


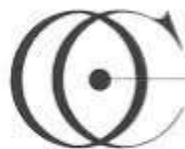
2016 Great Lakes Sedimentation
Workshop
Outagamie County



2015 GLRI Grant



MICHIGAN STATE
UNIVERSITY



OUTAGAMIE COUNTY
LAND CONSERVATION DEPARTMENT

3085 W. BREWSTER ST. APPLETON, WISCONSIN 54914-1602
PHONE (920) 832-5073 FAX (920) 832-4783



The Nature
Conservancy




Protecting nature. Preserving life.™

Grant Goal

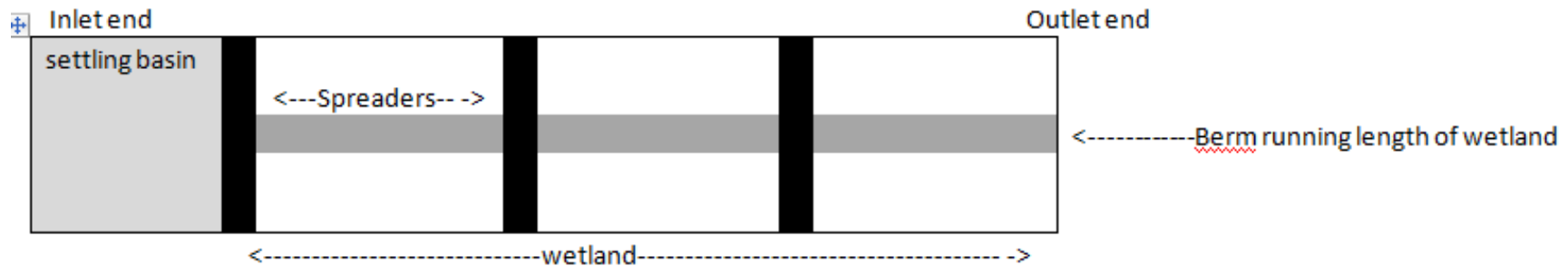
- ▶ Construct 6 “Treatment Wetlands”
 - 2 monitored
 - ½ to 1 acre in size
 - \$15k per
 - Reduce P and TSS
 - Treat both surface and subsurface sources

Monitoring

- ▶ Inlet Surface
 - ▶ Inlet Subsurface
 - ▶ Outlet combined
 - ▶ Vegetation P Uptake
 - ▶ Sediment Accretion
 - ▶ Real-time Phosphate Sensor
- 

Some criteria / considerations for planting zone of constructed wetland:

- Minimum of 12" of rooting medium for plants, preferably sandy loam;
- Water depth goal: at maximum anticipated rain event, 1' depth with residence time of 5 - 7 days;
- Critical to keep water in sheet flow across the wetland; it may be necessary to avoid channelization by using spreaders at several points down the length of the wetland; additionally some wetland designs have employed a longitudinal berm down the middle of the wetland to prevent channelization; e.g.,



