

# **infraMAP at EBMUD**

## **Valve Maintenance and Shutdown Reporting in the Field**

esri User Conference - San Diego

July 22, 2015

Presented By:

Teri Dean Alderson (EBMUD) & Patrick Ward (iWater Inc.) 

# About EBMUD



- EBMUD's water system serves approximately 1.3 million people in a 331 square mile area in the East Bay, including
  - 4,137 miles of pipe
  - 76,624 valves
  - 30,099 hydrants
  - 400,000+ service connections



# Importance of Valves



- Valves are the keys to our water distribution system
- Enable operational and maintenance activities
- Start, stop and regulate flow to customers, WTPs, pumping plants, pressure zones, etc.
- Critical in the control of water loss



# Current Challenges



- Aging valves and distribution pipes
- Long response time to control flow in emergencies
- No central management tool to track operational status
- No integration with customer data
- Manual shutdown planning required
- Existing valve testing and shutdown tracking applications extremely out of date

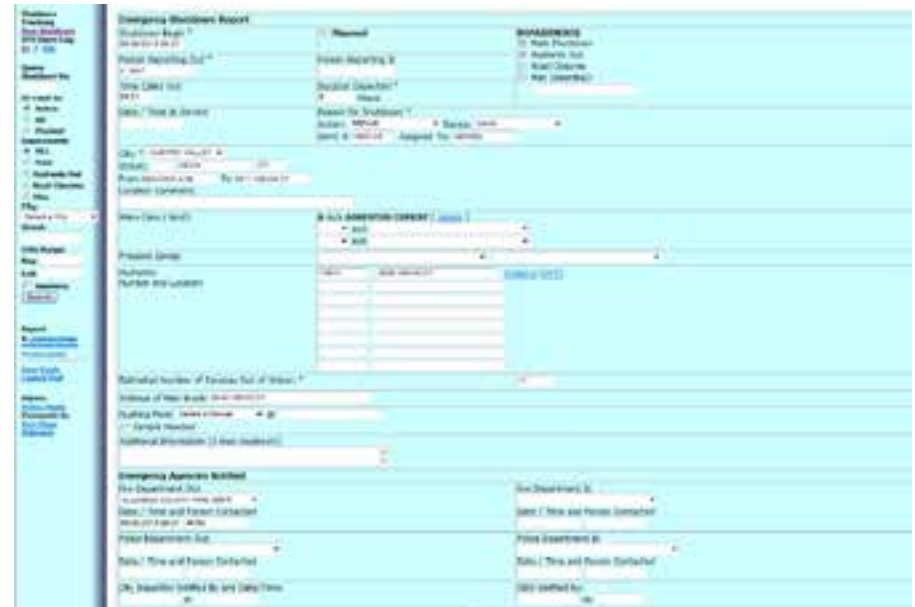
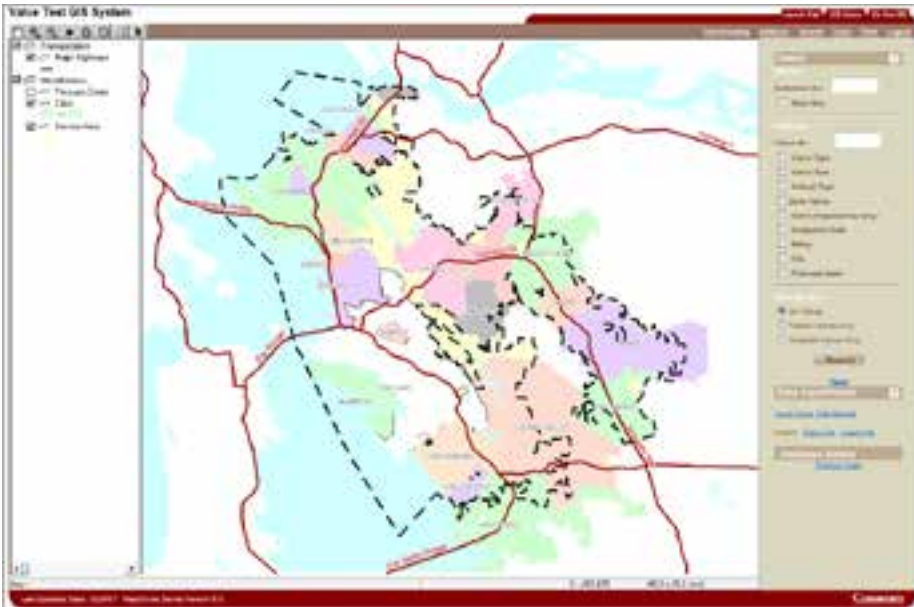


