
TR6-1#1          TR6-1#2            TR7#1
Area (acres)...........        42.07000         31.88000          8.42000
88.08000        138.49000        86.15000
Percent Impervious.....         0.00000          0.00000          0.00000
0.00000          0.00000         0.00000
```

```
 Total Rainfall (in)....          5.51000          5.51000          5.51000
 5.51000          5.51000          5.51000
 Max Intensity (in/hr)..          0.80033          0.80033          0.80033
 0.80033          0.80033          0.80033

 Pervious Area
 -------------
 Total Runoff Depth (in)          4.21742          4.21098          3.90333
 3.90269          3.90200          3.20459
 Peak Runoff Rate (cfs).         28.32574         22.37361          5.58939
55.54935         86.27371         45.55178

 Total Impervious Area
 ---------------------
 Total Runoff Depth (in)          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000

 Impervious Area with depression storage
 ---------------------------------------
 Total Runoff Depth (in)          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000

 Impervious Area without depression storage
 ------------------------------------------
 Total Runoff Depth (in)          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000

 Total Area
 ----------
 Total Runoff Depth (in)          4.21742          4.21098          3.90333
 3.90269          3.90200          3.20459
 Peak Runoff Rate (cfs).         28.32574         22.37361          5.58939
55.54935         86.27371         45.55178

 Rational Formula
 ----------------
 Pervious Tc. (mins)....          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Perv. Intensity (in/hr)          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Pervious C ...........           0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Impervious Tc. (mins)..          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Imp. Intensity (in/hr).          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Impervious C ..........          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Partial Area (Ha)......          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Partial Area Tc........          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Partial Area Intensity.          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000


 Subcatchment...........            TR7#2            TR7#3           TR5A#1
```

```
  TR5#1            TR9#1           TR10#1
 Area (acres)...........         18.53000         80.66000        151.27000
254.24000        51.34000         51.65000
 Percent Impervious.....          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Total Rainfall (in)....          5.51000          5.51000          5.51000
 5.51000          5.51000          5.51000
 Max Intensity (in/hr)..          0.80033          0.80033          0.80033
 0.80033          0.80033          0.80033

 Pervious Area
 -------------
 Total Runoff Depth (in)          0.00000          0.00000          3.30096
 2.92203          3.19909          3.30165
 Peak Runoff Rate (cfs).          0.00000          0.00000         81.94497
120.33207        27.92594         26.87487

 Total Impervious Area
 ---------------------
 Total Runoff Depth (in)          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000

 Impervious Area with depression storage
 ---------------------------------------
 Total Runoff Depth (in)          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000

 Impervious Area without depression storage
 ------------------------------------------
 Total Runoff Depth (in)          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000

 Total Area
 ----------
 Total Runoff Depth (in)          0.00000          0.00000          3.30096
 2.92203          3.19909          3.30165
 Peak Runoff Rate (cfs).          0.00000          0.00000         81.94497
120.33207        27.92594         26.87487

 Rational Formula
 ----------------
 Pervious Tc. (mins)....          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Perv. Intensity (in/hr)          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Pervious C ...........           0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Impervious Tc. (mins)..          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Imp. Intensity (in/hr).          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Impervious C ..........          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Partial Area (Ha)......          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Partial Area Tc........          0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
```

```
 Partial Area Intensity.         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000


 Subcatchment...........         TR10A#1            TR11#1           TR9A#1
  TR9B#1             TR8#1          TR1G-2#1
 Area (acres)...........        12.92000        202.23000         98.41000
14.76000         182.60000        25.85000
 Percent Impervious.....         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Total Rainfall (in)....         5.51000          5.51000          5.51000
 5.51000          5.51000          5.51000
 Max Intensity (in/hr)..         0.80033          0.80033          0.80033
 0.80033          0.80033          0.80033

 Pervious Area
 -------------
 Total Runoff Depth (in)         3.49752          2.38619          3.39887
 2.92237          3.01501          4.21854
 Peak Runoff Rate (cfs).         7.72686         81.85231         54.38505
 7.35385         91.80108         18.02052

 Total Impervious Area
 ---------------------
 Total Runoff Depth (in)         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Peak Runoff Rate (cfs).         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000

 Impervious Area with depression storage
 ---------------------------------------
 Total Runoff Depth (in)         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Peak Runoff Rate (cfs).         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000

 Impervious Area without depression storage
 ------------------------------------------
 Total Runoff Depth (in)         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Peak Runoff Rate (cfs).         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000

 Total Area
 ----------
 Total Runoff Depth (in)         3.49752          2.38619          3.39887
 2.92237          3.01501          4.21854
 Peak Runoff Rate (cfs).         7.72686         81.85231         54.38505
 7.35385         91.80108         18.02052

 Rational Formula
 ----------------
 Pervious Tc. (mins)....         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Perv. Intensity (in/hr)         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Pervious C ............         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Impervious Tc. (mins)..         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Imp. Intensity (in/hr).         0.00000          0.00000          0.00000
 0.00000          0.00000          0.00000
 Impervious C ..........         0.00000          0.00000          0.00000
```

```
 0.00000           0.00000           0.00000
 Partial Area (Ha)......          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000
 Partial Area Tc........          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000
 Partial Area Intensity.          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000


 Subcatchment...........         TR1D-2#1         TR1D-3#1            TR1B#1
  TR1C#1          TR1A-2#1          TR1A-1#1
 Area (acres)...........         21.32000         12.33000         39.95000
33.26000          89.10000          59.26000
 Percent Impervious.....          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000
 Total Rainfall (in)....          5.51000          5.51000          5.51000
 5.51000           5.51000           5.51000
 Max Intensity (in/hr)..          0.80033          0.80033          0.80033
 0.80033           0.80033           0.80033

 Pervious Area
 -------------
 Total Runoff Depth (in)          4.21827          4.21799          4.21634
 4.21686           4.21717           4.21652
 Peak Runoff Rate (cfs).         14.67997          8.51753         27.53549
22.81696          60.03730          41.76687

 Total Impervious Area
 ---------------------
 Total Runoff Depth (in)          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000
 Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000

 Impervious Area with depression storage
 ---------------------------------------
 Total Runoff Depth (in)          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000
 Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000

 Impervious Area without depression storage
 ------------------------------------------
 Total Runoff Depth (in)          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000
 Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000

 Total Area
 ----------
 Total Runoff Depth (in)          4.21827          4.21799          4.21634
 4.21686           4.21717           4.21652
 Peak Runoff Rate (cfs).         14.67997          8.51753         27.53549
22.81696          60.03730          41.76687

 Rational Formula
 ----------------
 Pervious Tc. (mins)....          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000
 Perv. Intensity (in/hr)          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000
 Pervious C ............          0.00000          0.00000          0.00000
 0.00000           0.00000           0.00000
```

```
Impervious Tc. (mins)..          0.00000          0.00000          0.00000
0.00000          0.00000          0.00000
Imp. Intensity (in/hr).          0.00000          0.00000          0.00000
0.00000          0.00000          0.00000
Impervious C ..........          0.00000          0.00000          0.00000
0.00000          0.00000          0.00000
Partial Area (Ha)......          0.00000          0.00000          0.00000
0.00000          0.00000          0.00000
Partial Area Tc........          0.00000          0.00000          0.00000
0.00000          0.00000          0.00000
Partial Area Intensity.          0.00000          0.00000          0.00000
0.00000          0.00000          0.00000


Subcatchment...........         TR1D-1#1           TR1E#1         TR1G-1#1
Area (acres)...........         64.45000         70.21000         55.05000
Percent Impervious.....         19.00000         11.00000         25.00000
Total Rainfall (in)....          5.51000          5.51000          5.51000
Max Intensity (in/hr)..          0.80033          0.80033          0.80033

Pervious Area
-------------
Total Runoff Depth (in)          3.57176          3.84678          3.34113
Peak Runoff Rate (cfs).         37.89329         42.03369         30.31066

Total Impervious Area
---------------------
Total Runoff Depth (in)          0.83782          0.47544          1.11371
Peak Runoff Rate (cfs).          8.88855          5.19518         10.10355

Impervious Area with depression storage
---------------------------------------
Total Runoff Depth (in)          0.00000          0.00000          0.00000
Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000

Impervious Area without depression storage
------------------------------------------
Total Runoff Depth (in)          0.00000          0.00000          0.00000
Peak Runoff Rate (cfs).          0.00000          0.00000          0.00000

Total Area
----------
Total Runoff Depth (in)          4.40958          4.32223          4.45484
Peak Runoff Rate (cfs).         46.78184         47.22887         40.41422

Rational Formula
----------------
Pervious Tc. (mins)....          0.00000          0.00000          0.00000
Perv. Intensity (in/hr)          0.00000          0.00000          0.00000
Pervious C ............          0.00000          0.00000          0.00000
Impervious Tc. (mins)..          0.00000          0.00000          0.00000
Imp. Intensity (in/hr).          0.00000          0.00000          0.00000
Impervious C ..........          0.00000          0.00000          0.00000
Partial Area (Ha)......          0.00000          0.00000          0.00000
Partial Area Tc........          0.00000          0.00000          0.00000
Partial Area Intensity.          0.00000          0.00000          0.00000

===> Runoff simulation ended normally.

*===================================================*
|  Table E6. Final Model Condition                  |
|            This table is used for steady state    |
|            flow comparison and is the information|
```

```
 |            saved to the hot-restart file.          |
 |            Final Time =    84.033 hours            |
 *====================================================*

 Junction / Depth  / Elevation    ===>  "*" Junction is Surcharged.
        TR1A-1/2/   0.00 /   645.90/          TR1G-1/   3.27 /   640.27/
TR6-1/   0.68 /   637.76/
             TR7/   0.29 /   633.35/             TR8/   0.32 /   631.76/
BD-0/   0.23 /   631.34/
           TR2-1/   0.00 /   638.54/             TR5/   0.02 /   649.02/
TR5A/   0.01 /   658.01/
             TR9/   0.00 /   639.16/            TR10/   0.00 /   640.50/
McCarty DS/   0.04 /   645.69/
            BD-1/   0.38 /   630.38/            BD-2/   0.14 /   628.14/
BD-3/   0.05 /   626.05/
            BD-4/   0.09 /   620.09/            TR11/   0.11 /   616.11/
BD-6/   0.05 /   614.05/
            BD-7/   0.06 /   610.06/            BD-8/   0.07 /   608.07/
BD-9/   0.64 /   604.64/
           BD-10/   0.60 /   604.60/          Node35/   0.00 /   639.90/
TR9A/   0.00 /   642.22/
           TR10A/   0.00 /   636.94/            TR9B/   0.00 /   641.84/
TR1B/   0.00 /   648.90/
          TR1B/C/   0.00 /   648.00/          TR1D-1/   0.02 /   644.62/
TR1F-2/   0.34 /   647.34/
            TR1E/   0.03 /   644.03/           TR6-3/   0.00 /   648.27/
TR6-2/   0.18 /   644.58/
          TR1F-3/   0.00 /   657.00/        TR1F-1/2/   0.00 /   647.90/
TR1D-2/   0.00 /   654.00/
        TR1D-2/3/   0.00 /   648.30/          TR1D-3/   0.00 /   653.00/
TR1A-2/   0.00 /   650.90/
          TR1A-1/   0.00 /   654.00/          TR1G-2/   0.00 /   653.00/
TR1F-1/   0.00 /   651.50/
            TR1C/   0.00 /   656.00/           TR2-3/   0.00 /   660.00/
TR2-2/   0.00 /   643.64/
          Outlet/   0.77 /   637.77/         TR2-2.1/   0.41 /   641.50/
TR1F-2.1/   0.29 /   646.29/
          Node71/   0.00 /   641.09/

   Conduit/       Flow   ===> "*" Conduit uses the normal flow option.
       McCarty 1/      -0.42 /        TR5 Link/       0.03 /        TR4 Link/
0.00 /
            I-65/       0.75 /          CR 550/       0.75 /       McCarty 3/
0.03 /
          Link17/       0.00 /           BD-L1/       0.79*/           BD-L2/
0.79 /
           BD-L3/       0.79 /           BD-L4/       0.79*/           BD-L5/
0.79*/
           BD-L6/       0.79 /           BD-L7/       0.79*/           BD-L8/
0.79*/
           BD-L9/       0.79*/          BD-L10/       0.80 /          Link31/
0.00 /
          Link32/       0.00*/          Link33/       0.00 /          Link34/
0.00*/
          Link35/       0.00 /          Link44/       0.00*/          Link52/
0.00*/
          Link53/       0.32*/          Link54/       0.00 /          Link55/
0.00 /
          Link56/       0.00*/          Link57/       0.00 /          Link58/
0.00 /
          Link59/       0.00 /          Link60/       0.00*/          Link61/
0.00 /
          Link62/       0.00 /          Link63/       0.00 /          Link65/
```

```
0.00 /
          Link66/       0.00*/          Link68/       0.00 /          Link69/
0.00 /
        Link66.1/       0.00*/         Primary/       0.78 /       Emergency/
0.00*/
      TR1B/C Out/       0.00 /        TR1D Out/       0.08*/        TR1E Out/
0.12 /
        TR1A Out/       0.00 /        TR1F Out/       0.31 /             Weir/
0.00 /
       WQ OUTLET/       0.21 /         STAGE 1/       0.00 /      WQV OUTLET/
0.39 /
       1ST STAGE/       0.03 /     TR5 - TR5A/       0.03 /          STAGE 2/
0.00 /
       2ND STAGE/       0.00 /        FREE # 1/       0.80 /

         Conduit/   Velocity
       McCarty 1/      -0.24 /        TR5 Link/       0.61 /         TR4 Link/
0.00 /
            I-65/       1.40 /          CR 550/       1.52 /       McCarty 3/
0.33 /
          Link17/       0.00 /           BD-L1/       0.51 /            BD-L2/
0.56 /
           BD-L3/       0.32 /           BD-L4/       0.42 /            BD-L5/
0.39 /
           BD-L6/       0.32 /           BD-L7/       0.42 /            BD-L8/
0.22 /
           BD-L9/       0.23 /          BD-L10/       0.15 /           Link31/
0.00 /
          Link32/       0.00 /          Link33/       0.00 /           Link34/
0.00 /
          Link35/       0.00 /          Link44/       0.00 /           Link52/
0.00 /
          Link53/       0.82 /          Link54/       0.00 /           Link55/
0.15 /
          Link56/       0.00 /          Link57/       0.00 /           Link58/
0.01 /
          Link59/       0.01 /          Link60/       0.00 /           Link61/
0.01 /
          Link62/       0.01 /          Link63/       0.01 /           Link65/
0.01 /
          Link66/       0.00 /          Link68/       0.08 /           Link69/
0.00 /
        Link66.1/       0.00 /         Primary/       1.49 /       Emergency/
0.00 /
      TR1B/C Out/       0.00 /        TR1D Out/       0.58 /         TR1E Out/
0.70 /
        TR1A Out/       0.01 /        TR1F Out/       1.28 /             Weir/
0.00 /
       WQ OUTLET/       1.52 /         STAGE 1/       0.00 /      WQV OUTLET/
2.04 /
       1ST STAGE/       0.12 /

         Conduit/      Width
       McCarty 1/       3.53 /        TR5 Link/       2.35 /         TR4 Link/
1.37 /
            I-65/       2.39 /          CR 550/       2.51 /       McCarty 3/
7.00 /
          Link17/       0.98 /           BD-L1/       3.82 /            BD-L2/
3.88 /
           BD-L3/       4.46 /           BD-L4/       4.35 /            BD-L5/
4.05 /
           BD-L6/       4.60 /           BD-L7/       3.28 /            BD-L8/
6.30 /
```

```
          BD-L9/       6.30 /          BD-L10/      11.37 /          Link31/
15.00 /
         Link32/       1.18 /          Link33/       1.96 /          Link34/
0.78 /
         Link35/       1.57 /          Link44/       1.57 /          Link52/
1.58 /
         Link53/       2.46 /          Link54/       2.00 /          Link55/
1.18 /
         Link56/       2.00 /          Link57/       1.18 /          Link58/
2.00 /
         Link59/       2.00 /          Link60/       2.00 /          Link61/
2.00 /
         Link62/       2.00 /          Link63/       2.00 /          Link65/
2.00 /
         Link66/       2.42 /          Link68/       1.18 /          Link69/
2.35 /
       Link66.1/       2.35 /         Primary/       2.38 /       Emergency/
0.98 /
     TR1B/C Out/       7.00 /       TR1D Out/       7.00 /       TR1E Out/
7.00 /
       TR1A Out/       7.00 /       TR1F Out/       1.27 /            Weir/
0.00 /
      WQ OUTLET/       0.47 /         STAGE 1/      10.00 /     WQV OUTLET/
0.22 /
      1ST STAGE/      12.00 /

       Junction/        EGL
       TR1A-1/2/       0.00 /          TR1G-1/       6.01 /           TR6-1/
0.69 /
            TR7/       4.02 /             TR8/       8.02 /            BD-0/
0.27 /
          TR2-1/       0.00 /             TR5/       0.02 /            TR5A/
0.01 /
            TR9/       0.00 /            TR10/       0.00 /     McCarty DS/
2.74 /
           BD-1/       0.39 /            BD-2/       0.14 /            BD-3/
0.06 /
           BD-4/       0.09 /            TR11/       0.11 /            BD-6/
0.06 /
           BD-7/       0.06 /            BD-8/       0.07 /            BD-9/
0.64 /
          BD-10/       0.60 /          Node35/       0.00 /            TR9A/
0.00 /
          TR10A/       0.00 /            TR9B/       0.00 /            TR1B/
0.00 /
         TR1B/C/       0.00 /          TR1D-1/       3.20 /          TR1F-2/
3.02 /
           TR1E/       0.03 /           TR6-3/       0.00 /           TR6-2/
0.21 /
         TR1F-3/       0.00 /        TR1F-1/2/       0.00 /          TR1D-2/
0.00 /
       TR1D-2/3/       4.50 /          TR1D-3/       0.00 /          TR1A-2/
0.00 /
         TR1A-1/       0.00 /          TR1G-2/       0.00 /          TR1F-1/
0.00 /
           TR1C/       0.00 /           TR2-3/       0.00 /           TR2-2/
7.36 /
         Outlet/       3.24 /         TR2-2.1/       0.41 /        TR1F-2.1/
1.26 /
         Node71/       0.00 /

       Junction/  Freeboard
       TR1A-1/2/      11.10 /          TR1G-1/       8.73 /           TR6-1/
```

```
10.24 /
           TR7/      10.65 /              TR8/      15.24 /            BD-0/
19.66 /
         TR2-1/       9.46 /              TR5/      10.98 /            TR5A/
3.99 /
           TR9/       6.84 /             TR10/       9.06 /      McCarty DS/
13.31 /
          BD-1/      20.62 /             BD-2/      27.86 /            BD-3/
22.95 /
          BD-4/      27.91 /             TR11/      31.89 /            BD-6/
32.95 /
          BD-7/      33.94 /             BD-8/      35.93 /            BD-9/
46.36 /
         BD-10/      46.40 /           Node35/       7.10 /            TR9A/
9.04 /
         TR10A/       9.06 /             TR9B/       7.48 /            TR1B/
5.10 /
        TR1B/C/       7.00 /           TR1D-1/      13.38 /          TR1F-2/
6.66 /
          TR1E/      13.97 /            TR6-3/      11.73 /           TR6-2/
7.42 /
        TR1F-3/       3.00 /         TR1F-1/2/       8.10 /          TR1D-2/
2.00 /
      TR1D-2/3/       7.70 /           TR1D-3/       3.00 /          TR1A-2/
3.10 /
        TR1A-1/       6.00 /           TR1G-2/       2.00 /          TR1F-1/
3.50 /
          TR1C/       2.00 /            TR2-3/       2.00 /           TR2-2/
14.36 /
        Outlet/      11.23 /          TR2-2.1/      11.50 /        TR1F-2.1/
6.71 /
        Node71/      11.91 /

      Junction/ Max Volume
      TR1A-1/2/      34.63 /           TR1G-1/ 4091070.05 /           TR6-1/
237044.65 /
           TR7/ 1328164.92 /              TR8/ 2969127.90 /            BD-0/
60.48 /
         TR2-1/   44489.81 /              TR5/      58.54 /            TR5A/
438991.55 /
           TR9/     104.02 /             TR10/      12.21 /      McCarty DS/
72.05 /
          BD-1/      64.42 /             BD-2/      45.37 /            BD-3/
22.15 /
          BD-4/      37.07 /             TR11/      44.87 /            BD-6/
33.66 /
          BD-7/      43.35 /             BD-8/      60.86 /            BD-9/
109.82 /
         BD-10/     109.25 /           Node35/      19.15 /            TR9A/
36.87 /
         TR10A/       9.72 /             TR9B/      13.26 /            TR1B/
22.14 /
        TR1B/C/      22.37 /           TR1D-1/ 2146473.06 /          TR1F-2/
566244.92 /
          TR1E/  880772.71 /            TR6-3/      24.21 /           TR6-2/
30.35 /
        TR1F-3/      13.62 /         TR1F-1/2/      57.53 /          TR1D-2/
13.66 /
      TR1D-2/3/      17.69 /           TR1D-3/      13.57 /          TR1A-2/
29.44 /
        TR1A-1/      20.74 /           TR1G-2/      13.90 /          TR1F-1/
21.33 /
          TR1C/      16.22 /            TR2-3/      16.81 /           TR2-2/
```

```
28.74 /
          Outlet/     112.81 /          TR2-2.1/      58.73 /        TR1F-2.1/
617184.86 /
          Node71/      54.86 /

        Junction/Total Fldng
        TR1A-1/2/       0.00 /           TR1G-1/       0.00 /           TR6-1/
0.00 /
             TR7/       0.00 /              TR8/       0.00 /            BD-0/
0.00 /
           TR2-1/       0.00 /              TR5/       0.00 /            TR5A/
0.00 /
             TR9/       0.00 /             TR10/       0.00 /      McCarty DS/
0.00 /
            BD-1/       0.00 /             BD-2/       0.00 /            BD-3/
0.00 /
            BD-4/       0.00 /             TR11/       0.00 /            BD-6/
0.00 /
            BD-7/       0.00 /             BD-8/       0.00 /            BD-9/
0.00 /
           BD-10/       0.00 /           Node35/       0.00 /            TR9A/
0.00 /
           TR10A/       0.00 /             TR9B/       0.00 /            TR1B/
0.00 /
          TR1B/C/       0.00 /           TR1D-1/       0.00 /          TR1F-2/
0.00 /
            TR1E/       0.00 /            TR6-3/       0.00 /           TR6-2/
0.00 /
          TR1F-3/       0.00 /         TR1F-1/2/       0.00 /          TR1D-2/
0.00 /
        TR1D-2/3/       0.00 /           TR1D-3/       0.00 /          TR1A-2/
0.00 /
          TR1A-1/       0.00 /           TR1G-2/       0.00 /          TR1F-1/
0.00 /
            TR1C/       0.00 /            TR2-3/       0.00 /           TR2-2/
0.00 /
          Outlet/       0.00 /          TR2-2.1/       0.00 /        TR1F-2.1/
0.00 /
          Node71/       0.00 /

         Conduit/ Cross Sectional Area
       McCarty 1/       1.79 /         TR5 Link/       0.06 /        TR4 Link/
0.00 /
            I-65/       0.53 /           CR 550/       0.49 /       McCarty 3/
0.10 /
          Link17/       0.00 /            BD-L1/       1.53 /           BD-L2/
1.42 /
           BD-L3/       2.48 /            BD-L4/       1.88 /           BD-L5/
2.05 /
           BD-L6/       2.48 /            BD-L7/       1.88 /           BD-L8/
3.53 /
           BD-L9/       3.38 /           BD-L10/       5.23 /          Link31/
0.00 /
          Link32/       0.00 /           Link33/       0.00 /          Link34/
0.00 /
          Link35/       0.00 /           Link44/       0.00 /          Link52/
0.02 /
          Link53/       0.39 /           Link54/       0.00 /          Link55/
0.00 /
          Link56/       0.00 /           Link57/       0.00 /          Link58/
0.00 /
          Link59/       0.00 /           Link60/       0.00 /          Link61/
0.00 /
```

```
         Link62/       0.00 /          Link63/       0.00 /          Link65/
0.00 /
         Link66/       0.09 /          Link68/       0.00 /          Link69/
0.00 /
       Link66.1/       0.00 /         Primary/       0.53 /       Emergency/
0.00 /
     TR1B/C Out/       0.00 /        TR1D Out/       0.15 /        TR1E Out/
0.17 /
       TR1A Out/       0.00 /        TR1F Out/       0.24 /            Weir/
3.60 /
      WQ OUTLET/       0.14 /         STAGE 1/       0.00 /      WQV OUTLET/
0.19 /
      1ST STAGE/       0.23 /

        Conduit/  Final Volume
      McCarty 1/     498.80 /        TR5 Link/      88.83 /        TR4 Link/
0.00 /
           I-65/     195.20 /          CR 550/     104.30 /       McCarty 3/
15.03 /
         Link17/       0.00 /           BD-L1/     402.71 /            BD-L2/
734.51 /
          BD-L3/    1697.22 /           BD-L4/     676.63 /            BD-L5/
1418.33 /
          BD-L6/    1223.38 /           BD-L7/     699.76 /            BD-L8/
2478.61 /
          BD-L9/    1329.57 /          BD-L10/    2432.95 /           Link31/
0.05 /
         Link32/       0.00 /          Link33/       0.00 /           Link34/
0.00 /
         Link35/       0.00 /          Link44/       0.00 /           Link52/
39.05 /
         Link53/    1781.43 /          Link54/       0.06 /           Link55/
0.00 /
         Link56/       0.12 /          Link57/       0.00 /           Link58/
0.11 /
         Link59/       1.10 /          Link60/       0.14 /           Link61/
0.35 /
         Link62/       0.51 /          Link63/       0.23 /           Link65/
0.50 /
         Link66/      98.93 /          Link68/       0.14 /           Link69/
0.00 /
       Link66.1/       0.01 /         Primary/     109.76 /       Emergency/
0.00 /
     TR1B/C Out/       0.03 /        TR1D Out/      17.44 /        TR1E Out/
20.91 /
       TR1A Out/       0.07 /        TR1F Out/     188.97 /            Weir/
0.00 /
      WQ OUTLET/     137.92 /         STAGE 1/       0.01 /      WQV OUTLET/
193.34 /
      1ST STAGE/     234.10 /

        Conduit/ Hydraulic Radius
      McCarty 1/       0.45 /        TR5 Link/       0.04 /        TR4 Link/
0.01 /
           I-65/       0.20 /          CR 550/       0.18 /       McCarty 3/
0.01 /
         Link17/       0.01 /           BD-L1/       0.16 /            BD-L2/
0.21 /
          BD-L3/       0.12 /           BD-L4/       0.04 /            BD-L5/
0.07 /
          BD-L6/       0.09 /           BD-L7/       0.05 /            BD-L8/
0.05 /
          BD-L9/       0.11 /          BD-L10/       0.45 /           Link31/
```

```
0.00 /
       Link32/       0.00 /          Link33/       0.00 /          Link34/
0.00 /
       Link35/       0.00 /          Link44/       0.01 /          Link52/
0.02 /
       Link53/       0.15 /          Link54/       0.00 /          Link55/
0.01 /
       Link56/       0.00 /          Link57/       0.01 /          Link58/
0.00 /
       Link59/       0.00 /          Link60/       0.00 /          Link61/
0.00 /
       Link62/       0.00 /          Link63/       0.00 /          Link65/
0.00 /
       Link66/       0.04 /          Link68/       0.01 /          Link69/
0.00 /
     Link66.1/       0.00 /         Primary/       0.20 /       Emergency/
0.00 /
   TR1B/C Out/       0.00 /       TR1D Out/       0.02 /        TR1E Out/
0.02 /
     TR1A Out/       0.00 /       TR1F Out/       0.17 /            Weir/
1.50 /
    WQ OUTLET/       0.14 /         STAGE 1/       0.00 /      WQV OUTLET/
0.13 /
    1ST STAGE/       0.02 /

      Conduit/ Upstream/ Downstream Elevation
    McCarty 1/   637.76/   637.77        TR5 Link/   645.69/   639.45        TR4
Link/   639.16/   637.43/
         I-65/   637.76/   637.05           CR 550/   633.35/   632.79
McCarty 3/   649.02/   648.39/
       Link17/   639.90/   639.46            BD-L1/   631.34/   630.38
BD-L2/   630.38/   628.14/
        BD-L3/   628.14/   626.05            BD-L4/   626.05/   620.09
BD-L5/   620.09/   616.11/
        BD-L6/   616.11/   614.05            BD-L7/   614.05/   610.06
BD-L8/   610.06/   608.07/
        BD-L9/   608.07/   604.64           BD-L10/   604.64/   604.60
Link31/   640.50/   639.90/
       Link32/   631.34/   631.34           Link33/   631.76/   631.76
Link34/   630.38/   630.38/
       Link35/   631.76/   631.76           Link44/   648.90/   648.00
Link52/   648.27/   644.58/
       Link53/   644.58/   637.76           Link54/   657.00/   650.02
Link55/   647.90/   647.70/
       Link56/   654.00/   648.30           Link57/   653.00/   652.80
Link58/   648.30/   645.60/
       Link59/   650.90/   645.90           Link60/   654.00/   645.90
Link61/   653.00/   641.60/
       Link62/   651.50/   647.90           Link63/   656.00/   648.00
Link65/   660.00/   651.00/
       Link66/   643.64/   641.50           Link68/   641.50/   641.00
Link69/   637.76/   637.76/
     Link66.1/   638.54/   638.54          Primary/   631.76/   631.34
Emergency/   631.34/   631.34/
   TR1B/C Out/   648.00/   647.80         TR1D Out/   644.62/   644.03
TR1E Out/   644.03/   643.01/
     TR1A Out/   645.90/   645.60         TR1F Out/   646.29/   644.58
Weir/   641.50/   641.09/
    WQ OUTLET/   647.34/   647.22          STAGE 1/   646.29/   646.29      WQV
OUTLET/   640.27/   640.06/
    1ST STAGE/   640.27/   640.24
```

```
*==========================================================*
|          Table E7 -  Iteration Summary                   |
*==========================================================*

Total number of time steps simulated...........       2520
Total number of passes in the simulation........     39181
Total number of time steps during simulation....     21456
Ratio of actual # of time steps / NTCYC.........     8.514
Average number of iterations per time step......     1.826
Average  time step size(seconds)................    14.094
Smallest time step size(seconds)................     1.000
Largest  time step size(seconds)................    60.000
Average minimum Conduit Courant time step (sec).    23.226
Average minimum implicit time step (sec)........    15.389
Average minimum junction time step (sec)........    15.389
Average Courant Factor Tf.......................    15.389
Number of times omega reduced...................     18998


