



**King County**

Department of Natural Resources and Parks  
**Wastewater Treatment Division**

# Resiliency and Recovery Program

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Resiliency Work to Date  
MWPAAC Subcommittee Briefing  
Thursday, April 12, 2018



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# Project Objective

Develop a comprehensive strategy for preparing King County Wastewater Treatment Division's (WTD) conveyance and treatment facilities for the impacts of a major earthquake, flooding or natural hazard events.





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# Project Team

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## Prime Consultant – HDR Engineering Inc.

- Advanced Industrial Automation Corp
- Aqualyze, Inc.
- Ballantyne Consulting, LLC
- Griffin, Hill & Associates, LLC
- Planning and Management Services, Inc.
- PRR, Inc.
- Reid Middleton
- Shannon & Wilson, Inc.

## MWPAAC Taskforce

- Alderwood Water and Wastewater District
- City of Redmond
- City of Seattle



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# Seismic Scenarios



## Cascadia Subduction Zone, Magnitude 9.0

- Primary focus as the most likely scenario



## Seattle Fault, Magnitude 7.2

- Very strong ground motion along Interstate-90 corridor
- Surface fault rupture can result change in sewer grade



## South Whidbey Island Fault, Magnitude 7.4

- Very strong ground motion near Brightwater
- Surface fault rupture/change in sewer grade





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# Natural Hazards Scenarios



## Flooding and Tsunami:

- 100-Year Recurrence Interval Flooding
- 500-Year Recurrence Interval Flooding
- Mechanical Failure-Induced Flooding
- Tsunami inundation associated with the Seattle Fault Scenario



## Landslides Caused by Earthquakes



## Extreme Weather:

- Tornadoes
- Damaging Winds
- Large Hail Events





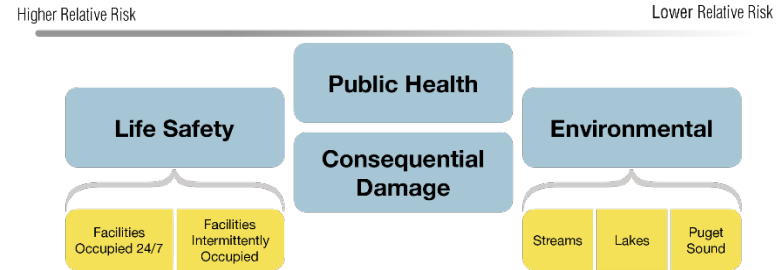
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# Prioritization of Mitigation Strategies

## Criticality Factors

- Life Safety
- Public Health
- Consequent Damage
- Environmental

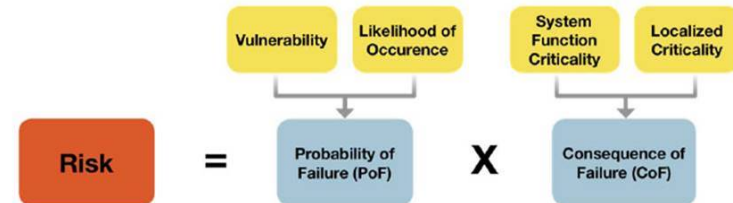


## Risk

- Consequence of Failure: Expected System Performance
- Probability of Failure: Vulnerability to Hazard

