

Water Utility Asset Management and Maintenance Program Update

SCVWD Board of Directors
March 28, 2017



Overview

- ▶ Background
- ▶ Water Utility Asset Management Planning
- ▶ Water Utility Maintenance Program
- ▶ Performance Monitoring and Improvement
- ▶ Additional WU Asset Management Activities
- ▶ Next Steps



- ▶ E-2.1. Current and future water supply for municipalities, industries, agriculture, and the environment is reliable.
- ▶ E-2.2. Raw water transmission and distribution assets are managed to ensure efficiency and reliability.
- ▶ E-2.3. Reliable high quality drinking water is delivered.
- ▶ EL-6. The BAOs shall protect and adequately maintain corporate assets.
 - ▶ 6.4. Maintain an Asset Management Program

- ▶ Board Organization Performance Monitoring Calendar:
 - ▶ Semi-annual asset management updates
- ▶ Board Policy and Planning Committee Discussions:
 - ▶ Board wanted better understanding of O&M prioritization process and priorities
 - ▶ Role of O&M needs to be elevated/celebrated

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Water Utility Asset Management Planning

Establish Maintenance Schedules

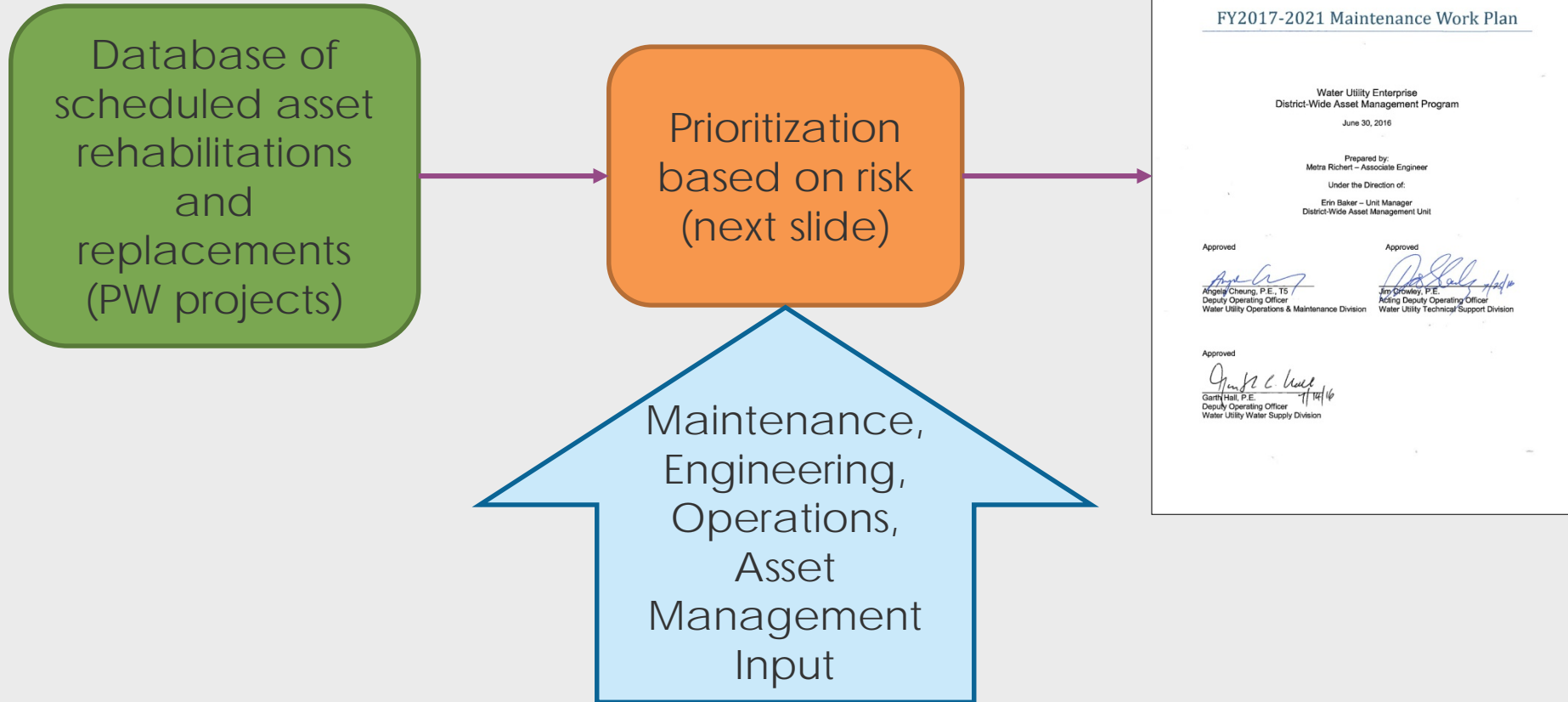
- ▶ Preventive Maintenance(PM): routine periodic activities to prevent premature asset failure
- ▶ Planned Work (PW): planned asset rehabilitations and replacements

