

SEWER SYSTEM CONDITION ASSESSMENT TOOLS AND PROACTIVE SYSTEM MANAGEMENT

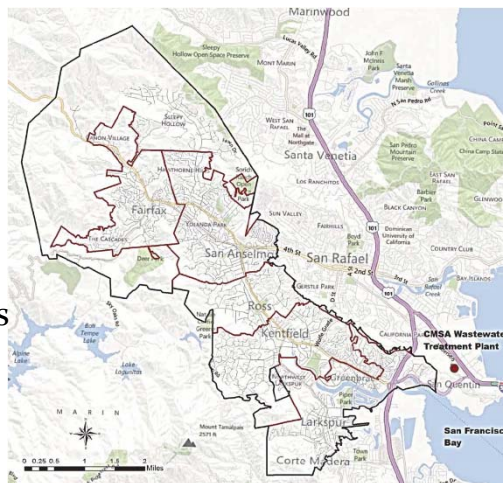
A CASE STUDY
OCTOBER 15, 2015

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Case Study: Ross Valley Sanitary District

- Established in 1899
- About 13 Square Miles
- Population of ~ 42,000
- 194 miles of gravity sewers
- 8.4 miles of force mains
- 19 pump and lift stations



In May 2013, the District Received a Cease and Desist Order

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
CEASE AND DESIST ORDER NO. R2-2013-0020
REQUIRING THE
SANITARY DISTRICT NO. 1 OF MARIN COUNTY
(ALSO KNOWN AS "ROSS VALLEY SANITARY DISTRICT")
SANITARY SEWER COLLECTION SYSTEM
IN MARIN COUNTY
TO CEASE AND DESIST DISCHARGING WASTE
IN VIOLATION OF REQUIREMENTS IN
STATE WATER BOARD ORDER NO. 2006-0003-DWQ,
STATE WATER BOARD ORDER NO. 2008-0002-EXEC,
SECTION 301 OF THE CLEAN WATER ACT, AND
CALIFORNIA WATER CODE SECTION 13376

WHEREAS the California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter Regional Water Board), finds that:

1. The Sanitary District No. 1 of Marin County (hereinafter Discharger) owns and operates a collection system subject to State Water Resources Control Board (State Water Board) Order No. 2006-0003-DWQ, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (Sanitary Sewer Order), and State Water Board Order No. 2008-0002-EXEC, Adopting Amended Monitoring and Reporting Requirements for Sanitary Sewer Order (MRP).
2. The Discharger signed a notice of intent Order, and any subsequent amendments.


-- Discharger's collection system



- Required District to complete all historical capital improvements within 5 years
- Price tag: > \$100M
- Fiscally infeasible
- Did not promote asset management



The RWQCB Agreed to an Infrastructure Asset Management Plan

Sanitary District No. 1 of Marin County
Infrastructure Asset Management Plan
October 1, 2013
RWQCB Order No. R2-2013-0020

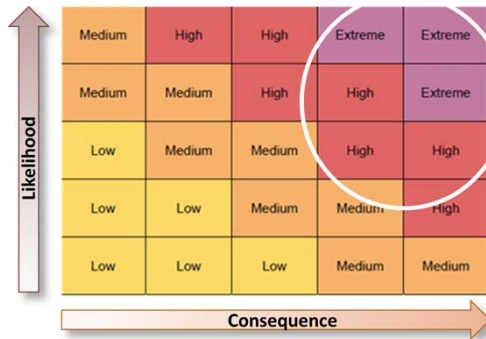


Prepared by  V.W. HOUSEN & ASSOCIATES
in association with  Sohref & Wheeler
2014 Corrosion
Humphrey Consulting

- Prioritized Needs to Rapidly Address Risk
- Justified Fewer Projects Over a Longer Period
- Gained Valuable Time Needed to Fine-Tune the Most Costly Projects
- Integrated Point Repairs & O&M



The CDO Demanded Accelerated Pipeline Rehabilitation to Reduce SSOs



The District Met This Challenge Using A Numerical Risk Management Tool



How the IAMP Risk Management Tool Works

Likelihood of Failure (from InfoNet CMMS)



