

Water Reclamation Facility Master Plan



Community Workshop
November 14, 2016

Presentation Overview



- Introduction
- Project Goals
- Project Background
- Recent and Upcoming Schedule
- WRF Program Overview – “Big Picture”
- Draft Facility Master Plan Overview
- Project Financing
- Next Steps
- Q&A

WRF Project Community Goals



- **Produce Tertiary Disinfected Wastewater**
 - *Project to be designed accordingly*
- **Produce Reclaimed Wastewater Cost-Effectively**
 - *Master Reclamation Plan will address this*
 - *Including reclamation as early as possible reduces long-term costs*
- **Allow for Onsite Composting**
 - *Onsite composting is not recommended, regional facility will be more cost-effective*

WRF Project Community Goals



- **Design for Energy Recovery**
 - *Consideration included in FMP*
- **Design to Treat for Contaminants of Emerging Concern**
 - *Included in treatment evaluation criteria*
- **Allow for other Municipal Uses**
 - *Site planning in FMP allows for this possibility*

WRF Project Community Goals



- **Ensure Compatibility with Neighboring Land Uses**
 - *Siting was key to this*
 - *FMP required this in project design; EIR will analyze this*
- **Operational within 5 years**
 - *Project on schedule for beginning operation in 2021*

WRF Project Background



- **Jan 2013:** CCC denial of CDP for WWTP Upgrade
- **Dec 2013:** Site Options Report 17 sites narrowed to 7; Council direction to compare the best sites (in both Morro and Chorro Valley)
- **May 2014:** Report recommends Morro Valley, but Chorro Valley also suitable; Council direction to compare WRF in MV to regional facility at CMC
- **Dec 2014:** Report determines CMC facility not desirable (very high cost; logistical challenges); Council focus remains on Morro Valley
- **April 2015:** CSD decides to pursue separate project

WRF Project Background



- **Feb 2016:** Neighborhood concerns in Morro Valley lead to additional site analysis
- **May 2016:** Chorro Valley site (South Bay Boulevard) determined to be most achievable in 5-year timeframe when balancing cost and other logistical issues
- **June 2016:** City Council selects South Bay Boulevard site for detailed studies, FMP site planning, and EIR analysis

Project Schedule – 2016



Key Milestone	Scheduled Date	Actual Date
City Council Selects Site for Study (South Bay Blvd.)	June 2016	June 2016
Technical Studies (biology, cultural, geotech, survey work)	August 2016	August 2016
EIR Scoping Meeting	August 2016	August 2016
MOU with Property Owner	October 2016	October 2016

Project Schedule – 2016-17



Key Milestone	Scheduled Date	Actual Date
Draft Facility Master Plan	December 2016	November 2016
Draft Master Water Reclamation Plan	March 2017	On Schedule
Draft EIR Released	August 2017	On Schedule
Final EIR Certified	November 2017	On Schedule

Project Schedule – 2018-21



Key Milestone	Scheduled Date	Actual Date
Award Contract for Phase I WRF Improvements	May 2018	On Schedule
Begin Project Design	August 2018	On Schedule
Project Construction Begins	June 2019	On Schedule
Completion of Phase I WRF Improvements	May 2021	On Schedule

WRF Program Overview



What we know now ...

- We can build a WRF at South Bay Blvd site that meets the Community Project Goals
- “Total WRF Project” by June 2021 is possible
 - *Recycled water 2 years ahead of schedule*
- Groundwater injection & extraction appears feasible

WRF Program Overview



What we know now ...

- **Total WRF Project** can provide recycled water for groundwater injection to supplement the City's **water supply** and provide **water independence**
- **Advantages** of Accelerating Recycled Water Component
 - *Potentially eligible for more **grant money***
 - *Long-term **construction cost savings***
 - *Potential **reduction in State Water Use = Cost Savings***

