UNITED SOUTH & EASTERN TRIBES, INC.

NASHVILLE, TENNESSEE

GIS Presentation for the Tribal Utility Summit

T.J. Lamers

3/5/2020

McMAHON ENGINEERS ARCHITECTS

Presentation Outline

- Intro To McMahon
- About GIS
- Trends in GIS Technology
- Application Demonstrations
  - Passamaquoddy Data Collection
- Summary
- Questions?

Introduction to McMAHON

- Headquartered in Neenah, WI with offices in Machesney Park, IL and Valparaiso, IN
- McMAHON Associates, Inc. (McMAHON)
  Full-Service A/E Firm with staff of 150+; Est. 1909
  - McMAHON, Inc.
    Full-Service Design/Build Firm, Est. 1991
  - Integrated Public Resources, LLC
    Full-Service Privatization Firm; Est. 2014
  - Integrated Public Resources Operations, LLC
    Facility Operations; Est. 2019
- Recognized regionally and nationally for award winning designs and leadership in innovation
- Implementation of sustainable design principles, including LEED Design, Lean Practices and Waste-to-Energy Concepts

Operations Team

- Offering project management to full-time operational support by licensed professional staff:
  - Regulatory Permit Management
  - Preventative Maintenance Programs
  - Class 1 Wastewater and Class A Water Certified
  - Facilities Management
  - Microscopic Analysis of Mixed Liquor
  - Troubleshooting
  - GIS (Geographical Information Systems) Services
  - Fire Hydrant Flushing and Maintenance Programs
  - Inflow and Infiltration (I/I) Investigations
  - Asset and Infrastructure Improvement Planning
  - On-Call Assistance 24 Hours Daily

McMAHON ENGINEERS ARCHITECTS

UNITED SOUTH AND EASTERN TRIBES, INC.

WASTEWATER STARTUP, TRAINING OR OPERATIONS	
Byron	IL
Davis Junction	IL
Earlville	IL
Farmer City	IL
Glenbard Wastewater Authority - Lombard	IL
Lostant	IL
Marengo, City of	IL
Morton	IL
Oglesby	IL
Pecatonica	IL
Pontiac	IL
Poplar Grove	IL
Rockton Sanitary District	IL
Spring Valley	IL
Sycamore	IL
Valparaiso, City of	IN
Passamoquoddy Tribe, Indian Township	ME
Bloomington Normal Sanitary District	MN
Anamax Corporation - Green Bay	WI
Bear Creek, Village of	WI
Brillion, City of	WI
Forest County Potawatomi Community	WI
Fox River Sanitary District	WI
Fremont, Village of	WI
Hollandtown Sanitary District	WI
Kewaskum, Village of	WI
Kewaunee, City of	WI
Little Chute, Village of	WI
Lomira, Village of	WI
Marion, City of	WI
Mount Calvary, Village of	WI
Neenah-Menasha Sewerage Commission	WI
Oakfield, Village of	WI

WASTEWATER STARTUP, TRAINING OR OPERATIONS	
Readstown	WI
Reedsville, Village of	WI
Saint Cloud, Village of	WI
Sherwood, Village of	WI
Stockbridge, Village of	WI
Sturgeon Bay Utilities - Sturgeon Bay	WI
Waldo, Village of	WI
Winneconne, Town of	WI

WATER TREATMENT PLANT OPERATIONS	
Little Chute, Village of	WI
Sherwood, Village of	WI
Hollandtown Sanitary District	WI
Saint Cloud, Village of	WI
Mount Calvary, Village of	WI
Winneconne, Town of	WI
Green Lake, City of	WI
Kimberly, Village of	WI
Brillion, City of	WI
Combined Locks (Village of	WI
Marion, City of	WI
Oakfield, Village of	WI
Reedsville, Village of	WI
Waldo, Village of	WI
Bear Creek, Village of	WI
Forest County Potawatomi Community, WI	WI

Operations Experience (partial)