Consequence of Failure (GIS Data)

- Material (Techite)
- Structural Condition
- O&M Condition
- Located in Bay Mud
- Located in Landslide Zone
- Capacity/SSOs
- Maintenance Needs

- Near Waterway
- Near School, Park
- Crosses Major Roadway
- Serves Large Area

 Risk Score for Every Pipe Segment



Risk Tool Requires Good Condition Assessment Data

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(from InfoNet CMMS)



Consequence of Failure
(GIS Data)

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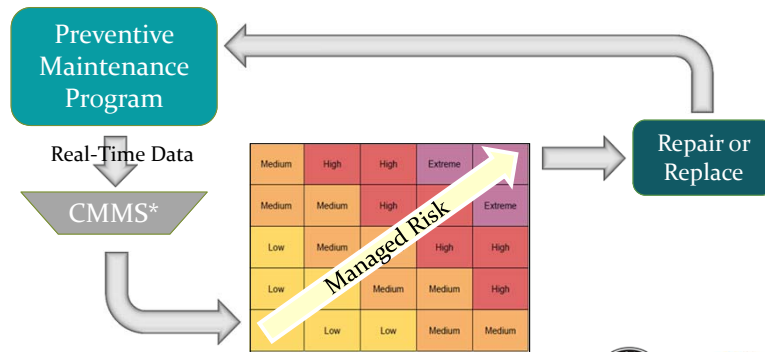


Ross Valley has a Thriving CMMS

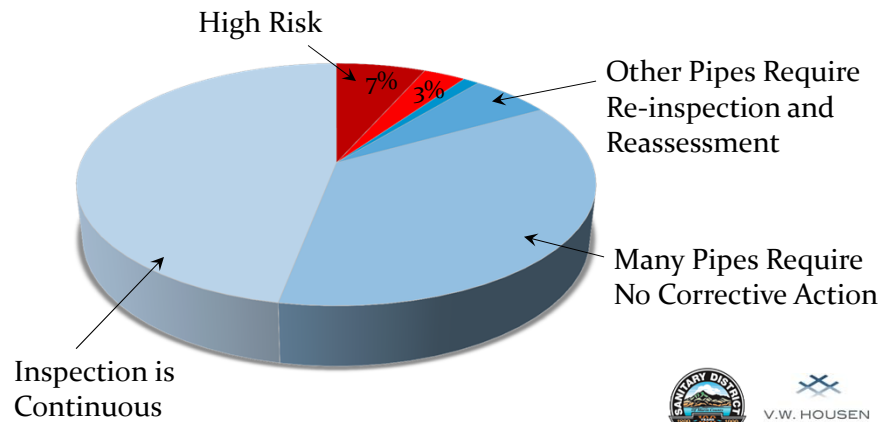
- Two full cleaning cycles for the entire system have been completed. Results from every pipe clean is logged.
- CCTV inspection of the entire system was completed in May 2014
- Large diameter CCTV inspection was conducted in 2015
- InfoNet CMMS fully implemented with multiple emerging experts



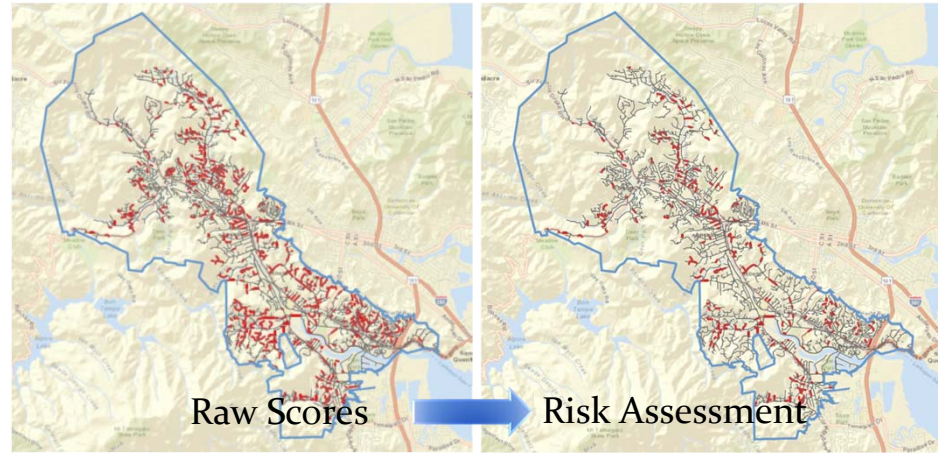
Risk Reduction is Achievable Through a Continuum of Action