Recommended PW Activities - Motor			
	Type	Freq., Yr	Cost
1	Replacement	50	\$ 1,800,000
2	Rehabilitation, Motor	12	\$ 82,500
3	Rehabilitation, Stator and/or Rotor re-wind	12	\$ 100,500
4	Rehabilitation, Bearings	12	\$ 120,000
5	Rehabilitation (cooler)	24	\$ 16,000



Water Utility Asset Management Planning

Annual Maintenance Work Planning



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Water Utility Asset Management Planning

Annual Prioritization of Planned Maintenance Work

- ▶ Planned Work Projects are prioritized annually based on asset risk
 - ▶ Probability of Failure – Asset Condition

Condition Score = 2



Condition Score = 3



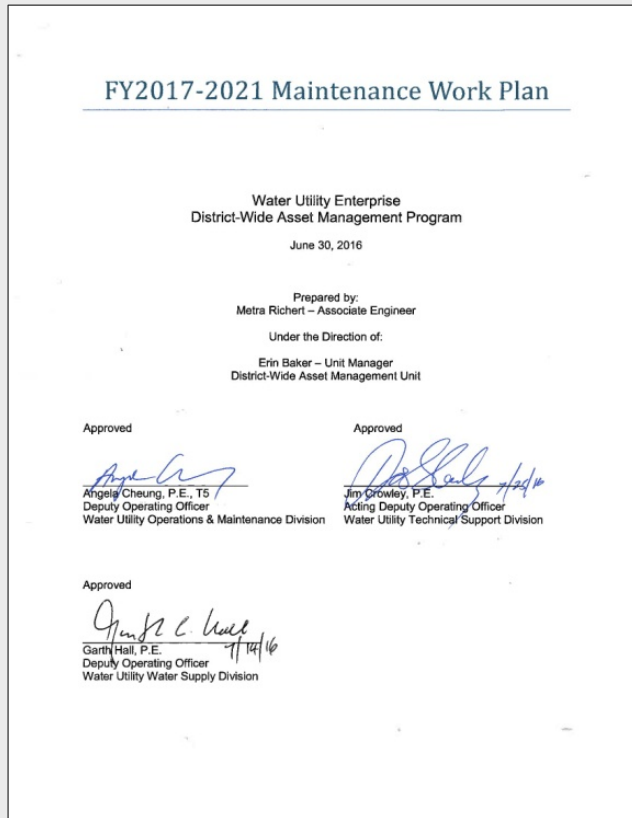
- ▶ Consequence of Failure – What happens if asset fails
 - ▶ Index Score from 0 – 30
 - ▶ Evaluates asset failure impacts on service delivery, community property, environment, life safety, financial, and reputation

Water Utility Asset Management Planning

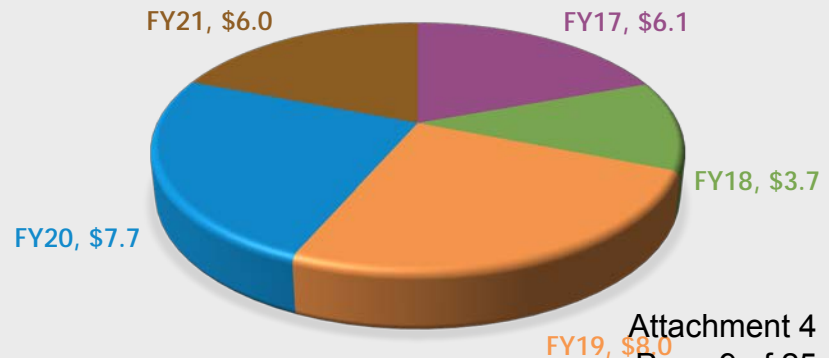
FY 17-21 Maintenance Work Plan

► Example Projects:

- Replace Ammonia Leak Detector
- Replace Filter Valve Operator
- Replace Sodium Hypochlorite Meter Pump Variable Frequency Drive
- Clean, Inspect and Paint Phosphoric Acid Tank



PW PROJECT COST PER FISCAL YEAR (MILLIONS)

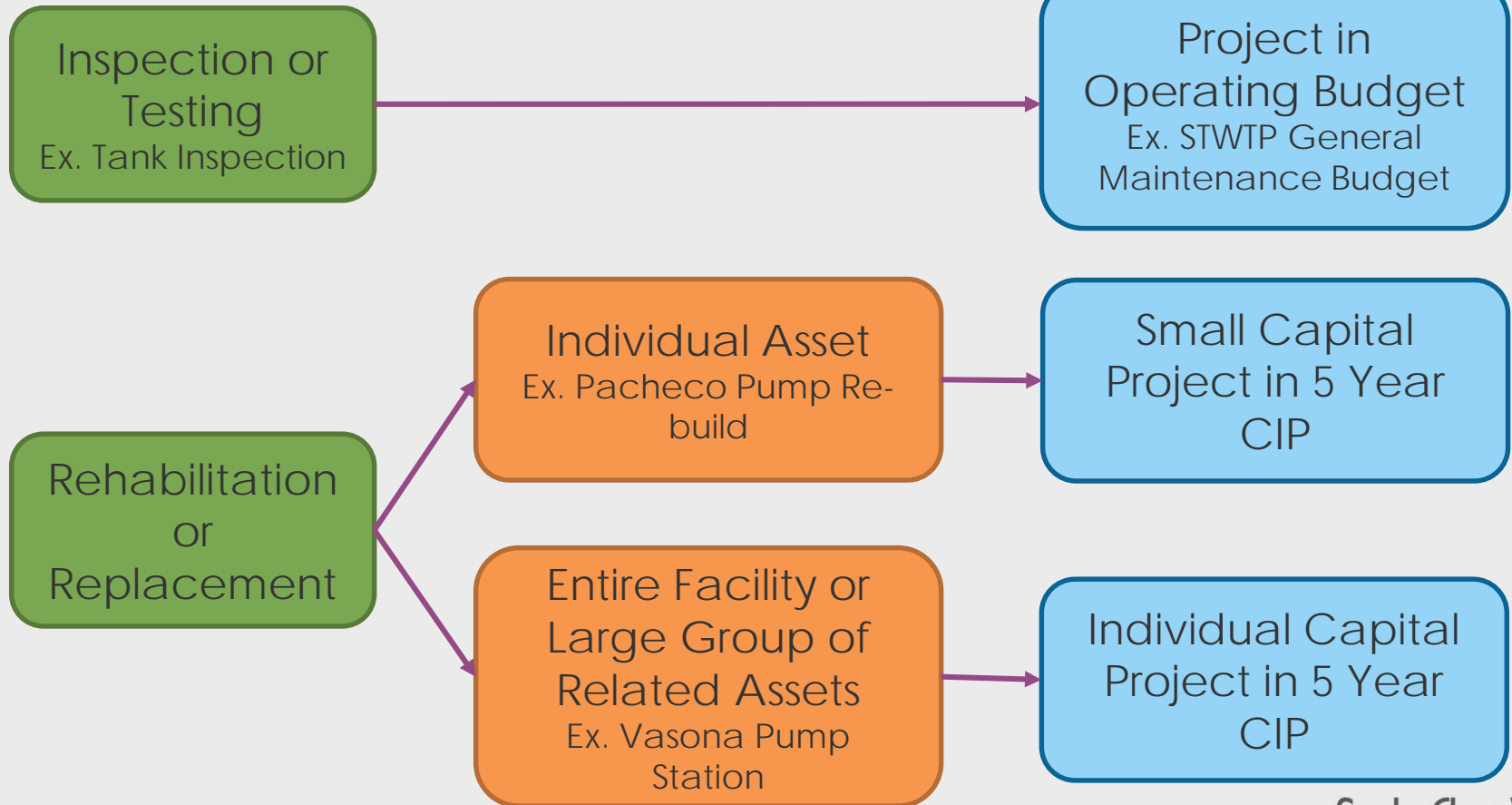


Water Utility Asset Management Planning

Execution of Planned Work

Type of PW Project

PW Executed As



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Water Utility Asset Management Planning