*==========================================================*
|      Table E8 - Junction Time Step Limitation Summary    |
*==========================================================*
|    Not Convr = Number of times this junction did not     |
|                converge during the simulation.           |
|    Avg Convr = Average junction iterations.              |
|    Conv err  = Mean convergence error.                   |
|    Omega Cng = Change of omega during iterations         |
|    Max Itern = Maximum number of iterations              |
*==========================================================*
```

Junction	Not Convr	Avg Convr	Total Itt	Omega Cng	Max Itern	Ittrn >10	Ittrn >25	Ittrn >40
TR1A-1/2	0	2.12	45409	0	7	0	0	0
TR1G-1	0	2.60	55738	21	313	16	14	11
TR6-1	0	2.84	60916	8	22	13	0	0
TR7	0	2.20	47117	1	14	1	0	0
TR8	3	2.88	61743	415	501	39	8	5
BD-0	0	2.69	57671	190	130	4	3	3
TR2-1	0	2.40	51601	2	16	4	0	0
TR5	0	2.18	46824	5	6	0	0	0
TR5A	0	1.00	21456	0	1	0	0	0
TR9	0	1.35	28963	133	31	10	1	0
TR10	0	1.77	37950	1	7	0	0	0
McCarty DS	0	1.91	41061	1	8	0	0	0
BD-1	0	2.25	48376	101	11	1	0	0
BD-2	0	2.35	50481	39	10	1	0	0
BD-3	0	2.21	47360	11	26	5	1	0

BD-4	0	2.03	43508	6	9	0	0	0
TR11	0	2.07	44436	78	24	4	0	0
BD-6	0	2.31	49530	37	93	12	3	2
BD-7	0	2.29	49133	7	20	2	0	0
BD-8	0	2.62	56285	4	16	1	0	0
BD-9	0	2.78	59552	2	32	3	1	0
BD-10	0	43.36	930333	15904	186	13959	10434	9373
Node35	0	1.62	34846	49	8	0	0	0
TR9A	0	1.43	30684	8	7	0	0	0
TR10A	0	1.28	27387	0	6	0	0	0
TR9B	0	1.29	27709	0	5	0	0	0
TR1B	0	1.37	29350	28	8	0	0	0
TR1B/C	0	1.60	34255	0	6	0	0	0
TR1D-1	0	2.45	52577	2	10	1	0	0
TR1F-2	0	3.41	73121	0	66	1	1	1
TR1E	0	2.19	47005	12	282	12	12	9
TR6-3	0	1.35	28906	1	8	0	0	0
TR6-2	0	1.99	42789	0	24	2	0	0
TR1F-3	0	1.38	29700	0	6	0	0	0
TR1F-1/2	0	3.05	65487	0	6	0	0	0
TR1D-2	0	1.35	28864	0	6	0	0	0
TR1D-2/3	0	1.57	33632	0	6	0	0	0
TR1D-3	0	1.31	28088	0	6	0	0	0
TR1A-2	0	1.46	31310	0	6	0	0	0
TR1A-1	0	1.35	28861	2	8	0	0	0
TR1G-2	0	1.38	29508	0	6	0	0	0
TR1F-1	0	1.46	31385	0	6	0	0	0
TR1C	0	1.39	29751	0	7	0	0	0
TR2-3	0	1.40	29953	0	7	0	0	0
TR2-2	0	1.55	33334	0	7	0	0	0
Outlet	49	13.10	281021	1927	501	1813	1764	1497
TR2-2.1	0	2.19	47035	3	460	6		

```
 1         1
       TR1F-2.1         0      2.06     44255         0        13         1
 0         0
         Node71         0      1.83     39166         0         7         0
 0         0
Total number of iterations for all junctions..   3175422



Minimum number of possible iterations.........   1051344



Efficiency of the simulation..................      3.02



                                                  Good Efficiency




*===========================================================*
| Extran Efficiency is an indicator of the efficiency of    |
| the simulation.  Ideal efficiency is one iteration per    |
| time step.  Altering the underrelaxation parameter,       |
| lowering the time step, increasing the flow and head      |
| tolerance are good ways of improving the efficiency,      |
| another is lowering the internal time step. The lower the|
| efficiency generally the faster your model will run.      |
| If your efficiency is less than 1.5 then you may try      |
| increasing your time step so that your overall simulation|
| is faster.  Ideal efficiency would be around 2.0          |
|                                                           |
| Good Efficiency      < 1.5           mean iterations      |
| Excellent Efficiency < 2.5 and > 1.5 mean iterations      |
| Good      Efficiency < 4.0 and > 2.5 mean iterations      |
| Fair      Efficiency < 7.5 and > 4.0 mean iterations      |
| Poor Efficiency      > 7.5           mean iterations      |
*===========================================================*


*========================================================*
|  T i m e  H i s t o r y  o f  t h e  H. G. L. ( feet) |
*========================================================*

           Max Ground Elevation: 999999.00
   Time    Max Crown  Elevation:    648.52
           Junction:TR1G-1
 Hr:Mn:Sc  Elevation     Depth Totl Area Node Area    Volume    Inflow   Outflow
```

```
% C.Err
  --------  --------- --------- --------- --------- --------- --------- ---------
---------

   0  2  0   639.7500    2.7500 401187.65 401187.60 295042.91    0.0000    0.0000
 0.0000    0.0000
  16 42  0   646.5990    9.5990 625272.83 603886.81 3786723.8   94.1529   62.3906
 0.1917    0.0000
  33 22  0   642.7651    5.7651 514080.56 503953.04 1677761.1    8.0018   42.7095
 0.0085    0.0000
  50  2  0   640.4901    3.4901 477778.43 417415.98 597956.44    0.9134    3.9579
-0.0206    0.0000
  66 42  0   640.3266    3.3266 438195.26 413801.98 529980.03    0.2816    0.7976
-0.0324    0.0000
  83 22  0   640.2730    3.2730 424897.66 412621.84 507846.56    0.1244    0.4276
-0.0364    0.0000
     Mean      641.70      4.70
  Maximum      646.60      9.60
  Minimum    639.7500    2.7500



 *=======================================================*
 |  T i m e  H i s t o r y  o f  t h e  H. G. L. ( feet) |
 *=======================================================*

          Max Ground Elevation: 999999.00
    Time  Max Crown  Elevation:    657.46
          Junction:TR1D-1
  Hr:Mn:Sc  Elevation     Depth Totl Area Node Area    Volume    Inflow   Outflow
% C.Err
  --------  --------- --------- --------- --------- --------- --------- ---------
---------

   0  2  0   644.6000    0.0000 590238.01 590238.00    0.0000    0.0000    0.0000
 0.0000    0.0000
  16 42  0   647.0398    2.4398 686850.40 681686.72 1556041.3    0.3275   45.9869
-0.0159    0.0000
  33 22  0   644.8860    0.2860 591078.00 590238.00 168801.39    0.0002    5.5976
-0.0041    0.0000
  50  2  0   644.6718    0.0718 591078.00 590238.00 42406.999    0.0000    0.6851
-0.0048    0.0000
  66 42  0   644.6337    0.0337 591078.00 590238.00 19912.797    0.0000    0.1980
-0.0050    0.0000
  83 22  0   644.6204    0.0204 590658.00 590238.00 12044.872    0.0000    0.0859
-0.0050    0.0000
     Mean      645.08      0.48
  Maximum      647.04      2.44
  Minimum    644.6000    0.0000



 *=======================================================*
 |  T i m e  H i s t o r y  o f  t h e  H. G. L. ( feet) |
 *=======================================================*

          Max Ground Elevation: 999999.00
    Time  Max Crown  Elevation:    657.44
          Junction:TR1E
  Hr:Mn:Sc  Elevation     Depth Totl Area Node Area    Volume    Inflow   Outflow
% C.Err
```

0	2	0	644.0000	0.0000	204732.00	204732.00	0.0000	0.0000	0.0000	0.0000	0.0000
16	42	0	646.8810	2.8810	269407.13	268776.95	691783.97	46.0443	63.7569	0.0399	0.0000
33	22	0	644.3155	0.3155	210142.72	209081.79	65300.954	5.5976	7.7494	0.0109	0.0000
50	2	0	644.0849	0.0849	206796.72	205897.30	17426.620	0.6851	0.9131	0.0090	0.0000
66	42	0	644.0440	0.0440	206206.33	205335.54	9019.5561	0.1980	0.2816	0.0087	0.0000
83	22	0	644.0273	0.0273	206825.21	205106.93	5601.5276	0.0859	0.1244	0.0085	0.0000
Mean			644.56	0.56							
Maximum			646.88	2.88							
Minimum			644.0000	0.0000							

===
| Table E9 - JUNCTION SUMMARY STATISTICS |
| The Maximum area is only the area of the node, it |
| does not include the area of the surrounding conduits|
===

Junction Name	Ground Elevation feet	Uppermost PipeCrown Elevation feet	Maximum Junction Elevation feet	Time of Occurence Hr.	Min.	Feet of Surcharge at Max Elevation	Freeboard of node feet	Maximum Junction Area ft^2	Maximum Gutter Depth feet	Maximum Gutter Width feet	Maximum Gutter Velocity ft/s
TR1A-1/2	657.0000	648.9000	648.6559	5	51	0.0000	8.3441	12.5660	0.0000	0.0000	0.0000
TR1G-1	649.0000	646.0000	647.0965	13	10	1.0965	1.9035	625004.09	0.0000	0.0000	0.0000
TR6-1	648.0000	644.4300	645.2755	12	55	0.8455	2.7245	100986.37	0.0000	0.0000	0.0000
TR7	644.0000	641.8300	641.1371	12	45	0.0000	2.8629	326512.10	0.0000	0.0000	0.0000
TR8	647.0000	646.1300	639.5173	11	59	0.0000	7.4827	581241.73	0.0000	0.0000	0.0000
BD-0	651.0000	646.1100	635.9227	10	39	0.0000	15.0773	12.5660	0.0000	0.0000	0.0000
TR2-1	648.0000	644.5400	645.3103	12	53	0.7703	2.6897	44006.546	0.0000	0.0000	0.0000
TR5	660.0000	654.0000	653.6583	7	13	0.0000	6.3417	12.5660	0.0000	0.0000	0.0000
TR5A	662.0000	658.0000	658.4449	7	19	0.4449	3.5551	1185956.4	0.0000	0.0000	0.0000
TR9	646.0000	642.6600	641.5480	5	39	0.0000	4.4520	43.5600	0.0000	0.0000	0.0000
TR10	649.5600	647.5000	641.4718	6	43	0.0000	8.0882	12.5660	0.0000	0.0000	0.0000
McCarty DS	659.0000	653.3900	651.3836	7	16	0.0000	7.6164	12.5660	0.0000	0.0000	0.0000
BD-1	651.0000	645.0000	635.1263	10	27	0.0000	15.8737	12.5660	0.0000	0.0000	0.0000

BD-2	656.0000	643.0000	631.6106	10	30		0.0000	24.3894
12.5660	0.0000	0.0000	0.0000					
BD-3	649.0000	641.0000	627.7626	10	32		0.0000	21.2374
12.5660	0.0000	0.0000	0.0000					
BD-4	648.0000	635.0000	622.9498	10	34		0.0000	25.0502
12.5660	0.0000	0.0000	0.0000					
TR11	648.0000	631.0000	619.5708	9	36		0.0000	28.4292
12.5660	0.0000	0.0000	0.0000					
BD-6	647.0000	629.0000	616.6785	9	40		0.0000	30.3215
12.5660	0.0000	0.0000	0.0000					
BD-7	644.0000	625.0000	613.4496	10	58		0.0000	30.5504
12.5660	0.0000	0.0000	0.0000					
BD-8	644.0000	623.0000	612.8430	10	7		0.0000	31.1570
12.5660	0.0000	0.0000	0.0000					
BD-9	651.0000	619.0000	612.7396	10	8		0.0000	38.2604
12.5660	0.0000	0.0000	0.0000					
BD-10	651.0000	619.0000	612.6938	10	7		0.0000	38.3062
12.5660	0.0000	0.0000	0.0000					
Node35	647.0000	646.9000	641.4240	6	44		0.0000	5.5760
12.5660	0.0000	0.0000	0.0000					
TR9A	651.2600	647.2200	645.1539	6	50		0.0000	6.1061
12.5660	0.0000	0.0000	0.0000					
TR10A	646.0000	638.9400	637.7133	5	34		0.0000	8.2867
12.5660	0.0000	0.0000	0.0000					
TR9B	649.3200	645.8400	642.8952	6	44		0.0000	6.4248
12.5660	0.0000	0.0000	0.0000					
TR1B	654.0000	652.9000	650.6618	5	48		0.0000	3.3382
12.5660	0.0000	0.0000	0.0000					
TR1B/C	655.0000	652.0000	649.7800	5	51		0.0000	5.2200
12.5660	0.0000	0.0000	0.0000					
TR1D-1	658.0000	650.8000	647.8946	12	57		0.0000	10.1054
699921.12	0.0000	0.0000	0.0000					
TR1F-2	654.0000	651.0200	652.4093	13	20		1.3893	1.5907
108900.00	0.0000	0.0000	0.0000					
TR1E	658.0000	647.0000	647.5715	13	14		0.5715	10.4285
278676.58	0.0000	0.0000	0.0000					
TR6-3	660.0000	652.2700	650.1963	5	32		0.0000	9.8037
12.5660	0.0000	0.0000	0.0000					
TR6-2	652.0000	650.4000	646.8155	6	48		0.0000	5.1845
12.5660	0.0000	0.0000	0.0000					
TR1F-3	660.0000	658.0000	658.0842	5	53		0.0842	1.9158
12.5660	0.0000	0.0000	0.0000					
TR1F-1/2	656.0000	650.9000	652.4782	13	13		1.5782	3.5218
12.5660	0.0000	0.0000	0.0000					
TR1D-2	656.0000	655.0000	655.0867	5	50		0.0867	0.9133
12.5660	0.0000	0.0000	0.0000					
TR1D-2/3	656.0000	655.8000	649.7077	5	41		0.0000	6.2923
12.5660	0.0000	0.0000	0.0000					
TR1D-3	656.0000	656.0000	654.0796	5	46		0.0000	1.9204
12.5660	0.0000	0.0000	0.0000					
TR1A-2	654.0000	651.9000	653.2431	6	8		1.3431	0.7569
12.5660	0.0000	0.0000	0.0000					
TR1A-1	660.0000	655.0000	655.6505	5	36		0.6505	4.3495
12.5660	0.0000	0.0000	0.0000					
TR1G-2	655.0000	654.0000	654.1066	5	44		0.1066	0.8934
12.5660	0.0000	0.0000	0.0000					
TR1F-1	655.0000	652.5000	653.1973	7	5		0.6973	1.8027
12.5660	0.0000	0.0000	0.0000					
TR1C	658.0000	657.0000	657.2909	5	53		0.2909	0.7091
12.5660	0.0000	0.0000	0.0000					
TR2-3	662.0000	661.0000	661.3374	5	44		0.3374	0.6626
12.5660	0.0000	0.0000	0.0000					
TR2-2	658.0000	652.0000	645.9269	6	48		0.0000	12.0731

```
 12.5660    0.0000    0.0000    0.0000
           Outlet    649.0000  642.0300  645.9773     13   59      3.9473    3.0227
 12.5660    0.0000    0.0000    0.0000
          TR2-2.1    653.0000  647.0900  645.7641     12   46      0.0000    7.2359
 12.5660    0.0000    0.0000    0.0000
         TR1F-2.1    653.0000  647.7500  652.3781     13   25      4.6281    0.6219
121579.92    0.0000    0.0000    0.0000
           Node71    653.0000  647.0900  645.4560     12   47      0.0000    7.5440
 12.5660    0.0000    0.0000    0.0000


 *===========================================*
 |     Time History of Flow and Velocity     |
 |    Q(cfs), Vel(ft/s), Total(cubic feet)   |
 *===========================================*


   Conduit:BD-L10
 Hr:Mn:Sc       Flow   Velocity     X-Area   H-Radius     Up HGL   Down HGL   Up
Node  Down Node     Volume
 --------      -----  --------   --------   --------   --------  ---------
--------  ---------  ---------
   0  2  0     0.0000     0.0000 1.0000E-05 1.0000E-05  604.0      604.0      604.0
    604.0     4.6500E-03
  16 42  0  310.6     0.6008      516.9      3.305      611.8      611.8      611.8
    611.8     2.3906E+05
  33 22  0  64.75     0.4739      136.6      2.088      608.3      608.3      608.3
    608.3     6.2998E+04
  50  2  0  7.224     0.2908      24.84      1.019      605.8      605.7      605.8
    605.7     1.1385E+04
  66 42  0  1.518     0.1940      7.822     0.5461      604.8      604.8      604.8
    604.8      3513.
  83 22  0 0.8142     0.1537      5.298     0.4482      604.6      604.6      604.6
    604.6      2360.
    Mean      64.15      0.29
  Maximum     310.58      0.60
  Minimum       0.00      0.00
    Total  1.028E+05


 *=====================================================*
 |        Table E10 - CONDUIT SUMMARY STATISTICS       |
 | Note: The peak flow may be less than the design flow |
 | and the conduit may still surcharge because of the   |
 | downstream boundary conditions.                      |
 |                                                      |
 | * denotes an open conduit that has been overtopped   |
 |   this is a potential source of severe errors        |
 *=====================================================*

                            Conduit  Maximum  Maximum    Time      Maximum    Time
Ratio of    Maximum Water      Ratio
                     Design   Design Vertical Computed     of      Computed     of
 Max. to  Elev at Pipe Ends     d/D
          Conduit     Flow Velocity    Depth     Flow  Occurence  Velocity Occurence
  Design  Upstream  Dwnstrm   US   DS
             Name    (cfs)   (ft/s)     (in)    (cfs)   Hr.  Min.  (ft/s)   Hr.
Min.    Flow    (ft)     (ft)
 ---------------  ------- -------- --------  ------- -----------  -------
----------  ------- -------- -------- ----- -----
       McCarty 1  18.9194   0.9636  60.0000 -71.6677    14    45  -3.6352    14
42  -3.7881 645.9773 645.2755 1.779 1.649
```

```
         TR5 Link 262.7790   9.2939  72.0000 190.2510     7    16   7.0711     7
16   0.7240 651.3836 643.2047 0.956 0.627
         TR4 Link  61.1702   6.3579  42.0000  27.9058     5    39   4.1456     5
40   0.4562 641.5480 639.5173 0.682 0.596
             I-65 105.5945   5.3779  60.0000 189.2802     7    12   9.7927     7
12   1.7925 645.2755 641.1371 1.569 0.861
           CR 550 202.0912   7.1475  72.0000 219.2378    14    13   7.7321    14
15   1.0848 641.1371 639.5173 1.346 1.156
        McCarty 3 325.9301   9.3123  60.0000 190.3489     7    13   6.0541     7
13   0.5840 653.6583 651.3836 0.932 0.599
           Link17  21.0539   4.2891  30.0000  10.1390     6    44   3.3587     6
44   0.4816 641.4240 640.5231 0.610 0.425
            BD-L1 11160.22   5.0059 180.0000 399.0833    10    46   3.3254    10
50   0.0358 635.9227 635.1262 0.321 0.342
            BD-L2 13803.77   6.2310 180.0000 402.3333    10    27   3.2796    10
27   0.0291 635.1263 631.6106 0.342 0.241
            BD-L3 13837.77   6.3565 180.0000 402.3264    10    30   2.1778    10
30   0.0291 631.6106 627.7626 0.241 0.118
            BD-L4 52933.44  19.4935 180.0000 402.3252    10    32   3.3599    10
30   0.0076 627.7626 622.9498 0.118 0.197
            BD-L5 24588.11   9.1816 180.0000 402.3222    10    35   3.2453    11
24   0.0164 622.9498 619.5708 0.197 0.238
            BD-L6 22749.05   8.3513 180.0000 447.1159     9    35   2.8294     9
31   0.0197 619.5708 616.6785 0.238 0.179
            BD-L7 32991.66  14.6613 180.0000 447.1032     9    38   4.0467     5
42   0.0136 616.6785 613.4496 0.179 0.230
            BD-L8 21695.68   7.5594 180.0000 446.9382     9    44   1.7483     5
24   0.0206 613.4496 612.8430 0.230 0.323
            BD-L9 40589.50  14.1061 180.0000 446.7055     9    55   1.3713     3
38   0.0110 612.8430 612.7396 0.323 0.583
           BD-L10 718.5285   0.0000 180.0000 446.6514    10     8   0.6765    10
7  0.6216 612.7396 612.6938 0.583 0.580
           Link31 1232.612   5.4181  84.0000  10.1982     6    41   0.6053     4
27   0.0083 641.4718 641.4240 0.139 0.218
           Link32  95.2890  13.4806  36.0000  16.9149     7    15   9.3138     7
20   0.1775 641.4718 635.9227 0.304 0.408
           Link33 208.5455  10.6211  60.0000  54.3808     6    50   5.1621     4
10   0.2608 645.1539 642.8704 0.587 0.348
           Link34  29.8706   9.5081  24.0000   7.7259     5    34   7.1205     5
54   0.2586 637.7133 635.1263 0.387 0.758
           Link35  63.9355   5.0878  48.0000   7.3535     6    45   2.8700     6
45   0.1150 642.8952 642.4162 0.264 0.197
           Link44 124.3987   9.8993  48.0000  27.5349     5    47   5.1600     5
42   0.2213 650.6618 649.7800 0.440 0.445
           Link52  65.3461   5.2001  48.0000  30.6043     5    32   5.0476     5
9  0.4683 650.1962 646.8155 0.482 0.604
           Link53 168.2852   5.9519  72.0000  40.3557     5    42   3.7450     4
57   0.2398 646.8155 645.2755 0.403 1.346
           Link54  17.6296   3.5259  28.6712  18.9504     5    53   3.5653     6
29   1.0749 658.0842 652.4093 0.454 1.000 *
           Link55  24.3548   3.4455  36.0000  24.5237     6    58   3.8843     4
41   1.0069 652.4782 652.4093 1.526 1.570
           Link56  12.2419   2.4484  16.8926  14.6645     5    50   2.4576     6
6  1.1979 655.0867 649.7077 0.772 1.000
           Link57  27.2295   3.8522  36.0000   8.5185     5    46   3.7942     5
46   0.3128 654.0796 653.7191 0.360 0.306
           Link58  12.4669   2.4934  27.5340  23.4243     5    52   2.9214     6
5  1.8789 649.7077 647.8946 0.614 1.000 *
           Link59   8.6536   1.7307  33.0710  59.9360     6     8   2.7437     6
10   6.9261 653.2431 648.6559 0.850 1.000 *
           Link60  13.6568   2.7314  33.0710  41.7147     5    36   3.2196     4
57   3.0545 655.6505 648.6559 0.599 1.000 *
           Link61  16.4471   3.2894  65.9568  18.7046     5    52   3.3966     5
```

```
52   1.1373 654.1066 647.0965 0.201 1.000 *
          Link62   8.8154   1.7631  54.9376  28.2834     6     8   2.0566     5
13   3.2084 653.1973 652.4782 0.371 1.000 *
          Link63  13.0091   2.6018  21.3599  22.7895     5    54   2.8038     5
56   1.7518 657.2909 649.7800 0.725 1.000 *
          Link65  14.3955   2.8791  16.0483  23.2426     5    44   3.0002     5
46   1.6146 661.3374 652.0145 1.000 0.759 *
          Link66 199.4266   7.0533  72.0000  43.3001     5    38   3.9847     5
7   0.2171 645.9269 645.7641 0.381 0.779
          Link68  14.9142   2.1099  36.0000 -32.5330    14    35  -4.5936    14
35  -2.1813 645.7641 647.0965 1.421 2.032
          Link69  86.6125   3.0633  72.0000  56.7914     9    57   2.6375     3
48   0.6557 645.3103 645.2755 1.128 1.141
        Link66.1 199.4266   7.0533  72.0000  57.6561    10    28   4.7041     4
59   0.2891 645.4560 645.3103 0.728 1.128
         Primary 103.4894   5.2707  60.0000 343.9850    11     4  17.5399    11
4   3.3239 639.5173 635.9227 1.615 0.963
       Emergency  23.9874   4.8867  30.0000  47.7024    11    59   9.7641    11
59   1.9886 639.5173 635.9339 1.971 0.906
      TR1B/C Out 101.2384   4.8209  36.0000  50.2759     5    51   4.1783     5
51   0.4966 649.7800 648.9695 0.593 0.390
        TR1D Out 175.3501   8.3500  36.0000 108.7273     7    31   5.4432     6
42   0.6201 647.8946 647.5715 1.098 1.190
        TR1E Out 226.3760  10.7798  36.0000 124.2808     8    59   7.0941     7
13   0.5490 647.5715 647.0965 1.190 1.365
        TR1A Out 123.9912   5.9043  36.0000  98.8881     5    51   5.3030     5
50   0.7975 648.6559 647.8946 0.919 0.765
        TR1F Out   6.6853   2.7794  21.0000  13.5309    13    53   5.7330    14
8   2.0240 652.3781 646.8155 3.645 1.380
            Weir   0.0000   0.0000   0.0000  57.7765    10    28   5.4348     5
6   0.0000 641.0900 641.0900 .0000 .0000
       WQ OUTLET   0.6670   0.4815   5.9947   1.5082     5    26   7.7171     5
24   2.2611 652.4093 652.3781 10.83 10.79
         STAGE 1  17.0235   0.4815   6.0000  39.1141     6    25   7.8969     6
24   2.2977 652.4093 652.3781 8.679 8.636
      WQV OUTLET   0.6670   0.4815   5.9947   1.9171    17    14   9.7666    17
14   2.8741 647.0965 645.9773 14.71 12.49
       1ST STAGE  20.4282   0.4815   6.0000  58.6644    17    14   9.7670    17
14   2.8717 647.0965 645.9773 13.69 11.47
      TR5 - TR5A  Undefnd  Undefnd  Undefn   70.7074     7    19
         STAGE 2  Undefnd  Undefnd  Undefn   13.9845    11     9
       2ND STAGE  Undefnd  Undefnd  Undefn   31.3270    13    10
        FREE # 1  Undefnd  Undefnd  Undefn  446.6520    10     7


 *===================================================*
 | Table E11.  Area assumptions used in the analysis|
 | Subcritical and Critical flow assumptions from   |
 |    Subroutine Head.  See Figure 17-1 in the      |
 |         manual for further information.          |
 *===================================================*

                Duration    Duration  Durat. of Durat. of
                   of       of Sub-    Upstream Downstream   Maximum   Maximum
Maximum
        Conduit    Dry       Critical   Critical   Critical Hydraulic    X-Sect
Vel*D
         Name    Flow(min)  Flow(min)  Flow(min)  Flow(min)  Radius-m Area(ft^2)
(ft^2/s)
 --------------- ---------- ----------  ---------  --------- ---------  ---------
--------
       McCarty 1     0.0000  5037.5000     0.0000     2.5000    1.5211    20.5745
27.5643
```

TR5 Link	151.2500	0.0000	0.0000	4888.7500	1.8007	26.9056	33.5808
TR4 Link	127.3333	535.0139	0.0000	4377.6528	1.0088	6.7315	8.3240
I-65	1.0000	332.4889	0.0000	4706.5111	1.5017	20.0502	58.9513
CR 550	1.5000	873.9333	0.0000	4164.5667	1.8170	29.5840	55.4984
McCarty 3	151.0000	96.1974	0.0000	4792.8026	1.9280	31.4421	23.1573
Link17	134.2857	0.0000	0.0000	4905.7143	0.6849	3.0187	4.3442
BD-L1	1.5000	5038.5000	0.0000	0.0000	2.8198	120.0144	16.5245
BD-L2	1.5000	5038.5000	0.0000	0.0000	1.9973	122.6793	14.3264
BD-L3	2.5000	5037.5000	0.0000	0.0000	1.7390	184.7406	5.8508
BD-L4	3.5000	5036.5000	0.0000	0.0000	1.0977	119.7447	7.9165
BD-L5	4.6667	5035.3333	0.0000	0.0000	1.9154	124.0387	10.5708
BD-L6	4.6667	5035.3333	0.0000	0.0000	1.7616	158.0281	8.8406
BD-L7	7.3333	5032.6667	0.0000	0.0000	1.5838	127.3572	10.7550
BD-L8	6.0000	5034.0000	0.0000	0.0000	2.1760	319.5696	5.7993
BD-L9	7.3333	5032.6667	0.0000	0.0000	2.8181	531.8313	5.7052
BD-L10	7.3333	5032.6667	0.0000	0.0000	4.0191	660.2416	5.8968
Link31	134.8571	4905.1429	0.0000	0.0000	0.8769	18.1105	0.7025
Link32	4240.4750	581.1838	0.0000	218.3412	0.5174	1.8168	9.1252
Link33	4100.0571	0.0000	0.0000	939.9429	1.3301	11.3850	11.1624
Link34	4251.4444	553.8889	0.0000	234.6667	0.4141	1.1065	6.5585
Link35	4177.7857	0.0000	0.0000	862.2143	0.5997	2.5622	2.6424
Link44	4181.2549	858.7451	0.0000	0.0000	0.9188	5.3384	9.1318
Link52	3074.8889	1965.1111	0.0000	0.0000	0.9833	6.0899	10.3570
Link53	0.0000	5040.0000	0.0000	0.0000	1.3120	12.4167	16.3147
Link54	89.3333	1275.0909	0.0000	3675.5758	0.6347	5.5641	3.9492
Link55	97.8667	3289.3000	0.0000	1652.8333	0.9120	7.3972	13.4545
Link56	87.3333	4952.6667	0.0000	0.0000	0.6595	6.0076	3.0303
Link57	88.0000	0.0000	0.0000	4952.0000	0.5860	2.2453	3.7908
Link58	88.0000	1125.7667	0.0000	3826.2333	0.7854	8.4174	4.1315
Link59	90.6667	4949.3333	0.0000	0.0000	1.2772	21.8483	6.9777
Link60	84.0000	4956.0000	0.0000	0.0000	0.9740	13.0924	6.9634
Link61	88.0000	1983.8000	0.0000	2968.2000	0.6755	12.2358	

							4.2012
Link62	90.6667	4949.3333	0.0000	0.0000	1.0591	16.6803	4.8254
Link63	89.3333	4950.6667	0.0000	0.0000	0.7698	8.1292	4.3036
Link65	82.0000	0.0000	0.0000	4958.0000	0.7527	7.7481	3.5275
Link66	111.3333	4928.6667	0.0000	0.0000	1.2948	11.1373	12.8040
Link68	100.0000	2203.2571	0.0000	2736.7429	0.9072	7.2962	21.0743
Link69	1769.0000	2749.0278	0.0000	521.9722	1.8254	29.6103	12.5611
Link66.1	2721.4643	2318.5357	0.0000	0.0000	1.7660	22.7925	14.6984
Primary	1.5000	5038.5000	0.0000	0.0000	1.5144	20.3050	113.0387
Emergency	3821.5476	253.6319	0.0000	964.8205	0.7578	5.0493	35.1074
TR1B/C Out	90.0000	0.0000	0.0000	4950.0000	1.1496	12.0328	6.1618
TR1D Out	90.0000	4950.0000	0.0000	0.0000	1.5090	21.1868	15.3485
TR1E Out	104.0000	1431.0000	0.0000	3505.0000	1.4999	21.1868	16.9469
TR1A Out	84.6667	1052.2745	0.0000	3903.0588	1.4910	18.6482	12.1765
TR1F Out	0.0000	5040.0000	0.0000	0.0000	0.5229	2.5092	22.4068
Weir	5040.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WQ OUTLET	91.3333	2394.2857	0.0000	2554.3810	0.1498	0.1991	25.0660
STAGE 1	2570.7619	2024.4833	0.0000	444.7548	0.4112	5.0256	18.0240
WQV OUTLET	84.6667	2301.8500	0.0000	2653.4833	0.1514	0.2029	48.1636
1ST STAGE	205.8182	1955.0152	0.0000	2879.1667	0.4051	6.0079	43.6908