Many Uses of GIS

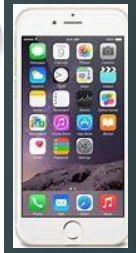
- Mapping/Analysis
  - Knowledge sharing
  - Allows decisions makers to make informed decisions through visual aids
  - Visualize spatial relationships between assets
  - Understand cultural use of land and resources
  - Ask simple questions of your data
    - Measure size, shape, distance
  - Determine how places are related
  - Find best location for assets
    - Building placement, recreational trail, utility assets etc…
  - Detect and quantify patterns in your data/make predictions

GIS Data Library

- GIS enables the creation of a spatial data library for a community
  - Base-map Layers
    - Aerial photos, parcel boundaries, transportation networks, water bodies, land-use, zoning, tribal boundaries
  - Environmental
    - Wetlands, hydric soils, environmentally sensitive areas, trees, contours, flood plains, watersheds
  - Infrastructure
    - Buildings, fences, special use areas, parking lots, signs
  - Utilities
    - Water, sanitary sewer, storm sewer, electric, gas

GPS Technologies

- GPS is simplifying the way users collect and manage geographic data
  - Allows GIS to support a double precision database
  - Improves the spatial quality of existing GIS datasets
  - Emerging local real-time differential networks
    - Allow the mitigation of errors in GPS positioning thus increasing the positional accuracy
      - VRS (Real-time sub-decimeter corrections)
  - Ease of use, GPS is everywhere



GIS Technology Trends

- Trends of GIS
  - One stop shop for storing and managing data
  - Taking it to the “clouds”
    - Data storage, data accessibility, software, applications
  - Web-based asset management
    - Mobile applications
    - Observations
    - “Live” data updating
  - Location Services
  - Improved data collection methods
    - UAVs
  - SaaS (Software as a Service)

Organizational ArcGIS OnLine (AGOL)

- Utility Mapping Applications
  - Sanitary Sewer, Water, Stormwater
- Electrical Systems
- Sign Inventory
- Sidewalk Inspections
- Building Permits
  - “Live” access to permit data; integration into GIS
  - Map visual of completed observations
  - Reporting functionality/data analysis

GIS For Tribal Entities

- Member Engagement
  - Empowering members through sharing information
  - Keep members informed and knowledgeable
    - Highlight key
  - Solicit member feedback

Passamaquoddy Tribe

- Data Collection
  - Need to inventory electrical utility assets
    - Also obtained some sewer/water assets
    - Establish GPS locations
      - Utilized handheld GPS Devices/sub-foot accuracies
  - Allowed for inventory counts and visualization of asset information

- Electric

http://mcmgrp.maps.arcgis.com/apps/webappviewer/index.html?id=4f2f1df32c4b461e8cb23e5882488bfb

- Water

http://mcmgrp.maps.arcgis.com/apps/webappviewer/index.html?id=0b965ca5bd454cebb758b6686a6bfb01

