Gage Drain and Pumping Station

Board of Determination

Buena Vista Community Center

December 6, 2016

6:30 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

Description of Drain Process

- Landowner Petition (Requires min. 5 signatures)
- Municipality Petition
- Board of Determination – Board is Impartial Parties appointed by Mr. Brian Wendling
- Board Votes – after reviewing presentation and hearing public testimony.
  - If Vote Yes = Move forward with a project (typically hire engineering firm to survey/engineer/bid/construct). Final project costs determined after bids received for construction.
  - If Vote No = No work completed on the drain.

Role of the B.O.D.

- The Board of Determination's role is to make two decisions:
  1. Whether a project is necessary based on public health, welfare or convenience.
  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.

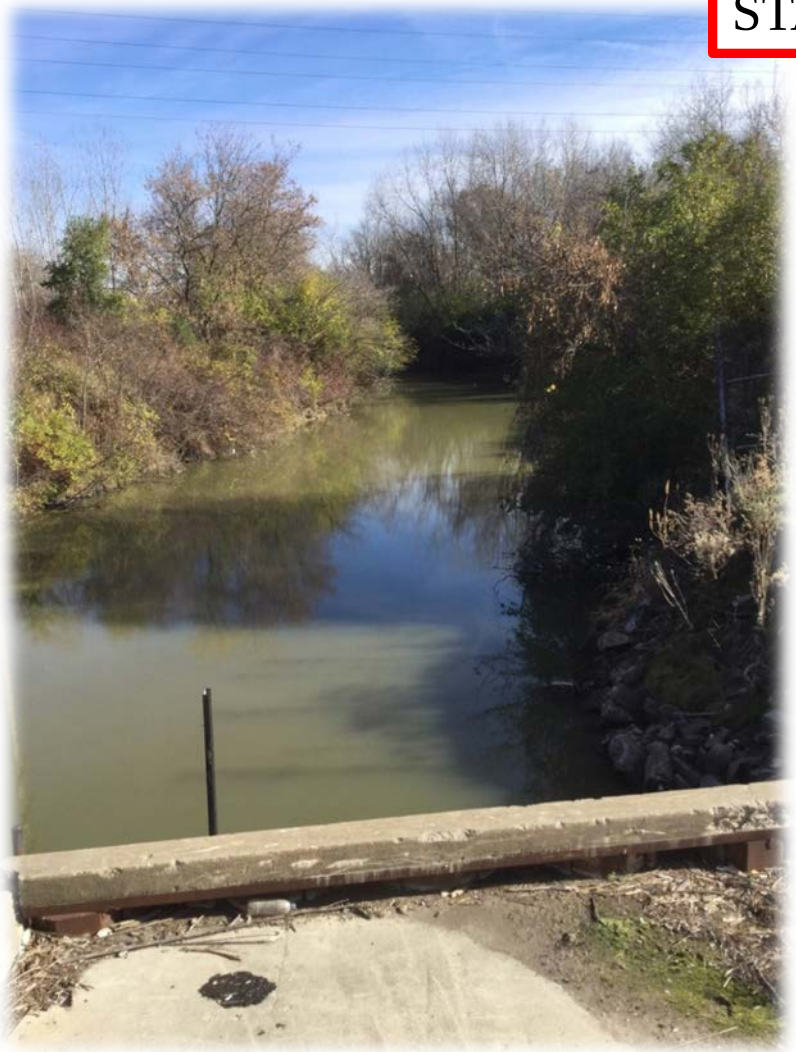
Public Comment

- *Please fill out a comment card.*
- The speaking order will be on a first come, first served basis.
- State your full name and address. Spell your last name for the court reporter.
- Limit comments to 3 minutes.