```
*==================================================*
| User defined weir submergence information        |
| Average Weir Submergence Constant and Weir Head |
*==================================================*
```

Weir Name	Mean Constant	Mean Weir Head
Weir	0.55729	1.02404

```
*============================================*
| Table E12. Mean Conduit Flow Information  |
*============================================*
```

Conduit Name	Mean Flow (cfs)	Total Flow (ft^3)	Mean Percent Change	Low Flow Weightng	Mean Froude Number	Mean Hydraulic Radius	Mean Cross Area	Mean Conduit Roughness
McCarty 1	-19.3774	-5859715.	0.0018	1.0000	0.1760	1.1645	14.3270	0.0240

TR5 Link	14.8839	4500904.1	0.0010	0.9867	0.8506	0.5764	5.7861	0.0130
TR4 Link	1.9685	595283.63	0.0002	0.3956	0.5324	0.2313	1.2047	0.0130
I-65	48.2459	14589565.	0.0013	0.9999	0.6490	1.1020	12.2660	0.0130
CR 550	51.5577	15591040.	0.0015	0.9998	0.5574	1.2122	15.4846	0.0130
McCarty 3	14.8840	4500918.9	0.0015	0.9867	0.9540	0.5281	6.8121	0.0130
Link17	0.9242	279473.37	0.0000	0.8290	2.4474	0.1907	0.6803	0.0130
BD-L1	81.5974	24675054.	0.0024	0.9998	0.2356	1.5824	55.1210	0.0500
BD-L2	82.1445	24840501.	0.0023	0.9998	0.2951	1.3400	53.4024	0.0500
BD-L3	82.1501	24842179.	0.0023	0.9997	0.3065	1.0776	79.6192	0.0526
BD-L4	82.1522	24842819.	0.0024	0.9997	0.4304	0.6129	52.8357	0.0500
BD-L5	82.1507	24842357.	0.0024	0.9995	0.3138	1.0591	55.6800	0.0500
BD-L6	87.9498	26596024.	0.0026	0.9995	0.3296	1.0944	66.9484	0.0503
BD-L7	87.9548	26597545.	0.0026	0.9994	0.4345	0.8876	51.4211	0.0508
BD-L8	87.9775	26604394.	0.0026	0.9994	0.1917	1.1087	123.4782	0.0511
BD-L9	87.9708	26602385.	0.0027	0.9993	0.1412	1.3588	197.7850	0.0574
BD-L10	88.0321	26620921.	0.0047	0.9993	0.0399	2.3862	278.5141	0.0516

	Link31	0.9241	279441.67	0.0001	0.9895	0.1035	0.1961
3.7545	0.0350						
	Link32	1.1222	339350.52	0.0001	0.3422	0.4984	0.1178
0.3561	0.0110						
	Link33	4.0154	1214270.9	0.0003	0.3825	0.6745	0.2952
2.0240	0.0130						
	Link34	0.5422	163972.35	0.0000	0.3232	0.3716	0.0941
0.2329	0.0130						
	Link35	0.5178	156592.81	0.0000	0.3585	0.5169	0.1252
0.4542	0.0130						
	Link44	2.0222	611528.28	0.0002	0.3428	0.2774	0.1984
0.8965	0.0130						
	Link52	2.2194	671146.01	0.0002	0.6530	0.1789	0.2567
1.2507	0.0130						
	Link53	7.7100	2331491.1	0.0003	1.0000	0.3775	0.7217
5.2654	0.0130						
	Link54	1.3973	422558.34	0.0001	0.9938	0.3690	0.1746
1.4879	0.0300						
	Link55	2.1366	646116.60	0.0002	0.9931	0.5536	0.5400
4.1859	0.0130						
	Link56	1.0797	326491.16	0.0001	0.9939	0.2398	0.1501
1.0891	0.0300						
	Link57	0.6244	188815.21	0.0000	0.3996	0.4548	0.1356
0.4207	0.0130						
	Link58	1.6998	514030.65	0.0001	0.9939	0.4195	0.2020
1.8992	0.0300						
	Link59	4.5208	1367082.3	0.0003	0.9938	0.2056	0.3208
4.2678	0.0300						
	Link60	3.0091	909949.35	0.0002	0.9942	0.2081	0.2272
2.4414	0.0300						
	Link61	1.3124	396883.16	0.0001	0.9940	0.2968	0.2527
4.3960	0.0300						

Link62	2.1497	650075.57	0.0002	0.9938	0.1031	0.3529	5.1174	0.0300
Link63	1.6831	508973.16	0.0001	0.9938	0.2981	0.1759	1.4534	0.0300
Link65	1.7018	514638.33	0.0001	0.9943	0.7120	0.1723	1.4007	0.0300
Link66	3.1741	959840.23	0.0003	0.9928	0.0948	0.5235	3.8151	0.0130
Link68	-4.1217	-1246395.	0.0004	0.9931	0.6094	0.5223	4.4643	0.0130
Link69	10.5520	3190914.4	0.0006	0.8513	0.3235	1.0219	12.9852	0.0130
Link66.1	10.5486	3189892.4	0.0005	0.7268	0.2484	0.7715	7.5860	0.0130
Primary	74.0587	22395345.	0.0021	0.9998	0.9090	1.0604	11.6862	0.0130
Emergency	6.4164	1940324.7	0.0002	0.4777	0.4436	0.2615	1.7330	0.0130
TR1B/C Out	3.7054	1120497.9	0.0003	0.9938	0.7910	0.2434	2.2859	0.0130
TR1D Out	16.3064	4931060.1	0.0006	0.9938	0.6636	0.6464	8.9845	0.0130
TR1E Out	19.9279	6026195.2	0.0008	0.9928	0.8888	0.6623	9.2940	0.0130
TR1A Out	7.5263	2275943.5	0.0006	0.9941	0.7282	0.5093	5.5973	0.0130
TR1F Out	5.0981	1541677.0	0.0001	1.0000	0.6543	0.3962	1.8285	0.0140
Weir	10.5450	3188814.2	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000
WQ OUTLET	0.4249	128477.58	0.0000	0.9934	0.4758	0.1249		

```
0.1902    0.0024


         STAGE 1    3.6293 1097504.9    0.0002    0.7473    0.2634    0.1699
3.4183    0.0037


      WQV OUTLET    0.7877 238203.97    0.0000    0.9938    0.8794    0.1237
0.1915    0.0024


       1ST STAGE   17.1479 5185511.0    0.0019    0.9743    0.9325    0.2097
4.8545    0.0038


      TR5 - TR5A    5.9659 1804102.9


         STAGE 2    0.9847 297771.01


       2ND STAGE    1.4465 437434.00


        FREE # 1   88.0235 26618308.



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 Water Surf   |     #                             ##
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  Elev(ft)    |     #                               #
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              |     #                                ##
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              0.0      10.0      20.0      30.0      40.0      50.0      60.0
70.0      80.0      90.0     100.0
```

LOCATION NO. : TR1G-1   Clock time in hours.

Plot of Junction Elevation

Invert Elev - 637.00 feet
Crown Elev - 646.00 feet
Ground Elev - 649.00 feet

```
1
        648.000
|=========|=========|=========|=========|=========|=========|=========|=========|==
=======|=========|
                |           #
                                |
                |         ## #
                                |
                |      ###   #
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                |      #     #
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                |      #      #
                                |
                |     #       #
                                |
                |     #       #
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                |     #       #
                                |
                |     #        #
                                |
        647.200 =     #        #
                               =
                |    #         #
                                |
                |    #          #
                                |
                |    #          #
                                |
                |    #          #
                                |
                |    #           #
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                |    #           #
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                |    #           #
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                |    #            #
                                |
```

```
                |     #            #
                                |
        646.400 =    #              #
                                =
                |    #              #
                                |
                |    #               #
                                |
  Junction      |    #               #
                                |
                |    #                #
                                |
 Water Surf     |    #                #
                                |
                |    #                #
                                |
  Elev(ft)      |    #                 #
                                |
                |    #                 #
                                |
                |    #                  #
                                |
        645.600 =   #                   #
                                =
                |   #                    #
                                |
                |   #                     #
                                |
                |   #                     ##
                                |
                |   #                      #
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                |   #                       #
                                |
                |   #                       ##
                                |
                |   #                        ##
                                |
                |  #                           ##
                                |
                |  #                             ###
                                |
        644.800 =  #                               #####
                                =
                |  #                                   ##########
                                |
                |##
####################################                |
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                                |
                |
                                |
                |
                                |
        644.000
```

```
|=========|=========|=========|=========|=========|=========|=========|=========|==
=======|=========|
                0.0      10.0      20.0      30.0      40.0      50.0      60.0
70.0      80.0      90.0     100.0

                 LOCATION NO. : TR1D-1       Clock time in hours.


                  Plot of Junction Elevation

                    Invert Elev -  644.60 feet
                     Crown Elev -  650.80 feet
                    Ground Elev -  658.00 feet

1
        648.000
|=========|=========|=========|=========|=========|=========|=========|=========|==
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                |           ##
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                |          ###
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                |         ##  #
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                |         #   #
                                |
                |        #    #
                                |
        647.200 =        #    #
                                =
                |        #     #
                                |
                |       #      #
                                |
                |       #      #
                                |
                |      #        #
                                |
                |      #        #
                                |
                |      #        #
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                |      #         #
                                |
                |     #          #
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                |     #          #
                                |
        646.400 =     #           #
                                =
                |     #           #
                                |
                |     #            #
                                |
  Junction      |     #            #
```

```
                                |
                |     #              #
                                |
 Water Surf     |     #              #
                                |
                |     #              #
                                |
  Elev(ft)      |     #               #
                                |
                |     #               #
                                |
                |     #               #
                                |
        645.600 =     #                #
                                =
                |     #                #
                                |
                |     #                #
                                |
                |    #                  #
                                |
                |    #                  #
                                |
                |    #                   #
                                |
                |    #                   #
                                |
                |    #                    #
                                |
                |    #                    #
                                |
                |    #                     #
                                |
        644.800 =    #                     #
                                =
                |    #                      #
                                |
                |   #                       #
                                |
                |   #                        #
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                |   #                         #
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                |   #                          ##
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                |   #                           ###
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                |   #                              ###
                                |
                |   #                                 ######
                                |
                |  #
###########################                             |
        644.000
|###=======|=========|=========|=========|=========|=========|========#############
##======|=========|
               0.0      10.0      20.0      30.0      40.0      50.0      60.0
70.0      80.0      90.0     100.0

                 LOCATION NO. : TR1E         Clock time in hours.


                  Plot of Junction Elevation
```

```
                     Invert Elev -  644.00 feet
                      Crown Elev -  647.00 feet
                     Ground Elev -  658.00 feet

1
        500.000
|=========|=========|=========|=========|=========|=========|=========|=========|==
=======|=========|
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                |        #####
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                |       #    #
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                |       #     #
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                |       #     #
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        400.000 =       #     #
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                |      #       #
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                |      #       #
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                |      #       #
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                |      #        #
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                |      #        #
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                |      #        #
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                |      #         #
                                |
        300.000 =     #          #
                                =
                |     #          #
                                |
                |     #           #
                                |
  Conduit       |     #           #
                                |
                |     #           #
                                |
  Flow In       |     #           #
                                |
                |     #           #
                                |
    cfs         |     #            #
                                |
```

```
                |     #            #
                                |
                |     #            #
                                |
        200.000 =     #            #
                                =
                |     #             #
                                |
                |     #             #
                                |
                |    #               #
                                |
                |    #               #
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                |    #                #
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                |    #                #
                                |
                |    #                #
                                |
                |    #                ##
                                |
                |    #                 ##
                                |
        100.000 =    #                  ###
                                =
                |    #                    ###
                                |
                |   #                        ###
                                |
                |   #                          ###
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                |   #                            ##
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                |   #                              ##
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                |   #                                ####
                                |
                |   #                                    ###
                                |
                |  #                                        ####
                                |
                |  #                                           ######
                                |
          0.000
|###======|=========|=========|=========|=========|=#############################
##=====|=========|
               0.0      10.0      20.0      30.0      40.0      50.0      60.0
70.0      80.0      90.0     100.0

                 LOCATION NO. : BD-L10       Clock time in hours.


                   Plot of conduit flow

 *================================================================*
 | Table E13. Channel losses(H), headwater depth (HW), tailwater |
 | depth (TW), critical and normal depth (Yc and Yn).            |
 | Use this section for culvert comparisons                      |
 *================================================================*

         Conduit   Maximum      Head  Friction  Critical    Normal        HW
TW
```

Name	Flow	Loss	Loss	Depth	Depth	Elevat	Elevat	
McCarty 1	-0.4225	0.0007	0.7113	0.1545	0.5061	637.7554	637.7689	Max Flow
TR5 Link	190.1875	1.0166	5.5234	3.7640	3.7852	651.3823	643.2040	Max Flow
TR4 Link	27.8550	0.3442	1.4232	1.6263	1.6572	641.5452	639.0563	Max Flow
I-65	189.2733	2.0832	1.9338	3.9327	5.0000	645.0635	640.7627	Max Flow
CR 550	219.2203	1.4114	0.5614	4.0513	6.0000	640.7858	638.9668	Max Flow
McCarty 3	190.2985	0.7382	0.4354	2.8413	2.7532	653.6576	651.3786	Max Flow
Link17	10.1270	0.2266	0.3292	1.0624	1.2220	641.4229	640.5224	Max Flow
BD-L1	399.0829	0.0000	1.0933	2.9511	4.5332	635.9227	635.1258	Max Flow
BD-L2	402.3294	0.0000	2.5126	3.3637	5.2283	635.1262	631.6106	Max Flow
BD-L3	402.3259	0.0000	2.3784	2.3066	3.5977	631.6106	627.7626	Max Flow
BD-L4	402.3217	0.0000	5.1918	1.4304	1.7575	627.7626	622.9498	Max Flow
BD-L5	402.3217	0.0000	3.8857	1.8883	2.9085	622.9498	619.5682	Max Flow
BD-L6	447.1159	0.0000	2.2541	2.0616	3.5669	619.5708	616.6784	Max Flow
BD-L7	447.0984	0.0000	3.9959	1.6889	2.6526	616.6784	613.4480	Max Flow
BD-L8	446.9334	0.0000	1.9709	1.1937	2.6512	613.4488	612.8410	Max Flow
BD-L9	446.7039	0.0000	2.0853	1.8690	2.9131	612.8425	612.7391	Max Flow
BD-L10	446.6486	0.0000	0.0688	2.9524	8.6937	612.7396	612.6938	Max Flow
Link31	10.1956	0.0000	0.5637	0.2210	0.4996	641.4713	641.4229	Max Flow
Link32	16.9060	1.2904	5.5659	1.3142	0.8548	641.4570	635.7342	Max Flow
Link33	54.3545	0.4424	0.8830	2.0672	1.7400	645.1530	642.8700	Max Flow
Link34	7.7204	0.7781	3.0113	0.9874	0.6929	637.7130	634.3029	Max Flow
Link35	7.3447	0.1667	0.1642	0.7857	0.9129	642.8945	642.4157	Max Flow
Link44	27.5349	0.6234	0.5529	1.5514	1.2788	650.6618	649.7791	Max Flow
Link52	30.5750	0.0000	3.8531	1.6389	1.9242	650.1954	646.5494	Max Flow
Link53	40.3542	0.0000	5.9256	1.6805	1.9980	646.6272	644.1386	Max Flow
Link54	18.9498	0.0000	6.0530	0.9197	1.0308	658.0842	650.9397	Max Flow
Link55	24.4725	0.2639	0.2086	1.5939	2.4753	651.0462	650.5685	Max Flow
Link56	14.6537	0.0000	5.5462	0.8078	1.0872	655.0863	649.6973	Max Flow
Link57	8.5155	0.0000	0.2696	0.9189	1.1512	654.0794	653.7189	Max Flow
Link58	23.3969	0.0000	2.4548	1.0173	1.3135	649.6782		

```
646.7883   Max Flow
          Link59   59.9206    0.0000    4.9625    1.5779    2.6569  653.2428
648.6453   Max Flow
          Link60   41.7147    0.0000    8.0065    1.3198    1.6714  655.6505
648.6138   Max Flow
          Link61   18.4158    0.0000   10.0497    0.9064    1.0492  654.0979
642.5593   Max Flow
          Link62   28.2726    0.0000    3.3569    1.1041    1.7148  653.1859
651.1412   Max Flow
          Link63   22.7895    0.0000    7.9317    1.0064    1.2719  657.2909
649.7792   Max Flow
          Link65   23.2290    0.0000    7.2361    1.0143    1.2251  661.3370
652.0143   Max Flow
          Link66   43.2798    0.0000    1.3662    1.7394    1.8977  645.9229
645.3327   Max Flow
          Link68    0.2998    0.0000    2.3699    0.1591    0.2884  643.0776
643.0777   Max Flow
          Link69   56.7559    0.0000    0.2210    2.0008    3.5432  644.9683
644.9246   Max Flow
        Link66.1   57.6469    0.0000    2.3570    2.0168    2.2072  645.2086
645.0117   Max Flow
         Primary  343.9841    0.0000    3.5949    4.7947    5.0000  639.5169
635.9220   Max Flow
       Emergency   47.7024    0.0000    3.5834    2.2639    2.5000  639.5173
635.9339   Max Flow
      TR1B/C Out   50.2456    0.3533    0.1501    1.1690    1.4756  649.7792
648.9690   Max Flow
        TR1D Out  108.6674    0.5955    0.3697    1.9557    1.7194  647.6245
646.6597   Max Flow
        TR1E Out  124.2669    0.8929    0.7775    2.1388    1.5813  646.8162
645.4023   Max Flow
        TR1A Out   98.8670    0.5711    0.2113    1.8362    2.0515  648.6554
647.4362   Max Flow
        TR1F Out   13.5309    0.0000    6.5521    1.3675    1.7500  652.3511
645.7986   Max Flow
            Weir    0.0000    0.0000    0.0000    0.0000    0.0000    0.0000
0.0000   Max Flow
       WQ OUTLET    1.5034    0.0000    2.5336    0.7215    0.4996  650.7964
648.2626   Max Flow
         STAGE 1   38.8282    0.0000    2.4525    0.7759    0.5000  650.9755
648.4907   Max Flow
      WQV OUTLET    1.9170    0.0000    4.1137    0.9367    0.4996  646.5143
642.3987   Max Flow
       1ST STAGE   58.6609    0.0000    4.1141    0.9052    0.5000  646.5143
642.3987   Max Flow

 *===========================================================*
 | Table E13a. CULVERT ANALYSIS CLASSIFICATION,              |
 | and the time the culvert was in a particular              |
 | classification during the simulation.  The time is        |
 | in minutes.  The Dynamic Wave Equation is used for        |
 | all conduit analysis but the culvert flow classification |
 | condition is based on the HW and TW depths.               |
 *===========================================================*
                            Mild      Mild     Steep                Mild      Mild
                           Slope  Slope TW  Slope TW Slug Flow     Slope     Slope
                      Critical D   Control   Insignf   Outlet/    TW > D   TW <= D

         Conduit      Outlet    Outlet  Entrance  Entrance    Outlet    Outlet
Outlet     Inlet         Inlet
            Name   Control   Control   Control   Control   Control   Control
Control   Control Configuration
 --------------- --------- --------- --------- --------- --------- ---------
```

```
--------- --------- -------------

      McCarty 1    0.0000 4032.0000    0.0000    0.0000 1008.0000    0.0000
0.0000    0.0000 None
       TR5 Link 2676.0000 1296.0000  474.0000    0.0000    0.0000    0.0000
0.0000  594.0000 Groove End Projecting
       TR4 Link   36.0000  378.0000 4062.0000    0.0000    0.0000    0.0000
0.0000  564.0000 Mitered to Embankment
          I-65 1146.0000 3600.0000    0.0000    0.0000    0.0000    0.0000
294.0000    0.0000 None
         CR 550 1302.0000 3288.0000    0.0000    0.0000  450.0000    0.0000
0.0000    0.0000 None
      McCarty 3 1416.0000 2604.0000  366.0000    0.0000    0.0000    0.0000
66.0000  588.0000 90 deg Headwall with .75inch Chamfer
         Link17  678.0000 1830.0000 1950.0000    0.0000    0.0000    0.0000
0.0000  582.0000 Mitered to Embankment
          BD-L1    0.0000 5040.0000    0.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
          BD-L2  216.0000 4824.0000    0.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
          BD-L3 1464.0000 3576.0000    0.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
          BD-L4    0.0000 5040.0000    0.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
          BD-L5    0.0000 5040.0000    0.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
          BD-L6    0.0000 5040.0000    0.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
          BD-L7    0.0000 5034.0000    6.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
          BD-L8    0.0000 5034.0000    6.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
          BD-L9    0.0000 5034.0000    6.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
         BD-L10    0.0000 5034.0000    0.0000    6.0000    0.0000    0.0000
0.0000    0.0000 None
         Link31    0.0000 4908.0000  132.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
         Link32    0.0000    0.0000 5040.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
         Link33    0.0000    0.0000 4494.0000    0.0000    0.0000    0.0000
6.0000  540.0000 Mitered to Embankment
         Link34    0.0000    0.0000 5040.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
         Link35  462.0000  402.0000 4176.0000    0.0000    0.0000    0.0000
0.0000    0.0000 Mitered to Embankment
         Link44    0.0000    0.0000 4518.0000    0.0000    0.0000    0.0000
522.0000    0.0000 None
         Link52   12.0000 1956.0000 3072.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
         Link53    0.0000 4470.0000    0.0000    0.0000  570.0000    0.0000
0.0000    0.0000 None
         Link54  540.0000 4206.0000   90.0000    0.0000  204.0000    0.0000
0.0000    0.0000 None
         Link55   72.0000 3816.0000  102.0000    0.0000 1050.0000    0.0000
0.0000    0.0000 None
         Link56    0.0000 4884.0000   84.0000    0.0000   72.0000    0.0000
0.0000    0.0000 None
         Link57  492.0000  528.0000 4020.0000    0.0000    0.0000    0.0000
0.0000    0.0000 None
         Link58  192.0000 4590.0000   84.0000    0.0000  174.0000    0.0000
0.0000    0.0000 None
         Link59    0.0000 4872.0000   90.0000    0.0000   78.0000    0.0000
```

							0.0000	0.0000	None
Link60	60.0000	4818.0000	84.0000	0.0000	78.0000	0.0000	0.0000	0.0000	None
Link61	150.0000	4620.0000	84.0000	0.0000	186.0000	0.0000	0.0000	0.0000	None
Link62	12.0000	4704.0000	90.0000	0.0000	234.0000	0.0000	0.0000	0.0000	None
Link63	0.0000	4848.0000	90.0000	0.0000	102.0000	0.0000	0.0000	0.0000	None
Link65	504.0000	4458.0000	78.0000	0.0000	0.0000	0.0000	0.0000	0.0000	None
Link66	0.0000	4956.0000	84.0000	0.0000	0.0000	0.0000	0.0000	0.0000	None
Link68	1284.0000	2364.0000	96.0000	0.0000	1296.0000	0.0000	0.0000	0.0000	None
Link69	192.0000	2598.0000	1770.0000	0.0000	480.0000	0.0000	0.0000	0.0000	None
Link66.1	6.0000	1842.0000	2718.0000	0.0000	474.0000	0.0000	0.0000	0.0000	None
Primary	1488.0000	3162.0000	0.0000	0.0000	0.0000	0.0000	390.0000	0.0000	None
Emergency	312.0000	432.0000	3816.0000	0.0000	0.0000	0.0000	480.0000	0.0000	None
TR1B/C Out	552.0000	4398.0000	90.0000	0.0000	0.0000	0.0000	0.0000	0.0000	None
TR1D Out	0.0000	0.0000	3576.0000	1008.0000	0.0000	0.0000	456.0000	0.0000	None
TR1E Out	0.0000	0.0000	3672.0000	798.0000	0.0000	144.0000	426.0000	0.0000	None
TR1A Out	330.0000	4626.0000	84.0000	0.0000	0.0000	0.0000	0.0000	0.0000	None
TR1F Out	2976.0000	168.0000	0.0000	0.0000	516.0000	0.0000	1380.0000	0.0000	None
Weir	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	None
WQ OUTLET	714.0000	996.0000	90.0000	0.0000	2028.0000	168.0000	1044.0000	0.0000	None
STAGE 1	306.0000	234.0000	2568.0000	0.0000	1644.0000	168.0000	120.0000	0.0000	None
WQV OUTLET	1236.0000	942.0000	90.0000	0.0000	516.0000	1416.0000	840.0000	0.0000	None
1ST STAGE	2262.0000	240.0000	228.0000	0.0000	114.0000	1644.0000	552.0000	0.0000	None

```
*=====================================*
|     Kinematic Wave Approximations    |
|  Time in Minutes for Each Condition |
*=====================================*
```

Conduit Name	Duration of Normal Flow	Slope Criteria	Super-Critical	Roll Waves
McCarty 1	2.1742	229.3074	0.0000	0.0000
TR5 Link	0.0000	0.0000	1097.8000	0.0000
TR4 Link	185.7250	498.4408	4070.2024	0.0000
I-65	0.0000	0.0000	0.5000	0.0000
CR 550	0.0000	0.0000	2.0000	0.0000
McCarty 3	0.0000	0.0000	3478.1444	0.0000
Link17	0.0000	0.2857	3895.8857	0.0000
BD-L1	1163.4762	5034.8333	1.5000	0.0000
BD-L2	0.0000	0.0000	2.5000	0.0000
BD-L3	0.6667	0.6667	1.0000	0.0000
BD-L4	5032.6667	5032.6667	2.8333	0.0000

BD-L5	4132.1048	5033.3333	2.6667	0.0000
BD-L6	0.0000	0.0000	4.0000	0.0000
BD-L7	4154.3957	4973.7955	2.6667	0.0000
BD-L8	3139.1212	5028.0000	1.0000	0.0000
BD-L9	3498.6571	5032.6667	2.6667	0.0000
BD-L10	0.0000	0.0000	0.0000	0.0000
Link31	897.1818	4899.0476	19.7143	0.0000
Link32	4544.6316	4627.5294	683.1895	0.0000
Link33	0.0000	0.4000	4140.4556	0.0000
Link34	4627.0588	4686.1000	657.3000	0.0000
Link35	0.0000	0.0000	4188.3195	0.0000
Link44	4163.0526	4412.6561	58.3333	0.0000
Link52	4669.2476	4782.1429	0.0000	0.0000
Link53	4476.5338	5040.0000	0.0000	0.0000
Link54	1265.9659	1281.9659	16.0000	0.0000
Link55	487.5000	3071.1491	1494.2333	0.0000
Link56	4913.0000	4913.6667	16.0000	0.0000
Link57	0.0000	0.0000	4120.5556	0.0000
Link58	1099.3667	1102.0333	2.6667	0.0000
Link59	1201.7265	1217.4437	5.3333	0.0000
Link60	4856.8000	4857.0000	11.3333	0.0000
Link61	1976.6000	1988.6000	12.0000	0.0000
Link62	2246.3143	2953.2667	18.6667	0.0000
Link63	681.1960	694.4833	6.0000	0.0000
Link65	0.0000	2.0000	2.0000	0.0000
Link66	3379.4000	4956.0000	5.3333	0.0000
Link68	198.7937	684.6100	1728.9333	0.0000
Link69	41.8667	2676.1773	2166.0000	0.0000
Link66.1	3496.5556	4883.3333	0.0000	0.0000
Primary	0.0000	0.0000	742.4048	0.0000
Emergency	3745.3187	3752.6154	476.1111	0.0000
TR1B/C Out	0.0000	2.0000	905.7961	0.0000
TR1D Out	1871.2000	4454.8000	174.0000	0.0000
TR1E Out	0.0000	1310.2000	3607.8333	0.0000
TR1A Out	121.2821	918.2121	1498.2333	0.0000
TR1F Out	96.0000	248.9333	10.0000	0.0000
Weir	0.0000	0.0000	0.0000	0.0000
WQ OUTLET	0.0000	0.0000	516.0655	0.0000
STAGE 1	0.0000	0.0000	162.5397	0.0000
WQV OUTLET	0.1818	5.6364	1729.6250	0.0000
1ST STAGE	0.0000	0.0000	1442.8824	0.0000

===
| Table E14 - Natural Channel Overbank Flow Information |
===

	<---- Maximum Velocity ----->			<------ Maximum Flow ------->			<------ Maximum Area ------>			<--- Max. Storage Volume --->			
Conduit Name	Left Velocity	Center Velocity	Right Velocity	Left Flow	Center Flow	Right Flow	Left Area	Center Area	Right Area	Left Area	Center Area	Right Area	Maximum Flow Depth
BD-L1	0.0000	3.3274	0.0000	0.0000	399.0833	0.0000	0.0000	119.9396	0.0000	0.0000	31664.050	0.0000	4.8440
BD-L2	0.0000	3.3106	0.0000	0.0000	402.3333	0.0000	0.0000	121.5287	0.0000	0.0000	63073.419	0.0000	5.0156
BD-L3	1.1858	3.2998	0.0000	115.1396	287.1868	0.0000							

```
97.1006   87.0307    0.0000 66416.824 59529.005    0.0000    3.4587


           BD-L4    0.0000    3.4652    0.0000    0.0000  402.3252    0.0000
0.0000  116.1059    0.0000    0.0000 41682.006    0.0000    1.9074


           BD-L5    0.0000    3.2453    0.0000    0.0000  402.3222    0.0000
0.0000  123.9718    0.0000    0.0000 85912.470    0.0000    3.0174


           BD-L6    0.7162    3.1299    0.5087   12.2114  434.2181    0.6864
17.0507  138.7323    1.3493 8405.9748 68395.025  665.2171    3.4893


           BD-L7    0.7320    3.9121    0.0000    9.8361  437.2670    0.0000
13.4377  111.7726    0.0000 4998.8409 41579.420    0.0000    2.7726


           BD-L8    0.3463    1.5570    0.3765   13.0560  432.4937    1.3884
37.6997  277.7735    3.6876 26502.881 195274.78 2592.3636    3.6233


           BD-L9    0.4768    1.2880    0.4292  127.4814  308.9175   10.3067
267.3610  239.8355   24.0142 105072.88 94255.357 9437.5645    5.2897


          BD-L10    0.0419    0.7922    0.3011    0.0031  400.0014   46.6468
0.0742  504.9371  154.9072   34.4927 234795.76 72031.861    8.7351



  *==========================================================*
  | Table E14a - Natural Channel Encroachment Information  |
  *==========================================================*

