

Universal Pumping Station

Board of Determination

Dow Event Center

March 23, 2016

7:00 PM



Brian J. Wendling

Saginaw County Public Works Commissioner

Meeting Agenda

- I. Introduction
- II. Opening of Board of Determination Meeting
- III. Outline of the Board of Determination Procedure
- IV. Engineer's Review
- V. Public Testimony - (3 minutes per person.)
- VI. Vote of Board of Determination
- VII. Appeal Procedures and Closing Comments
- VIII. Adjournment

Role of the B.O.D.

- The Board of Determination's role is to make two decisions:
 1. Whether a project is necessary
 2. Whether a portion of the cost is to be assessed at-large to the municipalities for benefit to public health

Role of B.O.D. (cont.)

- The Board of Determination DOES NOT decide:
 - ▣ The scope of the project
 - ▣ The cost of the project
 - ▣ How much property owners and municipalities are assessed for the project

Information on these topics will be made available at a later date. Please see a member of the Public Works Commissioner's staff after the meeting if you have questions.

Public Comment

- *Please fill out a comment card.*
- The speaking order will be called by the chairman from the comments cards submitted.
- Please make sure to fill out the entire comment card for accuracy of the minutes taken by the court reporter.
- Limit comments to 3 minutes.

Public Comment (cont.)

- Briefly state your position on the petition for the Universal Pumping Station. For example: “I support the petition for because . . .” or “I oppose the petition for because”
- Remember to stay on topic! Comments for tonight’s meeting are limited to the current petition for the Universal Pumping Station only.
- The Public Works Commissioner’s staff will gladly speak with you on other topics after the conclusion of tonight’s meeting.

Introduction by Public Works Comm.

- **Originally constructed in 1968**
 - ▣ Intended for flood protection
 - ▣ 3 large pumps installed in 1968
 - Axial Flow Pumps with 150 H.P. Motors
 - Rated at 30,000 gallons per minute (GPM) each
 - ▣ Gravity discharge when Saginaw River elevation is low
 - ▣ Flap gates to prevent Saginaw River backflow when river elevation is high
 - ▣ Bar screen to collect trash and debris

