

# Western Michigan University Facilities Management

## Campus Storm Water Projects and Best Management Practices



# Overview

- WMU Storm Water Committee
- WMU history
- Change in storm water attitude
- Completed Best Management Practices / Projects
- Future BMPs
- Geographic Information Systems



# WMU Storm Water Committee

- Cari DeLong
  - Manager – WMU Natural Areas
- Dr Pat Holton
  - Director – WMU Environmental Health and Safety
- Tim Holysz
  - Director – WMU Landscape Services
- Dan List
  - Manager – WMU Geographic Information Systems
- Greg Roseboom
  - Manager – WMU Campus Utilities
- Engineering Consultant
  - Kieser & Associates



# Kalamazoo River Watershed

## Legend

### Rivers

Kalamazoo

Others

### SQKM

Lakes

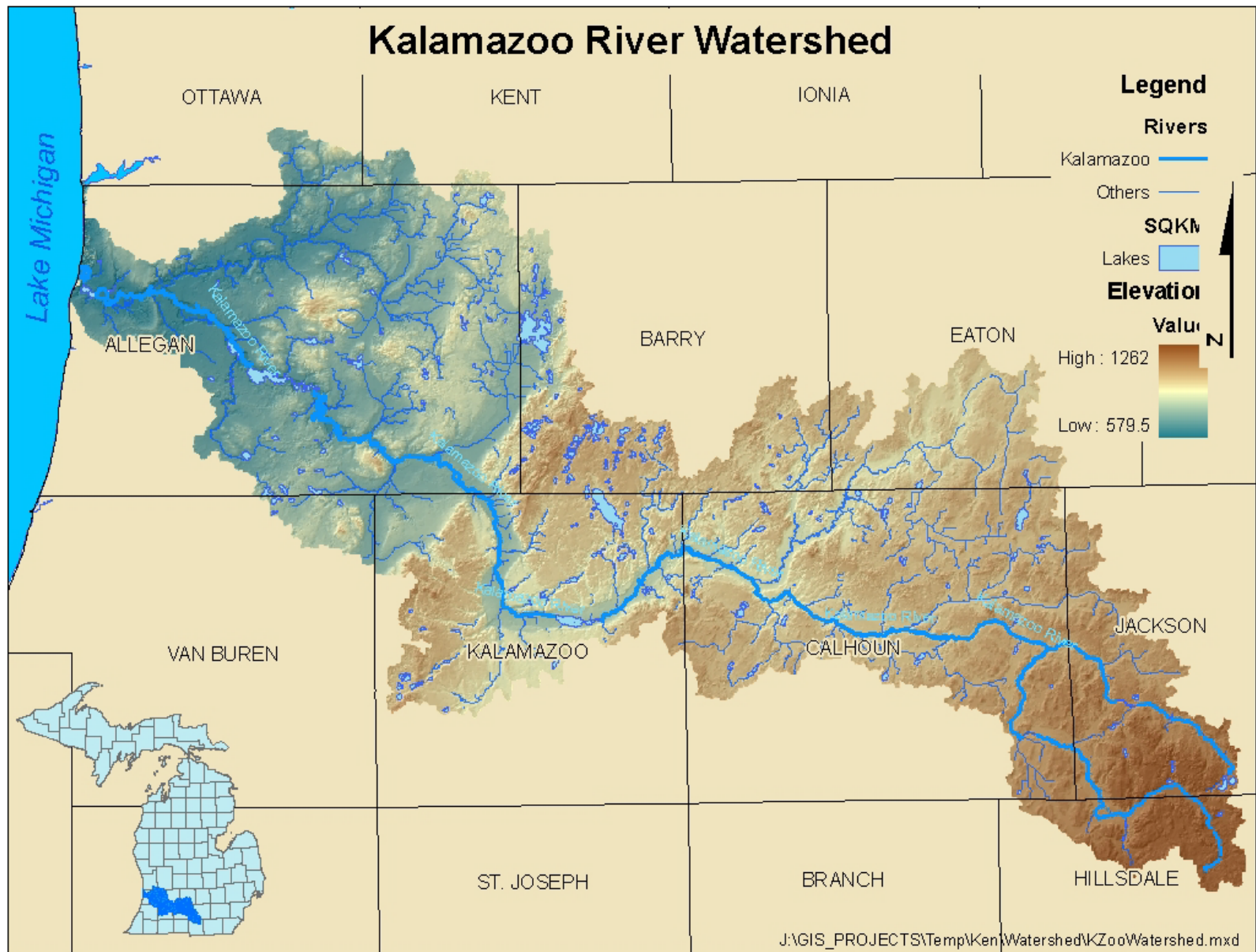
### Elevation

Value

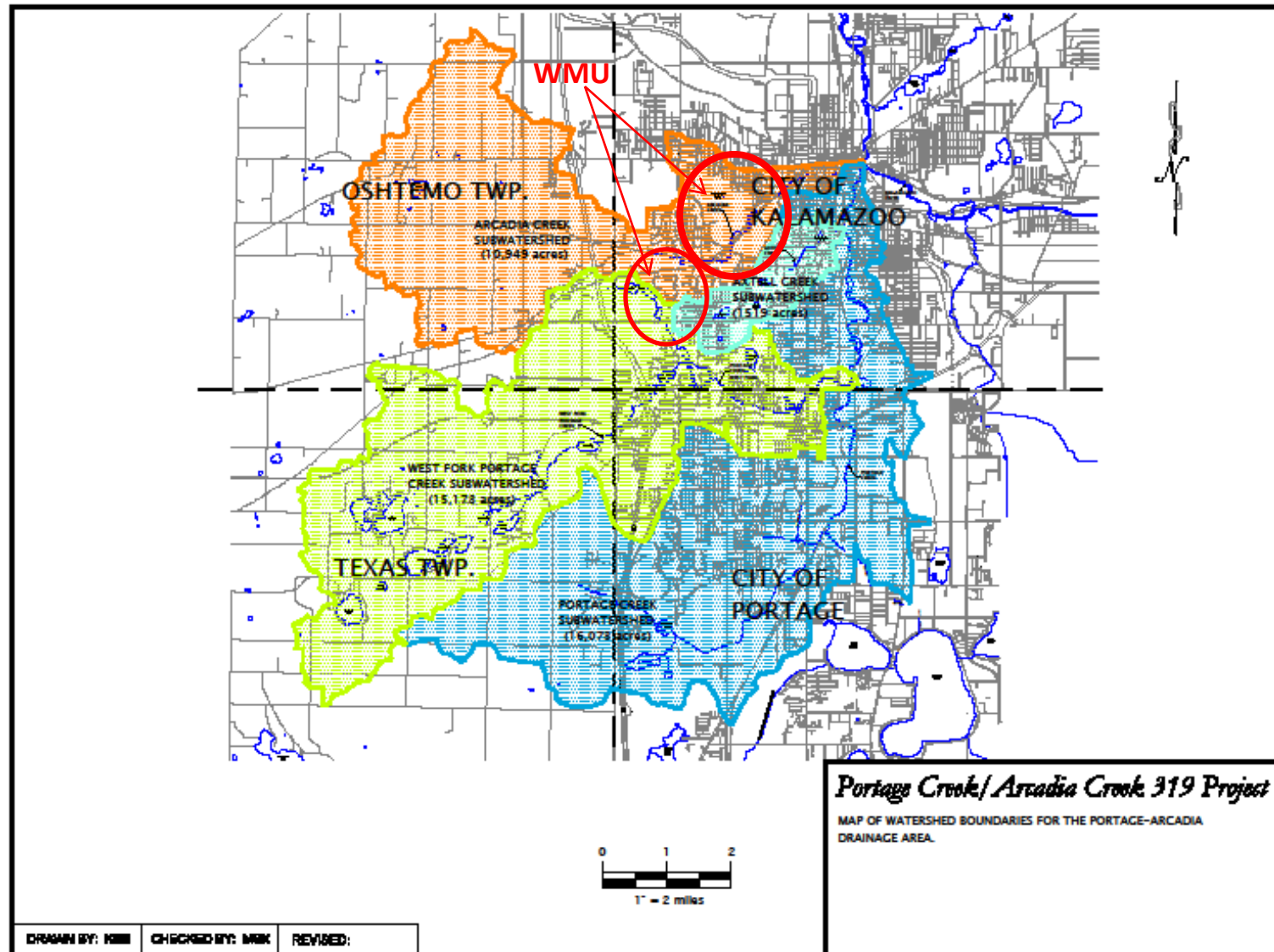
High : 1262

Low : 579.5

N