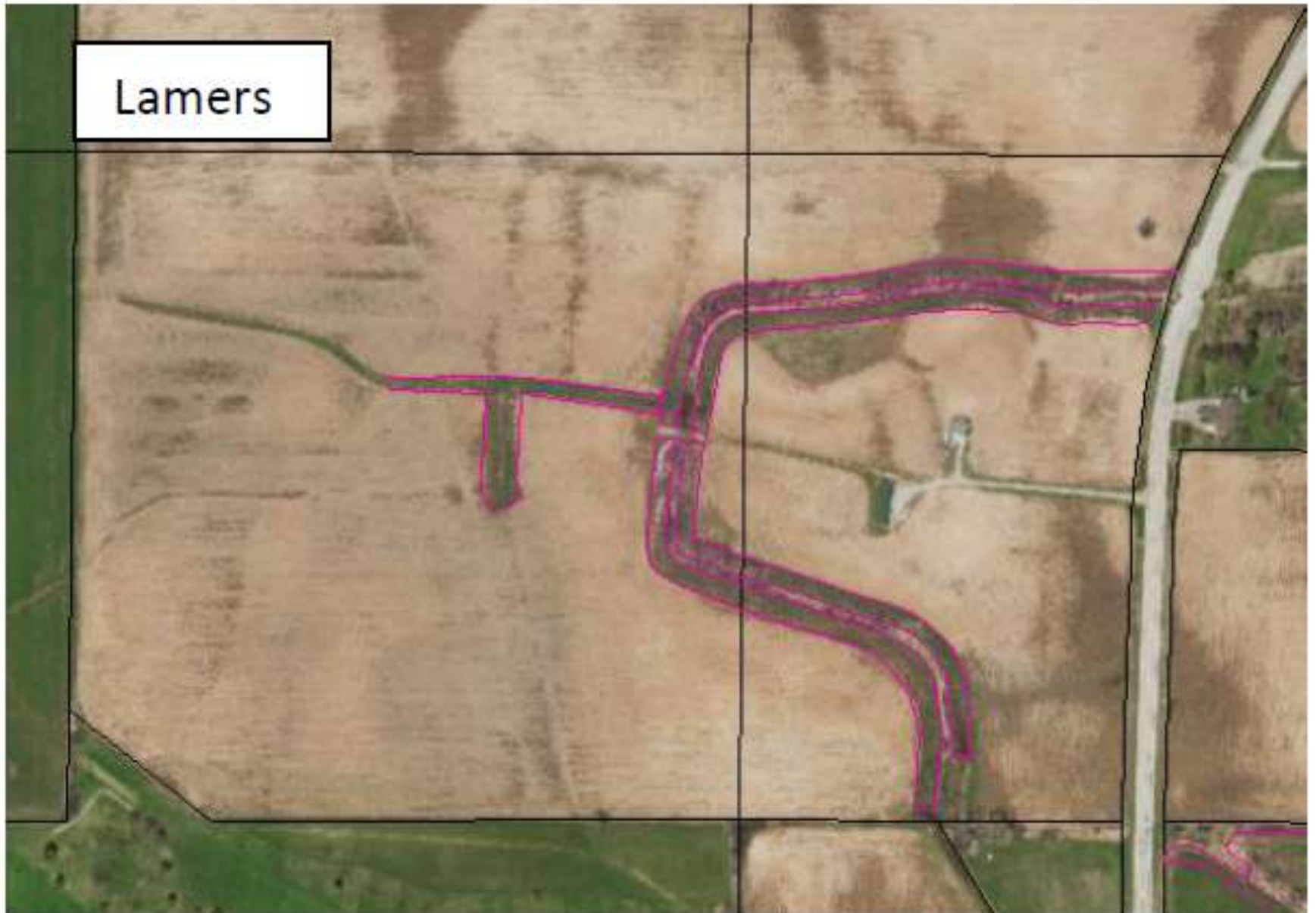
- The ideal length to width ratio for the wetland should be between 3/1 and 5/1 but sites may not allow this;
- Ideal would be to use both cool and warm season grasses to provide early, late and continuous nutrient uptake throughout the season (see Table 1 below);
- As the area of the wetland nearest the inlet would be expected to be wetter on average through the growing season than the area near the outlet, we might want to consider planting those wetland obligate species nearest the inlet and the non-obligate species

