SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Program Environmental Assessment for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM)

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PREFACE

This document constitutes the Final Program Environmental Assessment (PEA) for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM). An Initial Study was released for a 30-day public review and comment period from June 19, 2009 to July 21, 2009 which identified the environmental topics of aesthetics, air quality, energy, hydrology and water quality, hazards and hazardous materials, and transportation and traffic, as potentially being significantly adversely affected by the project. Three comment letters were received from the public regarding the preliminary analysis in the Initial Study. These comment letters and responses to individual comments are included in Appendix D of this document.

The Draft PEA was released for a 45-day public review and comment period from August 18, 2010 to October 1, 2010 which identified the topics of air quality and hydrology (water demand) as exceeding the SCAQMD's significance thresholds associated with implementing the proposed project. Three comment letters were received from the public regarding the analysis in the Draft PEA. These comment letters and responses to individual comments are included in Appendix E of this document. No comment letters were received that identified other potentially significant adverse impacts from the proposed project.

In addition, subsequent to release of the Draft PEA, minor modifications were made to the proposed project. To facilitate identification, modifications to the document are included as <u>underlined text</u> and text removed from the document is indicated by ~~strikethrough~~. Staff has reviewed the modifications to the proposed project and concluded that none of the modifications alter any conclusions reached in the Draft PEA, nor provide new information of substantial importance relative to the draft document. As a result, these minor revisions do not require recirculation of the document pursuant to CEQA Guidelines §15088.5. Therefore, this document now constitutes the Final PEA for the proposed project.

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LIST OF ACRONYMS & TERMS

AAM = annual arithmetic mean
AB = Assembly Bill
AFV = alternative fuel vehicle
AHM = acutely hazardous material
Al2O3 = aluminum oxide
ANPR = Advance Notice of Proposed Rulemaking
API = American Petroleum Institute
AQMP = Air Quality Management Plan
ATCM = Airborne Toxic Control Measure
BACM = Best Available Control Measure
BACT = Best Available Control Technology
BARCT = Best Available Retrofit Control Technology
Basin = South Coast Air Basin
BAU = business-as-usual
BLEVE = boiling liquid expanding vapor explosion
BMP = best management practice
BNSF = Burlington Northern Santa Fe
BOD = bio-chemical oxygen demand
BP = British Petroleum
bpd = barrels per day
BPTCP = Bay Protection and Toxic Cleanup Plan
CAA = Clean Air Act
CAFE = Corporate Average Fuel Economy
CalARP = California Accidental Release Prevention Program
CalEPA = California Environmental Protection Agency
CalOSHA = California Occupational Safety and Health Administration
Caltrans = California Department of Transportation
CaOH = calcium hydroxide
CAPCOA = California Air Pollution Control Officers Association
CARB = California Air Resources Board
CaSO3 = calcium sulfite
CaSO4 = calcium sulfate
CCAR = California Climate Action Registry
CCE = Chicago Climate Exchange
CCR = California Code of Regulations
CEC = California Energy Commission
CEMS = continuous emissions monitor system
CEQA = California Environmental Quality Act
CERs = Certified Emission Reductions
CFR = Code of Federal Regulations
CH4 = methane
CO2 = carbon dioxide
CO2eq = carbon dioxide equivalent
CO = carbon monoxide
COD = chemical oxygen demand
COHb = carboxyhemoglobin
COS = carbonyl sulfide

LIST OF ACRONYMS & TERMS (continued)

CFR = Code of Federal Regulations
CHP = California Highway Patrol
CM = control measure
CMA = Congestion Management Agency
CMP = Congestion Management Program
CPCC = California Portland Cement Company
CPUC = California Public Utilities Commission
CRA = Colorado River Aqueduct
CS2 = carbon disulfide
CUPA = Certified Unified Program Agency
CWA = Clean Water Act
CWRF = Colton Water Reclamation Facility
CWS = California Water Service
DEA = diethanolamine
DGS = dry gas scrubber
DHS = Department of Health Services
DIPA = di-isopropanolamine
District = South Coast Air Quality Management District
DOE = United States Department of Energy
DOT = United States Department of Transportation
DTSC = Department of Toxic Substance Control
DWR = California Department of Water Resources
EA = Environmental Assessment
EDV = Electro Dynamic Venturi
EGF = electric generating facility
EIR = Environmental Impact Report
ERPG = Emergency Response Planning Guidelines
ESP = electrostatic precipitator
EU = European Union
FCCU = fluid catalytic cracking unit
FedOSHA = Federal Occupational Safety and Health Administration
FGT = fuel gas treatment
FR = Federal Register
gal = gallons
GHG = greenhouse gases
GMC = Growth Management Chapter
gpm = gallons per minute
gWh = gigawatt-hour
GWP = global warming potential
H2S = hydrogen sulfide
H2SO4 = sulfuric acid
HAP = hazardous air pollutant
HF = hydrofluoric acid
HCFC = hydrochlorofluorocarbon
HFC = hydrofluorocarbon
HCl = hydrochloric acid
HI = Hazard Index

LIST OF ACRONYMS & TERMS (continued)

hr = hour
HRRWPP = Harbor Refineries Recycled Water Pipeline Project
HSC = Health and Safety Code
HSWA = Hazardous and Solid Waste Act
HWCL = Hazardous Waste Control Law
IARC = International Agency for Research on Cancer
ICTF = intermodal container transfer facility
IC = internal combustion
ID = identification
ISTEA = Intermodal Surface Transportation Efficiency Act of 1991
kW = kilowatt
kWh = kilowatt-hour
LACSB = Los Angeles City Bureau of Sanitation
LACSD = Los Angeles County Sanitation District
LADWP = Los Angeles Department of Water and Power
LAER = Lowest Achievable Emission Rate
LAX = Los Angeles International Airport
lb = pound
LEED = Leadership in Energy and Environmental Design
LOS = level of service
M&I = municipal and industrial
MDAB = Mojave Desert Air Basin
MDEA = methyl diethanol amine
Metro = Los Angeles County Metropolitan Transportation Authority
MgO = magnesium oxide
MICR = maximum individual cancer risk
mmBTU = million British Thermal Units
mmscf = million standard cubic feet
mpg = miles per gallon
MPO = Metropolitan Planning Organization
MSBACT = Minor Source Best Available Control Technology
MSDS = Material Safety Data Sheet
MT/yr = metric tons per year
MW = megawatt
MWD = Metropolitan Water District
MWh = megawatt-hour
N2O = nitrous oxide
Na2CO3 = sodium carbonate
Na2S2O5 = sodium pyrosulfate
Na2SO3 = sodium sulfite
NAAQS = National Ambient Air Quality Standards
NaHSO3 = sodium bisulfite
NaOH = sodium hydroxide
NESHAP = National Emission Standard for Hazardous Air Pollutants
NFC = National Fire Code
NH3 = ammonia
NHTSA = National Highway Traffic and Safety Administration

LIST OF ACRONYMS & TERMS (continued)