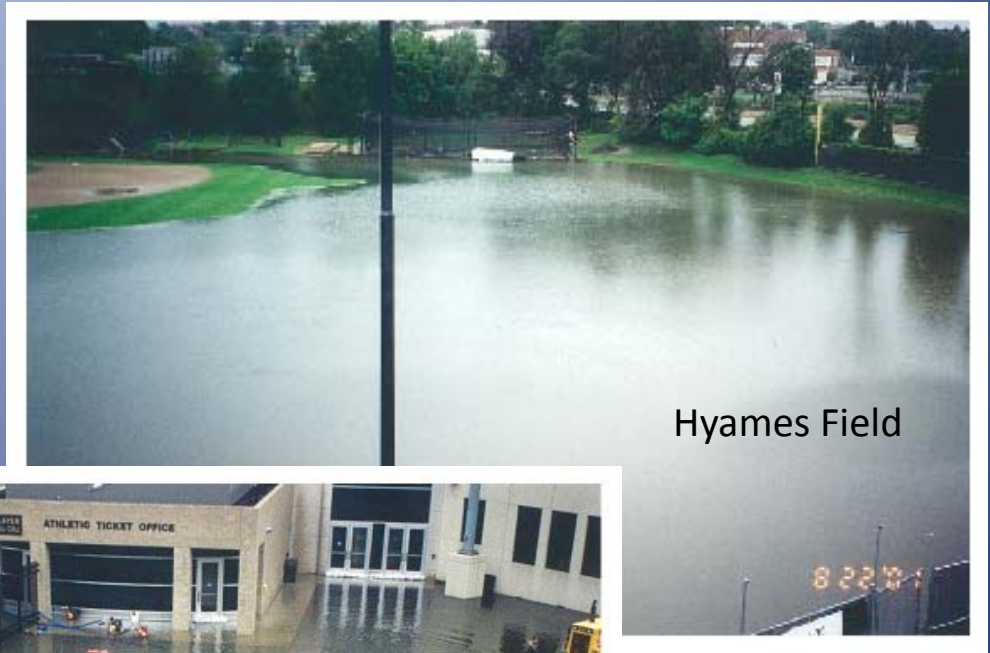
# Portage – Arcadia Drainage





# WMU History

- Direct discharge
  - Pipe to creek
- Preservation of facilities
- Limit liability
- Flooding



Hyames Field



Bronco Ticket Office at  
Waldo Stadium



# WMU History

## EPA - MS4 Permit

- Municipalities with Separate Storm Sewer System
- Began in 2002
- Public education and participation, finding and eliminating illicit discharge connections, storm water pollution prevention initiatives (SWIPPI)



# WMU History

## Storm Water Policy and BMP

- Signed by our Vice President of Finance (2008)
- Guidelines for BMPs
  - No new outfalls or discharges will be created
  - Projects over 1 acre will have 0% discharge
  - All additions and renovations projects require computer modeling to evaluate storm water systems
  - Contractor requirements
  - Routine maintenance
  - Testing throughout and at end construction