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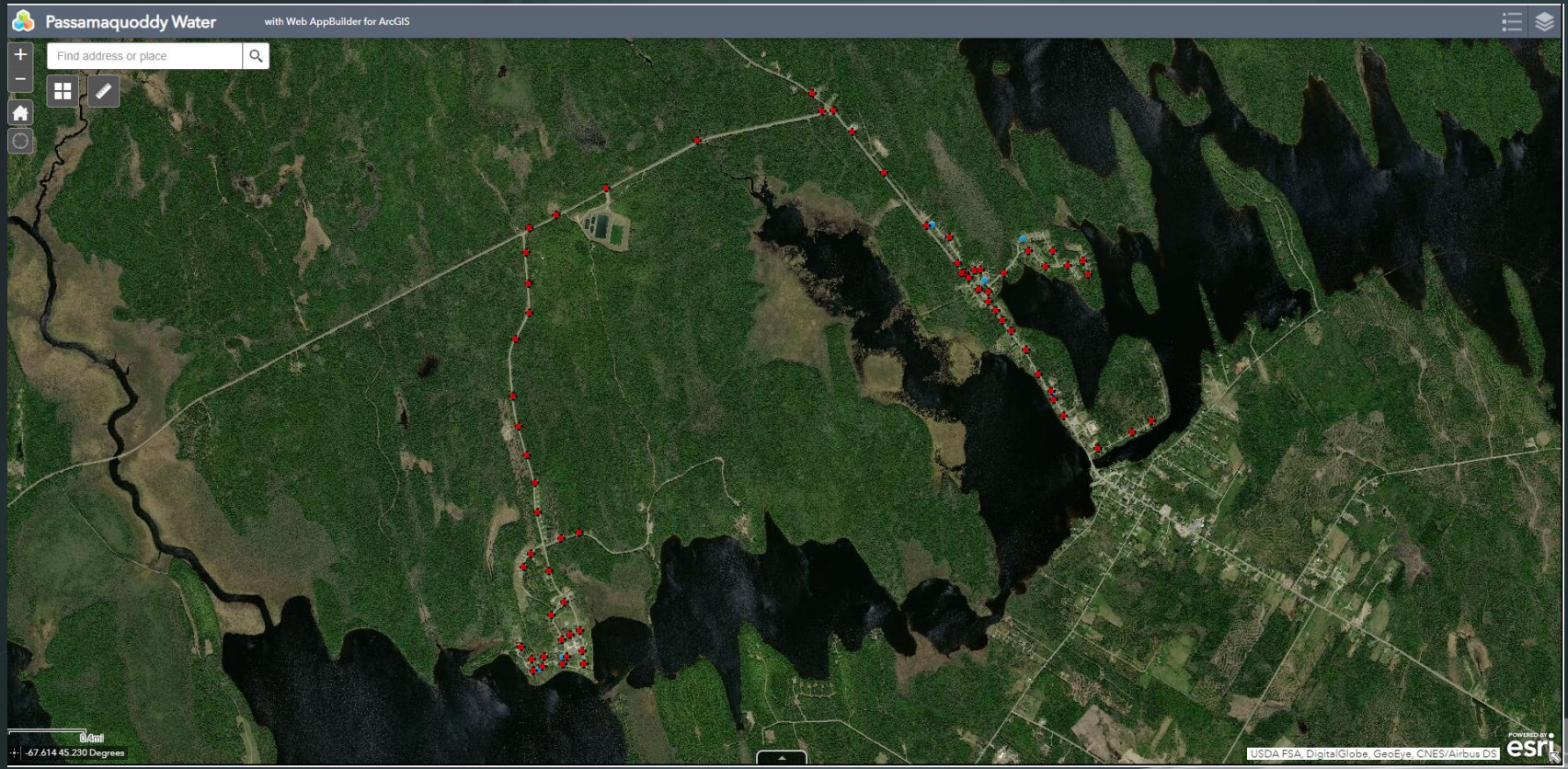
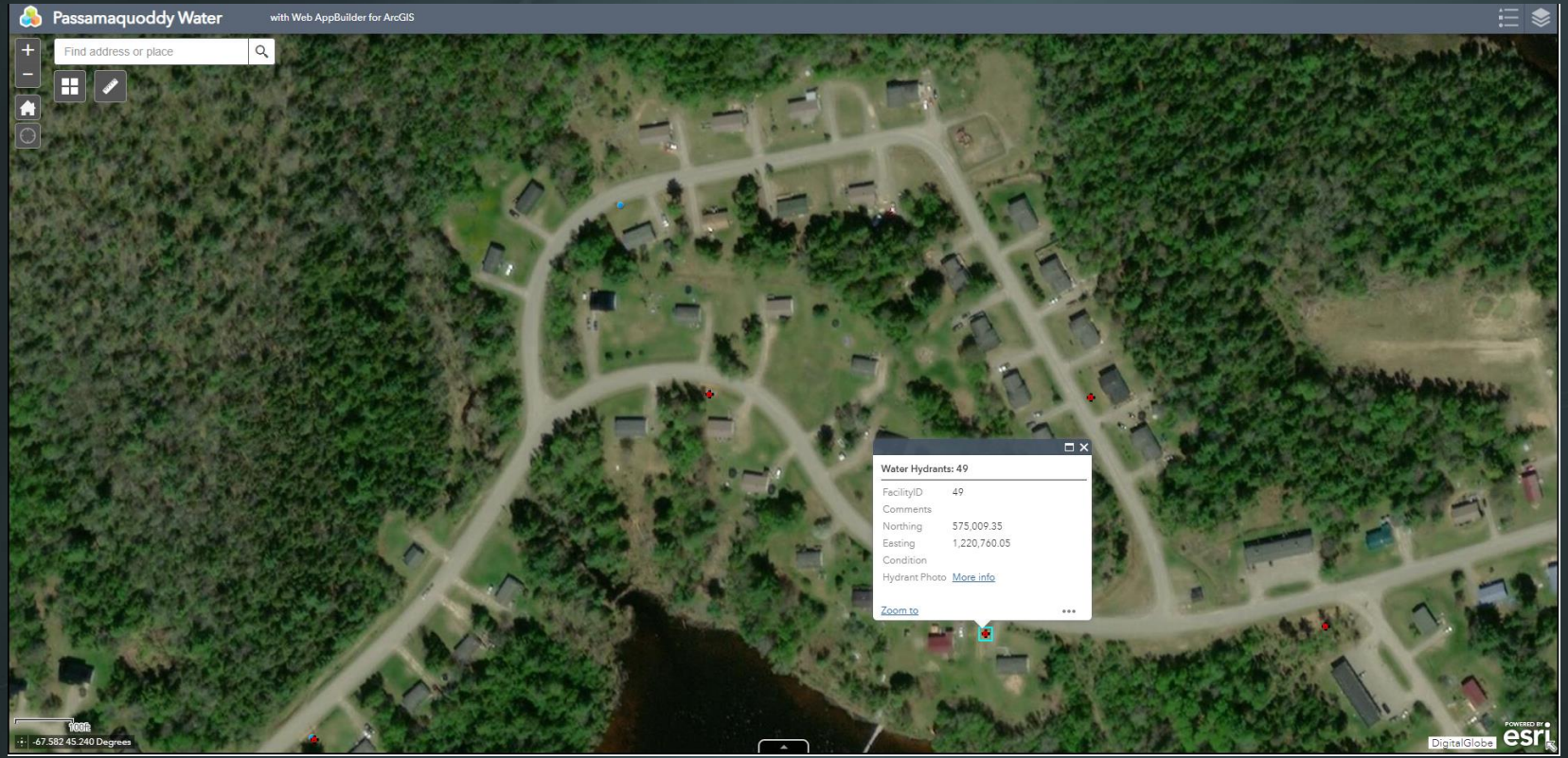