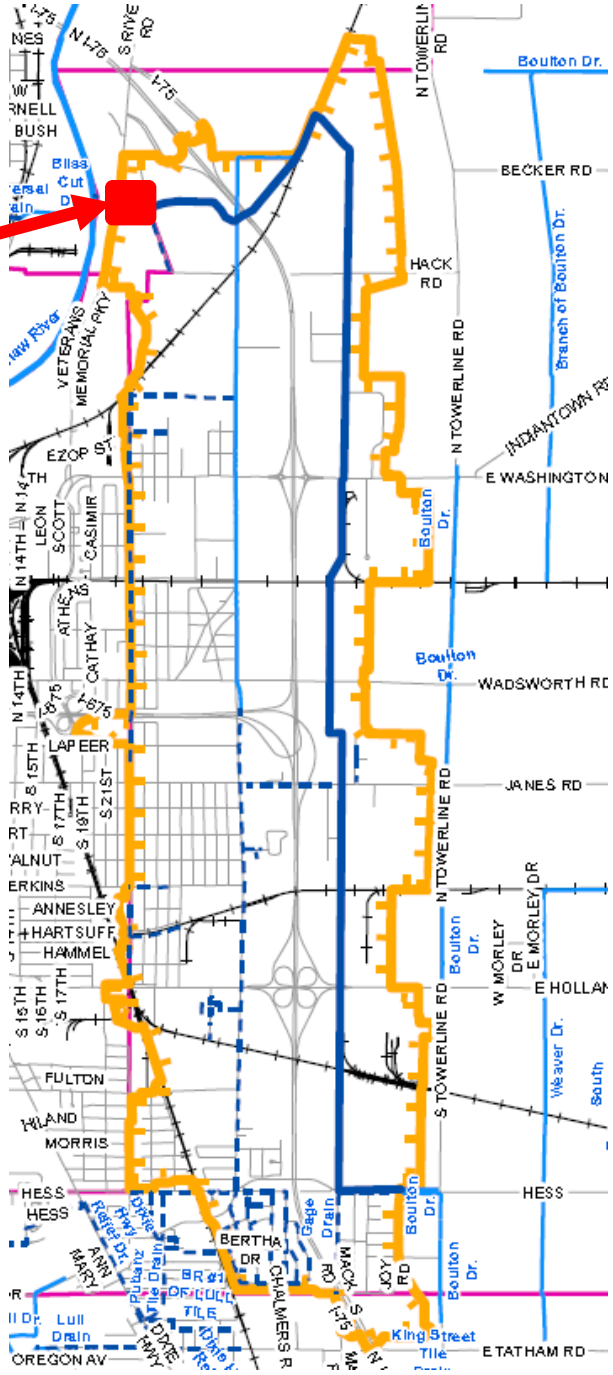
Public Comment (cont.)

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

Drainage District



PUMP STATION



Drainage District & Drain Facts

- Gage Drain and Pumping Station
  - Pump Station is Located at the Gage Drain's Outlet into the Saginaw River
  - Gage Drain is approximately 7.4 Miles (39,015 Feet) Long
  - Watershed area: 4,512 acres
- What is the drainage district?
  - Lands that contribute storm water to drain
  - Drainage District serves as the special assessment district
  - Gage Drain and Pumping Station Drainage District includes portions of:
    - Buena Vista Charter Township, City of Saginaw, Zilwaukee Township
    - M.D.O.T.
    - Saginaw County
    - 2 Railroad Companies
    - Landowners – Approximately 3,329 parcels

Drain Facts continued

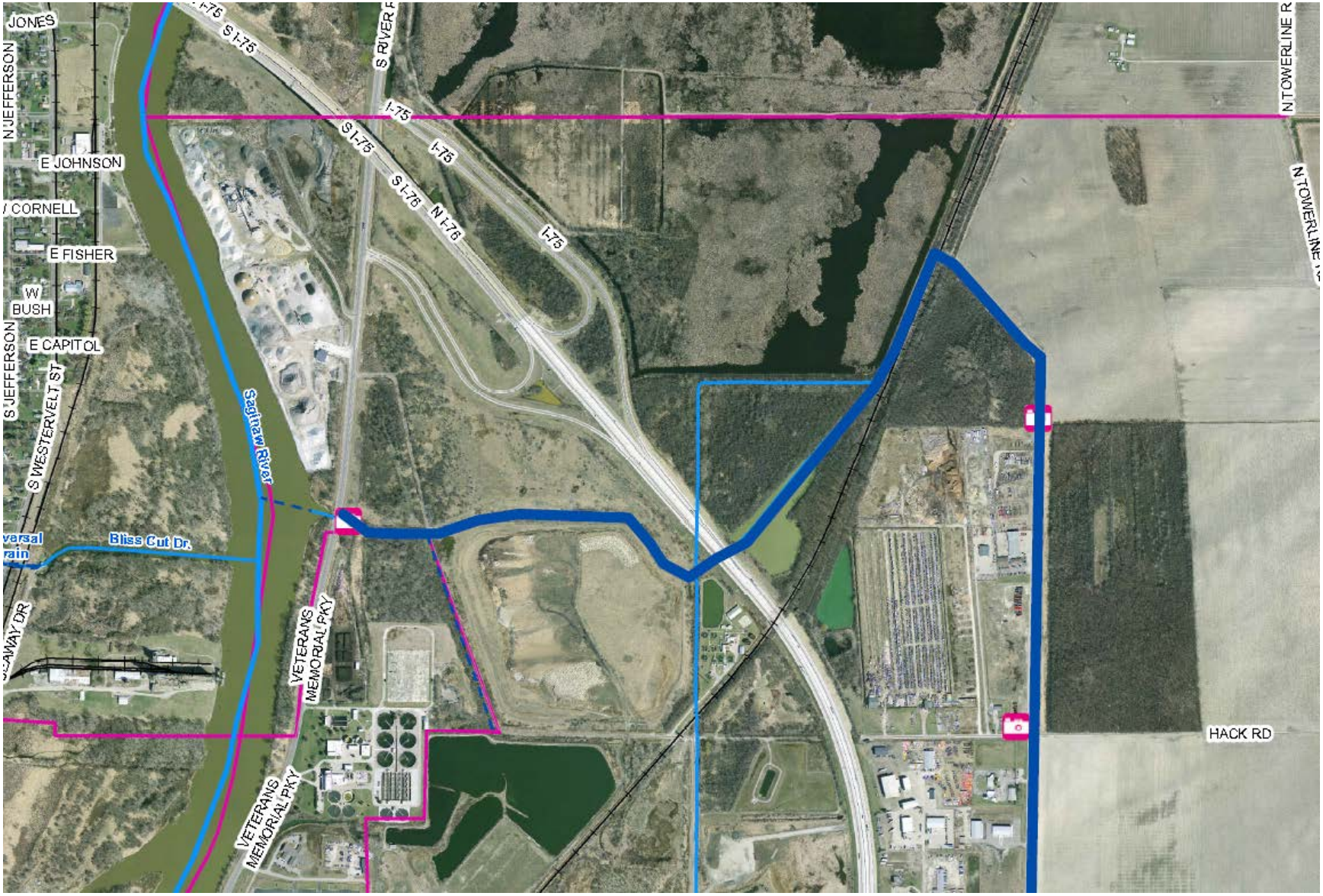
- The Gage Drain was established in 1879. It was cleaned out via petition in 1902, 1910, 1916, 1958, and 1969.
- The Pump Station was constructed at the end of the Gage, Koehler & Dieckman Drains in 1947.

