

# Agenda Item 9.A – CCSD Long-Term Water Supply Project Alternatives

- Water Master Plan (WMP) Background
- Summarize WMP Recommendations
- Briefly describe alternatives considered
- Explain why recycled water does not substitute the need for a new potable supply
- Review Estimated Costs of Various Alternatives
- Respond to questions

# Water Master Plan Background

- 2000 - Developed phased Water Master Planning
- 2001-2004 Engineering reports completed – Improving fire fighting given top priority
- 2004 – 2008: Constructed most critical fire safety needs (Pine Knolls Tanks & E-W Ranch Pipeline)
- 2008 - WMP Program EIR certified with buildout reduction program as a mitigation measure.

# Supply Alternatives Assessment

- Review all past studies & reports



- Update past reports



- Two-step screening



- Detailed analysis of surviving projects



- Recommendations

# Alternatives Considered

- Seawater Desalination
- Surface Water From Lake Nacimiento
- Whale Rock Exchange
- Additional Santa Rosa Creek Groundwater Wells
- Arroyo De La Cruz Groundwater Wells
- Hard Rock Drilling
- Recycled Water \*
- Water Demand Management
- Basin Management
- Subterranean Dam in San Simeon Basin
- Seasonal Storage for Groundwater Recharge
- Seasonal Storage for Direct Use

\* Recycled water subsequently recommended for non-potable irrigation

# Alternatives Studied in Detail

- **Seawater Desalination**
- **Nacimiento Water Supply**
- **Whale Rock Exchange**
- **Hard Rock Drilling**
- **Recycled Water**
- **Demand Management**
- **San Simeon Dam and Reservoir- Van Gordon Site**
- **Jack Creek Dam and Reservoir**

# Three Water Master Plan Recommendations

- Water Conservation (demand management measures - adopted as part of 2005 Urban Water Management Plan Update)
- Desalination to augment potable supply while providing long-term drought protection
- Recycled water for non-potable irrigation of landscaping

# Water Master Plan Cost Estimates

Major Category	Estimated cost from planning reports in July 2002 dollars	Inflated cost to June 2008 dollars
Water distribution System		
a) Pipelines	\$2,041,000	\$2,529,000
b) Tank Storage	\$3,350,000	\$4,151,000
c) Facility Replacements	\$450,000	\$558,000
Recycled water system	\$5,539,000	\$6,864,000
Desalination facility (600 gpm to 900 gpm sized facility)*	\$9,920,000 to \$12,785,000	\$12,290,000 to \$15,840,000

\* The recommended facility size was 602 acre feet capacity during the dry season, or a production rate of 740 gallons per minute (gpm). The cost for a 602 acre-foot capacity facility is approximately \$14,000,000 in June, 2008 dollars (not including solar costs).

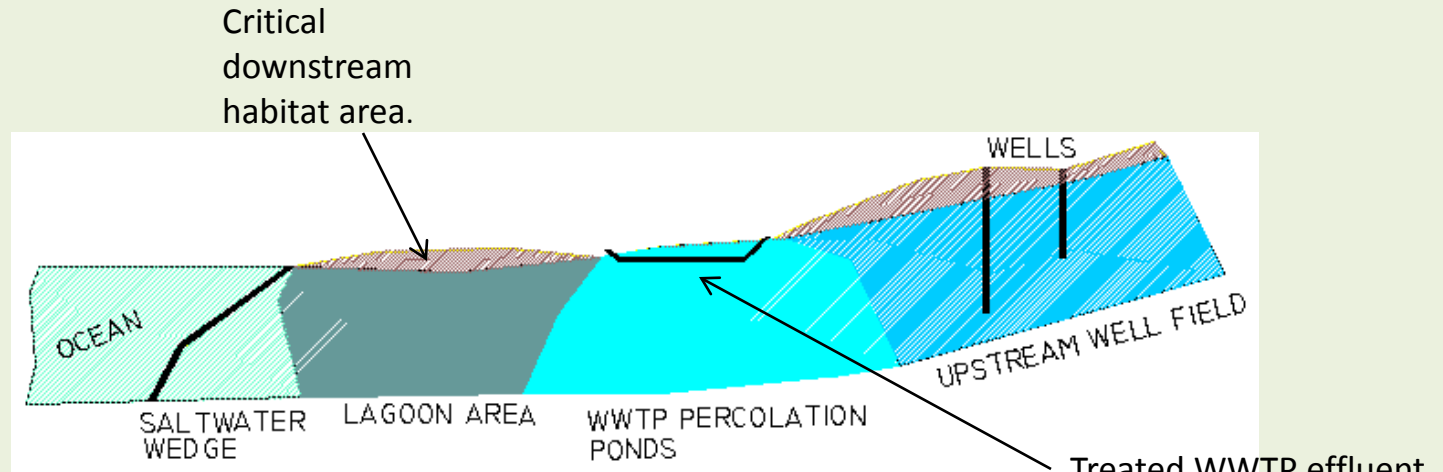
# Recycled Water as an “Alternative”

- Irrigation of landscaped areas using non-potable, treated wastewater effluent (i.e., recycled water [RW])
- Backbone Distribution System  
Developed in master plan RW report
- Both “No-net increase” demands and future additional demands estimated
- No net increase demands simply exchange existing potable use for non-potable RW, without changing the aquifer balance. About 50 acre feet “no-net” RW demands in plan.
- About 50 acre feet in future additional RW demands estimated in plan.



