Attachment

SOx RECLAIM

Refinery Committee Meeting
August 18, 2010

BACKGROUND

Why Reduce SOx Emissions?

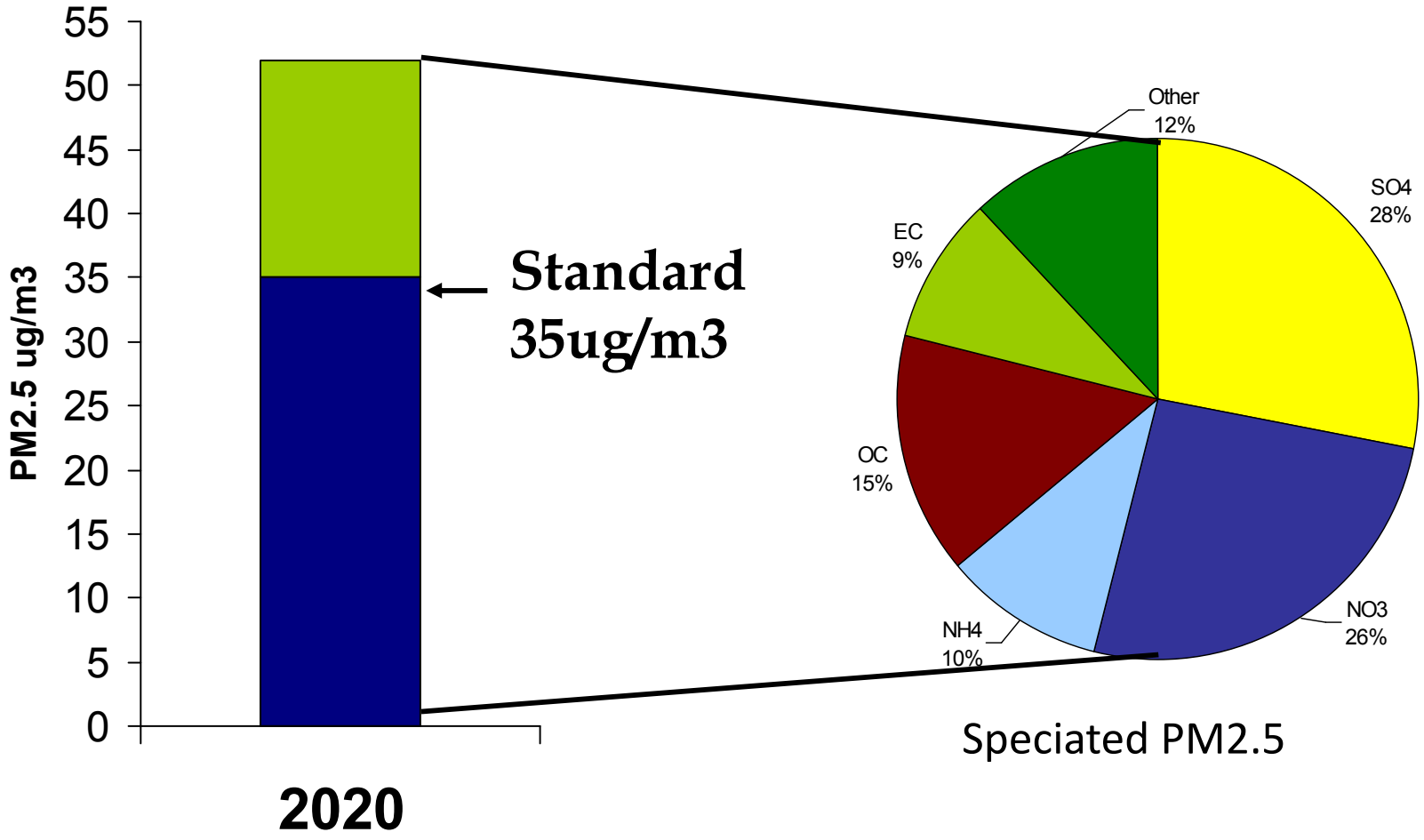
Legal Mandates

- Periodic BARCT update (H&S §40440)
- Command & control equivalency (H&S §39616 (c)(1))
- SIP commitment (2007 AQMP/SIP CMB-02)

