City of Corvallis Water Treatment and Distribution Facilities Master Plan

WATER
OUR FOCUS
OUR BUSINESS
OUR PASSION

carollo
Engineers...Working Wonders With Water®

Presentation Overview

- Water Master Plan Project Progress
- 50-year Water Supply Strategy

Corvallis has three main objectives for this Water Master Plan

Objective #1

Establish a public outreach process that establishes and maintains key stakeholder support throughout the planning project.

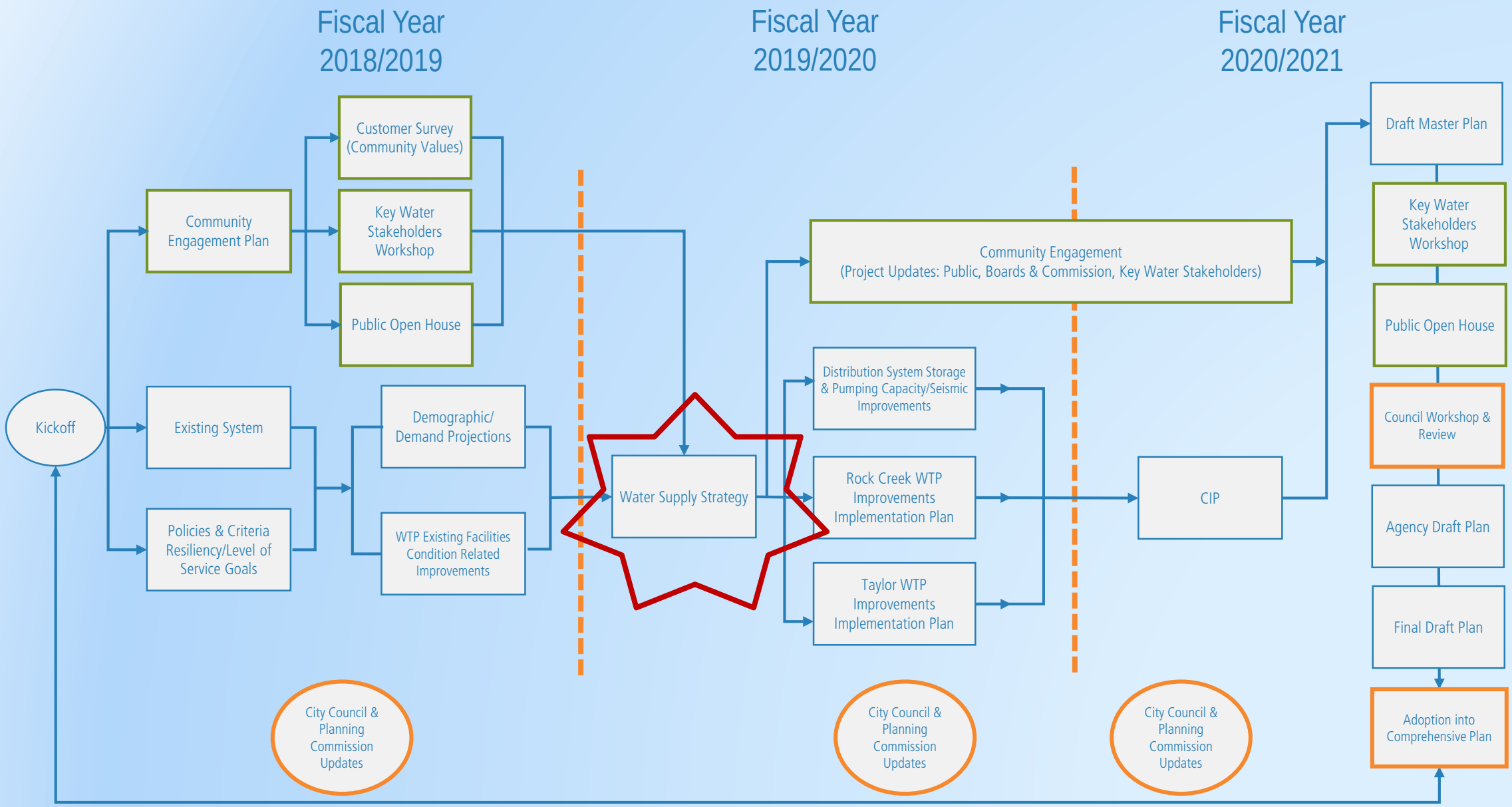
Objective #2

Establish the foundation for a long-term, seismically resilient water system for the City.

Objective #3

Planning for the future. Develop a water supply strategy and address future finished water demand and quality goals.

Water Master Plan project schedule



Many evaluations have been performed

Climate Change Impacts

Soliciting Community Values
- Customer Survey
- Key Stakeholders Workshop
- Public Open House

Demographic/ Demand Projections

Water Rights Evaluation

Level of Service Goals/ Policies and Criteria

Geotechnical Hazards/ Intake Existing Condition

Permitting and Environmental Implications Assessment

WTP Existing Condition and Water Quality

Supply Evaluation

		Alternatives		
Criteria	Weight	1	2	3
X	[1-5]	[1-5]	[1-5]	[1-5]
Y	[1-5]	[1-5]	[1-5]	[1-5]
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Cost	Capital Cost			
	Life Cycle Cost			

Score

Selected Water Supply Strategy

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Selected Water Supply Strategy

The customer survey helped us understand community's values and priorities

1 (Not important)	2	3	4	5	6	7 (Very important)