- A resolution was passed on January 19, 2016 by the Buena Vista Charter Township Board authorizing the supervisor to execute a petition for maintenance and improvement of the Gage Drain (including the Pumping Station).
  - The current petition was filed on September 15, 2016 by Buena Vista Charter Township. The petition was signed by the Supervisor and Clerk.

Drain Inspection

- On November 9, 2016 an engineering field review of the Drain was completed as a result of the petition filed with the Public Works Commissioner. The following was observed:
  - The drain flows through a heavy industrial area, along with agricultural and rural residential areas.
  - Many reaches of the drain have a low flow channel with sediment bars.
  - Minimal bank erosion was evident from the road crossings.
  - Portions of the drain are heavily wooded, with some deadfall/log jams noted.
  - Portions of the drain appear to be in good shape.

Location Map – Drain Inspection



Looking Upstream (East) from the Pump Station

Looking Downstream (North) from Farm Crossing

Looking Upstream (South) from Farm Crossing

Looking Downstream (North) from Hack Road

Looking Upstream (South) from Hack Road

Hack Road – South End of Culvert Crossing

Location Map – Drain Inspection

Looking Downstream (North) from Washington Road

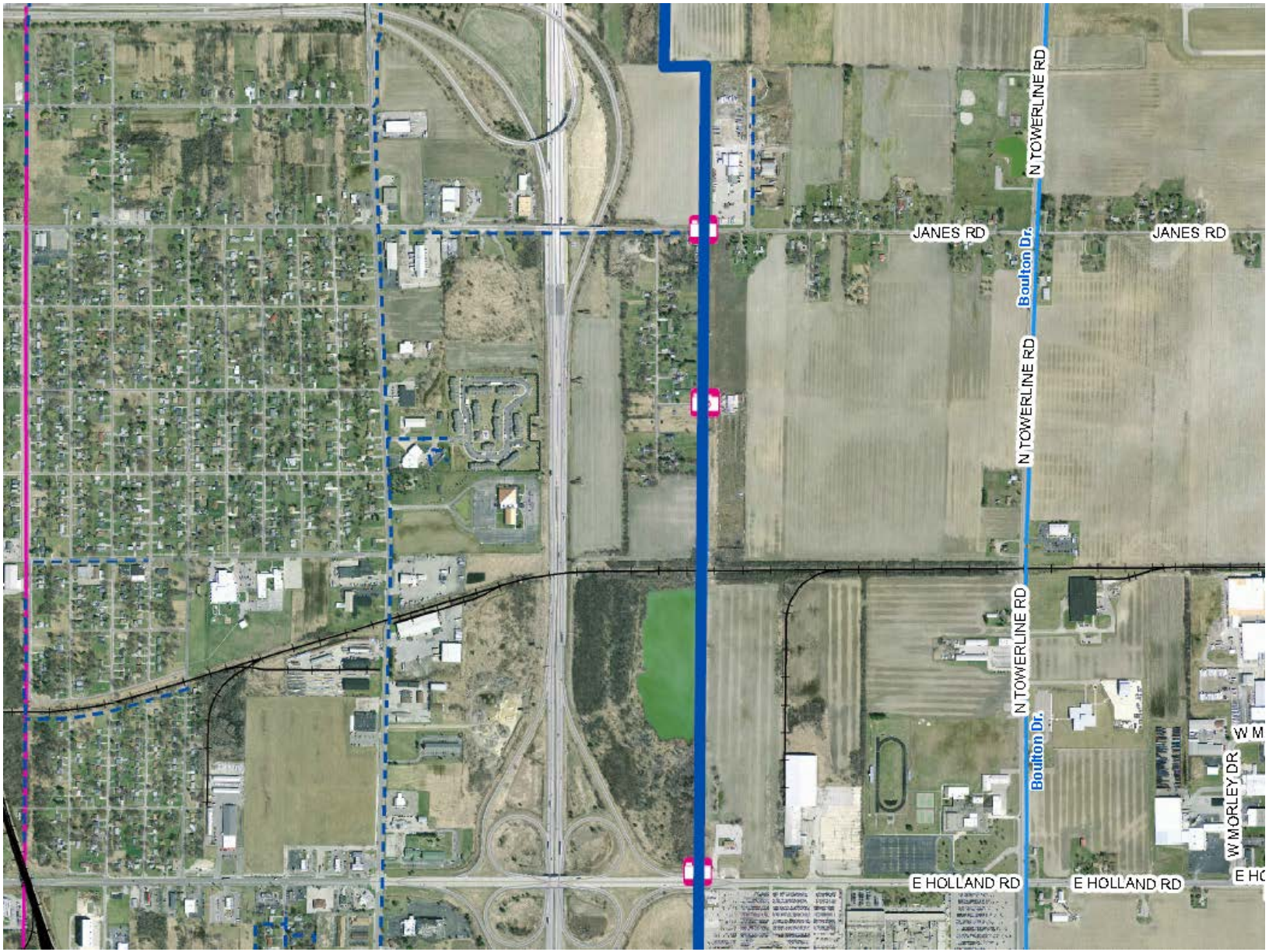
Upstream (South) side of Washington Road