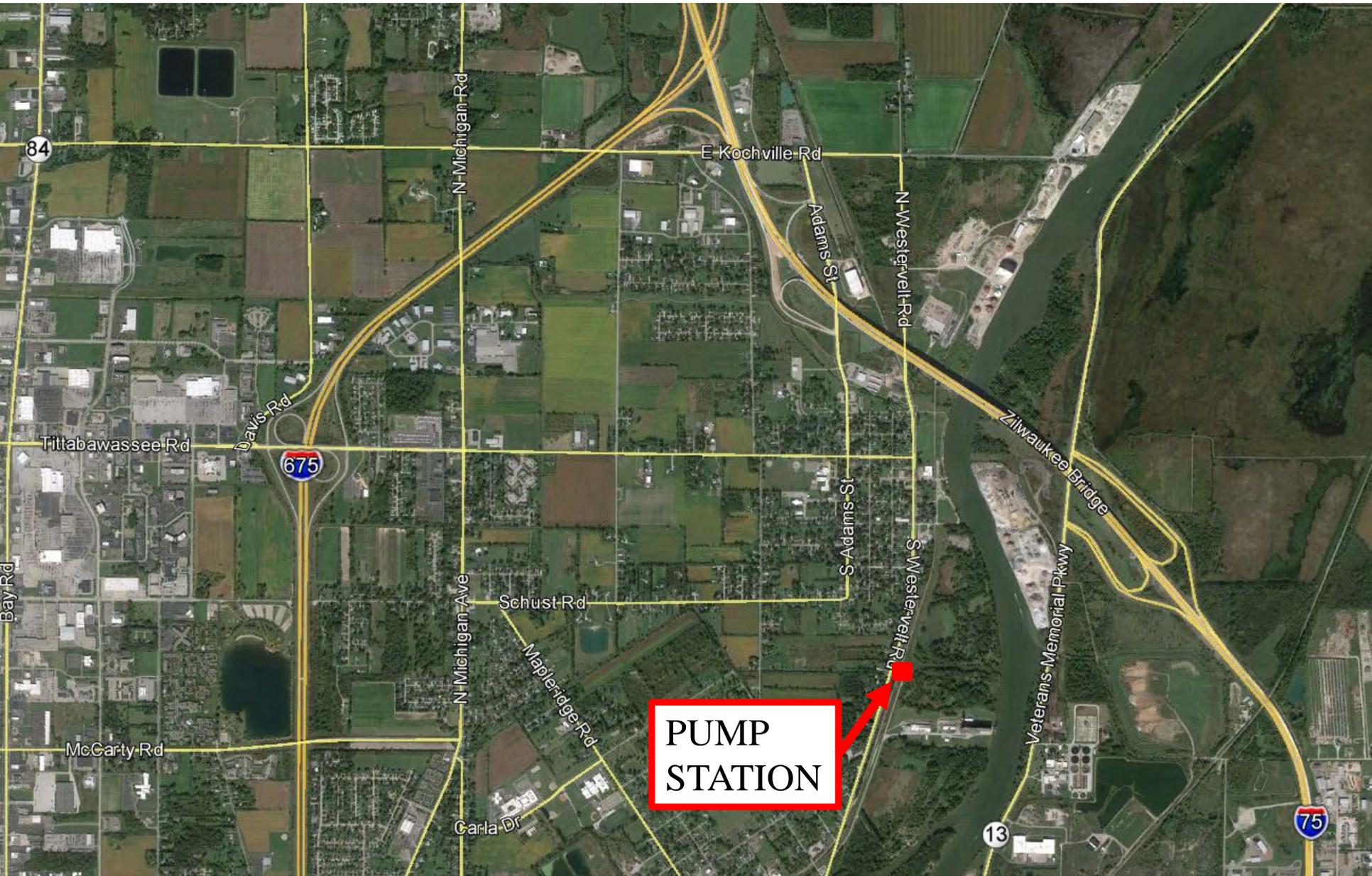
Introduction by Public Works Comm.

□ **1987 upgrades**

- Added 4th large pump
 - Axial flow pump with 200 HP motor
- Enclosed open drain up to Carrollton Road
- Added self cleaning trash rack to replace bar screen
- Added sluice gate to increase gravity outflow capacity
- Existing building at pump station reconfigured
- Existing pumps and outlets reconfigured