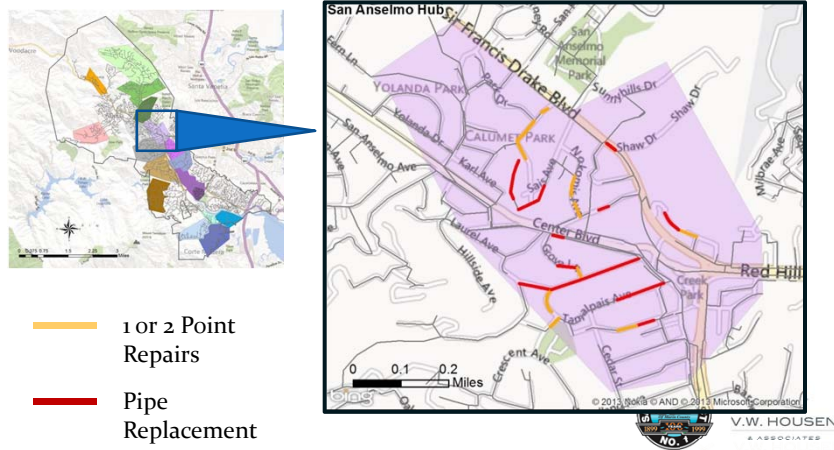
Risk Model Showed That 10% of the System's Pipes have the Highest Risk



A Comparison of System Needs Before and After the Risk Model



Condition Assessment Data Allowed Point Repairs to Rescue the Program



CCTV is Becoming One of the Most Valuable Tools in the Toolbox

- Routine inspections PLUS
- CCTV follows point repair crew (confirm, document)
- CCTV follows some cleaning (QA/QC)
- CCTV is conducted post-SSO

Not Every Camera Needs to be State of the Art



Condition Assessment Extends Beyond CCTV Inspection



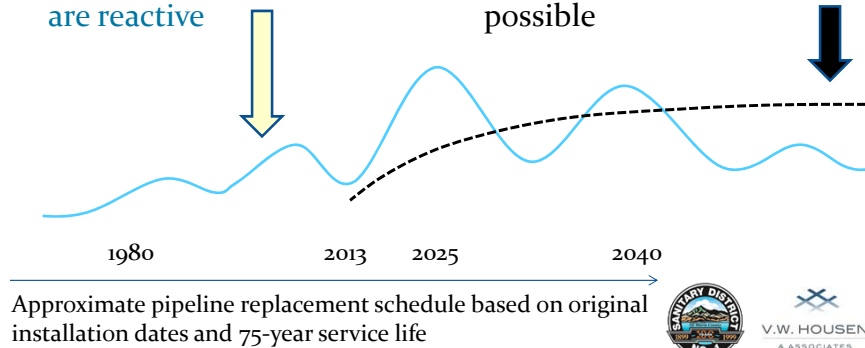
- Cleaning Results
- Hydraulic Model Results
- Flow Studies
- Other Fieldwork
- Existing Knowledge



End Goal is to Know Enough About the System to Eliminate Surprises

Without strategic asset management, replacements are reactive

With system-wide condition information, planning is possible



Top Five Things to Take Away from this Presentation

- Effective asset management requires a lot of data and good data
- CCTV establishes the foundation but is just one of many ways to assess condition
- Evaluate Risk, not just age or defects – a small portion of the system likely presents the majority of risk
- Effective sewer management is a continuum – what looks good today will need work tomorrow
- The goal is to smooth out the curve – plan, not react



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THANK YOU

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