Capital Projects in FY17-21 CIP that Originated in Maintenance Work Plans

- ▶ Coyote Pumping Plant ASD Replacement
- ▶ Small Capital Improvements, San Felipe Reach 1-3
- ▶ Five-Year Pipeline Rehabilitation
- ▶ Ten-Year Pipeline Rehabilitation
- ▶ Small Capital Improvements, Raw Water
- ▶ Small Capital Improvements, Treated Water
- ▶ Vasona Pumping Plant Upgrade
- ▶ PWTP Clearwell Recoating & Repair
- ▶ PWTP Residuals Management
- ▶ RWTP FRP Residuals Management Modifications
- ▶ RWTP Reliability Improvement Project
- ▶ Small Capital Improvements, Water Treatment

Project	Small Capital Improvements, San Felipe
Program	Water Supply – Storage
Priority No.	78
Project No.	91214010s
District Contact	Angela Cheung acheung@valleywater.org



Suction wear ring bacterial corrosion of Impeller. Similar rehabilitation projects will be done in this project.

PROJECT DESCRIPTION

This project provides resources for the improvement of small capital investments that replace or extend the life of an asset. This project implements a systematic approach to equipment replacement and renewal at facilities contained within San Felipe Division by designing and constructing improvements identified through the District's 10-year asset management program. Infrastructure within this project includes tunnels, large diameter pipelines and valve structures, pumps and associated equipment, as well as a large above ground storage tank. The Reach 1 renewal and replacement activities are conducted in coordination and cooperation with San Felipe Division Reach 1 contractors, partner cities, and other agencies. Planned projects for FY 2017 include:

- 91214010-Reach 1: Replace Pacheco Pumping Plant Fire Pump
- 91224010-Reach 2: Fix Calaveras Fault Inlet/Outlet road access; Fix Santa Clara Tunnel leakage, grouting and lining; Cathodic protection for 2 rectifiers and Anodes Well.
- 91234010-Reach 3: Cathodic protection for 2 rectifiers and Anodes Well; Replace Coyote pump discharge valve operator, flowmeter, HVOS air compressor, and isolation valve control valve operator.

All three projects have positive NPV saving at feasibility study phase subject to design phase validation.

PROJECT LOCATION



2017–2021 Five-Year Capital Improvement Program :: II-19

Overview

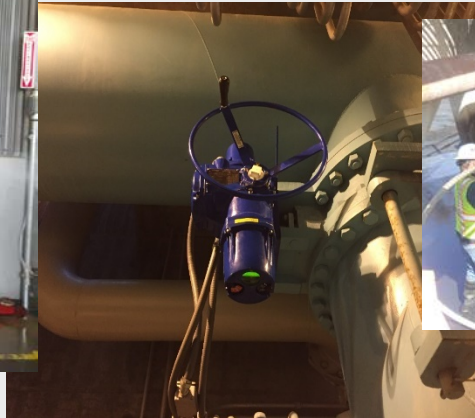
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Water Utility Maintenance Program

Workload



Treatment Plants	4
Miles of Distribution Pipe	142
Total Assets	8,000
Total Working Level Staff	45
Total FY16 Work Orders	16,000
Total FY17 Maintenance and Small Capital Project Budget	\$26.2 M



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Water Utility Maintenance Program

Maintenance Workforce

Craft Type	Number of Staff
Industrial Electrician	6
Control Systems Technician	10
Plant Maintenance Mechanic	17
Industrial Painter	2
Maintenance Planner (FOA)	4
Maintenance Supervisor	4
Capital Support Liaison	2
Total	45



Water Utility Maintenance Program

Maintenance Work Prioritization

Priority Level	Work Types
1	Emergencies
2	High priority CM
3	Most PM, CM and PW
4	Lower priority PM, CM and PW
5	Very low priority / limited value added work

- ▶ Maintenance staff balances their work for the day in real time to complete priority 1 and 2 work orders first
- ▶ Some PM work orders are postponed until the next PM cycle