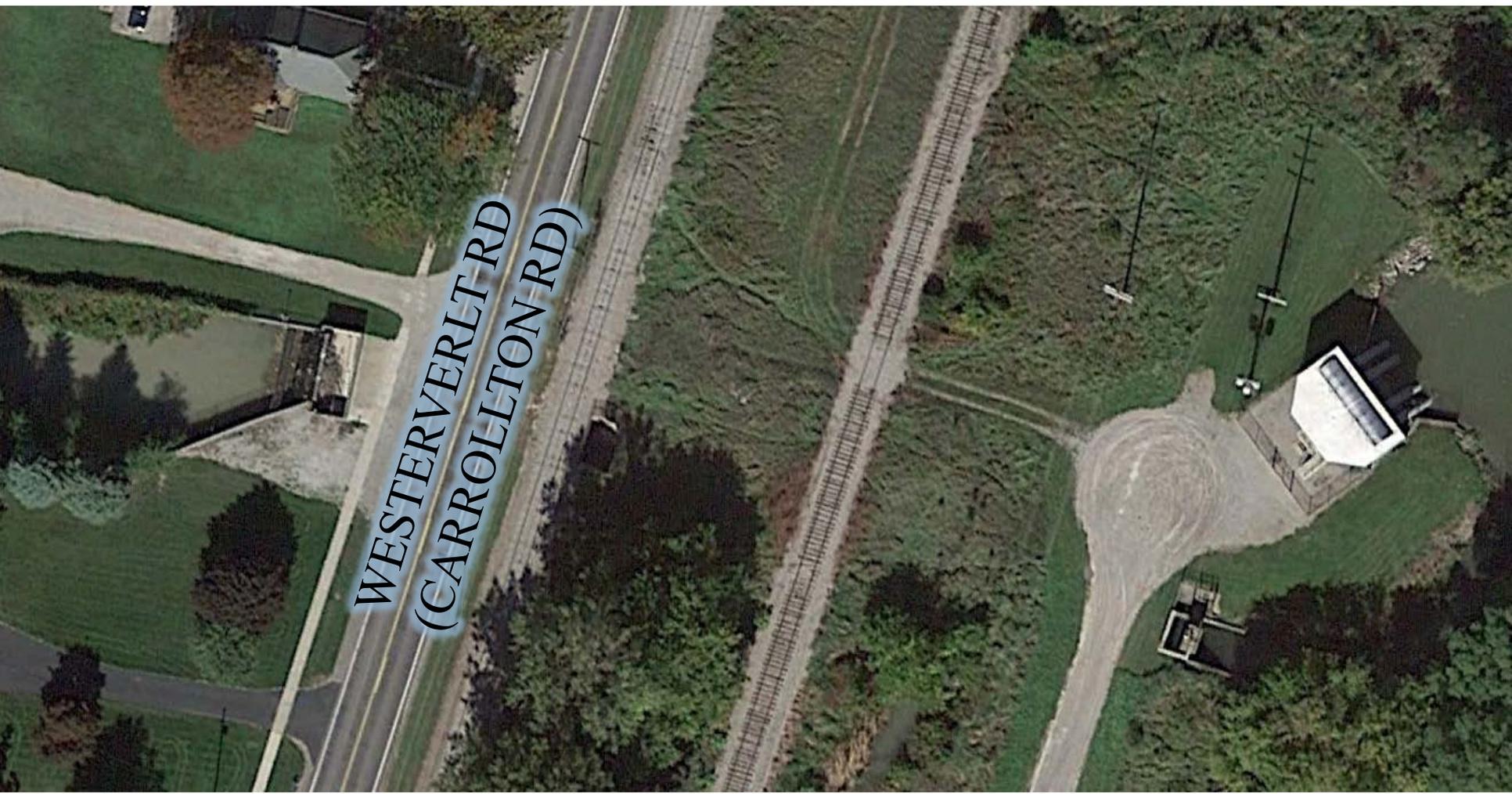
□ **Other upgrades**

- Added 5th pump for low flow pump conditions
 - Axial Flow pump with 25 H.P. Motor