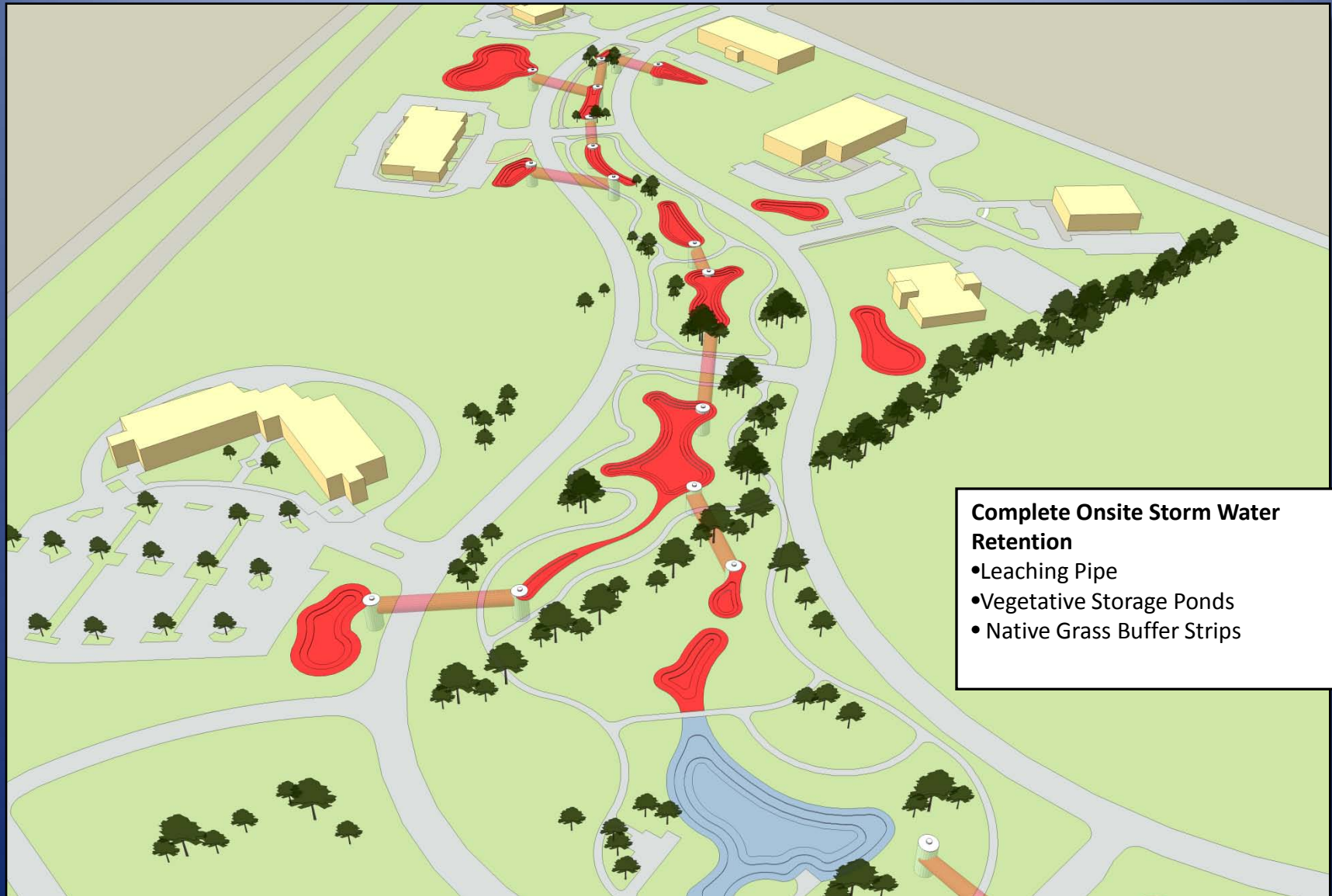


# Storm Water Projects

- Parkview Campus
  - Business, Technology & Research Park College of Engineering & Applied Sciences
- Chemistry Building
- S. Kohrman Hall / Richmond Ctr for the Visual Arts
- Parking Lot 23
- Best Management Practices
  - WMU Collaboration
  - Preventative Maintenance Program
  - Testing
  - Inspections
  - Data Management



