



## SANITARY DISTRICT #2 MEETING AGENDA

**DATE:** Monday, April 22, 2019  
**TIME:** Immediately Following Sanitary District #1  
**LOCATION:** Greenville Town Hall, W6860 Parkview Drive, Greenville, WI 54942

### **OPENING:**

#### **1. CALL TO ORDER/ROLL CALL**

### **PRESENTATIONS & PUBLIC FORUM:**

#### **2. PUBLIC HEARINGS:**

#### **3. PRESENTATIONS:**

#### **4. PUBLIC COMMENT FORUM:**

*Members of the public are welcome to address the Sanitary District/Storm Water Utility. Individuals wishing to speak on an item (whether on the agenda or not) must sign in prior to the start of the meeting and may speak during the Public Comment Forum segment of the meeting. This segment is placed early in the agenda so the public may make their comments prior to any discussion or action by the Sanitary District/Storm Water Utility. Individual comments are limited to no more than three minutes each. The Public Input section is limited to a total of 15 minutes. Once the public input segment ends there will be no additional discussion from the audience. The Board may suspend this rule if deemed necessary.*

*Note regarding non-agenda Town related matters: Pursuant to WI Statutes 19.83(2) and 19.84(2), the public may present matters; however, they cannot be discussed or acted upon until specific notice of the subject matter of the proposed action can be given.*

**SANITARY DISTRICT #2 BUSINESS AGENDA:**

*Notice is hereby given that the Greenville Town Board may take action on any item listed within this agenda.*

**5. CONSENT AGENDA:**

*(Items on the Consent Agenda are routine in nature and require one motion to approve all items listed. Prior to voting on the Consent Agenda, items on the Consent Agenda may be removed at the request of any Supervisor and addressed immediately following the motion to approve the other items on the Consent Agenda.)*

**6. UNFINISHED BUSINESS FOR DISCUSSION & POSSIBLE ACTION:**

**7. NEW BUSINESS FOR DISCUSSION & POSSIBLE ACTION:**

- 7.a. Deferral of Post Construction Stormwater Requirements for WE Energies Gas Regulator Station at Mayflower and STH 15.

[4-22-19 Stormwater Utility AgendaWeEnergies.pdf](#)

**8. ADJOURNMENT**

**MEETING:** Town Board  
**DATE:** April 22, 2019

**AGENDA ITEM #:** \_\_\_\_\_  
**ACTION TYPE:** Approval/Denial



*"Town of Greenville"*

## AGENDA MEMORANDUM

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**To:** Honorable Town Chairperson and Town Supervisors  
**From:** Chris Pagels, Stormwater Superintendent  
**Date:** April 22, 2019  
**RE:** WE Energies Natural Gas Substation

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**ACTION TYPE:** Approval/Denial

**BACKGROUND & SUMMARY:** WE Energies has approached the Town of Greenville to ask the Town for consideration allowing stormwater requirements for a Natural Gas Substation to be built at a later date along with the overall development of the site. The site is 6.14 acres with less than .40 acres disturbed for development. Stormwater water quality/flood control requirements from the We Energies site would be built as a regional basin. This area is within the Greenville TID District. However, the development has not yet occurred in this area or other locations in the Greenville TID. Critical gas infrastructure is needed to entice development and the creation of a regional stormwater basin providing the flood control and water quality requirements needed.

Staff has had meetings with We Energies at Town Hall to discuss options available. There are very little options at this time. The initial stormwater improvements on the WE Energies site do not meet DNR policy guidelines or technical standards. Staff then looked at the TID District stormwater Planning McMahon Inc. has performed for the Town. It is anticipated a regional stormwater basin would be constructed near Mayflower Road and STH 15 to serve the entire developed watershed.

**STAFF RECOMMENDATION:** Staff recommends the Board approve as proposed. If the Board is in agreement, the following motion may be made: ***"Motion to approve the We Energies Stormwater Requirements be deferred until the rest of the parcel develops within the TID and creation of a regional stormwater pond."***

**POLICY/PLAN REFERENCE(S):**

1. Town Purchasing Policy – Adopted August 2017

**FISCAL IMPACT:** The TID would fully fund the construction of the basin along with WE Energies site stormwater.

###

**Attachments:**

1. WE Energies Statement
2. Davel Engineering SWMP
3. McMahon Stormwater Planning

# GREENVILLE CAPACITY IMPROVEMENT PROJECT

## PROJECT BACKGROUND AND DESCRIPTION

### PROJECT BACKGROUND

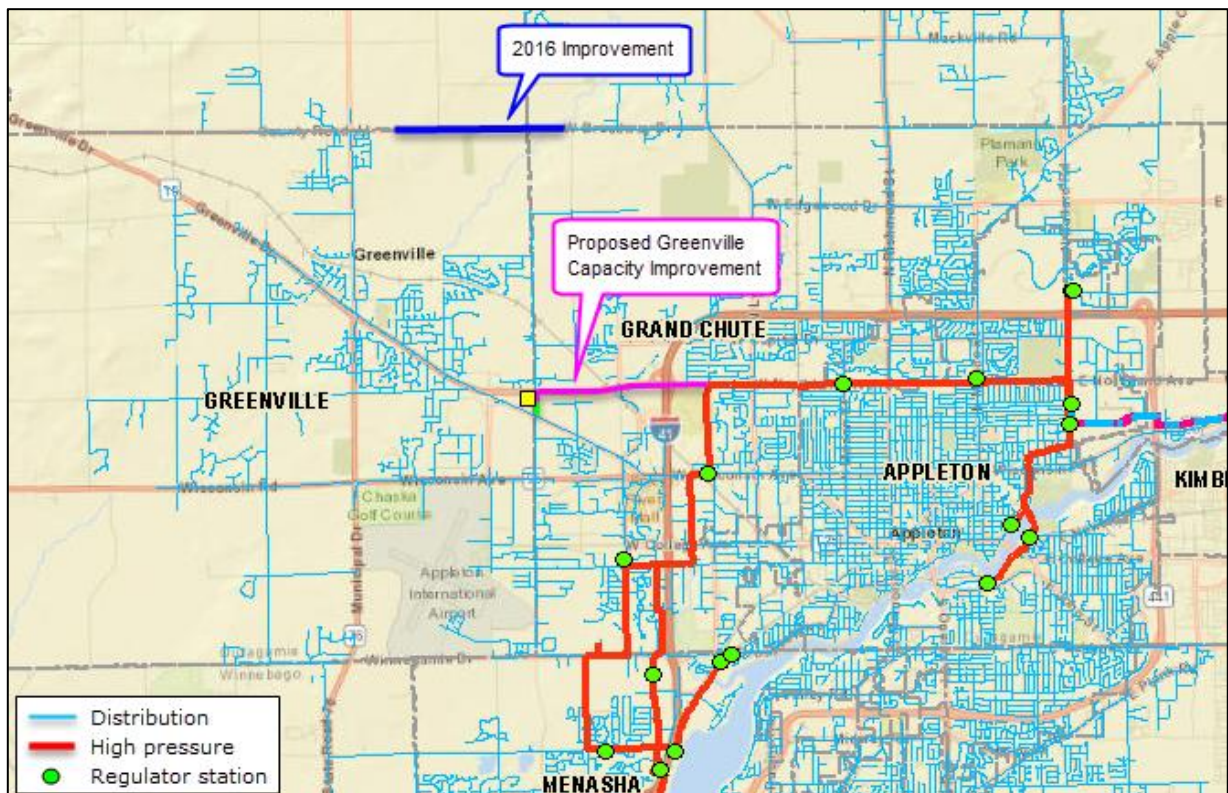
Over the last several years, there has been substantial residential, commercial and industrial growth in the Greenville area. As a result, the existing natural gas infrastructure is at capacity.

The existing high pressure pipe and the existing regulator stations feeding the distribution system are currently located in Appleton and Grand Chute, which means the gas needs to travel a considerable distance through the distribution system to the west to reach the Greenville area. This distance, along with the increasing demand for natural gas for residential and commercial growth in Greenville, results in the distribution system reaching capacity.

In 2016, We Energies completed a large distribution improvement project that extended 1.8 miles of new 4-inch plastic main to increase pressures in the Greenville area. This improvement project increased the system capacity to accommodate recent natural gas customer growth. For future growth in the area, a more substantial project is needed.

The 2019 Greenville Capacity Improvement Project will extend the high pressure system to the west, introducing a regulator station feed in the Town of Greenville that will provide the natural gas capacity needed to accommodate future growth in Greenville.

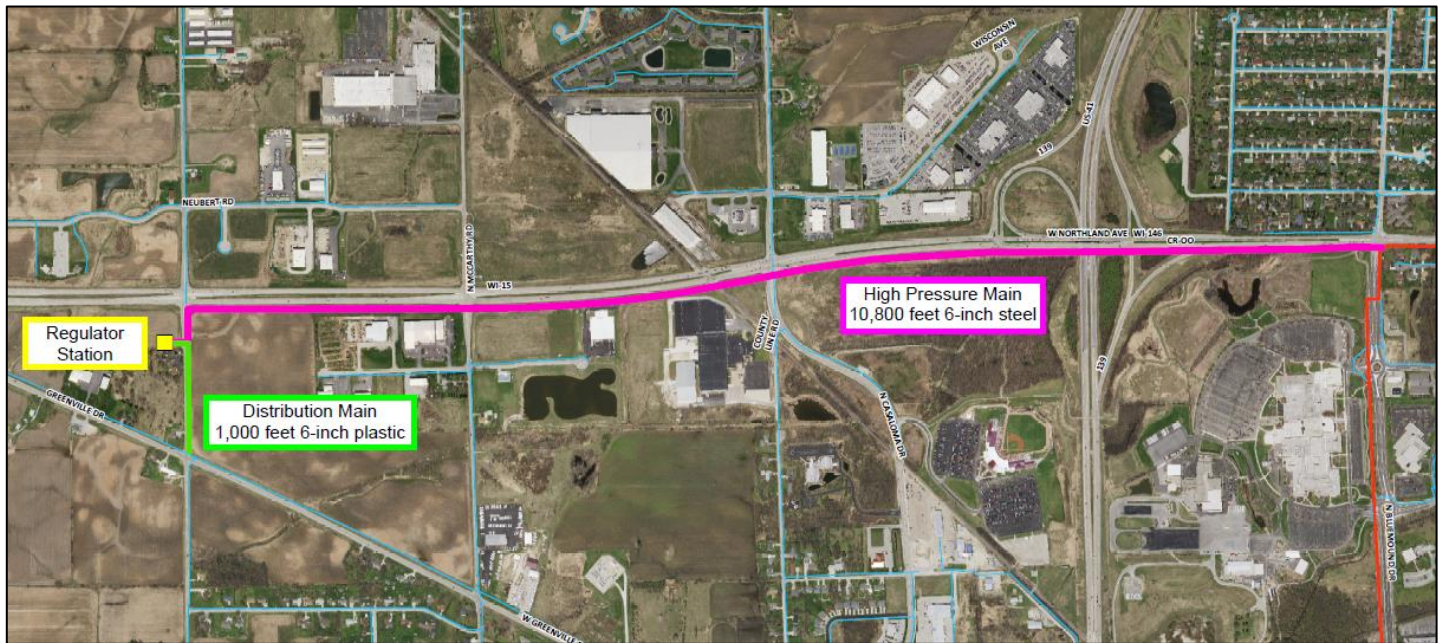
If the Greenville Capacity Improvement Project is not completed at this time, natural gas service to new development in the Greenville area will be denied or become very expensive to future development projects.





## PROJECT DESCRIPTION

The Greenville Capacity Improvement Project extends two miles of new 6-inch steel high pressure gas main to a new regulator station which reduces the pressure for the distribution system. 1,000 feet of new 6-inch plastic main then ties the regulator station into the existing distribution system.



The project is scheduled to be constructed during the summer in 2019 and in service by November of 2019.

# STORM WATER MANAGEMENT & OPERATION AND MAINTENANCE PLAN

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## Natural Gas Regulator Station – Mayflower Drive Town of Greenville Outagamie County, WI

April 2, 2019

For/Owner:  
**We Energies**  
333 West Everett  
Milwaukee, WI 53201

By:  
**DAVEL ENGINEERING & ENVIRONMENTAL, INC.**  
Timothy Wittmann, PE



1811 Racine Street, Menasha, WI 54952  
Phone: (920) 991-1866

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## **Introduction**

The property is described as part of Lots 3 of CSM 6325 being located in part of Northeast ¼ of the Northeast ¼ of Section 24, Township 21 North, Range 16 East, Town of Greenville, Outagamie County. We Energies is proposing the construction of natural gas regulator station within a 17,250 square foot easement on the 6.14 acre parcel.

### **Purpose**

The purpose of this report is to provide a storm water management plan for this small improvement project. The site is subject to the storm water management requirements of the Town of Greenville for new development. Town requirements (Mud Creek Watershed) are discussed below:

- Total suspended solids (TSS) reduction in the post development runoff shall be no less than 80% for new development
- Total phosphorus (TP) reduction in the post development runoff shall be no less than 48% for new development

Refer to the Erosion and Sediment Control plan for measures to be taken to reduce the TSS during construction.

### **Site Description**

The site is 6.14 acres with less than 0.40 acres disturbed for this proposed development plan. The site has existing field access that will be reconstructed as part of this project. The access will continue to be utilized for agricultural activities. This agricultural property generally slopes to the east with wetlands associated with the Mayflower Drive ditch. There is a watershed that drains from the adjacent south residential property north in the predevelopment condition, a swale is proposed along the south side of the proposed driveway to maintain surface water conveyance.

### **Soils**

The soil types and hydrologic groups were determined using the Soil Survey of Outagamie County. Soils are classified into four hydrologic groups (A, B, C, and D) based on their infiltration capacity. Table 1 summarizes the soils. Refer to Appendix A for the soils map.

**Table 1: Onsite Soil Conditions**

<b>Symbol</b>	<b>Soil Name</b>	<b>HSG*</b>
HrB	Hortonville Silt Loam	C

\* Hydrologic Soil Group

## **Storm Water Quantity**

Town regulations require the post development peak discharge rate not exceed the pre-development peak discharge rate for the 24-hour duration 1, 2, 10 and 100-year rainfall events.

### **Drainage Basins**

In the existing condition, the site drains to the north and east into the Mayflower Drive road ditch and is within the Mud Creek watershed. The developed conditions will continue discharge to the Mayflower drive via overland flow. Table 2 summarizes the post development proposed conditions assuming the open gradation stone is considered impervious. There onsite runoff storage will occur within the void space of the open gradation stone, due to site constraints no other runoff attenuation is proposed.

**Table 2: Post Development Conditions**

<b>Total Area</b>	<b>Proposed Impervious (percent impervious)</b>
<b>17,250 sq ft</b>	<b>10,350 sq ft (60%)</b>

### **Runoff Conveyance**

There exists a 15.7 acre watershed that discharge across the existing agricultural field and into the Mayflower Drive road ditch. A proposed swale will convey this runoff the Mayflower Drive with an overland overflow path within the proposed driveway section, refer to Appendix C for computations and Appendix B for drainage basin map.

## **Storm Water Quality**

Town regulations require that new development projects improve the storm water quality with an 80 percent reduction to total suspended solids (TSS) and 48 percent reduction to total phosphorus (TP) in the post development condition within the Mud Creek watershed.

### **Model Results**

The site was modeled using WinSLAMM (version 10.3.4) to determine the amount of TSS and TP generated onsite. Table 2 summarizes the results of the WinSLAMM model; the complete program input & output are included in Appendix C.

**Table 2: TSS & TP Generation Summary**

<b>Basin</b>	<b>Total Yield (lbs)</b>	<b>Total Yield (lbs)</b>
	<b>TSS</b>	<b>TP</b>
<b>Total Site</b>	<b>23</b>	<b>0.1209</b>

The development shall meet the requirements of the Town of Greenville for total phosphorus and total suspended solids upon full development of the property. At this time, there is no practicable stormwater management solution to apply within the

easement. The easement improvements generally discharge north that can provide for future stormwater management controls.

## **Storm Water Summary**

Site constraints including minimal elevation available near Mayflower Drive ditch, lack of municipal storm sewer within Mayflower Drive, and a narrow easement exist to limit or eliminate use of standard post construction stormwater management practices. Source controls including the use of an open gradation aggregate is proposed to minimize the impervious properties associated with gravel. Additionally, a filter strip is proposed along the north side of the proposed driveway.

The proposed improvements, as designed, reduces peak flow, TP, and TSS to the extent practicable with use of a filter strip and open gradation aggregate.

## **Operation & Maintenance**

### **Vegetation**

The establishment of trees, shrubs or other woody vegetation may occur naturally or as a result of the property owners' wishes. Mowing grass areas will discourage the growth of some species. Species which are more persistent may need to be treated with an herbicide. A qualified professional should be consulted before any vegetation, other than that specifically stated within the design, is established within a waterway or on the pond embankment. Improper vegetation may damage the structures, hinder maintenance or reduce detention volume.

### **Erosion**

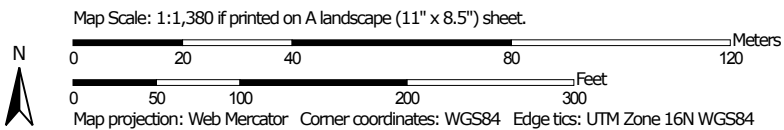
After the project is completed, the possibility for erosion problems within the storm water system remains. The loss of vegetation is the most common cause of soil erosion. There are two general types of erosion that may occur: sheet and rill.

- 1) Sheet erosion is the gradual loss of a thin sheet of soil from the surface caused by a lack of vegetation. Sheet erosion is typically found in low-slope areas. To correct, the vegetation should be re-established and an erosion blanket may be needed.
- 2) Rill erosion is typified by multiple small channels on the face of a slope. One heavy rain can cut these channels and large amounts of sediment can be transported within a short period of time. Rill erosion will typically occur on moderate to steep slopes within a few years of construction. To correct, the slope should be re-graded and vegetated. The vegetation should be protected with an erosion control mat.