Looking Downstream (North) from Wadsworth Road

Looking Upstream (South) from Wadsworth Road

Wadsworth Road – South End

Location Map – Drain Inspection



Looking Downstream (North) from Janes Road

Looking Upstream (South) from Janes Road

Looking Downstream (North) from Bondalyn Road

Looking Upstream (South) from Bondalyn Road

Looking Downstream (North) from Holland Road

Downstream (North) End Holland Road

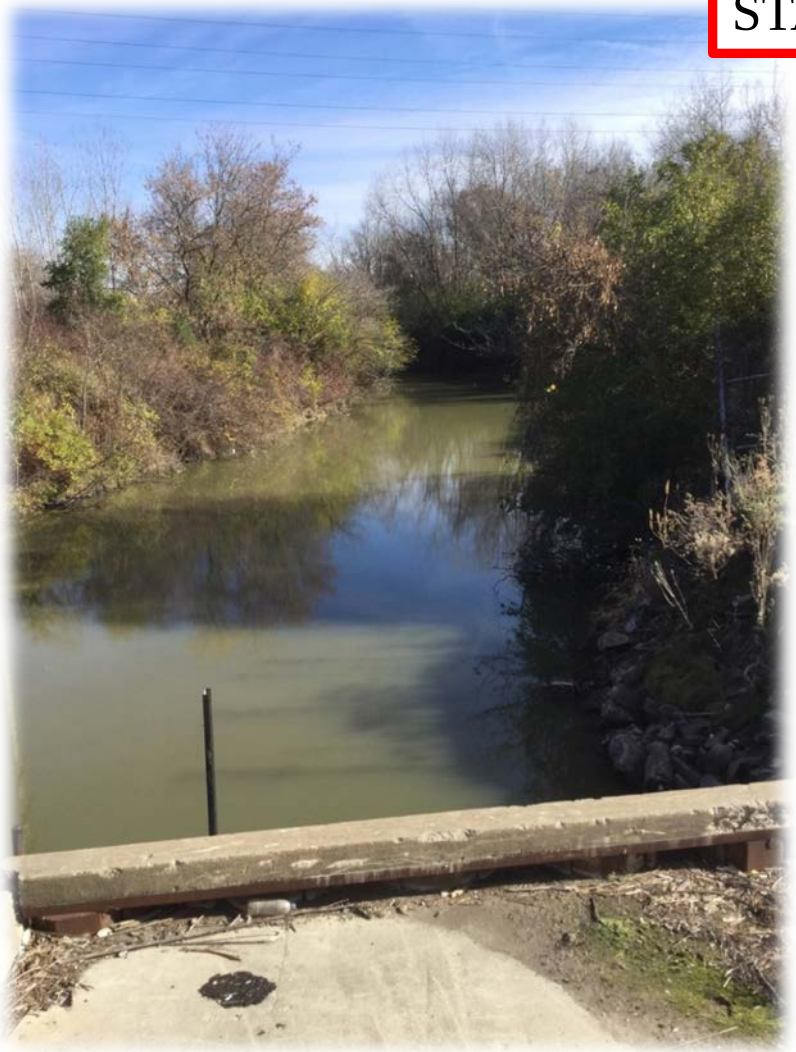
Looking Downstream (North) from Hess Road (Nexteer)

