Pure Water Phase 2 Planning Workshop

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- Review of Phase 2 Alternatives
- Alternatives Refinement Update
 - Treatment
 - Conveyance
- Next Steps

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Solution How We Got Here – 2018 PLWTP Considerations

- Maximize use of assets at the PLWTP
 - Keep wastewater treatment "centralized" at PLWTP
- Repurpose the existing primary sedimentation basins for water reclamation plant
 - Membrane Bioreactors
- Straightforward expansion of secondary treatment if waiver is lost and no secondary equivalency
- Reduce the amount of facilities constructed on "new" parcels
 - Stadium site was uncertain with potential SDSU West development

Alternative Development includes combinations of:

- Water Reclamation Plant
 - Point Loma
 - Harbor Drive
- Purified Water Facility
 - Harbor Drive
 - Mission Valley
- With and Without Waiver/Secondary Equivalency
- Brine/Centrate bypass of PLWTP directly to ocean outfall
- Padre Dam 11.5 mgd ECAWP facility a part of a "regional" 83 mgd solution



Alt	Secondary Equiv	Brine/Treated Centrate Bypass	Regional Purified Water Production	CAWRP/CAPWF Combined at Harbor Dr	Phase 2 Pure Water Production (mgd)
1A	Х				53
1B					53
1C	Х	Х			53
1D		Х			53
1E	Х		Х		41.5
1F		Х	Х		41.5
1G	Х		Х	Х	41.5
1H		Х	Х	Х	41.5
3A	Х	Х			53
3B		Х			53
3C	Х	Х	Х		41.5
3D		Х	Х		41.5

Alt	Secondary Equiv	Brine/Treated Centrate Bypass	Regional Purified Water Production	CAWRP/CAPWF Combined at Harbor Dr	Phase 2 Pure Water Production (mgd)
1A	Х				53
1B					53
1C	Х	Х			53
1D		Х			53
1E	Х		Х		41.5
1F		Х	Х		41.5
1G	Х		Х	Х	41.5
1H		Х	Х	Х	41.5
3A	Х	Х			53
3B		Х			53
3C	Х	Х	Х		41.5
3D		Х	Х		41.5

Alt	Secondary Equiv	Brine/Treated Centrate Bypass	Regional Purified Water Production	CAWRP/CAPWF Combined at Harbor Dr	Phase 2 Pure Water Production (mgd)
1A	Х				53
1B					53
1C	Х	Х			53
1D		Х			53
1E	Х		Х		41.5
1F		Х	Х		41.5
1G	Х		Х	Х	41.5
1H		Х	Х	Х	41.5
3A	Х	Х			53
3B		Х			53
3C	Х	Х	Х		41.5
3D		Х	Х		41.5

Alt	Secondary Equiv	Brine/Treated Centrate Bypass	Regional Purified Water Production	CAWRP/CAPWF Combined at Harbor Dr	Phase 2 Pure Water Production (mgd)
1A	Х				53
1B					53
1C	Х	Х			53
1D		Х			53
1E	Х		Х		41.5
1F		Х	Х		41.5
1G	Х		Х	Х	41.5
1H		Х	Х	Х	41.5
3A	Х	Х			53
3B		Х			53
3C	Х	Х	Х		41.5
3D		Х	Х		41.5

S What We've Learned

- Centrate significantly impacts water reclamation plant sizing and treatability
 - Bypass brine/centrate around water reclamation plant
 - For Alternative 3, centrate must be treated for ocean discharge
- Existing primary sedimentation basins at PLWTP cannot be retrofitted for secondary treatment
 - Insufficient volume, too shallow, and can't accommodate membrane bioreactors
 - For Alternative 3, different processes for water reclamation plant and secondary conversion (loss of waiver)
- The City has secured the Mission Valley site

Treatment Layouts

SD Treatment Elements

- Discharge to Murray Reservoir
 - Direct Potable Reuse Raw Water Augmentation
- Water Reclamation Plant
 - Enhanced primary treatment
 - Chemically-enhanced primary treatment or Densadeg®
 - Biological nutrient removal
 - Membrane Bioreactors
- Purified Water Facility
 - Ozone/biologically active carbon
 - Membrane filtration
 - Reverse Osmosis
 - Ultraviolet/Advanced Oxidation Process
 - Pipeline chlorination

sb) Alternative 1 (53 mgd) - Harbor Drive CAWRP Site Plan

Treatment options for:

- Primary Treatment
 - CEPT (as shown)
 - DensaDeg
- CAWRP Secondary/Tertiary Treatment
 - BNR/Secondary Clarifiers/Tertiary Filters (insufficient land)
 - Fine Screens/BNR/MBR (as shown)

Alt	Influent AADF (mgd)
1A, 1B	69



sb) Alternative 1 (42 mgd) - Harbor Drive CAWRP Site Plan

Treatment options for:

- Primary Treatment
 - CEPT (as shown)
 - DensaDeg
- CAWRP Secondary/Tertiary Treatment
 - BNR/Secondary Clarifiers/Tertiary Filters (insufficient land)
 - Fine Screens/BNR/MBR (as shown)

Alt	CAWRP Influent AADF (mgd)	
1A - 1B	69	
1E	53	



sb) Alternative 1 (53 mgd) – Mission Valley CAPWF Site Plan

- Treatment processes include:
 - Ozone
 - BAC
 - *MF*
 - *RO*
 - UV/AOP
 - Post Treatment

Alt	CAPWF Influent (mgd)
1A-1D	66



Full Secondary Treatment at Point Loma

Solution Discharge Limits – Secondary Effluent Standards

Parameter	30-d Average (Average Monthly) ^a	7-d Average (Average Weekly) ^b		
BOD ₅	30 mg/L (or 25 mg/L CBOD ₅)	45 mg/L (or 40 mg/L CBOD ₅)		
TSS	30 mg/L	45 mg/L		
рН	Within the li	mits of 6.0-9.0		
BOD ₅ and TSS removal (concentration)	<u>></u> 85%			
2 Calendar Month in accordance with 10 CER 122 Section 122 15(d)(2)				

b Calendar Week in accordance with 40 CFR 122, Section 122.45(d)(2)

Exhibit 5-2 in Chapter 5 of the NPDES Permit Writer's Manual (2010)

SD/ Biological Aerated Filter Configuration at PLWTP



SD) Alternative 1 – PLWTP Site Plan (Full Secondary)

Treatment options for:

- PLWTP Primary Treatment
 - CEPT (evaluating)
 - DensaDeg (as shown)
- PLWTP Secondary Treatment
 - Fine Screens/BAF
- Sludge Thickeners
 - Gravity Thickeners

Alt .	PLWTP Influ (mg	PLWTP Influent/Effluent (mgd)	
AIL	AADF	PWWF	Sludge Flow (mgd)
1B	78/76	285/279	3.2 - 4.9



sb) Alternative 3 – PLWTP Site Plan (Full Secondary)

- Treatment options for:
 - PLWWTP & CAWRP Primary Treatment
 - CEPT (insufficient land)
 - DensaDeg (as shown)
 - PLWWTP Secondary Treatment
 - Fine Screens/BAF (as shown)
 - CAWRP Secondary/Tertiary Treatment
 - BNR/Secondary Clarifiers/Tertiary Filters (insufficient land)
 - Fine Screens/BNR/MBR (as shown)
 - Sludge Thickeners
 - Gravity Thickeners

Alt	PLWTP Influent PWWF (mgd)	CAWRP Influent AADF (mgd)
3B	327	70



sb) Alternative 3 – PLWTP Site Plan (Full Secondary)

• Treatment options for:

- PLWWTP & CAWRP Primary Treatment
 - CEPT (insufficient land)
 - DensaDeg (as shown)
- PLWWTP Secondary Treatment
 - Fine Screens/BAF (as shown)
- CAWRP Secondary/Tertiary Treatment
 - BNR/Secondary Clarifiers/Tertiary Filters (insufficient land)
 - Fine Screens/BNR/MBR (as shown)
- Sludge Thickeners
 - Gravity Thickeners





S Alternative 3 – Harbor Drive CAPWF Site Plan

- Treatment processes include:
 - Ozone
 - BAC
 - *MF*
 - *RO*
 - UV/AOP
 - Post Treatment

Alt	CAPWF Influent (mgd)
3A, 3B	66
3C, 3D	52



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Conveyance Options

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Solution Conveyance Evaluation Areas



sb Point Loma Conveyance Options



6 Routes analyzed
2 Bay options
2 Navy Channel crossing locations

 New tunnel location vs. existing tunnel location

SD Conveyance Evaluation Criteria

- Health and Safety
- Community Impact
- Environmental Impact
- Property and Easements

- System Complexity
- System Efficiency
- Operational Reliability and Flexibility
- Ability to Implement



Solution Conveyance Alignments for Evaluation



Note: Alignments are not final and will be further evaluated under future Phase 2 planning. Only for purposes of determining potential costs.

Solution Conceptual Phase 2 Schedule Milestones

Milestone	Phase 2
Phase 2 refinement of alternatives	January 2020 – March 2021
City recommends alternative for Phase 2	March 2021 – June 2021
Demonstration testing	February 2020 (planning) - 2026
10% Design	October 2024 – July 2025
Environmental Permitting	July 2025 – February 2030
30% Design	August 2026 – May 2027
Final Design	2027 - 2029
Construction	2029 – 2034 (1)

1. 2035 deadline for Pure Water production

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- Finalize Alternatives Definition
- Prepare Cost Estimates
- Populate and Assess Evaluation Matrix
- Prepare Technical Memorandum





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