           <------- Existing Conveyance Condition -------> <----- Encroachment
Conveyance Condition -----> <- % Volume --> <-- Encroachment Data -->
  Conduit    Left   Centre   Right   Total   Left    Right   Left   Centre   Right
 Total   Left    Right     Reduction     Depth
    Name     Bank  Channel    Bank         Station Station   Bank  Channel    Bank
       Station Station    Left   Right   Incr.     Method
---------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- ------- -----------------
BD-L1       0.0000  7115.1  0.0000  7115.1  273.15  314.30  0.0000  7115.1  0.0000
7115.1  273.15  314.30  0.0000  0.0000  0.0000 None


BD-L2       0.0000  5702.6  0.0000  5702.6  230.72  290.95  0.0000  5702.6  0.0000
5702.6  230.72  290.95  0.0000  0.0000  0.0000 None


BD-L3       2063.6  5147.0  0.0000  7210.6  146.47  255.35  2063.6  5147.0  0.0000
7210.6  146.47  255.35  0.0000  0.0000  0.0000 None


BD-L4       0.0000  3703.6  0.0000  3703.6  87.114  191.09  0.0000  3703.6  0.0000
3703.6  87.114  191.09  0.0000  0.0000  0.0000 None


BD-L5       0.0000  5684.9  0.0000  5684.9  114.86  178.96  0.0000  5684.9  0.0000
5684.9  114.86  178.96  0.0000  0.0000  0.0000 None
```

```
BD-L6       214.99  7644.6  12.084  7871.6  194.94  283.79  214.99  7644.6  12.084
7871.6  194.94  283.79  0.0000  0.0000  0.0000 None


BD-L7       130.61  5806.3  0.0000  5936.9  253.16  335.64  130.61  5806.3  0.0000
5936.9  253.16  335.64  0.0000  0.0000  0.0000 None


BD-L8       539.63 17875.8  57.384 18472.9  243.08  390.17  539.63 17875.8  57.384
18472.9  243.08  390.17  0.0000  0.0000  0.0000 None


BD-L9       8274.1 20050.1  668.95 28993.2  203.09  390.49  8274.1 20050.1  668.95
28993.2  203.09  390.49  0.0000  0.0000  0.0000 None


BD-L10      0.3445 44373.2  5174.7 49548.2  128.85  291.25  0.3445 44373.2  5174.7
49548.2  128.85  291.25  0.0000  0.0000  0.0000 None



  *===================================*
  | Table E14b - Floodplain Mapping  |
  *===================================*

         Conduit  Upstream Downstream  Channel    Center  <----- Left Offsets
------> <----- Right Offsets  ------> <- Channel Widths->
            Name  WS Elev.  WS Elev.    Length   Station   Natural  Encroach
Bank   Natural  Encroach      Bank     Total Encroach.
 --------------- --------- --------- --------- --------- --------- ---------
--------- --------- --------- --------- --------- ---------
           BD-L1  635.9227  635.1262  264.0000  297.4900   24.3421   24.3421
63.8000   16.8064   16.8064   61.0400   41.1485   41.1485


           BD-L2  635.1263  631.6106  519.0000  256.7900   26.0696   26.0696
36.7900   34.1600   34.1600   73.0300   60.2296   60.2296


           BD-L3  631.6106  627.7626  684.0000  250.7500  104.2836  104.2836
24.9800    4.6023    4.6023    9.2000  108.8859  108.8859


           BD-L4  627.7626  622.9498  359.0000  186.9100   99.7958   99.7958
105.4100    4.1833    4.1833   67.3800  103.9791  103.9791


           BD-L5  622.9498  619.5708  693.0000  169.1300   54.2658   54.2658
69.5300    9.8304    9.8304   12.5600   64.0962   64.0962


           BD-L6  619.5708  616.6785  493.0000  268.3800   73.4375   73.4375
42.9700   15.4129   15.4129   11.4400   88.8503   88.8503


           BD-L7  616.6785  613.4496  372.0000  326.5400   73.3826   73.3826
37.8900    9.1007    9.1007    9.3800   82.4833   82.4833


           BD-L8  613.4496  612.8430  703.0000  370.4100  127.3337  127.3337
```

```
71.6200   19.7567   19.7567   15.2300  147.0904  147.0904


          BD-L9  612.8430  612.7396  393.0000  366.9300  163.8404  163.8404
39.5800   23.5596   23.5596   10.9500  187.4000  187.4000


          BD-L10  612.7396  612.6938  465.0000  202.6200   73.7705   73.7705
73.2500   88.6295   88.6295   24.6500  162.3999  162.3999


 *==========================================================*
 |     Table E15 - SPREADSHEET INFO LIST                    |
 | Conduit Flow and Junction Depth Information for use in   |
 | spreadsheets.  The maximum values in this table are the  |
 | true maximum values because they sample every time step.|
 | The values in the review results may only be the         |
 | maximum of a subset of all the time steps in the run.    |
 | Note: These flows are only the flows in a single barrel.|
 *==========================================================*

       Conduit      Maximum       Total        Maximum       Maximum   ##
Junction     Invert       Maximum
         Name          Flow        Flow       Velocity        Volume   ##
Name      Elevation    Elevation
                      (cfs)      (ft^3)         (ft/s)        (ft^3)   ##
          (ft)         (ft)
 ---------------  ----------  ----------   ----------   ----------   ##
---------------  ---------   ---------
       McCarty 1    -71.6677 -5859714.99       -3.6352     5720.6140   ##
TR1A-1/2   645.9000     648.6559


        TR5 Link    190.2510 4500904.100        7.0711    22581.5371   ##
TR1G-1   637.0000     647.0965


        TR4 Link     27.9058 595283.6347        4.1456     2482.3819   ##
 TR6-1   637.0800     645.2755


           I-65    189.2802 14589564.54        9.7927     6862.3950   ##
   TR7   633.0600     641.1371


          CR 550    219.2378 15591040.25        7.7321     6246.4433   ##
   TR8   631.4400     639.5173


       McCarty 3    190.3489 4500918.873        6.0541     4037.6089   ##
  BD-0   631.1100     635.9227


          Link17     10.1390 279473.3685        3.3587      424.0837   ##
 TR2-1   638.5400     645.3103


           BD-L1    399.0833 24675053.82        3.3254    33081.9299   ##
   TR5   649.0000     653.6583


           BD-L2    402.3333 24840501.01        3.2796    48193.3524   ##
```

```
     TR5A   658.0000     658.4449


             BD-L3    402.3264 24842178.57        2.1778    65968.3144    ##
      TR9   639.1600     641.5480


             BD-L4    402.3252 24842819.22        3.3599    32357.9209    ##
     TR10   640.5000     641.4718


             BD-L5    402.3222 24842356.74        3.2453    86659.4925    ##
McCarty DS   645.6500     651.3836


             BD-L6    447.1159 26596024.42        2.8294    63905.4226    ##
     BD-1   630.0000     635.1263


             BD-L7    447.1032 26597545.46        4.0467    49909.7259    ##
     BD-2   628.0000     631.6106


             BD-L8    446.9382 26604394.00        1.7483   287541.1599    ##
     BD-3   626.0000     627.7626


             BD-L9    446.7055 26602384.61        1.3713   323982.2520    ##
     BD-4   620.0000     622.9498


            BD-L10    446.6514 26620920.82        0.6765   305627.1157    ##
     TR11   616.0000     619.5708


            Link31     10.1982 279441.6684        0.6053     5839.5851    ##
     BD-6   614.0000     616.6785


            Link32     16.9149 339350.5174        9.3138      157.5156    ##
     BD-7   610.0000     613.4496


            Link33     54.3808 1214270.887        5.1621     1506.7537    ##
     BD-8   608.0000     612.8430


            Link34      7.7259 163972.3530        7.1205      124.0030    ##
     BD-9   604.0000     612.7396


            Link35      7.3535 156592.8143        2.8700      231.4560    ##
    BD-10   604.0000     612.6938


            Link44     27.5349 611528.2796        5.1600      643.9676    ##
   Node35   639.9000     641.4240


            Link52     30.6043 671146.0082        5.0476     7820.6048    ##
     TR9A   642.2200     645.1539
```

	Link53	40.3557	2331491.091	3.7450	96102.6393	##
TR10A	636.9400	637.7133				
	Link54	18.9504	422558.3379	3.5653	2461.1949	##
TR9B	641.8400	642.8952				
	Link55	24.5237	646116.6032	3.8843	1111.2030	##
TR1B	648.9000	650.6618				
	Link56	14.6645	326491.1573	2.4576	2093.3847	##
TR1B/C	648.0000	649.7800				
	Link57	8.5185	188815.2087	3.7942	247.1510	##
TR1D-1	644.6000	647.8946				
	Link58	23.4243	514030.6488	2.9214	4945.7681	##
TR1F-2	647.0000	652.4093				
	Link59	59.9360	1367082.264	2.7437	28081.6372	##
TR1E	644.0000	647.5715				
	Link60	41.7147	909949.3463	3.2196	8764.5842	##
TR6-3	648.2700	650.1963				
	Link61	18.7046	396883.1610	3.3966	25017.4483	##
TR6-2	644.4000	646.8155				
	Link62	28.2834	650075.5669	2.0566	48825.6867	##
TR1F-3	657.0000	658.0842				
	Link63	22.7895	508973.1595	2.8038	3334.4453	##
TR1F-1/2	647.9000	652.4782				
	Link65	23.2426	514638.3269	3.0002	992.7206	##
TR1D-2	654.0000	655.0867				
	Link66	43.3001	959840.2319	3.9847	18233.7628	##
TR1D-2/3	648.3000	649.7077				
	Link68	-32.5330	-1246395.42	-4.5936	7395.5430	##
TR1D-3	653.0000	654.0796				
	Link69	56.7914	3190914.403	2.6375	7792.9345	##
TR1A-2	650.9000	653.2431				
	Link66.1	57.6561	3189892.424	4.7041	30929.7020	##
TR1A-1	654.0000	655.6505				

Primary	343.9850	22395344.94	17.5399	4078.0919	##
TR1G-2	653.0000	654.1066			
Emergency	47.7024	1940324.654	9.7641	1288.4103	##
TR1F-1	651.5000	653.1973			
TR1B/C Out	50.2759	1120497.921	4.1783	1229.8448	##
TR1C	656.0000	657.2909			
TR1D Out	108.7273	4931060.139	5.4432	2532.9392	##
TR2-3	660.0000	661.3374			
TR1E Out	124.2808	6026195.162	7.0941	2530.5157	##
TR2-2	643.6400	645.9269			
TR1A Out	98.8881	2275943.539	5.3030	1915.7785	##
Outlet	637.0000	645.9773			
TR1F Out	13.5309	1541676.955	5.7330	1916.1715	##
TR2-2.1	641.0900	645.7641			
Weir	57.7765	3188814.213	5.4348	0.0100	##
TR1F-2.1	646.0000	652.3781			
WQ OUTLET	1.5082	128477.5773	7.7171	205.3996	##
Node71	641.0900	645.4560			
STAGE 1	39.1141	1097504.927	7.8969	5019.4945	##
WQV OUTLET	1.9171	238203.9730	9.7666	205.3395	##
1ST STAGE	58.6644	5185510.998	9.7670	6040.2037	##
TR5 - TR5A	70.7074	1804102.877	0.0000	0.0000	##
STAGE 2	13.9845	297771.0136	0.0000	0.0000	##
2ND STAGE	31.3270	437433.9971	0.0000	0.0000	##
FREE # 1	446.6520	26618308.31	0.0000	0.0000	##

```
*=====================================================*
|     Table E15a - SPREADSHEET REACH LIST              |
| Peak flow and Total Flow listed by Reach or those    |
|      conduits or diversions having the same          |
|      upstream and downstream nodes.                  |
*=====================================================*
```

Upstream Node	Downstream Node	Maximum Flow (cfs)	Total Flow (ft^3)
TR6-1	Outlet	71.6677	5859714.99
McCarty DS	TR8	190.2510	4500904.10
TR9	TR8	27.9058	595283.635
TR6-1	TR7	189.2802	14589564.5
TR7	TR8	219.2378	15591040.2
TR5	McCarty DS	190.3489	4500918.87
Node35	TR8	10.1390	279473.368
BD-0	BD-1	399.0833	24675053.8
BD-1	BD-2	402.3333	24840501.0
BD-2	BD-3	402.3264	24842178.6
BD-3	BD-4	402.3252	24842819.2
BD-4	TR11	402.3222	24842356.7
TR11	BD-6	447.1159	26596024.4

BD-6	BD-7	447.1032	26597545.5
BD-7	BD-8	446.9382	26604394.0
BD-8	BD-9	446.7055	26602384.6
BD-9	BD-10	446.6514	26620920.8
TR10	Node35	10.1982	279441.668
TR10	BD-0	16.9149	339350.517
TR9A	TR8	54.3808	1214270.89
TR10A	BD-1	7.7259	163972.353
TR9B	TR8	7.3535	156592.814
TR1B	TR1B/C	27.5349	611528.280
TR6-3	TR6-2	30.6043	671146.008
TR6-2	TR6-1	40.3557	2331491.09
TR1F-3	TR1F-2	18.9504	422558.338
TR1F-1/2	TR1F-2	24.5237	646116.603
TR1D-2	TR1D-2/3	14.6645	326491.157

TR1D-3	TR1D-2/3	8.5185	188815.209
TR1D-2/3	TR1D-1	23.4243	514030.649
TR1A-2	TR1A-1/2	59.9360	1367082.26
TR1A-1	TR1A-1/2	41.7147	909949.346
TR1G-2	TR1G-1	18.7046	396883.161
TR1F-1	TR1F-1/2	28.2834	650075.567
TR1C	TR1B/C	22.7895	508973.159
TR2-3	TR2-2	23.2426	514638.327
TR2-2	TR2-2.1	43.3001	959840.232
TR2-2.1	TR1G-1	-32.5330	-1246395.4
TR2-1	TR6-1	56.7914	3190914.40
Node71	TR2-1	57.6561	3189892.42
TR8	BD-0	391.6864	24335669.6
TR1B/C	TR1D-1	50.2759	1120497.92
TR1D-1	TR1E	108.7273	4931060.14
TR1E	TR1G-1	124.2808	6026195.16

TR1A-1/2	TR1D-1	98.8881	2275943.54
TR1F-2.1	TR6-2	13.5309	1541676.96
TR2-2.1	Node71	57.7765	3188814.21
TR1F-2	TR1F-2.1	40.6022	1523753.52
TR1G-1	Outlet	71.4235	5861148.97
TR5A	TR5	70.7074	1804102.88

```
##########################################################
# Table E16. New Conduit Information Section             #
#            Conduit Invert (IE) Elevation and Conduit  #
#            Maximum Water Surface (WS) Elevations      #
##########################################################
```

Conduit Name	Upstream Node	Downstream Node	IE Up	IE Dn	WS Up	WS Dn	Conduit Type
McCarty 1	TR6-1	Outlet	637.0800	637.0300	645.2755	645.9773	Circular
TR5 Link	McCarty DS	TR8	645.6500	639.4400	651.3836	643.2047	Circular
TR4 Link	TR9	TR8	639.1600	637.4300	641.5480	639.5173	Circular
I-65	TR6-1	TR7	637.4300	636.8300	645.2755	641.1371	Circular
CR 550	TR7	TR8	633.0600	632.5800	641.1371	639.5173	Circular
McCarty 3	TR5	McCarty DS	649.0000	648.3900	653.6583	651.3836	Rectangle
Link17	Node35	TR8	639.9000	639.4600	641.4240	640.5231	Circular

BD-L1 BD-0 BD-1 631.1100 630.0000 635.9227
635.1262 Natural

BD-L2 BD-1 BD-2 630.0000 628.0000 635.1263
631.6106 Natural

BD-L3 BD-2 BD-3 628.0000 626.0000 631.6106
627.7626 Natural

BD-L4 BD-3 BD-4 626.0000 620.0000 627.7626
622.9498 Natural

BD-L5 BD-4 TR11 620.0000 616.0000 622.9498
619.5708 Natural

BD-L6 TR11 BD-6 616.0000 614.0000 619.5708
616.6785 Natural

BD-L7 BD-6 BD-7 614.0000 610.0000 616.6785
613.4496 Natural

BD-L8 BD-7 BD-8 610.0000 608.0000 613.4496
612.8430 Natural

BD-L9 BD-8 BD-9 608.0000 604.0000 612.8430
612.7396 Natural

BD-L10 BD-9 BD-10 604.0000 604.0000 612.7396
612.6938 Natural

Link31 TR10 Node35 640.5000 639.9000 641.4718
641.4240 Trapezoid

Link32 TR10 BD-0 640.5600 634.7000 641.4718
635.9227 Circular

Link33 TR9A TR8 642.2200 641.1300 645.1539
642.8704 Circular

Link34 TR10A BD-1 636.9400 633.6100 637.7133
635.1263 Circular

Link35 TR9B TR8 641.8400 641.6300 642.8952
642.4162 Circular

Link44 TR1B TR1B/C 648.9000 648.0000 650.6618
649.7800 Circular

Link52	TR6-3	TR6-2	648.2700	644.4000	650.1962	646.8155	Circular
Link53	TR6-2	TR6-1	644.4000	637.2000	646.8155	645.2755	Circular
Link54	TR1F-3	TR1F-2	657.0000	650.0200	658.0842	652.4093	Trapezoid
Link55	TR1F-1/2	TR1F-2	647.9000	647.7000	652.4782	652.4093	Circular
Link56	TR1D-2	TR1D-2/3	654.0000	648.3000	655.0867	649.7077	Trapezoid
Link57	TR1D-3	TR1D-2/3	653.0000	652.8000	654.0796	653.7191	Circular
Link58	TR1D-2/3	TR1D-1	648.3000	645.6000	649.7077	647.8946	Trapezoid
Link59	TR1A-2	TR1A-1/2	650.9000	645.9000	653.2431	648.6559	Trapezoid
Link60	TR1A-1	TR1A-1/2	654.0000	645.9000	655.6505	648.6559	Trapezoid
Link61	TR1G-2	TR1G-1	653.0000	641.6000	654.1066	647.0965	Trapezoid
Link62	TR1F-1	TR1F-1/2	651.5000	647.9000	653.1973	652.4782	Trapezoid
Link63	TR1C	TR1B/C	656.0000	648.0000	657.2909	649.7800	Trapezoid
Link65	TR2-3	TR2-2	660.0000	651.0000	661.3374	652.0145	Trapezoid
Link66	TR2-2	TR2-2.1	643.6400	641.0900	645.9269	645.7641	Circular
Link68	TR2-2.1	TR1G-1	641.5000	641.0000	645.7641	647.0965	Circular
Link69	TR2-1	TR6-1	638.5400	638.4300	645.3103		

```
645.2755 Circular


       Link66.1           Node71            TR2-1  641.0900  638.5400  645.4560
645.3103 Circular


        Primary              TR8             BD-0  631.4400  631.1100  639.5173
635.9227 Circular


      Emergency              TR8             BD-0  634.5900  633.6700  639.5173
635.9339 Circular


     TR1B/C Out           TR1B/C          TR1D-1  648.0000  647.8000  649.7800
648.9695 Rectangle


       TR1D Out           TR1D-1             TR1E  644.6000  644.0000  647.8946
647.5715 Rectangle


       TR1E Out             TR1E          TR1G-1  644.0000  643.0000  647.5715
647.0965 Rectangle


       TR1A Out         TR1A-1/2          TR1D-1  645.9000  645.6000  648.6559
647.8946 Rectangle


       TR1F Out         TR1F-2.1            TR6-2  646.0000  644.4000  652.3781
646.8155 Circular


           Weir          TR2-2.1           Node71  641.0900  641.0900  641.0900
641.0900 Closd Cnd


      WQ OUTLET           TR1F-2         TR1F-2.1  647.0000  646.9900  652.4093
652.3781 Circ Orif


        STAGE 1           TR1F-2         TR1F-2.1  648.0700  648.0600  652.4093
652.3781 Circ Orif


     WQV OUTLET           TR1G-1           Outlet  639.7500  639.7400  647.0965
645.9773 Circ Orif


      1ST STAGE           TR1G-1           Outlet  640.2500  640.2400  647.0965
645.9773 Circ Orif


 *===============================================================================*
 |     Table E18 - Junction Continuity Error.   Division by Volume added 11/96   |
 |                                                                               |
 |   Continuity Error = Net Flow + Beginning Volume - Ending Volume              |
 |                      -------------------------------------------------        |
 |                      Total Flow + (Beginning Volume + Ending Volume)/2        |
 |                                                                               |
```

```
|  Net Flow   = Node Inflow - Node Outflow                                    |
|  Total Flow = absolute (Inflow + Outflow)                                   |
|  Intermediate column is a judgement on the node continuity error.           |
|                                                                             |
|  Excellent  < 1 percent    Great  1 to  2 percent  Good  2 to  5 percent    |
|  Fair  5 to 10  percent    Poor  10 to 25 percent  Bad  25 to 50 percent    |
|  Terrible > 50  percent                                                     |
*=============================================================================*
```

Junction Name	<------Continuity Error -------> Volume	% of Node	% of Inflow	Remaining Volume	Beginning Volume	Net Flow Thru Node	Total Flow Thru Node	Failed to Converge
TR1A-1/2	963.9391	0.0212	0.0036	0.4872	0.0000	964.4263	4552975.149	0
TR1G-1	-7170.8871	-0.0484	0.0267	507361.3733	295042.9120	205147.5742	14421017.91	0
TR6-1	-1045.4172	-0.0036	0.0039	2229.5900	0.0000	1184.1728	29181357.14	0
TR7	398.3930	0.0013	0.0015	439.5397	0.0000	837.9327	31182838.75	0
TR8	-2.5180	0.0000	0.0000	135.7059	0.0000	133.1879	48671845.29	3
BD-0	-399.3305	-0.0008	0.0015	296.8294	0.0000	-102.5011	49350073.93	0
TR2-1	-1290.7862	-0.0202	0.0048	0.0071	41.8176	-1332.5967	6380806.826	0
TR5	64.4530	0.0007	0.0002	4.2212	0.0000	68.6742	9001832.178	0
TR5A	-24.9680	-0.0007	0.0001	8721.6330	0.0000	8696.6650	3616839.487	0
TR9	939.4655	0.0788	0.0035	0.0029	0.0000	939.4684	1191541.107	0
TR10	216.3197	0.0175	0.0008	0.0293	0.0000	216.3491	1237846.632	0
McCarty DS	-91.6950	-0.0010	0.0003	32.5031	0.0000	-59.1919	9001822.973	0

```
             BD-1  -2137.8650     -0.0043      0.0080    509.5296      0.0000
-1628.3354 49679527.18         0


             BD-2  -3066.8303     -0.0062      0.0114    867.5577      0.0000
-2199.2726 49682679.58         0


             BD-3  -2379.1951     -0.0048      0.0089   1020.8997      0.0000
-1358.2955 49684997.80         0


             BD-4  -1509.3797     -0.0030      0.0056   1182.2132      0.0000
-327.1665 49685175.97         0


             TR11  -3465.4496     -0.0065      0.0129   1246.2966      0.0000
-2219.1530 53190160.55         0


             BD-6  -3235.0461     -0.0061      0.0121    836.8669      0.0000
-2398.1792 53193569.88         0


             BD-7  -9111.9529     -0.0171      0.0339   1661.0344      0.0000
-7450.9185 53201939.46         0


             BD-8  -2054.6320     -0.0039      0.0077   2945.9003      0.0000
891.2683 53206778.61         0


             BD-9 -19581.3219     -0.0368      0.0730   2820.9811      0.0000
-16760.3408 53223305.44         0


            BD-10  -1104.9257     -0.0021      0.0041   1174.2465      0.0000
69.3208 53239229.13         0


           Node35    -54.4087     -0.0097      0.0002      0.0282      0.0000
-54.3805 558915.0369         0


             TR9A    -63.2643     -0.0026      0.0002      0.0009      0.0000
-63.2635 2428526.051         0


            TR10A     74.7766      0.0228      0.0003      0.0010      0.0000
74.7776 328025.4318         0


             TR9B    -11.9023     -0.0038      0.0000      0.0005      0.0000
-11.9017 313182.7896         0


             TR1B    -37.2034     -0.0030      0.0001      0.0015      0.0000
-37.2019 1223046.060         0


           TR1B/C    -58.8767     -0.0026      0.0002      0.1011      0.0000
-58.7755 2240999.360         0
```

```
           TR1D-1   -733.0926     -0.0074      0.0027  11858.5331      0.0000
11125.4405 9873355.170         0


           TR1F-2   2123.9807      0.0686      0.0079  30261.0409      0.0000
32385.0217 3079824.612         0


             TR1E    976.2182      0.0081      0.0036   5530.2417      0.0000
6506.4599 12058918.81         0


            TR6-3   -934.1094     -0.0696      0.0035     65.5118      0.0000
-868.5976 1341494.099         0


            TR6-2  -1228.1191     -0.0263      0.0046   1838.7540      0.0000
610.6349 4663636.748         0


           TR1F-3    897.0804      0.1060      0.0033      0.0190      0.0000
897.0994 846042.4372         0


         TR1F-1/2   4033.7182      0.3112      0.0150      0.1334      0.0000
4033.8516 1296192.170         0


           TR1D-2     -7.3688     -0.0011      0.0000      0.0882      0.0000
-7.2806 652987.5660         0


         TR1D-2/3   1218.0278      0.1183      0.0045      0.1176      0.0000
1218.1454 1029337.015         0


           TR1D-3    -18.2187     -0.0048      0.0001      0.0007      0.0000
-18.2179 377626.3300         0


           TR1A-2  -3056.3220     -0.1119      0.0114      0.3779      0.0000
-3055.9441 2731174.372         0


           TR1A-1  -2788.5502     -0.1535      0.0104      0.0934      0.0000
-2788.4567 1817143.683         0


           TR1G-2  -1011.2468     -0.1276      0.0038      0.0878      0.0000
-1011.1591 792786.8769         0


           TR1F-1  -5947.3647     -0.4595      0.0222      0.1346      0.0000
-5947.2301 1294195.080         0


             TR1C    179.1044      0.0176      0.0007      0.0901      0.0000
179.1946 1018145.537         0


            TR2-3   -216.7119     -0.0211      0.0008      0.1219      0.0000
-216.5900 1029075.155         0
```

```
          TR2-2   -872.9031     -0.0455      0.0033    165.6833      0.0000
-707.2198 1919056.779         0


         Outlet    299.5901      0.0026      0.0011    393.4655      0.0000
693.0556 11720863.96        49


        TR2-2.1   4572.8833      0.0716      0.0170    170.7524      0.0000
4743.6356 6382619.723         0


       TR1F-2.1  -1097.8705     -0.0355      0.0041  21552.6606  37831.2413
-17376.4512 3065430.473         0


         Node71   -943.5004     -0.0148      0.0035      0.0058      0.0000
-943.4947 6378706.637         0

 The total continuity error was  -59795.     cubic feet
 The remaining total volume was  6.05325E+05 cubic feet
 Your mean node continuity error was   Excellent
 Your worst node continuity error was  Excellent

   *====================================================*
   |  Table E19 - Junction Inflow & Outflow Listing     |
   |              Units are either ft^3 or m^3          |
   |              depending on the units in your model.|
   *====================================================*

                   Constant       User       Interface       DWF         Inflow
RNF Layer                                Inflow
        Junction     Inflow      Inflow        Inflow       Inlow       through
 Inflow      Outflow    Evaporation     from
          Name    to Node     to Node        to Node      to Node      Outfall
 to Node    from Node    from Node    2D Layer
 ---------------  ----------  -----------  -----------  -----------  -----------
-----------  -----------  -----------  -----------
         TR1G-1      0.0000       0.0000       0.0000       0.0000       0.0000
890042.0175       0.0000       0.0000       0.0000


          TR6-1      0.0000       0.0000       0.0000       0.0000       0.0000
3.2091E+06    -318.5475       0.0000       0.0000


            TR7      0.0000       0.0000       0.0000       0.0000       0.0000
1.0021E+06       0.0000       0.0000       0.0000


            TR8      0.0000       0.0000       0.0000       0.0000       0.0000
1.9983E+06       0.0000       0.0000       0.0000


            TR5      0.0000       0.0000       0.0000       0.0000       0.0000
2.6965E+06       0.0000       0.0000       0.0000


           TR5A      0.0000       0.0000       0.0000       0.0000       0.0000
1.8125E+06       0.0000       0.0000       0.0000
```

```
             TR9      0.0000       0.0000       0.0000       0.0000       0.0000
596133.0296       0.0000       0.0000       0.0000


            TR10      0.0000       0.0000       0.0000       0.0000       0.0000
618992.2543       0.0000       0.0000       0.0000


            TR11      0.0000       0.0000       0.0000       0.0000       0.0000
1.7516E+06       0.0000       0.0000       0.0000


           BD-10      0.0000       0.0000       0.0000       0.0000       0.0000
   0.0000  26.6183E+06       0.0000       0.0000


            TR9A      0.0000       0.0000       0.0000       0.0000       0.0000
1.2141E+06       0.0000       0.0000       0.0000


           TR10A      0.0000       0.0000       0.0000       0.0000       0.0000
164013.6552       0.0000       0.0000       0.0000


            TR9B      0.0000       0.0000       0.0000       0.0000       0.0000
156561.1790       0.0000       0.0000       0.0000


            TR1B      0.0000       0.0000       0.0000       0.0000       0.0000
611369.4515       0.0000       0.0000       0.0000


          TR1D-1      0.0000       0.0000       0.0000       0.0000       0.0000
1.0314E+06       0.0000       0.0000       0.0000


          TR1F-2      0.0000       0.0000       0.0000       0.0000       0.0000
487227.7451       0.0000       0.0000       0.0000


            TR1E      0.0000       0.0000       0.0000       0.0000       0.0000
1.1015E+06       0.0000       0.0000       0.0000


           TR6-3      0.0000       0.0000       0.0000       0.0000       0.0000
670107.0169       0.0000       0.0000       0.0000


           TR6-2      0.0000       0.0000       0.0000       0.0000       0.0000
119285.6634       0.0000       0.0000       0.0000


          TR1F-3      0.0000       0.0000       0.0000       0.0000       0.0000
423388.2346       0.0000       0.0000       0.0000


          TR1D-2      0.0000       0.0000       0.0000       0.0000       0.0000
326418.2579       0.0000       0.0000       0.0000


          TR1D-3      0.0000       0.0000       0.0000       0.0000       0.0000
```

```
188763.7125       0.0000       0.0000       0.0000


          TR1A-2      0.0000       0.0000       0.0000       0.0000       0.0000
1.3638E+06       0.0000       0.0000       0.0000


          TR1A-1      0.0000       0.0000       0.0000       0.0000       0.0000
906874.6273       0.0000       0.0000       0.0000


          TR1G-2      0.0000       0.0000       0.0000       0.0000       0.0000
395787.1066       0.0000       0.0000       0.0000


          TR1F-1      0.0000       0.0000       0.0000       0.0000       0.0000
643997.6890       0.0000       0.0000       0.0000