## **Appendix A**

### Soils Information

# Soil Map—Outagamie County, Wisconsin




**Natural Resources  
Conservation Service**

Web Soil Survey  
National Cooperative Soil Survey


2/26/2019  
Page 1 of 3


## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Outagamie County, Wisconsin

Survey Area Data: Version 12, Sep 11, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 31, 2015—Jun 2, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

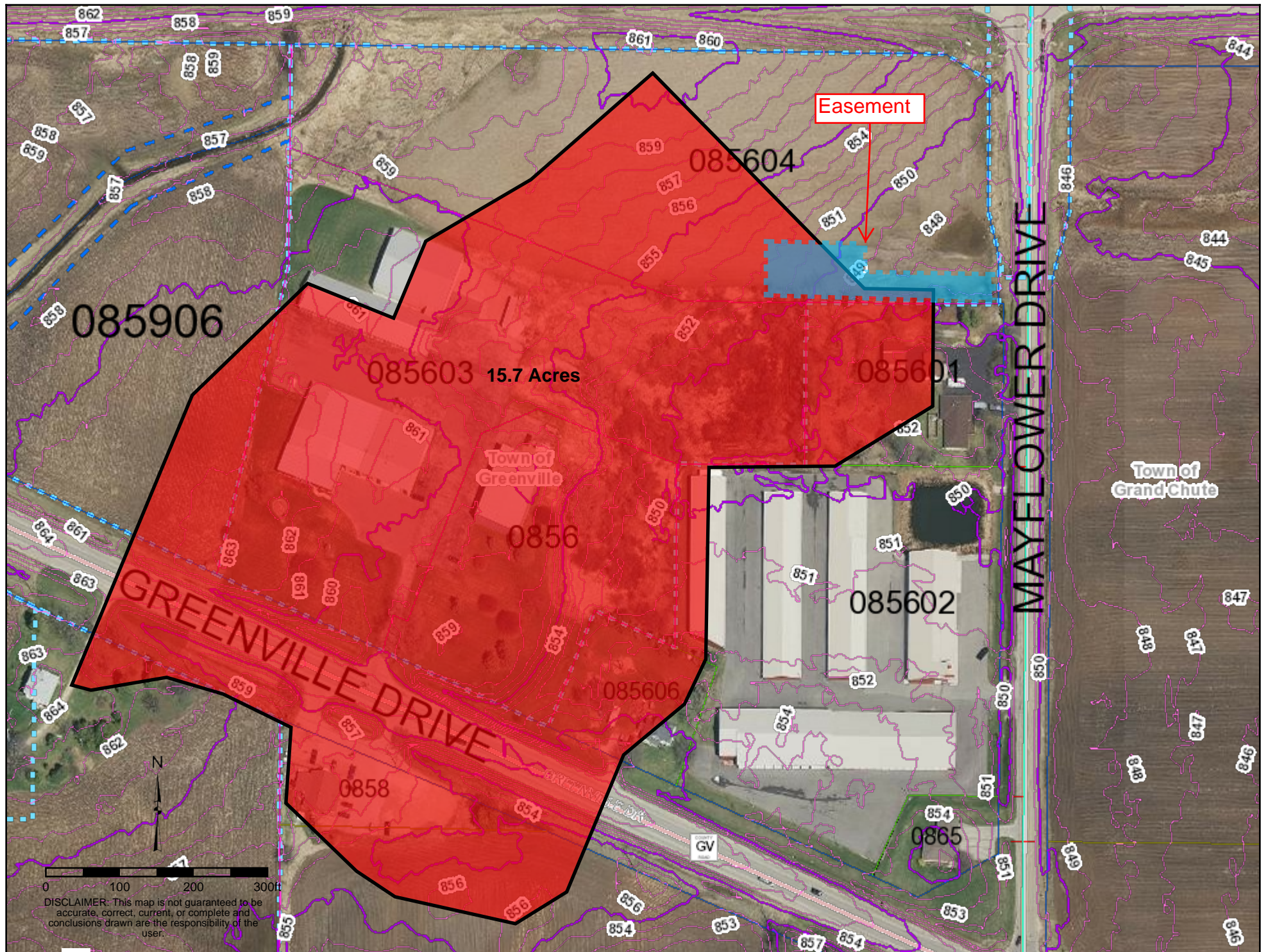
## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HrB	Hortonville silt loam, 2 to 6 percent slopes	6.0	72.9%
SyA	Symco silt loam, 0 to 3 percent slopes	2.2	27.1%
<b>Totals for Area of Interest</b>		<b>8.2</b>	<b>100.0%</b>



## **Appendix B**

### Drainage Basin Map



## **Appendix C**

WinSLAMM & Conveyance Calculations

Data file name: J:\Projects\5640wee\worksheets\WinSLAMM\5640.mdb  
 WinSLAMM Version 10.3.4  
 Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Green Bay WI 1969.RAN  
 Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI\_AVG01.pscx  
 Runoff Coefficient file name: C:\WinSLAMM Files\WI\_SL06 Dec06.rsvx  
 Residential Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
 Institutional Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std  
 Commercial Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std  
 Industrial Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std  
 Other Urban Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
 Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std  
 Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False  
 Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI\_GEO03.ppd  
 Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv  
 Cost Data file name:  
 Seed for random number generator: -42  
 Study period starting date: 01/02/69      Study period ending date: 12/28/69  
 Start of Winter Season: 11/25      End of Winter Season: 03/29  
 Date: 02-26-2019      Time: 18:33:20  
 Site information:

LU# 1 - Other Urban: Other Urban 1    Total area (ac): 0.231  
   1 - Roofs 1: 0.006 ac.    Pitched    Connected    Source Area PSD File: C:\WinSLAMM Files\NURP.cpz  
   25 - Driveways 1: 0.074 ac.    Connected    Source Area PSD File: C:\WinSLAMM Files\NURP.cpz    FS-CP#1  
   78 - Other Part Con Imp Areas 1: 0.151 ac.    Disconnected    Normal Clayey    Low Density    Source Area PSD  
 File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Filter Strip CP# 1 (SA) - SA Device, LU# 1 ,SA# 25  
   Total drainage area (acres)= 0.074  
   Fraction of drainage area served by filter strips (ac) = 1.00  
   Total filter strip width (ft) = 160.0  
   Effective flow length (ft) = 15  
   Infiltration rate (in/hr)= 0.050  
   Typical longitudinal slope (ft.H/ft.V) = 0.020  
   Typical grass height (in) = 4.0  
   Swale retardance factor = D  
   Use stochastic analysis to determine infiltration rate: False  
   Infiltration rate coefficient of variation (COV) = 0.00  
   Particle size distribution file name: Not needed - calculated by program  
   Surface Clogging Load (lbs/sf) = 3.50



Data file name: J:\Projects\5640wee\worksheets\WinSLAMM\5640.mdb  
Data file description:  
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Green Bay WI 1969.RAN  
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI\_AVG01.pscx  
Runoff Coefficient file name: C:\WinSLAMM Files\WI\_SL06 Dec06.rsvx  
Residential Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
Institutional Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std  
Commercial Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std  
Industrial Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std  
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std  
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI\_GEO03.ppd  
Start of Winter Season: 11/25      End of Winter Season: 03/29  
Model Run Start Date: 01/02/69    Model Run End Date: 12/28/69  
Date of run: 02-26-2019    Time of run: 18:32:49  
Total Area Modeled (acres): 0.231  
Years in Model Run: 0.99

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	5424	-	-	144.4	48.87
Outfall Total with Controls:	2774	48.86%	-	68.71	11.90
Annualized Total After Outfall Controls:	2813	-	-	12.06	75.65%

Pollutant Percent Reduction	Concentration - No Controls	Concentration - With Controls	Conc. Units	Pollutant Yield No Controls	Pollutant Yield With Controls	Pol. Yield Units
Particulate Solids	144.4	68.71	mg/L	48.87	11.90	lbs 75.65 %
Total Phosphorus	0.4674	0.2795	mg/L	0.1582	0.04840	lbs 69.42 %

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# Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.22

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-----	8.096	10.96	-----	-----	21.85	29.93	-----	44.43	Offsite Watershed
Proj. file: 5640runoff.gpw										Tuesday, Apr 2, 2019	



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	8.096	3	741	0.850	----	-----	-----	Offsite Watershed
5640runoff.gpw					Return Period: 1 Year			Tuesday, Apr 2, 2019	

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22

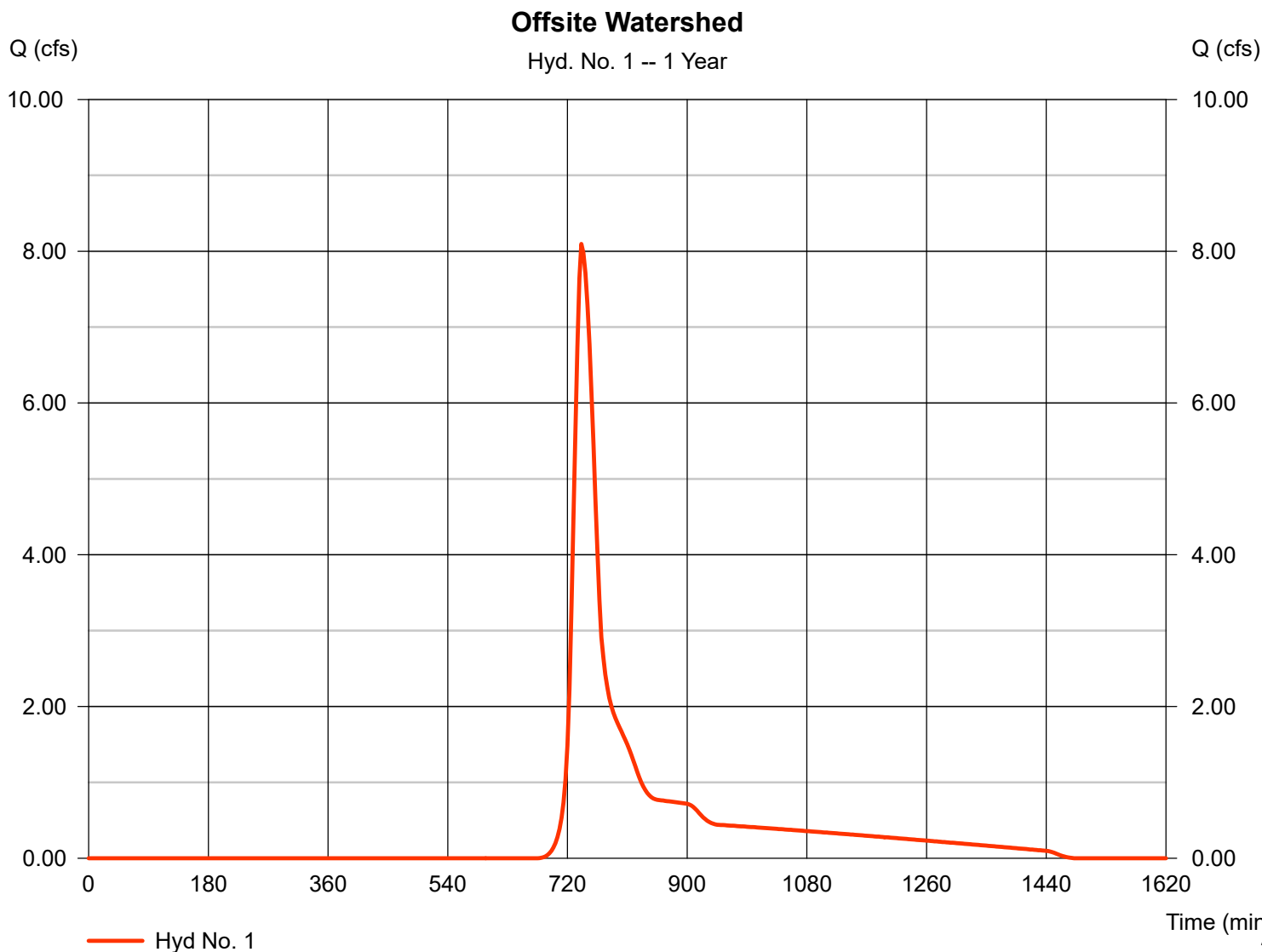
Tuesday, Apr 2, 2019

## Hyd. No. 1

### Offsite Watershed

Hydrograph type = SCS Runoff  
 Storm frequency = 1 yrs  
 Time interval = 3 min  
 Drainage area = 15.700 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 2.14 in  
 Storm duration = MSE4 (3 minute).cds

Peak discharge = 8.096 cfs  
 Time to peak = 741 min  
 Hyd. volume = 0.850 acft  
 Curve number = 80  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 29.90 min  
 Distribution = Custom  
 Shape factor = 484



# TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve v9.22

## Hyd. No. 1

Offsite Watershed

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
<b>Sheet Flow</b>							
Manning's n-value	= 0.240	0.011	0.011				
Flow length (ft)	= 100.0	0.0	0.0				
Two-year 24-hr precip. (in)	= 2.50	0.00	0.00				
Land slope (%)	= 1.00	0.00	0.00				
<b>Travel Time (min)</b>	<b>= 21.30</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>21.30</b>
<b>Shallow Concentrated Flow</b>							
Flow length (ft)	= 400.00	0.00	0.00				
Watercourse slope (%)	= 2.00	0.00	0.00				
Surface description	= Unpaved	Paved	Paved				
Average velocity (ft/s)	= 2.28	0.00	0.00				
<b>Travel Time (min)</b>	<b>= 2.92</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>2.92</b>
<b>Channel Flow</b>							
X sectional flow area (sqft)	= 12.00	0.00	0.00				
Wetted perimeter (ft)	= 8.00	0.00	0.00				
Channel slope (%)	= 0.80	0.00	0.00				
Manning's n-value	= 0.080	0.015	0.015				
Velocity (ft/s)	= 2.19	0.00	0.00				
Flow length (ft)	= 750.0	0.0	0.0				
<b>Travel Time (min)</b>	<b>= 5.72</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>5.72</b>
<b>Total Travel Time, Tc .....</b>					<b>29.90 min</b>		

# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	10.96	3	741	1.118	----	-----	-----	Offsite Watershed
5640runoff.gpw					Return Period: 2 Year			Tuesday, Apr 2, 2019	

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22

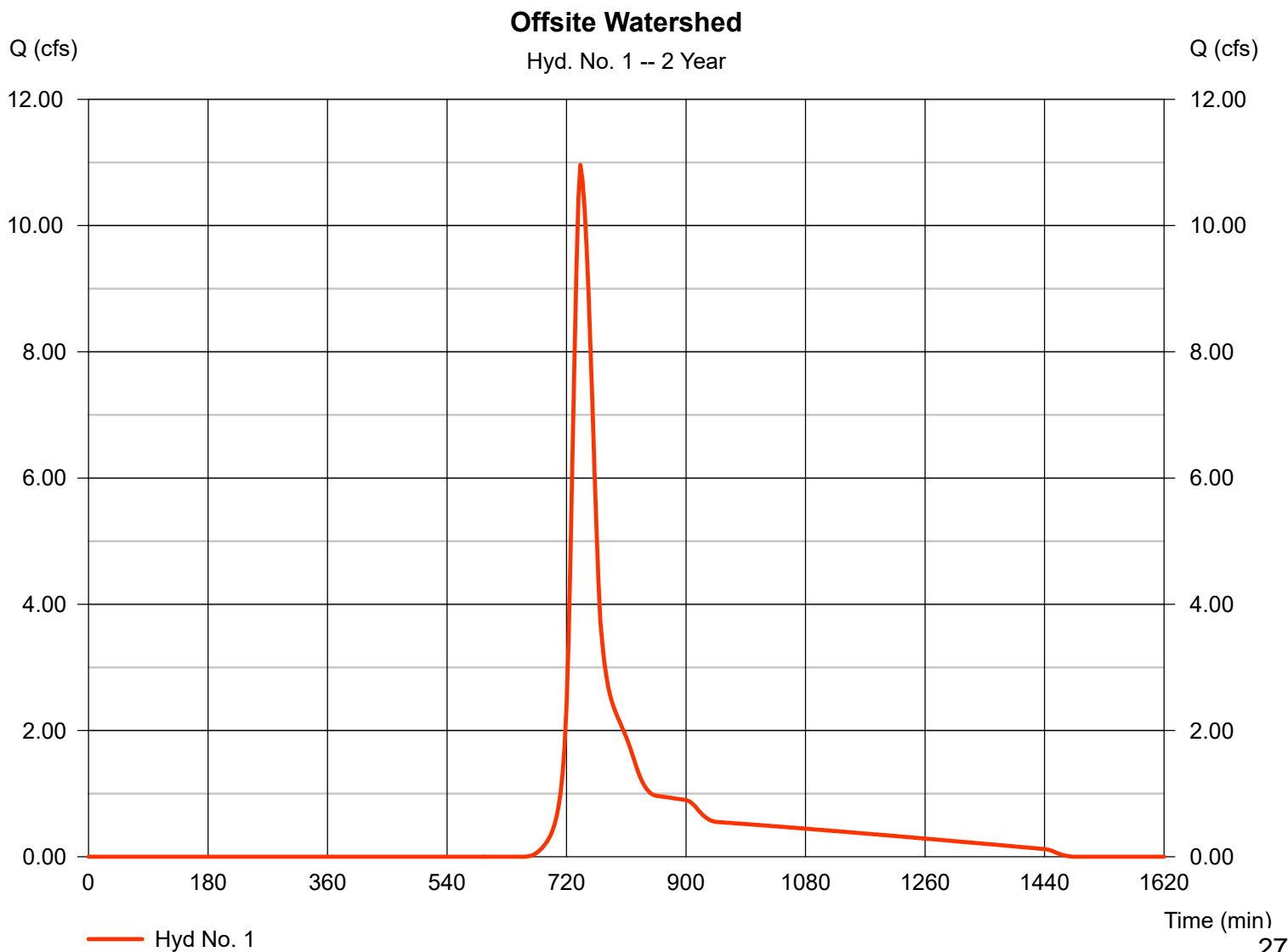
Tuesday, Apr 2, 2019

## Hyd. No. 1

### Offsite Watershed

Hydrograph type = SCS Runoff  
 Storm frequency = 2 yrs  
 Time interval = 3 min  
 Drainage area = 15.700 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 2.45 in  
 Storm duration = MSE4 (3 minute).cds