Need for Reductions Beyond 2007 AQMP

- 24-hour PM2.5 standard by 2020
- Proposed annual and 24-hr PM2.5 standards
  - 24-hr standard: 30-35 ug/m3
  - Annual standard: 11-13 ug/m3

Predicted Maximum 24-hour PM 2.5 Concentration (2020)

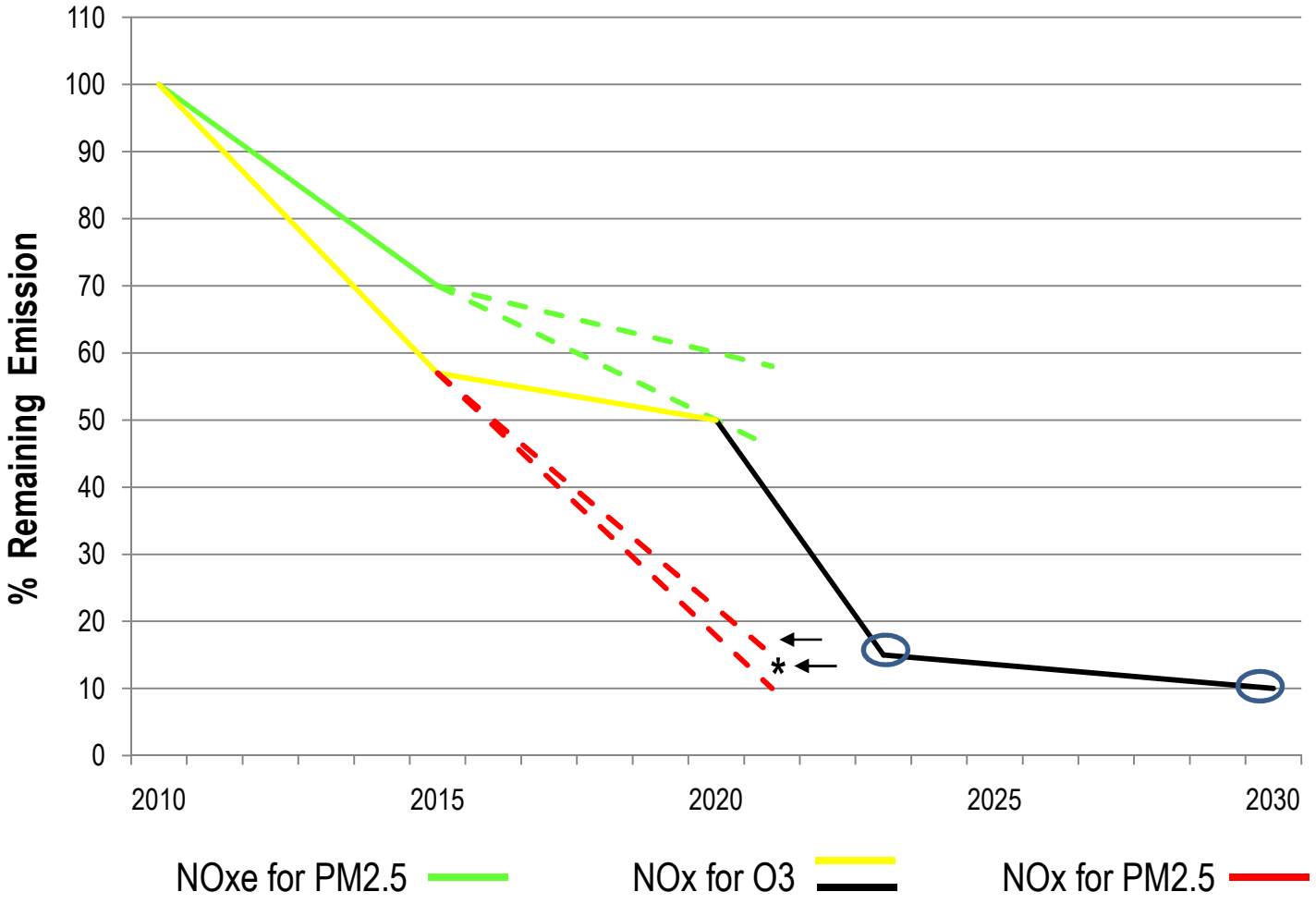


Source, 2007 AQMP

PM2.5 Preliminary Analysis

- Reduction effectiveness among PM2.5 and its precursors:
  - NOx:SOx:PM2.5:VOC = 1:15:10:0.4
- Basin wide average PM2.5 air quality improvement
  - 150 tons/day NOxe reductions for every 1 ug/m3
- Annual standard under consideration 11-13 ug/m3
  - 300 to 600 tons/day NOxe reductions