NOC = Notice of Completion
NOP/IS = Notice of Preparation/Initial Study
NOx = oxides of nitrogen
NPDES = National Pollutant Discharge Elimination System
NSR = New Source Review
NTP = United States National Toxicology Program
O3 = ozone
OCTA = Orange County Transportation Authority
OEHA = Office of Environmental Health Hazard Assessment
OES = Office of Emergency Services
OPR = Office of Planning and Research
OSHA = Occupational Safety and Health Administration
PAR = Proposed Amended Rule
PEA = Program Environmental Assessment
PEL = permissible exposure limit
PFC = perfluorocarbon
PM = particulate matter
PM2.5 = particulate matter with an aerodynamic diameter of 2.5 microns or less
PM10 = particulate matter with an aerodynamic diameter of 10 microns or less
POTW = publicly-owned treatment works
ppm = parts per million
ppmv = parts per million by volume
PST = Pacific Standard Time
PVC = polyvinyl chloride
RCPG = Regional Comprehensive Plan Guide
RCRA = Resource Conservation and Recovery Act
RCTC = Riverside County Transportation Commission
RECLAIM = Regional Clean Air Incentives Market
REL = Reference Exposure Level
RMP = Risk Management Programs
RO = reverse osmosis
RPS = renewables portfolio standard
RTC = RECLAIM Trading Credit
RTIP = Regional Transportation Improvement Program
RTP = Regional Transportation Plan
RWQCB = Regional Water Quality Control Board
SANBAG = San Bernardino Associated Governments
SANDAG = San Diego Association of Governments
SARA = Superfund Amendments and Reauthorization Act
SB = Senate Bill
SCAB = South Coast Air Basin
SCAG = Southern California Association of Governments
SCAQMD = South Coast Air Quality Management District
SCE = Southern California Edison
SCR = selective catalytic reduction
SEA = Supplemental Environmental Assessment
SF6 = sulfur hexafluoride

LIST OF ACRONYMS & TERMS (concluded)

SIP = State Implementation Plan
SO2 = sulfur dioxide
SO3 = sulfur trioxide
SOx = oxides of sulfur
SR = state route
SRU/TGU = sulfur recovery unit/tail gas unit
SSAB = Salton Sea Air Basin
SWMP = Storm Water Management Plan
SWP = State Water Project
SWPPP = Storm Water Pollution Prevention Plan
SWRCB = State Water Resources Control Board
TAC = toxic air contaminant
TAO = Technology Advancement Office
TDM = Transportation Demand Management
TEA-21 = Transportation Equity Act for the 21st Century
TMDL = total maximum daily load
TIMP = Transportation Improvement and Mitigation Program
tons/day = tons per day
tpd = tons per day
TRI = Toxic Release Inventory
TSCA = Toxic Substances Control Act
TSS = total suspended solids
TXI = Riverside Cement Company
$\mu g/m^3$ = micrograms per cubic meter
ULSD = ultra-low sulfur diesel
UP = Union Pacific
USC = United States Code
USEPA = United States Environmental Protection Agency
USPS = United States Postal Service
V2O5 = vanadium pentoxide
VOC = Volatile Organic Compounds
WBMWD = West Basin Municipal Water District
WCI = Western Climate Incentive
WDR = waste discharge requirements
WGS = wet gas scrubber

CHAPTER 1

EXECUTIVE SUMMARY

INTRODUCTION

The California Legislature created the South Coast Air Quality Management District (SCAQMD) in 1977[1] as the agency responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin) and portions of the Salton Sea Air Basin and Mojave Desert Air Basin, referred to herein as the District. By statute, the SCAQMD is required to adopt an air quality management plan (AQMP) demonstrating achievement and maintenance of all federal and state ambient air quality standards for the District[2]. Furthermore, the SCAQMD must adopt rules and regulations that carry out the AQMP, including requiring Best Available Retrofit Control Technology (BARCT) for existing sources[3]. The 2007 AQMP concluded that major reductions in emissions of volatile organic compounds (VOCs), oxides of sulfur (SOx) and oxides of nitrogen (NOx) are necessary to attain the air quality standards for ozone (the key ingredient of smog) and particulate matter (PM10 and PM2.5). Ozone, a criteria pollutant which has been shown to adversely affect human health, is formed when VOCs react with NOx in the atmosphere. VOCs, NOx, SOx (especially sulfur dioxide) and ammonia also contribute to the formation of PM10 and PM2.5.

The Basin is designated by the United States Environmental Protection Agency (USEPA) as a non-attainment area for PM2.5 emissions because the federal PM2.5 standards have been exceeded. For this reason, the SCAQMD is required to evaluate all reasonably available control measures in order to reduce direct PM2.5 emissions, as well as PM2.5 precursors, such as NOx and SOx. Because NOx and SOx are major building blocks of PM2.5 formation, reducing NOx and SOx emissions is highly effective in reducing ambient PM2.5 levels as compared to other primary and secondary contributors to PM2.5 formation. For example, the reduction of one ton of SOx is equal to 1.5 tons of directly emitted PM2.5 or 15 tons of NOx. Further, chemical speciation of PM2.5 samples indicates that in the South Coast Air Basin, 25 percent of the ambient PM2.5 is attributed to contribution from sulfates (a component of SOx). Thus, the 2007 AQMP contains a multi-pollutant control strategy to achieve attainment with the federal annual average PM2.5 standard with NOx and SOx reductions identified as the two most effective tools in reaching attainment with the PM2.5 standards.

As part of this ongoing PM2.5 reduction effort and to implement the BARCT requirement for existing sources, SCAQMD staff is proposing amendments to Regulation XX – Regional Clean Air Incentives Market (RECLAIM) to achieve additional SOx emission reductions as outlined in the 2007 AQMP in Control Measure (CM) CMB-02: Further SOx Reduction for RECLAIM (CM #2007CMB-02). Amendments are proposed to Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx), to address BARCT requirements, which may require installation or modification of SOx emission control equipment. Other changes proposed are administrative in nature and include minor clarifications for continuity.

The primary focus of the proposed project is to bring the SOx RECLAIM program up-to-date with the latest BARCT requirements to achieve, if feasible, the proposed SOx emission reductions in CM #2007CMB-02 (at least 2.9 tons per day) and to achieve the maximum feasible reductions. The proposed project may actually achieve additional SOx emission reductions beyond 2.9 tons per day depending on the actual BARCT SOx emission control efficiencies. The proposed project will affect the following types of equipment and processes at SOx

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1 The Lewis-Presley Air Quality Management Act, 1976 Cal. Stats., ch 324 (codified at Health & Safety Code, §§40400-40540).
2 Health & Safety Code, §40460 (a).
3 Health & Safety Code, §40440 (a).

RECLAIM facilities: 1) petroleum coke calciners; 2) cement kilns; 3) coal-fired boiler (cogeneration); 4) container glass melting furnace; 5) diesel combustion[4]; 6) fluid catalytic cracking units; 7) refinery boilers/heaters; 8) sulfur recovery units/tail gas treatment units; and, 9) sulfuric acid manufacturing. Additional amendments are proposed to establish procedures and criteria for reducing RECLAIM Trading Credits (RTCs) and RTC adjustment factors for year 2013 and later. Other minor changes are proposed for clarity and consistency throughout the proposed amended rule.

The proposed project is estimated to reduce at least 2.9 tons per day of SOx emissions or more by 2014. Despite this projected environmental benefit to air quality, the Initial Study, prepared pursuant to the California Environmental Quality Act (CEQA), identified the following environmental topics as areas that may be adversely affected by the proposed project: aesthetics, air quality, energy, hydrology and water quality, hazards and hazardous materials, and transportation/traffic. This ~~Draft~~ Final Program Environmental Assessment (PEA) has been prepared to analyze further whether the potential impacts to these environmental topics are significant. Any other potentially significant environmental impacts identified in the Notice of Preparation/Initial Study have also been analyzed in this ~~Draft~~ Final PEA.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The proposed amendments to Regulation XX are considered a "project" as defined by CEQA. CEQA requires that the potential adverse environmental impacts of proposed projects be evaluated and that methods to reduce or avoid identified significant adverse environmental impacts of these projects be implemented if feasible. The purpose of the CEQA process is to inform the SCAQMD's Governing Board, public agencies, and interested parties of potential adverse environmental impacts that could result from implementing the proposed project and to identify feasible mitigation measures or alternatives, when an impact is significant.

California Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a plan or other written documents in lieu of an environmental impact report once the Secretary of the Resources Agency has certified the regulatory program. The SCAQMD's regulatory program was certified by the Secretary of Resources Agency on March 1, 1989, and is codified as SCAQMD Rule 110 (the rule which implements the SCAQMD's certified regulatory program). CEQA and Rule 110 require that potential adverse environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid significant adverse environmental impacts of these projects be identified.

The SCAQMD as Lead Agency for the proposed project, prepared a Notice of Preparation/Initial Study (NOP/IS) which identified environmental topics to be analyzed in a Draft Environmental Assessment (EA). The NOP/IS provided information about the proposed project to other public agencies and interested parties prior to the intended release of the Draft EA. The NOP/IS was distributed to responsible agencies and interested parties for a 30-day review and comment period from June 19, 2009, to July 21, 2009. The initial evaluation in the NOP/IS identified the topics of aesthetics, air quality, energy, hydrology and water quality, hazards and hazardous materials, and transportation and traffic as potentially being adversely affected by the proposed project. During that public comment period, the SCAQMD received three comment letters.

[4] The proposed project does not establish a new BARCT level for diesel combustion. The BARCT level for this source category is incorporated into the proposed project for consistency with the existing 15 ppmv SOx requirement in SCAQMD Rule 431.2. For this reason, the diesel combustion source category is not included in this analysis.

These letters and their responses can be found in Appendix D of this document. In addition, the NOP/IS, is attached to this PEA as Appendix C, and can also be obtained by visiting the following website at: http://www.aqmd.gov/ceqa/documents/2009/aqmd/is_nop/RegXX.pdf.

Of the comment letters received relative to the NOP/IS, in particular, Comment 2-4 from Comment Letter #2 suggested that a Program Environmental Assessment (PEA) be prepared for the proposed project. In response to this comment, in accordance with CEQA Guidelines §15168, SCAQMD has prepared this ~~Draft~~ Final PEA to evaluate potential adverse impacts from the proposed project. The decision to prepare a ~~Draft~~ PEA is based on the proposed project: 1) being connected to the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program (CEQA Guidelines §15168 (a)(3)); and, 2) containing a series of actions that can be characterized as one large project and the series of actions are related as individual activities that would be carried out under the same authorizing regulatory authority and having similar environmental effects which can be mitigated in similar ways (CEQA Guidelines §15168 (a)(4)). This ~~Draft~~ PEA is a public disclosure document intended to: (a) provide the lead agency, responsible agencies, decision makers and the general public with information on the environmental impacts of the proposed project; and, (b) be used as a tool by decision makers to facilitate decision making on the proposed project.

The Draft PEA was released for a 45-day public review and comment period from August 18, 2010 to October 1, 2010. The ~~Thus, this~~ Draft PEA, prepared pursuant to CEQA, identified~~s~~ aesthetics, air quality, energy, hydrology and water quality, hazards and hazardous materials, and transportation and traffic as areas that may be adversely affected by the proposed project. Based on the conclusions in the NOP/IS prepared for the proposed project, the~~is~~ Draft PEA further analyzed~~s~~ whether or not the aesthetics, air quality, energy, hydrology and water quality, hazards and hazardous materials, and transportation and traffic impacts are significant. The Draft PEA concluded that only the topics of air quality and hydrology (water demand) would have significant adverse impacts.

Three~~Any~~ comment letters were received during the public comment period on the analysis presented in the~~is~~ Draft PEA. Responses to these comment letters have been prepared. The comment letters along with the responses are ~~will be responded to and~~ included in Appendix E of this~~e~~ Final PEA. Thus, this Final PEA, prepared pursuant to CEQA Guidelines §15132, identifies air quality and hydrology (water demand) as areas that may be adversely affected by the proposed project. Prior to making a decision on the proposed amendments to Regulation XX, the SCAQMD Governing Board must review and certify the Final PEA as providing adequate information on the potential adverse environmental impacts of the proposed amendments to Regulation XX.

PREVIOUS CEQA DOCUMENTATION FOR REGULATION XX

This ~~Draft~~ Final PEA is a comprehensive environmental document that analyzes potential environmental impacts from the proposed amendments to Regulation XX. SCAQMD rules, as ongoing regulatory programs, have the potential to be revised over time due to a variety of factors (e.g., regulatory decisions by other agencies, new data, and lack of progress in advancing the effectiveness of control technologies to comply with requirements in technology forcing rules, etc.). Several previous environmental analyses have been prepared to analyze past amendments to the rules that comprise Regulation XX. The following paragraphs summarize these previously prepared CEQA documents and are included for informational purposes only. The current ~~Draft~~ Final PEA focuses on the currently proposed amendments to Regulation XX and does not rely on these previously prepared CEQA documents. The following documents can be obtained by submitting a Public Records Act request to the SCAQMD's Public Records Unit. In addition, a link for downloading files from the SCAQMD's website is provided for those CEQA documents prepared after January 1, 2000. The following is a summary of the contents of these documents.

Notice of Exemption From CEQA for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM); April 2007: The amendments to Regulation XX – RECLAIM were administrative in nature and focused on the following rules: Rule 2004 – Requirements; Rule 2007 – Trading Requirements; and Rule 2010 – Administrative Remedies and Sanctions. The amendments to Rule 2004 provided an exemption from submitting Quarterly Certification Emission Reports for facilities that do not have any NOx or SOx emitting equipment located on site. The amendments to Rule 2007 clarified the trading requirements for foreign entities that are not residing or licensed to conduct business in California, and clarified reporting requirements for parties entering into a forward contract or a contingent right contract. Amendments to Rule 2010 specified liability for allocation violations when changes of ownership occur. Other minor administrative changes were included that improved the clarity of these rules. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/ceqa/notices/2007/noe/RegXX_NOE.pdf

Notice of Exemption From CEQA for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM); May 2005: The amendments to Regulation XX – RECLAIM were administrative in nature and focused on the following rules and protocols: Rule 2000 – General; Rule 2001 – Applicability; Rule 2005 – New Source Review for RECLAIM; Rule 2007 – Trading Requirements; Protocol for Rule 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SOx) Emissions; and Protocol for Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions. Amendments to Rule 2000 and Protocols for Rules 2011 and 2012 were proposed for consistency with the new source requirements for non-RECLAIM sources and for clarification that mobile source emissions are part of the total RECLAIM pollutants emitted from a facility. Amendments to Rule 2005 clarified that emissions from affected sources shall include mobile source emissions and to include an alternative quarterly holding period for RTCs for offsetting emissions from a new source. Amendments to Rule 2007 reinstated the trading provision that would allow power producers to transfer NOx RECLAIM Trading Credits among facilities under common ownership which was inadvertently omitted during the January 7, 2005 amendments to Rule 2007. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the proposed project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/ceqa/notices/2005/noe/NOE_RegXX.doc

Final Environmental Assessment for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM); December 2004 (SCAQMD No. 031104BAR): A Draft Environmental Assessment (EA) for amendments to Regulation XX (Rule 2001 – Applicability; Rule 2002 – Allocations for NOx and SOx; Rule 2007 – Trading Requirements; Rule 2009 – Compliance Plans for Power Producing Facilities; Rule 2010 – Administrative Remedies and

Sanctions; Rule 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for SOx Emissions; and, Appendix A – Protocol for SOx; and, Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions; and, Appendix A – Protocol for NOx) was released for a 45-day public review period from October 22, 2004 to December 7, 2004. The amendments implemented control measure CMB-10 in the 2003 AQMP and addressed BARCT requirements to achieve additional NOx emission reductions. The Draft EA identified the topic of air quality as the only area that may be significantly adversely affected by the project. After circulation of the Draft EA, a Final EA was prepared and certified by the SCAQMD Governing Board on January 7, 2005. This document can be obtained by visiting the following website at: http://www.aqmd.gov/ceqa/documents/2005/aqmd/finalEA/FEA_RegXX.doc .