            TR1C      0.0000       0.0000       0.0000       0.0000       0.0000
509055.4090       0.0000       0.0000       0.0000


           TR2-3      0.0000       0.0000       0.0000       0.0000       0.0000
514276.6728       0.0000       0.0000       0.0000


           TR2-2      0.0000       0.0000       0.0000       0.0000       0.0000
444406.2051       0.0000       0.0000       0.0000


         TR2-2.1      0.0000       0.0000       0.0000       0.0000       0.0000
987266.0424       0.0000       0.0000       0.0000


   *=======================================================*
   | Table E20 - Junction Flooding and Volume Listing.     |
   |             The maximum volume is the total volume    |
   |             in the node including the volume in the   |
   |             flooded storage area. This is the max     |
   |             volume at any time. The volume in the     |
   |             flooded storage area is the total volume|
   |             above the ground elevation, where the     |
   |             flooded pond storage area starts.         |
   | The fourth column is instantaneous, the fifth is the|
   | sum of the flooded volume over the entire simulation|
   | Units are either ft^3 or m^3 depending on the units.|
   *=======================================================*

                                                    Out of               Passed to 2D
cell
                                                 1D-System               OR  Volume
Stored
        Junction    Surcharged   Flooded       (Flooded     Maximum    in allowed
Flood
            Name    Time (min)  Time(min)       Volume)      Volume   Pond of
1D-System
 ---------------    ----------  ---------    ---------   ---------
-----------------
        TR1A-1/2        0.0000     0.0000       0.0000     34.6309
0.0000
```

TR1G-1	661.6000	0.0000	0.0000	4091070.051	0.0000
TR6-1	478.9333	0.0000	0.0000	237044.6464	0.0000
TR7	0.0000	0.0000	0.0000	1328164.924	0.0000
TR8	0.0000	0.0000	0.0000	2969127.902	0.0000
BD-0	0.0000	0.0000	0.0000	60.4766	0.0000
TR2-1	469.6140	0.0000	0.0000	44489.8111	0.0000
TR5	0.0000	0.0000	0.0000	58.5366	0.0000
TR5A	4914.0000	0.0000	0.0000	438991.5514	0.0000
TR9	0.0000	0.0000	0.0000	104.0220	0.0000
TR10	0.0000	0.0000	0.0000	12.2113	0.0000
McCarty DS	0.0000	0.0000	0.0000	72.0480	0.0000
BD-1	0.0000	0.0000	0.0000	64.4165	0.0000
BD-2	0.0000	0.0000	0.0000	45.3708	0.0000
BD-3	0.0000	0.0000	0.0000	22.1487	0.0000
BD-4	0.0000	0.0000	0.0000	37.0675	0.0000
TR11	0.0000	0.0000	0.0000	44.8708	0.0000

BD-6	0.0000	0.0000	0.0000	33.6580	0.0000
BD-7	0.0000	0.0000	0.0000	43.3476	0.0000
BD-8	0.0000	0.0000	0.0000	60.8572	0.0000
BD-9	0.0000	0.0000	0.0000	109.8223	0.0000
BD-10	0.0000	0.0000	0.0000	109.2459	0.0000
Node35	0.0000	0.0000	0.0000	19.1512	0.0000
TR9A	0.0000	0.0000	0.0000	36.8671	0.0000
TR10A	0.0000	0.0000	0.0000	9.7178	0.0000
TR9B	0.0000	0.0000	0.0000	13.2601	0.0000
TR1B	0.0000	0.0000	0.0000	22.1384	0.0000
TR1B/C	0.0000	0.0000	0.0000	22.3677	0.0000
TR1D-1	0.0000	0.0000	0.0000	2146473.064	0.0000
TR1F-2	918.6538	0.0000	0.0000	566244.9245	0.0000
TR1E	435.3500	0.0000	0.0000	880772.7116	0.0000
TR6-3	0.0000	0.0000	0.0000	24.2053	0.0000
TR6-2	0.0000	0.0000	0.0000	30.3528	

0.0000					
	TR1F-3	125.4622	0.0000	0.0000	13.6244
0.0000					
	TR1F-1/2	996.2678	0.0000	0.0000	57.5292
0.0000					
	TR1D-2	142.7619	0.0000	0.0000	13.6555
0.0000					
	TR1D-2/3	0.0000	0.0000	0.0000	17.6894
0.0000					
	TR1D-3	0.0000	0.0000	0.0000	13.5669
0.0000					
	TR1A-2	656.6316	0.0000	0.0000	29.4432
0.0000					
	TR1A-1	576.3778	0.0000	0.0000	20.7404
0.0000					
	TR1G-2	138.1681	0.0000	0.0000	13.9050
0.0000					
	TR1F-1	618.9282	0.0000	0.0000	21.3286
0.0000					
	TR1C	248.4534	0.0000	0.0000	16.2220
0.0000					
	TR2-3	275.2982	0.0000	0.0000	16.8054
0.0000					
	TR2-2	0.0000	0.0000	0.0000	28.7370
0.0000					
	Outlet	1012.6264	0.0000	0.0000	112.8086
0.0000					
	TR2-2.1	0.0000	0.0000	0.0000	58.7342
0.0000					
	TR1F-2.1	2118.5000	0.0000	0.0000	617184.8641
0.0000					

```
         Node71        0.0000     0.0000       0.0000     54.8628
0.0000


 *==================================*
 | Simulation Specific Information  |
 *==================================*
 Number of Input Conduits..........        48 Number of Simulated Conduits......
    56
 Number of Natural Channels........        10 Number of Junctions...............
    49
 Number of Storage Junctions.......        11 Number of Weirs...................
     3
 Number of Orifices................         4 Number of Pumps...................
     0
 Number of Free Outfalls...........         1 Number of Tide Gate Outfalls......
     0


 *=========================================================*
 | Average % Change in Junction or Conduit is defined as:  |
 | Conduit  % Change ==> 100.0 ( Q(n+1) - Q(n) ) / Qfull   |
 | Junction % Change ==> 100.0 ( Y(n+1) - Y(n) ) / Yfull   |
 *=========================================================*

 The Conduit with the largest average change was..BD-L10     with     0.005 percent
 The Junction with the largest average change was.Outlet     with     0.227 percent
 The Conduit with the largest sinuosity was.......McCarty 1  with    42.541


 *===================================================================*
 | Table E21. Continuity balance at the end of the simulation        |
 |            Junction Inflow, Outflow or Street Flooding            |
 | Error = Inflow  + Initial Volume - Outflow - Final   Volume       |
 *===================================================================*

        Inflow          Inflow      Average
        Junction   Volume,ft^3   Inflow, cfs
 ---------------  ------------  -------------
          TR1G-1   890395.2018        2.9444


           TR6-1   3.20967E+06       10.6140


             TR7   1.00223E+06        3.3143


             TR8   1.99861E+06        6.6092


             TR5   2.69681E+06        8.9180


            TR5A   1.81274E+06        5.9945
```

TR9	596257.4722	1.9718
TR10	619054.4461	2.0471
TR11	1.75178E+06	5.7929
TR9A	1.21426E+06	4.0154
TR10A	164053.0788	0.5425
TR9B	156589.9753	0.5178
TR1B	611517.7806	2.0222
TR1D-1	1.03182E+06	3.4121
TR1F-2	487396.1536	1.6118
TR1E	1.10166E+06	3.6431
TR6-3	670348.0908	2.2168
TR6-2	119322.6935	0.3946
TR1F-3	423484.0993	1.4004
TR1D-2	326496.4087	1.0797
TR1D-3	188811.1212	0.6244
TR1A-2	1.36409E+06	4.5109

TR1A-1	907194.3370	3.0000
TR1G-2	395903.7159	1.3092
TR1F-1	644119.5134	2.1300
TR1C	509172.3775	1.6838
TR2-3	514436.8282	1.7012
TR2-2	444578.2202	1.4702
TR2-2.1	987569.8616	3.2658
BD-10	-26.618E+06	-88.0235

Outflow Junction	Outflow Volume,ft^3	Average Outflow, cfs
BD-10	26.61831E+06	88.0235

===

| Initial system volume   =   332915.9710 Cu Ft |

| Total system inflow volume   = 26.834909E+06 Cu Ft |

| Inflow + Initial volume   = 27.167825E+06 Cu Ft |

===

```
| Total system outflow         =  26.618308E+06 Cu Ft |


| Volume left (Final volume)   =    605325.4949 Cu Ft |


| Evaporation                  =         0.0000 Cu Ft |


| Outflow + Final Volume       =  27.223634E+06 Cu Ft |


*=====================================================*



*================================================*
| Total Model Continuity Error                   |
| Error in Continuity, Percent =        -0.2054 |
| Error in Continuity, ft^3    =     -55808.940 |
| + Error means a continuity loss, - a gain     |
*================================================*


###################################################
# Table E22. Numerical Model judgement section    #
###################################################

Overall error was (minimum of Table E18 & E21)             -0.2054 percent



Worst nodal error was in node BD-9             with        -0.0368 percent



Of the total inflow this loss was                           0.0730 percent



Your overall continuity error was                 Excellent



                                                 Good Efficiency
```

```
 Efficiency of the simulation                       3.02



 Most Number of Non Convergences at one Node       49.



 Total Number Non Convergences at all Nodes        52.



 Total Number of Nodes with Non Convergences        2.




 #########################################################
 # Table E23. New Basin Design Information               #
 #           Maximum Hydraulic Grade Line,               #
 #           Out Conduit Sizes and Maximum Flow          #
 #########################################################

 A) Resize d/s Pipes based on given HGL
 B) Resize Basin based on given HGL
 C) Resize d/s Pipes and Basin based on HGL and max discharge
 D) Resize d/s pipes based on given max discharge

    Basin Name    Type    Max.HGL   Conduit         Depth   Width   Barrels
Max.Flow
                            (ft)                     (ft)    (ft)
(ft^3/s)
 -------------- ------  --------- -------------- ------- ------- ---------
---------

 ===> Hydraulic model simulation ended normally.
 ===> XP-SWMM Simulation ended normally.



 ===> Your input file was named  : R:\2012\12-0065\Models\XPSWMM\Upper
```

Berlowitz_Design_100yr 12hr Huff.DAT

===> Your output file was named : R:\2012\12-0065\Models\XPSWMM\Upper
Berlowitz_Design_100yr 12hr Huff.out