Peak discharge = 10.96 cfs  
 Time to peak = 741 min  
 Hyd. volume = 1.118 acft  
 Curve number = 80  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 29.90 min  
 Distribution = Custom  
 Shape factor = 484



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	21.85	3	741	2.151	----	-----	-----	Offsite Watershed
5640runoff.gpw					Return Period: 10 Year			Tuesday, Apr 2, 2019	

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22

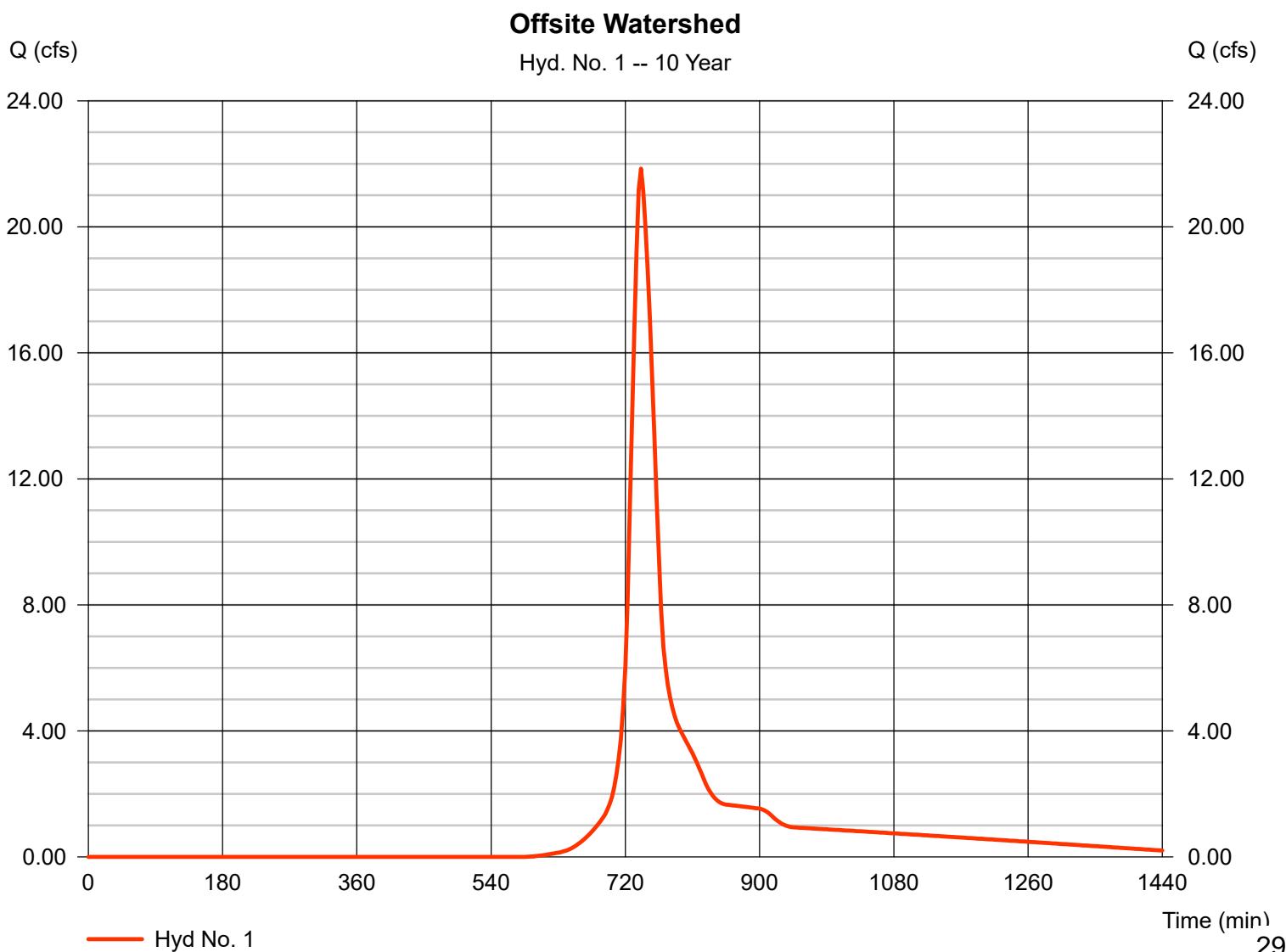
Tuesday, Apr 2, 2019

## Hyd. No. 1

### Offsite Watershed

Hydrograph type = SCS Runoff  
 Storm frequency = 10 yrs  
 Time interval = 3 min  
 Drainage area = 15.700 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 3.51 in  
 Storm duration = MSE4 (3 minute).cds

Peak discharge = 21.85 cfs  
 Time to peak = 741 min  
 Hyd. volume = 2.151 acft  
 Curve number = 80  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 29.90 min  
 Distribution = Custom  
 Shape factor = 484





# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	29.93	3	741	2.933	----	-----	-----	Offsite Watershed
5640runoff.gpw					Return Period: 25 Year			Tuesday, Apr 2, 2019	

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22

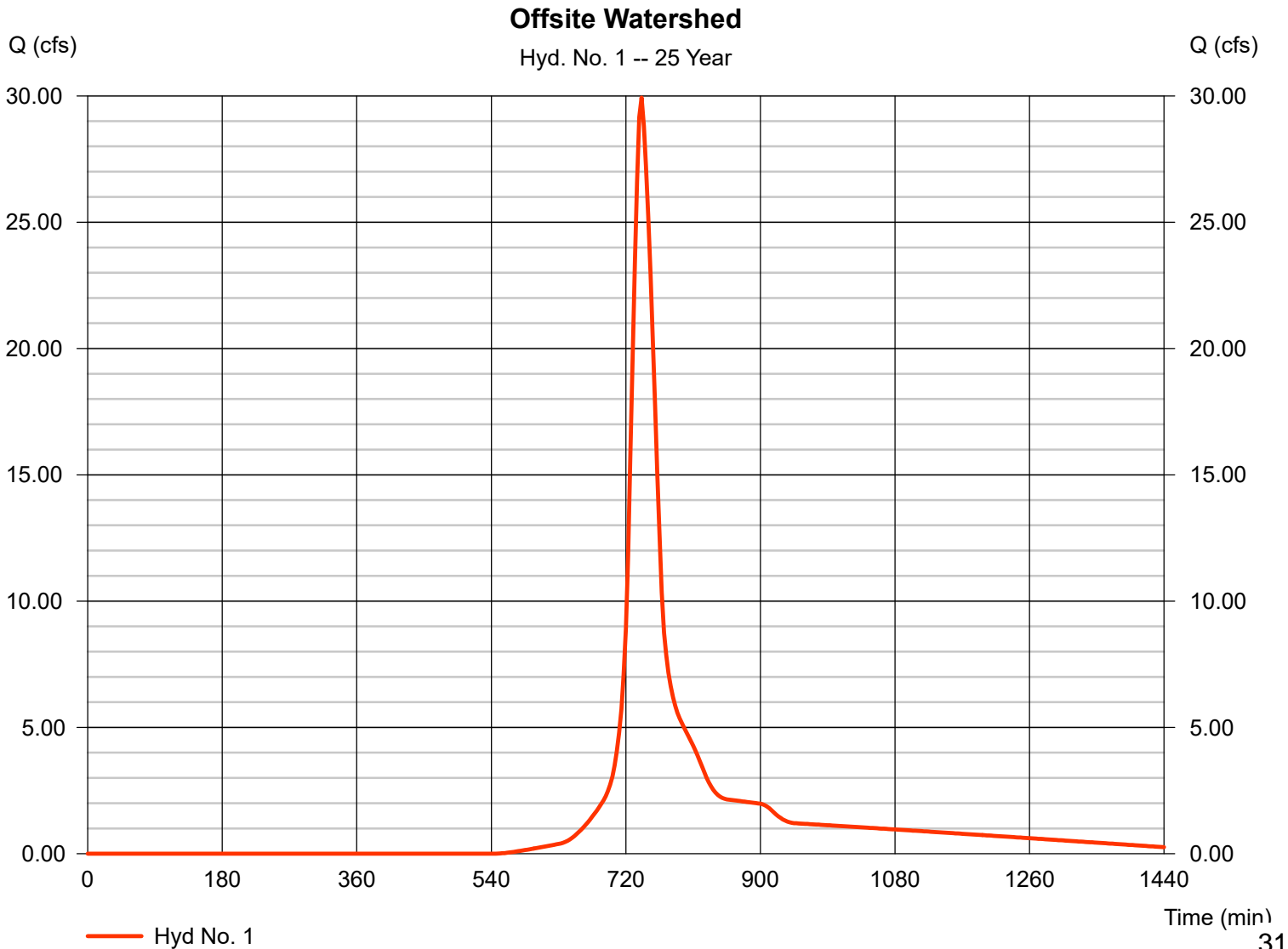
Tuesday, Apr 2, 2019

## Hyd. No. 1

### Offsite Watershed

Hydrograph type = SCS Runoff  
 Storm frequency = 25 yrs  
 Time interval = 3 min  
 Drainage area = 15.700 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 4.24 in  
 Storm duration = MSE4 (3 minute).cds

Peak discharge = 29.93 cfs  
 Time to peak = 741 min  
 Hyd. volume = 2.933 acft  
 Curve number = 80  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 29.90 min  
 Distribution = Custom  
 Shape factor = 484



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.22

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	44.43	3	741	4.361	----	-----	-----	Offsite Watershed
5640runoff.gpw					Return Period: 100 Year			Tuesday, Apr 2, 2019	

# Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.22

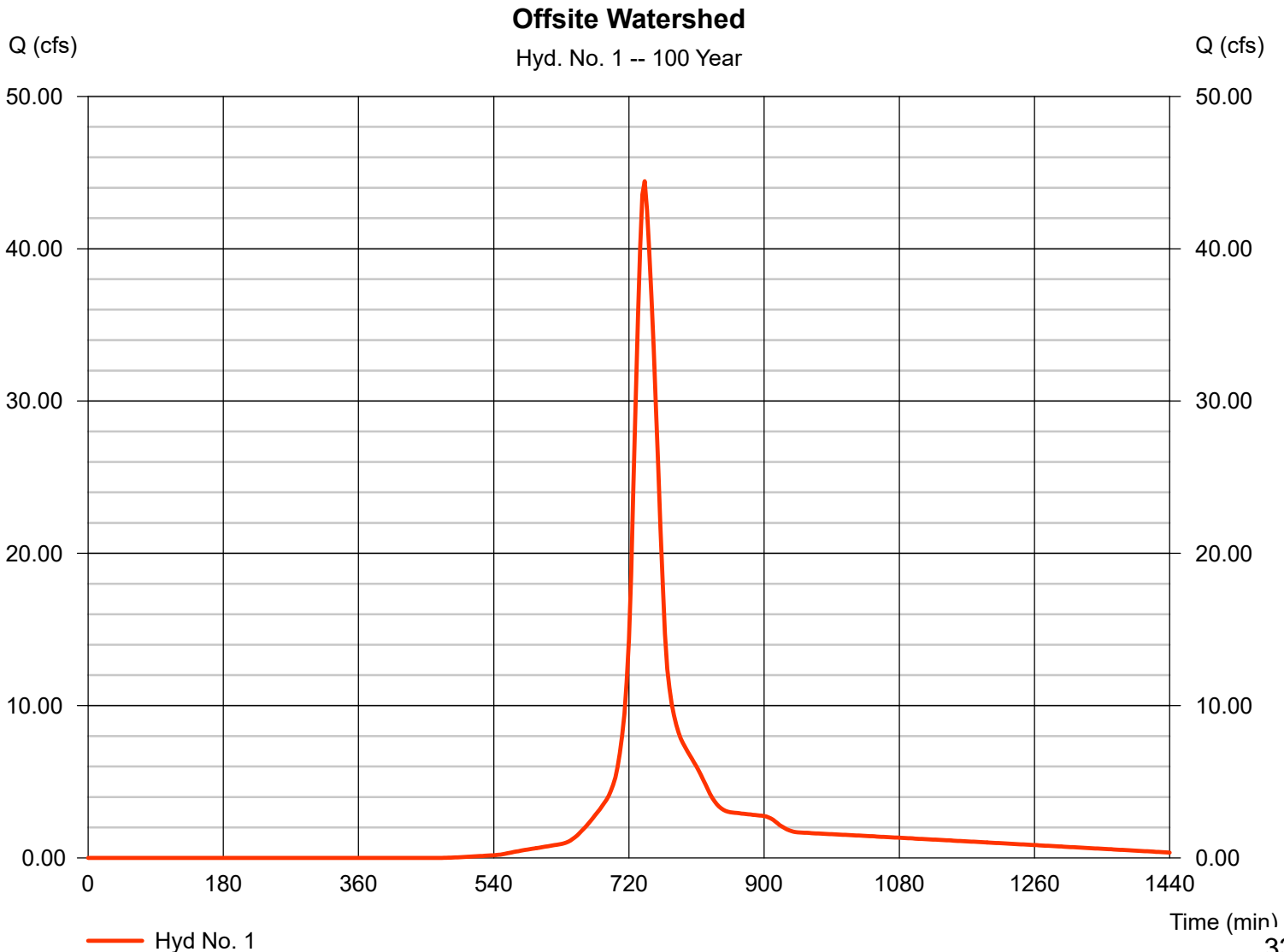
Tuesday, Apr 2, 2019

## Hyd. No. 1

### Offsite Watershed

Hydrograph type = SCS Runoff  
 Storm frequency = 100 yrs  
 Time interval = 3 min  
 Drainage area = 15.700 ac  
 Basin Slope = 0.0 %  
 Tc method = TR55  
 Total precip. = 5.50 in  
 Storm duration = MSE4 (3 minute).cds

Peak discharge = 44.43 cfs  
 Time to peak = 741 min  
 Hyd. volume = 4.361 acft  
 Curve number = 80  
 Hydraulic length = 0 ft  
 Time of conc. (Tc) = 29.90 min  
 Distribution = Custom  
 Shape factor = 484