WRF Program Overview

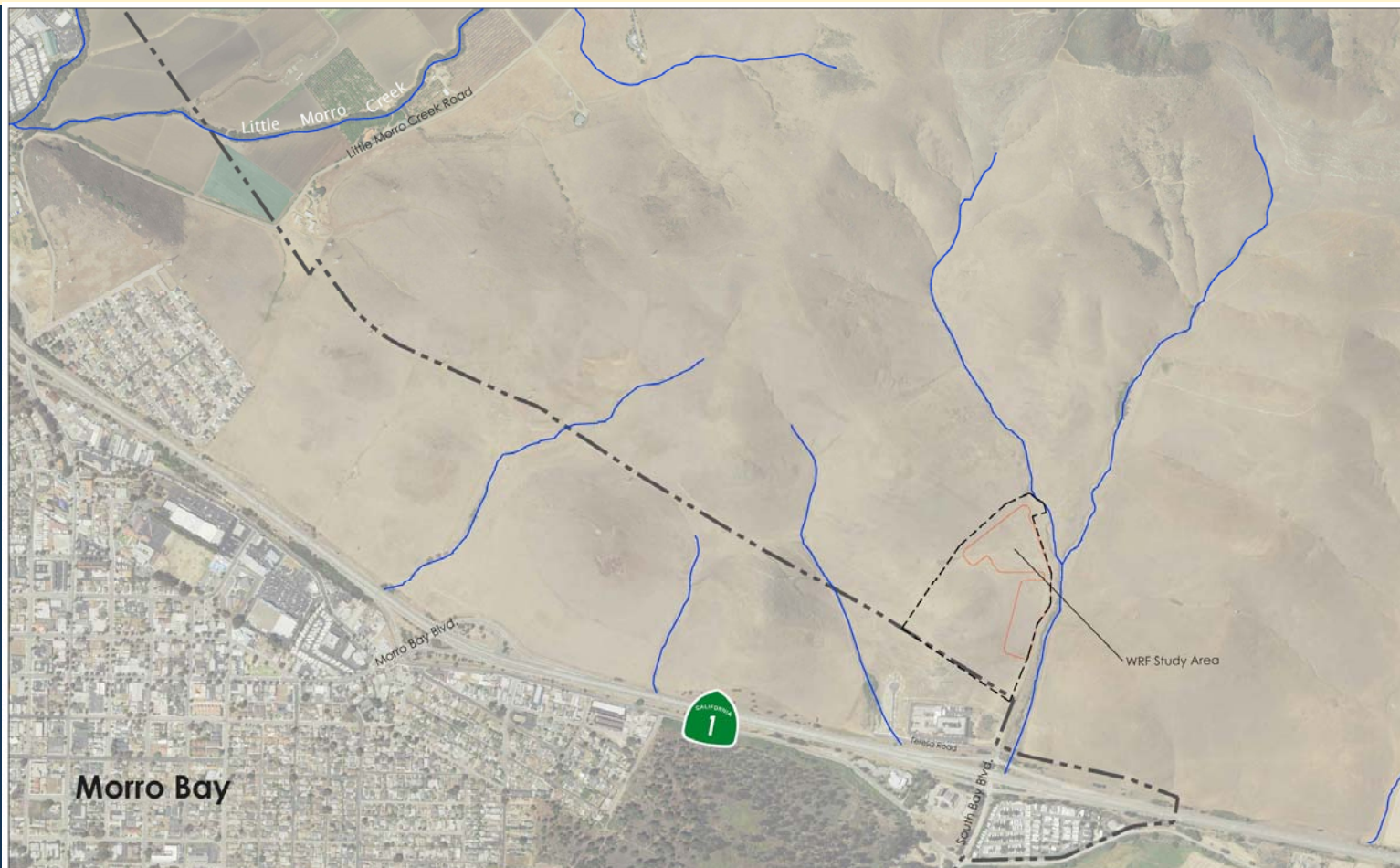


What we know now ...

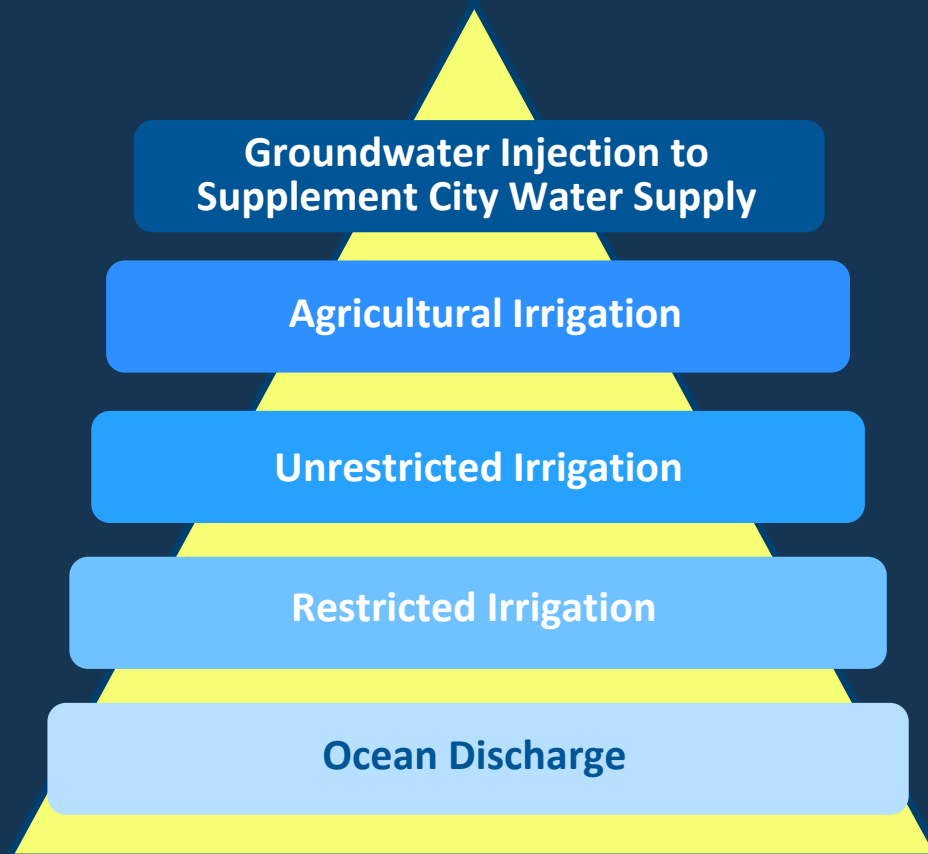
- Estimated Cost without recycled water: \$114M - \$136M*
- Estimated Total Cost with recycled water: \$125M - \$168M*
- *High includes Contingency + “High Cost” Reuse alternative
- Rates: Estimated Total Cost Effect on combined Water/Sewer