- 6.8 Providing safe, high-quality water
- 6.7 Planning ahead now for future water needs
- 6.6 Being a good steward of our water and natural resources
- 6.4 Being prepared for an earthquake or other natural disasters
- 6.4 Promoting conservation
- 6.2 Being prepared for global climate change
- 6.2 Providing multiple sources of reliable water supply

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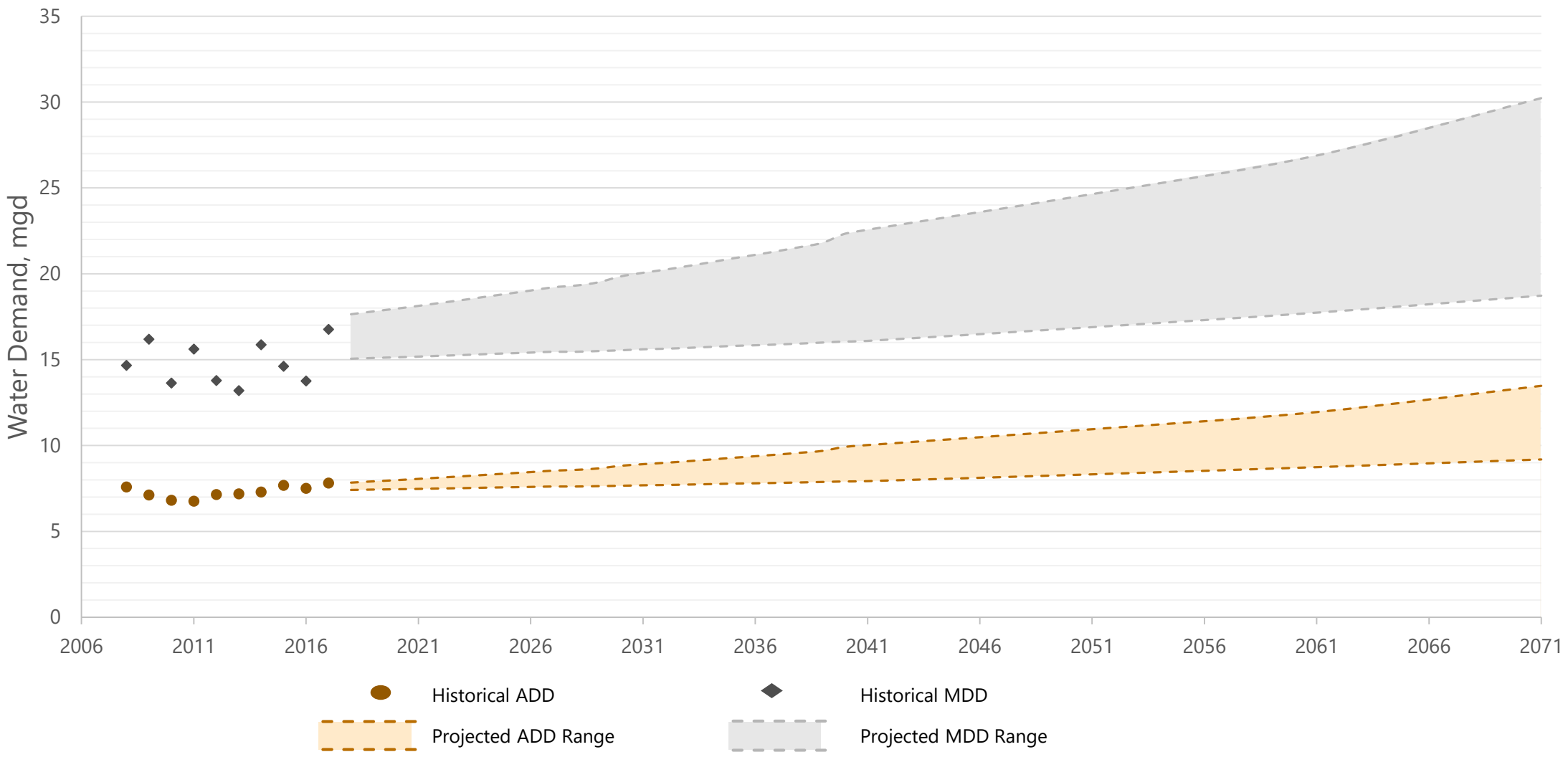
Selected Water Supply Strategy

