Laguna Treatment Plant Disinfection System Improvements

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Board of Public Utilities | Study Session

July 18, 2019

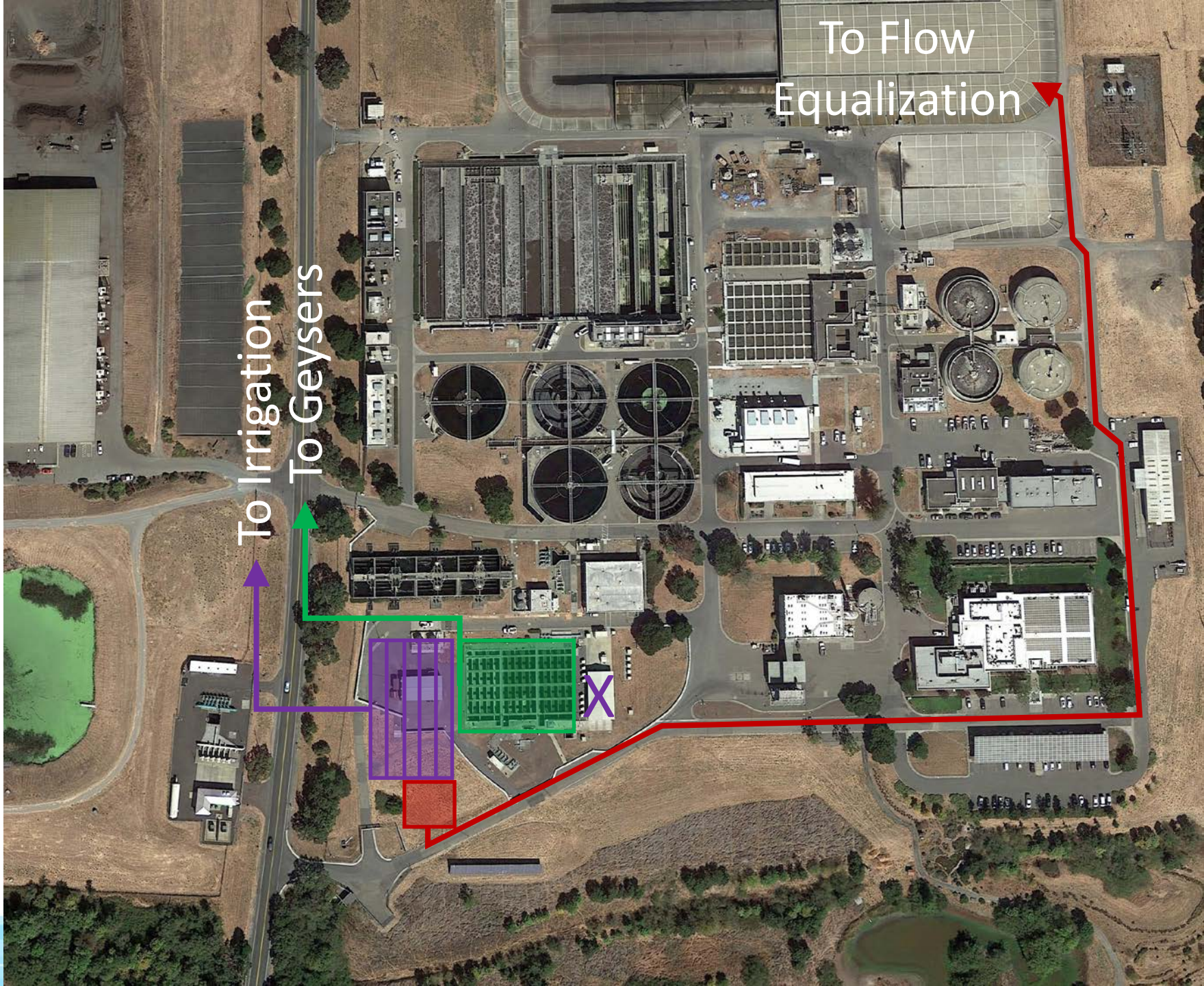
Project Background

- Pre-1998 Disinfected with Gaseous Chlorine
- 1998 Commission UV System
  67 MGD Capacity
- 2012 DDW De-Rated UV System
  ~~67~~ > 48.5 MGD Capacity
- 2013-2015 Alternatives Analysis