Looking Upstream (East) Along Hess Road

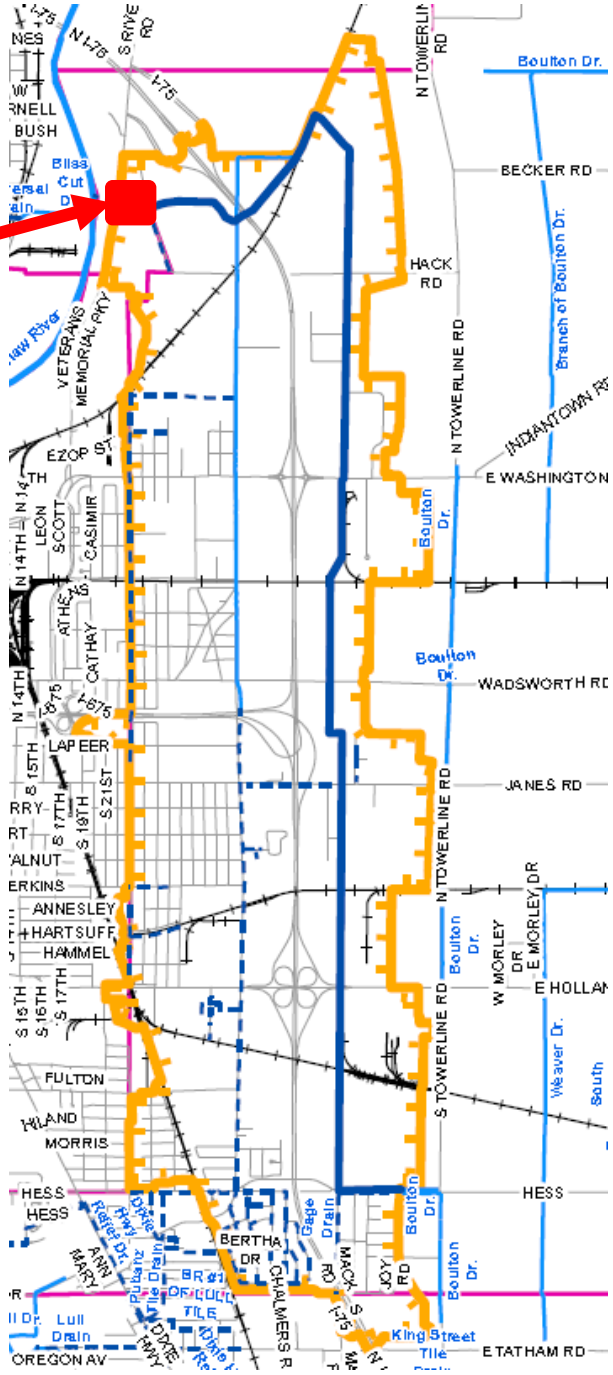
Drain Inspection - Summary

- The drain flows through a heavy industrial area, along with agricultural and rural residential areas.
- Many reaches of the drain have a low flow channel with sediment bars.
- Minimal bank erosion was evident from the road crossings.
- Portions of the drain are heavily wooded, with some deadfall/log jams noted.
- Portions of the drain appear to be in good shape.

Drainage District



PUMP STATION



Gage Pumping Station - History

- Originally constructed in 1947
  - Intended for flood protection
  - 2 large pumps installed in 1947
    - 3rd pump installed at later date
    - Axial Flow Pumps with 100 H.P. Motors
    - Rated at 26,000 – 28,000 gallons per minute (GPM) each
  - No gravity discharge to Saginaw River (box culvert under M-13 to Saginaw River is too high to allow flow out)
  - Flap gates to prevent Saginaw River backflow when river elevation is high
  - Bar screen to collect trash and debris

Pipe Under M-13 to Saginaw River

Flap Gates to prevent back flow from Saginaw River

Trash Rack at outlet of the Gage Drain to the Pump Station

Gage Pumping Station

1983 upgrades

- Rebuilt existing pumps
  - Re-worked impellers, new bearings and new pump shafts. Sand blasted and painted
- Rebuilt existing electric motors
- Replaced rusted discharge pipes