Maximum Daily Demand (MDD) could be as high as 30 mgd by 2070



Many evaluations have been performed to get us here today

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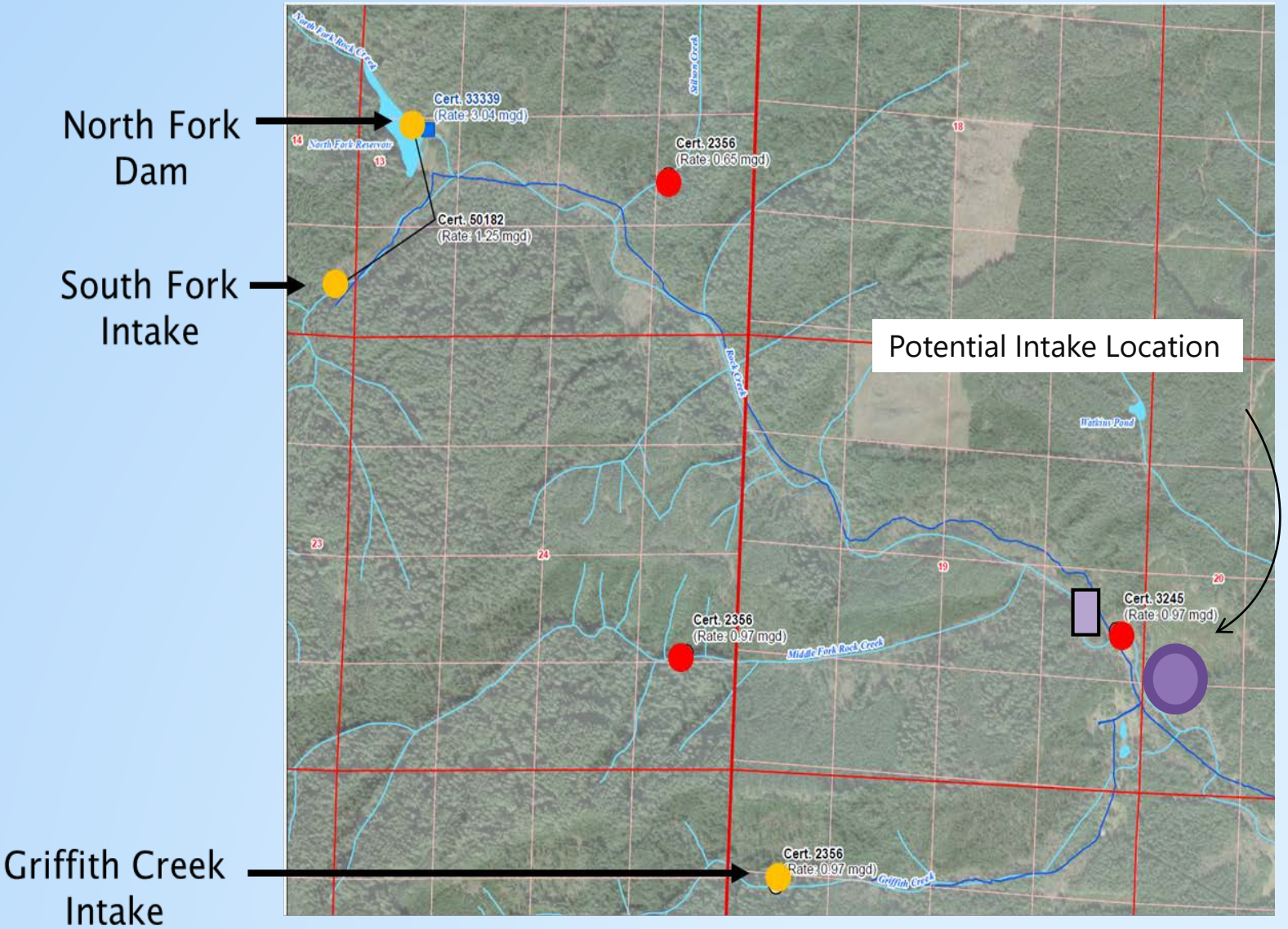
Selected Water Supply Strategy

A new intake is required to use all of the Rock Creek water rights of 5 mgd.

The City's Willamette River water rights is 58 mgd.

Rock Creek Watershed



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Selected Water Supply Strategy

City's 50-year resilience level of service goals

Table 3.2 City of Corvallis Water System Recovery Goals – following a M9.0 CSZ Earthquake (adapted from OSSPAC 2013 and NIST 2015)

Water Systems	Target Timeframe for Recovery				
	Phase 1: Short-Term Days			Phase 2: Intermediate Weeks	
	No Disruption	1-3	3-7	1-2	2-4
Source					
Raw water reservoir and intakes	30% of 2063 WDD[1]	60% of 2063 WDD			90% of 2063 WDD
Raw water conveyance (pump stations and piping to WTP)	30% of 2063 WDD	60% of 2063 WDD			90% of 2063 WDD
Water Production	30% of 2063 WDD	60% of 2063 WDD			90% of 2063 WDD
Water Quality					
Treatment operations functional[2]	30% of 2063 WDD (Potable)	60% of 2063 WDD (Potable)			90% of 2063 WDD (Potable)