Water Utility Maintenance Program

Capital Construction Support

Pre-Construction

- ▶ Provide input and review during design phase
- ▶ Support asset preparation for construction

During Construction

- ▶ Coordinate concurrent daily work with construction
- ▶ Review new equipment submittals
- ▶ Provide functional testing input
- ▶ Work with Asset Management and Engineering to develop PM program
- ▶ Set up required special tooling and spare parts inventories

Post Construction

- ▶ Follow up with project engineers on repairs during post construction warranty period



Water Utility Maintenance Program

Emergency Response

- ▶ 24/7 operation of water utility facilities
 - ▶ After hours on-call support
- ▶ Emergency response by staff is immediate/quick
- ▶ WU DOC opens for multiple day, complex recovery efforts



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Performance Monitoring & Improvement

Maintenance KPI Development

Problem

- ▶ Standard Key Performance Indicator (KPI) reports not automated in Maximo
- ▶ Each group had variations of reporting KPIs

Solution

- ▶ Develop standard KPI reports in Maximo
- ▶ Expand KPIs to help optimize maintenance strategies

Implementation Plan

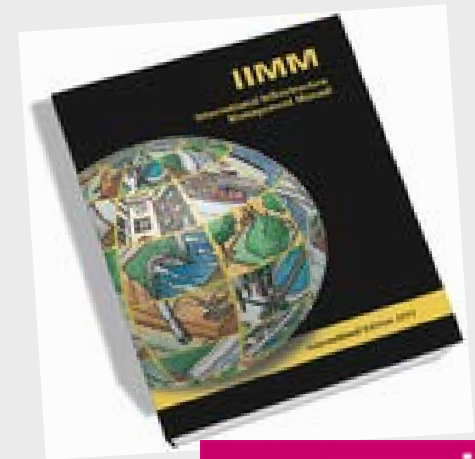
- ▶ Develop automated reports using data from CMMS – Currently 30% completed; est. completion FY18
- ▶ Establish reasonable performance targets and train field staff
- ▶ Deploy ‘continuous improvement’ processes utilizing KPI data as the primary drivers



Performance Monitoring and Improvement

Asset Management Standards

- ▶ AM staff monitors standards to ensure programs are up to date
 - ▶ International Infrastructure Management Manual (IIMM)
 - ▶ British Standards Institution's Publicly Available Specification for asset management (PAS 55)
 - ▶ International Organization for Standardization's guidelines for asset management (ISO 55000)
 - ▶ EPA 10-Step Asset Management Planning Model



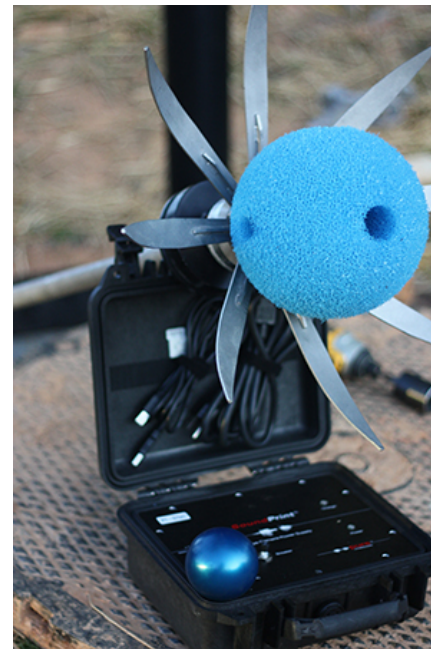
Performance Monitoring & Improvement

New Technology

- ▶ District monitors and tests new water technologies for opportunities to improve efficiency, reduce cost, and reduce risk



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Water Utility Asset Management Program Activities

- ▶ Continuing registry maintenance, asset condition assessments, and maintenance work planning
- ▶ Advancing work on advanced AM principals:
Thorough evaluation of one unique asset class or facility each year (FY17/18 – Pipelines)
 - ▶ Refine risk scores
 - ▶ Optimize maintenance schedules and lifecycle costs
 - ▶ Document in an asset management plan

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Next Steps

- ▶ Continue maintenance planning and execution
 - ▶ Provide FY18-22 Maintenance Work Plan to Board in August 2017
- ▶ Continue facility asset management plans
- ▶ Future Board Updates: Asset Risk, Operations Priorities, Security, Watershed and Administration Asset Management Programs