**PUMP
STATION**

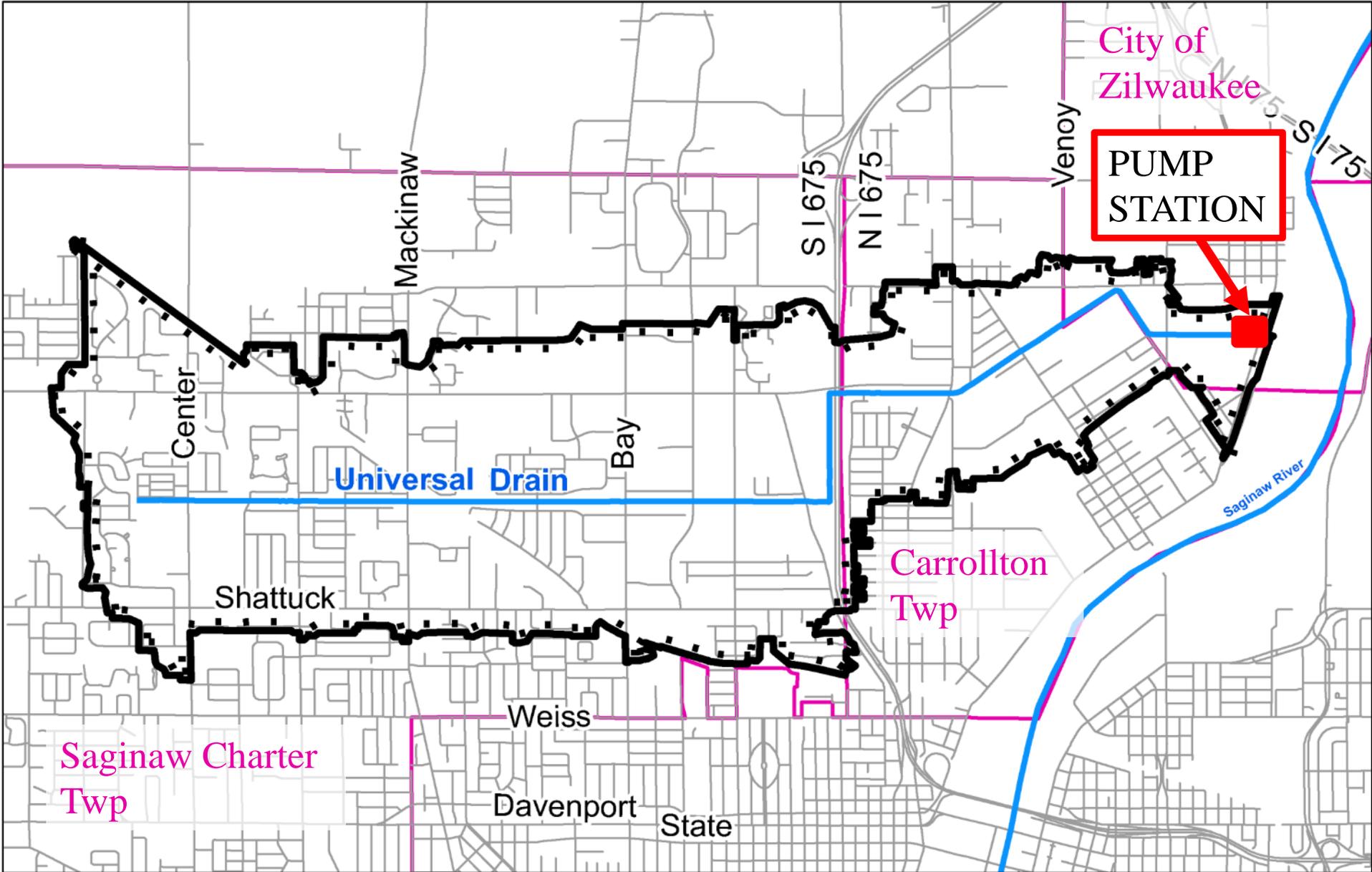
**WESTERVELT RD
(CARROLLTON RD)**



Introduction by Public Works Comm.

- **Recent problems**
 - Trash rack regularly breaks
 - Pump shaft broke
 - Increase man hours to keep pumping station functioning
 - Multiple motor and starter failures
 - Many features of pumping station broken or corroded creating safety and reliability concerns
- **Engineering Report Requested**