Recovery goals are based on guidance from the Oregon Resilience Plan

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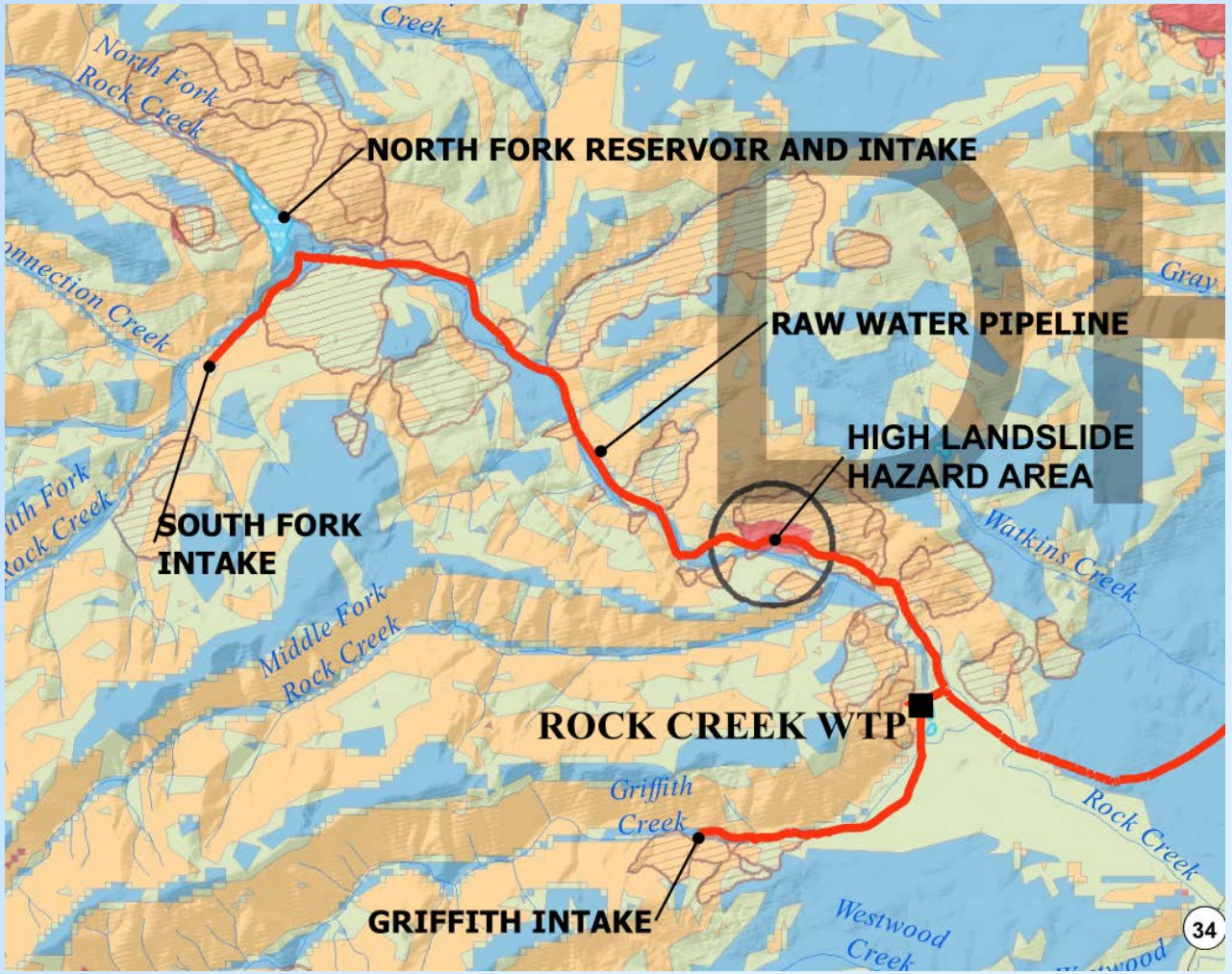
Selected Water Supply Strategy

Geotechnical seismic hazard risk assessments at existing water infrastructure sites



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Selected Water Supply Strategy

Permitting and environmental impacts

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Selected Water Supply Strategy

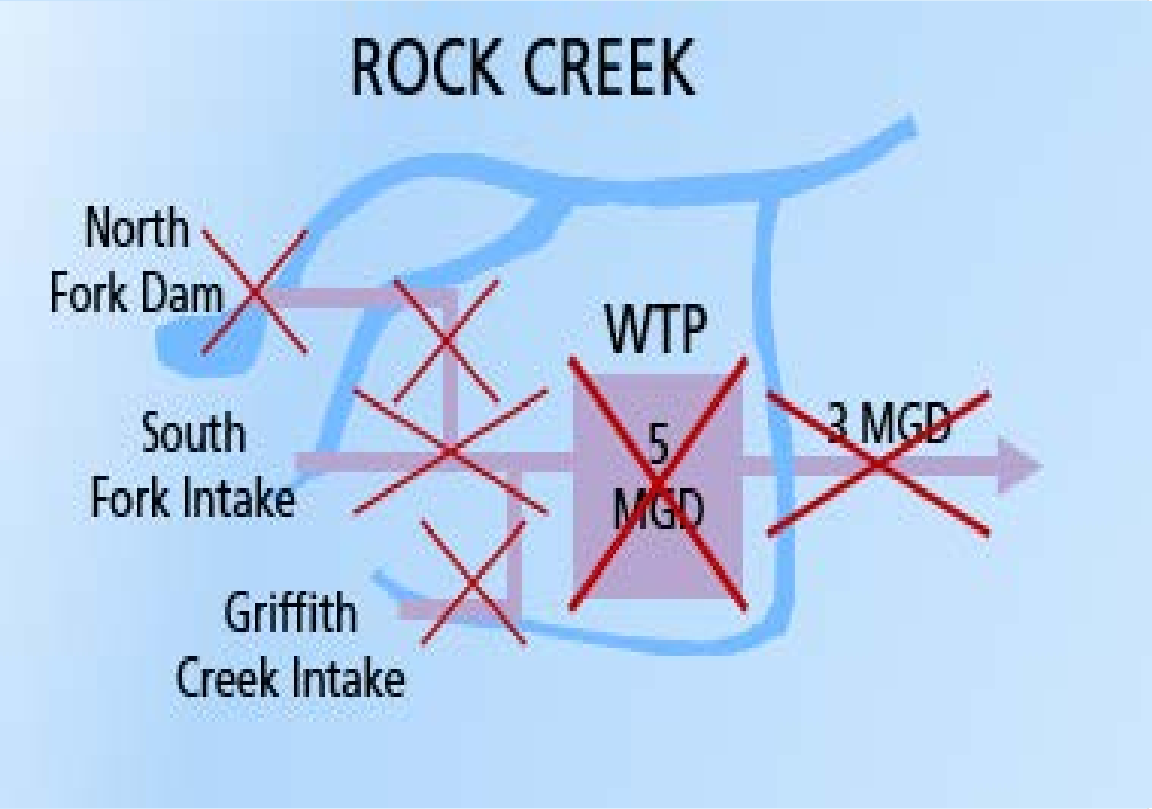
Water Quality

- Finished water quality exceeds regulatory requirements at both treatment plants
- Based on measured parameters, finished water quality is comparable between the two plants