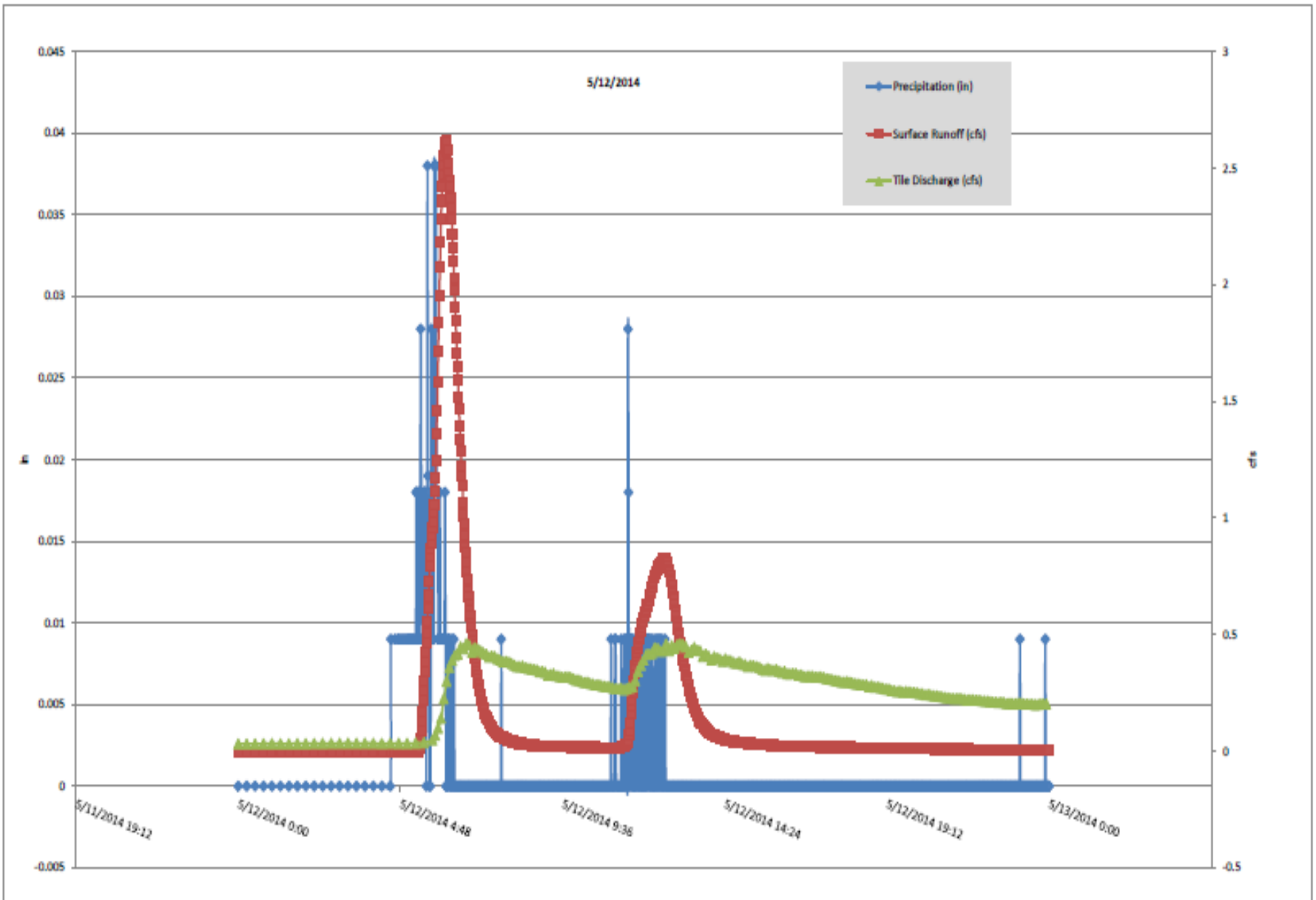
Site Selection



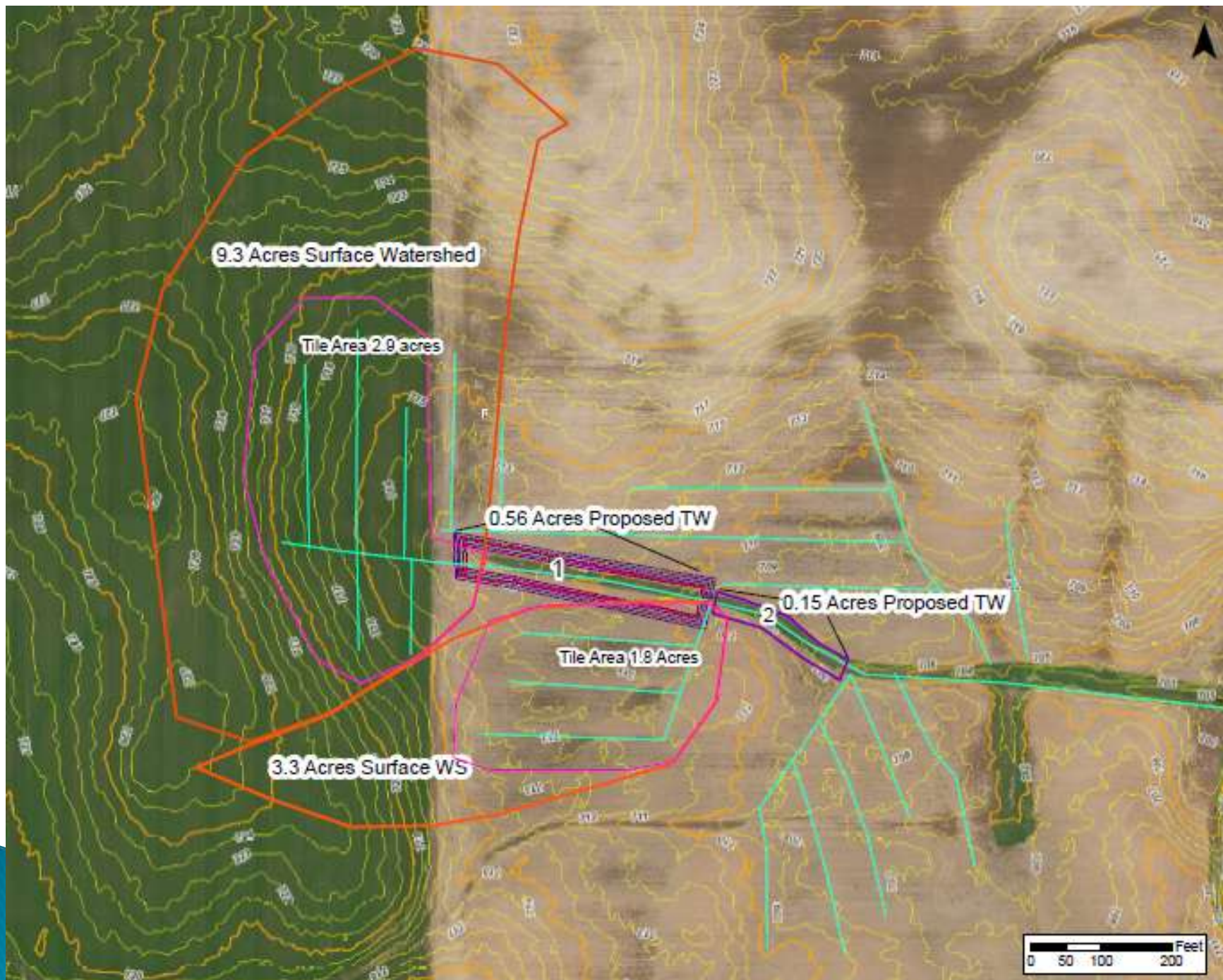
Site #1

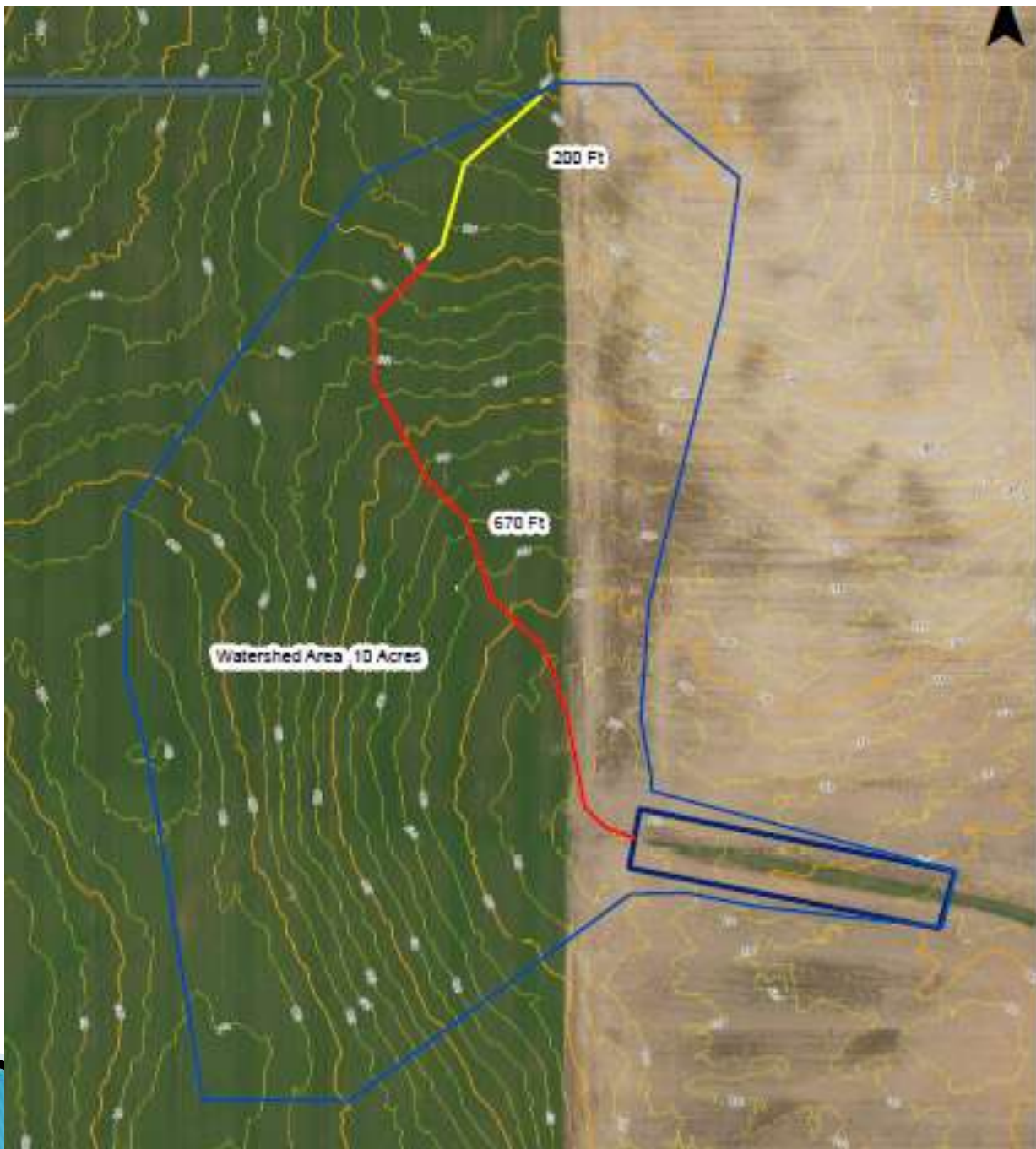
Lamers











PEAK DISCHARGE, EFH CHAPTER 2 METHOD, TR55 GRAPHICAL METHOD

VER. 12-2014

CLIENT: **Jim Lamers**
 DSN BY: **Sarah Francart**

COUNTY: **Outagamie MSE4**
 CHK BY:

DATE: **12/4/2015**
 DATE:

COMMENT

WOULD YOU LIKE TO DESIGN THIS TO EFH2
 OR TR55 GRAPHICAL METHOD? (ENTER 2 OR 55)