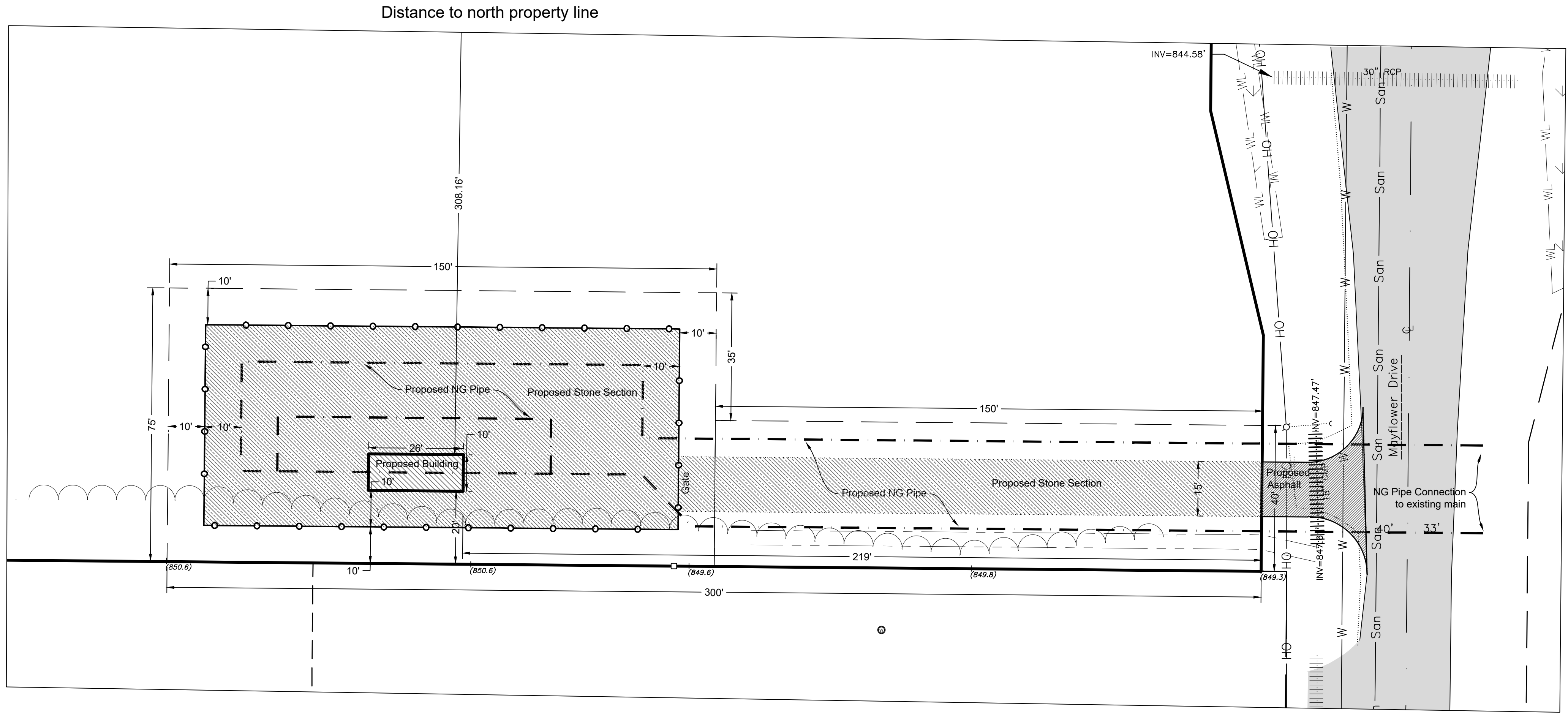


**Swale Bypass - Offsite Runoff**

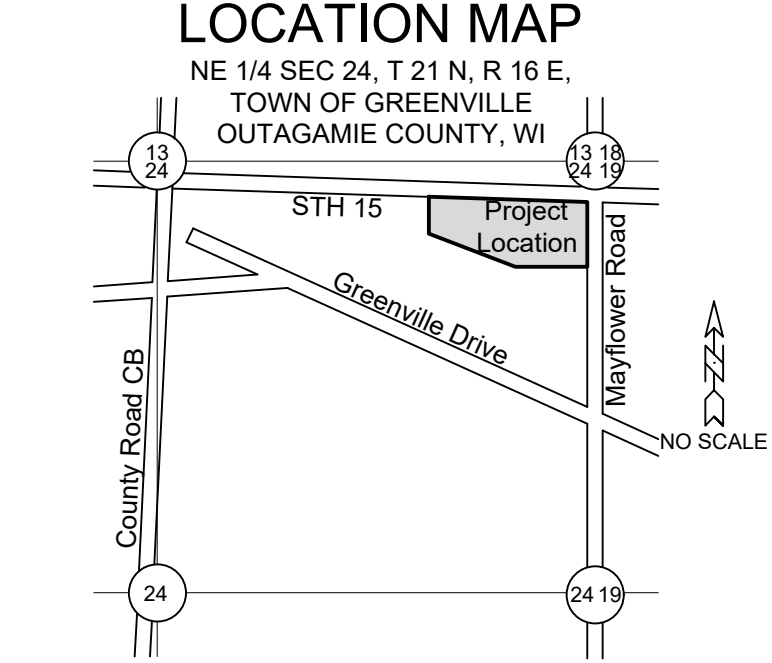
Minimum Channel Slope			Maximum Channel Slope		
Trapezoidal Channel Properties		Flow Characteristics	Trapezoidal Channel Properties		Flow Characteristics
Left Side Slope, H:1 (ft) =	4	Flow Depth, y (ft) =			Flow Depth, y (ft) =
Right Side Slope, H:1 (ft) =	4	Mannings n =			Mannings n =
Average Side Slope, z:1 (ft) =	4.00	Wetted Area, A (ft <sup>2</sup> ) =			Wetted Area, A (ft <sup>2</sup> ) =
Longitudinal Slope, S (ft/ft) =	0.0070	Wetted Perimeter, P (ft) =			Wetted Perimeter, P (ft) =
Bottom Width, B <sub>w</sub> (ft) =	4.00	Top Width, B <sub>T</sub> (ft) =			Top Width, B <sub>T</sub> (ft) =
Discharge, Q (cfs) =	15.00	Hydraulic Radius, R (ft) =			Hydraulic Radius, R (ft) =
		Velocity, v (ft/s) =			Velocity, v (ft/s) =
		Shear Stress, τ (lbs/ft <sup>2</sup> ) =			Shear Stress, τ (lbs/ft <sup>2</sup> ) =
Required BMP: Seed & Mulch			Required BMP: Class I Type B Erosion Mat		
Overland Overflow provided for larger flow capacity.					

## **Appendix D**

### Development Plans



LEGEND			
	Proposed Contour		Proposed Building
	Proposed Gas Line		Proposed Gravel
	Proposed Fence		Proposed Asphalt



### Project Information

Owner:  
We Energies  
333 West Everett  
Milwaukee, WI 53201  
Phone (414) 221-2850

Site:  
Parcel ID # 110085604

Zoning: General Commercial District  
Airport: Zone 2b

Easement Areas:  
Open Gradation: 10,090 square feet  
Building: 260 square feet  
Green Space: 6,900 square feet  
Total: 17,250 square feet

Setbacks:  
Front Town Road: 37'  
Rear: 20'  
Side: 20'  
Maximum Height: 20'

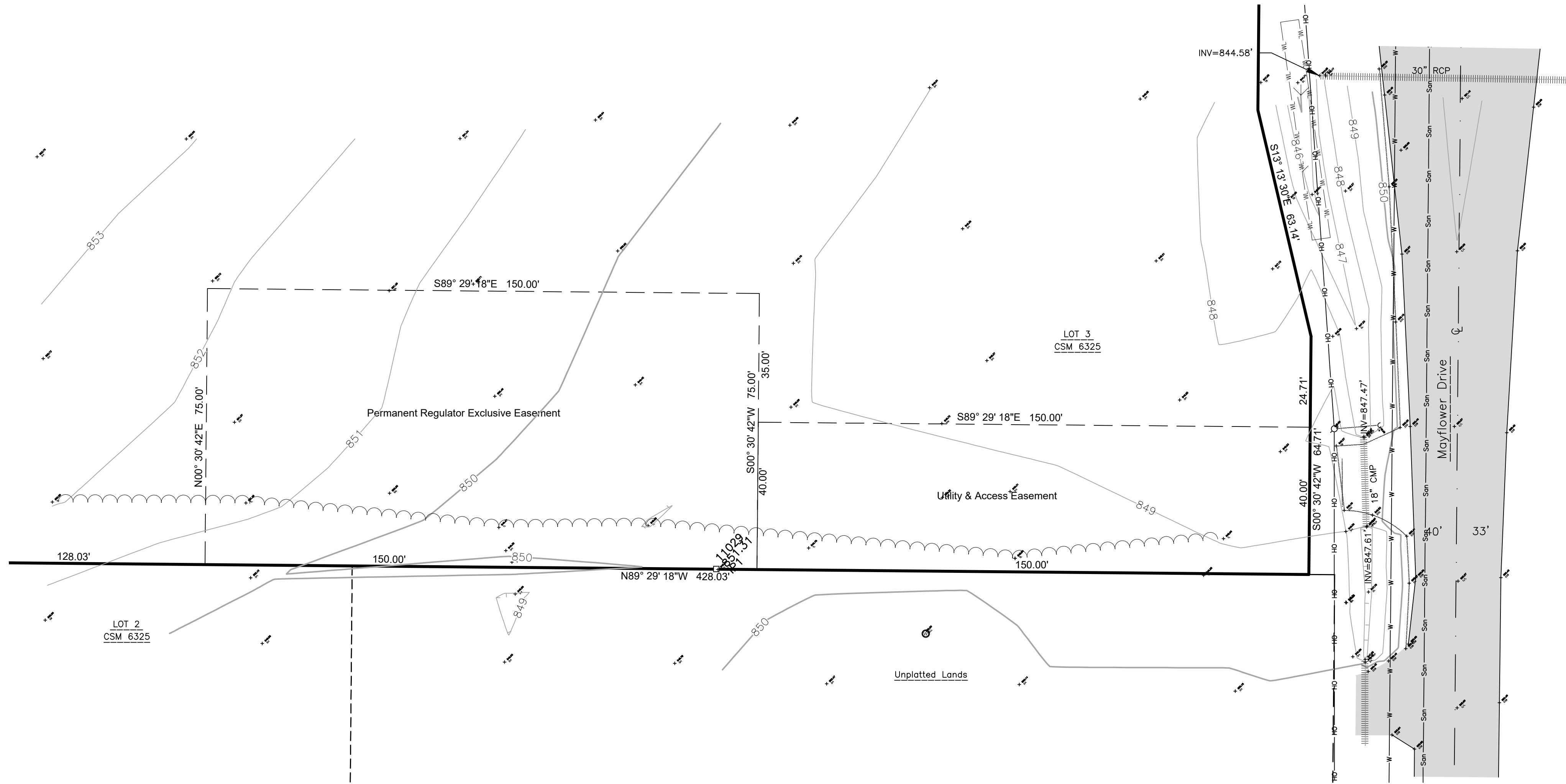
SHEET INDEX:	
Sheet	Page
Site Plan	1.0
Topographic Survey	1.1
Drainage and Grading Plan	1.2
Erosion & Sediment Control Plan	1.3

## SITE PLAN

Gas Regulator Station, Mayflower Drive  
Town of Greenville, Outagamie County, WI  
For: We Energies

Date:	04/1/2019
Filename:	5640engr.dwg
Author:	----
Last Saved by:	tim
Page	1.0



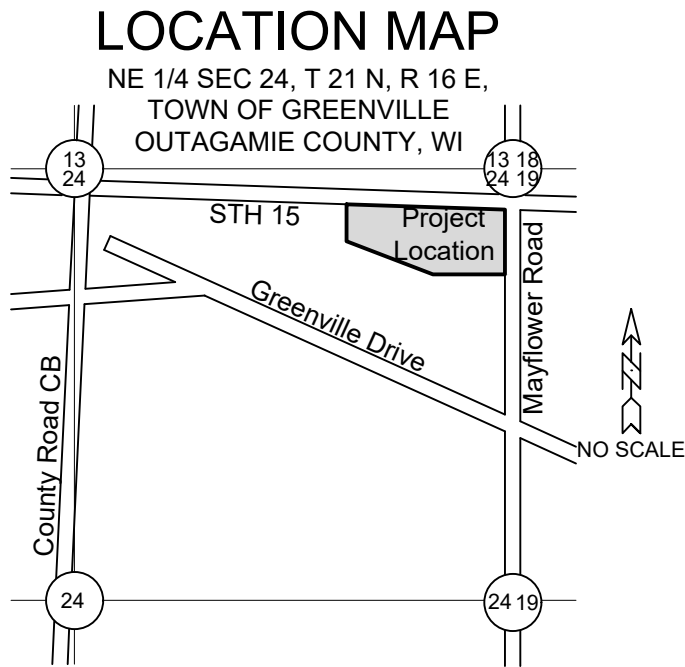


LEGEND

	Wetlands		Utility Pole		Benchmark
	Treeline		Guy Wire		Well
	Culvert		Ex Spot Elevation		Asphalt Pavement
	Index Contour				
	Intermediate Contour				



Bearings are referenced to the East line of the Northeast 1/4, Section 24, T21N, R16E, assumed to bear N00°30'42"E, base on the Outagamie County Coordinate System.



BENCHMARKS (NAVD88)

BM 0	NGS Monument(DF6092) West R/W of McCarthy Road Elev 819.20
BM 1	Fire Hydrant, Tag Bolt ±180' E of North of Easement Elev 850.47
BM 2	Nail In Power Pole ±80' N of BM 1 Elev 853.33

NOTES

This topographic survey was performed during winter conditions. Utility and ground features shown on this map are indicated based on what was observed at the time. Utility markings and existing features may have been covered by snow and/or ice and may not be shown on this map.

Existing utilities shown are indicated in accordance with available records and field measurements. The contractor shall be responsible for obtaining exact locations & elevations of all utilities, including sewer & water from the the property owners of the respective utilities. All utility the property owners shall be notified by the contractor 72 hours prior to excavation. Contact Digger's Hotline (1-800-242-8511) for exact utility locations.

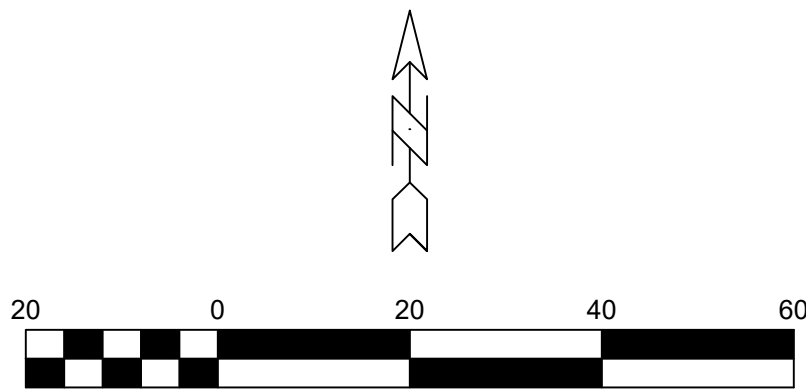
This is not a boundary survey.

TOPOGRAPHIC SURVEY

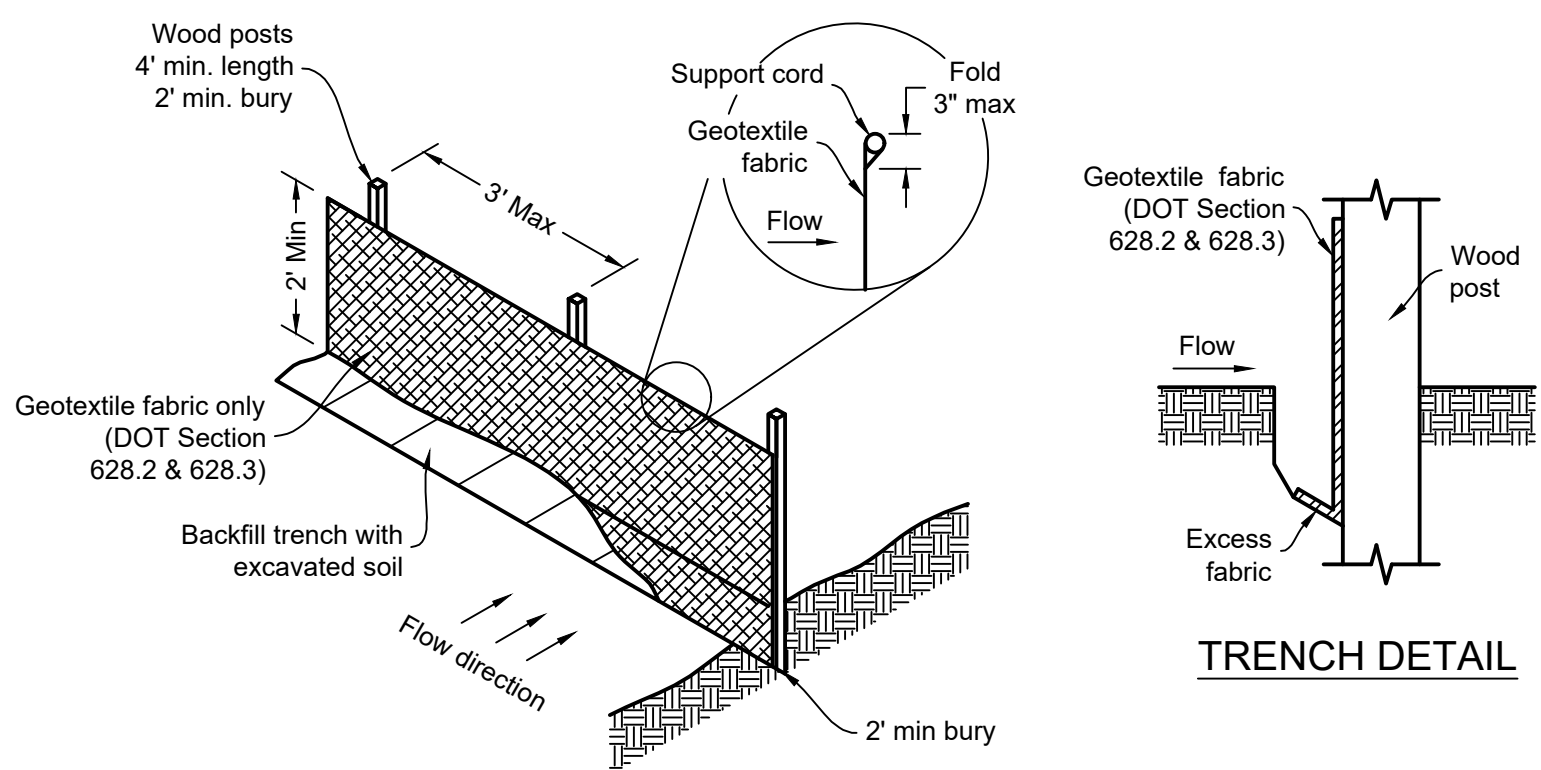
Gas Regulator Station, Mayflower Drive  
Town of Greenville, Outagamie County, WI  
For: We Energies



1. Existing utilities shown are indicated in accordance with available records and field measurements. The contractor shall be responsible for obtaining exact locations & elevations of all utilities, including sewer and water from the owners of the respective utilities. All utility owners shall be notified by the contractor 72 hours prior to excavation. Contact Digger's Hotline (1-800-242-8511) for exact utility locations.
2. The Contractor shall verify all staking and field layout against the plan and field conditions prior to constructing the work and immediately notify the Engineer of any discrepancies.
3. The contractor shall minimize the area disturbed by construction as the project is constructed. Disturbed areas shall be seeded as soon as final grade is established. Contractor shall replace topsoil and then seed, fertilize and mulch all lawn areas within 1 week of topsoil placement.
4. Contractor shall remove all excess materials from the site. Earthwork contractors shall verify topsoil depth.
5. Updated survey and title search have not been authorized and the boundary and easements shown may be inaccurate or incomplete.