Key issues at Rock Creek to consider for the water supply strategy

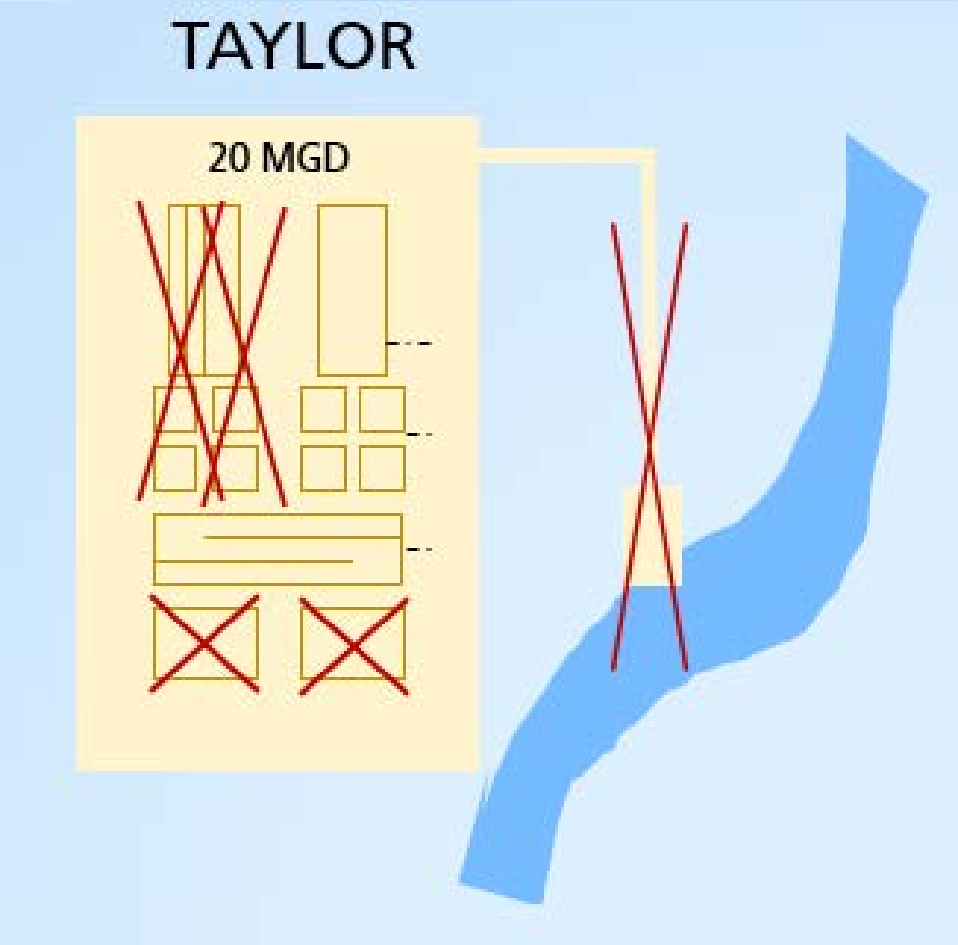
Raw Water Availability

In 2070, all major systems are past their useful life.



Key issues at Taylor to consider for water supply strategy

In 2070, nearly all systems are past their useful life.



Intake Structure

Long-term Supply Strategy Purpose and Need

Long-term Supply Strategy Purpose and Need Statement

The purpose of the City's long-term supply strategy is to meet the **50-year** (through **2070**) water demand needs of the community with a water supply that achieves the redundancy criteria and resilience level of service goals.

- 50-year Maximum Daily Demand projection: **30 mgd**.
- Redundancy criteria: More than one supply source allowing City to provide 7.5 mgd (year 2063 winter demands) for three days with largest source out-of-service.