```
*===========================================================*
|             SWMM Simulation Date and Time Summary          |
*===========================================================*
| Starting Date... March      24, 2014  Time...    8:21:14:40  |
|   Ending Date... March      24, 2014  Time...    8:21:31:60  |
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*===========================================================*
```

Appendix 2
(Wetland/"Waters" Delineation Report)

BERLOWITZ MASTERPLAN

TIPPECANOE COUNTY
20 N. 3rd Street
Lafayette, IN 47901

PREPARED BY

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PNC Center
115 W. Washington St.
Suite 1368 South Tower
Indianapolis, IN 46204

June 2013

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BERLOWITZ MASTER PLAN PROJECT
TIPPECANOE COUNTY, INDIANA

EXECUTIVE SUMMARY

Christopher B. Burke Engineering, LLC (CBBEL) staff conducted an onsite field investigation of the Berlowitz Masterplan project area, Tippecanoe County, Indiana. Field work was conducted on May 22nd and 23rd, 2013 during which time (9) wetlands and one unnamed tributary were identified and delineated (**Exhibit 6**).

Wetland delineations were conducted using methods identified in the Regional Supplement to the Corps of Engineers Delineation Manual: Midwest Region (Version 2.0) (August 2010), and wetland boundaries were mapped using current aerial photography (c. 2005) and a sub-meter accurate GPS unit.

Table 1 is a summary of the wetland/"waters" sites identified, including acreage and our opinion of state and federal regulatory jurisdiction.

Table 1: Summary of Wetlands in Project Area

Site	Wetland/Stream Type	Acreage/Linear Footage (within project limits)	Jurisdiction
1	Class I Isolated Wetland (Non-Forested)	1.58	State
2	Class I Isolated Wetland (Non-Forested)	0.10	State
3	Class II Isolated Wetland (Forested)	0.10	State
4	Class II Isolated Wetland (Forested)	0.04	State
5	Class II Isolated Wetland (Forested)	0.01	State
6	Class II Isolated Wetland (Forested)	0.10	State
7	Class II Isolated Wetland (Forested)	0.01	State
8	Class I Isolated Wetland (Non-Forested)	0.10	State
9	Class II Isolated Wetland (Forested)	0.85	State
UNT #1 to Elliot Ditch	Intermittent	1,294	State and Federal

1.0 STUDY AREA

On May 22nd and 23rd, 2013 Christopher B. Burke Engineering, LLC (CBBEL) completed a "Waters of the U.S."("Waters")/Wetland delineation of the Berlowitz Masterplan project area in Tippecanoe County, Indiana (**Exhibit 1**). This report was prepared to document our findings and to determine if the on-site "waters"/wetland areas are jurisdictional under Sections 404/401 of the Clean Water Act (CWA) or under current Indiana Regulations. The project site includes primarily farm fields with several scattered residences and is located southeast of downtown Lafayette. Specifically, the project site is located southwest of the intersection of McCarty Lane and Veterans Memorial Parkway, in Section 36, Township 23 North, Range 4 West of the Lafayette East Quadrangle. The property consists of approximately 600 acres of farm field with three (3) small wood lots located in the eastern portion of the site. "Waters"/wetland boundaries were delineated in accordance with the Midwest Region methodology established by the USACE. The wetlands, jurisdictional waters, and data points are shown on **Exhibit 6**, and photos documenting these resources are displayed on **Exhibit 7**. Information collected on site is listed in the attached data forms (**Appendix 2**).

2.0 METHODOLOGY

2.1 WETLAND DETERMINATION METHODOLOGY

Wetland determinations were conducted using the methodology from the *Regional Supplement to the Corps of Engineers Delineation Manual: Midwest Region (Version 2.0),* dated August 2010. The Midwest Regional Supplement identifies the mandatory technical criteria for wetland identification. The three essential characteristics of a wetland are hydrophytic vegetation, hydric soils and wetland hydrology as described below:

Hydrophytic Vegetation: The hydrophytic vegetation criterion is based on a separation of plants into five basic groups:

(1) Obligate wetland plants (OBL) almost always occur (estimated probability >99%) in wetlands under natural conditions;

(2) Facultative wetland plants (FACW) usually occur in wetlands (estimated probability 67-99%), but occasionally are found in non-wetlands;

(3) Facultative plants (FAC) are equally likely to occur in wetlands or nonwetlands (estimated probability 34-66%);

(4) Facultative upland plants (FACU) usually occur in non-wetlands (estimated probability 67-99%), but occasionally are found in wetlands (estimated probability 1-33%); and

(5) Obligate upland plants (UPL) almost always occur (estimated probability >99%) in non-wetlands under natural conditions.

***Indicator 1 - Rapid Test for Hydrophytic Vegetation*:** The rapid test for hydrophytic vegetation is met if all dominant species across all strata are OBL or FACW, or a combination of the two, based on a visual assessment.

Indicator 2 - Dominance Test: If greater than 50% of the plants present are FAC, FACW, or OBL the subject area is considered to be wetland in terms of vegetation, and no further vegetation analysis is required.

Indicator 3 - Prevalence Index: This test is conducted if the plant community fails the Dominance Test, but indicators of hydric soil and wetland hydrology are both present. The Prevalence Index is a weighted-average (based on percent cover) wetland indicator status of all plant species in the sampling plot, where each indicator status category is given a numeric value (OBL=1, FACW=2, FAC=3, FACU=4, and UPL=5). If the Prevalence Index is less than or equal to 3.0, then the hydrophytic vegetation criteria has been met.

Indicator 4 - Morphological Adaptations: This test is conducted if the plant community fails the prevalence test, but indicators of morphological adaptations for life in wetlands, on otherwise upland plant species, are present. If more than 50 percent of FACU species have morphological adaptations for life in wetlands, this species is considered a hydrophyte and is re-assigned an indicator of FAC. The Dominance Test and Prevalence Test should be re-calculated, and the hydrophytic vegetation criteria is satisfied if either test is satisfied.

<u>Hydric Soils:</u> Hydric soils are defined in the Midwest Regional Supplement as "soils that have formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." Field indicators include matrix color, redox depletions and concentrations, sulfate reduction and resultant odor, organic matter accumulation, gleying, and soil texture. Specific types of hydric soils in the Midwest Region include, Histosols, Sandy Soils, Muck or Peat, and Loam or Clay Soils. Within these soil groups, there are many indicators specific to each type of soil.

<u>Wetland Hydrology:</u> The wetland hydrology criterion is often the most difficult to determine. Typically, the presence of water for a week or more during the growing season creates anaerobic conditions. Anaerobic conditions lead to the prevalence of wetland plants and soils. In the Midwest Regional Supplement, hydrology indicators are divided into four groups; Group A. Observation of Surface Water or Saturated Soils, Group B. Evidence of Recent Inundation, Group C. Evidence of Current or Recent Soil Saturation, and Group D. Evidence from Other Site Conditions or Data. Within each group, indicators are divided into two categories, *Primary* and *Secondary*. In the absence of a primary indicator, two or more secondary indicators from any group are required to conclude that wetland hydrology is present. Some indicators of wetland hydrology are surface water, saturation, water marks, sediment deposits, water stained leaves, drainage patterns, sulfide odor, crayfish burrows, stunted or stressed plants, or geomorphic position.

2.2 STREAM METHODOLOGY

The location of potentially jurisdictional channels was determined using the Tippecanoe County Soil Survey, the USGS Quadrangle Map, and aerial photography. An onsite evaluation determined if additional channels, not shown on any existing mapping, were present within the project limits. Potentially jurisdictional small streams were documented, and a discussion can be found in the results section below.

3.0 RESULTS AND DISCUSSION

3.1 IDENTIFIED WETLAND AREAS

Wetland Site 1 (DP 12): Wetland Site 1 (PEM) is broad, low lying, bowl shaped area located in a field bordered by tilled farm fields to the north, east, and south, and a parking lot to the west. This delineated emergent wetland is 1.58 acre in size and is located completely within the project limits. Dominant vegetation includes Eastern cottonwood saplings (*Populus deltoides*, FAC), sandbar willow saplings (*Salix interior*, FACW), and curly dock (*Rumex crispus*, FAC). Hydrology for this wetland includes up to 12-inches of standing water, saturated soils, appropriate geomorphic position, and the FAC-neutral test.

The soil has a matrix color of 10YR 2/1. No redox features were identified. The soil mapped for this area is Milford Silty Clay Loam (Mu) which is a poorly drained hydric soil and the soil identified in the field matches the description of this soil unit.

Wetland Site 1 appears to be isolated in the landscape and not connected by a "significant nexus" to any waterway leading to a navigable waterway. It is also not within a regulatory floodplain or floodway. Therefore, Site 1 does not appear to fall under USACE jurisdiction, but a final Jurisdictional Determination must be made by the USACE. The State of Indiana retains jurisdiction over Isolated Wetlands. This wetland should be considered a Class I Isolated Wetland because of its location, species composition, and lack of significant wildlife or aquatic habitat.

Wetland Site 2 (DP 13): Wetland Site 2 (PEM) is a slight depressional area located just northeast of Wetland Site 1. This delineated emergent wetland is 0.10 acre in size. Dominant vegetation includes Eastern cottonwood saplings (FAC), and Kentucky blue grass (*Poa pratensis*, FAC). Hydrology for this wetland includes surface soil cracks, drainage patterns, geomorphic position, and the FAC-Neutral test.

The soil sampled for this wetland site was identical the soil found at Wetland Site 1. The soil mapped for this area is Drummer Soils (Du) which is a poorly drained hydric soil. The soil identified in the field matches the description of this soil unit.

Wetland Site 2 appears to be isolated in the landscape and not connected by a "significant nexus" to any waterway leading to a navigable waterway. It is also not within a regulatory floodplain or floodway. Therefore, Site 2 does not appear to fall under USACE jurisdiction, but a final Jurisdictional Determination must be made by the USACE. The State of Indiana retains jurisdiction over Isolated Wetlands. This wetland should be considered a Class I Isolated Wetland because of its location, species composition, and lack of significant wildlife or aquatic habitat.

Wetland Site 3 (DP 32): Wetland Site 3 (PFO) is located in an early succesional forested area southwest of the intersection of McCarty Lane and Veteran's Memorial Parkway. The delineated forested wetland is approximately 0.10 acre in size. Dominant vegetation within this wetland consists of black walnut (*Junglans nigra*, FACU), burr oak (*Quercus macrocarpa*, FAC), multiflora rose (*Rosa multiflora*, FACU), great ragweed (*Ambrosia trifida*, FAC), bebb's sedge (*Carex bebbii*, OBL), meadow fescue (*Festuca pratensis*, FACU) giant golden-rod (*Solidago gigantea*, FACW), and eastern poison ivy (*Toxicodendron radicans*, FAC). Hydrology for this wetland includes geomorphic position and the FAC-Neutral test.

The soil sampled at this location has a matrix color of 10YR 4/1 with 10YR 5/7 mottles. The soil mapped for this area was Chalmers Silty Clay Loam (Cm) which is a poorly drained hydric soil and consistent with what was found at this site.

Wetland Site 3 appears to be isolated in the landscape and not connected by a "significant nexus" to any waterway leading to a navigable waterway. It is also not within a regulatory floodplain or floodway. Therefore, Site 3 does not appear to fall under USACE jurisdiction, but a final Jurisdictional Determination must be made by the USACE. The State of Indiana retains jurisdiction over Isolated Wetlands. This wetland should be considered a Class II Isolated Wetland. Although this site has some quality native wetland species, because of its size and location, it will not likely support significant wildlife or aquatic habitat.

Wetland Site 4 (DP 34): Wetland Site 4 (PFO) is located in the same forested area and is northwest of Wetland Site 3. This delineated wetland is 0.04 acre in size. Dominant vegetation at this site includes common hackberry (*Celtis occidentalis*, FAC), great ragweed (FAC), bebb's sedge (OBL), nodding wild-rye (*Elymus canadensis*, FACU), and giant golden-rod (FACW). Hydrology for this wetland includes geomorphic position, and the FAC-Neutral test.

The soil at this site has a matrix color of 10YR 4/1. The soil mapped for this area is Chalmers Silty Clay Loam (Cm) which is consistent with what was found at this site.

Wetland Site 4 appears to be isolated in the landscape and not connected by a "significant nexus" to any waterway leading to a navigable waterway. It is also not within a regulatory floodplain or floodway. Therefore, Site 4 does not appear to fall under USACE jurisdiction, but a final Jurisdictional Determination must be made by the USACE. The State of Indiana retains jurisdiction over Isolated Wetlands. This wetland should be considered a Class II Isolated Wetland. Although this site has some quality native wetland species, because of its size and location, it will not likely support significant wildlife or aquatic habitat.

Wetland Site 5 (DP37): Wetland Site 5 (PFO) is a very small depressional area located northwest of Wetland site 4. The delineated wetland is 0.01 acre in size. The dominant vegetation included at this site consists of common button-bush (*Cephalanthus occidentalis*, OBL), bebb's sedge (OBL), fox sedge (*Carex vulpinoidea*, FACW), spotted joe pye-weed (*Eupatoriadelphus maculatus*, OBL), and clustered black snake-root (*Sanicula gregaria*, FAC). Hydrology for this wetland includes geomorphic position, and the FAC-Neutral test.

The soil identified at this site has a matrix color of 10YR 3/1. The soil mapped for this area is Chalmers Silty Clay Loam (Cm) which is consistent with what was found at this site.

Wetland Site 5 appears to be isolated in the landscape and not connected by a "significant nexus" to any waterway leading to a navigable waterway. It is also not within a regulatory floodplain or floodway. Therefore, Site 5 does not appear to fall under USACE jurisdiction, but a final Jurisdictional Determination must be made by the USACE. The State of Indiana retains jurisdiction over Isolated Wetlands. This wetland should be considered a Class II Isolated Wetland. Although this site has some quality native wetland species, because of its size and location, it will not likely support significant wildlife or aquatic habitat.

Wetland Site 6 (DP 35): Wetland Site 6 (PFO) is another slight depressional area located within the same wood lot as Wetlands 3, 4, and 5. This delineated forested wetland is approximately 0.10 acre in size. Dominant vegetation at this site consists of garlic mustard (*Alliaria petiolata*, FAC), Fox Sedge (FACW), and Virginia water-leaf (*Hydrophyllum virginianum*, FAC). Hydrology for this wetland includes geomorphic position, and the FAC-Neutral test.

The soil identified at Wetland Site 6 has a matrix color of 10YR 4/1. The soil mapped for this area is Chalmers Silty Clay Loam (Cm) which is consistent with what was found at this site.

Wetland Site 6 appears to be isolated in the landscape and not connected by a "significant nexus" to any waterway leading to a navigable waterway. It is also not within a regulatory floodplain or floodway. Therefore, Site 6 does not appear to fall under USACE jurisdiction, but a final Jurisdictional Determination must be made by the USACE. The State of Indiana retains jurisdiction over Isolated Wetlands. This wetland should be considered a Class II Isolated Wetland. Although this site has some quality native wetland species, because of its size and location, it will not likely support significant wildlife or aquatic habitat.

Wetland Site 7 (DP 39): Wetland Site 7 (PFO) is a low-lying forested wetland located along the western boundary of the subject wood lot. This delineated forested wetland is approximately 0.01 acre in size. Dominant vegetation at this site consists of shellbark hickory (Carya laciniosa, FACW), multiflora rose (FACU), bebb's sedge (OBL), spotted joe pye-weed (OBL), and creeping Jenny (*Lysimachia nummularia*, FACW. Hydrology for this wetland includes geomorphic position, and the FAC-Neutral test.

The soil identified within Wetland Site 7 has a matrix color of 10YR 4/1. The soil mapped for this area is Chalmers Silty Clay Loam (Cm) which is consistent with what was found at this site.

Wetland Site 7 appears to be isolated in the landscape and not connected by a "significant nexus" to any waterway leading to a navigable waterway. It is also not within a regulatory floodplain or floodway. Therefore, Site 7 does not appear to fall under USACE jurisdiction, but a final Jurisdictional Determination must be made by the USACE. The State of Indiana retains jurisdiction over Isolated Wetlands. This wetland should be considered a Class II Isolated Wetland. Although this site has some quality native wetland species, because of its size and location, it will not likely support significant wildlife or aquatic habitat.

Wetland Site 8 (DP 40): Wetland Site 8 (PUB) is an open water pond surrounded by a narrow wetland fringe, located in the backyard of a private residence within the project limits. This delineated wetland is approximately 0.10 acre in size. Dominant vegetation at this site consists of green ash (*Fraxinus pennsylvanica*, FACW), Eastern Cottonwood (FAC), sandbar willow (FACW), and creeping Jenny (FACW). Hydrology for this wetland includes approximately 16 inches of standing water, soil saturation, appropriate geomorphic position, and the FAC-Neutral test.

The soil identified at this site has a matrix color of 10YR 3/1. No redox features were identified. The soil mapped for this area is Chalmers Silty Clay Loam (Cm) which is a poorly drained hydric soil and matches the description of this soil unit.

Wetland Site 8 appears to be isolated in the landscape and not connected by a "significant nexus" to any waterway leading to a navigable waterway. It is also not within a regulatory floodplain or floodway. Therefore, Site 8 does not appear to fall under USACE jurisdiction, but a final Jurisdictional Determination must be made by the USACE. The State of Indiana retains jurisdiction over Isolated Wetlands. This wetland should be considered a Class I Isolated Wetland because of its location, species composition, and lack of significant wildlife or aquatic habitat.

Wetland Site 9 (DP 41 and 42): Wetland Site 9 (PFO) is a forested wetland of approximately 0.85 acre in size and is located at the terminus of a grassed swale, on the southwest corner of the subject wood lot. Dominant vegetation at this site consists of eastern cottonwood (FAC), pin oak (*Quercus palustris*, FACW), sandbar willow (FACW), blunt broom sedge (*Carex tribuloides*, OBL) and Kentucky bluegrass (FAC). Hydrology for this wetland includes geomorphic position and the FAC-Neutral test.

The soil sampled within Wetland Site 9 has a matrix color of 10YR 2/1 with no mottles present. The soil mapped for this area is Milford Silty Clay Loam (Mu) which is a poorly drained hydric soil. The soil identified in the field matches the description of this soil unit.

Wetland Site 9 appears to be isolated in the landscape and not connected by a “significant nexus” to any waterway leading to a navigable waterway. It is also not within a regulatory floodplain or floodway. Therefore, Site 9 does not appear to fall under USACE jurisdiction, but a final Jurisdictional Determination must be made by the USACE. The State of Indiana retains jurisdiction over Isolated Wetlands. This wetland should be considered a Class II Isolated Wetland. Although this site has some quality native wetland species, because of its size and location, it will not likely support significant wildlife or aquatic habitat.

3.2 NON WETLAND DATA POINTS

Data Points 1-7: These data points are located in open tilled farm fields. No vegetation is present at any of these sampling locations. The soils at these sites have matrices with colors of 10YR 2/1, 10YR 3/1, and 10YR 4/1. These areas did not exhibit any indicators of wetland hydrology; therefore, since all three criteria were not met, the areas represented by these data points do not qualify as wetland.

Data Points 8-10: These data points were taken in a farm field that had not yet been tilled at the time of the site visit. The dominant vegetation located at these sites consists of Timothy grass (*Phleum pretense*, FACU) and common sowthistle (*Sonochus oleraceus*, FACU). The soil sampled at each of these three data points has a matrix color of 10YR 4/1. The areas did not exhibit any indicators of wetland hydrology; therefore, since all three criteria were not met, the areas represented by these data points do not qualify as wetland.

Data Point 11: Data point 11 is located in an open field directly west of Wetland Site 1. Dominant vegetation existing at this point includes Kentucky bluegrass

(FAC), and hairy aster (Symphyotrichum pilosum, FACU). The soil has a matrix color of 10YR 3/3 and there are no indicators of wetland hydrology, therefore this data point does not qualify as a wetland.

Data Points 14-20: Data points 14-20 are located within open tilled farm fields. No vegetation exists at any of these data points. The soil color at each of these data points was 10YR 2/1. These areas did not exhibit any indicators of wetland hydrology; therefore, since all three criteria were not met, the areas represented by these data points do not qualify as wetland.

Data Points 21-23: Data points 21-23 are located in an approximately 2 acre forested section close to the center of the project limits. Dominant vegetation taken at these data points consists of, shagbark hickory (*Carya ovata*, FACU), common hackberry (FAC), green ash (FACW), red oak (*Quercus rubra*, FACU), Virgina creeper (*Parthenocissus quinquefolia*, FACU), May-apple (*Podophyllum peltatum*, FACU), black clustered snake-root (FAC), and Solomon's seal (*Polygonatum biflorum*, FACU). The soil at each of these data points has a matrix color of 10YR 2/1. These areas did not exhibit any indicators of wetland hydrology; therefore, since all three criteria were not met, the areas represented by these data points do not qualify as wetland.

Data Point 24: Data point 24 is located in a tilled farm field and therefore no vegetation was present. The soil at this data point has a matrix color of 10YR 2/1; however there were no indicators of wetland hydrology. Since all 3 criteria were not met, the area represented by this data point does not qualify as a wetland.

Data Points 25-27: These data points are located in a wooded upland area northwest of the intersection of Veteran's Memorial Parkway and Haggerty Lane. Dominant vegetation at these points consists of, sugar maple (*Acer saccharinum*, FACW), quaking aspen (*Populous tremuloides*, FAC), tartarian honeysuckle (*Lonicera tatarica*, FACU) red mulberry (Morus rubra, FACU), meadow fescue (FACU), eastern poison ivy (FAC), and red clover (*Trifolium pratense*, FACU). The soil at data point 25 has a matrix color of 10YR 3/3 and at data points 26 and 27 the matrix color was 10 YR 4/3. There are no indicators of wetland hydrology so; therefore, the areas represented by these data points do not qualify as wetland.

Data Points 28-30: Data points 28-30 are located in an open, tilled farm field. There was no vegetation was present. Soils sampled at each of these data points have matrices of 10YR 2/1. These areas did not exhibit any indicators of wetland hydrology; therefore, since all three criteria were not met, the areas represented by these data points do not qualify as wetland.

Data Point 31, 33, 36 and 38: These data points are located in a forested area west of Veteran's Memorial Parkway and adjacent to several residences located within the project limits. Dominant vegetation located at these data points includes shagbark hickory (FACU), black walnut (FACU), red oak (FACU), tartarian honeysuckle (FACU), multiflora rose (FACU), garlic mustard (FAC), great ragweed (FAC), spotted joe pye-weed (OBL), Fragrant Bedstraw (*Galium triflorum*, FACU), and black clustered snake-root (FAC). The soil matrix color at data points 31, 33, and 38 was 10YR 4/2 and at data point 36 was 10YR 3/2. There were no indicators of wetland hydrology; therefore the areas represented by these data points do not qualify as wetland.

Data Points 43-46: Data points 43-46 are located in an open tilled farm field. There was no vegetation present at the time of the site visit. Soil matrix color was 10YR 2/1 at each of the points sampled. This area did not exhibit any indicators of wetland hydrology; therefore, since all three criteria were not met, the areas represented by these data points do not qualify as wetland.

3.3 OTHER JURISDICTIONAL WATERS

One unnamed tributary that drains to Elliot Ditch was identified within the project limits. This channel is located along Veterans Memorial Parkway and flow south for approximately 1,294 feet within the project limits before crossing Haggerty Lane. This tributary exhibited a defined bed and bank and an Ordinary High Water Mark (OHWM) which was documented at approximately 6 inches above the channel bed. Dominant substrates included gravel, sand, and silt.

This stream should be considered a "Waters of the U.S." and, therefore, under federal jurisdiction. Any work within the channel will require Clean Water Act approval from the USACE and the IDEM. This stream does not drain an area of more than one square mile (640 acres); therefore Construction in the Floodway approval from the Indiana Department of Natural Resources (IDNR) will not be required for work within this stream.

4.0 REFERENCE MATERIALS

4.1 EXHIBIT REFERENCES

The following reference materials were reviewed and used to assist in the "Waters"/Wetland field reconnaissance. They are included as Exhibits 1-6.

EXHIBIT 1 –Site Location Map

The project site includes farm fields with several private residences located southeast of the City of Lafayette. Specifically the project site is located southwest of the intersection of McCarty Lane and Veterans Memorial Parkway in Section 36, Township 23 North, Range 4 West on the Lafayette East Quadrangle.

EXHIBIT 2- National Wetlands Inventory Map

The National Wetland Inventory (NWI) indicates several small wetland areas located within the project limits. The NWI serves only as a large-scale guide; actual wetland locations and types often vary from that mapped.

EXHIBIT 3 – Soils Map

The Soil Survey of Tippecanoe County, Indiana (1998) was reviewed to determine the location of hydric soils on site. Mapped hydric soil can be indicative of wetland conditions. According to the soil survey the site consists of approximately 50% hydric soils. Hydric soil types are listed in the table below.

Soil	Full Name	Description
Mu	Milford Silty Clay Loam	Very Poorly Drained Hydric Soil
Du	Drummer Soils	Poorly Drained Hydric Soil
Cm	Chalmers Silty Clay Loam	Poorly Drained Hydric Soil
Md	Mahalasville- Treaty Complex	Poorly Drained Hydric Soil

EXHIBIT 4 –USGS Topographic Map

The United States Geological Services (USGS) Topographic map was reviewed to determine the local drainage pattern. The map indicates sloping terrain surrounding the project site.

EXHIBIT 5 – Flood Insurance Rate Map

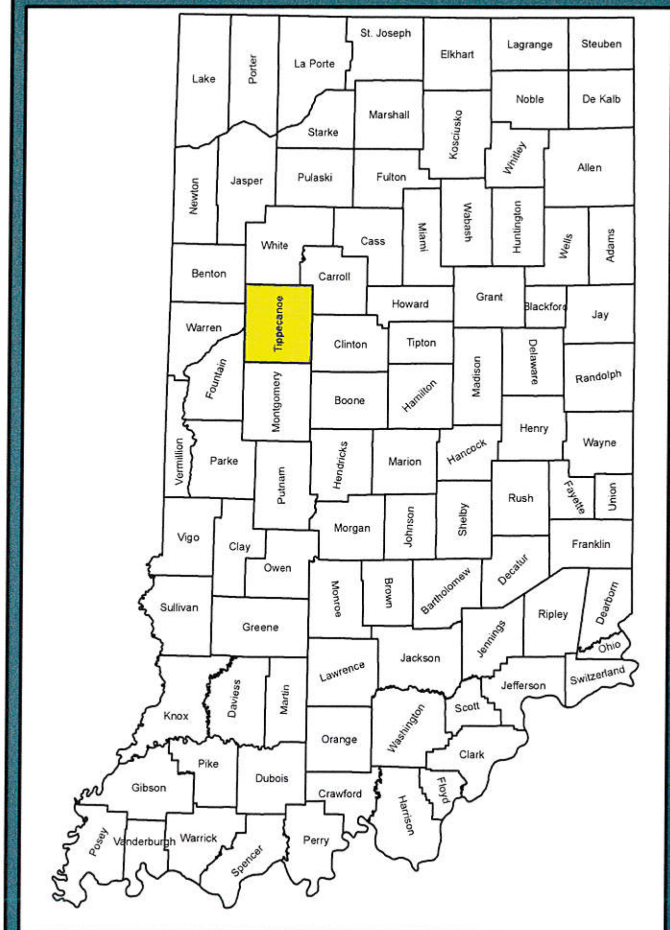
The Preliminary Digital Flood Insurance Rate Map was reviewed to determine the location of floodplain or floodway within the study area. Mapped floodplains can be indicative of wetland hydrology. The FIRM does not indicate floodway or floodplain within the project limits.

EXHIBIT 6 –Wetlands, Jurisdictional Waters, and Data Points

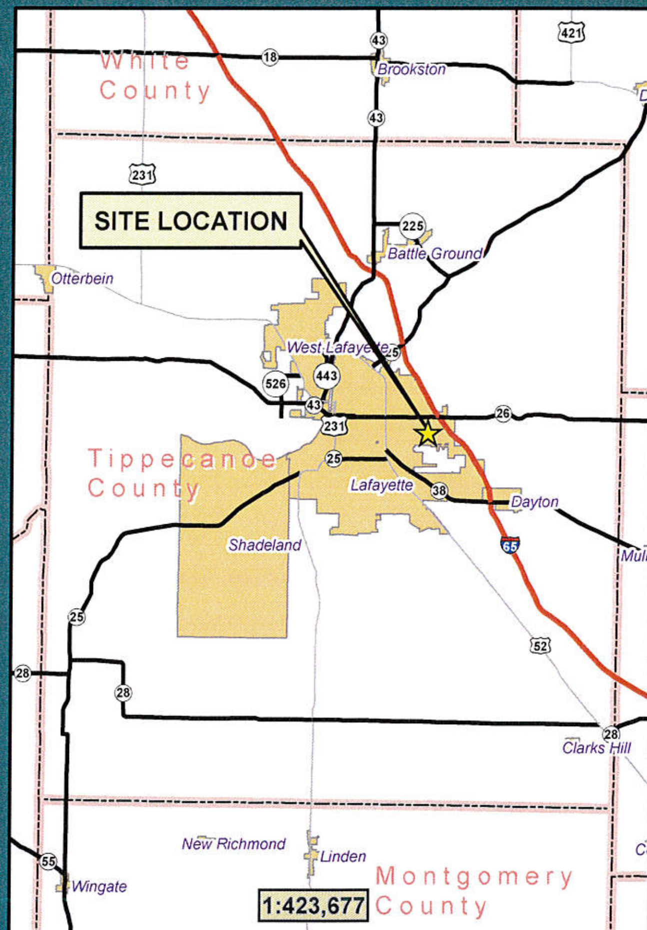
The aerial photograph of the site was reviewed to determine drainage patterns and identify poorly drained areas, or note changes in vegetation. Forested areas and potential small streams in particular were noted and closely investigated in the field. The wetlands, jurisdictional waters, and data points are overlaid on the aerial photograph.

EXHIBIT 7- Photo Stations

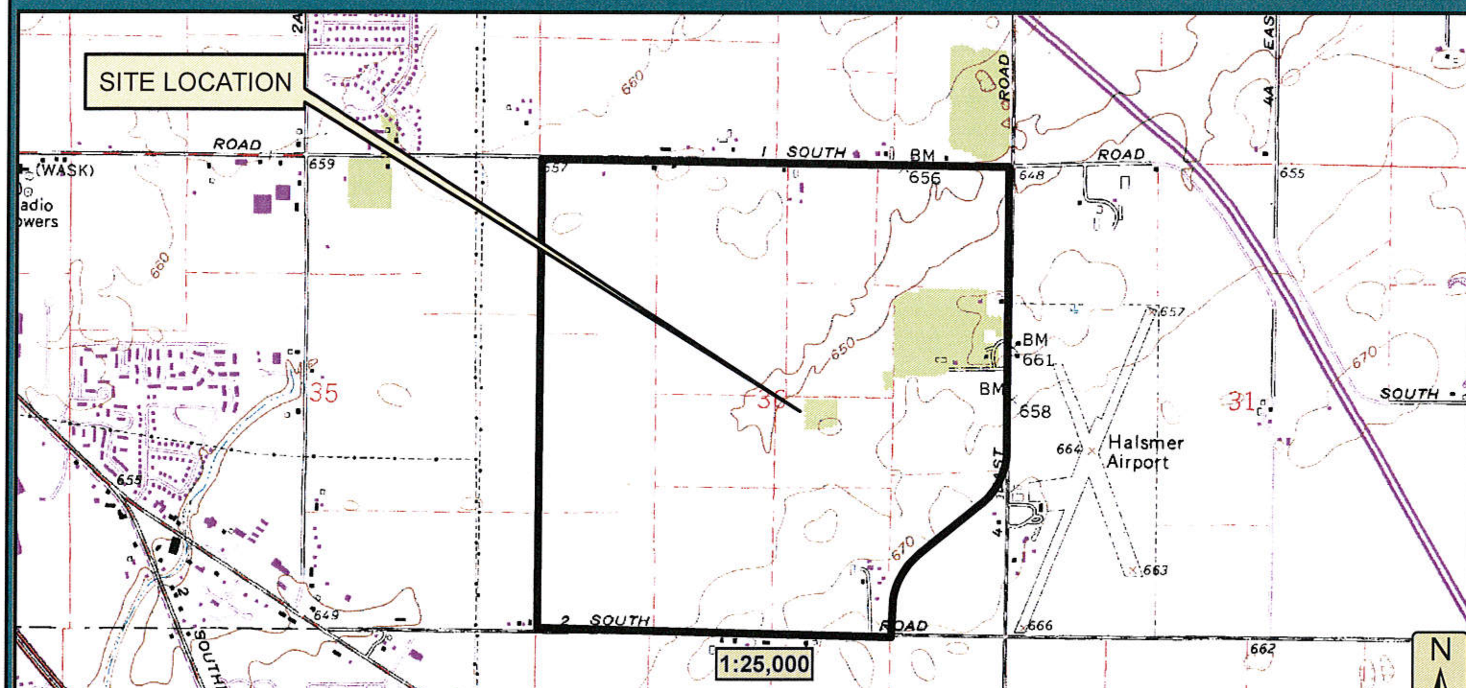
Photographs were taken throughout the project area and used as additional information to support the findings during the field reconnaissance.



STATE MAP

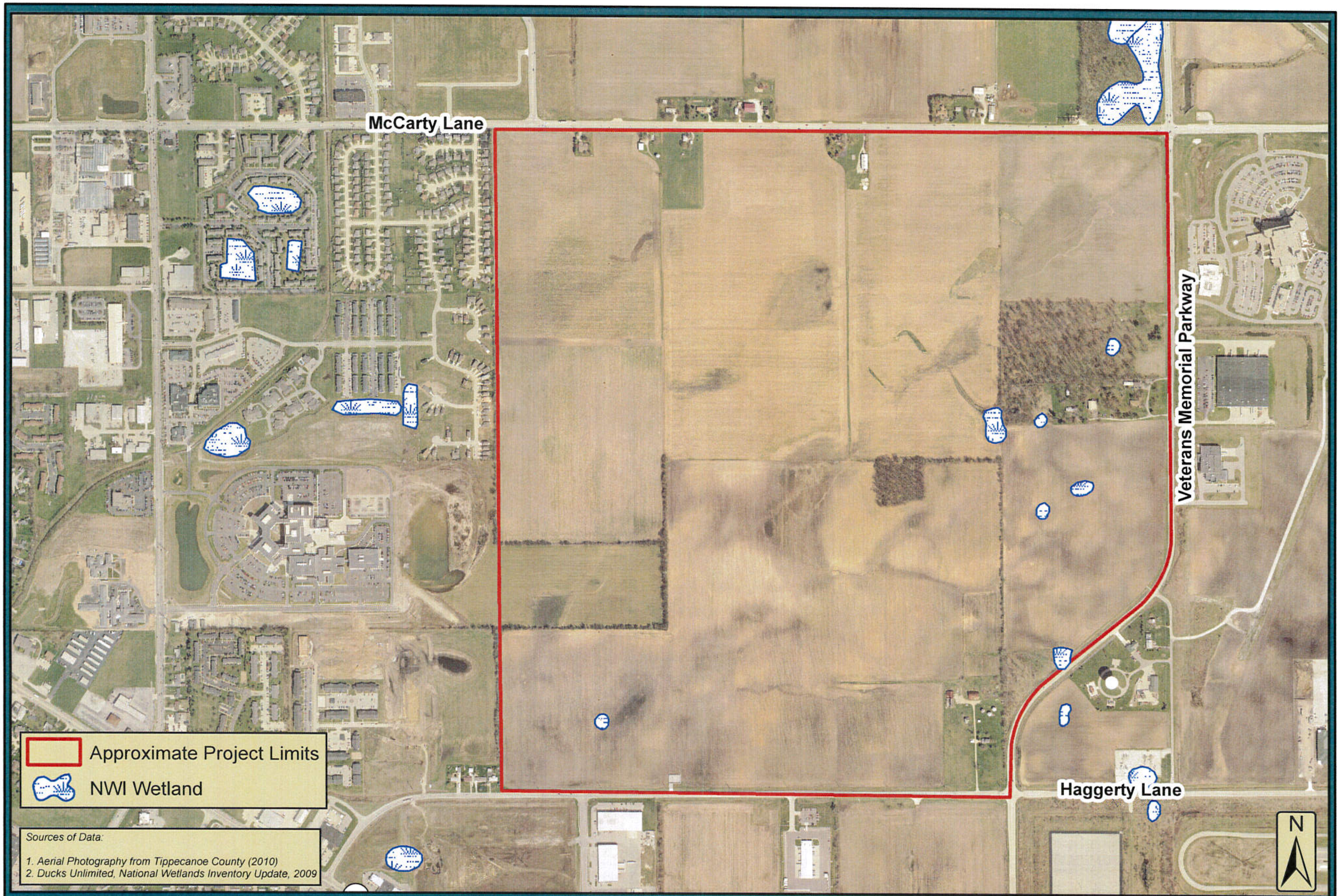


VICINITY MAP



AREA MAP