Preliminary Analysis of Emission Levels for Pending O3 & PM2.5 Standards



*Additional SOx and PM2.5 reductions still needed

Staff Proposal

- BARCT for 6 source categories (5ppm – 10ppm)
  - FCCUs
  - Sulfur Recovery/Tail Gas Units (SRU/TGU)
  - Sulfuric Acid Plants
  - Coke Calciner
  - Glass Melting Furnaces
  - Cement Kilns
- Investment (present value, 25 years)= $630 – $750 million
- Weighted Average Cost Effectiveness= $15k-19k/ton SOx
- CEQA Alternatives: 3 tpd – 6.14 tpd RTC Reductions (25% – 55% shave)

Staff Proposal (continued)

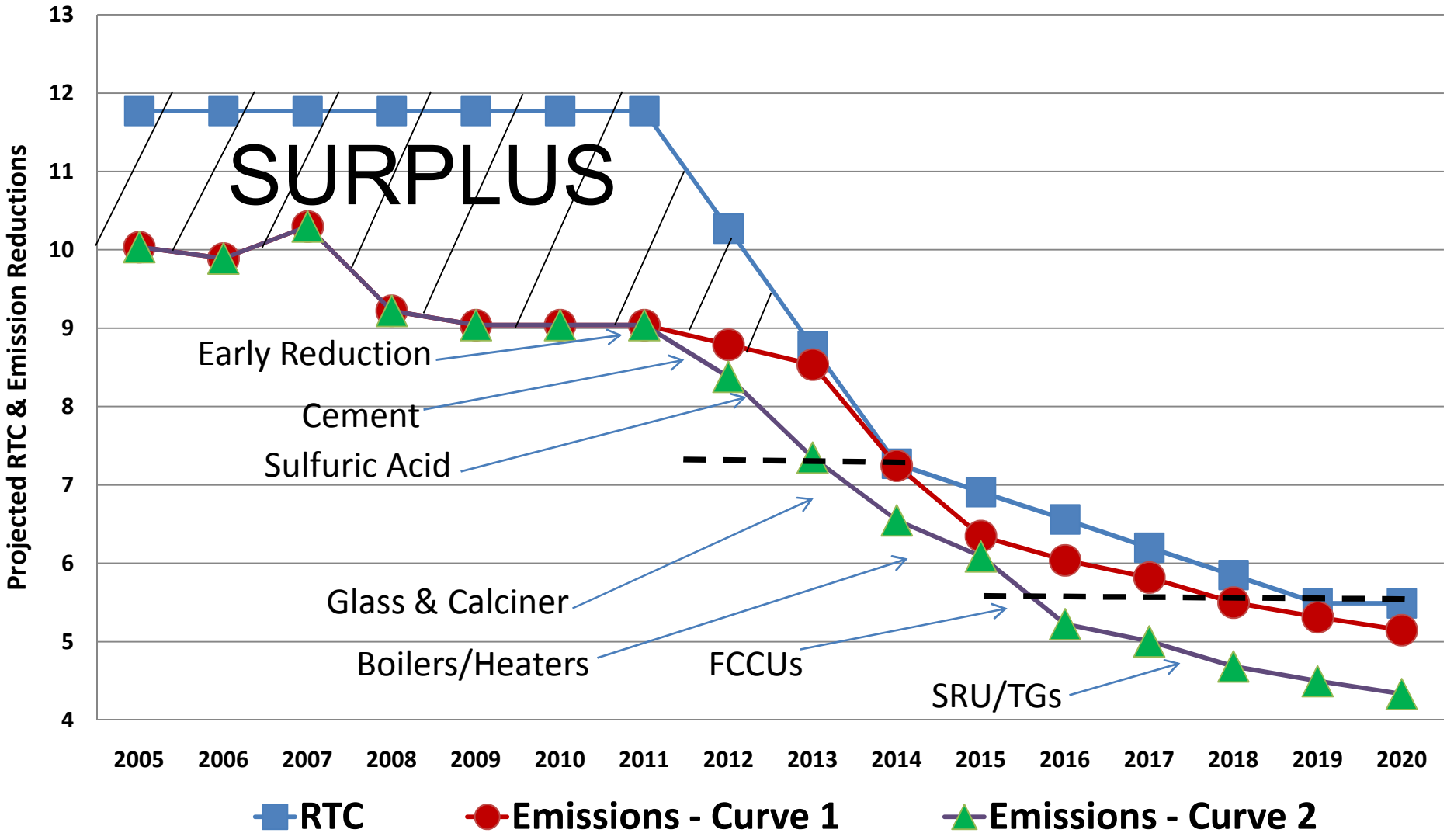
- 55% shave (RTC Reductions 6.14 tpd) by 2019 in two phases
  - Original staff proposal: 67.5% shave by 2017
  - 6.14 tpd RTC Reductions = 5.35 tpd actual emission reductions
- Two-phase reduction w/ annual reduction targets
  - 41% by 2014 (4.5 tpd)
  - 55% by 2019 (6.14 tpd)
- Limited exemption from shave for certain small emitters
- Provisions for market viability
  - Set-aside RTC amounts similar to NOx RECLAIM
  - Board review if SOx RTC price greater than $50k per ton SOx