# Existing Applications



Valve Test GIS  
no longer in use

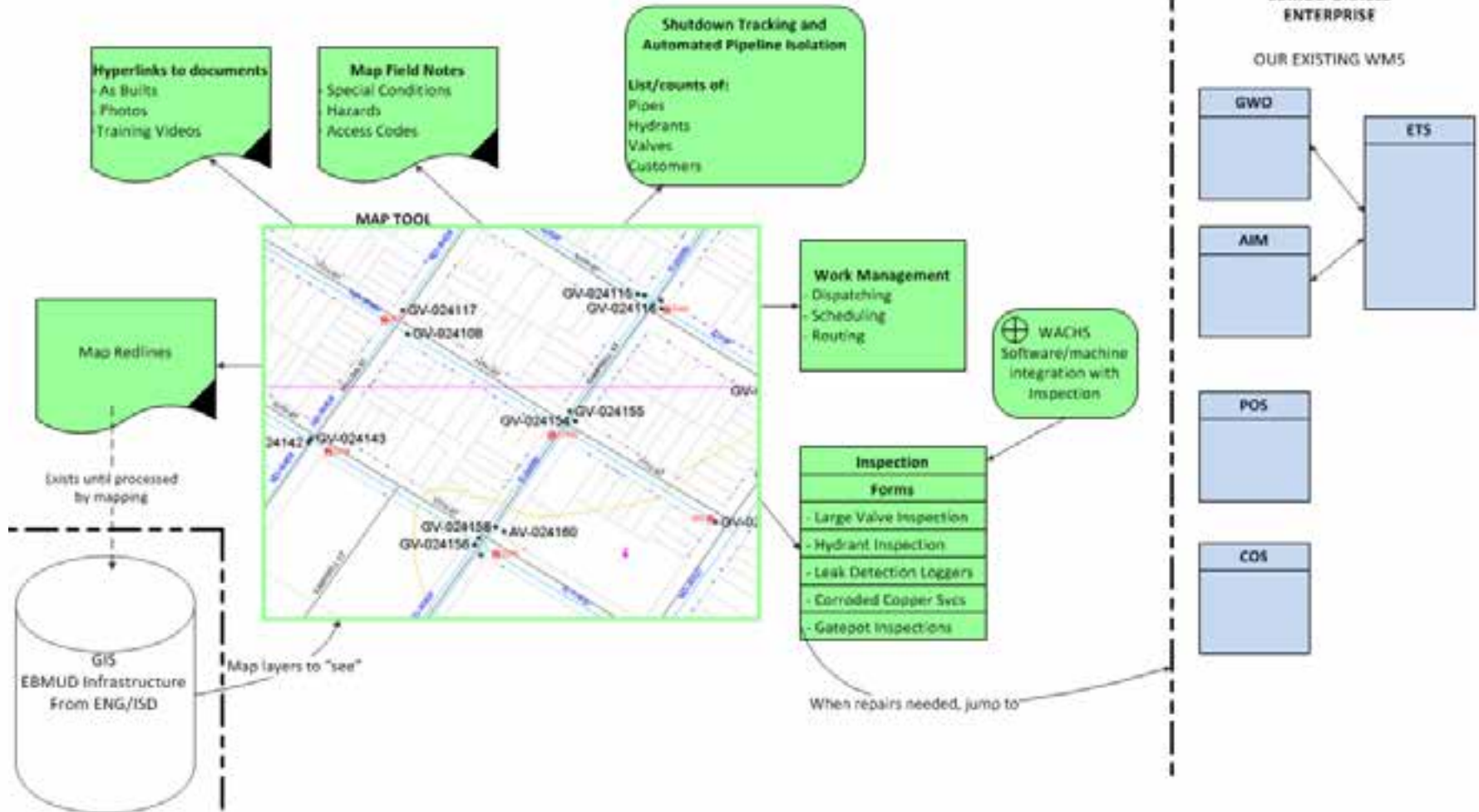
Shutdown Tracking  
System



# Vision for new Valve GIS



## NEW VALVE TESTING "PLUS" SOFTWARE

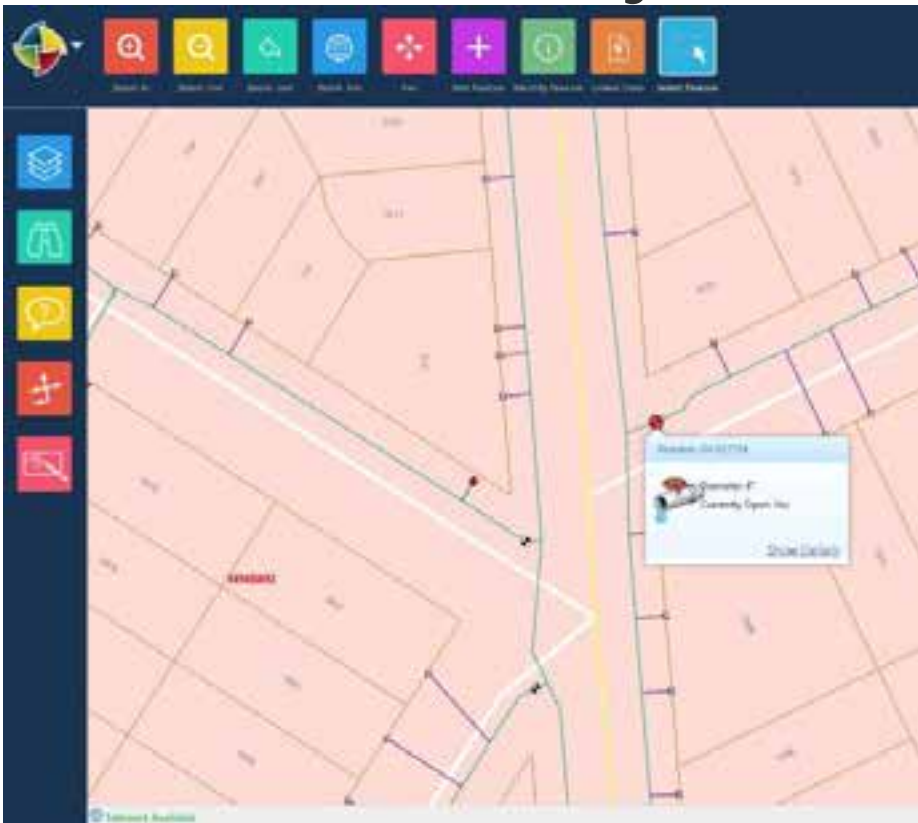


# EBMUD - infraMAP Project



- Portable, graphic and interactive distribution system

- Configurable inspection forms



# EBMUD – infraMAP Project



- Integration with WACHS Valve Machine
  - Operate valve machine controller
  - Record data & track valve history/life cycle
  - Collect valve torque data & display animation
- GPS enabled
  - Locate valves
  - Manage work routes