Notice of Exemption From CEQA for Proposed Amended Rule 2007 – Trading Requirements; September 2004: The purpose of the amendments to Rule 2007 was to address CARB concerns regarding the reintroduction of power plants to the RECLAIM trading market. The proposal contained a provision that delayed the date when the trading restrictions would be lifted until such time that other RECLAIM rule amendments (scheduled for January 2005) were adopted that would decrease allocations to implement the 2003 AQMP Control Measure CMB-10 and to reflect BARCT in accordance with Health and Safety Code (HSC) §40440. The air quality objective was to ensure that BARCT adjustments are made to facility allocations prior to removal of power plant trading restrictions. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at:
http://www.aqmd.gov/ceqa/notices/2004/noe/NOE_2007.doc

Notice of Exemption From CEQA for Proposed Amended Rule 2015 – Backstop Provisions; June 2004: The purpose of the amendments to Rule 2015 was to address the USEPA's conditional approval of Regulation XX – RECLAIM, as amended May 11, 2001. The USEPA determined that the accounting procedures for and mitigations of excess emissions that occur during a breakdown in the current version of the RECLAIM program needed to be modified because these provisions conflict with USEPA's 1999 'Excess Emissions Policy' and §110 and Part D of the federal Clean Air Act (CAA). Specifically, the amendments to Rule 2015: 1) required the SCAQMD to monitor excess emissions occurring during breakdowns that are not covered by facility RTCs, and to compare that amount to the quantity of available, unused RTCs each year for the entire RECLAIM program; and, 2) required offsets for excess unmitigated breakdown emissions. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/ceqa/notices/2004/noe/NOE_2015.doc

Addendum to May 2001 Final Environmental Assessment for Proposed Amended Rule 2007 – Trading Requirements; Proposed Amended Rule 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for SOx Emissions; and, Proposed Amended Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions; October 14, 2003 (SCAQMD No. 101403BAR): The amendments to Rule 2007 required the power producers to re-enter the RECLAIM trading market. Specifically, the power producing facilities were brought back into the RECLAIM trading market and allowed to use RTCs to reconcile emissions, and to sell or transfer RTCs below the original allocation after compliance year 2003. The amendments to Rules 2011 and 2012 clarified that the 90-day recertification period for Continuous Emission Monitoring Systems (CEMS) applies when a new CEMS or a component of an existing CEMS is added to an existing or modified major RECLAIM source. An Addendum to the May 2001 Final EA for the amendments to Regulation XX (Rules 2007, 2011, and 2012) was prepared. The SCAQMD determined that an Addendum to the May 2001 Final EA was the appropriate document to prepare because none of the conditions described in CEQA Guidelines §15162 were triggered since the amendments did not contain new information of substantial importance and would not create any new significant adverse impacts or substantially increase the severity of the previously identified significant environmental effects in the original project. Further, the SCAQMD concluded that the amendments would not change the environmental analysis or conclusions in the previously certified May 2001 Final EA. Pursuant to CEQA Guidelines §15164 (c), it was not necessary to circulate the Addendum for public review. The Addendum to the May 2001 Final EA was certified by the SCAQMD Governing Board on December 5, 2003. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/ceqa/2003/aqmd2003.html.

Final Environmental Assessment for Proposed New and Amended Rules, Regulation XX – RECLAIM; Rule 1631 – Pilot Credit Generation Program for Marine Vessels; Rule 1632 – Pilot Credit Generation Program for Hotelling Operations; Rule 1633 – Pilot Credit Generation Program for Truck/Trailer Refrigeration Units; and Rule 2507 – Pilot Credit Generation Program for Agricultural Pumps; May 2001 (SCAQMD No. 010201JDN): An integrated group of new and amended rules were adopted to help ensure compliance with emission allocations contemplated during initial RECLAIM program design while reducing impacts of California's electricity crisis on the RECLAIM market. The project included proposed new and amended RECLAIM rules and four voluntary mobile and area source NOx pilot credit generation rules. The project components were designed to work together to lower and stabilize RTC prices by increasing supply, reducing demand, and increasing RTC trading information availability and accuracy. A Draft EA for the amendments to Regulation XX plus proposed Rules 1631, 1632, 1633 and 2507 (which established pilot NOx credit generation rules as a means of creating additional NOx RTCs) was released for a 30-day public review period from March 27, 2001 to April 25, 2001. The analysis showed that there were potential adverse environmental effects that may result from implementing the amendments (primarily removing power producers from the trading market). The Draft EA identified "air quality" and "hazards and hazardous materials" as the only areas that may be significantly adversely affected by the project. After circulation of the Draft EA, a Final EA was prepared and certified by the SCAQMD Governing Board on May 11, 2001. This document can be obtained by visiting the following website at: http://www.aqmd.gov/ceqa/2001/aqmd2001.html.

Final Environmental Assessment for Proposed Amended Rules 1303 – Requirements, 2005 – New Source Review for RECLAIM, 1302 - Definitions and 1309.1 - Priority Reserve; April 9, 2001 (SCAQMD No. 021401MK): The amendments to Rules 1303 and 2005 revised the modeling standard for sources locating in an attainment sub-region of the district so that any proposed new emissions plus the measured background could not create a violation of any applicable ambient air quality standard. In sub-regions designated as nonattainment areas for specified criteria pollutants, the modeling criteria remained the same, but emissions from new or modified sources were not allowed to exceed the allowable change in concentration thresholds as set forth in Rule 1303, Table A-2. The amendments to Rule 1309.1 allowed temporary access to the SCAQMD's Priority Reserve PM10 account for new electric generating facilities (EGF) for applications deemed complete between 2001 and 2003, provided that all the other requirements were met and the appropriate mitigation fee was paid. The Draft EA was released for a 30-day public review and comment period from February 14, 2001 to March 15, 2001. The Draft EA concluded that the project would not have any significant or potentially significant effects on the environment. After circulation of the Draft EA, a Final EA was prepared and certified by the SCAQMD Governing Board on April 20, 2001. This document can be obtained by visiting the following website at: http://www.aqmd.gov/ceqa/2001/aqmd2001.html.

Notice of Exemption From CEQA for Proposed Amended Rule 2011 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SOx) Emissions; and, Proposed Amended Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Nitrogen (NOx) Emissions; March 2001: Because the substantive components of the project involved the addition of an alternative recordkeeping option, the SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can also be obtained by visiting the following website at: http://www.aqmd.gov/hb/2001/010337a.html.