  Issue #1: Insufficient Capacity
  Issue #2: End of Useful Life

2016 Preferred Alternative

- Replace (E) UV with (N) UV
- Add Supplemental Hypo-Chlorination
- Add On-Site Diversion



Project Timeline

MOU with Calgon

Intent: Pre-Selection of Equipment

- Equipment Configurations Differ Significantly
- Designing Around Unknown Equipment = Inefficiencies and CCOs

Calgon Carbon

Xylem/Wedeco

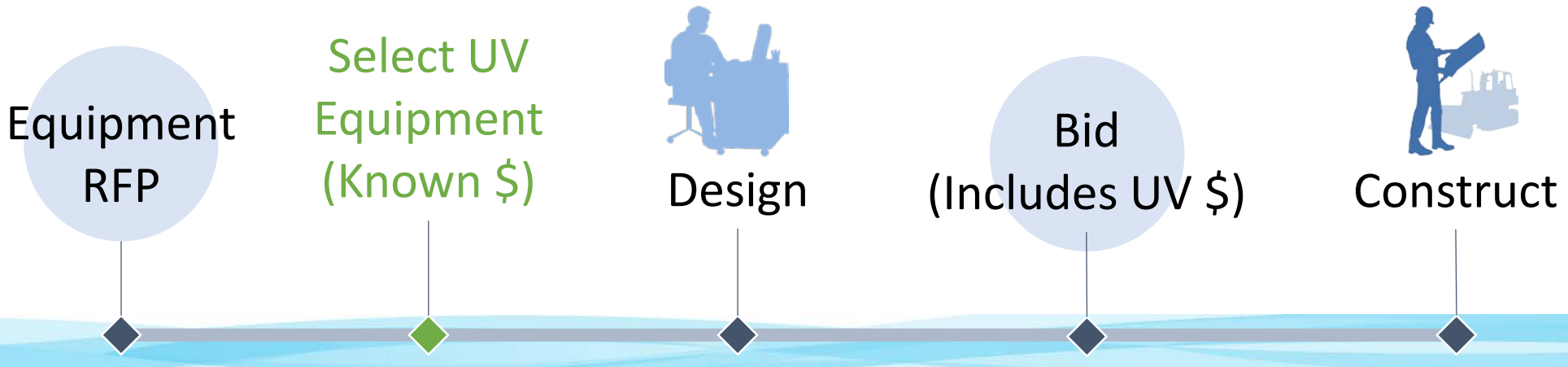
Trojan

Suez/Ozonia

MOU with Calgon

Benefits of Pre-Selection

- Eliminates Design Inefficiencies
- City Selection based on Best Value
- Competitive Pricing
- Minimizes Risk