Drainage District



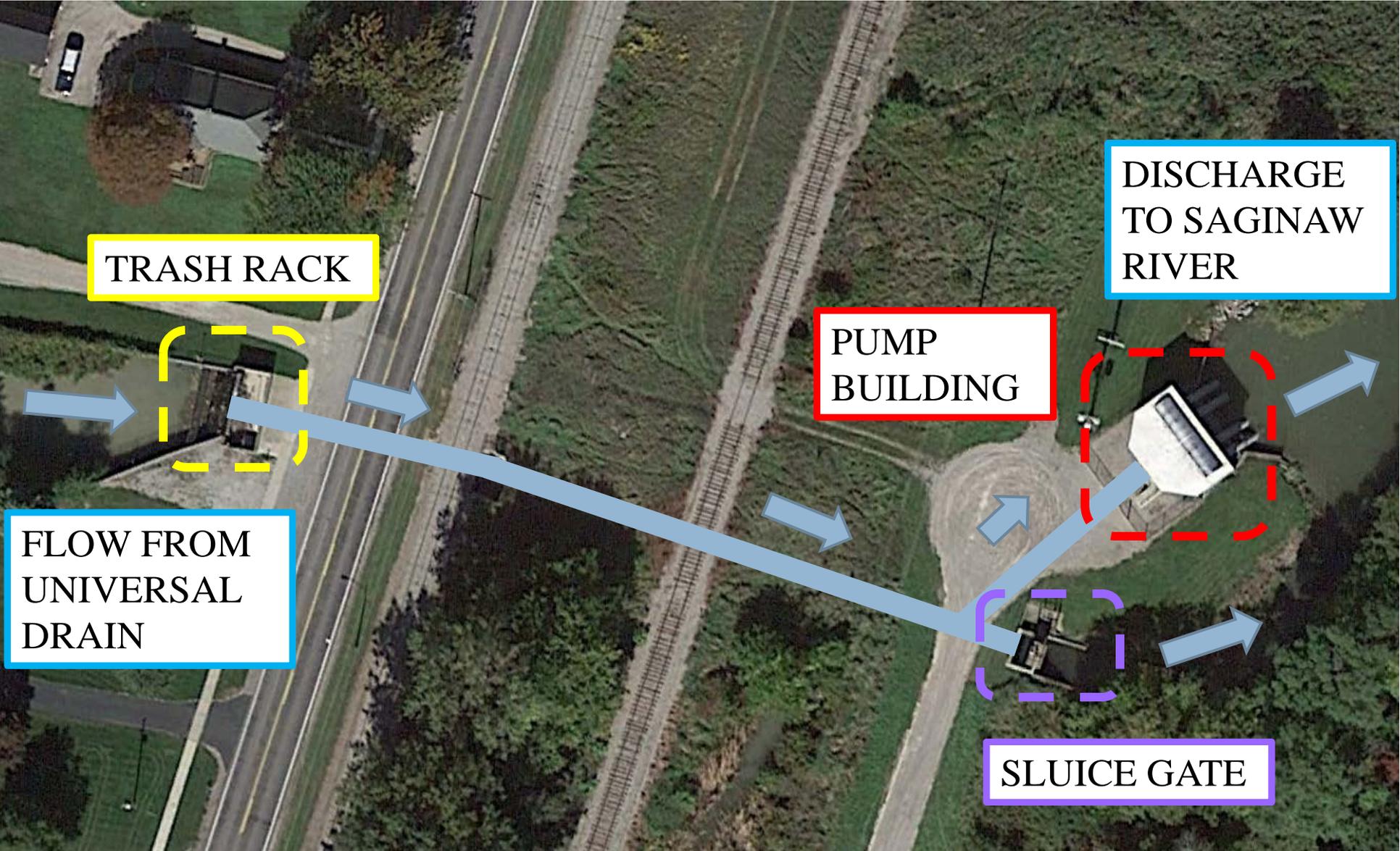
Drainage District

- Where is the Universal Pumping Station?
 - ▣ Located at the Universal Drain's Outlet into the Saginaw River
 - ▣ Watershed area: 4,148 acres
- What is the drainage district?
 - ▣ Lands that contributes storm water to drain
 - ▣ Drainage District serves as the special assessment district
 - ▣ Universal Pumping Station Drainage District includes portions of:
 - City of Zilwaukee
 - Carrollton Twp
 - Saginaw Charter Twp
 - M.D.O.T.
 - Saginaw County
 - Railroad Companies
 - Landowners – Approximately 4,867 parcels

Engineering Report

- ❑ Pumps have outdated controls that make them operate inefficiently
- ❑ Trash rack & sluice gate are manually controlled and are expensive/difficult to efficiently operate
- ❑ Trash rack contains parts that are no longer available when failures occur
- ❑ Pump station cannot be remotely monitored therefore requires routine on site personnel
- ❑ Pumping station does not have back up power therefore will not work when there is a power outage
- ❑ Does not meet current safety standards
- ❑ Regularly breaks down and needs repairs