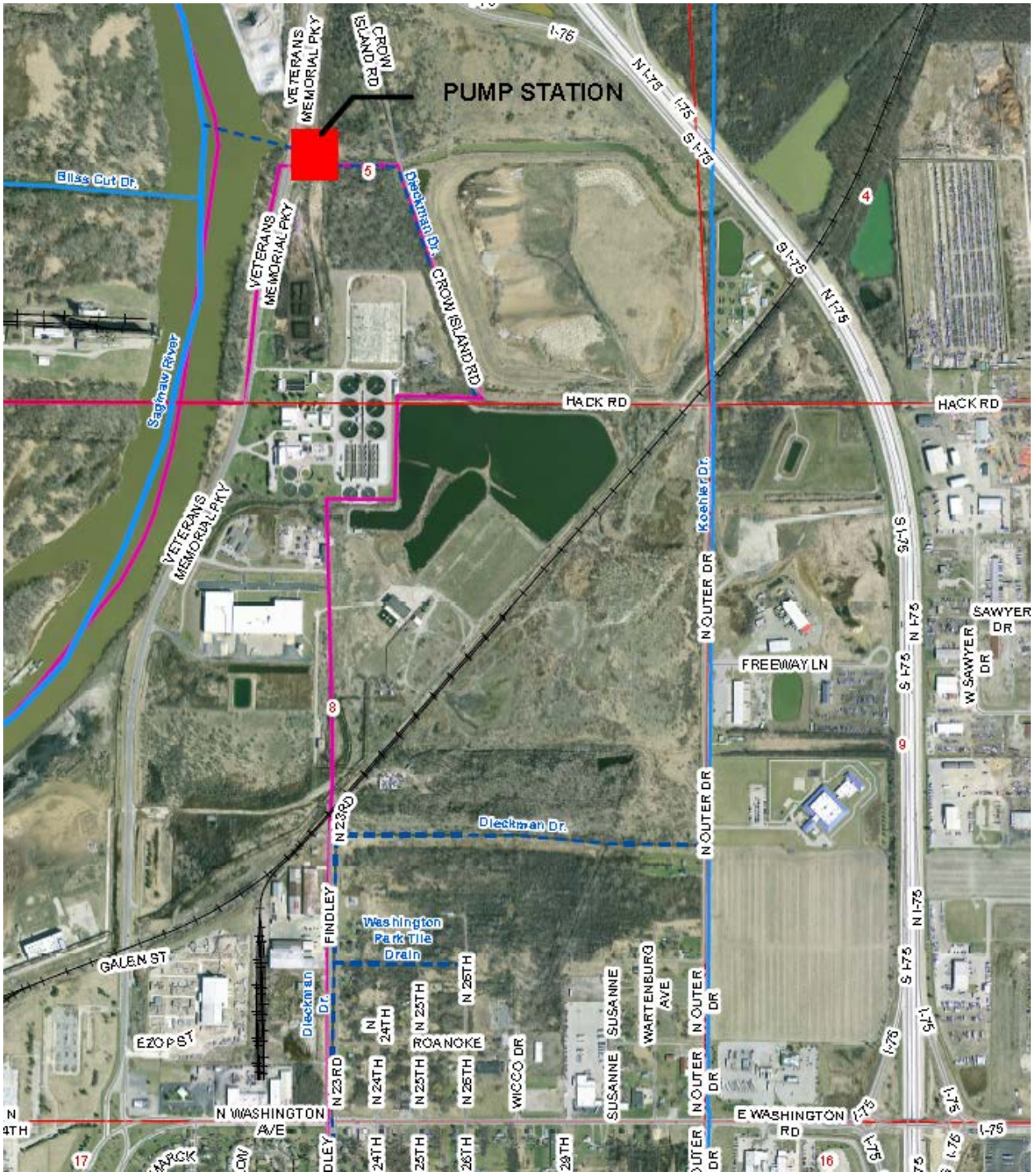
Other upgrades

- Approximately 1985 - Added self cleaning trash rack to replace bar screen
- Mid 1990's – added sheeting to outside of building

Discharge Pipes

- In 1983, the discharge pipes through the pump station were replaced.

Added Sheeting to Outside of the Building in the Mid-1990s


PUMP STATION
VETERANS MEMORIAL PKY
CROW ISLAND RD
I-75
N I-75
S I-75
Bliss Cut Dr.
Saginaw River
Dieckman Dr.
HACK RD
Koehler Dr.
N OUTER DR
FREEWAY LN
SAWYER DR
W SAWYER DR
N 23RD
FINDLEY
Washington Park Tile Drain
GALEN ST
EZOP ST
N 24TH
N 25TH
N 26TH
ROANOKE
WICCO DR
SUSANNE
WARTENBURG AVE
N WASHINGTON AVE
E WASHINGTON RD
4
5
8
9
16
17

Gage Pumping Station

- **Recent problems**
  - Trash rack regularly breaks (chains are stretched & rusted)
  - No. 3 pump is out of rotation. Bearings are worn way out of tolerance.
  - Poor access to pumps – roof is tongue & groove lumber with metal I-beams and a Duralast rubber roof.
  - Past motor and starter failures

Roof – No easy way to remove pumps

Pump Being Removed for Service in 1983

Pumping Station – Inventory/Summary

- Facility roof needs to be updated in order to be able to efficiently remove the pumps.
- The pumps have reached the end of their design life
- The trash rack has reached the end of its design life
- The overall facility is in need of safety improvements
- There is no backup power source
- The controls and the alarm equipment are outdated.
- Freeze prevention system needs to be updated to be more efficient (need to keep water inside of the pump from freezing to allow the pump to operate)

Pumping Station - Inventory

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

Pumping Station - Inventory

- Power Source
  - No Backup Power Source is available in case of an emergency
- Pumps
  - Pump Nos. 1 & 3 are approximately 68 years old. Age of Pump No. 2 is unknown, but it is a newer model than the others.
  - Pump Nos. 1 & 2 have approximately 9,500 hours, while Pump No. 3 has approximately 8,500 hours since 1983.
  - Recent problems include:
    - Pump number 3 was taken out of circulation in 2014 due to excessive bearings wear

Pumps 1 & 3 are original. Pump 2 is newer model.