Staff Proposal (continued)
% Shave* & RTC Reductions

	2014		2017		2019	
	Shave	Reductions	Shave	Reductions	Shave	Reductions
Original Proposal	41%**	4.5 tpd	67.5%	7.5	------	------
Current Proposal	41%	4.5 tpd			55%	6.1

* % shave is calculated by dividing RTC Reductions by RTC Holdings of major emitters and investors (11.09 tpd)
** Current margin (unused RTCs) between RTC Holdings and Actual Emissions: ~2.55 tpd (22% of RTC holdings)

Staff Proposal



Emissions - Curve 1: BARCT for staff proposal. Curve 2: Additional opportunity for reductions with slower rate of growth than Curve 1

Is SOx RECLAIM Shave Overdue?

- Significant overallocation since program inception
- First BARCT review since 1994
- 1994 BARCT review included only two source categories by 2000
- More reduction options than needed

Command and Control Equivalency & SOx Shave Methodology

Staff's Approach

- Not to penalize or create windfalls due to trades since the inception of the program
- Afford the same growth opportunities as C&C
- Consistent with NOx RECLAIM

AQMP Methodology

- Use 1997 audited emissions at the start of the program
- Apply 2007 AQMP growth assumptions by industry between 1997- 2019
- Full implementation of Tier 1 controls by 2000
- Full implementation of proposed BARCT by 2019
- 10% compliance margin

Who Does the Shave Apply to?

- SOx RECLAIM Universe = 32 Facilities
- Staff Proposes to Apply Shave to:
  - 11 largest emitters (93% of emissions)
  - Private investors/brokers
  - Exclude 21 facilities
    - small emitters
    - no applicable BARCT
    - holdings less than initial allocation minus recently acquired credits (3 facilities)
    - 4 facilities with no holdings

Work Plan

Work Plan Elements	Completed	Partially Completed	Conclusions
Stranded Investments (ESPs)	✓		•Equipment costs w/in estimated range •Installation costs varied significantly •Bottlenecks: Preference toward, same vendor/contractor and compressed construction schedule due to litigation •No need to remove ESPs
Consultant Analyses	✓		•Hired 2nd consultant •Higher cost estimates than 1st set of consultants but w/in uncertainty range of analysis •Cost-effectiveness ~20% higher

Work Plan (continued)

Work Plan Elements	Completed	Partially Completed	Conclusions
Water Demand & Wastewater Discharge	✓		•Water demand can be met •Water demand significant •Mitigation: Use recycled water if available •Wastewater treatment capacity adequate
Market Viability		✓	•Staff analysis completed and being discussed with WSPA
CEQA	✓		•Program EA •Water and GHG emission significant •Mitigation: Use recycled water, if available
Permitting		✓	•Wil initiate meetings between WSPA and E & C