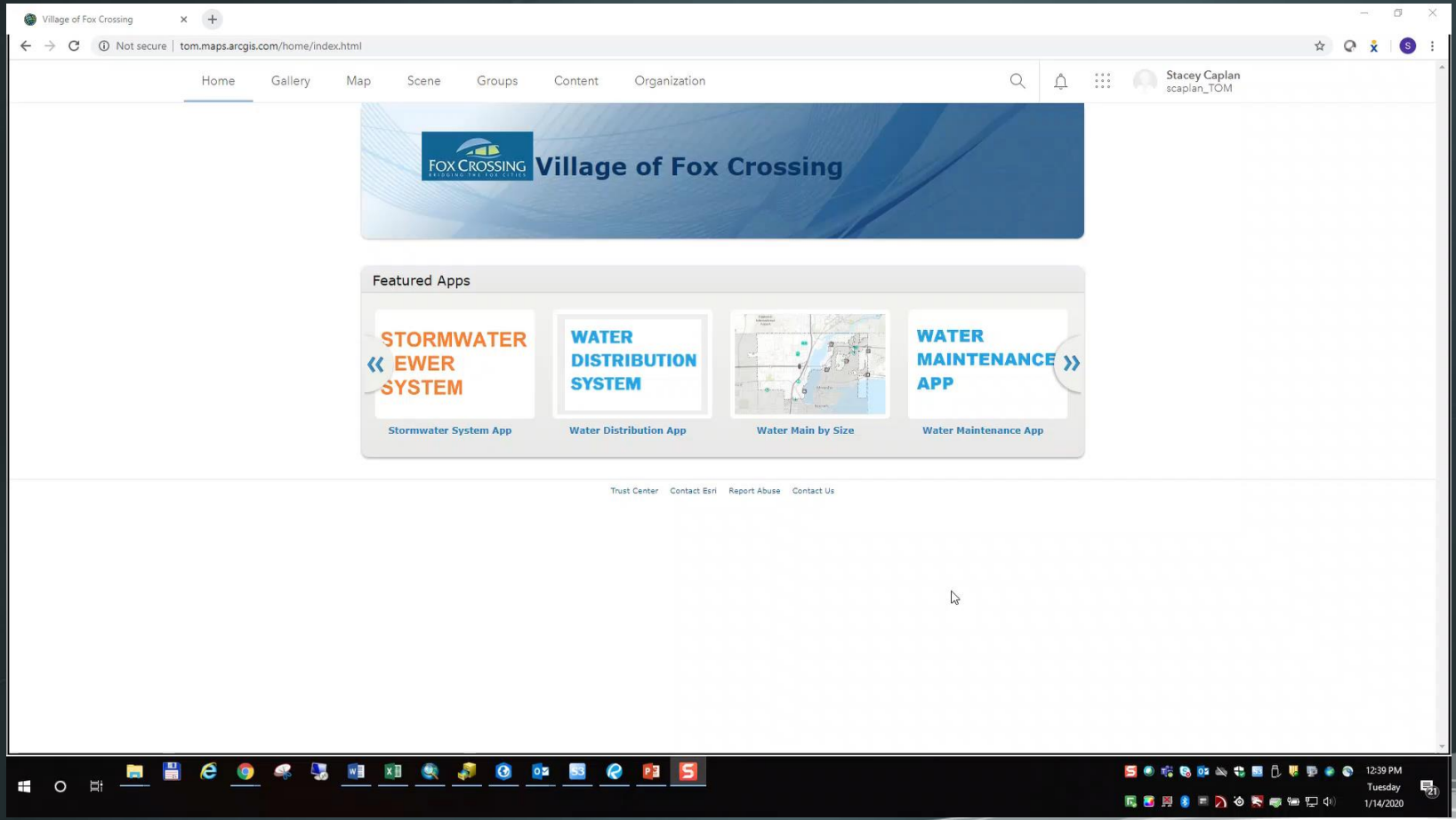