continued…

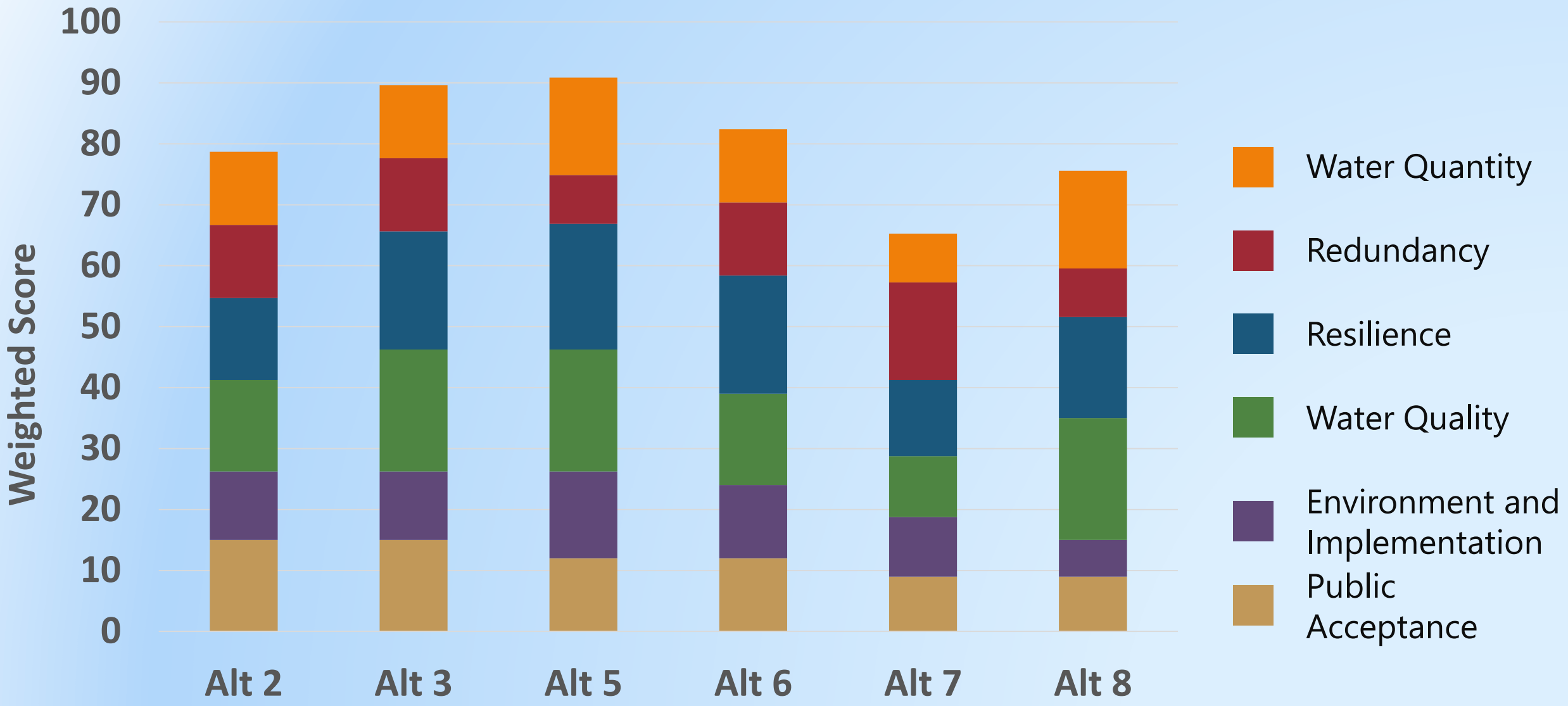
- Resilience level of service goals:
  - **7.5 mgd** (year 2063 winter demands) of seismically resilient supply.
  - Uninterrupted water service during 500-year flood.
  - Back-up power to provide year 2063 winter demands for a minimum of three days if regular power supply is unavailable.

Long-term Supply Strategy Alternatives

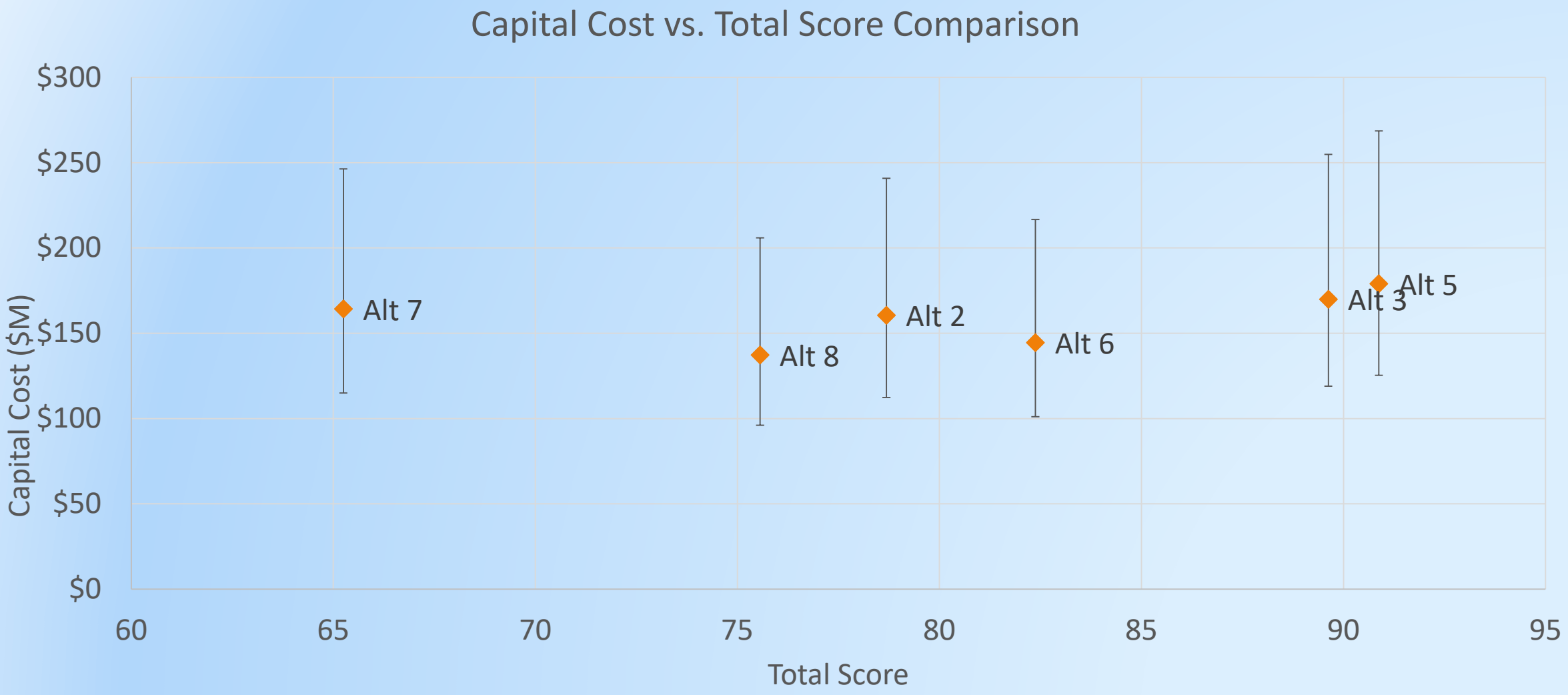
Alternatives were evaluated on six non-economic criteria