# WMU Parkview Campus



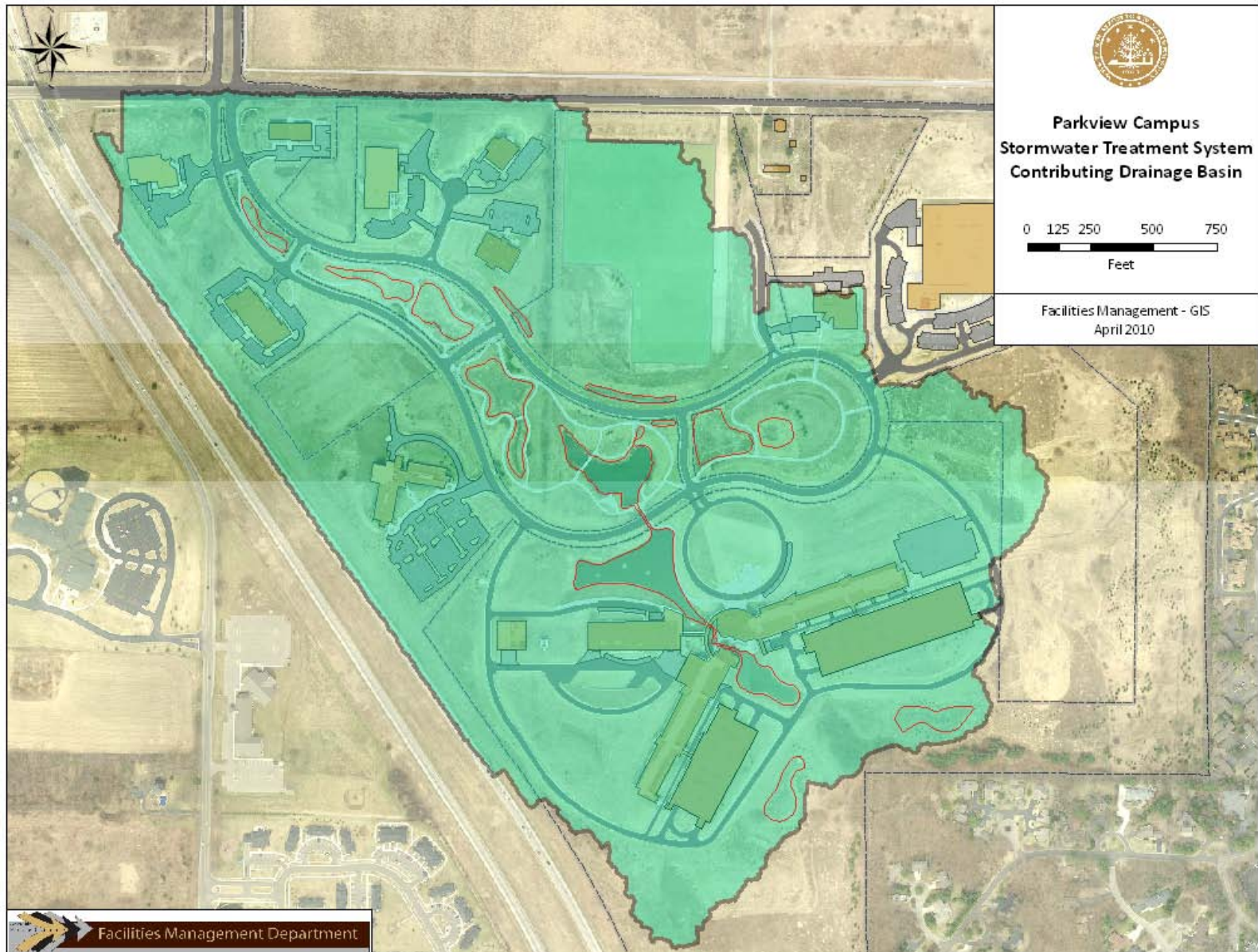


# WMU Parkview Campus

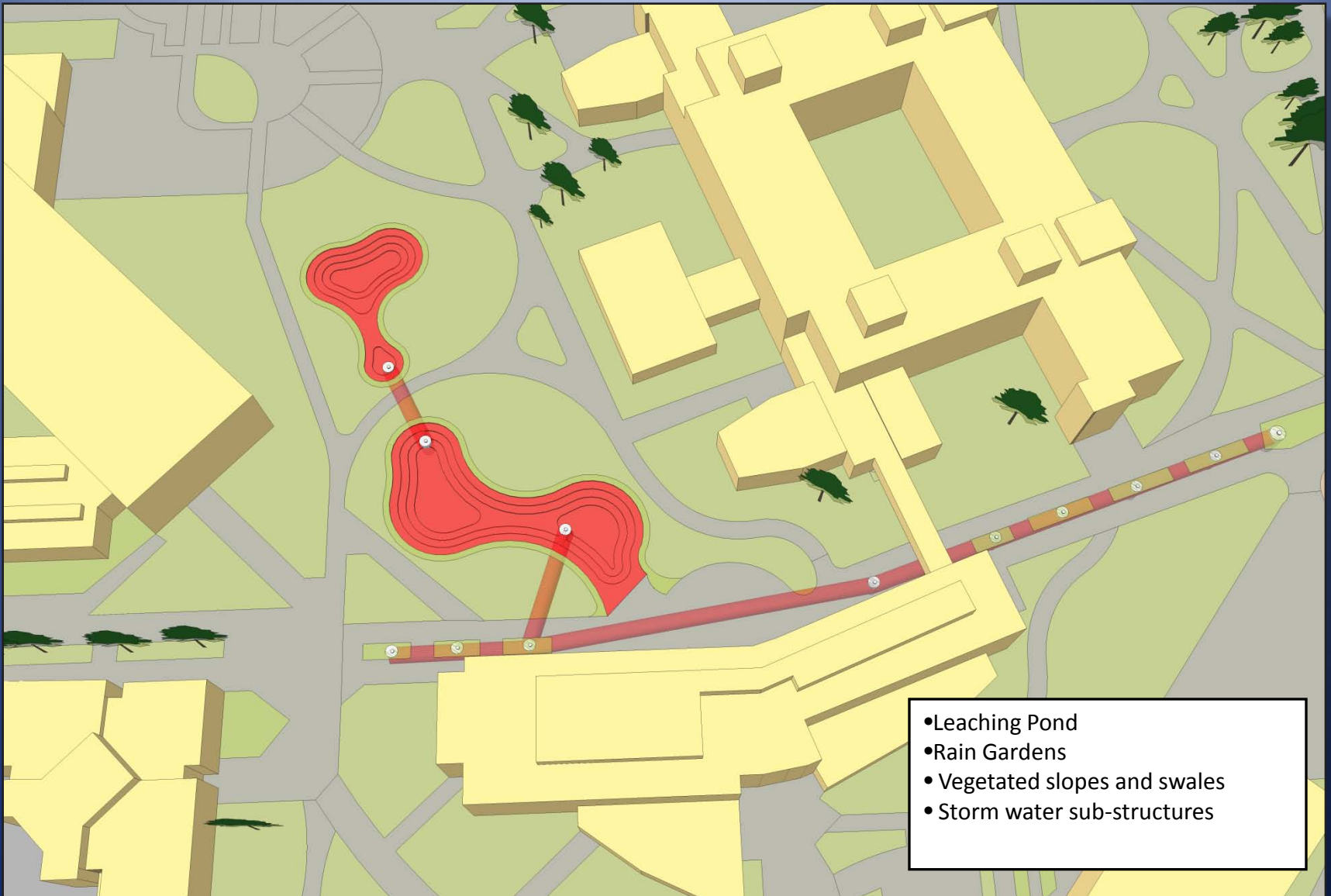




# WMU Parkview Campus



# Chemistry Building Project



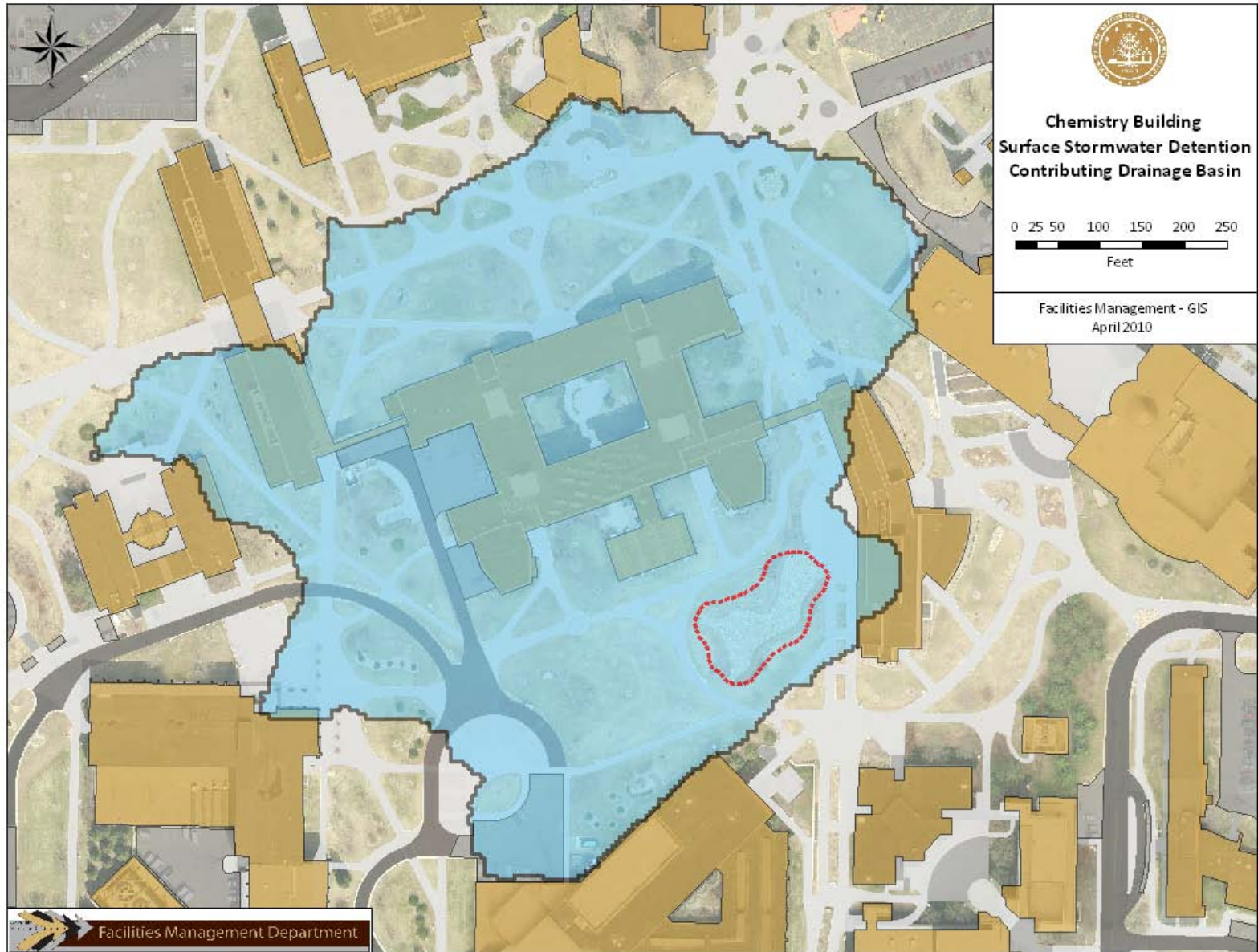


# Chemistry Building Project





# Chemistry Building Project



# RCVA / S. Kohrman Hall Project

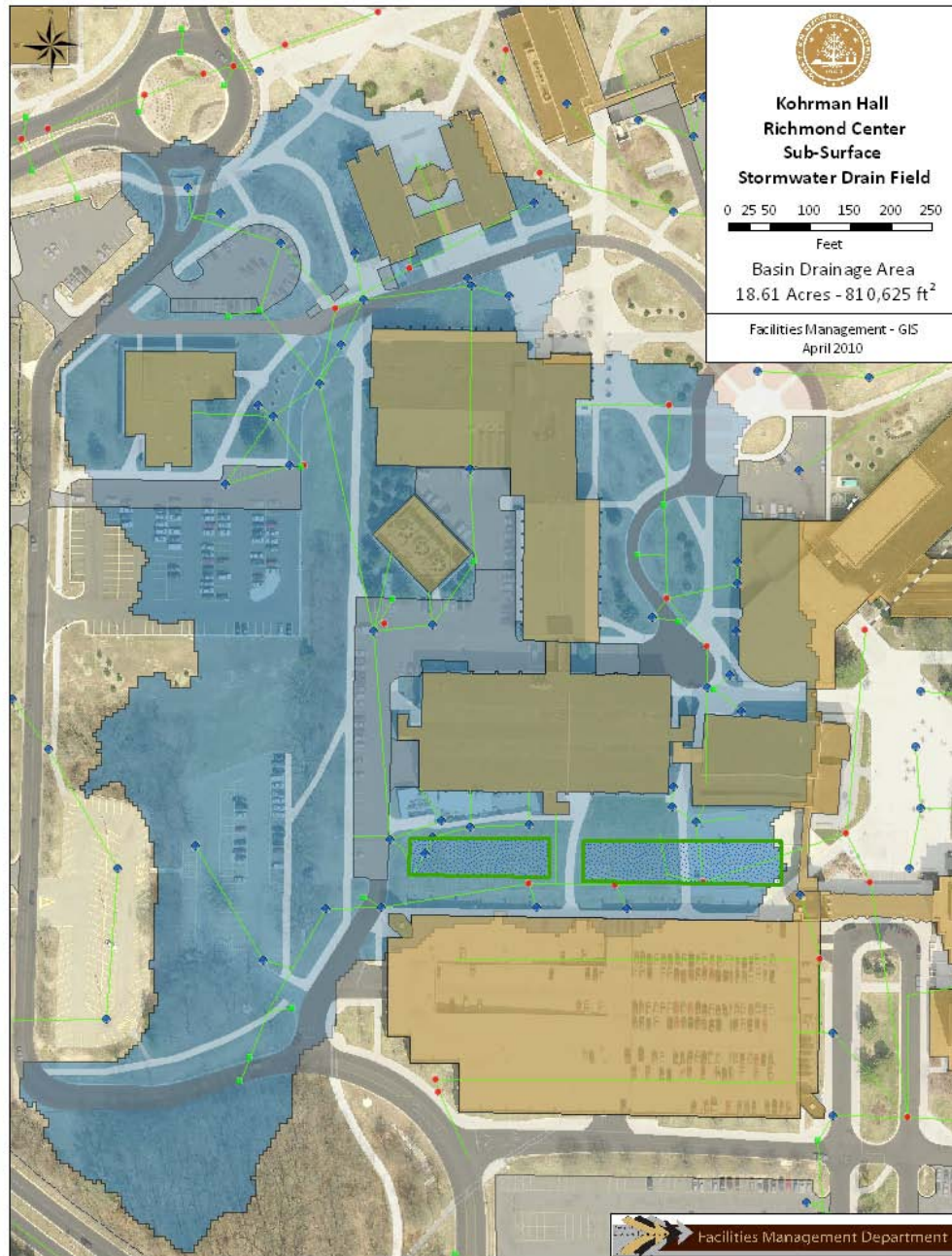




# RCVA / S. Kohrman Hall Project

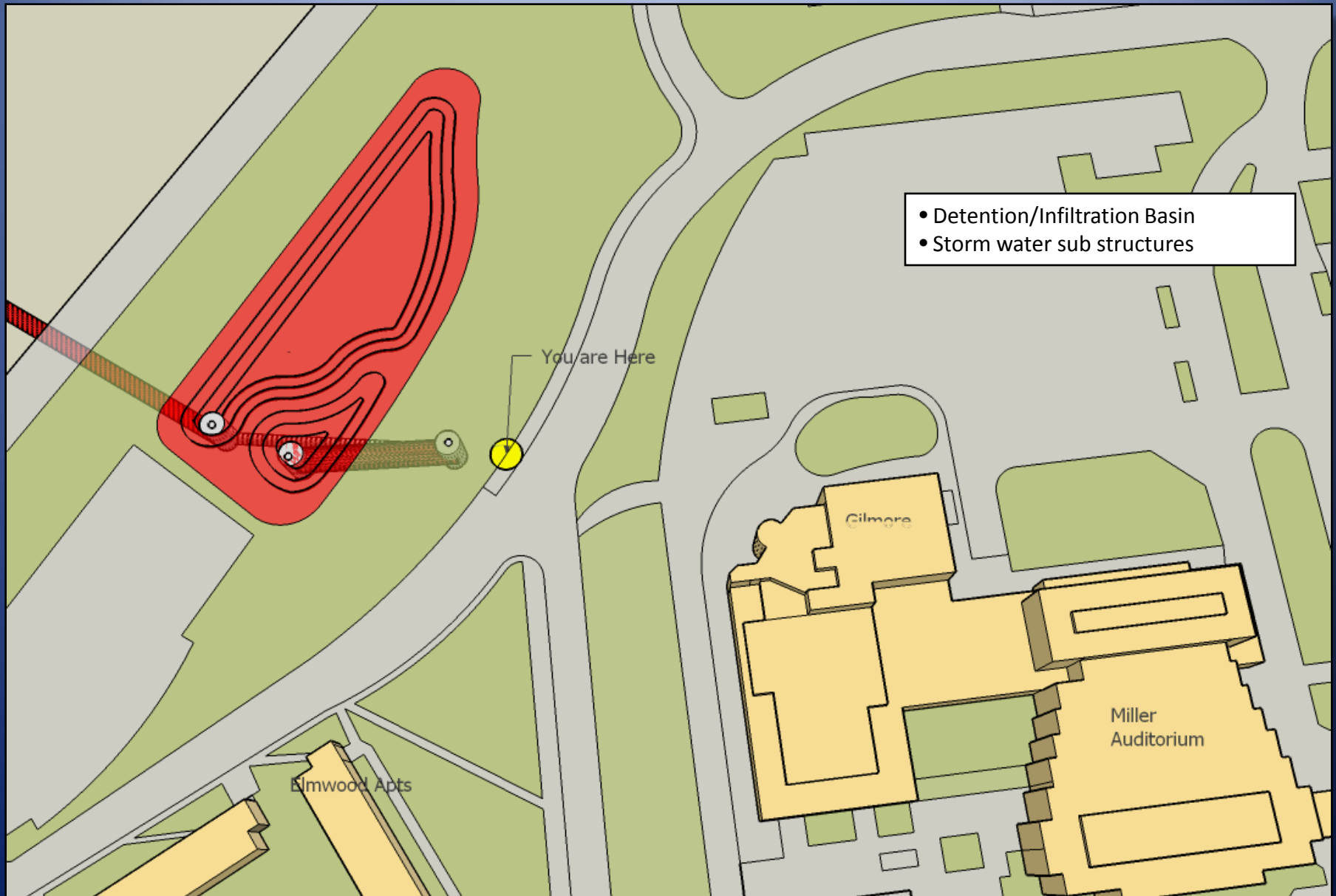








# Parking Lot 23 Project



# Parking Lot 23 Project



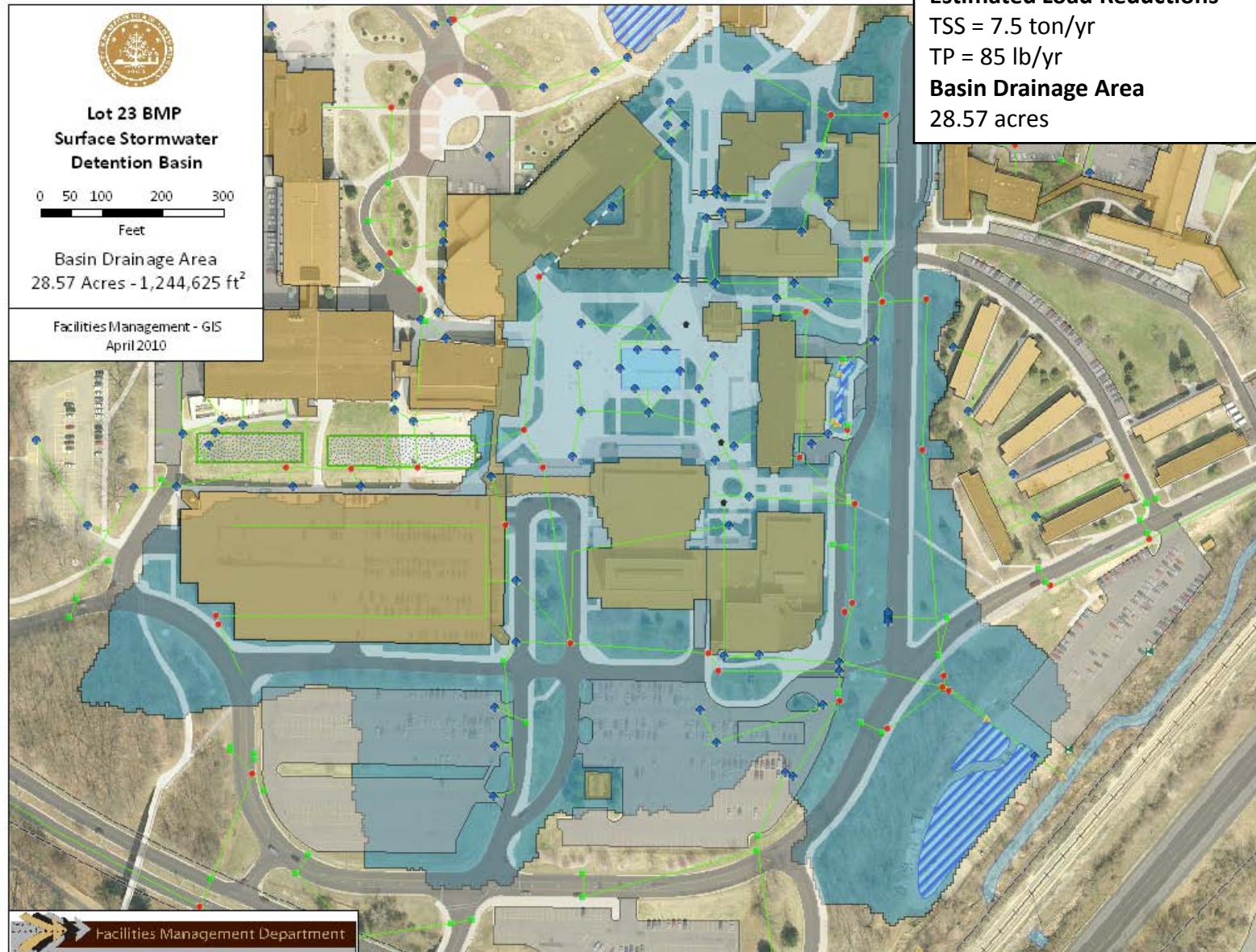