Christopher B. Burke Engineering, LLC PNC Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 (t) 317.266.8000 (f) 317.632.3306	PROJECT: **Tippecanoe County Berlowtiz Masterplan**	PROJECT NO. **12-0065**	APPROX. SCALE **as shown**
	TITLE: **SITE LOCATION**		DATE: **06/2013**
			EXHIBIT **1**



CBB **Christopher B. Burke Engineering, LLC** PNC Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 (t) 317.266.8000 (f) 317.632.3306	PROJECT: Tippecanoe County Berlowitz Masterplan	PROJECT NO. 12-0065	APPROX. SCALE 1 " = 1,000 '
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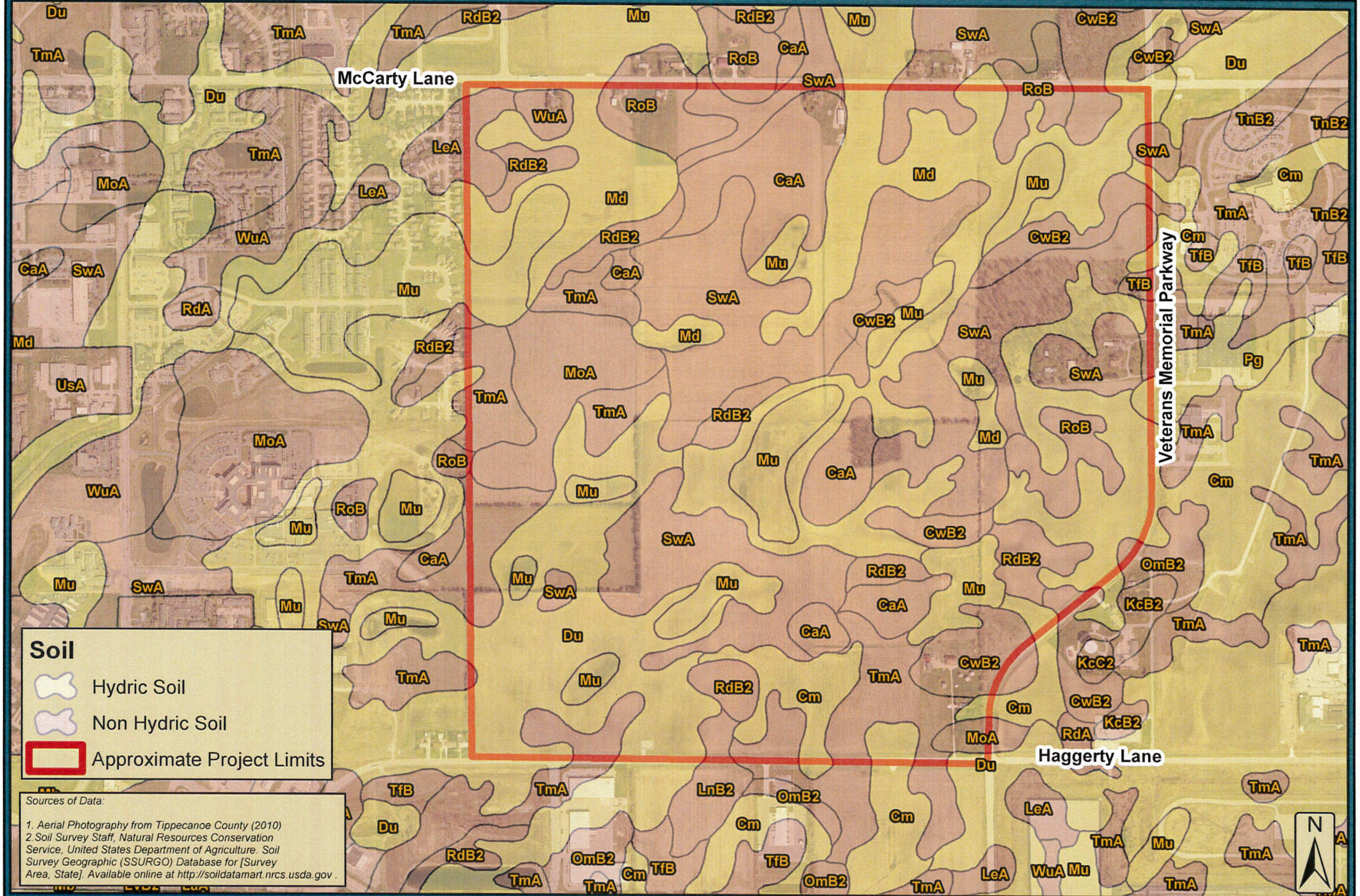
			EXHIBIT 2



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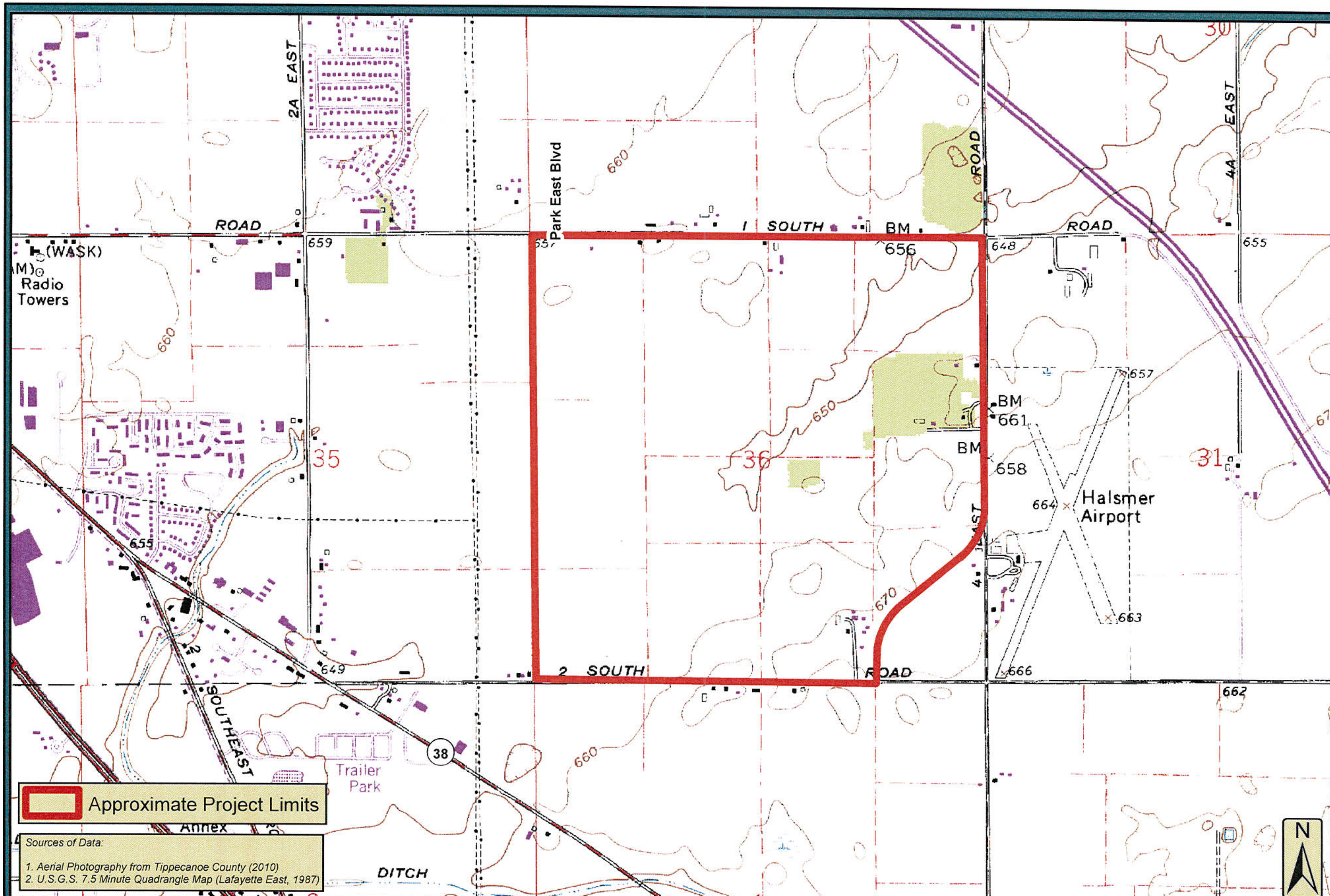
PROJECT:	PROJECT NO.	APPROX. SCALE
Tippecanoe County Berlowtiz Masterplan	12-0065	1 " = 1,000 '
TITLE: SOILS		DATE: 06/2013
		EXHIBIT 3



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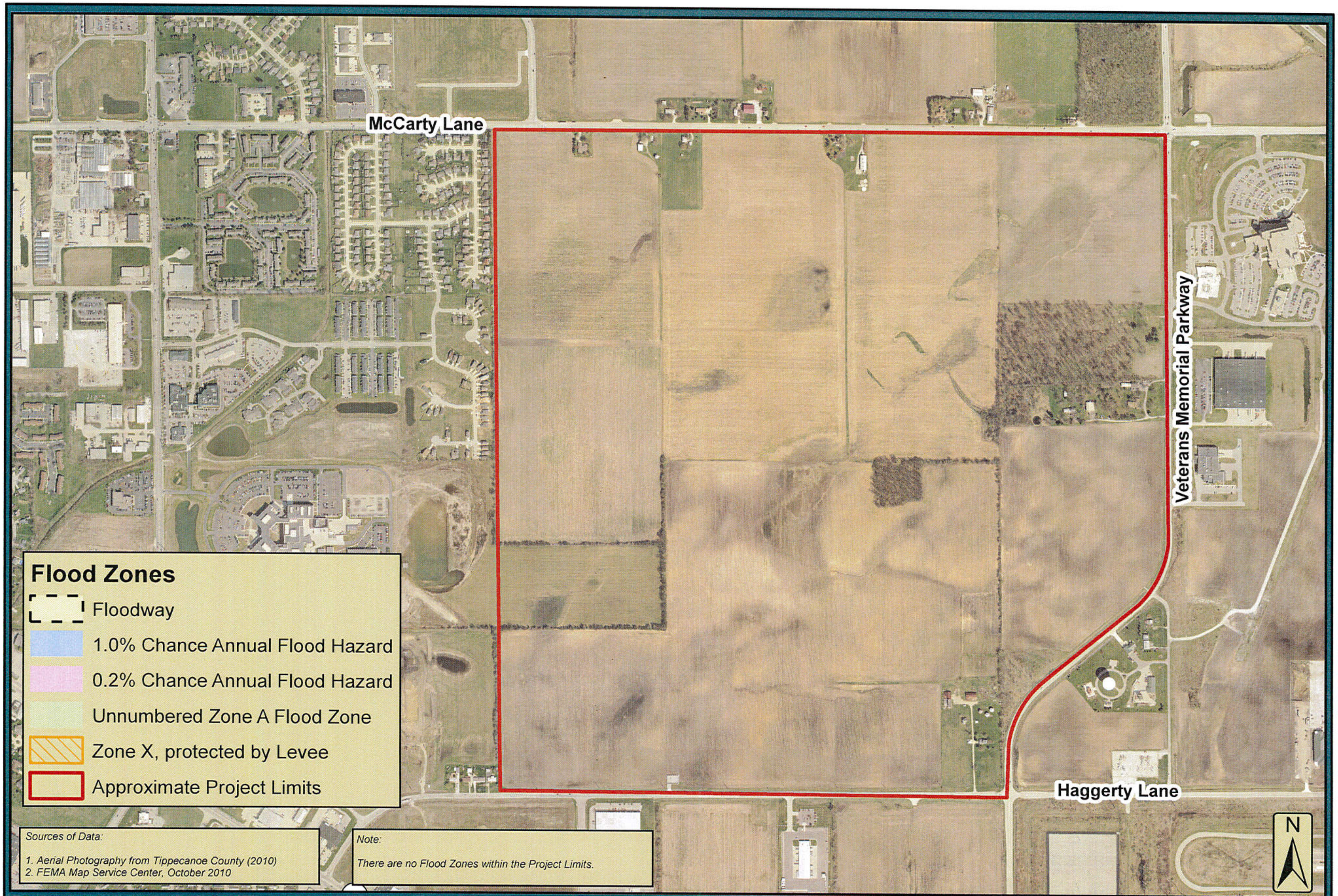
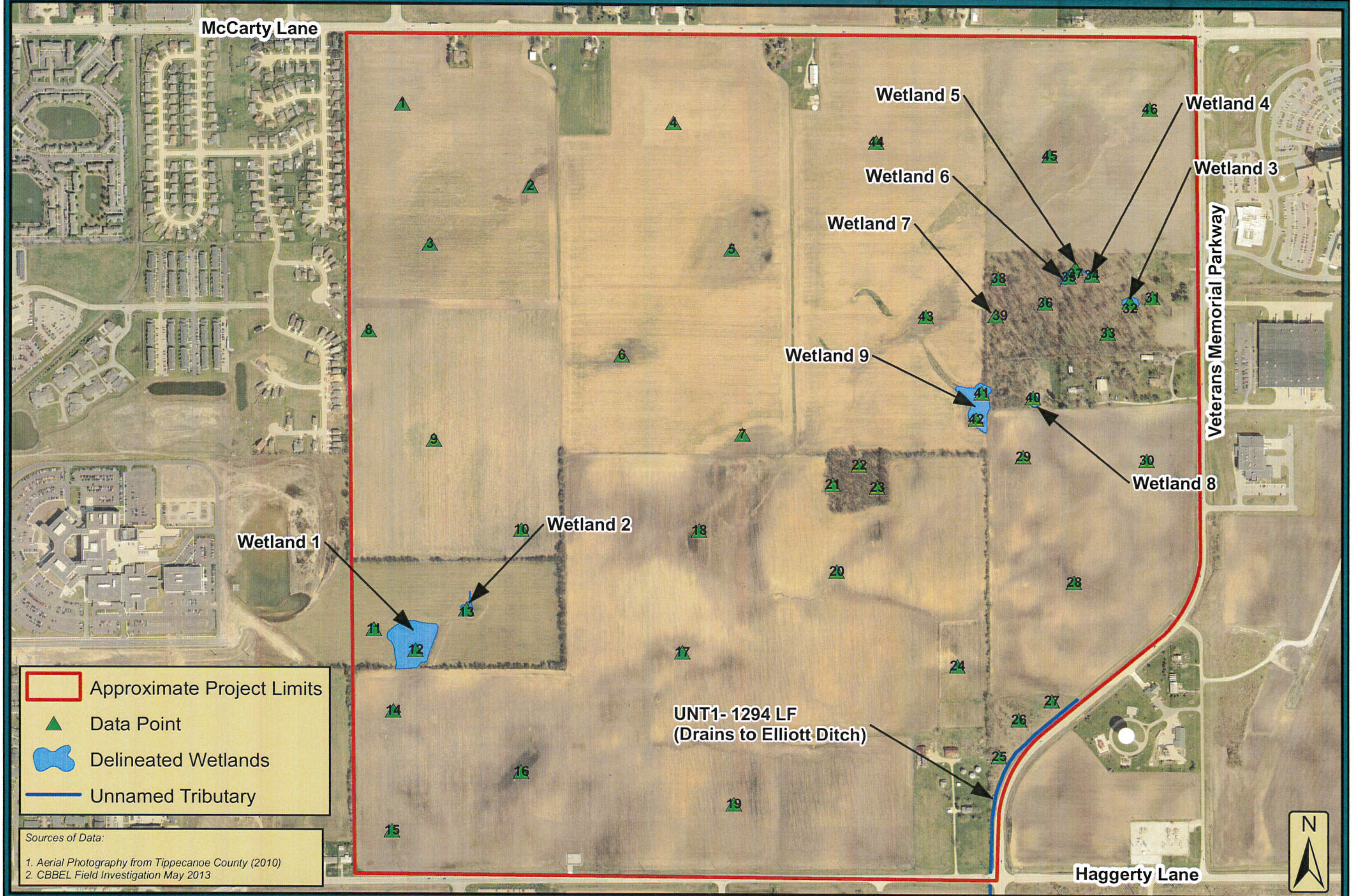
PROJECT:	Tippecanoe County Berlowtiz Masterplan	PROJECT NO. 12-0065	APPROX. SCALE 1 " = 1,500 '
			DATE: 06/2013
TITLE:	TOPOGRAPHY		EXHIBIT 4

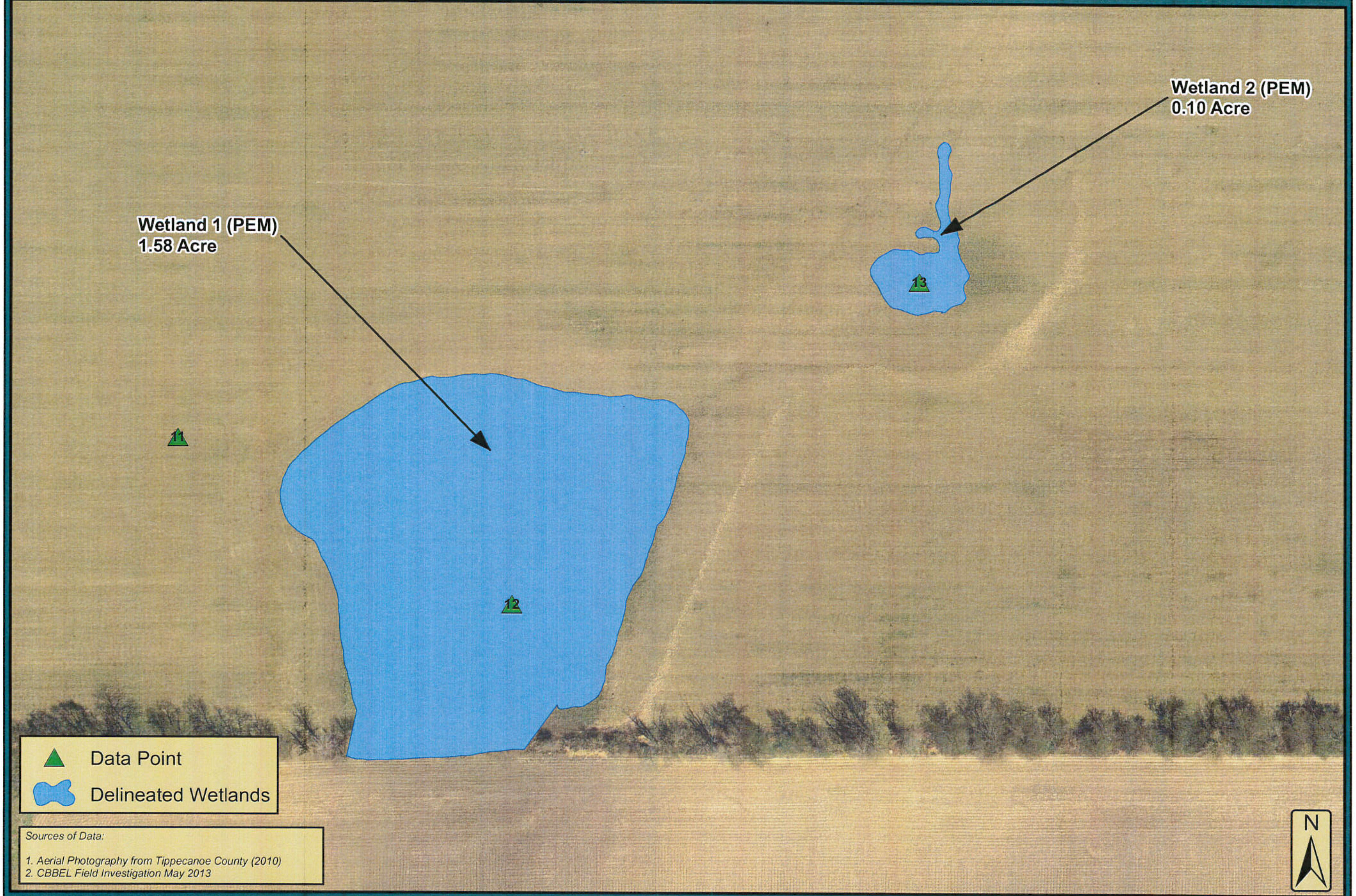


Christopher B. Burke Engineering, LLC
PNC Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
(t) 317.266.8000 (f) 317.632.3306

PROJECT:	Tippecanoe County Berlowitz Masterplan	PROJECT NO. 12-0065	APPROX. SCALE 1 " = 1,000 '
TITLE:	DFIRM		DATE: 06/2013
			EXHIBIT 5



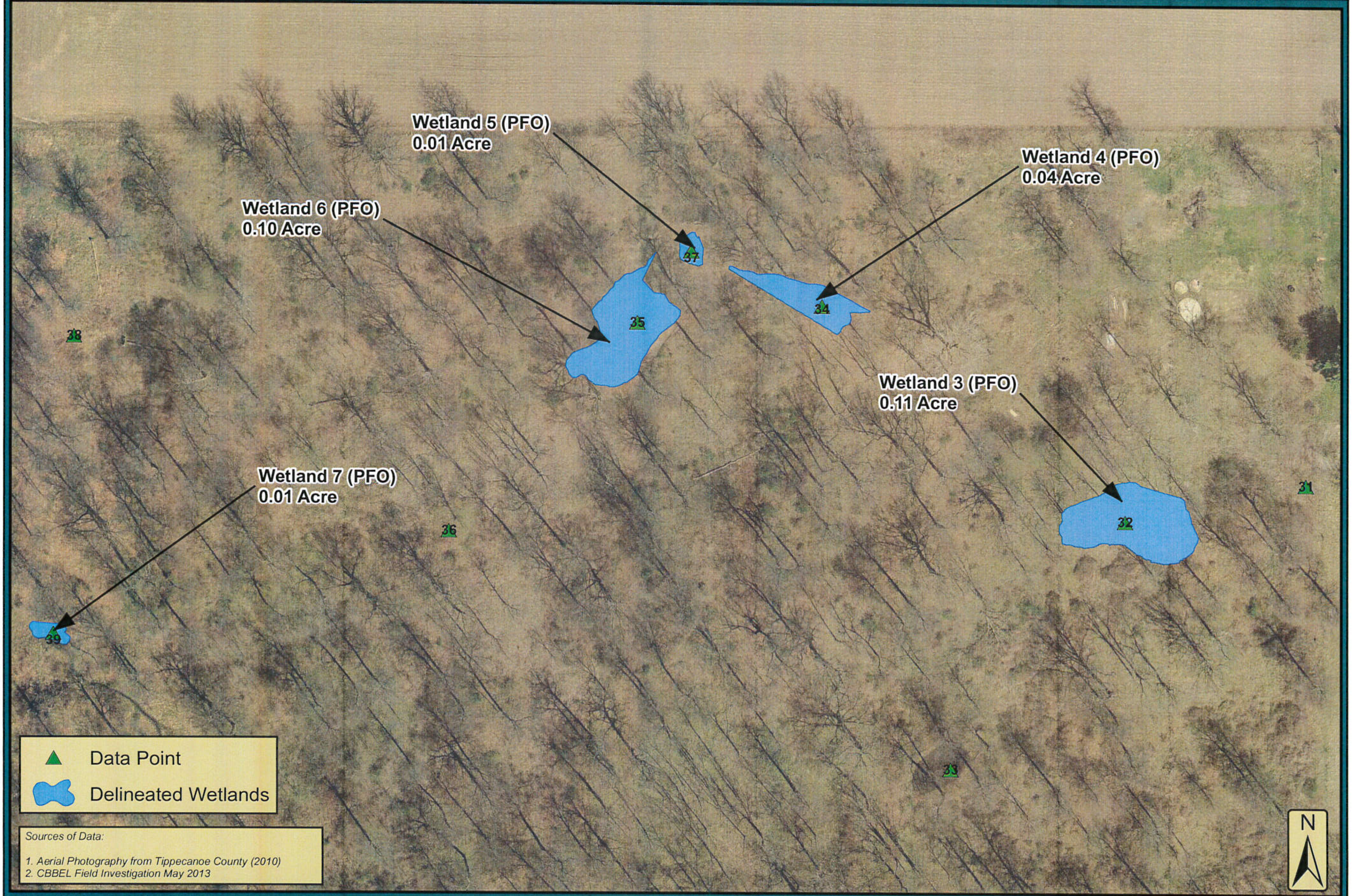
CBB **Christopher B. Burke Engineering, LLC** PNC Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 (t) 317.266.8000 (f) 317.632.3306	PROJECT: **Tippecanoe County Berlowitz Masterplan**	PROJECT NO. **12-0065**	APPROX. SCALE 1 " = 800 '
	TITLE: **Data Points & Delineated Wetlands Overview**		DATE: 07/2013
			EXHIBIT 6



Sources of Data:

1. Aerial Photography from Tippecanoe County (2010)
2. CBBEL Field Investigation May 2013

Christopher B. Burke Engineering, LLC PNC Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 (t) 317.266.8000 (f) 317.632.3306	PROJECT: **Tippecanoe County Berlowitz Masterplan**	PROJECT NO. **12-0065**	APPROX. SCALE 1 " = 100 '
	TITLE: **Wetland 1 & 2**		DATE: 07/2013
			EXHIBIT 6A



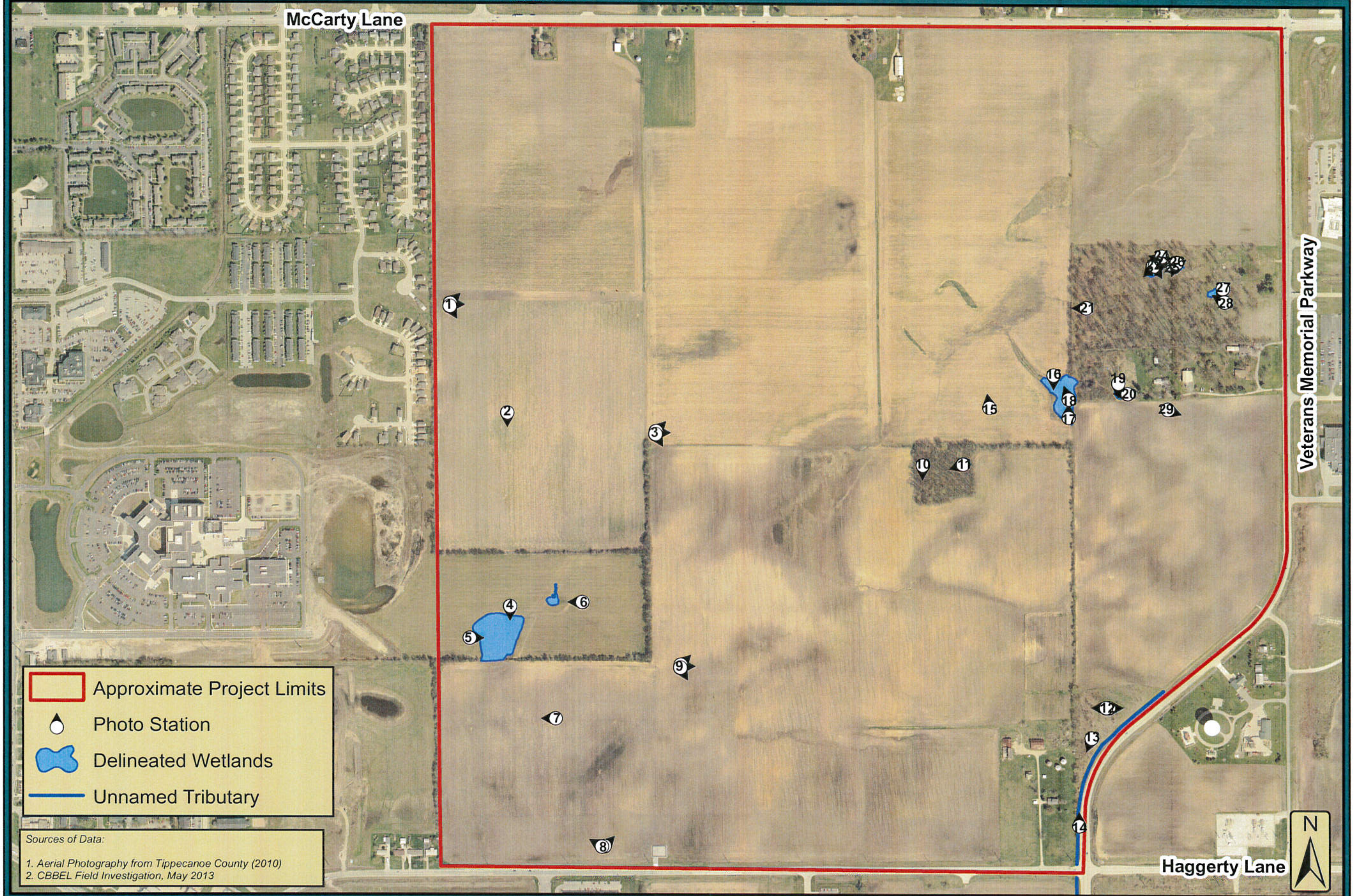
Sources of Data:

1. Aerial Photography from Tippecanoe County (2010)
2. CBBEL Field Investigation May 2013

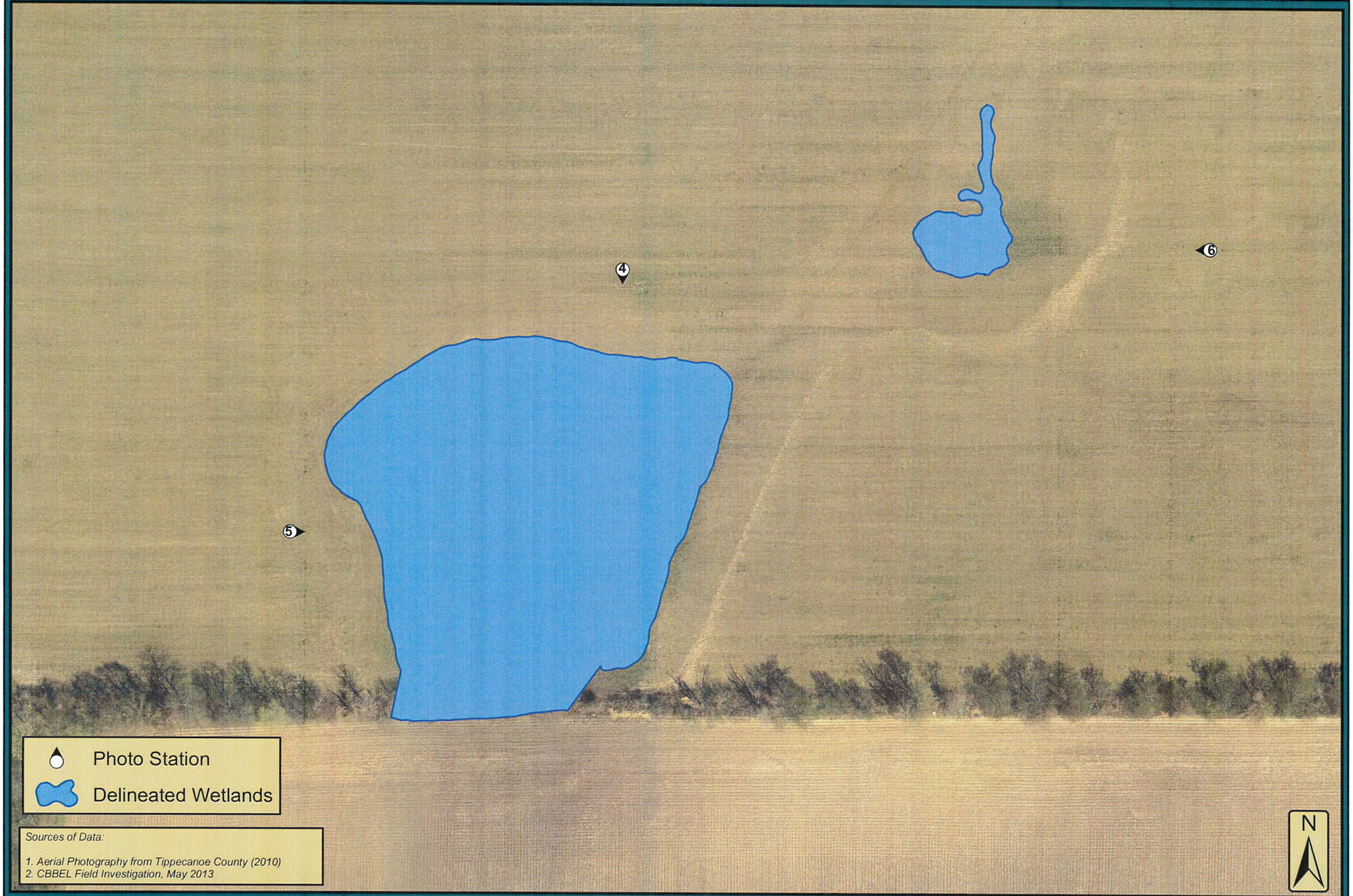
Christopher B. Burke Engineering, LLC
PNC Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
(t) 317.266.8000 (f) 317.632.3306

PROJECT: Tippecanoe County Berlowitz Masterplan	PROJECT NO. 12-0065	APPROX. SCALE 1 " = 100 '
TITLE: Wetland 3,4,5,6 & 7		DATE: 07/2013
		EXHIBIT 6B

Christopher B. Burke Engineering, LLC PNC Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 (t) 317.266.8000 (f) 317.632.3306	PROJECT: **Tippecanoe County Berlowitz Masterplan**	PROJECT NO. **12-0065**	APPROX. SCALE 1 " = 100 '
	TITLE: **Wetland 8 & 9**		DATE: 07/2013
			EXHIBIT 6C



Christopher B. Burke Engineering, LLC PNC Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 (t) 317.266.8000 (f) 317.632.3306	PROJECT: **Tippecanoe County Berlowitz Masterplan**	PROJECT NO. **12-0065**	APPROX. SCALE **1 " = 800 '**
	TITLE: **Photo Stations**		DATE: **06/2013**
			EXHIBIT **7**



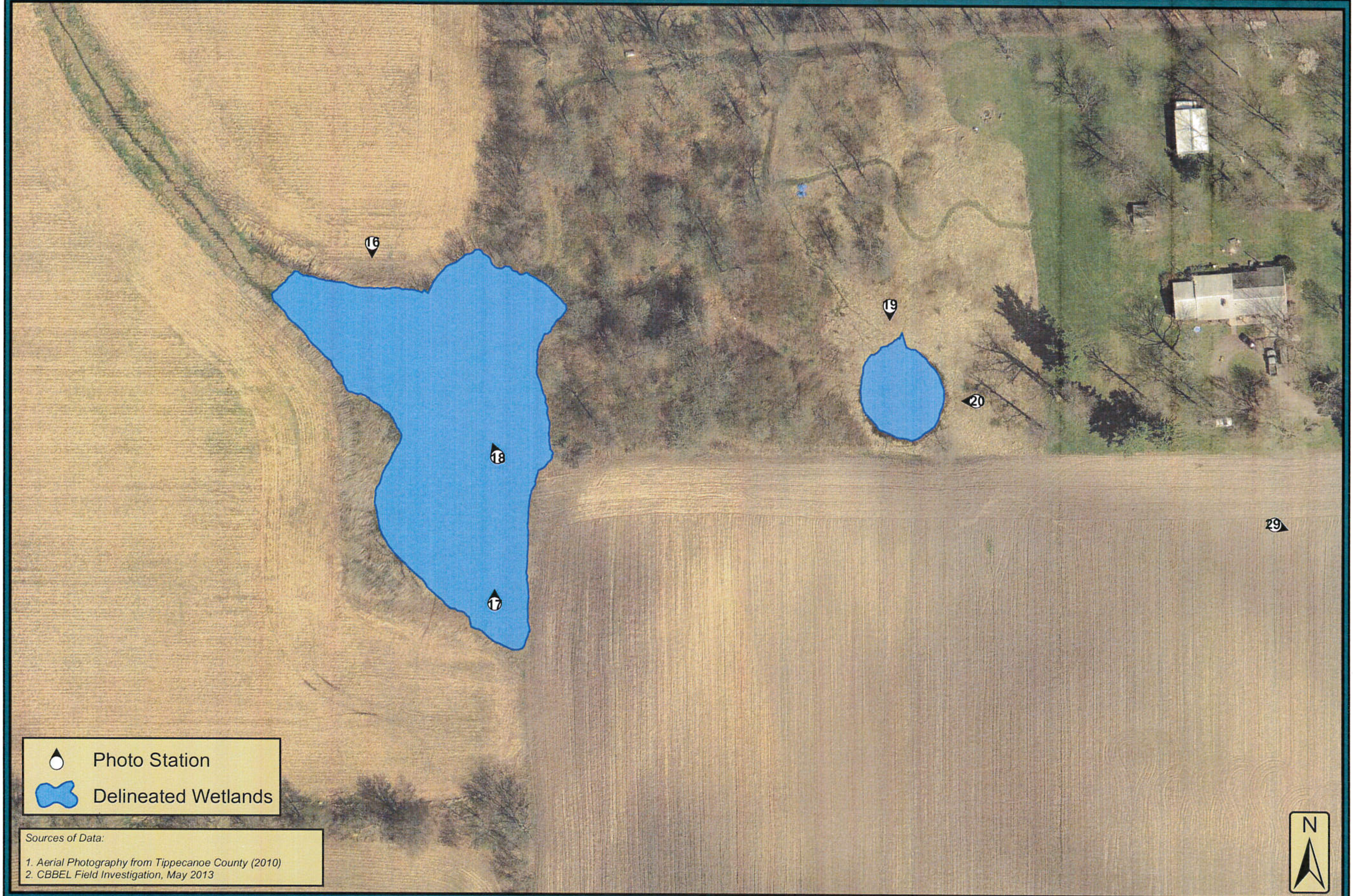
Sources of Data:

1. Aerial Photography from Tippecanoe County (2010)
2. CBBEL Field Investigation, May 2013

Christopher B. Burke Engineering, LLC PNC Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 (t) 317.266.8000 (f) 317.632.3306	PROJECT: **Tippecanoe County Berlowitz Masterplan**	PROJECT NO. **12-0065**	APPROX. SCALE 1 " = 100 '
	TITLE: **Photo Stations**		DATE: 07/2013
			EXHIBIT 7A

CBB
Christopher B. Burke Engineering, LLC
PNC Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
(t) 317.266.8000 (f) 317.632.3306

PROJECT:	Tippecanoe County Berlowitz Masterplan	PROJECT NO. 12-0065	APPROX. SCALE 1 " = 100 '
TITLE:	Photo Stations		DATE: 07/2013
			EXHIBIT 7B



Sources of Data:

1. Aerial Photography from Tippecanoe County (2010)
2. CBBEL Field Investigation, May 2013

Christopher B. Burke Engineering, LLC
PNC Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
(t) 317.266.8000 (f) 317.632.3306

PROJECT:	PROJECT NO.	APPROX. SCALE
Tippecanoe County Berlowitz Masterplan	12-0065	1 " = 100 '
TITLE: Photo Stations		DATE: 07/2013
		EXHIBIT 7C

Appendix A - Photographs

CHRISTOPHER B. BURKE ENGINEERING, LLC. National City Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 TEL (317)266-8000 FAX (317)632-3306	**PROJECT:** Berlowitz Master Plan	**PROJECT NO:** 12-0065	**APPROX. SCALE:** N/A
	TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		**DATE:** 05/13
			SITE 1

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT:	PROJECT NO:	APPROX. SCALE:
Berlowitz Master Plan	12-0065	N/A
TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		DATE: 05/13
		SITE 2

CHRISTOPHER B. BURKE ENGINEERING, LLC. National City Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 TEL (317)266-8000 FAX (317)632-3306	PROJECT: Berlowitz Master Plan	PROJECT NO: 12-0065	APPROX. SCALE: N/A
	TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		DATE: 05/13
			SITE 3

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT:	PROJECT NO:	APPROX. SCALE:
Berlowitz Master Plan	12-0065	N/A
TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		DATE: 05/13
		SITE 4&5

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT: Berlowitz Master Plan	**PROJECT NO:** 12-0065	**APPROX. SCALE:** N/A
TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		**DATE:** 05/13
		SITE 6&7

CHRISTOPHER B. BURKE ENGINEERING, LLC. National City Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 TEL (317)266-8000 FAX (317)632-3306	**PROJECT:** Berlowitz Master Plan	**PROJECT NO:** 12-0065	**APPROX. SCALE:** N/A
	TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		**DATE:** 05/13 **SITE 8**

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT:	PROJECT NO:	APPROX. SCALE:
Berlowitz Master Plan	12-0065	N/A
TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		DATE: 05/13
		SITE 9

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT:	PROJECT NO:	APPROX. SCALE:
Berlowitz Master Plan	12-0065	N/A
TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		DATE: 05/13
		SITE 10&11

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT:	PROJECT NO:	APPROX. SCALE:
Berlowitz Master Plan	12-0065	N/A
TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		DATE: 05/13
		SITE 12

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT:	PROJECT NO:	APPROX. SCALE:
Berlowitz Master Plan	12-0065	N/A
TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		DATE: 05/13
		SITE 13&14

CHRISTOPHER B. BURKE ENGINEERING, LLC. National City Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 TEL (317)266-8000 FAX (317)632-3306	**PROJECT:** Berlowitz Master Plan	**PROJECT NO:** 12-0065	**APPROX. SCALE:** N/A
	TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		**DATE:** 05/13 **SITE 15&16**

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT:	PROJECT NO:	APPROX. SCALE:
Berlowitz Master Plan	12-0065	N/A
		DATE: 05/13

TITLE:
PROJECT PHOTOGRAPHS
May 22nd and 23rd 2013

SITE 17&18

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT:	PROJECT NO:	APPROX. SCALE:
Berlowitz Master Plan	12-0065	N/A
TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		DATE: 05/13
		SITE 19&20

CHRISTOPHER B. BURKE ENGINEERING, LLC. National City Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 TEL (317)266-8000 FAX (317)632-3306	**PROJECT:** Berlowitz Master Plan	**PROJECT NO:** 12-0065	**APPROX. SCALE:** N/A
	TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		**DATE:** 05/13
			SITE 21

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT:	PROJECT NO:	APPROX. SCALE:
Berlowitz Master Plan	12-0065	N/A
TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		DATE: 05/13
		SITE 22

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT:	PROJECT NO:	APPROX. SCALE:
Berlowitz Master Plan	12-0065	N/A
		DATE: 05/13

TITLE:
PROJECT PHOTOGRAPHS
May 22nd and 23rd 2013

SITE 23&24

CHRISTOPHER B. BURKE ENGINEERING, LLC. National City Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 TEL (317)266-8000 FAX (317)632-3306	**PROJECT:** Berlowitz Master Plan	**PROJECT NO:** 12-0065	**APPROX. SCALE:** N/A
	TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		**DATE:** 05/13 **SITE 25&26**

CHRISTOPHER B. BURKE ENGINEERING, LLC.
National City Center, Suite 1368 South
115 West Washington Street
Indianapolis, Indiana 46204
TEL (317)266-8000 FAX (317)632-3306

PROJECT:	PROJECT NO:	APPROX. SCALE:
Berlowitz Master Plan	12-0065	N/A
TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		DATE: 05/13
		SITE 27&28

CHRISTOPHER B. BURKE ENGINEERING, LLC. National City Center, Suite 1368 South 115 West Washington Street Indianapolis, Indiana 46204 TEL (317)266-8000 FAX (317)632-3306	**PROJECT:** Berlowitz Master Plan	**PROJECT NO:** 12-0065	**APPROX. SCALE:** N/A
	TITLE: PROJECT PHOTOGRAPHS May 22nd and 23rd 2013		**DATE:** 05/13
			SITE 29

Appendix B – Data Sheets

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP1

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ____ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Md- Mahalasville-Treaty complex NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes ( ) No (●)	Is the Sampled Area within a Wetland? Yes ( ) No (●)
Hydric Soil Present?	Yes (●) No ( )	
Wetland Hydrology Present?	Yes ( ) No (●)	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover	0		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover	0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ( ) No (●)

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ________

Water Table Present? Yes ○ No ◉ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ________

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan   City/County: Lafayette/Tippecanoe   Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette   State: IN   Sampling Point: DP2

Investigator(s): Sarah E. Wright, WPIT   Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______   Lat: 40.3959   Long: 86.8195   Datum: NAD 1983

Soil Map Unit Name: Md Mahalasville-Treaty Complex   NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?   Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ◉	
Hydric Soil Present?	Yes ◉ No ○	Is the Sampled Area
Wetland Hydrology Present?	Yes ○ No ◉	within a Wetland? Yes ○ No ◉

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ **Depth (inches):** ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP3

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ____ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Milford silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ⦿	Is the Sampled Area within a Wetland? Yes ○ No ⦿
Hydric Soil Present?	Yes ⦿ No ○	
Wetland Hydrology Present?	Yes ○ No ⦿	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ⦿

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 3/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____________

Water Table Present? Yes ○ No ◉ **Depth (inches):** ____________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____________

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP4

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: CaA- Camden silt loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○	No ⦿	
Hydric Soil Present?	Yes ⦿	No ○	Is the Sampled Area within a Wetland? Yes ○ No ⦿
Wetland Hydrology Present?	Yes ○	No ⦿	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ⦿

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____

Water Table Present? Yes ○ No ◉ **Depth (inches):** ____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan | City/County: Lafayette/Tippecanoe | Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette | State: IN | Sampling Point: DP5

Investigator(s): Sarah E. Wright, WPIT | Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Milford silty clay loam | NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

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

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

Hydrophytic Vegetation Present?	Yes ( )	No (•)
Hydric Soil Present?	Yes (•)	No ( )
Wetland Hydrology Present?	Yes ( )	No (•)

Is the Sampled Area within a Wetland? Yes ( ) No (•)

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	0 (A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ( ) No (•)

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 3/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____

Water Table Present? Yes ○ No ◉ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP6

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Md- Mahalasville-Treaty complex NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

	Yes	No
Hydrophytic Vegetation Present?	○	◉
Hydric Soil Present?	◉	○
Wetland Hydrology Present?	○	◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____________

Water Table Present? Yes ○ No ◉ **Depth (inches):** ____________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____________

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP7

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ____ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Milford silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ◯

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

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

Hydrophytic Vegetation Present?	Yes ◯ No ⦿	Is the Sampled Area within a Wetland?	Yes ◯ No ⦿
Hydric Soil Present?	Yes ⦿ No ◯		
Wetland Hydrology Present?	Yes ◯ No ⦿		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◯ No ⦿

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP7

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ **Depth (inches):** ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP8

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Milford silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes ( )	No (●)	
Hydric Soil Present?	Yes (●)	No ( )	Is the Sampled Area within a Wetland? Yes ( ) No (●)
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5)			
1. Phleum pratense	50	Yes	FACU
2. Sonchus oleraceus	40	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species	90	x 4 = 360
UPL species		x 5 =
Column Totals:	90 (A)	360 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ( ) No (●)

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

SOIL

Sampling Point: DP8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____

Water Table Present? Yes ○ No ◉ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP9

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: MoA- Mellott silt loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes ( ) No (●)	Is the Sampled Area within a Wetland?	Yes ( ) No (●)
Hydric Soil Present?	Yes (●) No ( )		
Wetland Hydrology Present?	Yes ( ) No (●)		

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5)			
1. Phleum pratense	70	Yes	FACU
2. Sonchus oleraceus	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species	90	x 4 = 360
UPL species		x 5 =
Column Totals:	90 (A)	360 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ( ) No (●)

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

SOIL

Sampling Point: DP9

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/1	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ **Depth (inches):** ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP10

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Miford silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ●	Is the Sampled Area within a Wetland?	Yes ○ No ●
Hydric Soil Present?	Yes ● No ○		
Wetland Hydrology Present?	Yes ○ No ●		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5)			
1. Phleum pratense	50	Yes	FACU
2. Sonchus oleraceus	30	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	80	x 4 =	320
UPL species		x 5 =	
Column Totals:	80 (A)		320 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ●

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

SOIL

Sampling Point: DP10

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____________

Water Table Present? Yes ○ No ◉ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____________

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP11

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: TmA- Toronto-Millbrook complex NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○	No ⦿
Hydric Soil Present?	Yes ○	No ⦿
Wetland Hydrology Present?	Yes ○	No ⦿

Is the Sampled Area within a Wetland? Yes ○ No ⦿

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5ft.)			
1. Poa pratensis	70	Yes	FAC
2. Symphyotrichum pilosum	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	70	x 3 =	210
FACU species	20	x 4 =	80
UPL species		x 5 =	
Column Totals:	90 (A)		290 (B)

Prevalence Index = B/A = 3.22

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ⦿

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

SOIL

Sampling Point: DP11

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 3/3	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP12

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Millford silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ⦿ No ○	Is the Sampled Area within a Wetland?	Yes ⦿ No ○
Hydric Soil Present?	Yes ⦿ No ○		
Wetland Hydrology Present?	Yes ⦿ No ○		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1. Populus deltoides	30	Yes	FAC
2. Salix interior	30	Yes	FACW
3.			
4.			
5.			
	60 = Total Cover		
Herb Stratum (Plot size: 5)			
1. Rumex crispus	25	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	25 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	30	x 2 = 60
FAC species	55	x 3 = 3
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	85 (A)	165 (B)

Prevalence Index = B/A = 1.94

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ⦿ No ○

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

SOIL

Sampling Point: DP12

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes (●) No ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes (●) No ( ) Depth (inches): 12

Water Table Present? Yes ( ) No (●) Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes (●) No ( ) Depth (inches): ______

Wetland Hydrology Present? Yes (●) No ( )

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP13

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ____ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Du- Drummer soils NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ⦿ No ○	Is the Sampled Area within a Wetland? Yes ⦿ No ○
Hydric Soil Present?	Yes ⦿ No ○	
Wetland Hydrology Present?	Yes ⦿ No ○	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Populus deltoides	25	Yes	FAC
2.			
3.			
4.			
5.			
	25 = Total Cover		
Herb Stratum (Plot size: 5)			
1. Poa pratensis	50	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species		x 1 =
FACW species		x 2 =
FAC species	2	x 3 = 6
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	2 (A)	6 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ⦿ No ○

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

SOIL

Sampling Point: DP13

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ________

Water Table Present? Yes ○ No ◉ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ________

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP14

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ________ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Du- Drummer soils NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ◉	Is the Sampled Area within a Wetland?	Yes ○ No ◉
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ○ No ◉		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ________)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ________)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ________)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 0 (A)		(B)

Prevalence Index = B/A = ________

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP14

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP15

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Du- Drummer soils NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ⦿	Is the Sampled Area within a Wetland?	Yes ○ No ⦿
Hydric Soil Present?	Yes ⦿ No ○		
Wetland Hydrology Present?	Yes ○ No ⦿		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ⦿ No ○

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP15

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ________

Water Table Present? Yes ○ No ◉ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ________

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP16

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Milford silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ⦿	Is the Sampled Area within a Wetland?	Yes ○ No ⦿
Hydric Soil Present?	Yes ⦿ No ○		
Wetland Hydrology Present?	Yes ○ No ⦿		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ⦿ No ○

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP16

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP17

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Milford silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○	No ⦿	Is the Sampled Area within a Wetland? Yes ○ No ⦿
Hydric Soil Present?	Yes ⦿	No ○	
Wetland Hydrology Present?	Yes ○	No ⦿	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0	= Total Cover	
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ⦿ No ○

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP17

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____

Water Table Present? Yes ○ No ◉ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP18

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Milford silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○	No ◉
Hydric Soil Present?	Yes ◉	No ○
Wetland Hydrology Present?	Yes ○	No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP18

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes (●) No ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ( ) No (●) Depth (inches): ____

Water Table Present? Yes ( ) No (●) Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ( ) No (●) Depth (inches): ____

Wetland Hydrology Present? Yes ( ) No (●)

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP19

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⊙ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ⊙	Is the Sampled Area within a Wetland? Yes ○ No ⊙
Hydric Soil Present?	Yes ⊙ No ○	
Wetland Hydrology Present?	Yes ○ No ⊙	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ⊙ No ○

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP19

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes (●) No ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ( ) No (●) Depth (inches): ______

Water Table Present? Yes ( ) No (●) Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ( ) No (●) Depth (inches): ______

Wetland Hydrology Present? Yes ( ) No (●)

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP20

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Md- Mahalasville-Treaty complex NWI classification: None

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

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

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

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

Hydrophytic Vegetation Present?	Yes ( )	No (•)
Hydric Soil Present?	Yes (•)	No ( )
Wetland Hydrology Present?	Yes ( )	No (•)

Is the Sampled Area within a Wetland? Yes ( ) No (•)

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (•) No ( )

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP20

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____

Water Table Present? Yes ○ No ◉ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP21

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ____ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: CaA- Camden silt loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ⦿	Is the Sampled Area within a Wetland?	Yes ○ No ⦿
Hydric Soil Present?	Yes ⦿ No ○		
Wetland Hydrology Present?	Yes ○ No ⦿		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya ovata	40	Yes	FACU
2. Fraxinus pennsylvanica	35	Yes	FACW
3.			
4.			
5.			
	75 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft.)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5ft.)			
1. Podophyllum peltatum	45	Yes	FACU
2. Polygonatum biflorum	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	35	x 2 = 70
FAC species		x 3 =
FACU species	105	x 4 = 420
UPL species		x 5 =
Column Totals:	140 (A)	14 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ⦿

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

SOIL

Sampling Point: DP21

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP22

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Md- Mahalasville-Treaty complex NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ◉	
Hydric Soil Present?	Yes ◉ No ○	Is the Sampled Area within a Wetland? Yes ○ No ◉
Wetland Hydrology Present?	Yes ○ No ◉	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya ovata	30	Yes	FACU
2. Celtis occidentalis	25	Yes	FAC
3.			
4.			
5.			
	55 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft.)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5ft.)			
1. Parthenocissus quinquefolia	30	Yes	FACU
2. Polygala senega	30	Yes	FACU
3. Polygonatum biflorum	20	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	25	x 3 = 75
FACU species	110	x 4 = 440
UPL species		x 5 =
Column Totals:	135 (A)	515 (B)

Prevalence Index = B/A = 3.80

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP22

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____

Water Table Present? Yes ○ No ◉ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP23

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: SwA- Starks-Fincastle complex NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ◉	Is the Sampled Area within a Wetland?	Yes ○ No ◉
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ○ No ◉		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya ovata	30	Yes	FACU
2. Celtis occidentalis	25	Yes	FAC
3. Quercus rubra	35	Yes	FACU
4.			
5.			
	90 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft.)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5ft.)			
1. Polygala senega	30	Yes	FACU
2. Polygonatum biflorum	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	25	x 3 = 75
FACU species	115	x 4 = 460
UPL species		x 5 =
Column Totals:	140 (A)	535 (B)

Prevalence Index = B/A = 3.80

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP23

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes (selected) No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes No (selected) Depth (inches): ______

Water Table Present? Yes No (selected) Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes No (selected) Depth (inches): ______

Wetland Hydrology Present? Yes No (selected)

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP24

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Milford silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ◉	Is the Sampled Area within a Wetland?	Yes ○ No ◉
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ○ No ◉		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP24

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP25

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: CwB2- Crosby-Miami complex NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ◉	Is the Sampled Area within a Wetland?	Yes ○ No ◉
Hydric Soil Present?	Yes ○ No ◉		
Wetland Hydrology Present?	Yes ○ No ◉		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharinum	25	Yes	FACW
2.			
3.			
4.			
5.			
	25 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft.)			
1. Morus rubra	30	Yes	FACU
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: 5ft.)			
1. Festuca pratensis	50	Yes	FACU
2. Trifolium pratense	25	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species 25	x 2 = 50
FAC species	x 3 =
FACU species 105	x 4 = 420
UPL species	x 5 =
Column Totals: 130 (A)	435 (B)

Prevalence Index = B/A = 3.35

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP25

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 3/3	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP26

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ____ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: CwB2- Crosby-Miami complex NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

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

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

	Yes	No
Hydrophytic Vegetation Present?	( )	(•)
Hydric Soil Present?	( )	(•)
Wetland Hydrology Present?	( )	(•)

Is the Sampled Area within a Wetland? Yes ( ) No (•)

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus tremuloides	30	Yes	FAC
2.			
3.			
4.			
5.			
	30 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft)			
1. Lonicera tatarica	25	Yes	FACU
2.			
3.			
4.			
5.			
	25 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Festuca pratensis	50	Yes	FACU
2. Toxicodendron radicans	25	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	55	x 3 = 165
FACU species	75	x 4 = 300
UPL species		x 5 =
Column Totals:	130 (A)	465 (B)

Prevalence Index = B/A = 3.58

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ( ) No (•)

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

SOIL

Sampling Point: DP26