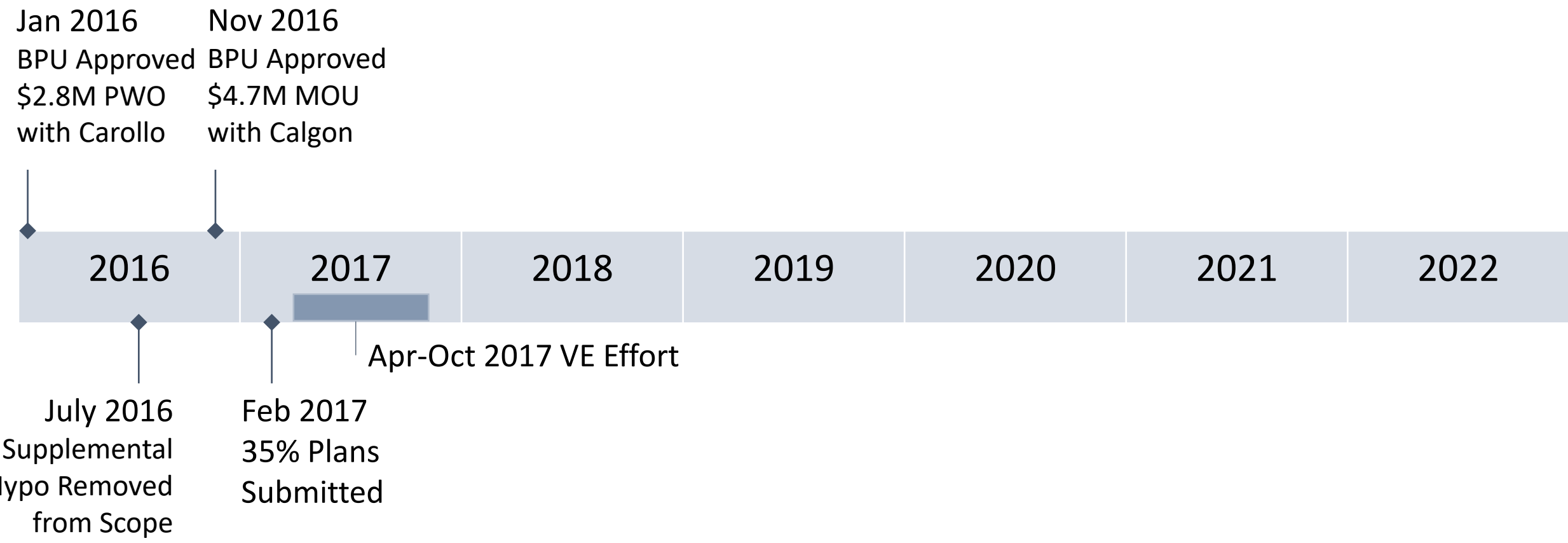


MOU
with Calgon

- BPU Approved MOU Nov 2016
- Guaranteed Price of Equipment $4,726,500
- Price Held for 18 months
- MOU Expired June 2018
- Communication with Calgon has been On-going

*Need to Renegotiate and Re-Approve MOU

Project Timeline



2017 Value Engineering Effort

Intent – Consider More Economical Disinfection Options

- Reconsider Supplemental Hypo-Chlorination
- Review Design Parameters

Reconsider Supplemental Hypo-Chlorination

Original Approach - Install Supp-Hypo in Advance of New UV

- Benefits
  - Utilize (E) Chlorine Contact Basins
  - Extend Useful Life of (E) UV
  - Push out Capital Investment
- Problem
  - UV Beyond Useful Life
  - Need Capital Investment Now
  - Regional Board has Requested a Compliance Schedule

Question Becomes: Are there benefits to having two Disinfection Systems?

Reconsider Supplemental Hypo-Chlorination

New UV System (67 mgd)	New UV (43 mgd) w/ Supp-Hypo (30 mgd)
Single Process	Dual/Parallel Processes
67 mgd Capacity	73 mgd Capacity
↑ Capital	↓ Capital
↓ O&M	↑ O&M

Cost Considerations

	New UV System	New UV w/ Supp-Hypo
Capital Costs ($M)		
New UV	$20.5	$14.5
New Supp-Hypo	-	$2.5
Off-Spec Diversion	$15.5	$15.5
Total Capital Costs	**$36.0**	**$32.5**
O&M Costs ($M)		
Annual O&M Costs	$0.53	$0.6
20-year O&M Costs	**$10.6**	**$12.0**
Total Capital + 20-yr O&M	**$46.6**	**$44.5**

Operational/Regulatory Considerations

- In-plant Upstream Processes
  - Limits Nutrient Removal Options
- Disinfection System Operations
  - Difficult Startup/Shutdown
  - Difficult Flow Split
  - Multiple Disinfection Compliance Points
- Reuse Operations
  - Potential Benefits for Geysers Biofouling
  - Disinfection By-Products may Limit Discharge Abilities