Final Environmental Assessment for Proposed Amended Rules 1302 – Definitions, 1303 – Requirements, 1306 – Emissions Calculations, 2000 – General; and BACT Guidelines; August 23, 2000 (SCAQMD No. 33100JDN): The amendments bifurcated the New Source Review (NSR) control technology requirements into Lowest Achievable Emission Rate (LAER) for federal major polluting facilities and Minor Source Best Available Control Technology (MSBACT) for all others. Unlike federal LAER, state law allows the cost of the control equipment to be taken into consideration when making a BACT determination. All major polluting facilities, as defined in the federal CAA, would continue to be required to employ LAER for a new or relocated source and any emission increase from a modified source. All other facilities would be required to employ MSBACT. The amendments applied to both RECLAIM and non-RECLAIM sources. Additionally, the amendments allowed relocations of non-major polluting facilities that meet certain conditions, including no emission increases upon relocation and for two years thereafter, to maintain the existing control level from the prior location instead of requiring the installation of new BACT controls. The Draft EA was released for a 30-day public review and comment period from July 11, 2000 to August 9, 2000. The Draft EA concluded that the project would not have any significant or potentially significant effects on the environment. After circulation of the Draft EA, a Final EA was prepared and certified by the SCAQMD Governing Board on October 20, 2000. This document can be obtained by visiting the following website at: http://www.aqmd.gov/hb/2000/001037a.html.

Notice of Exemption for Proposed Amended Rule 2005 - New Source Review for RECLAIM, Rule 2011 - Requirements for Monitoring, Reporting, and Recordkeeping for SOx Emissions, and Rule 2012 - Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions; April 1999: The amendments included clarifications to New Source Review requirements for change of operator and modifications to new facilities. For major sources, the amendments clarified monitoring requirements and added calculation methods for cases currently not addressed. For large sources, the amendments added monitoring and calculations methods for cases currently not addressed and clarified source testing requirements. For process units, the amendments established concentration limits for determining emissions and added guidelines for category specific emission rates. The amendments also corrected rule references, extended deadlines for monthly emissions reporting, and added clarifying language to enhance enforcement and consistency. The amendments were necessary to clarify rule requirements and improve enforceability. The amendments also increased flexibility for RECLAIM facilities. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can be obtained by visiting the following website at: http://www.aqmd.gov/hb/1999/990432a.html.

Notice of Exemption for Proposed Amended Rule 2000 - General, Rule 2011 - Requirements for Monitoring, Reporting and Recordkeeping for SOx Emissions and Rule 2012 - Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions; April 1997: The amendments clarified the rule requirements for emissions from contractors' equipment at RECLAIM facilities by: 1) adding a definition for contractor; 2) specifying that emissions from contractors' equipment should be accounted for by the RECLAIM facility in the same manner as emissions from rental equipment, with the exception of specific processes that do not contribute to a facility's manufacturing process; and, 3) excluding emissions from certain contractors' equipment at a Super Compliant facility. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can be obtained by visiting the following website at: http://www.aqmd.gov/hb/1997/970436a.html.

Notice of Exemption for Proposed Amended Rule 2000 - General, Rule 2001 - Applicability, Rule 2002 - Allocations for NOx and SOx, Rule 2005 - New Source Review for RECLAIM, Rule 2011 - Requirements for Monitoring, Reporting and Recordkeeping for SOx Emissions, Rule 2012 - Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions and Rule 2015 - Backstop Provisions; February 1997: The amendments modified requirements for non-operating and infrequently-operated major sources, exemption provisions, emission factors, and certain monitoring, reporting, and recordkeeping (MRR) requirements. The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can be obtained by visiting the following website at: http://www.aqmd.gov/hb/1997/970238a.html.

Final Supplemental Environmental Assessment for Proposed Amended Rule 2002 - Allocations for NOx and SOx, Rule 2004 - Requirements, Rule 2005 - New Source Review for RECLAIM, Rule 2011 - Requirements for Monitoring, Reporting, and Recordkeeping for SOx Emissions, Rule 2012 - Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions, and Rule 2015 - Backstop Provisions; June 1996: The amendments clarified rule requirements and improved monitoring, reporting, and recordkeeping flexibility for RECLAIM facilities. The amendments provided: 1) procedures consistent with Rule 430 - Breakdown Provisions; 2) procedures for reporting equipment breakdowns affecting RECLAIM pollutants; 3) more accurate emission factors; 4) clarifications of RTC allocations after year 2010; 5) consolidated requirements for reports on RECLAIM issues; 6) clarified requirements for Super Compliance facilities; 7) a period of time for CEMS repairs; 8) clarifications of monitoring, reporting, recordkeeping, and other requirements; and, 9) an alternative to the NOx ending emission factor for cement kilns based on a demonstration plan. Pursuant to CEQA, the SCAQMD prepared a Draft Supplemental Environmental Assessment (SEA) for the amendments to Regulation XX - RECLAIM. The Draft SEA was a supplement to the October 1993 Final EA for Regulation XX (SCAQMD No. 930524SS) and was circulated for a 45-day public review and comment period that ended May 10, 1996. The Final SEA was certified by the SCAQMD Governing Board on July 12, 1996. This document can be obtained by visiting the following website at: http://www.aqmd.gov/hb/1996/960731a.html.

Notice of Exemption for Proposed Amended Rule 1303 - Requirements (New Source Review) and Rule 2005 - New Source Review for RECLAIM; May 1996: The amendments incorporated protection of visibility for Federal Class I areas into Regulations XIII and XX. Protection of visibility for Federal Class I areas and notification of Federal Land Managers are requirements of federal law. The SCAQMD determined that the amendments were exempt from CEQA pursuant to CEQA Guidelines §15308 - Action by Regulatory Agencies for the Protection of the Environment, since the activity was covered by this Class 8 exemption for actions to assure the maintenance, restoration, enhancement, or protection of the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared. This document can be obtained by visiting the following website at: http://www.aqmd.gov/hb/1996/960538a.html.

Final Supplemental Environmental Assessment for Proposed Amended Regulation XX – RECLAIM; December 1995: The Final Supplemental EA for Regulation XX addressed the potential air quality, energy and risk of upset impacts associated with the exemption of two facilities from the RECLAIM program, State Implementation Plan (SIP) approvability issues and the allocation revision for one facility participating in the program. Air quality was the only environmental area determined to be adversely impacted from the amendments. The air quality impacts resulted from removing two facilities from the RECLAIM program and the loss of anticipated NOx emission reductions from the allocation revisions. A Statement of Findings and Overriding Considerations were prepared for the project.

Notice of Exemption for Proposed Amended Rule 2011 - Requirements for Monitoring, Reporting and Recordkeeping for SOx Emissions, and Rule 2012 - Requirements for Monitoring, Reporting, and Recordkeeping for NOx Emissions; September 1995: The SCAQMD concluded that the amendments would not have an effect on emissions and that there was no possibility that the project would have the potential to have a significant adverse effect on the environment. Therefore, pursuant to CEQA Guidelines §15061(b)(3) - Review for Exemption, the project was determined to be exempt from CEQA and a Notice of Exemption was prepared.

Final Supplemental Environmental Assessment for Proposed Amended Rule 2002 - Allocations for NOx and SOx; March 1995: The Final EA for Rule 2002 addressed the potential air quality and energy impacts from adjusting the years 2000 and 2003 Allocations for the petroleum coke calcining industry. Air quality was the only area determined to be adversely impacted from the amendments due to the loss of future emission reductions. A Statement of Finding and Overriding Considerations was prepared for the amendments.