Average Monthly Rate Today	Approved Average 19/20 Monthly Rate	Estimated Average Monthly Rate with Total WRF project
\$114.50	\$150.00	\$177 - 224

WRF Site Context



WRF Provides City Ability to Make “Highest and Best Use” of New Water Supply Resource



*To Be Determined in
Master Water
Reclamation Plan*

Evaluation Criteria Align With Community Goals



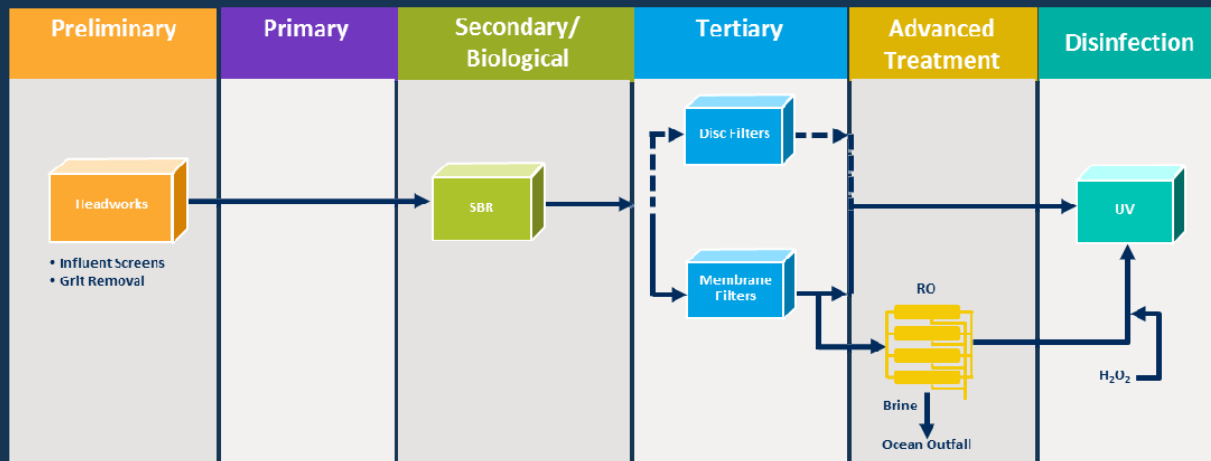
Comparative Capital Cost
Comparative Operating Cost
Odor Mitigation
Technical Complexity
Reliability
Staff Requirements
Scalability
Product Water Quality
Flexibility for Title 22 Redundancy
Visual Impact/Footprint

List of Treatment Technologies Considered Was Inclusive

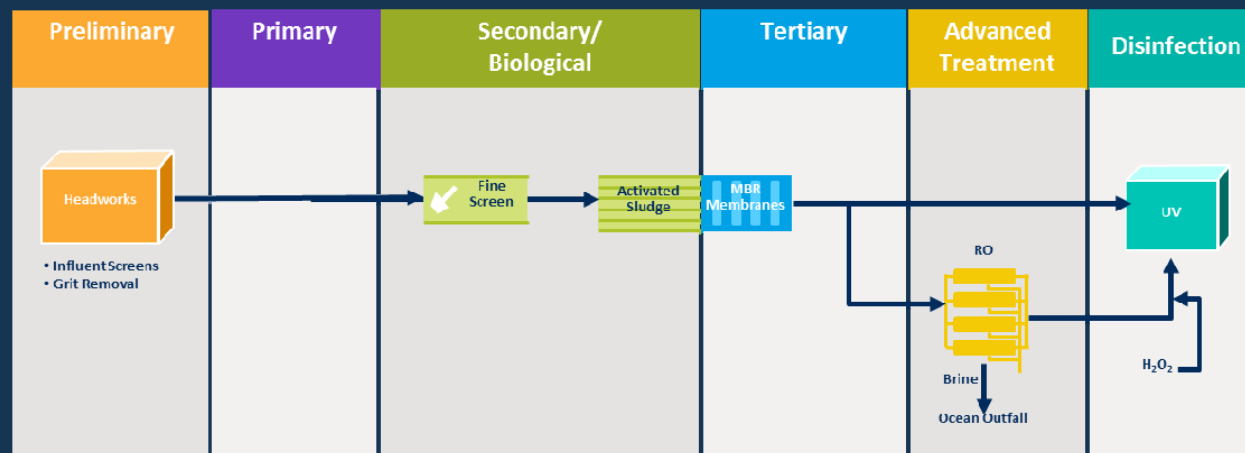
TREATMENT STEP	UNIT PROCESSES
Preliminary Treatment	<ul style="list-style-type: none"> ■ Influent Screens <ul style="list-style-type: none"> ● Shaftless Spiral Screen ● Mechanically-Cleaned Bar Screen ■ Grit Removal <ul style="list-style-type: none"> ● Horizontal Flow Grit Chambers ● Aerated Grit Chambers ● Vortex Grit Chambers
Primary Treatment	<ul style="list-style-type: none"> ■ Primary Clarifiers <ul style="list-style-type: none"> ● Rectangular Clarifiers ● Circular Clarifiers
Biological Treatment	<ul style="list-style-type: none"> ■ Suspended Growth Biological Treatment <ul style="list-style-type: none"> ● Activated Sludge (AS) ● Sequencing Batch Reactor (SBR) ● Oxidation Ditch ● Aerated Lagoons/ Pond Systems ■ Fixed Film Biological Treatment <ul style="list-style-type: none"> ● Trickling Filters (TFs) and Rotating Biological Contactors (RBCs) ● Moving Bed Bioreactors (MBBR) ● Biological Aerated Filter (BAF) ■ Hybrid Biological Treatment <ul style="list-style-type: none"> ● Integrated Fixed-Film Activated Sludge (IFAS) ■ Membrane Bioreactor (MBR)
Tertiary Treatment	<ul style="list-style-type: none"> ■ Disc Filters ■ Media Filters
Disinfection	<ul style="list-style-type: none"> ■ Chlorine ■ Ozone ■ Ultraviolet Light (UV)