55

GO TO RCN DATA	PRINT RUNOF F	GO TO T _c TR-55	SOILS INFO
GO TO STAGE- STORAG e	GO TO FLOOD ROUTE	PRINT RCN DATA	HELP

Drainage Area Acres
 Runoff Curve Number

Time of Concentration Hours

NOAA Atlas 14 Rainfall Distribution Zone: **MSE4**

Frequency	yr	1	2	5	10	25	50	100
Rainfall, P (24 hour)	in	2.14	2.45	3.01	3.51	4.24	4.85	5.5
Initial Abstraction, I _a	in	0.439	0.439	0.439	0.439	0.439	0.439	0.439
I _a /P ratio		0.205	0.179	0.146	0.125	0.104	0.091	0.080
Unit Peak Discharge, q _u	cfs/aci _{in}	1.242	1.254	1.270	1.280	1.290	1.292	1.292
Runoff, Q	in	0.74	0.96	1.39	1.79	2.41	2.95	3.53
Runoff	AC FT	0.62	0.80	1.16	1.49	2.01	2.45	2.94
Peak Discharge, q _p	cfs	9.2	12.1	17.6	22.9	31.1	38.1	45.6

HYDROLOGY

Drainage Area: 10.0 acres
 1 Year Rainfall: 2.2 inches

RCN's Pre 71 Post 82 (1 acre lots)

FLOWS:	Peaks		Post Volumes	
	Pre	Post		
1 Year:			0.78 inch	28,454 cu ft
2 Year:	3 cfs	12 cfs	1.41 inch	51,183 cu ft
10 Year:	8 cfs	23 cfs	2.37 inch	86,031 cu ft
100 Year:	20 cfs	46 cfs	4.25 inch	154,275 cu ft

Min. Pool Area from Table 1: 0.7 % of drainage area (From Table 1 in Stnd 1001)
 Minimum % for Dry Pool: 1.4 % (2 X value from Table 1)
 Minimum Area for Dry Pool: 6,098 sq ft This is minimum size 1' above outlet invert.

STAGE STORAGE FOR FLOOD POOLS

	Elev.	Sq Ft	Acc.Stor., cu ft
	707	4,589 (Bottom Dry Basin)	0
Higher Elevations	708	6,526	5,558
	709	8,535	13,089
	710	10,615	22,664
	711	12,768	34,356
	712	14,993	48,237
	713	19,864	65,666

STORAGE VOLUME TO BE RELEASED SLOWLY- (24 hours or more)

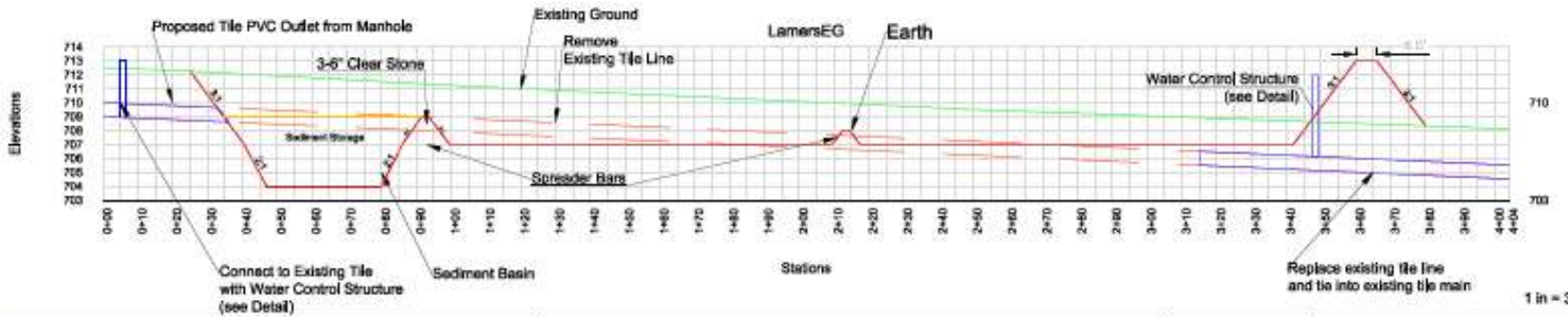
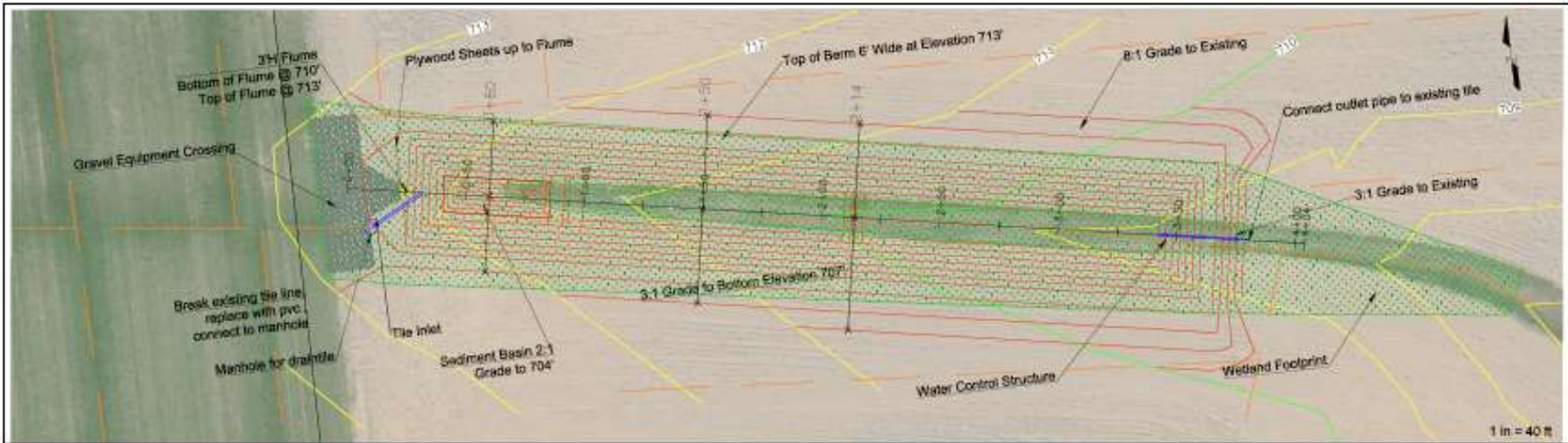
	Input Output	
Runoff:	<input type="text" value="0.78"/>	inches
		8,105 cu ft
Top, slow release storage	<input type="text" value="708.8"/>	Elevation
Q out for 24 hr release	<input type="text" value="0.02"/>	cfs
Orifice elevation	<input type="text" value="707.0"/>	elev
Orifice Diameter		0.9 inches
Your choice, orifice diam.	<input type="text" value="1.60"/>	It's too far from req'd size; Try again
	(2" is min. req'd.)	
Equiv. No. of 1/2" holes		5 number (Based on diameter in E56)