Final Environmental Assessment for the Proposed Adoption of Regulation XX - RECLAIM; October 1993: A Draft EA for the proposed NOx and SOx RECLAIM program, comprised of three volumes: Volume I - Development Report and Proposed Rules, Volume II - Supporting Documentation and Volume III - Socioeconomic and Environmental Assessments, was released for a 30-day public review and comment period on May 24, 1993. In response to comments received regarding the Draft EA, some components of the proposed project were modified. Subsequently, a Revised Draft EA was prepared and re-circulated for an additional public review and comment period of 45 days on July 22, 1993 The SCAQMD concluded that the changes in the Revised Draft EA did not alter the significance determination for any environmental impact areas analyzed in the May 1993 version of the Draft EA. After circulation of the Revised Draft EA, a Final EA was prepared and certified by the SCAQMD Governing Board at its hearing in October 1993.

Notice of Preparation/Initial Study of Draft Environmental Assessment for the Proposed Adoption of Regulation XX - RECLAIM; October 1992: The NOP/IS of a Draft EA for the proposed adoption of the NOx and SOx RECLAIM program was released for a 30-day public review and comment period on October 23, 1992. The NOP/IS identified "air quality," "energy," and "hazards and hazardous materials" as the key areas that may be adversely affected by the proposed project.

INTENDED USES OF THIS DOCUMENT

In general, a CEQA document is an informational document that informs a public agency's decision-makers and the public generally of potentially significant adverse environmental effects of a project, identifies possible ways to avoid or minimize the significant effects, and describes reasonable alternatives to the project (CEQA Guidelines §15121). A public agency's decision-makers must consider the information in a CEQA document prior to making a decision on the project. Accordingly, this ~~Draft~~ Final PEA is intended to: (a) provide the SCAQMD Governing Board and the public with information on the environmental effects of the proposed project; and, (b) be used as a tool by the SCAQMD Governing Board to facilitate decision making on the proposed project.

Additionally, CEQA Guidelines §15124(d)(1) requires a public agency to identify the following specific types of intended uses of a CEQA document:

1. A list of the agencies that are expected to use the PEA in their decision-making;
2. A list of permits and other approvals required to implement the project; and,
3. A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

There are no permits or other approvals required to implement the project. Moreover, the project is not subject to any other related environmental review or consultation requirements.

To the extent that local public agencies, such as cities, county planning commissions, et cetera, are responsible for making land use and planning decisions related to projects that must comply with the requirements in the proposed project, they could possibly rely on this PEA during their decision-making process. Similarly, other single purpose public agencies approving projects at facilities complying with the proposed project may rely on this PEA.

AREAS OF CONTROVERSY

CEQA Guidelines §15123(b)(2) requires a public agency to identify the areas of controversy in the CEQA document, including issues raised by agencies and the public. Over the course of developing the proposed project, the predominant concerns expressed by representatives of industry and environmental groups, either in public meetings or in written comments, regarding the proposed project are highlighted in Table 1-1.

Table 1-1
Areas of Controversy

	Area of Controversy	Topics Raised by the Public	SCAQMD Evaluation
1.	BARCT analysis versus potentially adverse environmental impacts	Industry representatives expressed concern that the CEQA process gives a "back door" from properly conducting the BARCT analysis because CEQA can be used to justify adverse significant impacts by the Statement of Findings and Statement of Overriding Considerations.	The process of conducting a BARCT analysis is separate from the CEQA analysis. For a market-based incentive program, SCAQMD staff is required by the Health and Safety Code to conduct periodic BARCT reassessments and demonstrate equivalency with command-and-control rules which would otherwise be developed as a result of BARCT reassessment. The purpose of CEQA is to disclose the environmental effects of a project, in this case, the implementation of BARCT. Both the adverse and beneficial environmental effects of the proposed amendments to SOx RECLAIM are analyzed in this CEQA document. Because the proposed project will have some significant adverse impacts, a Statement of Findings and a Statement of Overriding Considerations will be required.
2.	Shortcomings with analysis prepared by consultants.	Industry representatives expressed concern that the consultants did not consider all of the compliance options and their analyses did not properly include the cost of credits and the true cost of regulatory compliance.	SCAQMD staff has hired a consultant to provide a second opinion on the previously prepared cost analysis.
3.	Amount of SOx shave	Industry representatives expressed concern that reducing the available SOx RTCs could kill the SOx RECLAIM program because there will not be enough SOx RTCs to trade.	Contrary to the comment, the rule analysis shows that after the shave is imposed, there will be sufficient SOx RTCs available to maintain trading within the SOx RECLAIM program.

Table 1-1
Areas of Controversy (continued)

	Area of Controversy	Topics Raised by the Public	SCAQMD Evaluation
4.	Equity of the Proposed SOx shave	SOx reductions should be based on facility-specific and technology-specific data. Many facilities are super-compliant and cannot reduce SOx further. Other facilities do not have equipment subject to BARCT.	The proposed shave is based on source categories for which additional SOx reductions can be achieved.
5.	Space limitations	Industry representatives indicated that the affected facilities may not have enough available land or space to install additional SOx controls.	According to both of the consultants' reports, a facility-by-facility evaluation was conducted which included an analysis of plot space availability. The analysis does not support the claim that there is not adequate plot space available to install SOx controls.
6.	Equipment installed as part of complying with SCAQMD Rule 1105.1 will be stranded investments.	Industry representatives indicated that the installation of dry electrostatic precipitators (ESPs) to comply with SCAQMD Rule 1105.1 and control PM and ammonia will have been a wasted investment since the equipment that would need to be installed to control SOx (e.g., wet gas scrubber) could also be used to control PM and ammonia.	The dry ESPs selected as the control technology by most but not all local operators to comply with the PM requirements in Rule 1105.1 will not be wasted and can continue to be effectively utilized in the event that wet gas scrubbers are installed as part of this proposal because the wet gas scrubbers are predominantly for reducing SOx emissions. While it is true that all scrubbers provide some PM reduction benefit as well, only the very sophisticated ones such as ones equipped with a wet ESP, however, can control PM at the levels required by Rule 1105.1. Thus, for any facility that already has dry ESPs in operation, it may not be necessary to install a scrubber that also controls the full amount of PM reductions required by Rule 1105.1. Scrubbers that can achieve the required SOx and PM emission levels per SOx RECLAIM, and Rule 1105.1, respectively, are much more expensive than the ones considered for this analysis.

Table 1-1
Areas of Controversy (continued)

	Area of Controversy	Topics Raised by the Public	SCAQMD Evaluation
7.	SOx controls for cement kilns.	Industry representatives indicated that the BARCT assessment as it applies to the cement industry is incorrect in that the cement kiln, by the nature of its design, acts as a SOx scrubber, and that any attempt to further control SOx will cause the NOx emissions to increase beyond allowable levels.	Contrary to the claim that installation of SOx controls on cement kilns will increase NOx emissions, there are other installations of dry scrubbers on cement kilns worldwide which demonstrate that both SOx and NOx emissions can be effectively reduced.
8.	Impacts from wet gas scrubber technology.	Industry representatives indicated that there are too many potentially significant adverse environmental impacts from wet gas scrubber technology, especially aesthetics and water impacts.	The analysis shows that the aesthetics impacts from the proposed project would be less than significant. With regard to water demand impacts, SCAQMD staff recognizes that wet gas scrubber technology is water intensive. However, recycled water can be used in lieu of potable water. Specifically, up to 75 percent of the estimated increase in water demand due to the wet gas scrubbers under Option 1 of the proposed project can be satisfied with recycled water. With regard to the potential increases in wastewater processing, none of the affected facilities is anticipated to need to increase their wastewater discharge in excess of 25 percent of their currently allowed levels. Thus, no modifications to any existing wastewater discharge permits are anticipated.