- Achieve Highest and Best Use of Water
- Proven
- Cost-effective
- Achieve to regulatory compliance
- Appropriate to plants of this size and scale

Two Treatment Strategy Alternatives Provide for “Highest and Best” End Uses

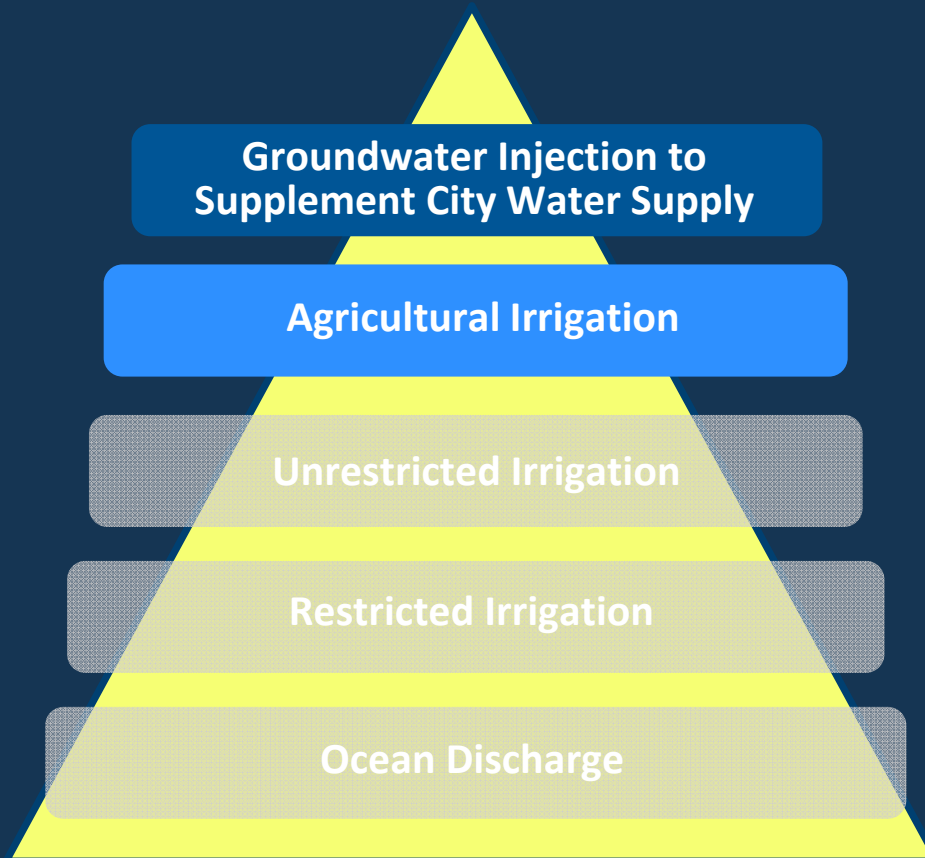


**Conventional Train:
Sequencing Batch
Reactor (SBR)**



**Combined
Secondary/Tertiary
Train:
Membrane
Bioreactor (MBR)**

Advanced Treatment Required to Achieve Community Goals for Highest and Best Uses of Product Water



- Advanced treatment is used to remove dissolved salts, viruses, TOCs, organic and inorganic chemicals, and emerging contaminants
- Title 22 requires MF/RO + AOP for IPR
- Many agricultural irrigation uses require salt removal (MF/RO)

New Pipelines and Pump Stations Needed to Connect WRF to City System



- Alignment Generally Follows Quintana Road
- Lower Cost
- Less Environmental Impact
- More Energy Efficient



New Pipelines and Pump Stations Needed to Connect WRF to City System



- Location Near Existing WWTP Most Efficient and Least Expensive
- Floodplain Issues to be Mitigated
- CCC Supportive of Location

Solid Material from Treatment Process Will Be Composted at a Regional Facility



Investigated opportunities to reduce costs for project by:

- Create marketable products processing materials on-site
- Use biosolids to generate energy