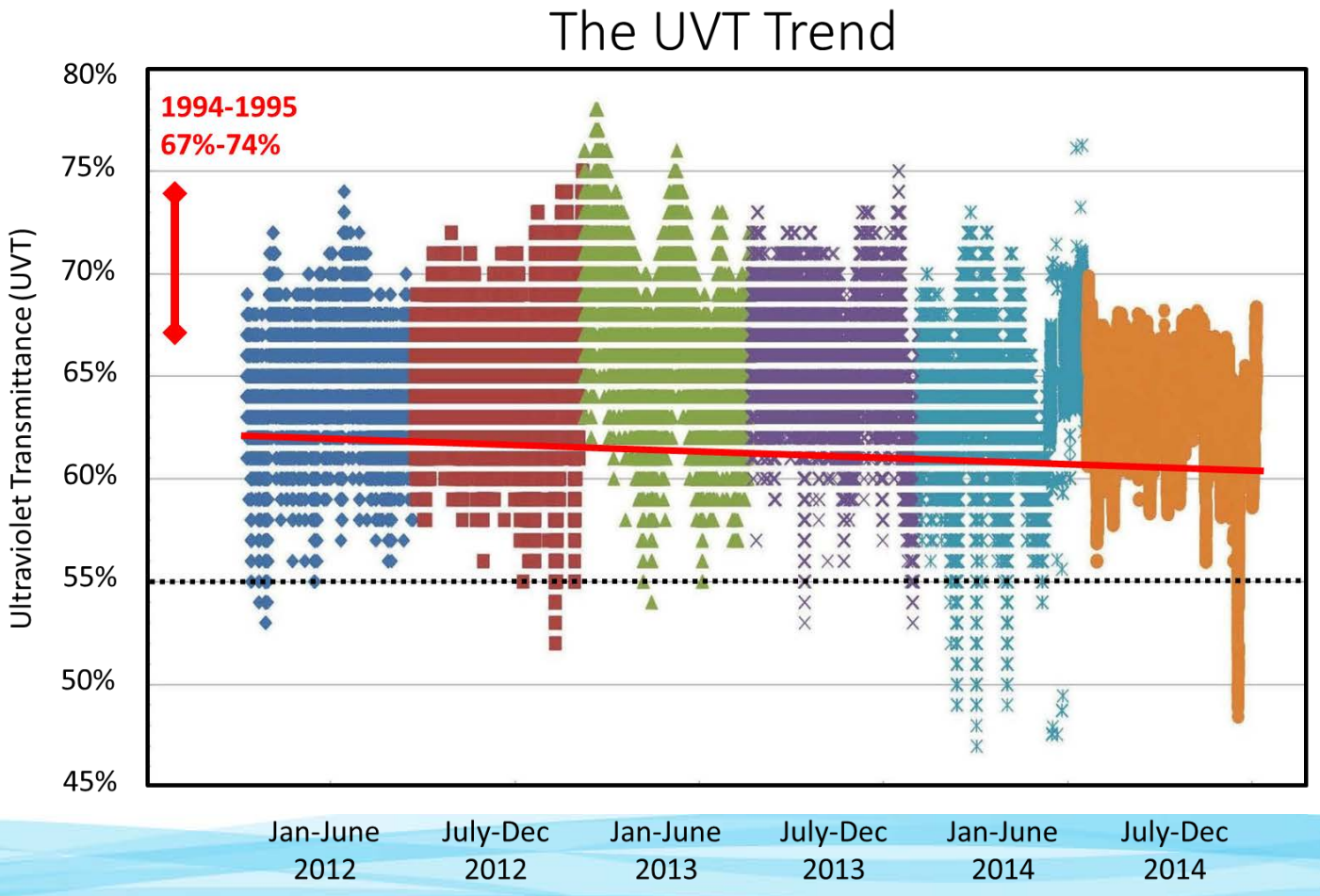
Recommended Disinfection Approach

Remove Supp-Hypo, Construct Full Capacity UV

- Single Process
- Provides most Future Flexibility
- Challenges with Supplemental Hypo-Chlorination don’t overcome Benefits of Additional Capacity

Review Design Parameters

- Ultraviolet Transmittance (UVT)
  - Original Design - 55%
- Capacity
  - Original Design - 67 mgd