Pump Station Layout



Engineering Review/Inventory

- The following components of the pumping station were reviewed:
 - Power Source
 - Pumps
 - Trash Rack
 - Controls and Sluice Gate
 - Monitoring Capabilities
 - Site Lighting and Safety
 - General Facility Conditions

Inventory

▣ Power Source

- No Backup Power Source is available in case of an emergency
- Two power failures have occurred in the last year

▣ Pumps

- Three of the existing primary pumps are 48 years old
- The fourth existing primary pump is 29 years old
- Recent problems include:
 - One pump failed in 2014 due to failed drive shaft
 - Two pumps stopped functioning due to starter failure



Pumps 1 & 2 – Installed 1968



Pump 3 (Low Flow Pump) – Installed 2000



Pump 4 – Installed 1968



Pump 5 – Installed 1987



Broken Pump Shaft Coupling



Pump Being Removed for Service

Pump Station Inspection (Cont.)

▣ Trash Rack

- Existing trash rack is in poor condition
 - Only 2/3 of cleaning mechanism functions properly
- Excessive rusting and corrosion
- Frequent breakage and failure
- Difficult to repair due to very limited availability of replacement parts due to age
- Frequently requires manual cleaning due to poor operation
- No lifting device is present to aid in the removal of large debris
- Requires manual operation



Trash Rack – Installed 1987



Trash Rack



Trash Rack: Chains

Pump Station Inspection (Cont.)

▣ Controls

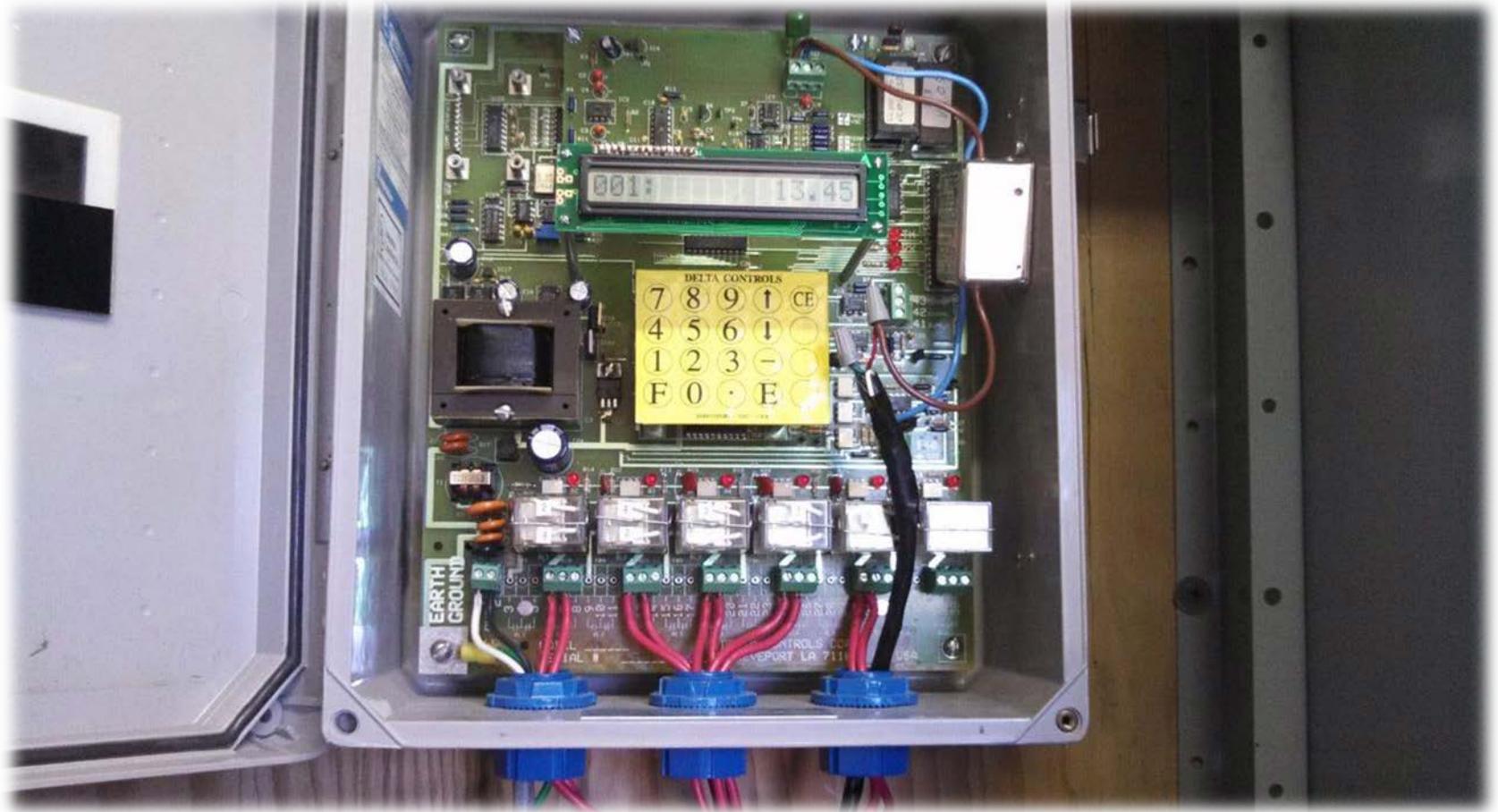
- Existing controls are in poor condition
- Existing pump controls are automated
 - Pumps have very limited alternation capability due to current configuration
 - Pump No. 1 Runs 6 times more frequently than others
- Existing trash rack and sluice gate controls are manually controlled
- Sluice gate requires special equipment to be brought out to site and is not easily or conveniently operated