- City's current practice is most cost-effective
- Processing on-site or providing facilities to generate energy not cost-effective
- Liberty Composting in Kern County provides beneficial use of processed materials

Preliminary Architectural Concept Developed for Consistency with Highway 1 Corridor



- Farm or Dairy style buildings
- Color palette similar to buildings along Highway 1 between CMC and Morro Bay
- Landscaping screening envisioned near entrance

WRF Site Overview



WRF Site



WRF Site with Consolidated Maintenance Facilities



WRF Looking South

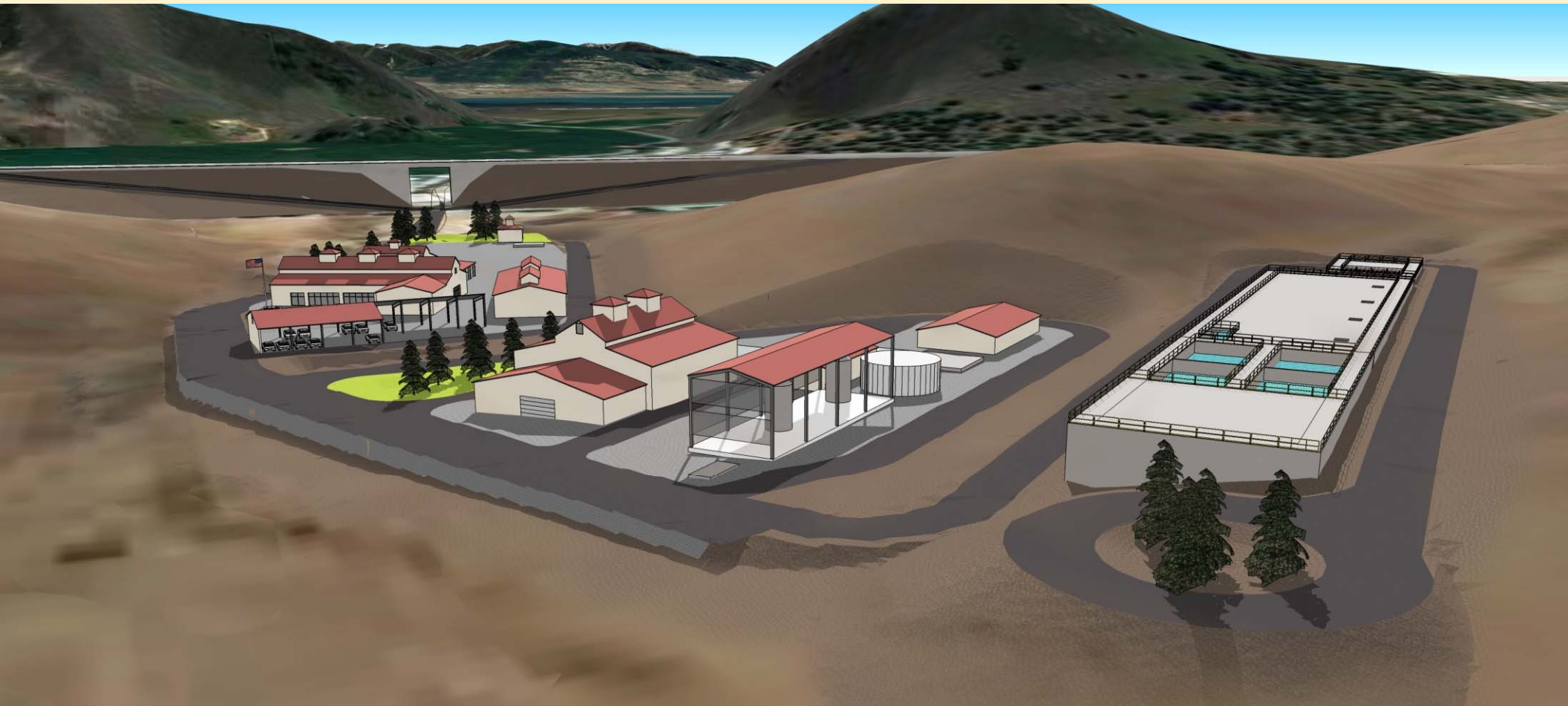


WRF with Consolidated Maintenance Facilities Looking South

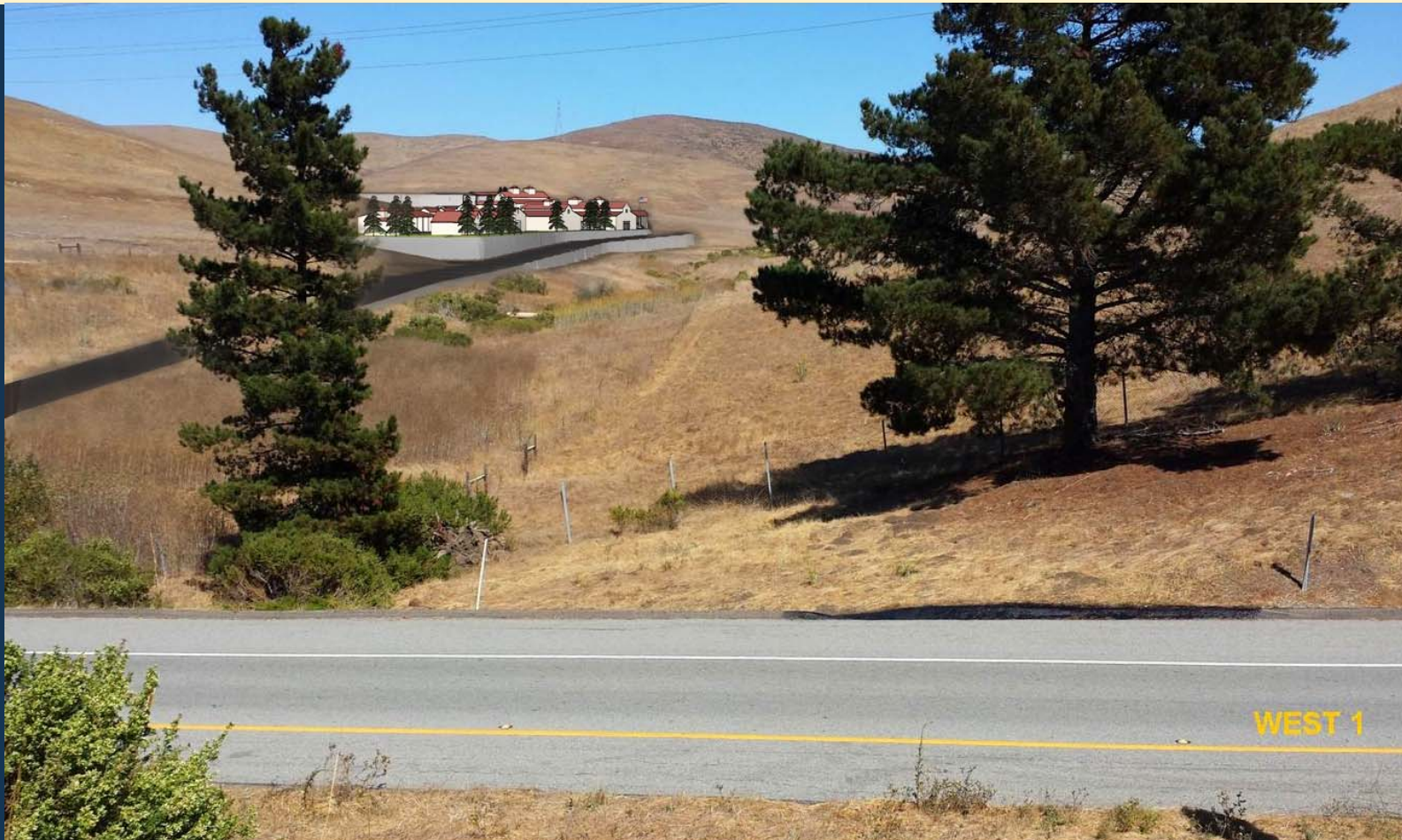


WRF Looking Southeast

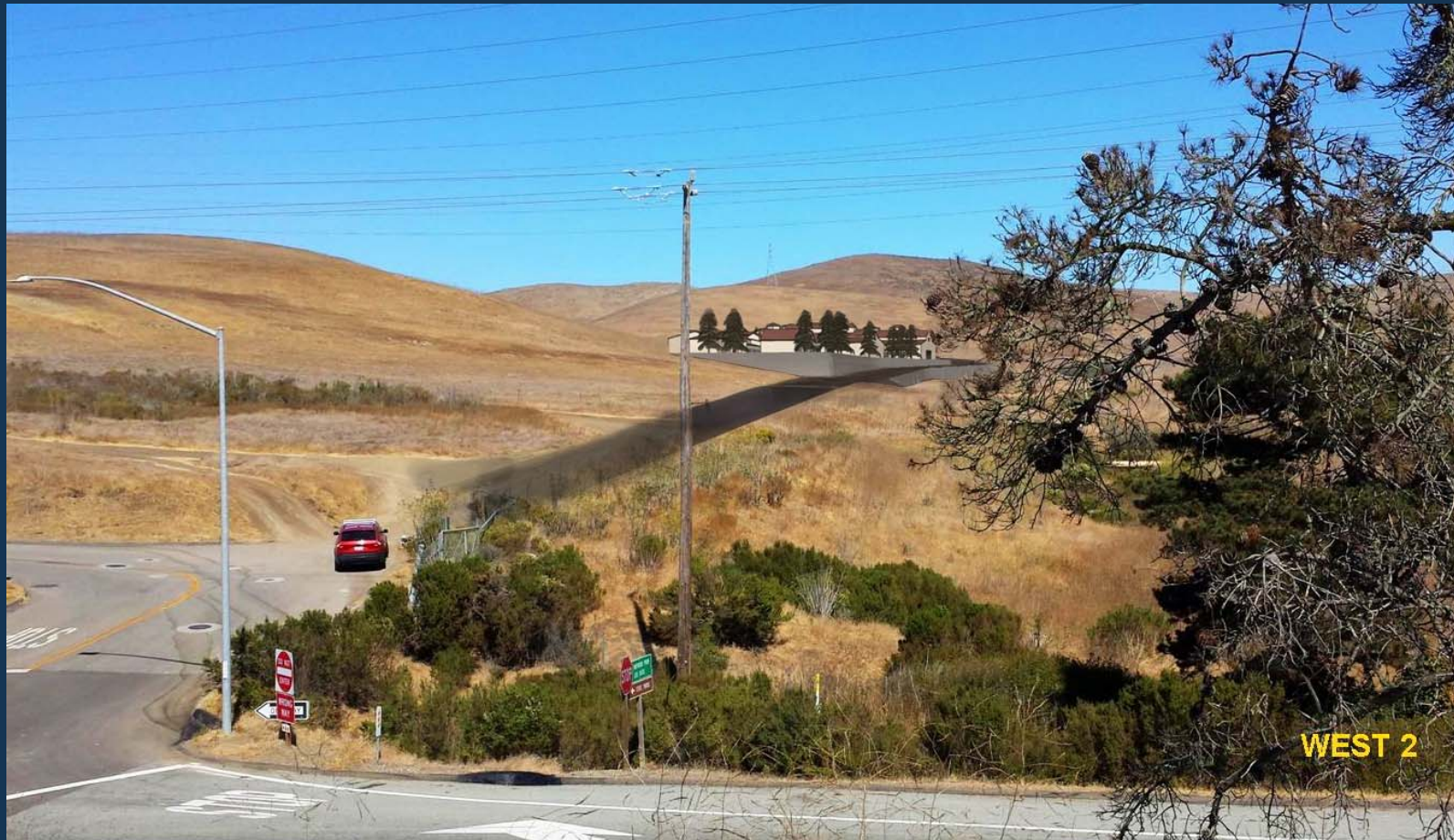
CITY OF MORRO BAY
**WATER RECLAMATION
FACILITY PROJECT**



View From Highway 1 Heading West East of South Bay Boulevard



View From Highway 1 Heading West Just East of South Bay Boulevard



View From Highway 1 Heading West Just West of South Bay Boulevard