Water & Wastewater

Water Demand

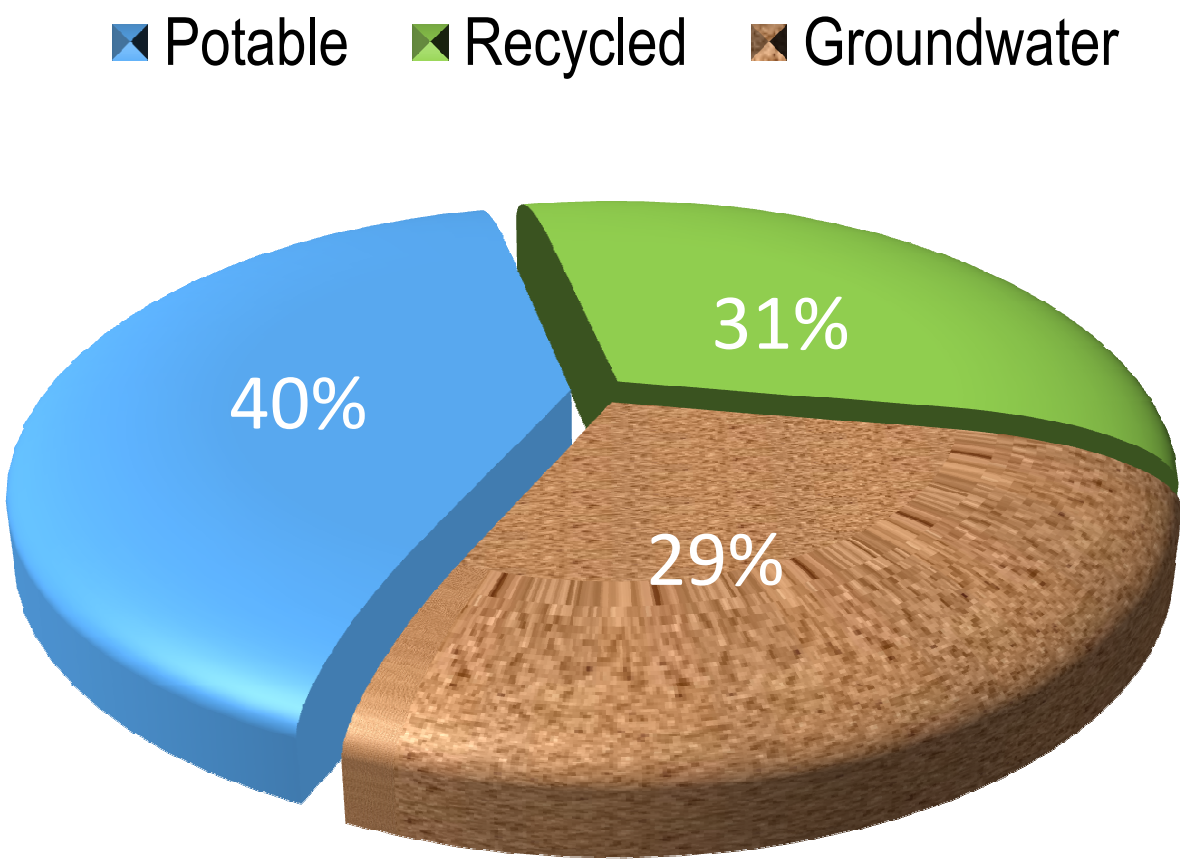
Facility	Baseline (Million Gals/Day)	Increase (Million Gals/Day)	% Increase
Refinery 1	2	0.04	2%
Refinery 2	9	0.2	2%
Refinery 3	10	0.2	2%
Refinery 4	6	0.06	1%
Refinery 5*	9	0.02	<1%
Refinery 6	12	0.2	2%
Sulf. Acid	0.7	0.02	3%
Coke	1	0.04	4%
Glass	0.1	0.06	48%
Cement	3	0.1	3%
Total	53 Million Gals/Day 163 Acre-Ft/Day 59 Thousand Acre-Ft/Yr	1 Million Gals/Day 3 Acre-Ft/Day 1 Thousand Acre-Ft/Yr	2%

Water Demand

- South Coast Regional Water Demand = 6.37 Million Acre-Ft Per Year
  - Project Increase = 1,000 Acre-Ft Per Year = 0.02% of South Coast Water Demand
  - 80% Below CEQA Threshold of 5 Million Gals Per Day
- Water Suppliers Can Meet Demand for Next 20 Years (2005 Urban Water Management Plans)
- Potable Water Increase = 0.3 Acre-Ft per Day
  - Negligible Effect on Governor's Goal of 20% Potable Reduction by 2020
- Recycled Water & Well Water Available