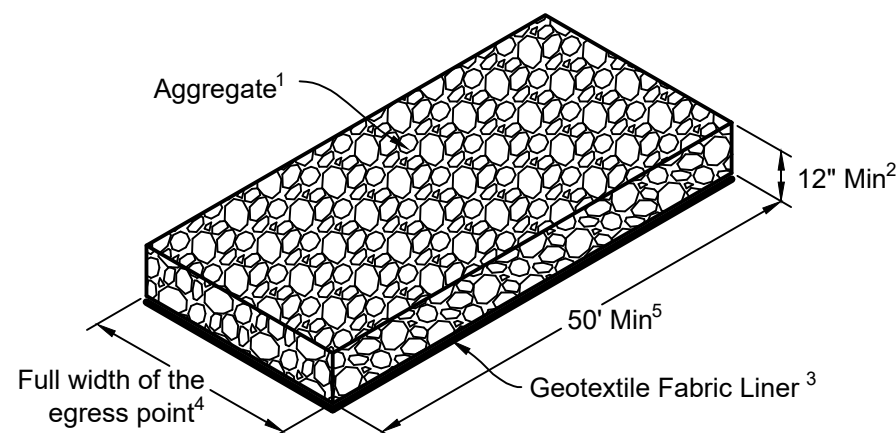
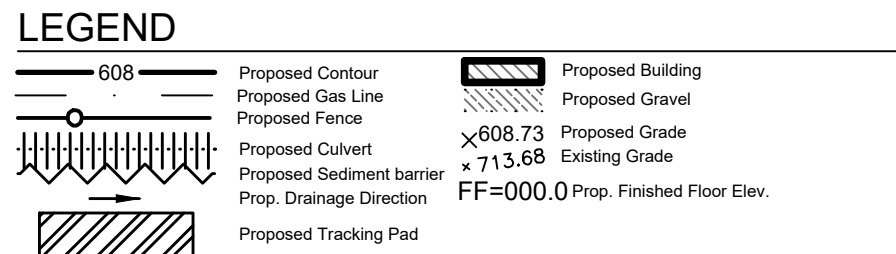




Silt fence notes:

- Detail of construction not shown on this drawings shall conform to criteria set by authorities having jurisdiction and by DNR Technical Standard 1056.
- When possible, the silt fence should be constructed in an arc or horseshoe shape with the ends pointing upslope to maximize both strength and effectiveness.
- Attach the fabric to the posts with wire staples or wooden lath and nails.
- 8'-0" post spacing allowed if a woven geotextile fabric is used.
- Trench shall be a minimum of 4" wide and 6" deep to bury and anchor the geotextile fabric. Fold material to fit trench and backfill and compact trench with excavated soil.
- Geotextile fabric shall be reinforced with an industrial polypropylene netting with a maximum mesh spacing of 3/4" or equal. A heavy-duty nylon top support chord or equivalent is required.
- Steel posts shall be studded "tee" or "u" type with a minimum weight of 128 lbs/lineal foot (without anchor). Pin anchors shall be a minimum size of 4" diameter or 1 1/2" x 3 1/2", except wood posts for geotextile fabric reinforced with netting shall be a minimum size of 1 1/8" x 1 1/8" oak or hickory.

SILT FENCE INSTALLATION



TRACKING PAD DETAIL

Note 1 Use hard, durable, angular stone or recycled concrete meeting the gradation in Table 1. Where this gradation is not available, meet the gradation in Wisconsin Department of Transportation (DOT) 2018 Standard Specification, Section 312. Select Crushed Material.

Note 2 Slope the stone tracking pad in a manner to direct runoff to an approved treatment practice.

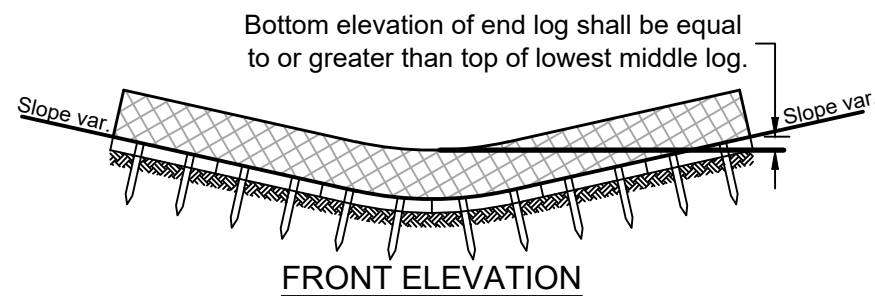
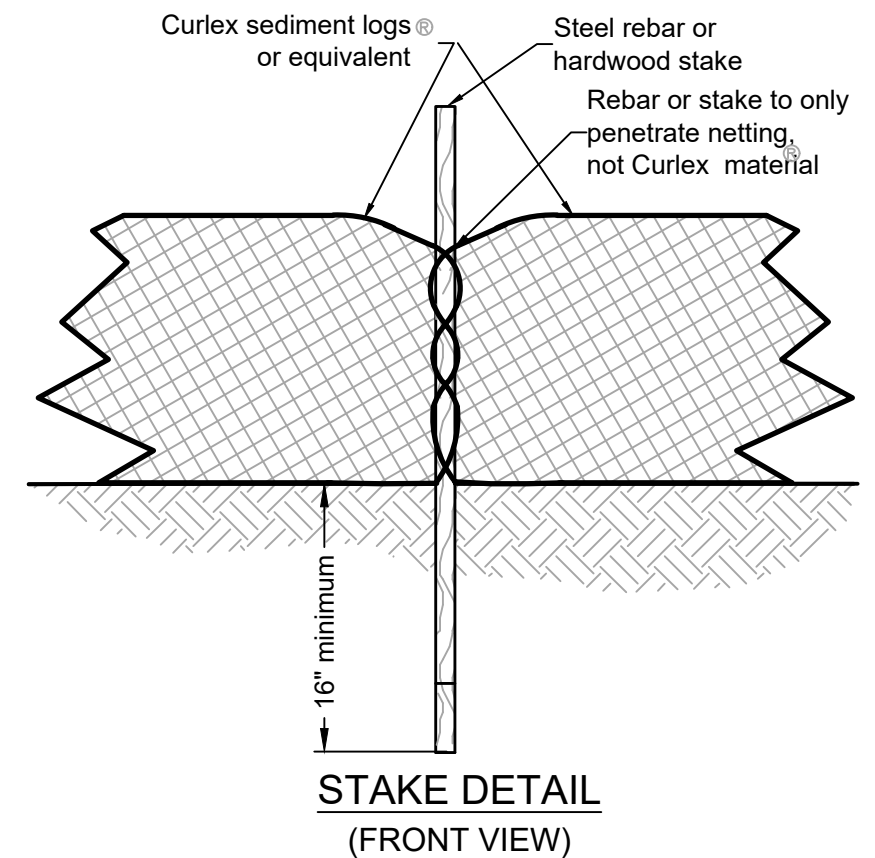
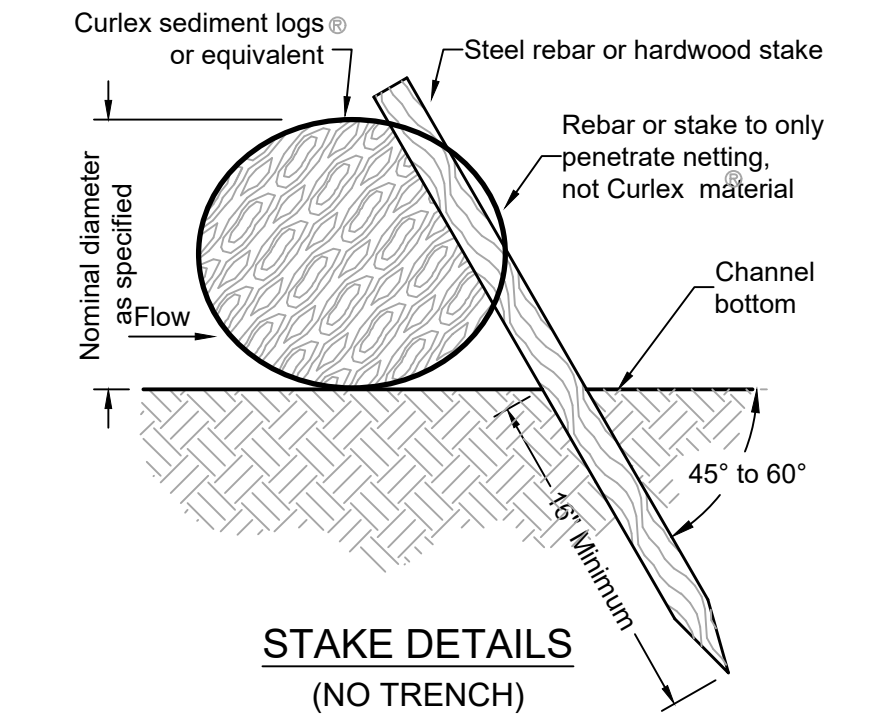
Note 3 Select fabric type based on soil conditions and vehicles loading.

Note 4 Install tracking pad across full width of the access point, or restrict existing traffic to a dedicated egress lane at least 12 feet wide across the top of the pad.

Note 5 If a 50' pad length is not possible due to site geometry, install the maximum length practicable and supplement with additional practices as needed.

TABLE 1: GRADATION FOR STONE TRACKING PADS

Sieve Size	Percent by weight passing
3"	100
2-1/2"	90-100
1-1/2"	25-60
3/4"	0-20
3/8"	0-5



NOTE: Stake installation shall meet manufacturer's requirements in regard to spacing, material, size, and bury depth.

SEDIMENT LOG DETAIL

**Site Description**  
The site is an easement for a natural gas regulator station. The site has access from an existing field access on Mayflower Drive. The balance of the property (outside the easement) is agricultural land within the Mud Creek watershed having outlet to the Mayflower Drive cross culvert north of the easement location.

**Soils**  
Soils are silt loam to silty clam loam being Hortonville Silt Loam and Symco Silt Loam.

Planned Sediment and Erosion Control Practices

All erosion control practices shall be in place prior to disturbing the site. All sediment and erosion control devices and methods shall be in accordance with DNR Technical Standards and the WisDOT Erosion Control product acceptability lists (PAL). It is the responsibility of the Contractor to minimize the area disturbed and the duration of the disturbance. Erosion & sediment control measures shall be maintained on a continuing basis until the site is permanently stabilized. All applicable controls must be in place at the end of each work day with all off-site sediments being cleaned daily or as necessary as no sediment flushing is allowed.

- Diverting Flow
  - Permanent Diversion - Intended to divert runoff around disturbed areas to a location where the water can be discharged without adversely impacting the receiving area or channel. Permanent diversions will be used to route runoff from the swale to the Mayflower Drive road ditch.
- Overland Flow
  - Silt Fence - Intended to provide a temporary barrier to the transportation of sediment offsite. Silt fencing also reduces the velocity of sheet flow, thereby reducing the erosion potential of flowing water. Silt fencing is not to be used in areas of channelized flow and sediment deposits shall be removed when a 6 inch depth is reached. The silt fence shall be repaired or replaced as necessary to maintain a barrier. **All Silt Fence shall be installed and maintained in accordance with DNR Technical Standard 1056.** It will be placed at the following locations:
    - along the site boundary where runoff will leave the site.
  - Mulching and Erosion Mat - Intended to reduce the amount of erosion caused by raindrop impact, high overland and concentrated flow velocities and assist the establishment of both temporary and permanent vegetation. **All Erosion Mat shall be installed and maintained in accordance with DNR Technical Standards 1052 and 1053 and all Mulching with DNR Technical Standard 1058.** In addition to mulching, Erosion Mat is required per plan and if field conditions warrant.
  - Seeding - Intended to provide a reduction of overland flow velocities and stabilize disturbed areas. Seeding will be used on all disturbed areas within seven days of the completion of the activity that will disturb the area. **All seeding shall be in accordance with DNR Technical Standard 1059.** A no mow seed mixture shall be applied for permanent seeding prior to September 15<sup>th</sup>. If required, temporary seeding shall consist of Oats, Rye, Winter Wheat, and/or Annual Ryegrass applied at rates and during the season specified by the Technical Standard but no later than November 1<sup>st</sup>. Sod placement may occur at any time sod is available and the sod and soil are not frozen.
- Permanent Channel Stabilization
  - Vegetated Waterway - Intended to establish permanent vegetation to reduce the velocity of concentrated runoff thereby protecting the waterway from erosion. The type of erosion mat used will depend upon the velocity of the runoff in the channel and are specified in accordance with DOT Erosion Control Product Acceptability Lists (PAL). Vegetated waterways will be used in the following areas:
    - drainage swale as indicated on the plans;
- Tracking Out Control - Intended to reduce the amount of sediment transported onto public roads. **The Tracking Pad shall be installed and maintained in accordance with DNR Technical Standard 1057.** A stone tracking pad will be constructed at the site entrance as indicated on the plan.
- Dust Control - Intended to reduce surface to air transport of dust during construction. **Dust control shall be implemented with use of methods provided in DNR Technical Standard 1068.** These methods include the use of polymers, seeding, and mulch.
- Dewatering BMP - Intended to reduce the amount of sediment conveyed due to dewatering practices. **Dewatering practices require compliance with DNR Technical Standard 1061.** The use of geotextile bags is required to prevent sedimentation with a stable discharge to the storm water pond or upland area (if pumping is required for stormwater pond construction). The bags shall meet the requirements of Technical Standard 1061. Upon completion of the dewatering operation, all materials must be disposed of properly in accordance with all state and local requirements. Dewatering is not anticipated.
- Waste Material - All onsite waste and construction materials shall be handled and disposed of properly. No pavement material, runoff from concrete washout, or other waste material is allowed to enter the drainage system or receiving waters.

Sequence of Construction

- Obtain plan approval and other applicable permits
- Install & maintain all sediment control measures: May 2019
- Strip topsoil in the area of the station and driveway: May 2019
- Site Work Construction (utilities, grade, gravel, building): May-June 2019
- Stabilize lawn and ditch areas no later than one week after final grade is established, the entire site shall be stabilized by the end of June with vegetation established prior to the end of 2019 growing season.
- Apron paving: July 2019

Maintenance Plan

The contractor is responsible for inspection and maintenance of sediment and erosion control measures until the project is completed. The inspections shall be made every seven days or within 24-hours of a rainfall event of 0.50-inch or greater. Any practices that are damaged or not working properly shall be repaired by the end of the day. Accumulated sediment shall be removed when it has reached a height of one-half the height of the structure. In addition, the following measures shall be taken:

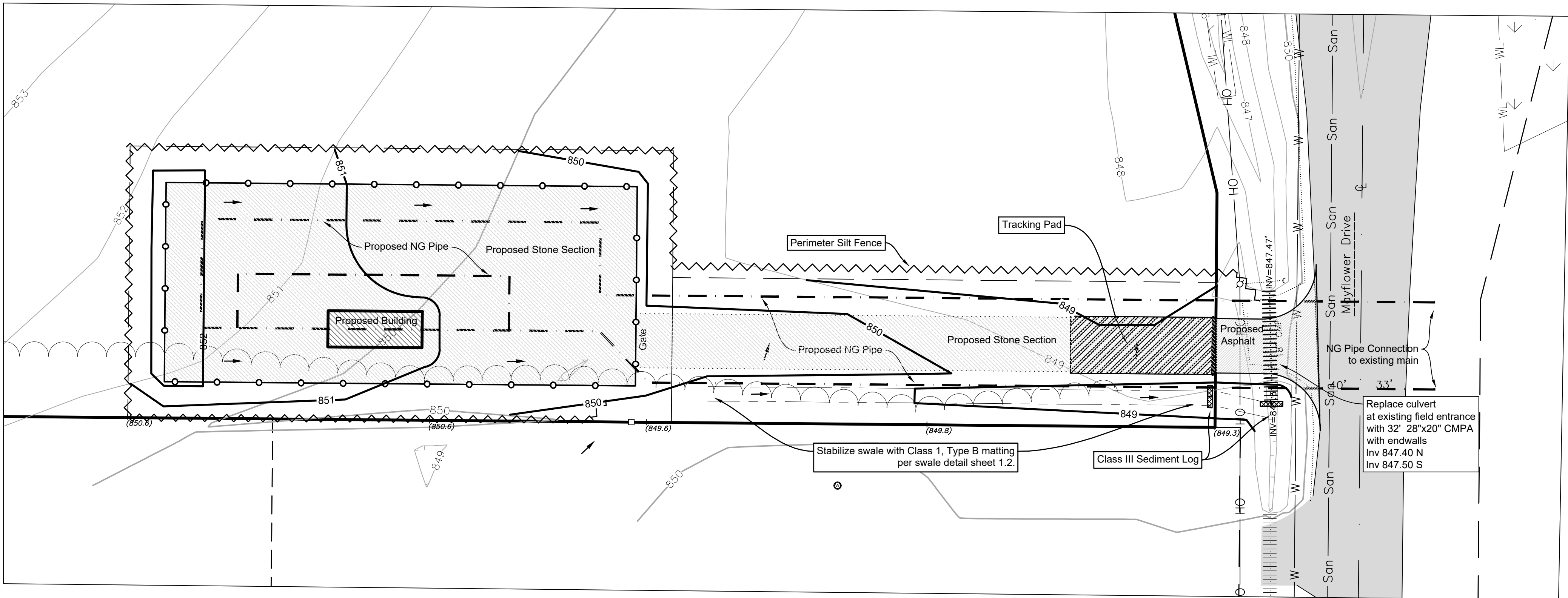
- All seeded areas will be re-seeded and mulched as necessary according to the specifications in the planned practices to maintain a vigorous, dense vegetated cover.
- Remove silt fence and temporary structures only after final stabilization and vegetative cover is established.
- Avoid the use of fertilizers and pesticides in or adjacent to channels or ditches.
- Construction and waste materials shall be properly disposed.

Weekly inspection reports shall be maintained by the contractor. These reports shall document inspections and maintenance performed. The date and time of the inspections, the inspector's name, and the status of construction and any maintenance performed. Refer to the DNR website for a template; <http://dnr.wi.gov/runoff/stormwater/constforms.htm#forms>. Upon request, the inspection reports shall be made available to the owner, the engineer, or the Town of Greenville.

Responsible Parties

**Best Management Practices (BMPs) Construction and Maintenance:**  
To be Determined (TBD)

**BMP Inspection and Compliance Enforcement**  
Town of Greenville



## **Appendix E**

### Storm Water System Maintenance Agreement

**TOWN OF GREENVILLE  
STORMWATER FACILITIES  
MAINTENANCE AGREEMENT**

Document No. \_\_\_\_\_

**THIS STORMWATER MAINTENANCE AGREEMENT** made between the TOWN OF GREENVILLE, Outagamie County, Wisconsin, a body politic and municipal corporation, by its Town Board of Supervisors, ("Town"), and ***We Energies***, ("Owner"):

**WHEREAS**, the Owner has proposed to develop property lying within the Town of Greenville, Outagamie County, Wisconsin, described as follows:

***Gas Distribution and Regulator Easement per document number \_\_\_\_\_ being part of Lot 3 of CSM 6325 being located in part of the Northeast ¼ of the Northeast ¼ of section 24, township 21 north, range 16 east, Town of Greenville, Outagamie County, Wisconsin.***

*Recording Area*

**WHEREAS**, the Owner has submitted for approval by the Town a permit application and Storm Water Management Plan, to utilize stormwater management facilities pursuant to the Town of Greenville Stormwater Management Ordinance; and

**WHEREAS**, the Stormwater Management Ordinance requires, as a condition of permit approval, a financial guarantee and maintenance agreement between the Town and the Owner to ensure that the Owner will maintain the stormwater facilities identified in the Stormwater Management Plan; and

**WHEREAS**, the Town and Owner have agreed to the estimated costs of the stormwater management facilities restoration and the method of financial security to ensure the facilities will be constructed according to the plan.