View From Highway 1 Heading West West of South Bay Boulevard



EAST 1

Why So Much Higher than 2013 Costs?

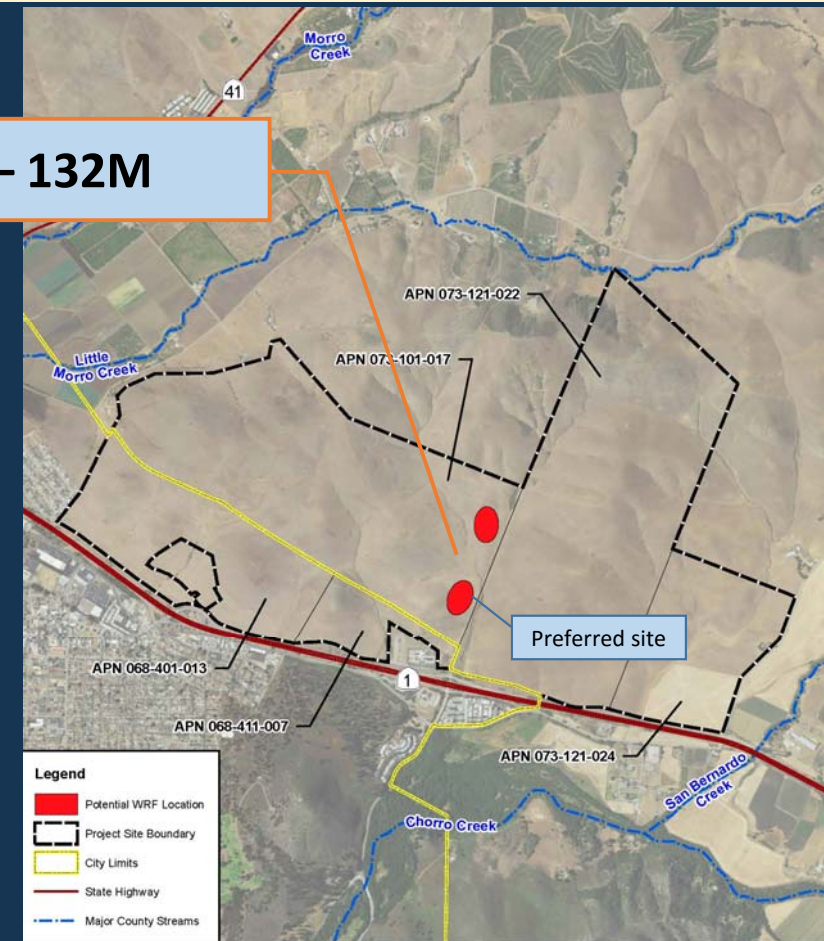


- \$100 M Estimate was mid-range for comparison of sites ONLY
- South Bay Boulevard is 10-15% higher than Morro Valley sites
- 3 Yrs of cost escalation was 8-9%
- Highest and best water recycling opportunities required higher-end treatment processes
- Ancillary facilities and work not known or included (plant decommissioning, recycled water delivery system, etc.)