# EBMUD – infraMAP Project



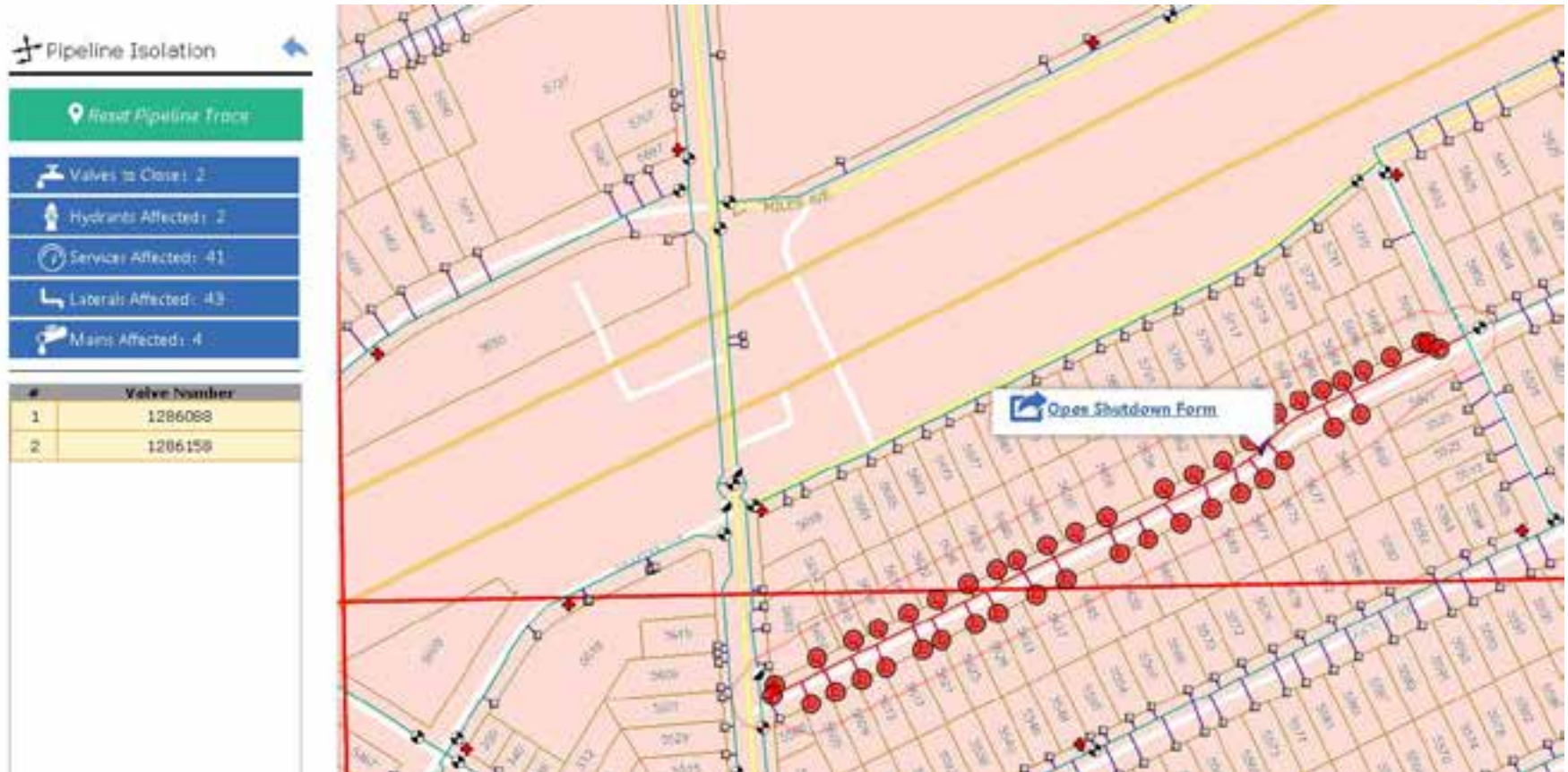
- Map redlines, field notes, linked documents
  - Redlines created for ENG Mapping Services to make updates to master maps
  - Field notes captured for sharing of information about a valve or location
  - Ability to link documents, photos, drawings, etc. to a specific valve



# EBMUD – infraMAP Project



- Specific water distribution network and customer identification with Pipe Isolation Trace tool
  - Valves to shut down for isolation
  - Hydrants, Customers & Mains affected by shutdown



# EBMUD – infraMAP Project



- Configurable Form for Automated shutdown planning & reporting

Emergency Shutdown Report

Emergency Shutdown Report Trace Results Emergency Agencies Notified

ShutdownReportNO	Shutdown Begin	Person Reporting Out	Expected Duration(Hours)
1857098097	06/30/2015 17:02:00	tdcan	8

Emergency  Main Shutdown  Hydrants Out  Road Closures

Reason For Shutdown

GWOW#	Action	Device	Assigned To
18564825			

Location

City	BMAP	Pressure Zone	Additional Location Information
OAKLAND	33	North Central	
Street1	Sfx	From To	
MCMILLAN ST		1566 1602	
Street2	Sfx	From To	
OCEAN VIEW DR		800 888	
Street3	Sfx	From To	
COLLEGE AVE		1145 1152	
Street4	Sfx	From To	

Save Report Data Report Preview Print Close



# New Shutdown Reporting Feature



- Associated with Pipe Isolation Trace tool
- Includes ability to record shutdown event