Design Parameter Review - UVT

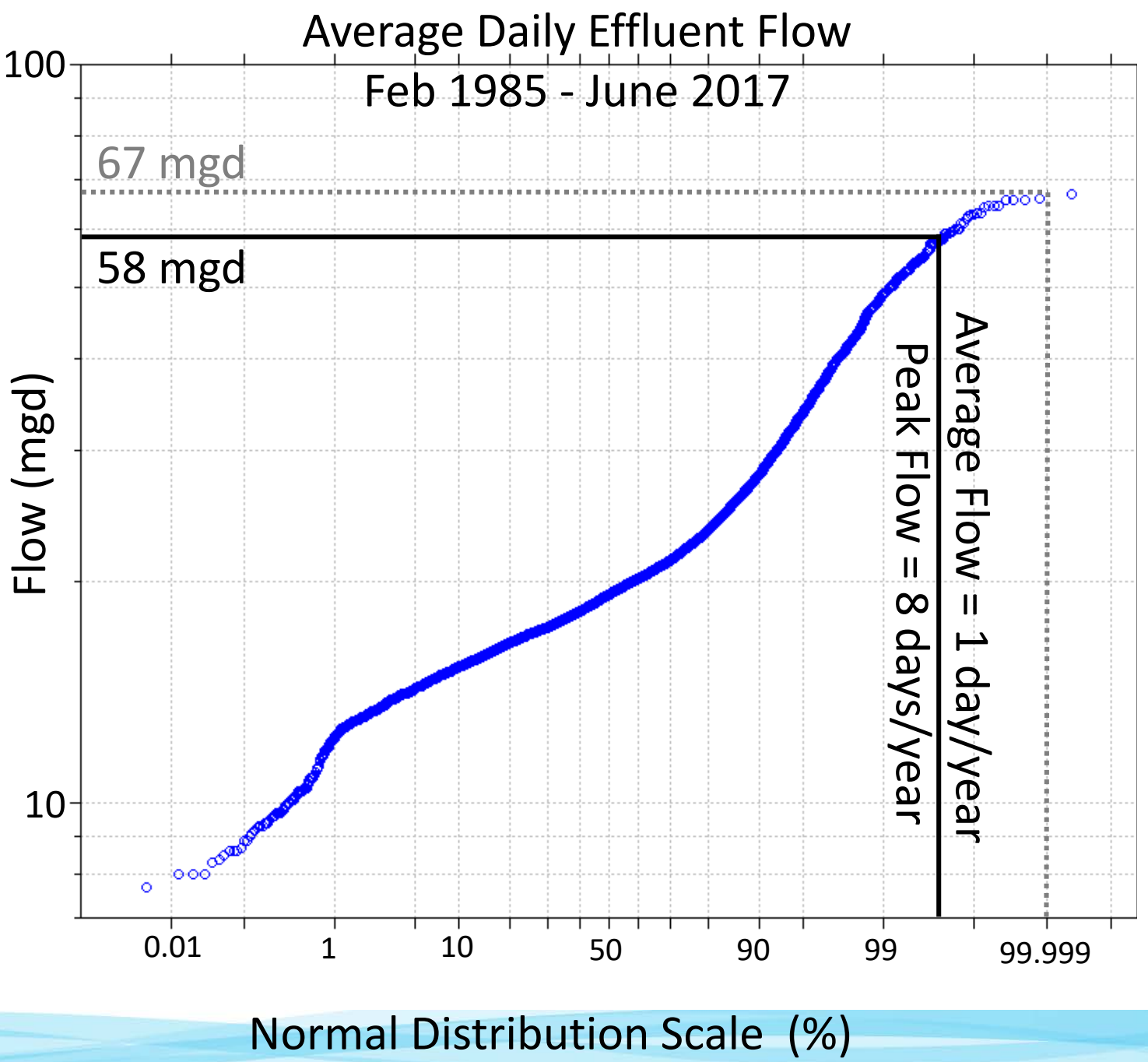
VE Recommendation

~~55%~~ → 61%

Design Parameter Review - Capacity

VE Recommendation

~~67 mgd~~ → 58 mgd



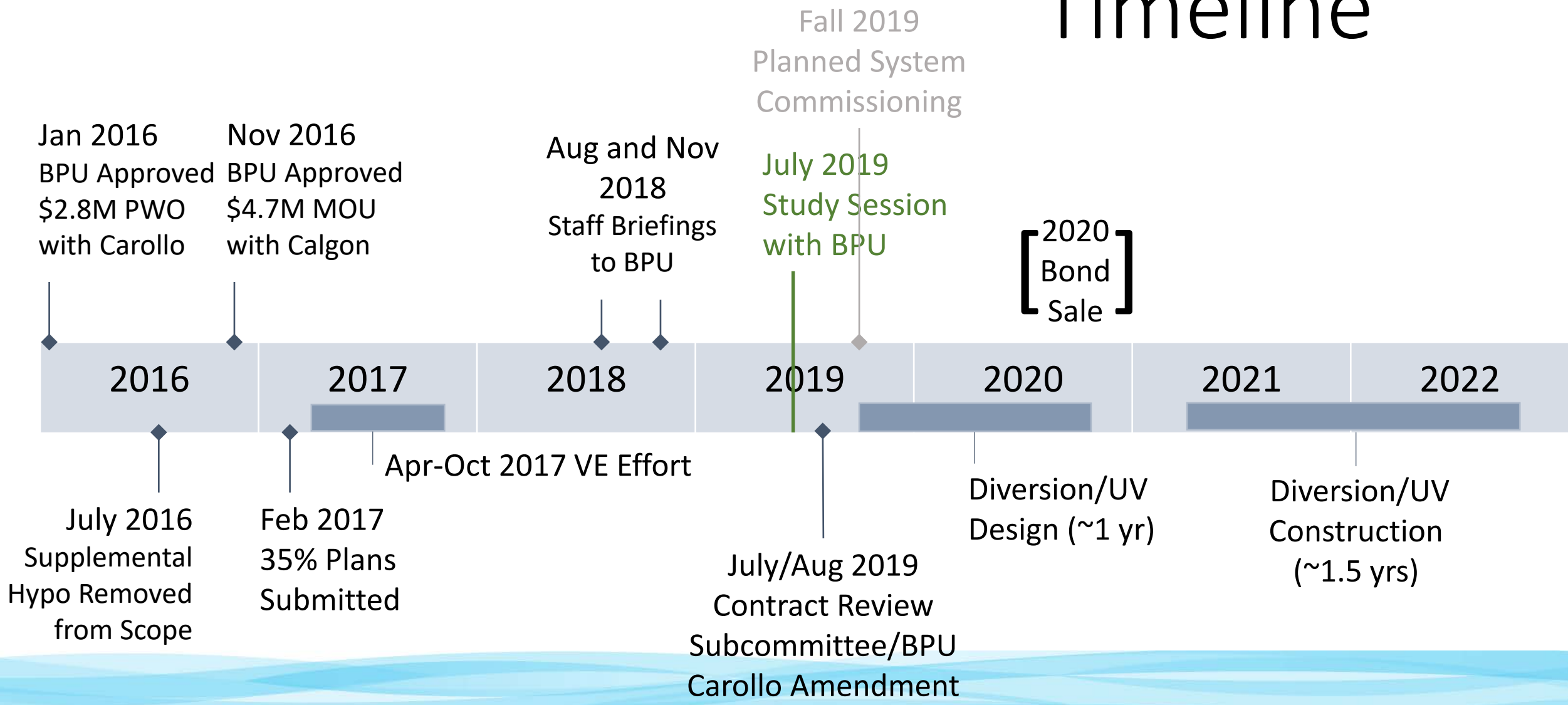
Recommended Design Parameters

~~55%~~ → **61% UVT** (VE Recommendation)

~~67 mgd~~ → 58 mgd (VE Recommendation)
+ 6 mgd (10% Operational Buffer)
= **64 mgd (Design Process Capacity)**

+ 6 mgd (10% Safety Factor)
= 70 mgd (Peak Hydraulic Capacity)