Passamaquoddy Water
with Web AppBuilder for ArcGIS
Find address or place
0.4mi
-67.614 45.230 Degrees
USDA FSA, DigitalGlobe, GeoEye, CNES/Airbus DS
esri

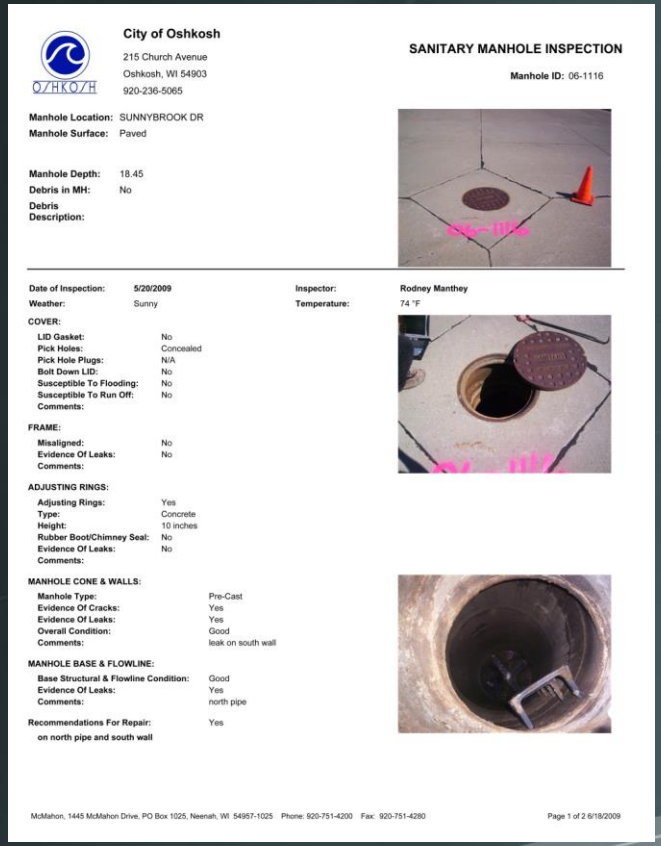

Passamaquoddy Water
with Web AppBuilder for ArcGIS
Find address or place
Water Hydrants: 49
FacilityID 49
Comments
Northing 575,009.35
Easting 1,220,760.05
Condition
Hydrant Photo More info
Zoom to
100ft
-67.582 45.240 Degrees
DigitalGlobe
POWERED BY esri



McMAHON
ENGINEERS ARCHITECTS

UNITED SOUTH AND EASTERN TRIBES, INC.

Integrating Field Inspections to GIS



City of Oshkosh
215 Church Avenue
Oshkosh, WI 54903
920-236-5065

SANITARY MANHOLE INSPECTION

Manhole ID: 06-1116

Manhole Location: SUNNYBROOK DR
Manhole Surface: Paved

Manhole Depth: 18.45
Debris in MH: No
Debris Description:

Date of Inspection: 5/20/2009
Weather: Sunny
Inspector: Rodney Manthey
Temperature: 74 °F

COVER:
LID Gasket: No
Pick Holes: Concealed
Pick Hole Plugs: N/A
Bolt Down LID: No
Susceptible To Flooding: No
Susceptible To Run Off: No
Comments:

FRAME:
Misaligned: No
Evidence Of Leaks: No
Comments:

ADJUSTING RINGS:
Adjusting Rings: Yes
Type: Concrete
Height: 10 inches
Rubber Boot/Chimney Seal: No
Evidence Of Leaks: No
Comments:

MANHOLE CONE & WALLS:
Manhole Type: Pre-Cast
Evidence Of Cracks: Yes
Evidence Of Leaks: Yes
Overall Condition: Good
Comments: leak on south wall

MANHOLE BASE & FLOWLINE:
Base Structural & Flowline Condition: Good
Evidence Of Leaks: Yes
Comments: north pipe

Recommendations For Repair: Yes
on north pipe and south wall

McMahon, 1445 McMahon Drive, PO Box 1025, Neenah, WI 54957-1025 Phone: 920-751-4200 Fax: 920-751-4280