Water Demand

Current Water Demand

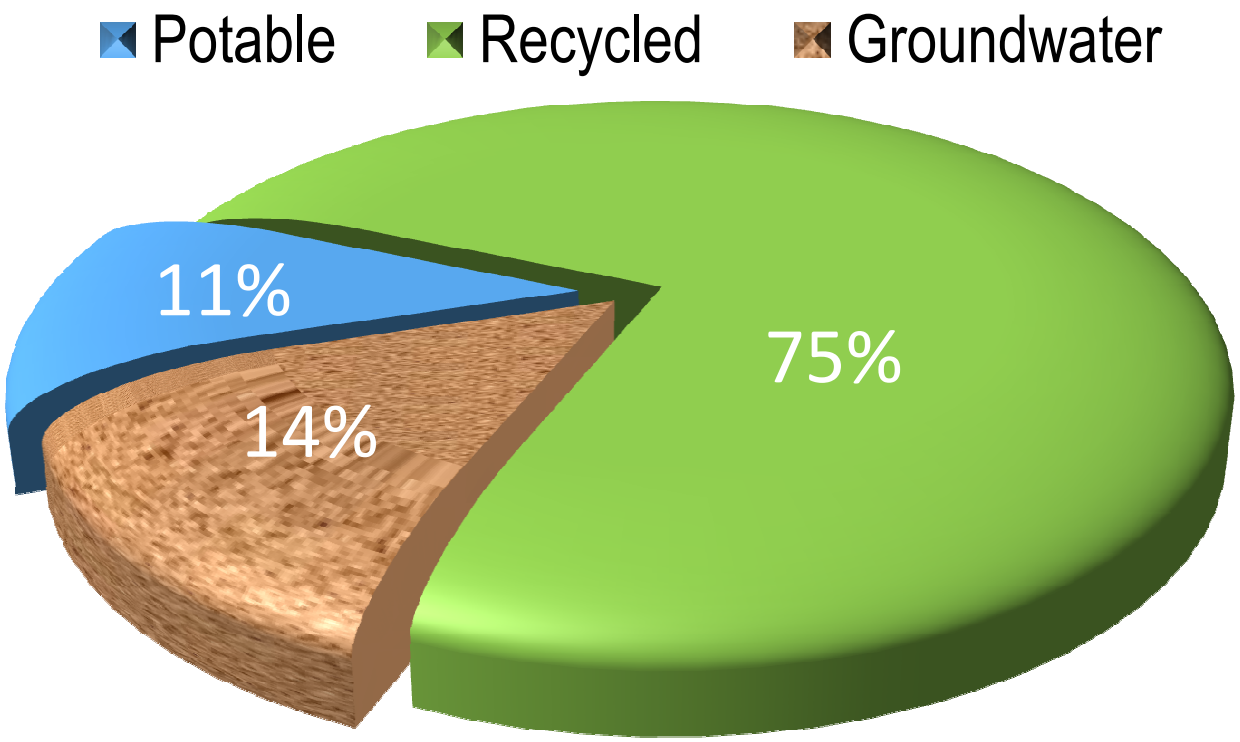


Total Baseline Water Use in CEQA = 58 million gallons per day*

* Reflects potential demand. Actual usage is 53 million gallons per day.

Water Demand

Future Water Demand With Wet Gas Scrubbers (Option 1)
If Future Supplies of Recycled Water ARE Available