May 2016 Site Analysis

- Goal was comparison of sites only
- Partial WRF Costs at South Bay Blvd site
 - Midpoint of cost range (based on 2014 assumptions) = \$107M
- 2013 siting studies assumed wide range of treatment technologies
- No regional recycled water system
- No decommissioning of existing site

\$84M – 132M



New Information from FMP and Studies



SBB site is preferred & has less delays

Standalone EQ storage is needed for advanced treatment

WWTP decommissioning costs are higher than previous estimates

SBR/MBR, membrane filtration, and UV disinfection are essential

Groundwater aquifer storage is available in the Morro Valley

Possible to offset State Water deliveries with groundwater injection

New Opportunities

Water independence is possible

All water demand may be met through reuse and groundwater

Current and future costs of State Water could be eliminated

Initial water/wastewater costs will be higher, but less vulnerable to escalation

WRF will be well positioned to meet the Project Goals

Highest & best use

Lower water rates
in future

- Reclaimed Water
- Best available treatment for CECs
- Ph 1 + Ph 2 built in 5 yrs

WRF Cost to Customers



**“Hard” Costs
(Construction, Demolition)**

**Operation & Maintenance
(Power, Staffing, and
Chemicals)**

**“Soft”
Costs**

How Do We Predict Rate Impacts?



- What are the Total Project Costs (“Hard”, “Soft”, and Operation & Maintenance (ongoing))?
- Can the WRF Project reduce other customer utility costs?
 - Can we buy less imported water and what would that save?
- What will be the financing cost (interest rates & terms)?
- What grants can we pursue?
- Could project design include solar power to reduce ongoing costs?

WRF Project Contingency



- “Contingency” – Not a “soft cost”, but not used if not needed
 - “What we don’t know we don’t know”
 - Typically reduced as project moves forward

WRF Project Components



Phase 1 WRF

- Lift Station
- WRF for tertiary disinfected
- Pipeline to ocean outfall

Phase 2 onsite

- Advanced treatment
- Recycled water storage
- Recycled water pump station

Phase 2 offsite

- Recycled water distribution system options:
 - Groundwater Injection
 - Ag Exchange
 - Urban Irrigation

Phase 1 WRF Capital Cost Opinion



"Hard" and "Soft" Costs	2016 US \$MM
Phase I WRF Construction Cost Subtotal (FMP w/o contingency)	97.1
Procurement (4%)	4.3
Project Administration and CM (12%)	10.6
Permitting, Monitoring, and Mitigation (1%)	0.9
Existing WWTP Demolition	3.3
Property Acquisition	0.3
Phase 1 WRF Capital Cost Subtotal	114
Construction Contingency (25% of construction subtotal)	22
Phase 1 WRF Capital Cost Opinion Total	136

Note: Phase 1 WRF costs based on Draft Facility Master Plan (Nov 2016)

WRF Project Capital Cost Opinion



"Hard" and "Soft" Costs	Capital Cost Opinion (2016 US \$MM)
Phase 1 WRF	114
Phase 2 Recycled Water Facilities	11 – 26
Total WRF Capital Cost Subtotal	126 – 140
Construction Contingency	25 – 28
Total WRF Capital Cost Total	150 – 168

Note: Phase 1 WRF costs based on Draft Facility Master Plan (Nov 2016). Phase 2 costs are preliminary and to be further developed in the Master Reclamation Plan (Draft March 2017)

WRF Project O&M Costs



	Annual O&M Cost Opinion (2016 US \$MM)
Phase 1 WRF	\$1.3 – 1.6
Phase 2 Recycled Water Facilities	\$0.5 – 0.8
Total WRF	\$1.8 – 2.4

Note: Phase 1 WRF O&M costs are based on the Draft Facility Master Plan (Nov 2016). Phase 2 costs are preliminary and to be further developed in the City's Master Reclamation Plan (Draft March 2017)

Water Supply Costs



- Indirect potable reuse could offset State Water Costs
- State Water Project Costs
 - \$2,000 per acre foot (16/17)
 - \$2,200 - \$2,400 per AF (est. future)
- Morro Valley Groundwater costs
 - \$1,000 per acre foot
 - 580 AFY allocation
- Seawater desalination costs
 - \$1,600 per acre foot

Annual Cost of State Water



	Estimated Annual Cost
State Water at Current Rate (\$2,000/AF)	\$2.4M
State Water at Estimated Future Rate (\$2,200/AF)	\$2.64M

Note: Annual cost based on 1200 acre-feet (AF)

How Much Could We Reduce Costs?



	Potential Savings
30 Year SRF Loan Payment (2% vs. 2.5% Financing)	\$1.6M/yr
Savings without State Water Project costs	\$1.5M/yr
Grant Funding	10 – 20% of capital costs
Solar Power Purchase Agreement	Up to 1/3 of power costs

What Would be Impact on Utility Rates



	Current Water/Sewer Rate (FY 16/17)	Approved Rate (FY 19/20)	With Total WRF Project
Estimated Average Monthly Rate	\$114.50	\$150	\$177 – 224
Future Rate Increase			\$27 - 74

Average sewer rate for single family residential and water rate for 5 units/month

Next Steps



- Provide Input on Draft FMP – **Now until December 2016**
- WRFCAC Meeting - **December 6**
- City Council Meeting – **December 13**
- Draft Master Reclamation Plan – **March 2017**
- Rate Study – **Fall 2017**
- Draft EIR – **August 2017**
- Final EIR – **November 2017**

Q&A