## Team Validation

## Equity and Social Justice



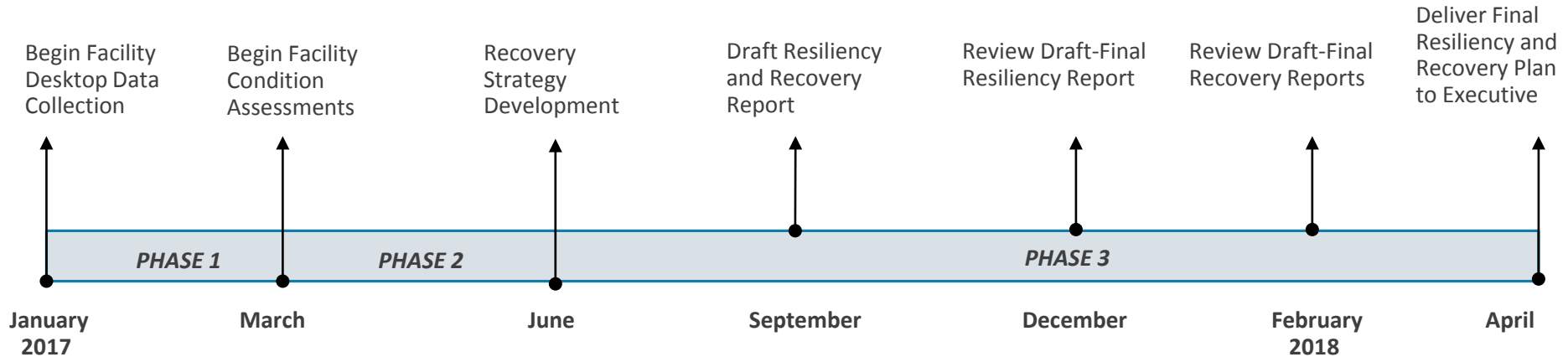


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# Schedule

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# Completed Since October 2017 Briefing

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## October 2017

- Developed conceptual solutions for problems identified
- Developed pre-class 5 Cost Estimates for preliminary solutions

## November 2017

- Refined Capital Projects List

## December 2017

- Draft Resiliency Recommendations Report WTD Management Review

## January 2018

- Draft Recovery Recommendations Report WTD Management Review

## April 2018

- Deliver Final Resiliency and Recovery Reports to Executive





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# Resiliency Mitigation Concepts

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- 17 Seismic Structural
- 10 Seismic Liquefaction
- 1 Landslide
- 8 Flooding
- 5 Programmatic Improvement Projects
- 11 Recommendations for Further Study





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# Capital Investments

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- Near- and long- term capital investments
- WTD's proposed six-year Capital Improvement Program:
  - Two capital projects estimated at approximately \$22 million
  - Remaining CIP projects estimated at approximately \$128 million



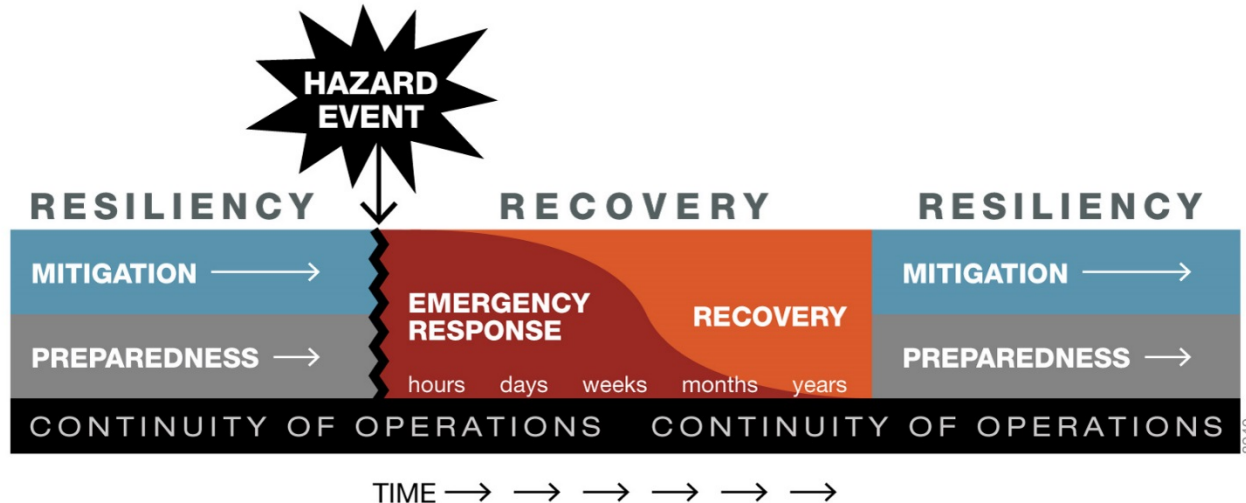


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# Recovery Recommendations

- Strategies are designed to drive timely, efficient and safe system recovery





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# Recovery Recommendations

- Preparedness and Recovery Strategies:
  - WTD Continuity of Operations Plan
  - Designated Emergency Management Program Coordinator
  - Employee Training + Capacity Development
  - Contracting + Procurement
  - System-wide Information + Documentation
  - Financial Risk Management
  - Emergency Recovery Working Group





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# Program Next Steps

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- Identify synergies in six-year capital improvement portfolio
- Financial analysis and implementation timeframe
- Ongoing coordination and briefings with WTD management and regional stakeholders





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# Program Implementation

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- Leadership support
- Resiliency & Recovery program manager
- Capital improvement portfolio integration
- Designated resiliency mitigation funding



# Thank You

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