Table 1-1
Areas of Controversy (concluded)

	Area of Controversy	Topics Raised by the Public	SCAQMD Evaluation
9.	Availability of Wet Gas Scrubbers	Industry representatives indicated that there may be a shortfall of available wet gas scrubbers if there are multiple units being bought and assembled simultaneously at multiple facilities.	Implementation of the proposed project is expected to span over seven years, which should be adequate time for purchasing and installing wet gas scrubbers.

Pursuant to CEQA Guidelines §15131(a), "Economic or social effects of a project shall not be treated as significant effects on the environment." CEQA Guidelines §15131(b) states further, "Economic or social effects of a project may be used to determine the significance of physical changes caused by the project." Physical changes caused by the proposed project have been evaluated in Chapter 4 of this PEA. No direct or indirect physical changes resulting from economic or social effects have been identified as a result of implementing the proposed project.

Of the topics discussed to address the concerns raised relative to CEQA and the secondary impacts that would be associated with implementing the proposed project, to date, no other controversial issues were raised as a part of developing the proposed project.

EXECUTIVE SUMMARY

CEQA Guidelines §15123 requires a CEQA document to include a brief summary of the proposed actions and their consequences. In addition, areas of controversy including issues raised by the public must also be included in the executive summary (see preceding discussion). This ~~Draft~~ Final PEA consists of the following chapters: Chapter 1 – Executive Summary; Chapter 2 – Project Description; Chapter 3 – Existing Setting, Chapter 4 – Potential Environmental Impacts and Mitigation Measures; Chapter 5 – Project Alternatives; Chapter 6 - Other CEQA Topics and various appendices. The following subsections briefly summarize the contents of each chapter.

Summary of Chapter 1 – Executive Summary

Chapter 1 includes a discussion of the legislative authority that allows the SCAQMD to amend and adopt air pollution control rules, identifies general CEQA requirements and the intended uses of this CEQA document, and summarizes the remaining five chapters that comprise this ~~Draft~~ Final PEA.

Summary of Chapter 2 - Project Description

The proposed project would affect the following types of equipment and processes at SOx RECLAIM facilities: 1) petroleum coke calciners; 2) cement kilns; 3) coal-fired boiler (cogeneration); 4) container glass melting furnace; 5) diesel combustion; 6) fluid catalytic cracking units; 7) refinery boilers/heaters; 8) sulfur recovery units/tail gas treatment units; and, 9) sulfuric acid manufacturing. The following is a summary of the key proposed amendments to Rule 2002. Other minor changes are also proposed for clarity and consistency throughout the rule. A copy of Proposed Amended Rule (PAR) 2002 can be found in Appendix A.

Proposed Amended Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx)

Annual Allocations for NOx and SOx and Adjustments to RTC Holdings - subdivision (f)
In accordance with the analysis prepared for Control Measure #2007CMB-02 in the 2007 AQMP which estimates an additional reduction in SOx RECLAIM emissions of 2.9 tons per day, new criteria, procedures, adjustment factors and equations for adjusting tradable/usable and non-tradable/non-usable SOx RTC holdings have been added to subdivision (f), specifically, subparagraphs (f)(1)(I-L) in order to achieve at least these projected emission reductions from SOx RTC holders beginning in compliance year 2012 through compliance year 2019 and after. The actual amount of reductions varies and depends on the compliance year.

New subparagraph (f)(1)(M) establishes procedures for publishing SOx RTC adjustment factors. New subparagraph (f)(1)(N) establishes procedures for calculating a 12-month rolling average of SOx RTC prices. Subparagraph (f)(1)(O) contains new procedures for holding a public hearing in the event that SOx RTC prices exceed $50,000 per ton based on a 12-month rolling average.

New subparagraph (f)(1)(P) contains criteria for submitting the emission reductions obtained via the RTC Holdings adjustments to the SIP.

New subparagraph (f)(1)(Q) contains procedures for assigning SOx allocations to facilities that enter the RECLAIM program after the date of adoption of the proposed rule amendments.

Paragraph (f)(1) contains two clarifications: 1) that SOx Allocations for 2004 through 2011 are equal to the facility's 2003 Allocation; and, 2) that NOx RTC Allocations and holdings subsequent to the year 2006 and SOx Allocations and holdings subsequent to the year 2011 shall be adjusted to the nearest pound. Lastly, subparagraph (f)(1)(B) contains a clarification to include RTC swap transactions into the computation of rolling average prices.

RECLAIM NOx 2011 Ending Emission Factors – Table 3
Table 3 has been revised to extend the RECLAIM NOx ending emission factors from 2010 to 2011. This revision is an administrative change for consistency and continuity with the changes adopted in the January 2005 amendments to the NOx RECLAIM program.

RECLAIM SOx Tier III Emission Factors – Table 4
New Table 4 has been added to Rule 2002 to establish BARCT for petroleum coke calciners, cement kilns, coal-fired boilers, container glass melting furnaces, diesel combustion, fluid catalytic cracking units, refinery boilers and heaters, sulfur recovery units/tail gas treatment units, and sulfuric acid manufacturing.

List of SOx RECLAIM Holders – Table 5
New Table 5 has been added to Rule 2002 to identify the list of holders of SOx RECLAIM RTCs.

Summary of Chapter 3 - Existing Setting
Pursuant to the CEQA Guidelines §15125, Chapter 3 – Existing Setting, includes descriptions of those environmental areas that could be adversely affected by the proposed project as identified in the NOP/IS (Appendix C). The following subsection briefly highlights the existing setting for the following environmental areas identified that could potentially be adversely affected by

implementing the proposed project: aesthetics, air quality, energy, hazards and hazardous materials, hydrology and water quality, and, transportation and traffic.

Aesthetics

Implementation of the proposed project has the potential for the installation of new air pollution control devices or the modification of existing air pollution control devices at the 11 affected facilities. Ten facilities are located within Los Angeles County and consist of six oil refineries (BP Carson, ExxonMobil, Chevron, ConocoPhillips, Tesoro, and Ultramar/Valero), one petroleum coke calciner plant (BP Wilmington), two sulfuric acid manufacturing plants (Rhodia and ConocoPhillips) and one container glass manufacturing facility (Owens-Brockway). The remaining facility, California Portland Cement Company (CPCC) is located in the City of Colton in San Bernardino County. The aesthetic setting for each of these facilities is briefly described in Chapter 3.

Air Quality

Air quality in the area of the SCAQMD's jurisdiction has shown substantial improvement over the last two decades. Nevertheless, some federal and state air quality standards are still exceeded frequently and by a wide margin. Of the National Ambient Air Quality Standards (NAAQS) established for seven criteria pollutants (ozone, lead, sulfur dioxide, nitrogen dioxide, carbon monoxide, PM10 and PM2.5), the area within the SCAQMD's jurisdiction is only in attainment with carbon monoxide, sulfur dioxide, and nitrogen dioxide standards. Air monitoring for PM10 indicates that SCAQMD has attained the NAAQS but USEPA has not yet approved the SCAQMD's request for re-designation. The Los Angeles County portion of the SCAQMD is proposed to be designated as non-attainment for the new federal standard for lead, based on emissions from two specific facilities. Chapter 3 provides a brief description of the existing air quality setting for each criteria pollutant, as well as the human health effects resulting from exposure to each criteria pollutant. In addition, this section includes a discussion on greenhouse gases (GHGs), climate change and toxic air contaminants.