# Parking Lot 23 Project





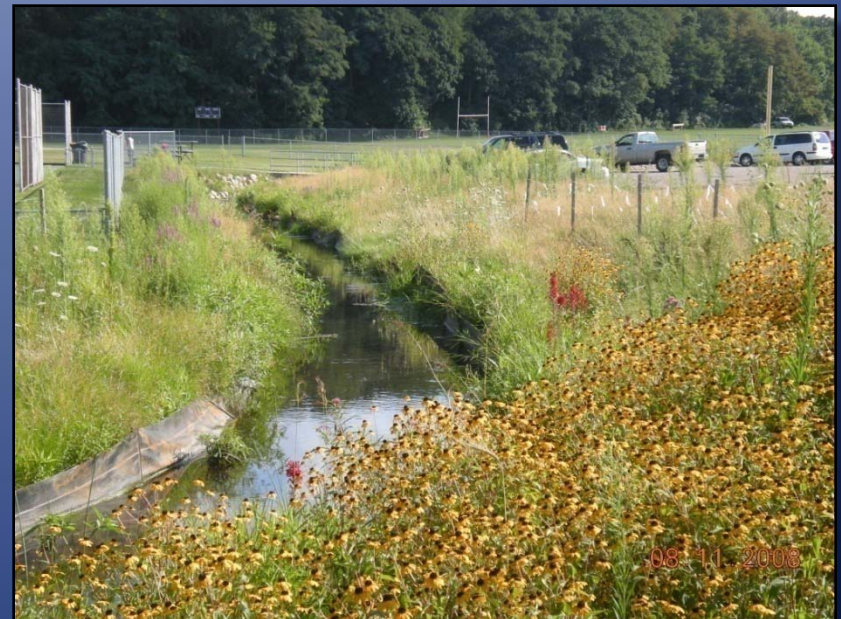
# Parking Lot 23





# Community Storm Water Projects

- The Forum of Greater Kalamazoo
  - Chemistry Building Project used as match for Kalamazoo Christian School (Arcadia Creek)
- Match-E-Be-Nash-She-Wish Band of Pottawatomi Tribe (Gun Lake)
  - Large portion of funding for Parking Lot 23





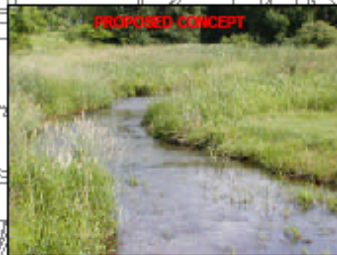
# DNRE Grant

## Arcadia Creek at WMU Power Plant

DRAWN BY: KBB CHECKED BY: MSK REVISED:

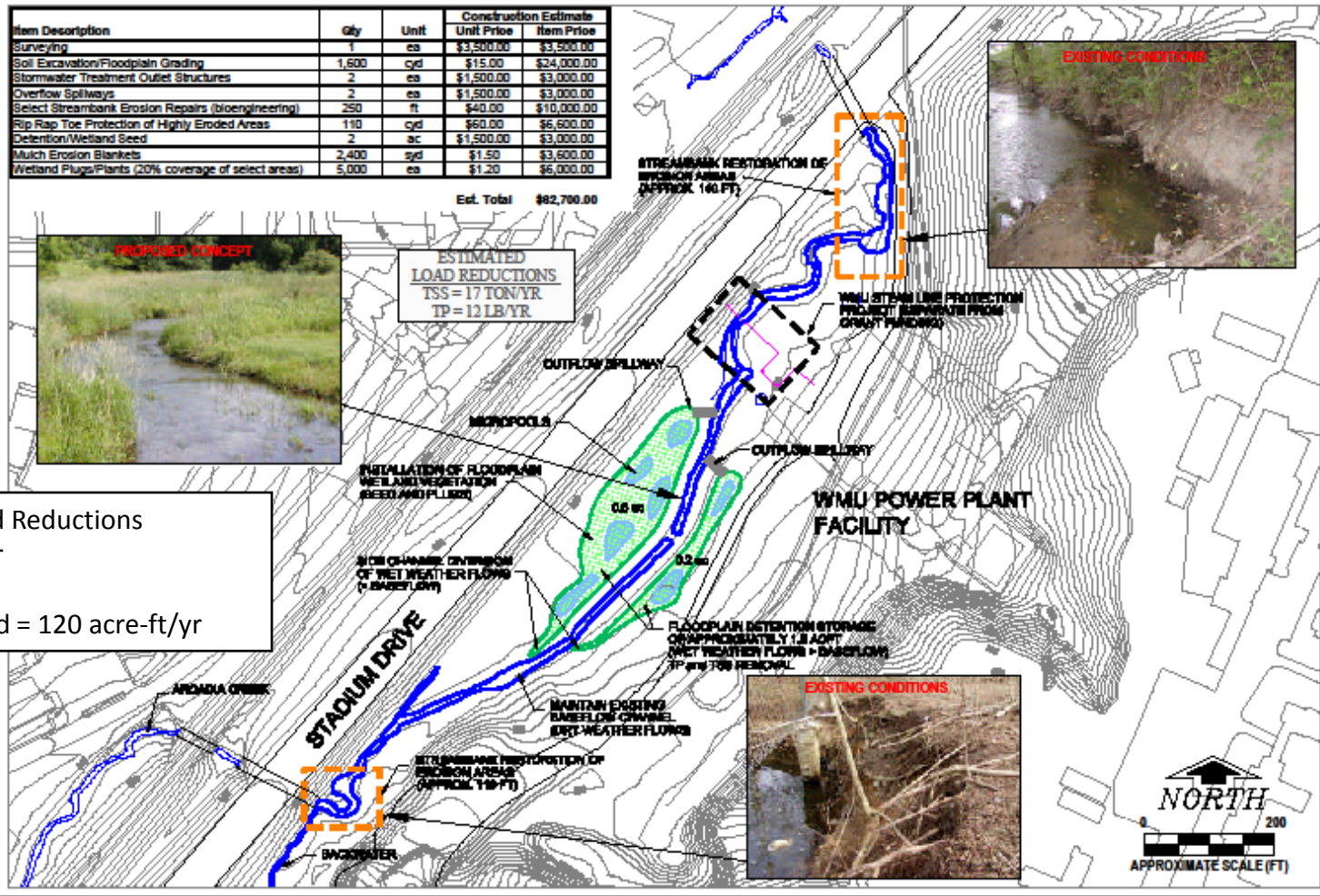