Criteria	**Sub-criteria**
• Water Quantity	
• Redundancy	
• Resilience	o Seismic Vulnerability o Flooding Vulnerability o Wild Fire Vulnerability o Reliability
• Water Quality	
• Environment and Implementation	o Stewardship of Natural Resources o Implementation Complexity
• Public Acceptance	

Preliminary Scoring Results



Preliminary cost estimates

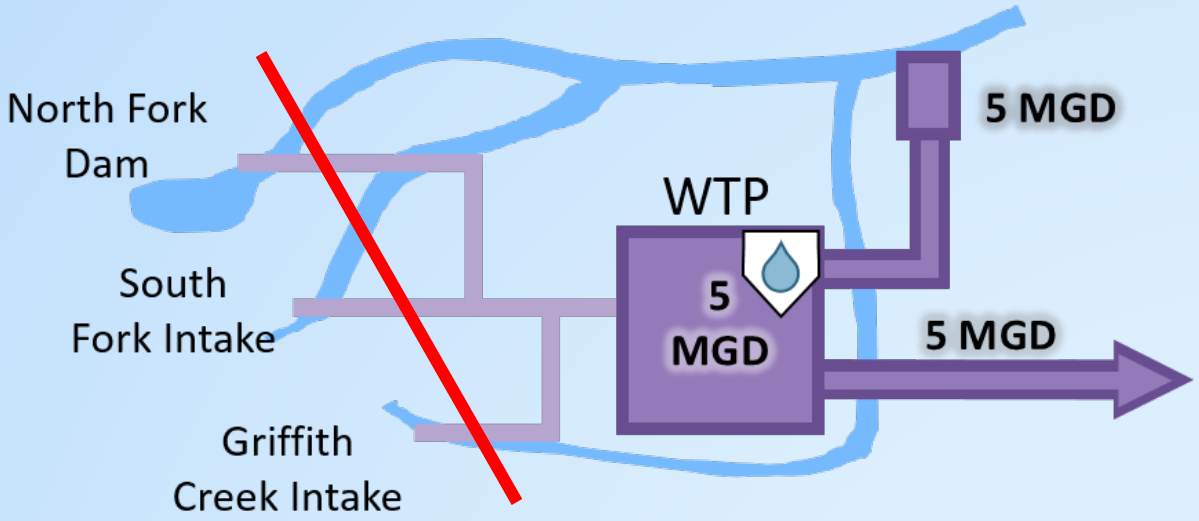


Selected Long-term Supply Strategy

Long-term strategy for the RocK Creek Water Treatment Plant

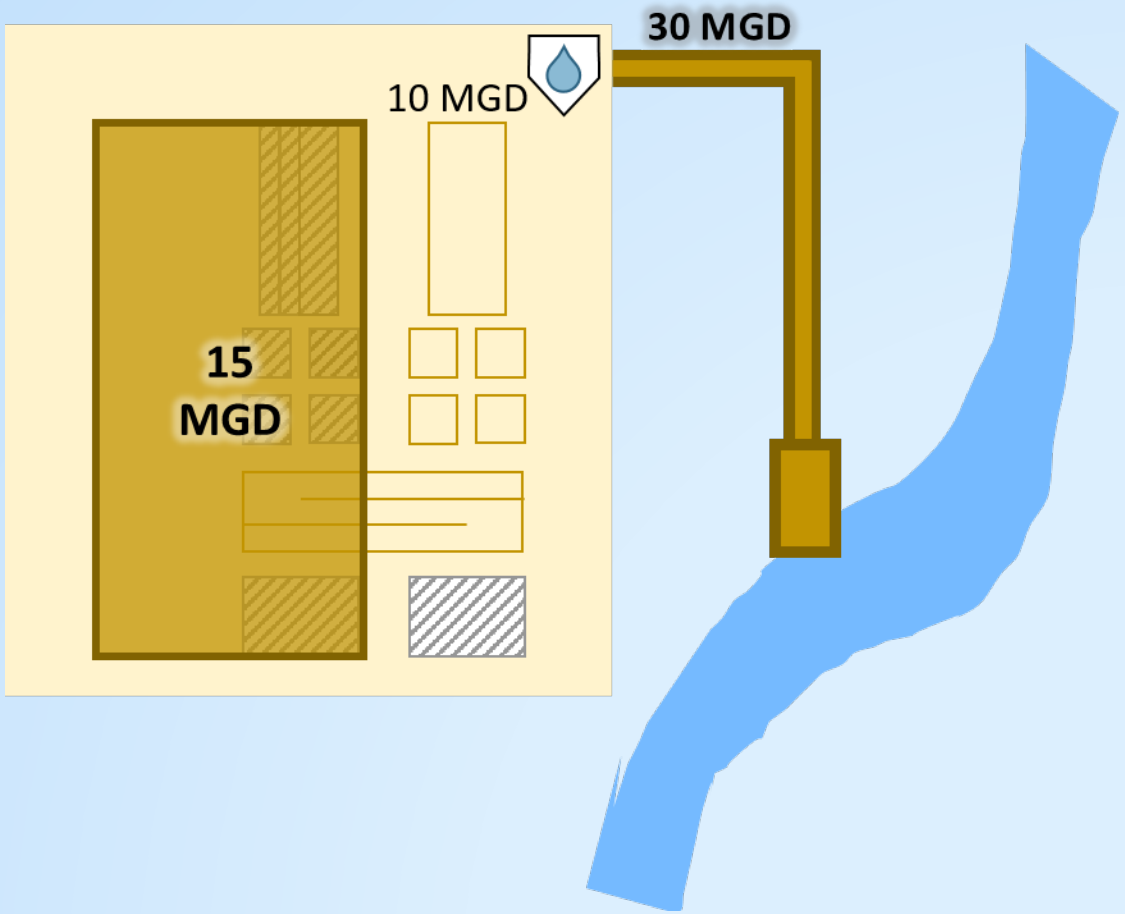
<u>Rock Creek</u>

- Move PODs to Rock Creek and construct new intake on Rock Creek.
- Construct new seismically resilient 5 mgd WTP.