**NOW THEREFORE, IT IS AGREED AS FOLLOWS:**

**1. Identification of Facilities and Costs.** The Owner shall connect stormwater discharges to the stormwater management facilities as depicted and shown on the Site Plan, attached hereto as ***Exhibit B***, in accordance with the plans and specifications contained in the Stormwater Management Plan dated ***March 1, 2019*** on file with the Town, within two years from the date of this Agreement. The estimated cost of such facilities, including erosion control, is itemized as follows:

<b><i>Erosion &amp; Sediment Controls / Restoration</i></b>	<b><i>\$2,700</i></b>
---	-----------------------

**2. Financial Guarantee.** To ensure that the stormwater management improvements will be timely constructed according to plans and specifications in the Stormwater Management Plan and as a condition of approval of a permit, the Owner shall provide one of the following financial guarantees in the amount of 100 percent of the above estimated costs.

- a. **Cash Bond.** The Owner may make a cash deposit of funds in the Town of Greenville Stormwater Management Trust Fund that has a separate numbered account for each Owner/ stormwater management permit involving a cash bond. The Owner shall execute a deposit agreement providing that the Town may draw all or a portion of the account funds to complete the stormwater management practices and facilities pursuant to a draw request signed by the Town Chair and attested to by the Town Clerk.
- b. **Escrow Account.** In lieu of a cash bond, the Owner may provide a financial guarantee by the establishment of an escrow account for the benefit of the Town of Greenville and in the name of the Town of Greenville. The escrow instructions shall provide: (1) that the Owner shall have no right to a return of any of the funds except as authorized by the Town upon completion of the stormwater management practices and facilities; and (2) that the escrow agent shall have a legal duty to deliver all or a portion of the escrowed funds to the Town of Greenville upon receipt of written notice from the Town of Greenville signed by the Town Board Chair and attested to by the Town Clerk, whether or not the Owner protests delivery of all or a portion of the funds. The escrow agent shall be acceptable to the Town of Greenville.
- c. **Letter of Credit.** In lieu of a cash bond or escrow account, the Owner may provide a financial guarantee by a letter of credit for the benefit of the Town of Greenville and in the name of the Town of Greenville. The letter of credit shall be: 1) irrevocable; (2) for a term sufficient for the completion and inspection of stormwater management practices and facilities; and (3) require only that the Town of Greenville present the credit with a sight draft and written notice, signed by the Town Board Chair and attested to by the Town Clerk, of the Town's right to draw funds under the credit. The issuer of the letter of credit shall be acceptable to the Town of Greenville.

**3. Maintenance.** The Owner shall maintain the stormwater management facilities in good working order in accordance with their design functions and the Stormwater Post-Construction Maintenance Plan. The Owner shall conduct regular inspections at least two times per year. The Operations and Maintenance Report attached to the Stormwater Post-Construction Maintenance Plan shall be used in connection with the regular inspections. The Owner shall keep the Operations and Maintenance Reports from past inspections and shall keep a log of all maintenance activities, including the date and type of maintenance performed. The reports and maintenance log shall be made available to the Town for review upon request. Deficiencies shall be noted in the Operations and Maintenance Reports.

**4. Access.** The Owner hereby grants to the Town the right to access the property to conduct inspections of the stormwater management facilities during construction; the right to access the property, upon reasonable notice to the Owner, to conduct inspections to determine whether the stormwater management facilities are maintained pursuant to the schedule of maintenance; and the right to access the property upon 30 days written notice, to perform required maintenance. The Town may assess the cost of such maintenance against the Owner/property.

**5. Protection.** The Owner hereby agrees to restrict use of the property to protect the stormwater practices facilities. No building or structure (except for stormwater management ) shall hereafter be erected, constructed or moved into or onto any detention or retention pond, drainageway, drainage easement or vegetative buffer. No fill, grading or excavating (except for the construction and maintenance of the drainage facilities) shall be constructed within any detention or retention pond, drainageway, drainage easement, or vegetative buffer. There shall be no cultivation of crops, fruits or vegetables; no dumping of ashes, waste, compost, or other garden, lawn, or domestic waste; nor any storage of vehicles, equipment, materials, or personal property of any kind in or on any detention or retention pond, drainageway, drainage easement, or vegetative buffer.

**6. Successors.** This Stormwater Facilities Maintenance Agreement shall bind the Owner, his, her or its successors and assigns, and shall inure to the benefit of the Town of Greenville.

OWNER: \_\_\_\_\_

TOWN OF GREENVILLE

\_\_\_\_\_  
Owner

\_\_\_\_\_  
Jack Anderson, Town Chair

ATTEST:

\_\_\_\_\_  
Wendy Helgeson, Town Clerk

Personally came before me this \_\_\_\_  
day of \_\_\_\_\_, 2\_\_\_\_, the above  
\_\_\_\_\_  
to me known to be the person(s) who  
executed the foregoing instrument and  
acknowledged the same.

Personally came before me this \_\_\_\_  
day of \_\_\_\_\_, 2\_\_\_\_, the above  
Randy Leiker & Deborah Wagner  
to me known to be the person(s) who  
executed the foregoing instrument and  
acknowledged the same.

\_\_\_\_\_  
Notary Public, State of Wisconsin  
My commission expires:\_\_\_\_\_

\_\_\_\_\_  
Notary Public, State of Wisconsin  
My commission expires:\_\_\_\_\_



---

## TECHNICAL MEMORANDUM

---

To: Dave Tebo, Community Development Director – Town of Greenville

From: Nick Vande Hey, P.E., CPESC - McMAHON  
Phil Kleman, CPESC - McMAHON

Date: August 25, 2017

Re: TIF District Stormwater Planning

McM No.: G0014-9-17-00491.04

---

The purpose of this Technical Memorandum is to summarize the findings of our recent street and stormwater planning effort for the portion of the Town's TIF District generally located east of CTH CB, west of Mayflower Drive, north of STH 96 and south of STH 15. The stormwater planning also looked at benefiting a future multi-use trail located along the west side of CTH CB and portions of the developed Business Park located west of CTH CB, north of STH 96, and south of STH 15. Stormwater management options for the Business Park are intended to assist the Town with Municipal Stormwater Permit and Total Maximum Daily Load (TMDL) compliance. Figure 1 depicts the stormwater planning area, TIF District boundary, future multi-use trail and drainage areas associated with the Business Park.

### Wetland Delineation

To assist with the stormwater planning, we reviewed the area for the presence of wetlands. A formal wetland delineation was performed on the Schlimm and Coenen properties, as they provided consent to access the site to conduct the necessary field work. A formal wetland delineation was not performed on the Koerner (Erners) property, as consent was not provided to access the site. As such, we completed a desktop review of the Koerner (Erners) property to identify potential wetland areas on based on soils mapping and aerial photography. It's of note that we extended the wetland desktop review onto the Schroth properties located south of the stormwater planning area and down to STH 96. The potential wetlands on the Schroth properties were considered as part of developing the overall street layout, as it's anticipated that Schroth Lane would be extended north into the TIF district. A formal wetland delineation report was prepared for the Schlimm and Coenen properties. The wetland delineation report has not been submitted to the Department of Natural Resources (DNR) for concurrence. Figure 2

depicts the delineated wetlands on the Schlimm and Coenen properties and the potential wetland areas on the Koerner (Ermers) & Schroth properties.

Regulated wetlands cannot be filled or impacted without permit approval from the DNR and in some cases, the U.S. Army Corps of Engineers (ACOE). It should be noted that even if wetlands are not filled or disturbed, the DNR typically reviews potential wetland impacts due to hydrology changes. Development of the stormwater planning area will involve general site grading that will most likely change current drainage patterns and possibly hydrology to existing wetlands. As such, individual developments in the TIF District and stormwater planning area will need to consider wetland hydrology when designing their site. Furthermore, the DNR typically requires some pre-treatment before discharging to wetland areas. Although detailed wetland hydrology calculations were not performed as part of the stormwater planning exercise, maintaining wetland hydrology was considered during the development of the potential street, lot and stormwater facility layouts and is discussed further in the Stormwater Planning section below.

### **Navigable Streams**

The DNR was contacted to conduct navigability determinations for the waterways that drain through the stormwater planning area. The DNR determined that the waterway that crosses STH 15 and CTH GV is navigable up to the east side of CTH CB. For reference, this navigable stream is tributary to Bear Creek and flows in a northeasterly direction. The DNR determined that the waterway further to the south that drains most of the Town's Business Park from CTH CB is navigable up to the east side of Tower View Drive. This navigable waterway drains east and discharges into another waterway that flows east to Mayflower Road. The DNR determined that the waterway that crosses Mayflower Road and STH 96 is navigable past STH 96 and into the Appleton International Airport property. For reference, this navigable stream is tributary to Mud Creek and flows in a northeasterly direction.

To assist with the stormwater planning, approximate 100-year flooding limits along the navigable streams were determined using the XP-SWMM hydrologic and hydraulic computer model. The approximate 100-year flooding limits are depicted on Figure 3. The approximate 100-year flooding limits, along with the delineated / potential wetlands, help depict the remaining "buildable areas" on lots adjacent to the navigable streams and wetlands.

### **Airport Air Operations Area (AOA)**

It's of note that the entire stormwater planning area is within 10,000 feet of the Appleton International Airport AOA. Any stormwater facility within 10,000 feet of the AOA is required to obtain a Special Exception Permit from the Outagamie County Zoning Committee. For ponds that will hold water for more than 48-hours after a rain event, there is specific design guidance that will need to be satisfied in

order to obtain the Special Exception Permit. Much of the design guidance is geared towards monitoring the pond area for bird use and ensuring wildlife that are hazardous to aviation are not using the pond site. When developing opinions of probable cost for the proposed stormwater management options, we provided a bird control line item in anticipation of having to install a wire-system similar to what was installed at the Towering Pines West Pond.

### **Stormwater Planning**

NR 151 and the Town's post-construction stormwater management ordinance identify performance standards for water quality, peak discharge, infiltration, protective areas and fueling & vehicle maintenance areas. The stormwater planning effort only focuses on the water quality and peak discharge performance standards. Infiltration, protective areas and fueling & vehicle maintenance areas were not investigated as part of this planning effort. Based on NRCS soil maps, infiltration will likely be exempt pursuant to NR 151. The Town's water quality performance standards are determined by the sub-watershed that the development is located within. The TIF District area is located within the Mud Creek and Bear Creek sub-watersheds. The Mud Creek sub-watershed is part of the Lower Fox River Basin, for which a Total Maximum Daily Load (TMDL) has been developed and approved. The LFR Basin TMDL identifies pollutant reduction goals for total suspended solids (TSS) and total phosphorus (TP). As such, new development within the Mud Creek sub-watershed requires an 80% TSS and a 48% TP reduction. The Bear Creek sub-watershed is part of the Upper Fox & Wolf River Basin, for which a TMDL is currently being developed. As such, the Bear Creek sub-watershed currently requires an 80% TSS reduction. It's anticipated that once the Upper Fox & Wolf River Basin TMDL is approved, the Bear Creek sub-watershed will also include a TP reduction. The Town's peak discharge performance standard requires the post-development peak discharge rates for the 1, 2, 10 and 100-year design storm events to be reduced down to the respective pre-development peak discharge rates. The pre-development condition refers to a "meadow" land use condition.

The stormwater planning effort included developing two slightly different potential street and lot layouts for the stormwater planning area. Stormwater management options were then developed that will satisfy the water quality and peak discharge performance standards for the stormwater planning area. Furthermore, stormwater management options that benefit the future multi-use trail along CTH CB and the Business Park were also evaluated to assist the Town with Municipal Stormwater Permit and TMDL compliance.

#### **I. Potential Layout 1**

Figure 4 depicts a potential lot and street layout, including several proposed stormwater facilities for the stormwater planning area. It's anticipated that Lots 1-5 and 17-20 will have their own on-site stormwater facilities to satisfy water quality, peak discharge and wetland

recharge goals. These lots are generally on the smaller side and have restricted developable areas due to wetland and/or 100-year flooding limits. It's anticipated that Lots 1-5 and 17-20 will utilize biofilters, sand filters, permeable pavement, vegetated swales, proprietary devices, dry detention or any combination thereof to satisfy the water quality and peak discharge performance standards. These types of best management practices (BMP's) are better suited to serve smaller drainage areas (less than 5 acres) as compared to wet detention ponds. However, it may be difficult to achieve the required TP reduction on these lots, as the DNR currently limits TP removal credits for some of these BMPs. For example, the current engineered soil used in biofilters does not provide any TP removal credit. Sand filters and permeable pavement currently provide a filtering credit of 35% TP. It's of note that DNR allows 100% TSS and TP removal credit for the volume of runoff that is infiltrated into the underlying soil. As such, the on-site soils and their respective infiltration rates may ultimately dictate the overall TP reduction provided to the maximum extent practicable (MEP). A small on-site stormwater facility is also anticipated on Stormwater Outlot 4 to provide treatment for the future street between the two navigable waterways that are tributary to Mud Creek.

A regional wet detention pond (Pond A) is proposed to serve the TIF district development generally located south of CTH GV, east of CTH CB and north of the future Design Drive. It's anticipated that lots 6-12 will drain to the proposed Pond A located on Stormwater Outlot 1 via storm sewer and/or drainage swales. Wetland hydrology should be able to be maintained to the larger wetland area that runs east-west across lots 6, 8 & 9 through general site grading. It's anticipated that a culvert may be needed under the future street to allow this wetland area to continue to drain east. From there, the wetland area would drain south along Lots 9 & 10 and then east along Lots 10 & 11 and into the pond. The watershed for Pond A is approximately 97 acres. The 3.6 acre Pond A is anticipated to achieve an 80% TSS and 60% TP reduction for its post-development watershed.

Another regional wet detention pond (Pond B) is proposed to serve future development located south of the TIF district and Design Drive. It's anticipated that Lots 13-15 will drain to the proposed Pond B located on Stormwater Outlot 2 via storm sewer and/or drainage swales. Wetland hydrology should be able to be maintained to the larger wetland area that drains south along Lots 13 & 14 to the navigable waterway through general site grading. Since the waterway that drains east along the south side of Lots 13-15 is considered navigable, it may be necessary to collect flows from the larger wetland area prior to discharging into the stream with a storm sewer or grass swale in order to convey flows to the pond. The watershed for Pond B is approximately 41 acres. The 1.5 acre Pond B is anticipated to achieve an 80% TSS and 60% TP reduction for its post-development watershed.

In order to provide stormwater management for the future multi-use trail along CTH CB and Business Park area, several regional wet detention pond concepts were also developed. In an effort to improve water quality within the Bear Creek sub-watershed, a large regional wet detention pond (Levi Pond) is proposed west of CTH CB and south of Levi Drive. The existing dry pond north of School Specialty would be converted to a wet pond and expanded. The Levi Pond watershed is approximately 362 acres and would have permanent pool area of 5.3 acres. It's anticipated the Levi Pond would achieve an 80% TSS and 60% TP reduction for its post-development watershed.

In an effort to improve water quality within the Mud Creek sub-watershed, two regional wet detention ponds are proposed east of CTH CB to treat the remaining portions of the Business Park, including the future multi-use trail. The proposed Business Park Pond is located just south of the northern navigable waterway contributory to Mud Creek and would serve a majority of the Business Park and Lot 16. Since navigability of the waterway begins on the east side of Tower View Drive, it's anticipated that a storm sewer interceptor will be needed to convey flows from the west side of Tower View Drive and the Business Park to the Pond. The watershed for the Business Park Pond is approximately 142 acres. The 3.4 acre Business Park Pond is anticipated to achieve an 80% TSS and 60% TP reduction for its post-development watershed.

The proposed Wisconsin Pond is located near the intersection of CTH CB and STH 96 and would serve the southern portion of the Business Park. The watershed for the Wisconsin Pond is approximately 57 acres. The 1.1 acre Wisconsin Pond is anticipated to achieve an 80% TSS and 60% TP reduction for its post-development watershed.

Although outside of the stormwater planning area, another regional wet detention pond (Pond C) concept was developed for the area south of navigable stream tributary to Mud Creek. It's anticipated that lots 21-26 will drain to the proposed Pond C located on Stormwater Outlot 5 via storm sewer and/or drainage swales. The watershed for Pond C is approximately 49 acres. The 1.7 acre Pond C is anticipated to achieve an 80% TSS and 60% TP reduction for its post-development watershed. No opinion of probable cost was prepared for this concept, as it was outside of the stormwater planning area.