Item Description	Qty	Unit	Unit Price	Item Price
Surveying	1	ea	\$3,500.00	\$3,500.00
Soil Excavation/Floodplain Grading	1,600	cyd	\$15.00	\$24,000.00
Stormwater Treatment Outlet Structures	2	ea	\$1,500.00	\$3,000.00
Overflow Spillways	2	ea	\$1,500.00	\$3,000.00
Select Streambank Erosion Repairs (bioengineering)	250	ft	\$40.00	\$10,000.00
Rip Rap Toe Protection of Highly Eroded Areas	110	cyd	\$60.00	\$6,600.00
Detention/Wetland Seed	2	ac	\$1,500.00	\$3,000.00
Mulch Erosion Blankets	2,400	sqd	\$1.50	\$3,600.00
Wetland Plugs/Plants (20% coverage of select areas)	5,000	ea	\$1.20	\$6,000.00

Est. Total \$82,700.00



ESTIMATED  
LOAD REDUCTIONS  
TSS = 17 TON/YR  
TP = 12 LB/YR

Estimated Load Reductions  
TSS = 17 ton/yr  
TP = 12 lb/yr  
Volume Treated = 120 acre-ft/yr



**KIESER & ASSOCIATES**  
ENVIRONMENTAL SCIENCE & ENGINEERING

536 E. MICHIGAN AVE., SUITE 300  
KALAMAZOO, MI 49007  
ph: (269) 344-7117 fax: (269) 344-2493

Proposed 319 Grant Site #1.  
Streambank restoration areas and proposed floodplain detention areas (micro-pools) for stormwater treatment during large storm events.