- Seismically harden North Fork Reservoir.
- Replace finished water piping to Bald Hill Reservoir (seismically resilient).

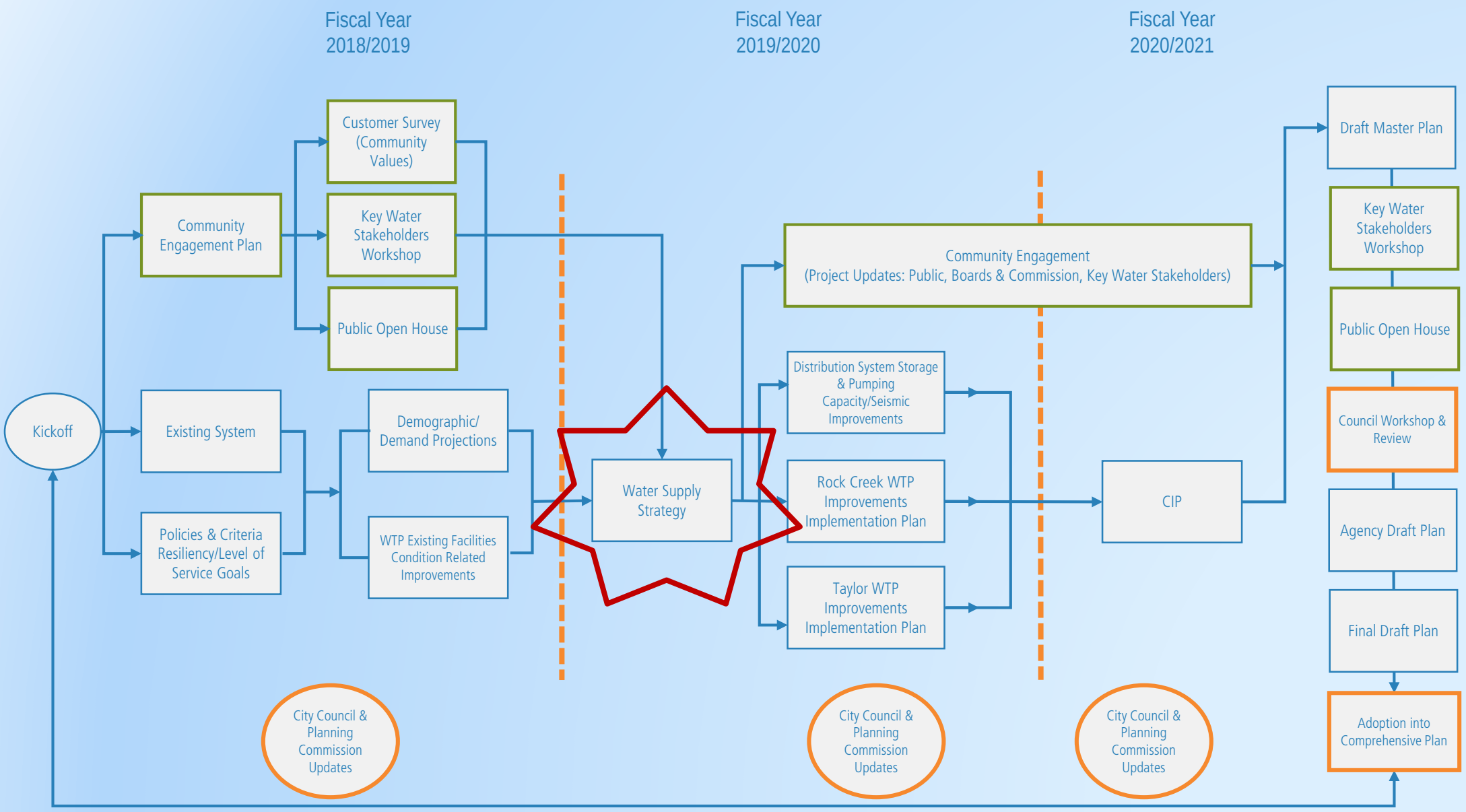


Long-term strategy for the Taylor Water Treatment Plant

- Replace intake (seismically resilient).
- Expand Taylor to 25 mgd.
- Add new treatment processes.
- Seismically harden facility



Alternative 3 Meets Water Supply Strategy Objectives

Water Supply Strategy	Alternative 3
Max Day Demand of 30 MGD	25 MGD from Taylor 5 MGD from Rock Creek
Redundancy	More than one water source and treatment plant
Resiliency	Seismically-hardened infrastructure

Water Master Plan project schedule