Pump Station Inspection (Cont.)

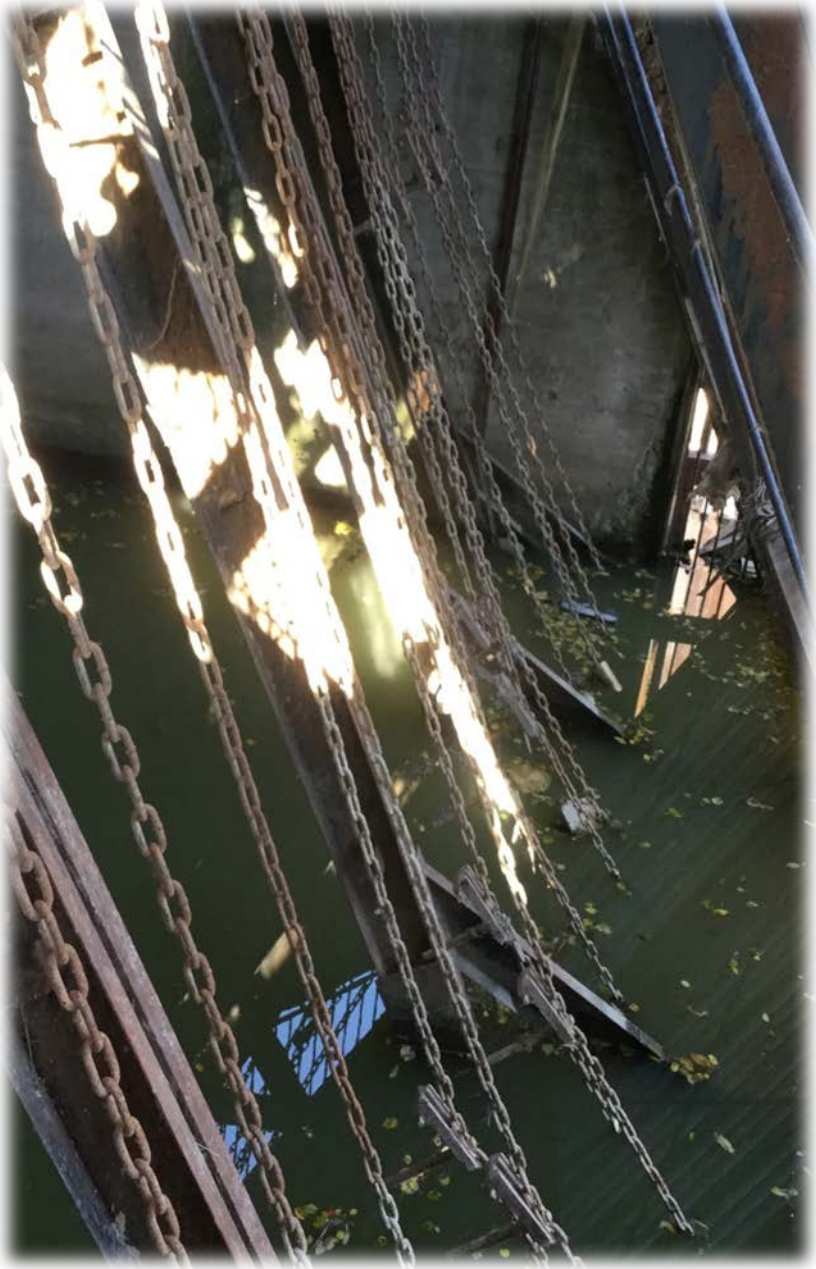
- Trash Rack (approximately 31 years old)
  - Existing trash rack is in poor condition
    - Only 2/3 of cleaning mechanism functions properly
  - Excessive rusting and corrosion
  - Frequent breakage and failure
  - Difficult to repair due to very limited availability of replacement parts due to age
  - 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 1985

Trash Rack:
Auger System
Excessive
Corrosion

Trash Rack: Auger System
Does not handle larger debris such as logs or tree branches

Trash Rack: Debris Pit
Costly to remove debris. Trash must be separated, loaded into a dump truck, and hauled away.



Trash Rack: Chains

Pump Station Inspection (Cont.)

- Controls
  - Existing pump controls are automated but outdated.

Pump Station Inspection (Cont.)