Task 3 Report: Recycled Water Distribution System Master Plan, July 2004, Kennedy/Jenks Consultants

# Recycled Water Diversion Considerations



- A positive hydraulic differential is maintained by operations from the upstream well field & percolation ponds
- In a drought, the upstream well fields can drop, which can necessitate pumping the percolation pond mound area to prevent a reverse gradient.
- The SWRCB diversion permit on the well field requires maintaining flow into the mouth of the San Simeon Lagoon

# Recycled Water Considerations

- Cambria has a relatively low % of outdoor water use; about 17 to 26 % of total production(\*); 136 - 208 AFA
- 50 AFA of recycled water could replace existing potable demands, with another 50 AFA estimated for future demands. (The total 2009 CCSD potable dry season demand was about 400 AFA.)
- RW could lower the size of a potable water system for drought protection, but would not provide the same level of drought protection as a potable water supply alternative. It was therefore given a lower funding priority than a new potable supply alternative.
- Diverting 50 AFA of percolated WWTP effluent towards future RW demands will require further analysis to address potential downstream habitat concerns; while also considering balancing needs between the upstream San Simeon well field and the downstream lagoon area. It's a complex balancing act between water and wastewater operations, which can vary yearly.
- About 184 acre feet in future non-potable ag-water demands downstream from the WWTP effluent percolation pond area also need to be considered in balancing the San Simeon aquifer per a 11/06/2006 settlement agreement with C. Warren.
- The \$6.8 million planning level cost (2008 dollar basis) for the treatment systems and backbone recycled water distribution system .

\* 1998 USGS report, "Hydrogeology, Water Quality, Water Budgets, and Simulated Responses to Hydrologic Changes in Santa Rosa and San Simeon Creek Ground-Water Basins, San Luis Obispo County, California. p.66

•AFA acre-feet per year. Once acre foot is around 326,000 gallons.

# 2008 Present Value Analysis

Alternative	Capital Cost	Fixed O&M	Annual Fixed Cost \$/year	Variable Cost \$/AF	Net Present Worth (30 yr, i=4%)	\$/AF 30 yr PW basis
<b>Nacimientto Water</b>						
Town Creek Route ~ 730 AFY	21,930,640	161,000	1,184,000	580	-30,752,344	-1,404
Franklin Creek Route ~ 739 AFY	23,176,840	161,000	1,242,000	560	-31,790,348	-1,434
<b>Whale Rock Exchange</b>						
602 AFY (See note 1)	19,141,800	55,900		500	-25,313,327	-1,402
700 AFY (2)	4,757,880	65,000	287,000	1,920	-25,868,686	(2) -1,232
1,000 AFY	34,144,640	111,000	1,703,000	2,210	-59,069,723	-1,969
<b>Seawater Desalination (costs assume no outside grant funding plus solar at \$5.50 per watt installed)</b>						
300 gpm (~300AFY)	11,546,280	107,000	584,000	280	-16,311,273	-1,812
600 gpm (~520 AFY)	14,940,800	132,000	706,000	249	-19,810,185	-1,270
740 gpm (~602 AFY)	17,220,180	144,000	795,000	245	-22,260,635	-1,233
900 gpm (~820 AFY)	19,813,400	157,000	895,000	238	-25,005,783	-1,016
<b>Recycled Water</b>						
160 AFY (3)	5,437,400	33,620	287,000	90	-6,955,641	(3) -1,449
<b>San Simeon Dam &amp; Reservoir</b>						
700 AFY	10,728,480	59,000	559,000	100	-12,789,690	-609
<b>Jack Creek Dam &amp; Reservoir</b>						
700 AFY	10,355,240	104,000	587,000	200	-14,235,572	-678

Annual fixed costs = capital cost @ 4% over a 30 yr period + fixed portion of O&M costs

Note 1: 602 Whale Rock Exchange size estimate based on a proportioned 700 AFA local distribution cost + Nacimientto buy in at \$25K/AF.

2. The 700 AFY Whale Rock alternative capital costs relied on a report that had used a water treatment plant cost of \$178,000. This capital cost item may have been under estimated by \$5,000,000, which is not included in the costs shown for 700 AFY. The \$/AF would increase to \$1,470.

3. The 160 AFY RW value includes approx. 60 AFY for less likely RW users due to distances from the main pipeline, (e.g., State Parks campground, Cambria cemetery). If 100 AFY were used, the RW unit price shown would increase to approx. \$2,319/AF

# Local Cost Share Estimates With Approval of Local Credit & WRDA Authorization Increase

Source	Date	Total (2) \$	Federal (75%) (2) \$	Local (25%) \$	Net Local share after \$3,000,000 credit (1), \$
Original Estimate, Army Corps PCA	3/24/2006 + past exp.	13,700,000	10,275,000	3,425,000	
		<u>3,000,000</u>			
		16,700,000	12,525,000	4,175,000	1,175,000
Inflated to an estimated 6/2012 Construction Midpoint, w/o solar	1/29/2009 + past exp.	16,400,000	12,300,000	4,100,000	
		<u>3,000,000</u>			
		19,400,000	14,555,000	4,845,000	1,845,000
Inflated to an estimated 6/2012 Construction Midpoint, w/ solar	1/29/2009 + past exp.	20,100,000	15,075,000	5,025,000	
		<u>3,000,000</u>			
		23,100,000	17,325,000	5,775,000	2,775,000

(1) Local \$3,000,000 credit for past project expenditures has been approved since this slide was originally presented on 10/22/2009.

(2) This illustrates how the \$3,000,000 credit can further reduce the local cost share cost. A future WRDA authorization increase would be required to increase the current \$10.275 million Federal limit. [E.g., \$4,100,000 (local share prior to \$3 million credit) ----> \$1,845,000 with credit ]

# Policy Consideration

Should the CCSD spend \$6.8 million towards a recycled water system that may provide 50 to 100 AFA?

Or,

Should the CCSD spend a local share amount (potentially as low as \$2 to 3 million) towards a desalination, potable water system that can provide full summertime capacity, and still be capable of providing year-round capacity during an extended drought?

Questions?