2 Year Routing

Maximum Permissible Q out :	3.0 cfs	Your input at top of sheet
Chosen Q out :	<input type="text" value="3.0"/>	Generally use max permissible.
Routed top elev.:	708.2 elev	
Top of Slow Release :	708.8 elev	
If top of slow release is above routed 2 year top, no need for a separate 2 year outlet.		
If top of slow release is lower than routed top, then you need to decide how to design the outlet.		

10 Year Routing (The top of routed storm is used to set crest of open spillway.)

Maximum Permissible Q out :	8.0 cfs	(Pre Q for storm)
Your Chosen Q out :	<input type="text" value="8.0"/>	
Routed open Spillway Elev.:	708.9	
Top of Slow Release + 1' :	709.8	
Open Spillway Crest:	<input type="text" value="709.8"/>	elev. Highest of E76 and E77



Spreader Bar Details



Notes:
 0.72 Acres Wetland Footprint
 0.09 Acres Existing Buffer
 1.35 Acres Disturbed Area

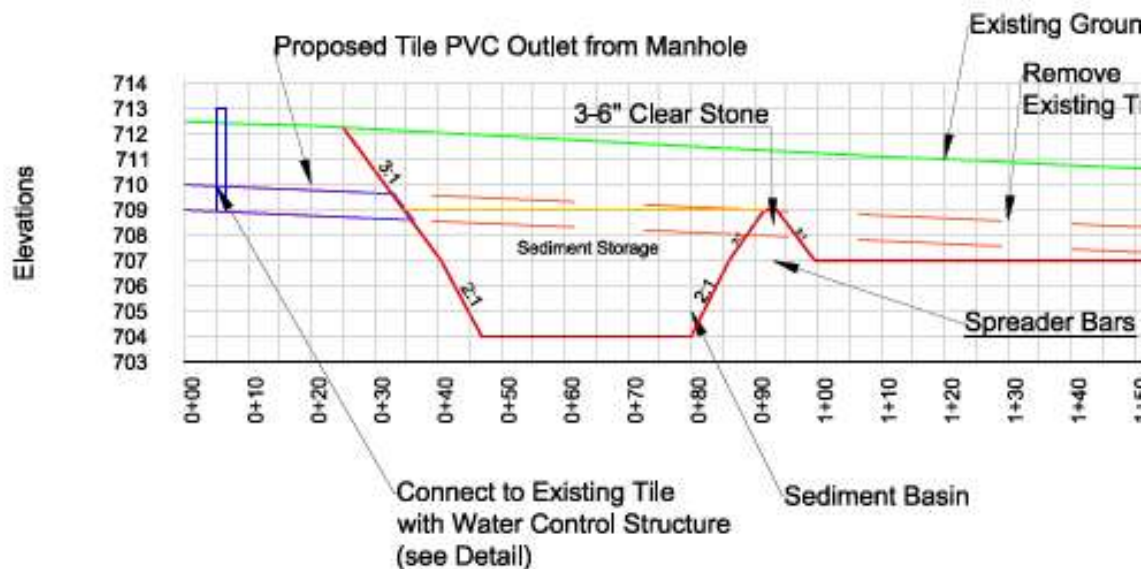
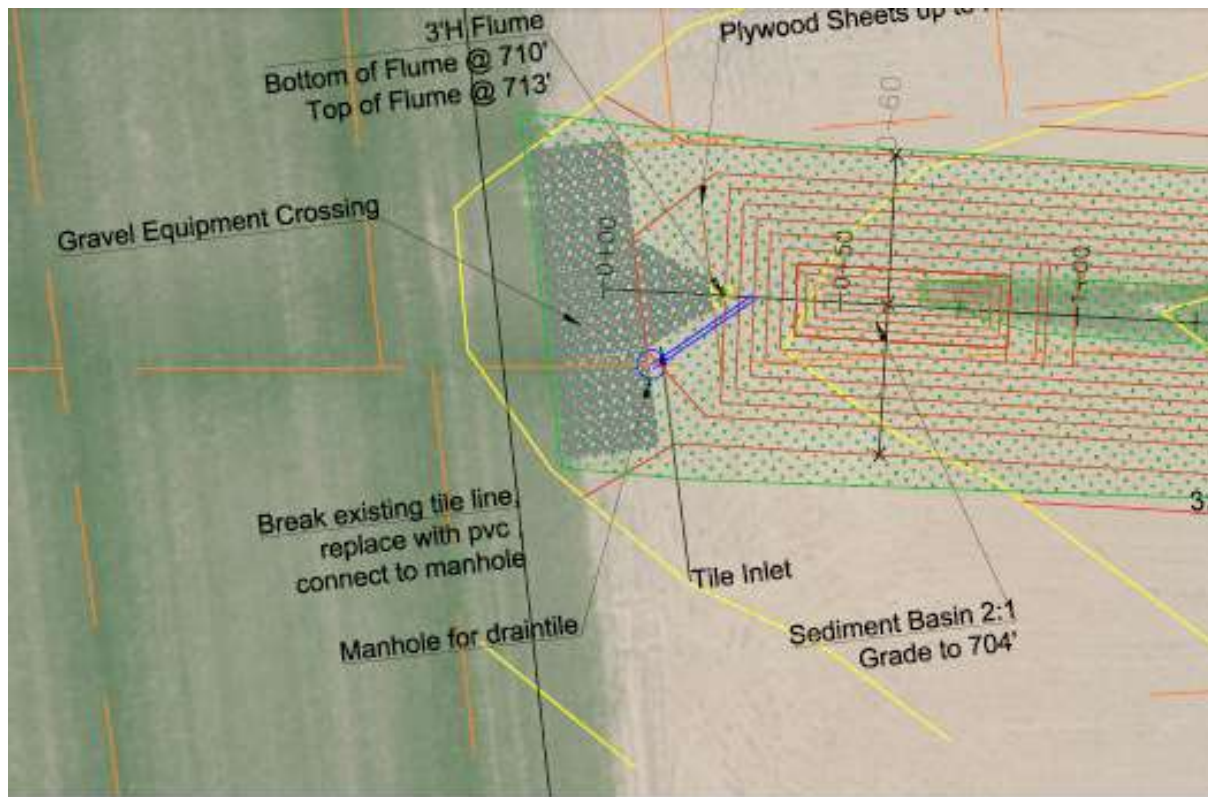