- Controls
  - Existing switch gear controls are original. (Also called Pump Starters)

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
  - Safety in and around pump station needs to be brought up to today's standards (vs 1950's standards).
  - Existing lighting does not meet current standards and presents potential safety risk to operators
  - Fall prevention system not present on trash rack
    - No hand railing along cat walk in front
    - No hand railing along headwalls
  - 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 Exterior Lighting

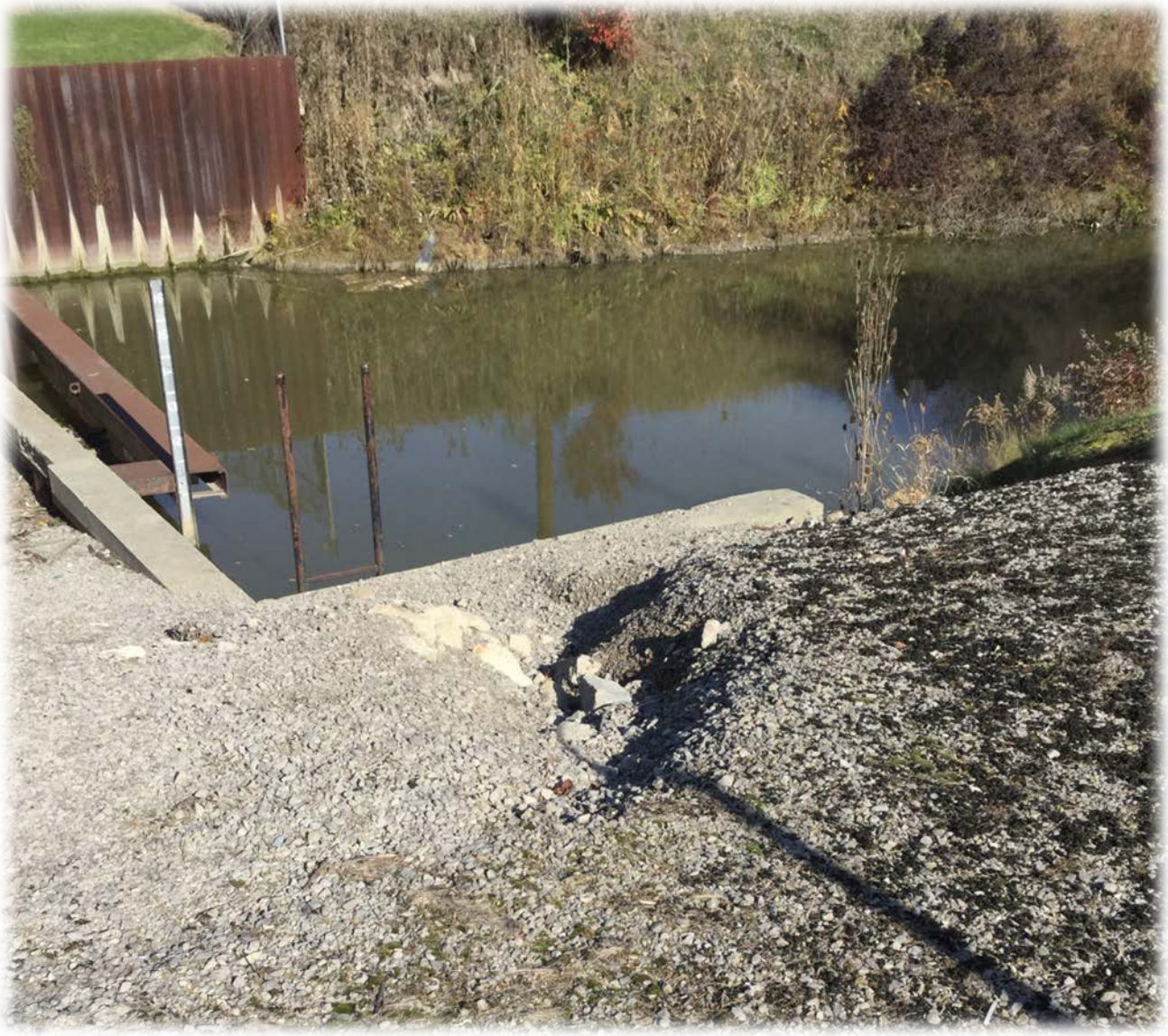
No Fall Prevention System at Trash Rack

No Fall Prevention System at Discharge Pipes

Pump Station Inspection (Cont.)

- General Facility Conditions
  - 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
  - Freeze prevention system needs to be updated to be more efficient (need to keep water inside of the pump from freezing to allow the pump to operate)

Trash Pit: Damaged Concrete



Soil Erosion Near Trash Pit

Wet Well – Problems with pumps freezing, confined space entry required to access, and no safety railings

Pumping Station - Review/Summary

- Facility roof needs to be updated in order to be able to efficiently remove the pumps.
- The pumps have reached the end of their design life
- The trash rack has reached the end of its design life
- The overall facility is in need of safety improvements
  - Lighting
  - Hand Rails
  - Ventilation
  - Fall Prevention
- There is no backup power source

Pumping Station - Review/Summary

- The controls and the alarm equipment are outdated.
  - Requires someone on-site to know status
    - Typically at 3 times a week, or more depending on weather and/or ice conditions
  - No alarms other than lost power
- Freeze prevention system needs to be updated to be more efficient (need to keep water inside of the pump from freezing to allow the pump to operate)

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