Trash Rack: Control Panel



Pump Power Controller



Pump Level Controller



Pump Station Basement: Level Sensor, Wiring Unprotected



Sluice Gate has manual controls that are difficult to operate and require special equipment

Pump Station Inspection (Cont.)

- ▣ Monitoring Capabilities
 - Pump Station has auto-dialer to alert operator when power goes out
 - No remote monitoring capabilities of equipment are installed



Pump Station Inspection (Cont.)

- ▣ Site Lighting and Safety
 - Existing lighting does not meet current standards and presents potential safety risk to operators
 - Pump station has exposed wiring at various locations
 - Various metal components in pump station have excessive corrosion and rust present
 - Fall prevention system not present on trash rack
 - Ventilation system is not operating as originally intended
 - No railings/permanent ladder present on roof for use during pump removal operations



Pump Station Interior Lighting



Pump Station Interior Lighting



Pump Station Exterior Lighting



Exposed Wiring in Pump Station



No Fall Prevention System at Trash Rack



Pump Station Basement: Beam Corrosion



Air Intake Fan Missing in Pump Station

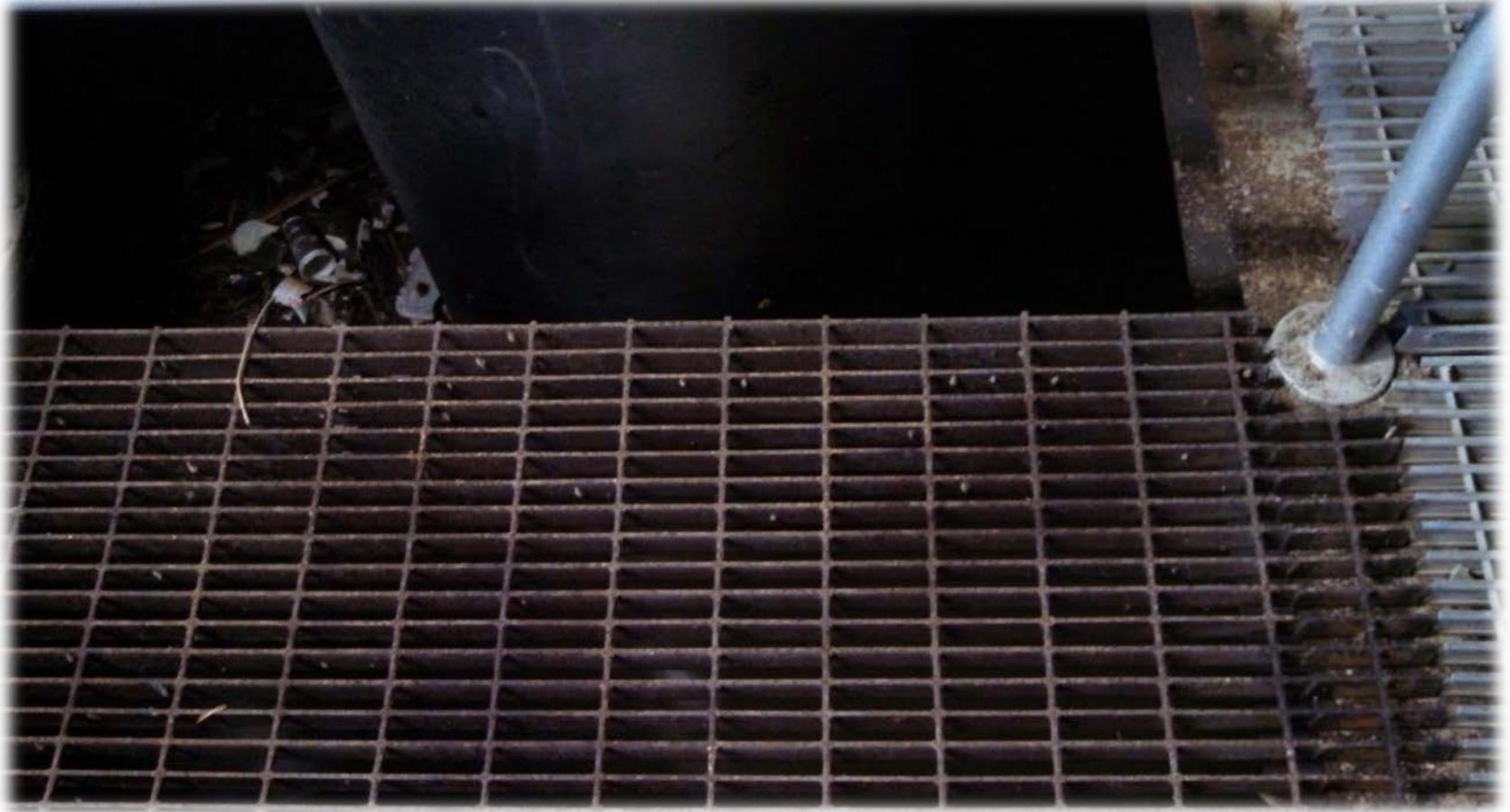
Pump Station Inspection (Cont.)

▣ General Facility Conditions

- Many metal surfaces need to be cleaned and repainted to prevent further corrosion
- Existing concrete is damaged at various locations
- Soil erosion around existing facilities is present at various locations
- Perimeter security fence at pump station is degraded
- No freeze prevention system in place to ensure equipment operates through winter months



Pump Station Exterior: Utility Entrance



Rusted Safety Grating in Pump Station



Trash Rack Intake: Damaged Concrete



Sluice Gate: Soil Erosion and Concrete Damage

Engineering Review/Inventory Summary

- ❑ There is no backup power source
- ❑ The pumps have reached the end of their design life
- ❑ The trash rack has reached the end of its design life
- ❑ The controls and monitoring equipment are very outdated and requires frequent manual operation
- ❑ The overall facility is in need of safety improvements
- ❑ The overall facility is in need of maintenance to support functionality into the future

Planning Level Project Cost

- Planning level cost estimate is \$3 Million
- Costs to be assessed to drainage district
 - ▣ Drainage District includes portions of:
 - City of Zilwaukee
 - Carrollton Twp
 - Saginaw Charter Twp
 - M.D.O.T.
 - Saginaw County
 - Railroad Companies
 - Landowners – Approximately 4,867 parcels
- Subdivision residential lot \$40 to \$60 annual assessment
- Large and commercial lots will vary based on size and contribution

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