Figure 5 depicts the watersheds associated with each of the regional stormwater ponds identified with Layout 1. Opinions of probable costs for each of various regional stormwater ponds related to Layout 1 were developed. These opinions of probable costs include land acquisition, engineering & construction and are summarized below:

- Pond A: \$903,500
- Pond B: \$481,900

- Levi Pond: \$1,975,300
- Business Park Pond: \$1,350,000
- Wisconsin Pond: \$533,400

## II. Potential Layout 2

Figure 6 depicts another potential lot and street layout, including several proposed stormwater facilities for the stormwater planning area. It's anticipated that Lots 1-5, 15-16, 19-23 will have their own on-site stormwater facilities to satisfy water quality, peak discharge and wetland recharge goals. These lots are generally on the smaller side and have restricted developable areas due to wetland and/or 100-year flooding limits. It's anticipated that Lots 1-5, 15-16, 19-22 will utilize biofilters, sand filters, permeable pavement, vegetated swales, proprietary devices, dry detention or any combination thereof to satisfy the water quality and peak discharge performance standards. These types of best management practices (BMP's) are better suited to serve smaller drainage areas (less than 5 acres) as compared to wet detention ponds. However, it may be difficult to achieve the required TP reduction on these lots, as the DNR currently limits TP removal credits for some of these BMPs. For example, the current engineered soil used in biofilters does not provide any TP removal credit. Sand filters and permeable pavement currently provide a filtering credit of 35% TP. It's of note that DNR allows 100% TSS and TP removal credit for the volume of runoff that is infiltrated into the underlying soil. As such, the on-site soils and their respective infiltration rates may ultimately dictate the overall TP reduction provided to the maximum extent practicable (MEP). Lot 23 may be suitable to construct a small wet detention pond.

A regional wet detention pond (Pond A) is proposed to serve the TIF district development generally located south of CTH GV, east of CTH CB and north of the future Design Drive. It's anticipated that lots 6-11 will drain to the proposed Pond A located on Stormwater Outlot 1 via storm sewer and/or drainage swales. Wetland hydrology should be able to be maintained to the larger wetland area that runs east-west across lots 6-9 through general site grading. It's anticipated that a culvert may be needed under the future street to allow this wetland area to continue to drain east and into the pond. The watershed for Pond A is approximately 86 acres. The 3.1 acre Pond A is anticipated to achieve an 80% TSS and 60% TP reduction for its post-development watershed.

Another regional wet detention pond (Pond B) is proposed to serve future development located south of the TIF district and Design Drive. It's anticipated that Lots 12-14 will drain to the proposed Pond B located on Stormwater Outlot 2 via storm sewer and/or drainage swales. Wetland hydrology should be able to be maintained to the larger wetland area that drains south along Lots 12 & 13 to the navigable waterway through general site grading or the Design Drive

Storm Sewer Diversion discussed below. The watershed for Pond B is approximately 41 acres. The 1.5 acre Pond B is anticipated to achieve an 80% TSS and 60% TP reduction for its post-development watershed.

In order to provide stormwater management for the future multi-use trail along CTH CB and Business Park area, several regional wet detention pond concepts were also developed. In an effort to improve water quality within the Bear Creek sub-watershed, a large regional wet detention pond (Levi Pond) is proposed west of CTH CB and south of Levi Drive. The existing dry pond north of School Specialty would be converted to a wet pond and expanded. However, rather than re-treating water from the existing Pebble Park Pond, a storm sewer is proposed along the north side of Levi Drive to divert runoff from the Pebble Park Pond to the large wetland area that drains south along Lots 12 & 13. It should be noted that the Pebble Park Pond currently achieves a 74.8% TSS reduction. It's recommended that an outlet structure be added to the Pebble Park Pond to increase its water quality benefits so it can satisfy the water quality requirements (80% TSS reduction) for future development within its contributing watershed. By diverting the Pebble Park Pond discharge, the contributing watershed to the Levi Pond is significantly reduced allowing for a smaller permanent pool area. Furthermore, the Design Drive Storm Sewer Diversion would assist in maintaining hydrology to the large wetland area that drains south along Lots 12 & 13. It should be noted that if this option is pursued, it's recommended a detailed hydrologic and hydraulic analysis be completed to ensure there are no increase in flows or water surface elevations to the Mud Creek tributaries. The smaller Levi Pond concept would have a contributing watershed of approximately 149 acres, which also includes treating the CTH CB storm sewer from the roundabout near Community First Credit Union. The Levi Pond would have permanent pool area of 3.1 acres and would achieve an 80% TSS and 60% TP reduction for its post-development watershed.

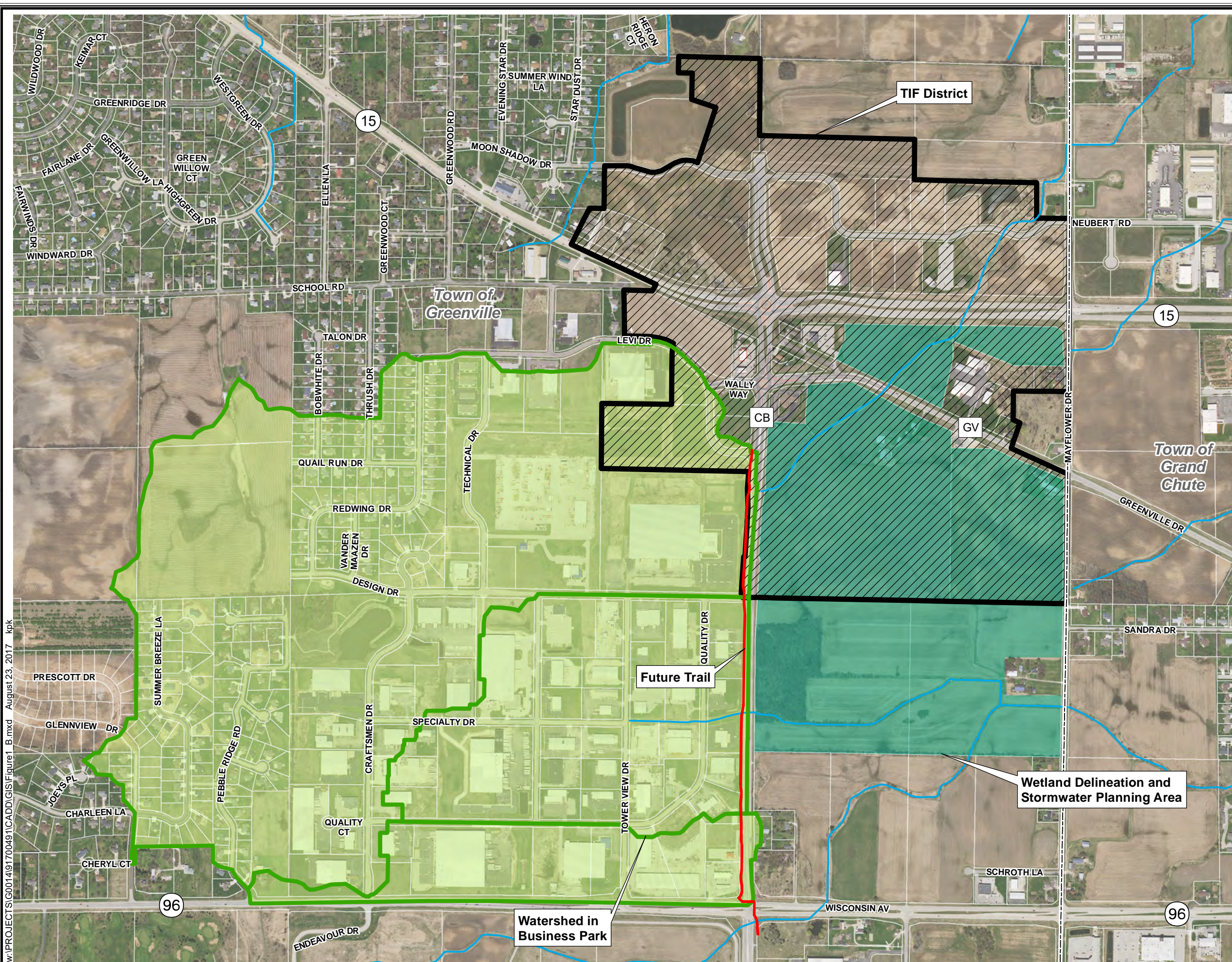
In an effort to improve water quality within the Mud Creek sub-watershed, a large regional wet detention pond (Business Park Pond) is proposed east of the future north/south street on Stormwater Outlot 3 to treat the remaining portions of the Business Park, including the future multi-use trail. The proposed Business Park Pond would also serve Lots 17 & 18 and a portion of the future north/south street. The watershed for the Business Park Pond is approximately 218 acres. The 4.7 acre Business Park Pond is anticipated to achieve an 80% TSS and 60% TP reduction for its post-development watershed.

Figure 7 depicts the watersheds associated with each of the regional stormwater ponds identified with Layout 2. Opinions of probable costs for each of various regional stormwater ponds related to Layout 2 were developed. These opinions of probable costs include land acquisition, engineering & construction and are summarized below:

- Pond A: \$1,436,800
- Pond B: \$399,100
- Levi Pond: \$1,550,300
- Design Drive Storm Sewer Diversion: \$244,800
- Business Park Pond: \$2,630,500

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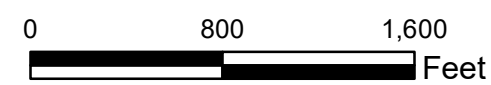


**Mapped Features**

- Wetland Delineation and Stormwater Planning Area
- Watershed
- TIF District
- Future Trail
- Municipal Boundary
- Parcel Line
- Stream

Source: Outagamie County, 2014-17.

Disclaimer: The property lines, right-of-way lines, and other property information on this drawing were developed or obtained as part of the County Geographic Information System or through the County property tax mapping function. McMAHON ASSOCIATES, INC. does not guarantee this information to be correct, current, or complete. The property and right-of-way information are only intended for use as a general reference and are not intended or suitable for site-specific uses. Any use to the contrary of the above stated uses is the responsibility of the user and such use is at the user's own risk.





**FIGURE 1  
PLANNING AREA  
TIF DISTRICT  
STORMWATER PLANNING  
TOWN OF GREENVILLE  
OUTAGAMIE COUNTY, WISCONSIN**

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### Wetlands

-  Delineated Wetlands
-  Potential Wetlands (Not Delineated)

### Other Mapped Features

-  TIF District
-  Municipal Boundary
-  Parcel Line
-  Navigable Stream

Source: Outagamie County, 2014-17.

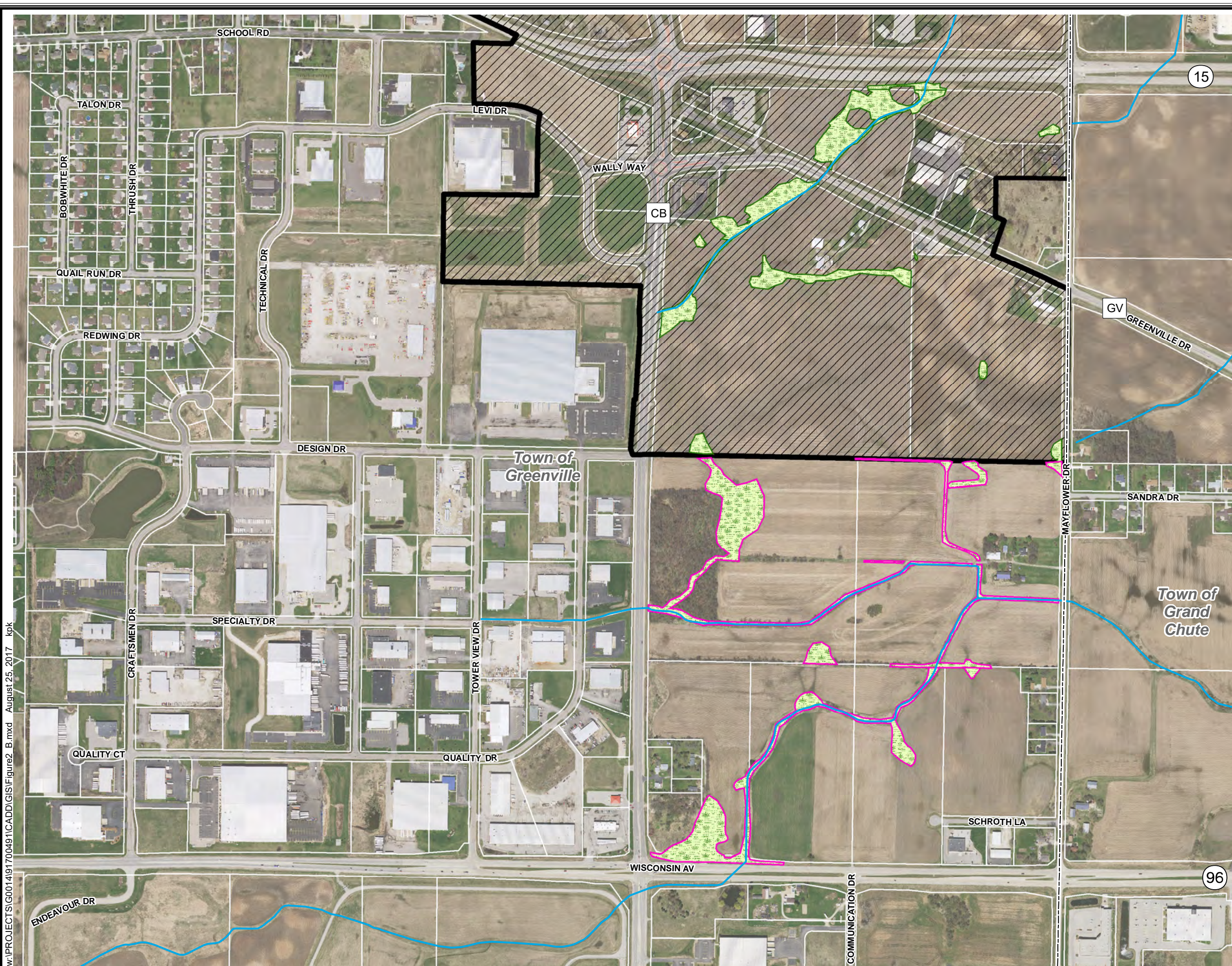
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0 600 1,200 Feet

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**FIGURE 2  
WETLANDS**  
TIF DISTRICT  
STORMWATER PLANNING  
TOWN OF GREENVILLE  
OUTAGAMIE COUNTY, WISCONSIN







Navigable Stream

Approximate 100-Year Flooding Limits

**Other Mapped Features**

TIF District

Municipal Boundary

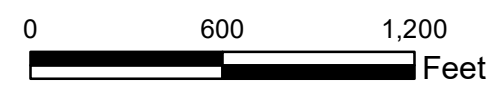
Parcel Line

Existing Storm System

Culvert

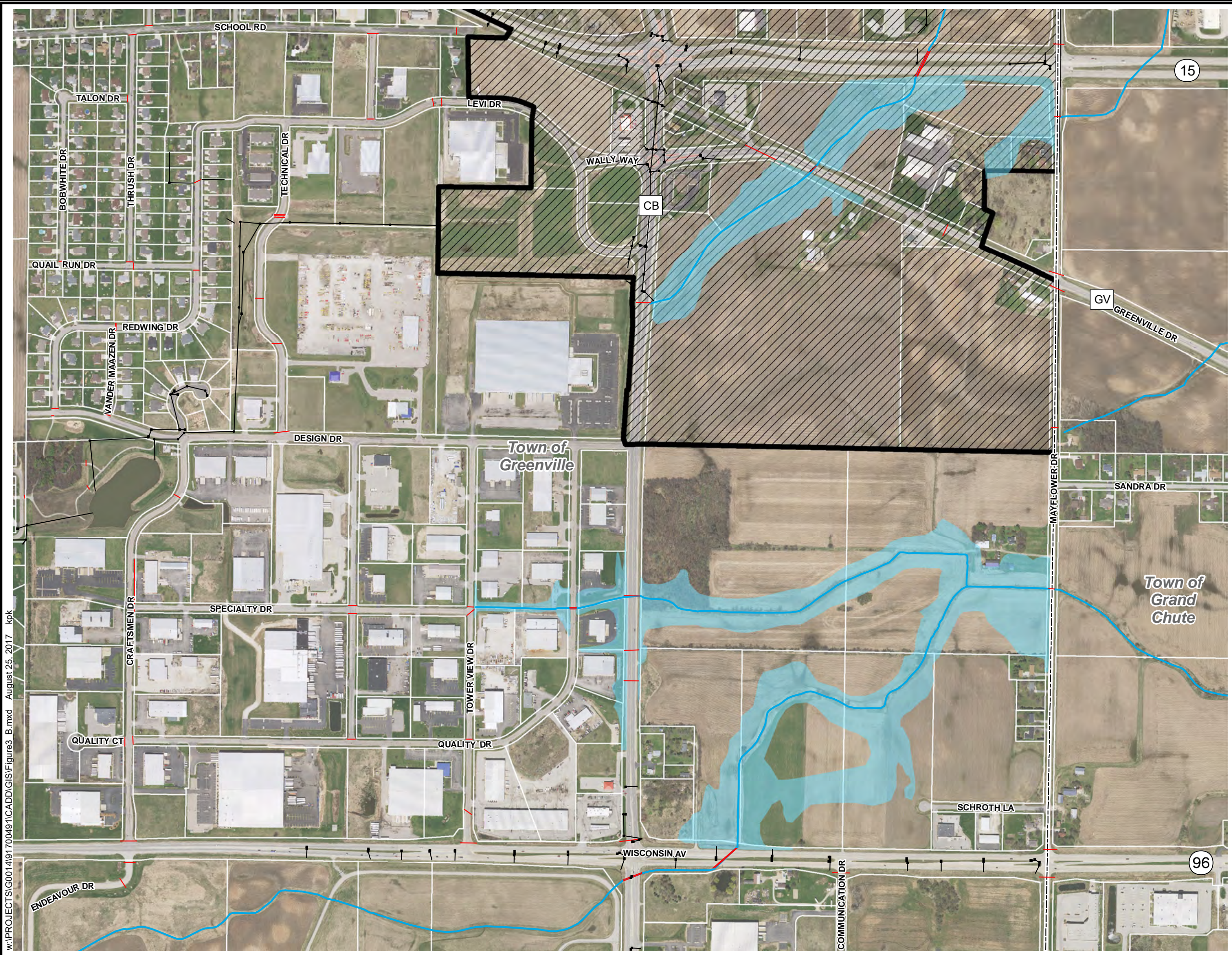
Source: Outagamie County, 2014-17.