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 3/4	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: __________

Depth (inches): __________

Hydric Soil Present? Yes ○ No ⦿

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ⦿ Depth (inches): ______

Water Table Present? Yes ○ No ⦿ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ⦿ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ⦿

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP27

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: CwB2- Crosby-Miami complex NWI classification: None

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

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

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

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

Hydrophytic Vegetation Present?	Yes ( ) No (●)	**Is the Sampled Area within a Wetland?**	**Yes** ( ) **No** (●)
Hydric Soil Present?	Yes ( ) No (●)		
Wetland Hydrology Present?	Yes ( ) No (●)		

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft.)			
1. Lonicera tatarica	30	Yes	FACU
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: 5ft.)			
1. Festuca pratensis	60	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species	90	x 4 = 360
UPL species		x 5 =
Column Totals:	90 (A)	360 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ( ) No (●)

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

SOIL

Sampling Point: DP27

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 3/4	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ________

Water Table Present? Yes ○ No ◉ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ________

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP28

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○	No ⦿
Hydric Soil Present?	Yes ⦿	No ○
Wetland Hydrology Present?	Yes ○	No ⦿

Is the Sampled Area within a Wetland? Yes ○ No ⦿

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0	= Total Cover	
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ⦿ No ○

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP28

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP29

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

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

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

Hydrophytic Vegetation Present?	Yes ( ) No (•)	Is the Sampled Area within a Wetland? Yes ( ) No (•)
Hydric Soil Present?	Yes (•) No ( )	
Wetland Hydrology Present?	Yes ( ) No (•)	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (•) No ( )

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP29

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP30

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ____ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ◉	Is the Sampled Area within a Wetland?	Yes ○ No ◉
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ○ No ◉		

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP30

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes ● No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches): ____

Water Table Present? Yes ○ No ● Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches): ____

Wetland Hydrology Present? Yes ○ No ●

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP31

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: None

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

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

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

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

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes ( )	No (●)
Wetland Hydrology Present?	Yes ( )	No (●)

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1. Juglans nigra	70	Yes	FACU
2.			
3.			
4.			
5.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. Lonicera tatarica	20	Yes	FACU
2.			
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 5 ft.)			
1. Ambrosia trifida	20	Yes	FAC
2. Eupatoriadelphus maculatus	30	Yes	OBL
3. Galium triflorum	10	No	FACU
4. Sanicula gregaria	20	Yes	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species		x 2 =	
FAC species	40	x 3 =	120
FACU species	30	x 4 =	120
UPL species		x 5 =	
Column Totals:	100 (A)		270 (B)

Prevalence Index = B/A = 2.70

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP31

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/2	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan | City/County: Lafayette/Tippecanoe | Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette | State: IN | Sampling Point: DP32

Investigator(s): Sarah E. Wright, WPIT | Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ | Lat: 40.3959 | Long: 86.8195 | Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam | NWI classification: PEMA

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ⦿	No ○
Hydric Soil Present?	Yes ⦿	No ○
Wetland Hydrology Present?	Yes ⦿	No ○

Is the Sampled Area within a Wetland? Yes ⦿ No ○

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Junglans nigra	40	Yes	FACU
2. Quercus macrocarpa	20	Yes	FAC
3. Rosa multiflora	10	No	FACU
4.			
5.			
	70 = Total Cover		

Herb Stratum (Plot size: 5 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ambrosia trifida	10	No	FAC
2. Carex bebbii	40	Yes	OBL
3. Festuca pratensis	20	Yes	FACU
4. Solidago gigantea	20	Yes	FACW
5. Toxicodendron radicans	10	No	FAC
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
	0 = Total Cover		

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	40	x 1 = 40
FACW species	20	x 2 = 40
FAC species	40	x 3 = 120
FACU species	70	x 4 = 280
UPL species		x 5 =
Column Totals:	170 (A)	480 (B)

Prevalence Index = B/A = 2.82

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ⦿ No ○

SOIL

Sampling Point: DP32

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/1	100	10 YR 5/7	30	C	M	Clay	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ________

Water Table Present? Yes ○ No ◉ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ________

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP33

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): [illegible]

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: SwA- Starks-Fincastle complex NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

	Yes	No
Hydrophytic Vegetation Present?	○	◉
Hydric Soil Present?	○	◉
Wetland Hydrology Present?	○	◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya ovata	50	Yes	FACU
2. Juglans nigra	35	Yes	FACU
3.			
4.			
5.			
	85 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Lonicera tatarica	20	Yes	FACU
2.			
3.			
4.			
5.			
	20 = Total Cover		

Herb Stratum (Plot size: 5 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alliaria petiolata	30	Yes	FAC
2. Ambrosia trifida	30	Yes	FAC
3. Sanicula gregaria	30	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	90	x 3 = 270
FACU species	105	x 4 = 420
UPL species		x 5 =
Column Totals:	195 (A)	690 (B)

Prevalence Index = B/A = 3.54

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP33

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-16	10 YR 4/2	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP34

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ● No ○

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

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

Hydrophytic Vegetation Present?	Yes ● No ○	Is the Sampled Area within a Wetland?	Yes ● No ○
Hydric Soil Present?	Yes ● No ○		
Wetland Hydrology Present?	Yes ● No ○		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. Celtis occidentalis	20	Yes	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Ambrosia trifida	40	Yes	FAC
2. Carex bebbii	20	Yes	OBL
3. Elymus canadensis	10	No	FACU
4. Solidago gigantea	20	Yes	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	20	x 1 = 20
FACW species	20	x 2 = 40
FAC species	60	x 3 = 180
FACU species	10	x 4 = 40
UPL species		x 5 =
Column Totals:	110 (A)	280 (B)

Prevalence Index = B/A = 2.55

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ● No ○

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

SOIL

Sampling Point: DP34

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____________

Water Table Present? Yes ○ No ◉ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____________

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP35

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ◉	No ○
Hydric Soil Present?	Yes ◉	No ○
Wetland Hydrology Present?	Yes ◉	No ○
Is the Sampled Area within a Wetland?	Yes ◉	No ○

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		
Herb Stratum (Plot size: 5 ft.)			
1. Alliaria petiolata	30	Yes	FAC
2. Carex vulpinoidea	40	Yes	FACW
3. Hydrophyllum virginianum	20	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover	90		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover	0		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	40	x 2 = 80
FAC species	50	x 3 = 150
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	90 (A)	230 (B)

Prevalence Index = B/A = 2.55

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP35

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ________

Water Table Present? Yes ○ No ◉ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ________

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP36

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ◉	Is the Sampled Area within a Wetland? Yes ○ No ◉
Hydric Soil Present?	Yes ○ No ◉	
Wetland Hydrology Present?	Yes ○ No ◉	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya ovata	50	Yes	FACU
2.			
3.			
4.			
5.			
	50 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. Lonicera tatarica	35	Yes	FACU
2. Rosa multiflora	25	Yes	FACU
3.			
4.			
5.			
	60 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Ambrosia trifida	30	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species 30	x 3 =	90
FACU species 110	x 4 =	440
UPL species	x 5 =	
Column Totals: 140 (A)		530 (B)

Prevalence Index = B/A = 3.79

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

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

SOIL

Sampling Point: DP36

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 3/2	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: __________

Depth (inches): __________

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP37

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ________ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ◯

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

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

Hydrophytic Vegetation Present?	Yes ⦿ No ◯	Is the Sampled Area within a Wetland?	Yes ⦿ No ◯
Hydric Soil Present?	Yes ⦿ No ◯		
Wetland Hydrology Present?	Yes ⦿ No ◯		

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. Cephalanthus occidentalis	10	No	OBL
2.			
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Carex bebbii	10	No	OBL
2. Carex vulpinoidea	20	Yes	FACW
3. Eupatoriadelphus maculatus	30	Yes	OBL
4. Sanicula gregaria	10	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: ________)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	50	x 1 = 50
FACW species	20	x 2 = 40
FAC species	10	x 3 = 30
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	80 (A)	120 (B)

Prevalence Index = B/A = 0.15

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ⦿ No ◯

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

SOIL

Sampling Point: DP37

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 3/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____________

Water Table Present? Yes ○ No ◉ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____________

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP38

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

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

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

Hydrophytic Vegetation Present?	Yes (●) No ( )	Is the Sampled Area within a Wetland?	Yes ( ) No (●)
Hydric Soil Present?	Yes ( ) No (●)		
Wetland Hydrology Present?	Yes ( ) No (●)		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya ovata	40	Yes	FACU
2. Quercus rubra	35	Yes	FACU
3.			
4.			
5.			
	75 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Ambrosia trifida	20	Yes	FAC
2. Eupatoriadelphus maculatus	20	Yes	OBL
3. Sanicula gregaria	25	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	20	x 1 = 20
FACW species		x 2 =
FAC species	45	x 3 = 135
FACU species	75	x 4 = 300
UPL species		x 5 =
Column Totals:	140 (A)	475 (B)

Prevalence Index = B/A = 3.39

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes (●) No ( )

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

SOIL

Sampling Point: DP38

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/2	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____

Water Table Present? Yes ○ No ◉ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP39

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ◉ No ○	Is the Sampled Area within a Wetland? Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○	
Wetland Hydrology Present?	Yes ◉ No ○	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya laciniosa	30	Yes	FACW
2.			
3.			
4.			
5.			
	30 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Carex bebbii	10	No	OBL
2. Eupatoriadelphus maculatus	30	Yes	OBL
3. Lysimachia nummularia	40	Yes	FACW
4. Rosa multiflora	10	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	40	x 1 = 40
FACW species	70	x 2 = 140
FAC species		x 3 =
FACU species	10	x 4 = 40
UPL species		x 5 =
Column Totals:	120 (A)	12 (B)

Prevalence Index = B/A = 1.83

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP39

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP40

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Cm- Chalmers silty clay loam NWI classification: PUBF

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☉ No ◯

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

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

Hydrophytic Vegetation Present?	Yes ☉ No ◯	Is the Sampled Area within a Wetland? Yes ☉ No ◯
Hydric Soil Present?	Yes ☉ No ◯	
Wetland Hydrology Present?	Yes ☉ No ◯	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	25	Yes	FACW
2. Populus deltoides	30	Yes	FAC
3. Salix interior	30	Yes	FACW
4.			
5.			
	85 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Lysimachia nummularia	50	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	105	x 2 = 210
FAC species	30	x 3 = 90
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	135 (A)	300 (B)

Prevalence Index = B/A = 2.22

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☉ No ◯

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

SOIL

Sampling Point: DP40

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 3/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ◉ No ○ Depth (inches): 16

Water Table Present? Yes ○ No ◉ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): ____

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP41

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Milford silty clay loam NWI classification: PEMA

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○		
Hydric Soil Present? Yes ◉ No ○	Is the Sampled Area within a Wetland?	Yes ◉ No ○
Wetland Hydrology Present? Yes ◉ No ○		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix interior	55	Yes	FACW
2.			
3.			
4.			
5.			
	55 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1. Carex tribuloides	25	Yes	OBL
2. Poa pratensis	50	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	25	x 1 = 25
FACW species	55	x 2 = 110
FAC species	50	x 3 = 150
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	130 (A)	285 (B)

Prevalence Index = B/A = 2.19

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

SOIL

Sampling Point: DP41

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ________

Water Table Present? Yes ○ No ◉ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ________

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP42

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu-Milford silty clay loam NWI classification: PEMA

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ⦿ No ○	Is the Sampled Area within a Wetland? Yes ⦿ No ○
Hydric Soil Present?	Yes ⦿ No ○	
Wetland Hydrology Present?	Yes ⦿ No ○	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	65	Yes	FAC
2. Quercus palustris	30	Yes	FACW
3.			
4.			
5.			
	95 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft.)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	30	x 2 = 60
FAC species	65	x 3 = 195
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	95 (A)	12 (B)

Prevalence Index = B/A = 2.68

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ⦿ No ○

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

SOIL

Sampling Point: DP42

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ________

Water Table Present? Yes ○ No ◉ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ________

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP43

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Milford silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ◉	Is the Sampled Area within a Wetland? Yes ○ No ◉
Hydric Soil Present?	Yes ◉ No ○	
Wetland Hydrology Present?	Yes ○ No ◉	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: 0 (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP43

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP44

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: SwA- Starks-Fincastle complex NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ⦿ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○ No ⦿	
Hydric Soil Present?	Yes ⦿ No ○	Is the Sampled Area within a Wetland? Yes ○ No ⦿
Wetland Hydrology Present?	Yes ○ No ⦿	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ⦿

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP44

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ______

Water Table Present? Yes ○ No ◉ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ______

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP45

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Mu- Milford silty clay loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

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

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

Hydrophytic Vegetation Present?	Yes ○	No ◉	Is the Sampled Area within a Wetland? Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

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

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP45

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes (•) No ( )

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ( ) No (•) Depth (inches): ____________

Water Table Present? Yes ( ) No (•) Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ( ) No (•) Depth (inches): ____________

Wetland Hydrology Present? Yes ( ) No (•)

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Berlowitz Master Plan City/County: Lafayette/Tippecanoe Sampling Date: 5/22/13

Applicant/Owner: City of Lafayette State: IN Sampling Point: DP46

Investigator(s): Sarah E. Wright, WPIT Section, Township, Range: Section 36, Township 23 North, Range 4 West

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

Slope (%): ______ Lat: 40.3959 Long: 86.8195 Datum: NAD 1983

Soil Map Unit Name: Md Mahalasville-Treaty complex NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○ No ◉	Is the Sampled Area within a Wetland?	Yes ○ No ◉
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ○ No ◉		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: 0 (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks: (Include photo numbers here or on a separate sheet.)

This data point was located in a tilled farm field, therefore no vegetation was present.

SOIL

Sampling Point: DP46

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 2/1	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☑ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): ____

Water Table Present? Yes ○ No ◉ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): ____

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix C - Permitting Summary and Jurisdictional Guidance

Permitting Summary

The following discussion includes information on USACE Section 404, IDEM Section 401 and IDNR Construction in a Floodway permitting processes. Permits are only necessary if the water resources (wetlands, other jurisdictional waters, and floodway areas) are impacted. If temporary impacts occur, the USACE and IDEM will require notification; however, mitigation might not be required if the water resources can be returned to their original condition. IDNR typically deals with temporary impacts on a case-by-case basis if the impacts are not part of a larger overall project. The following sections summarize the current permitting mechanisms used by the USACE, IDEM, and IDNR for the above mentioned permits. Other federal, state, and local permits may be required for work in and around wetlands, Waters of the U.S. (Waters) and floodway areas depending on the nature of the work.

U.S. Army Corps of Engineers and the Indiana Department of Environmental Management

Regional General Permit: The Regional General Permit (RGP) is a permitting process for Section 401 and Section 404 permits that replaced most of the nationwide permits in Indiana. The RGP was developed by the USACE and IDEM to speed up the permitting process for projects in Indiana that obviously do not involve more than minimal impacts to Waters. To qualify as an RGP with the USACE, the project can not involve cumulative discharges of dredged or fill material to more than 1 acre of Waters of the United States, including wetlands. To qualify as an RGP with IDEM, the project can't have cumulative impacts to more than 0.1 acre of wetlands, Special Aquatic Sites, or open water areas. In addition, IDEM specifies that the project cannot impact more than 300 linear feet of stream channel beneath the Ordinary High Water Mark (OHWM), and cannot involve any stream channel relocation. IDEM and the USACE require that notification be provided by the permittee at least 30 working days prior to the proposed waterbody impact for all activities in which an Individual Permit is not required. After 30 days, if there are no objections from IDEM, the project is approved and the application/notification form is the permit. Within 30 – 45 days, the USACE should respond in writing that the project qualifies for their Regional General Permit (RGP). As long as the 401 WQC is obtained from IDEM, the project is approved.

Individual Permit: Individual Section 401 and Section 404 permit applications are more involved than Regional General Permits. This type of permit covers projects that are larger in scope and/or typically cause more than minimal impacts to Waters of the United States. These projects are subjected to public review and comment as part of the permit process. Comments from the general public as well as other agencies are taken into consideration when applications are being reviewed. After the application is received by the USACE, a Public Notice is issued to the general public, special interest groups, local and state agencies, and other federal agencies, giving them 15 to 30 days to comment on the proposed action. The USACE then considers all comments received (including the results of the IDEM Water Quality Certification review), consults with other federal agencies, and may request additional information from the applicant. A public hearing may also be required in order to present further details on the proposed activity to the public and give them an opportunity to voice their concerns. Following the public hearing, the USACE will decide whether to issue or deny the permit. If the permit is denied, the applicant will be given justification for the denial. The entire individual permit process for both IDEM and the USACE takes a minimum of 4 months, if no problems are encountered, but can legally take up to a year.

The following table summarizes the mitigation ratios that are typically used for impacts to wetlands under the USACE jurisdiction.

Table 1: USACE Mitigation Ratios

Wetland Type	**Mitigation Ratio**
Emergent	1:1 – 2:1
Scrub-Shrub/Immature Forest	2:1 – 3:1
Mature Forest	3:1 – 4:1
Unique and Rare Wetlands	4:1 and above

State Regulated Wetlands: The State of Indiana, through IDEM, retains jurisdiction over isolated (non-USACE jurisdictional) wetlands through recently passed legislation and administrative rules. The State Regulated Wetland rule identifies "Exempt Activities" and divides wetlands into three (3) classes: Class I includes wetlands of lower quality which are provided less protection. Class III includes wetlands of high quality which are provided a high level of protection. Class II, by definition, includes wetlands that are not Class I or Class III. Class III wetlands do not qualify for any permitting exemptions.

Key Exemptions for State Regulated Wetlands:

A.) Class I Size Exemption: A Class I isolated wetland with an area of one-half (1/2) acre or less is exempt from regulation if it is the only wetland on the tract. If more than one Class I wetland is found on the tract, then the total exempt acreage is limited to the larger of the following:
- The acreage of the largest individual isolated wetland on the tract that qualifies for the exemption;
- Fifty percent (50%) of the cumulative acreage of all individual isolated wetlands on the tract that would qualify for the exemption.

B.) Class II Size Exemption: A Class II isolated wetland with an area of one-quarter (1/4) acre or less is exempt from regulation if it is the only wetland on the tract. If more than one Class II wetland is found on the tract, then the total exempt acreage is limited to the larger of the following:

- The acreage of the largest individual isolated wetland on the tract that qualifies for the exemption;
- Thirty three percent (33%) of the cumulative acreage of all individual isolated wetlands on the tract that would qualify for the exemption.

The following table summarizes the mitigation requirements for state regulated wetlands:

Table 2: State Regulated Wetland Mitigation Ratios

Wetland Class	Replacement Class	On-Site Ratio	Off-Site Ratio
Class I	Class II or III	1:1	1:1
Class I	Class I	1.5:1	1.5:1
Class II	Class II or III	1.5:1 Not Forested 2:1 Forested	2:1 Not Forested 2.5:1 Forested
Class III	Class III	2:1 Not Forested 2.5:1 Forested	2.5:1 Not Forested 3:1 Forested

Indiana Department of Natural Resources

Construction in a Floodway Permit: In order to control damage to property and protect against loss of life due to flooding, the State of Indiana has charged the IDNR with the responsibility of regulating all work conducted in Indiana's floodways to ensure that proposed work will not restrict the flow of flood waters and increase flood stages.

The IDNR generally requires a Construction in a Floodway Permit for any activity in or along a stream which drains over one (1) square mile, or 640 acres. Some types of projects, including state or county road bridges with a drainage area of less than 50 square miles, regulated drains less than 10 miles in total length, log jam removal, utility lines, outfall structures, and wetland restoration in a floodway are exempted from the IDNR permitting process either by state law or administrative code.

Jurisdictional Guidance

On December 2, 2008, the USEPA and USACE jointly issued a guidance memorandum regarding their jurisdiction in light of the Rapanos/Carabell Supreme Court Decision. With respect to isolated wetlands, the memo identified "significant nexus" to include consideration of hydrologic factors including the following:

- proximity to the traditional navigable water,
- size of the watershed,
- average annual rainfall, and
- average annual winter snow pack.

The memo also identified "significant nexus" to include consideration of ecologic factors including the following:

- provision of aquatic habitat that supports a traditional navigable water,
- potential of wetlands to trap and filter pollutants or store flood waters, and
- maintenance of water quality in traditional navigable waters.

Based on the guidance, the agencies will assert jurisdiction over the following waters:

- Traditional Navigable Waters (TNWs)
- Wetlands adjacent to TNWs
- Non-Navigable tributaries of TNWs that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally Relatively Permanent Waters (RPWs)
- Wetlands that directly abut RPWs

The agencies will decide jurisdiction over the following waters based on a fact specific analysis:

- Non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to but not directly abutting an RPW

The agencies will generally not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent or short duration flow)
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water

Wetlands are considered to have a significant nexus to other Waters if the subject wetland was found to be positioned immediately adjacent to a jurisdictional channel or within the floodplain of a jurisdictional channel. Wetlands found in these positions are assumed to have a surface water exchange with other Waters that could affect the flow quality and quantity within those Waters.

Appendix 3

(Preliminary Design Plans – Provided Under Separate Cover)