UNION SANITARY DISTRICT
UNION CITY, CA

GIS Application of Wastewater Treatment Plant Infrastructure
Union Sanitary District

• Regional Wastewater District
  • Serve the cities of Fremont, Newark and Union City
  • Located in East Bay area of San Francisco, south of Oakland
• Own and maintain 720 miles of sewer pipe
• Wastewater Treatment Plant has a daily average flow of 30 MGD
• WWTP and Administration Headquarters located in Union City
• Own, maintain, and operate 4 Pump Stations and 3 Lift Stations
• 135 employees
History

• Used as-builts to locate underground utilities
• Senior staff depended on heavily for knowledge of plant utilities and location
• Many hours spent determining where underground utilities were located
• During excavations staff often found unknown process lines
Reasons for a Treatment Plant GIS

• Plant process lines were occasionally damaged during excavation
• Took a lot of research time to figure out which pipe was what process
• Plant operation staff asked if GIS could alleviate the headache and guessing game associated with excavated pipes
What we wanted

• Stage 1: Collect and verify data using as-builts and potholing
• Stage 2: Make data available to staff via a web application
• Stages 3-7: Add links to Hansen, O&M manuals, SCADA, Purchasing, etc.
Stage 1

USD put out an RFP and selected Woolpert to gather data and develop a Treatment Plant Geodatabase

- USD and Woolpert staff worked together to:
  - Research as-builts and utilize institutional knowledge to determine locations for potholing
  - Excavate potholes
  - Assess and GPS survey process lines
  - Verify quality and accuracy of as-builts
    - Notes were added to as-builts as supplemental information
  - Create Treatment Plant Geodatabase
  - Digitize as-builts and import GPS survey data
  - Verify GIS data quality
USD put out an RFP and selected Farallon Geographics to design and build a Treatment Plant GIS Web Application

- Requirements confirmed in workshops with USD staff
- Solution design determined through iterative prototype, pilot, and feedback process
- Over 70 infrastructure and process layers created
- Rich interactive web application built from Open Source and Esri web APIs
- Dig here tool created to return all underground features in user defined area
- Implemented a single search text box to find anything in any layer in the Geodatabase
Stage 3

Plant GIS Web Application Version 1.1 implemented by Farallon Geographics and USD staff

• Upgraded ArcGIS Server from 9.3 to 10.0
  • Web application revised to take advantage of upgraded map services
  • Overall web application stability and performance noticeably improved
• Implemented numerous user requested fixes and improvements such as:
  • Features for finding and using existing maps
  • User markup drawing performance
  • Print map features and quality
  • Search and Dig Here results
• Photo viewer added to Potholes layer
• Enabled custom ordering of graphics layers
Application Splash Page

• System Maps
  • default maps made by system administrator
• My Maps
• Shared Maps
• Make A Map!
• System Maps
• My Maps and Shared maps are made by users and they decide to share or not
• Make a Map goes to blank map of plant and user builds from there
Liquid System Map
Map Lib
Layer Lib
Dig Here Tool
Create polygon - (add arrow in transition)
Dig here results – (transition box)
Labeling Map
Save AS (transition arrow)
Shared Map Library
Next Steps

• Vertical Assets
  • Asses and map above ground lines and equipment
• Hansen (CMMS) integration
• Mobile Access
• O&M manuals
• SCADA data integration (ODMS)
• Parts inventory and purchasing
Questions?

• Union Sanitary District
  • Union City, CA

• Richard Scobee
  • SR GIS/Database Administrator
  • 510-477-7635
  • Richards@unionsanitary.ca.gov

• Mohammad Ghoury
  • Engineering/GIS Tech
  • 510-477-7610
  • mohammadg@unionsanitary.ca.gov