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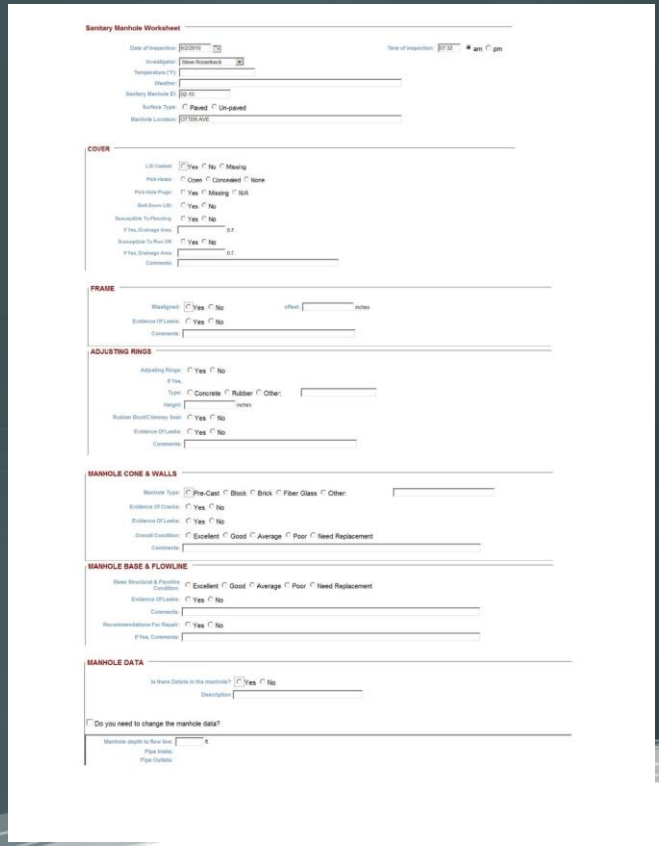


Sanitary Manhole Worksheet

COVER

FRAME

ADJUSTING RINGS

MANHOLE CONE & WALLS

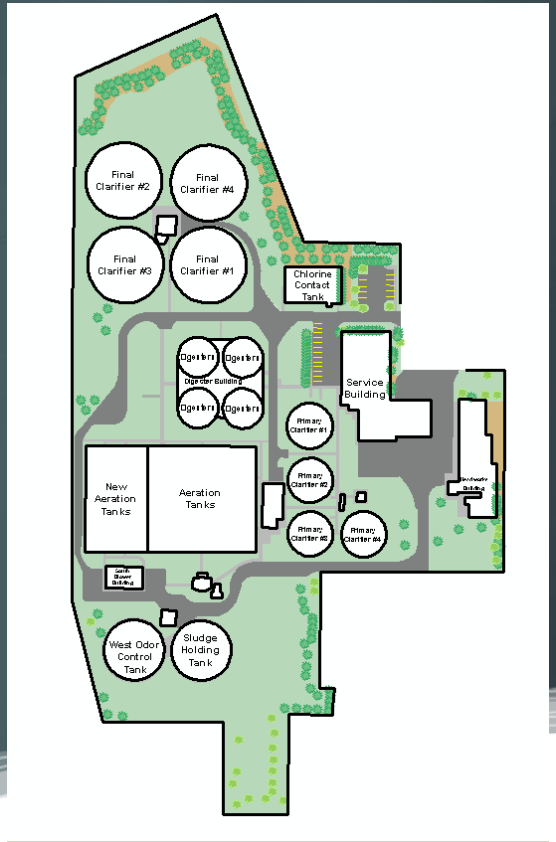
MANHOLE BASE & FLOWLINE

MANHOLE DATA

Case Study: Regional Treatment Facility GIS Work Order Management System

Neenah-Menasha Wastewater Treatment Plant GIS

- GIS Based-Work Order Management System
- Map locations of all facility assets
- Associate detailed information to asset location
  - Open Work-Orders
  - Shop Drawings
  - O&M Manuals
  - Start-up Videos
  - Emergency Procedures
  - Manufacturers Website



Summary

- GIS technology is improving access to data
  - Make more informed decisions
  - Simplified end user experience
  - Manage asset information in one central location
  - Integrate field information directly into your GIS
    - Fewer silos of information
  - Member engagement
    - Both communication to the members and data gathering from the members
  - Advancement in senor technologies
    - Provide opportunity to improve data collection methods
    - See data in ways never seen before
  - Improve data knowledge within your entity

Thank You for inviting us to present today!

Questions?

THE McMAHON Way
• FOR OVER 100 YEARS •
Values. Culture. Relationships