SHUTDOWN REPORT NO. 02501		
<b>Shutdown Begin:</b> 05/20/2015 15:50	<b>Person Reporting Out:</b> T. Cronin	<b>Expected Duration:</b> 6 hours
<input checked="" type="checkbox"/> <b>Emergency</b>	<b>IMPAIRMENTS</b> <input type="checkbox"/> Main Shutdown <input type="checkbox"/> Hydrants Out <input type="checkbox"/> Road Closures	
<b>REASON FOR SHUTDOWN</b>		
<b>GWO:</b> 123456	<b>Action:</b> Repair <b>Device:</b> Main	<b>Assigned To:</b> TCROWEN
<b>LOCATION</b>		
<b>City:</b> Alameda		<b>BMAP:</b> 14575453
<b>Streets</b>		
<b>Taylor Ave From:</b> 741 <b>To:</b> 777	<b>Or St From:</b> 1400 <b>To:</b> 1414	<b>From To:</b>
<b>Additional Location Information:</b>		
<b>WATER DISTRIBUTION SYSTEM</b>		
<b>Estimated Count of Mains</b> 2	<b>Pipe Extension(s)</b> E-8417 35300	<b>Pipe Size and Material</b> 6" Cast Iron 8" Asbestos Cement
<b>Estimated Count of Hydrants</b> 1	<b>Hydrant Number(s)</b> 433	<b>Location</b> 777 Taylor Ave
<b>Estimated Count of Valves</b> 4	<b>Valve Number(s)</b> GV-044018 GV-044073 GV-044074 GV-044075	<b>Pressure Zone</b> Q10
<b>Estimated Count of Services</b> 26		
<b>Flushing From:</b> Hydrant 433	<b>At:</b> 777 Taylor Ave	<b>Sample Needed</b> <input type="checkbox"/>
<b>Additional Water Distribution System Information:</b>		
<b>AGENCY NOTIFICATION</b>		
<b>Fire Department</b>		<b>Police Department</b>
<b>Agency:</b> Alameda FD <b>Date/Time Out:</b> 05/20/2015 16:51 <b>Person Contacted:</b> #570 <b>Date/Time In:</b> 05/21/2015 00:05 <b>Person Contacted:</b> #578		<b>Agency:</b> <b>Date/Time Out:</b> <b>Person Contacted:</b> <b>Date/Time In:</b> <b>Person Contacted:</b>
<b>Date/Time in Service</b> 05/20/2015 03:04	<b>Person Reporting in</b> RBJARAZZA	<b>Actual Duration</b> 11:25 hours



# Improvements



- Easy to locate valves and identify status
- Identify when valves are due for inspection and testing (preventive maintenance)
- Reduce time to plan and execute shutdown
- Reduce damage and water loss

# esri Technical Specifications



- ArcGIS for Server 10.1 and higher
  - One feature service per template
  - One map service per template
  - One cached basemap map service per template
    - Can also use ArcGIS Online basemaps
  - One geocode service per template
    - Can also use ArcGIS Online service
  - One geoprocessing service for Pipe Isolation Trace/Shutdown Reporting
  - One print map task service per template
  - One geometry service per template
- ArcGIS JavaScript API
  - API hosted on ArcGIS Online

# infraMAP NOW Tech. Specs



- JavaScript and HTML 5 for cross platform use
  - Google Chrome recommended but also runs on Safari, Internet Explorer
- Internet Information Services (IIS) 7
- .NET 4.5.1
- infraMAP Database in SQL Server or Oracle
- Future integration for EBMUD General Work Order (GWO) with infraMAP Work & Task
- infraMAP Field for fully disconnected use with Wachs Valve Machine

# About infraMAP Software



## infraMAP NOW • New Online Workflow



- Collect, Inspect and Update assets in Real-Time
- Runs on iPad, Android and Windows tablets
- Utilizes Esri's ArcGIS for Server Technology
- New Online Workflow for Local Government and Utility agencies
- NOW connects the office with field crews and delivers the data they need when they need it, NOW

## infraMAP Manager

- Centralized manager for your data settings
- Connect to multiple databases GIS, GIS, AMR/RTM, CIMS and other external databases
- Control who, what and how users see your data
- Configure URL's and other applications to run within the infraMAP Platform
- Features field specific quality assurance and quality control
- Supports any data model
- Configure any asset inspection form with the built-in form designer



## infraMAP Field



- Collect, Inspect and Update assets Disconnected
- Display's maintenance history from the office or out in the field
- Directly control Wachs hydraulic wake machines
- Fully functioning GPS navigation system
- Features include Work and Tasks, Inspections, One-Click Reporting, Redlining and Isolation Tracing
- Utilizes Esri's ArcGIS Engine Runtime Technology