Project Timeline



First Next Step

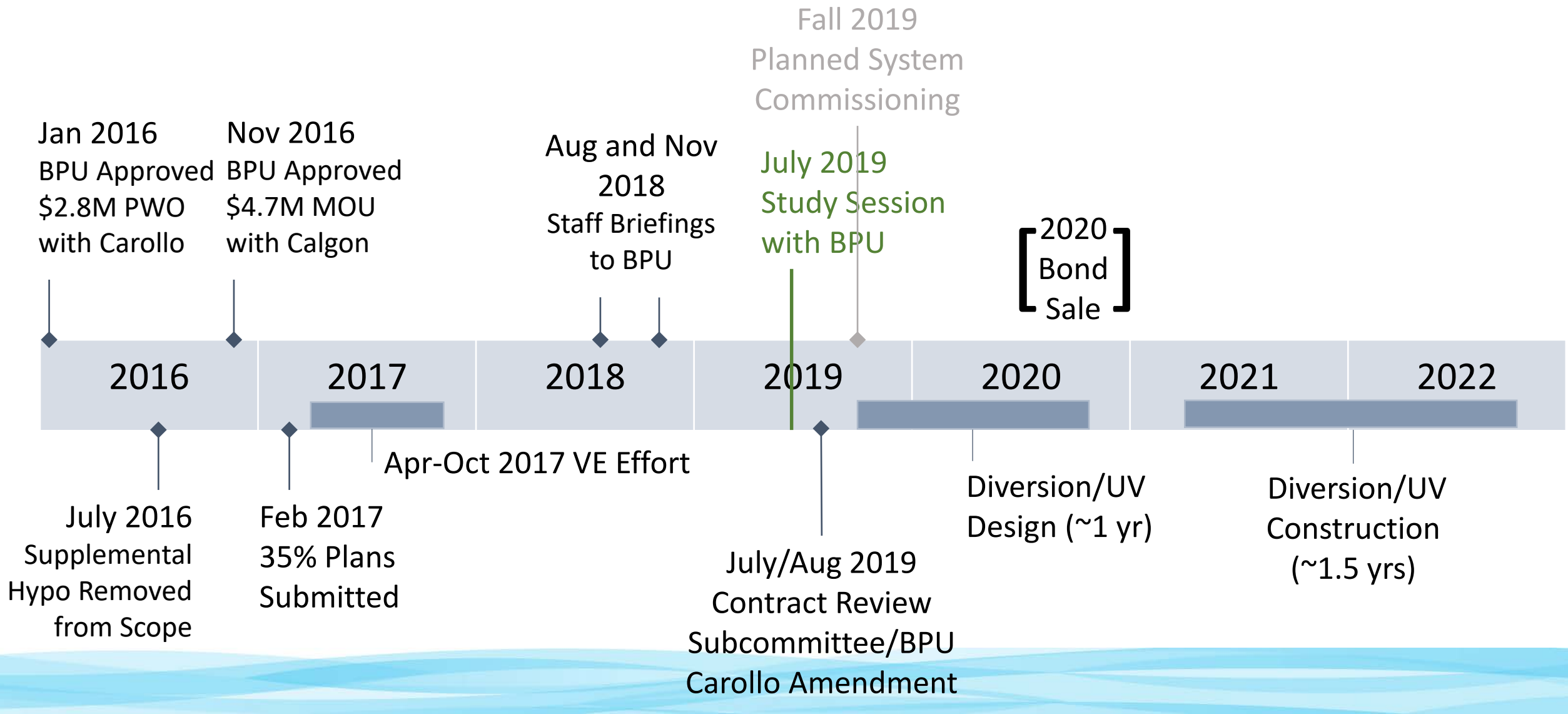
- Amend Carollo Contract (~$1.5M anticipated)
  - July 29, 2019 Contract Review Subcommittee
  - Fall 2019 Anticipated BPU Approval

- Why Amend?
  - Value Engineering Effort
  - Delay in Project
  - Changes in Scope

Future Next Steps

- Re-Execute MOU with Calgon
  - Late 2019 BPU Approval
- Bond Issuance
  - Late 2020 BPU Approval
- Award Construction Contract
  - Early 2021 BPU Approval
  - Late 2022 Commission Diversion/UV System

Questions?


Jan 2016
BPU Approved
$2.8M PWO
with Carollo
Nov 2016
BPU Approved
$4.7M MOU
with Calgon
Aug and Nov
2018
Staff Briefings
to BPU
Fall 2019
Planned System
Commissioning
July 2019
Study Session
with BPU
[2020
Bond
Sale]
2016
2017
2018
2019
2020
2021
2022
July 2016
Supplemental
Hypo Removed
from Scope
Feb 2017
35% Plans
Submitted
Apr-Oct 2017 VE Effort
July/Aug 2019
Contract Review
Subcommittee/BPU
Carollo Amendment
Diversion/UV
Design (~1 yr)
Diversion/UV
Construction
(~1.5 yrs)