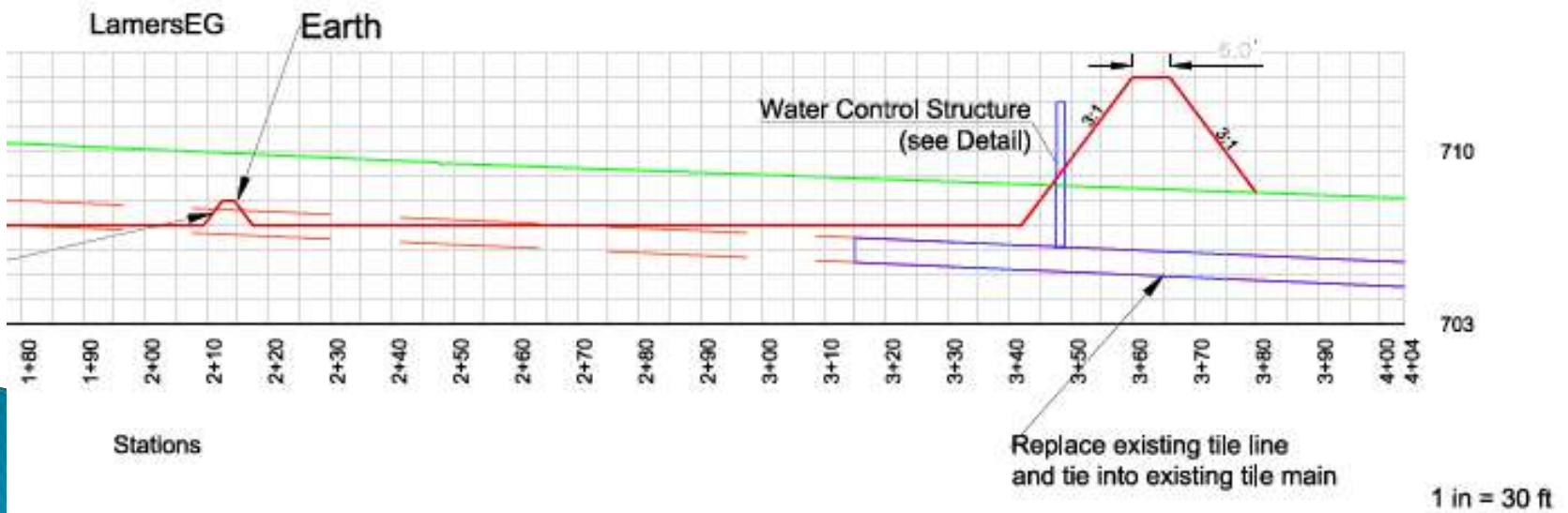
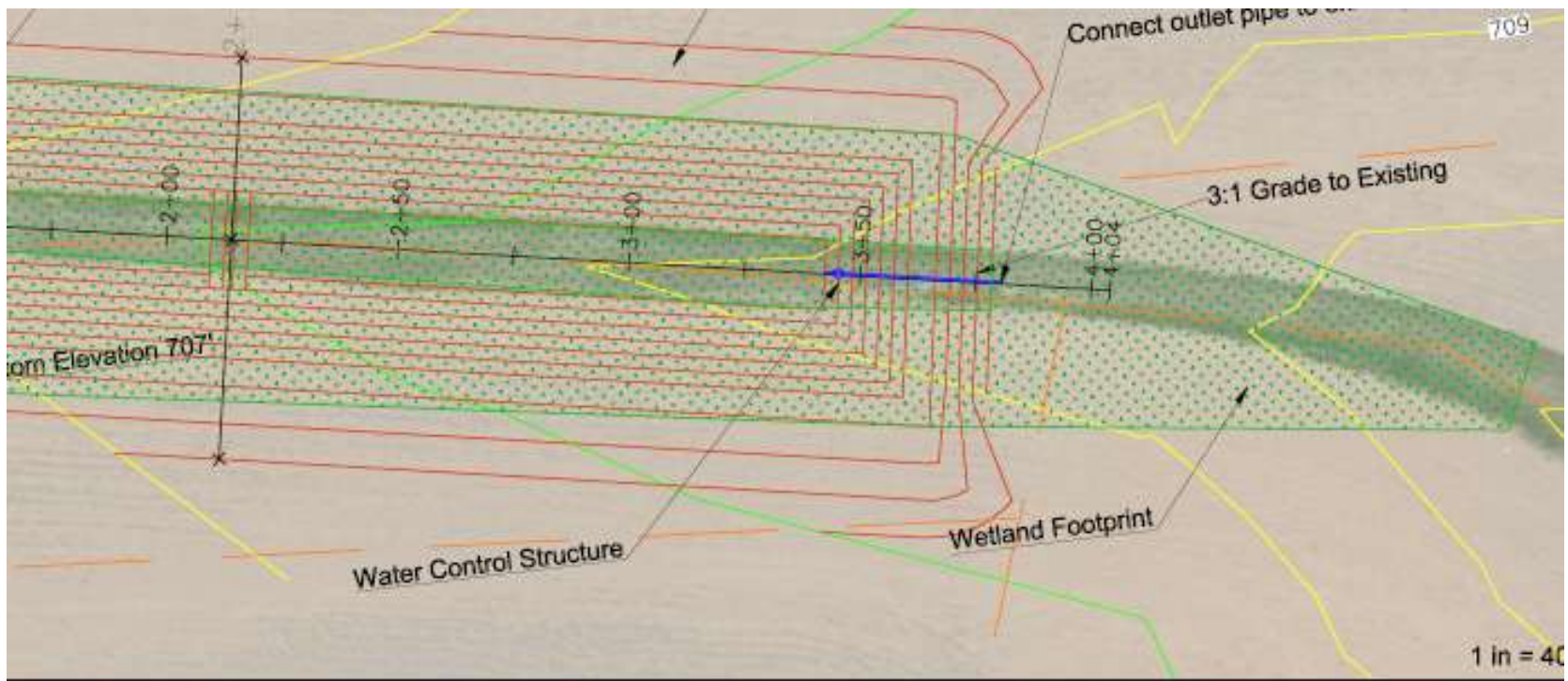
SCALE:
 1"=40'/1"=30'

Jim Lamoy
 OWNER
 OUTAGAMIE COUNTY
 COUNTY

Des. grad: SF
 Date: _____ Checked: _____

SHEET xx OF xx





Lessons Learned