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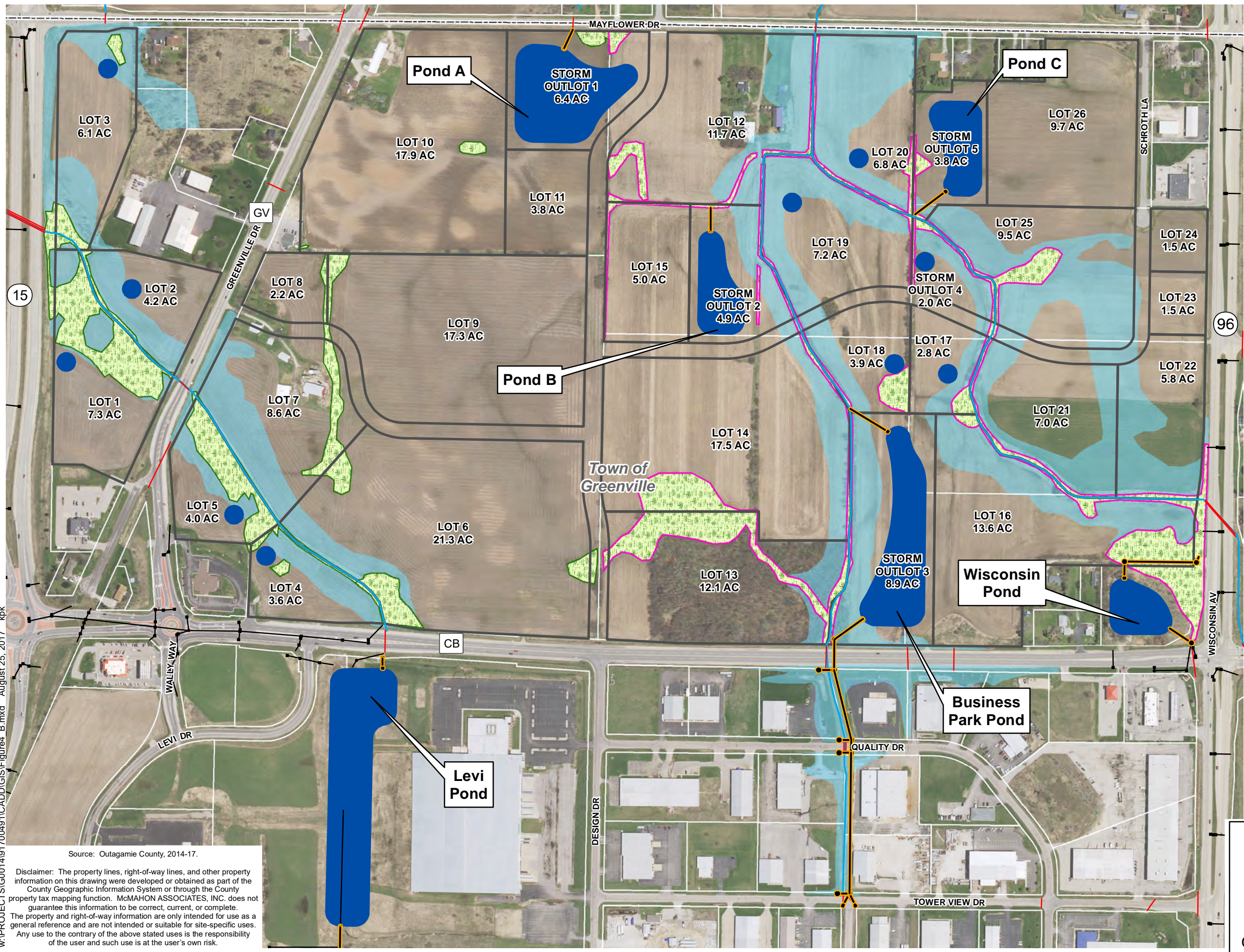
**FIGURE 3**  
**NAVIGABLE STREAMS**  
**AND APPROXIMATE**  
**100-YEAR FLOODING LIMITS**  
TIF DISTRICT  
STORMWATER PLANNING  
TOWN OF GREENVILLE  
OUTAGAMIE COUNTY, WISCONSIN

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- Proposed Features**
- Lot/Right-of-Way
  - Pond
  - On-Site BMP
  - Storm System
- Other Mapped Features**
- Delineated Wetland
  - Potential Wetland (Not Delineated)
  - Approximate 100-Year Flooding Limits
  - Municipal Boundary
  - Parcel Line
  - Navigable Stream
  - Existing Storm System
  - Existing Culvert



0 400 800 Feet



**FIGURE 4**  
**POTENTIAL STREET AND**  
**STORMWATER LAYOUT 1**  
TIF DISTRICT  
STORMWATER PLANNING  
TOWN OF GREENVILLE  
OUTAGAMIE COUNTY, WISCONSIN

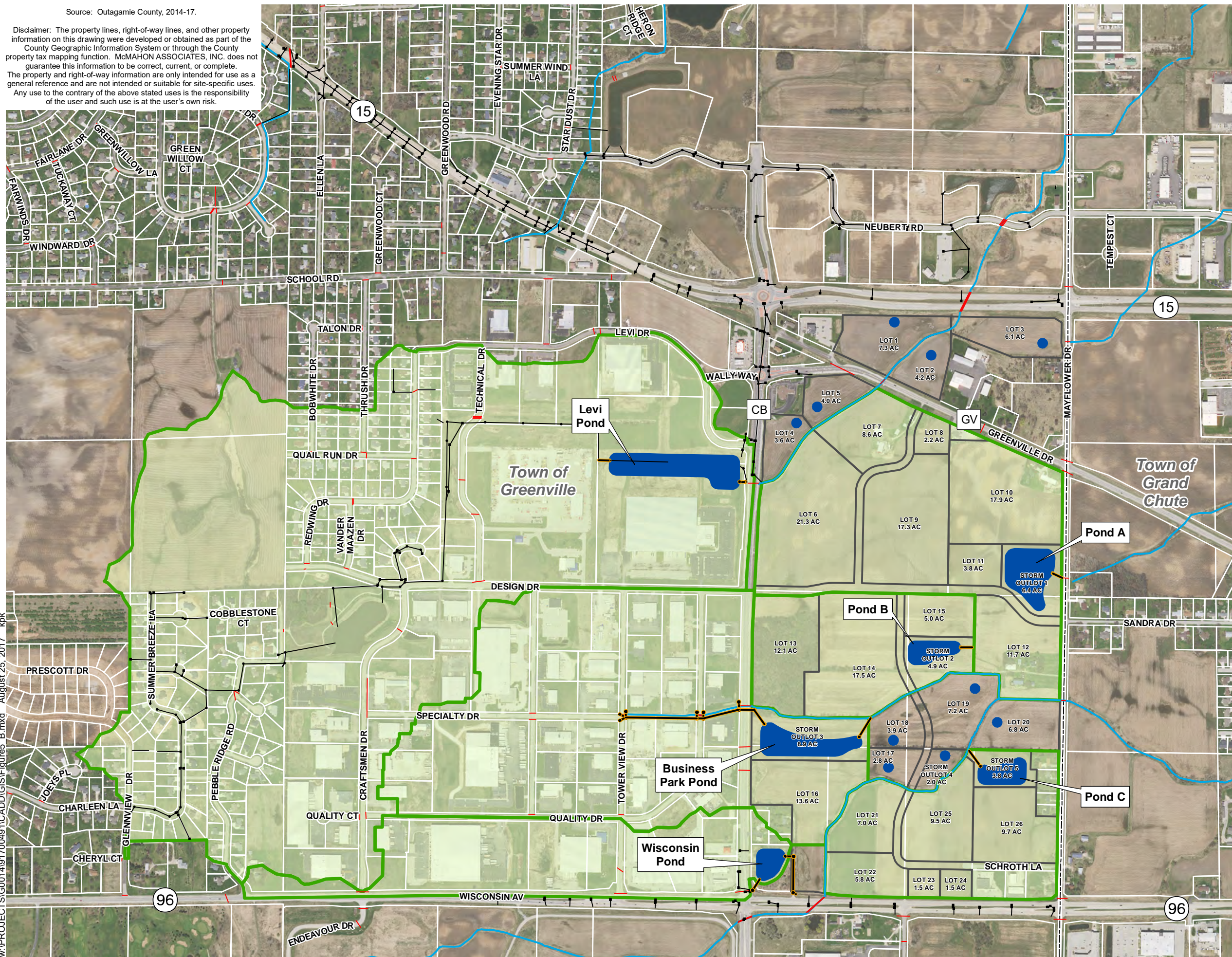
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Source: Outagamie County, 2014-17.

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### Proposed Features

- Pond Watershed
- Lot/Right-of-Way
- Pond
- On-Site BMP
- Storm System

### Other Mapped Features

- Municipal Boundary
- Parcel Line
- Navigable Stream
- Existing Storm System
- Existing Culvert



0 800 1,600 Feet

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**FIGURE 5  
POND WATERSHEDS  
LAYOUT 1**  
TIF DISTRICT  
STORMWATER PLANNING  
TOWN OF GREENVILLE  
OUTAGAMIE COUNTY, WISCONSIN





### Proposed Features

- Lot/Right-of-Way
- Pond
- On-Site BMP
- Storm System

### Other Mapped Features

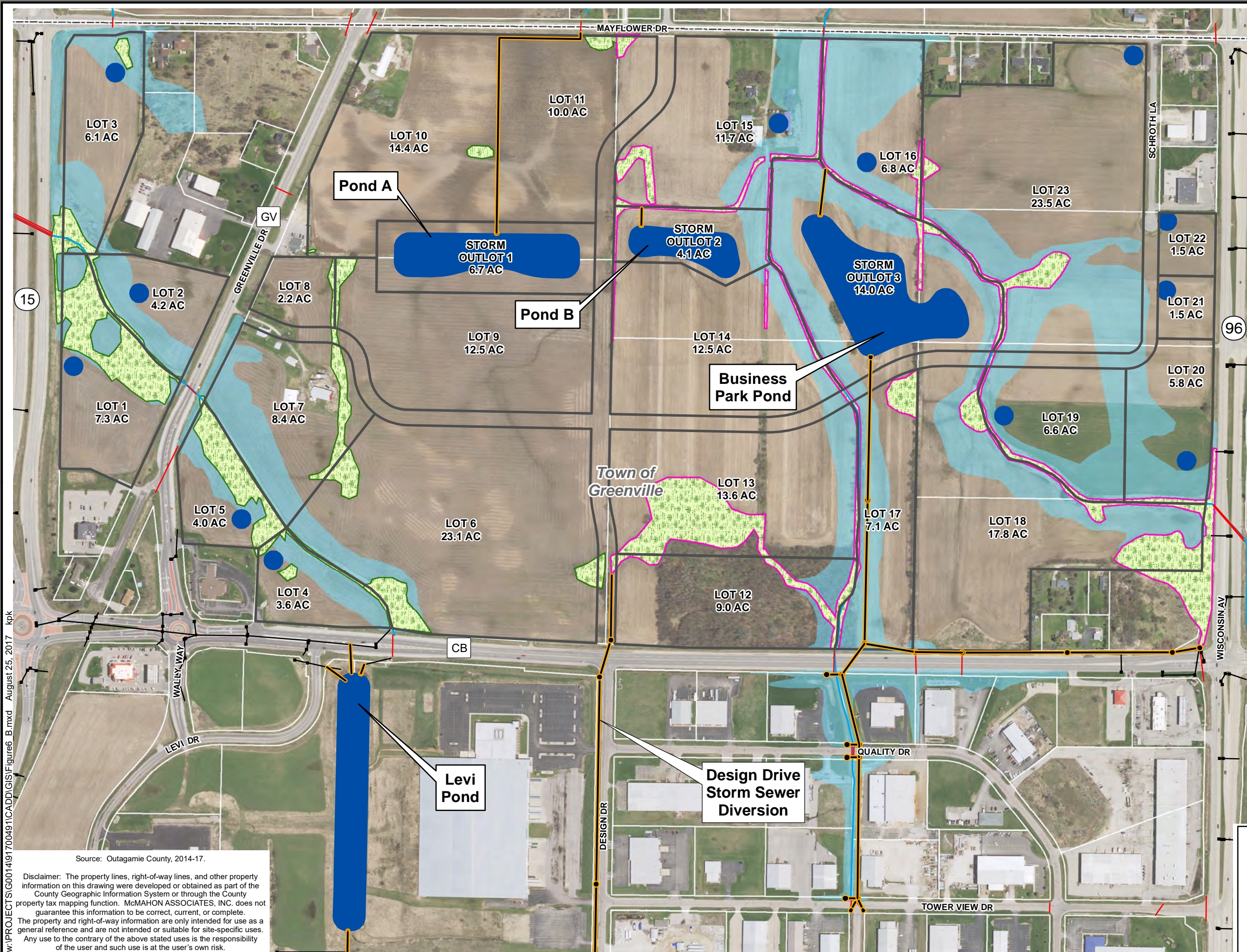
- Delineated Wetland
- Potential Wetland (Not Delineated)
- Approximate 100-Year Flooding Limits
- Municipal Boundary
- Parcel Line
- Navigable Stream
- Existing Storm System
- Existing Culvert



0 400 800 Feet

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FIGURE 6  
**POTENTIAL STREET AND  
STORMWATER LAYOUT 2**  
TIF DISTRICT  
STORMWATER PLANNING  
TOWN OF GREENVILLE  
OUTAGAMIE COUNTY, WISCONSIN



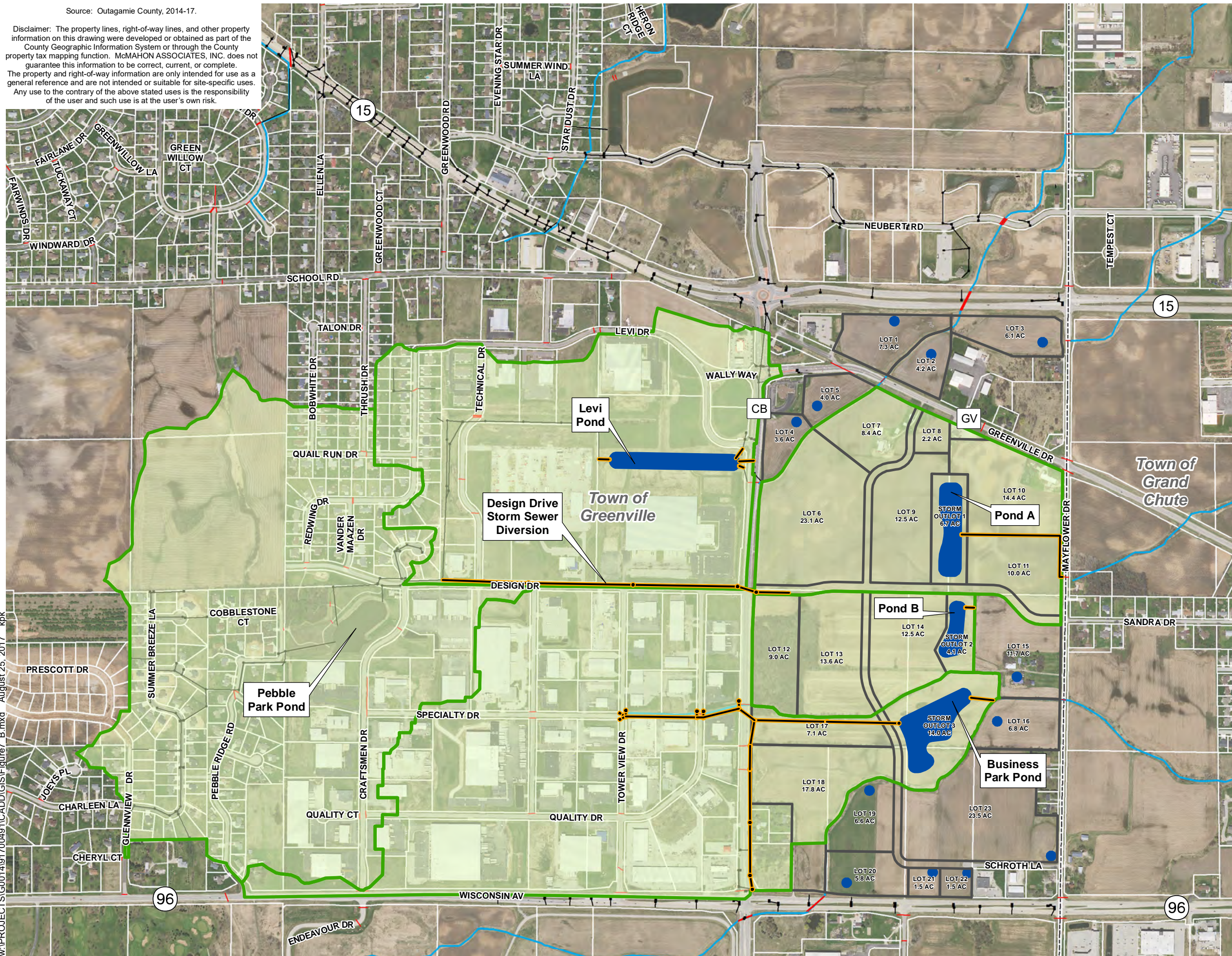
Source: Outagamie County, 2014-17.

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### Proposed Features

- Pond Watershed
- Lot/Right-of-Way
- Pond
- On-Site BMP
- Storm System

### Other Mapped Features

- Municipal Boundary
- Parcel Line
- Navigable Stream
- Existing Storm System
- Existing Culvert



0 800 1,600 Feet

**McMAHON**  
ENGINEERS ARCHITECTS  
McMAHON ASSOCIATES, INC.

**FIGURE 7  
POND WATERSHEDS  
LAYOUT 2**  
TIF DISTRICT  
STORMWATER PLANNING  
TOWN OF GREENVILLE  
OUTAGAMIE COUNTY, WISCONSIN