FIGURE  
3



# Arcadia Creek at WMU Power Plant



# Future BMPS

- Total Maximum Daily Load (TMDL) Grant
  - Baseline (1998) vs. today for all WMU property
    - TSS, TP, flow
  - Quantify campus projects holistically since 1998
  - Future projects
    - Identify projects to best reduce our TMDL
  - Reduce or eliminate WMU's storm water footprint
- Great Lakes Restoration Initiative Grant
  - 7 shovel-ready storm water projects



# Geographic Information Systems

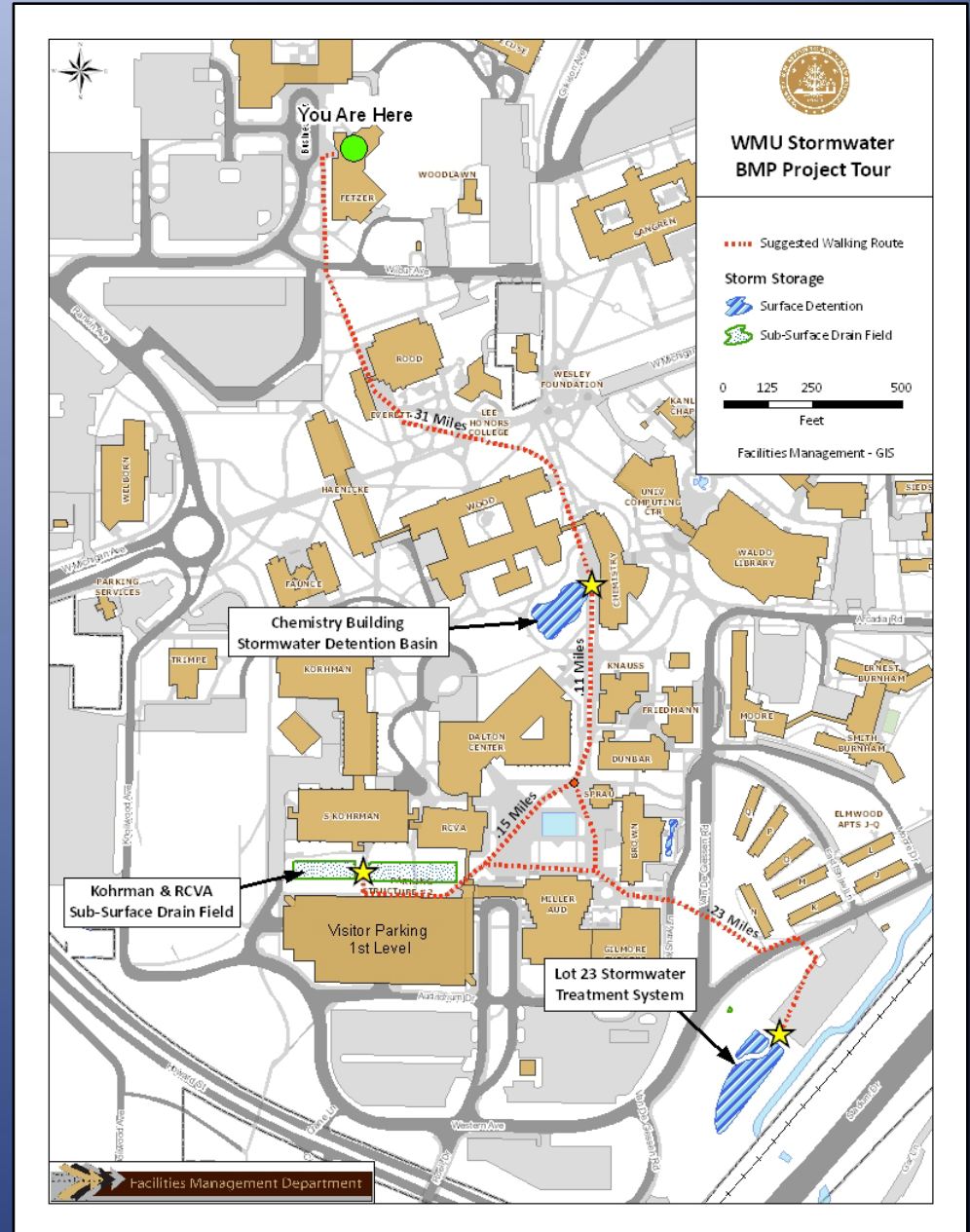
- Data Collection of Utility Infrastructure
  - 1426 Storm Points
  - Points of Discharge
  - Over 28 Miles of Storm Lines
- Aerial Imagery Catalog
- Base Mapping
  - Impervious vs Pervious Surfaces
  - LiDAR Elevation Data (2008)
- Interactive Web Mapping Application
  - Share data University wide
    - <http://gis.fm.wmich.edu>





# WMU Storm Water Tour

- Self Guided
  - Maps Available
- Round Trip Walking
  - About 1 ¾ miles
- Visitor Parking at Kohrman RCVA Drain Field
  - Lower Level of Parking Structure (Meters)





# Thank You

- Dan List – Manager - GIS  
– [daniel.list@wmich.edu](mailto:daniel.list@wmich.edu)
- Cari DeLong – Manager – Natural Areas  
– [cari.delong@wmich.edu](mailto:cari.delong@wmich.edu)
- Greg Roseboom – Manager – Campus Utilities  
– [gregory.roseboom@wmich.edu](mailto:gregory.roseboom@wmich.edu)
- Tim Holysz – Director - Landscape Services  
– [tim.holysz@wmich.edu](mailto:tim.holysz@wmich.edu)
- Pat Holton – Director - Environmental Health & Safety  
– [patrica.holton@wmich.edu](mailto:patrica.holton@wmich.edu)