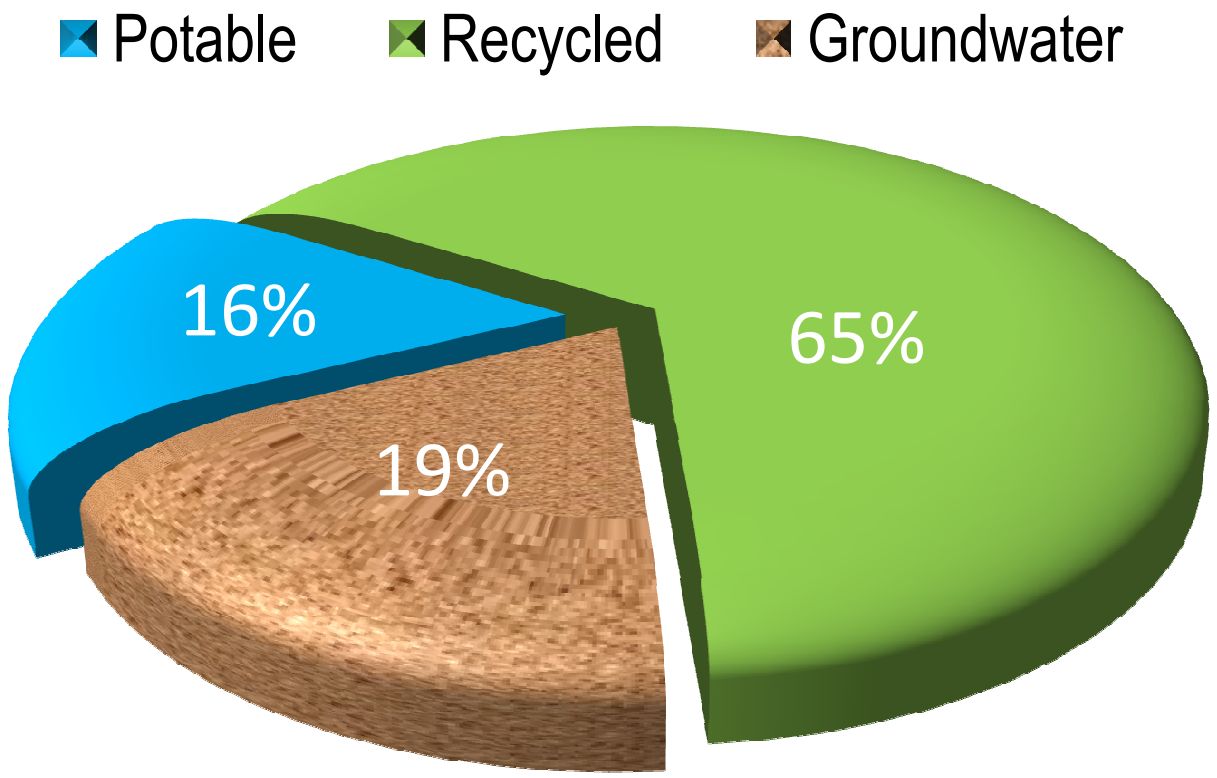


Increase in Water Use = 883,368 gallons per day

Potable water projected increase is below CEQA Significance Threshold

Water Demand

Future Water Demand With SOx Reducing Catalysts (Option 2)
If Future Supplies of Recycled Water ARE Available



Increase in Water Use = 642,272 gallons per day

Potable water projected increase is below CEQA Significance Threshold

Water Demand

- CEQA Significance Threshold = 5 million gallons per day
- Exercise Abundance of Caution – Consider New CEQA Significance Threshold
  - Potable water usage by a 500 dwelling unit project
    - 0.134 million – 0.223 million gallons per day
- The projected increase in potable water usage in Option 1 triggers significance if future recycled water supplies are not available
- Mitigation to reduce potable water demand:
  - Use recycled water, if available (Harbor Refineries Recycled Water Pipeline Project)

Wastewater

- Small increase in wastewater discharge. No need to revise discharge permits.

Facility	Discharge Limit (GPM)	Current Discharge (GPM)	Increase (GPM)	% Increase
Refinery 1	764 - 1,000	903	15	2%
Refinery 2	7,500 - 12,200	3,000	40	<1%
Refinery 3	6,000 – 16,000	5,000	36	<1%
Refinery 4	10,000	2,200	22	<1%
Refinery 5*	5,000	1,400 – 2,000	14	<1%
Refinery 6	5,200 – 8,000	4,000	51	1%
Sulf. Acid	425	175 - 387	8	2%
Coke	125	65	11	9%
Glass	Not Reported	250	9	----
Cement	No Limit	Evaporation Pond	Small	Small
Total	35,000 – 53,000	17,000 – 18,000	206	<1%

Next Steps

- Continue to Meet with Stakeholders
- Draft CEQA Released Today
- Revised Draft Staff Report & Socioeconomic Analysis - In Progress
- Public Hearing – November 2010