Energy

Federal and state agencies regulate energy use and consumption through various means and programs. On the federal level, the United States Department of Transportation (DOT), the United States Department of Energy (DOE), and the USEPA are three agencies with substantial influence over energy policies and programs. On the state level, the California Public Utilities Commission (CPUC) and California Energy Commission (CEC) are two agencies with authority over different aspects of energy.

The CEC collects and analyzes energy-related data, prepares statewide energy policy recommendations and plans, promotes and funds energy efficiency programs, and regulates the power plant siting process. Recent energy use figures show that in 2008, 38.12 percent of the crude oil came from in-state, with 13.41 percent coming from Alaska, and 48.46 percent being supplied by foreign sources. Also in 2008, 73.2 percent of the electricity came from in-state sources, while 26.8 percent was imported into the state. The total electricity imported in 2008 was 306,577 gigawatt-hours (gWh), with 23,945 gWh coming from the Pacific Northwest and 74,113 gWh from the Southwest (CEC, 2009)[5]. (Note: One gW is equal to one million kilowatts (kW)). For natural gas in 2007, 40.8 percent came from the Southwest, 22.1 percent from Canada, 12.9 percent from in-state, and 24.2 percent from the Rockies (CEC, 2008).

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[5] http://www.energy.ca.gov/2009publications/CEC-200-2009-010/CEC-200-2009-010.PDF

One of the key areas of concern in the energy sector is reducing the amount of petroleum-based fuels in the District. Consumption of these fuels is a major factor in the amount of criteria pollutants in southern California. Alternative fuels play an important role in the strategy to reach attainment in the region. Renewable energy resources include: biomass, hydro, geothermal, solar and wind.

Hazards and Hazardous Materials

Potential hazard impacts may be associated with the production, use, storage, and transport of hazardous materials. For the purposes of this ~~Draft~~ Final PEA, the term "hazards" refers to both hazardous materials and hazardous wastes. Specifically, implementation of the proposed project is expected to result in potentially increased use of catalysts, caustic solutions, additives and other scrubbing agents that may contain TACs that are either chronic or acutely hazardous materials (or both), for SOx control purposes. In general, hazards can occur due to natural events, such as earthquake, and non-natural events, such as mechanical failure or human error. The risk associated with each affected facility is defined by the probability of an event and the consequence (or hazards) should the event occur. This section discusses existing hazards to the community from potential upset conditions at the affected facilities, to provide a basis for evaluating the changes in hazards posed by the proposed project.

The major types of public safety risks at the affected facilities consist of risk from releases of hazardous substances and from major fires and explosions. The shipping, handling, storage, and disposal of hazardous materials inherently pose a certain risk of a release to the environment. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, including toxic gas clouds, torch fires, flash fires, pool fires, and vapor cloud explosions, thermal radiation and explosion/overpressure.

The use, storage and transport of hazardous materials are subject to numerous laws and regulations at all levels of government. The most relevant existing hazardous materials laws and regulations include hazardous materials management planning, hazardous materials transportation, hazardous materials worker safety requirements, hazardous waste handling requirements and emergency response to hazardous materials and waste incidents. Potential risk of upset is a factor in the production, use, storage and transportation of hazardous materials. Risk of upset concerns are related to the risks of explosions or the release of hazardous substances in the event of an accident or upset conditions.

Releases of hazardous materials have the potential for harmful effects on workers and the public. Causes of these releases may include plant upsets; leaks in seals, pipeline failures; vehicular traffic accidents; and failures during delivery, such as hose leaks.

Hydrology and Water Quality

The Federal Safe Drinking Water Act, enacted in 1974 and implemented by the USEPA, imposes water quality and infrastructure standards for potable water delivery systems nation-wide. The California Safe Drinking Water Act was enacted in 1976. Potable water supply is managed through local agencies and water districts, the State Department of Water Resources (DWR), the Department of Health Services (DHS), the State Water Resources Control Board (SWRCB), the USEPA, and the United States Bureau of Reclamation. The DWR manages the State Water Project (SWP), and compiles planning information on supply and demand within California.

The DWR divides the state into ten hydrologic regions. Some regions contain a great deal of water, while other regions are very dry and must have their water imported by aqueducts. The South Coast Air Basin lies within the South Coast Hydrologic Region. The cities of Los Angeles, Long Beach, Santa Ana, and Riverside are among the many urban areas in this hydrologic region. The Santa Clara, Los Angeles, San Gabriel, and Santa Ana Rivers are among the area's hydrologic features. Most lakes in this area are actually reservoirs, made to hold imported water.

Imported sources of water (including the Colorado River Aqueduct (CRA), the State Water Project's California Aqueduct, and the Los Angeles Aqueduct) have, in previous years, supplied more than six million acre-feet[6] or two trillion gallons of water to the southern California region annually. Imported sources have accounted for approximately 74 percent of the total water used in the region.

However, back-to-back dry years and low reservoir levels have put California in a statewide drought. In late 2008, the state's major reservoirs were at about one-third of capacity, at a time when they would typically be at about two-thirds. As a result, the DWR has allocated only 15 percent of requested amounts of water to be delivered to the SWP in 2009. This allocation is the second lowest in the history of the project. Adding to California's water difficulties is a federal judge's restrictions on pumping in the Delta, ordered in 2007 to protect the threatened Delta smelt. These restrictions reduced water deliveries by as much as 30 percent in 2008 to 25 million Californians in the San Francisco Bay Area, the Central Coast, the San Joaquin Valley, and Southern California. Because of the drought, local water resources, which include groundwater and captured surface water runoff, are not expected to be stable in the future on a region-wide basis. Further, several groundwater basins in the region are threatened by overdraft conditions, increasing levels of salinity, and contamination by agricultural land to urban development, thereby reducing the land surface available for groundwater recharge. Increasing demand for groundwater may also be limited by water quality, since levels of salinity in sources currently used for irrigation could be unacceptably high for domestic use without treatment.

On June 4, 2008, Governor Arnold Schwarzenegger issued Executive Order S-06-08 and declared an official drought for California[7]. Further, California Water Code §71460 et seq. states that a water district may restrict the use of water during any emergency caused by drought, or other threatened or existing water shortage, and may prohibit the use of water during such periods for any purpose other than household uses or such other restricted uses as determined to be necessary. The water district may also prohibit the use of water during such periods for specific uses which it finds to be nonessential. On February 27, 2009, Governor Schwarzenegger proclaimed a state of emergency regarding the drought and the availability and future sustainability of California's water resources[8]. The proclamation directed all state government agencies to utilize their resources, implement a state emergency plan and provide assistance for people, communities and businesses impacted by the drought. The proclamation further requested that all urban water users immediately increase their water conservation activities in an effort to reduce their individual water use by 20 percent.

[6] One acre-foot is equivalent to 325,851 gallons.
[7] http://gov.ca.gov/press-release/9796
[8] http://gov.ca.gov/press-release/11556/

In response to the Governor's proclamation, the California legislature has proposed Assembly Bill (AB) 49 – Water Efficiency[9] and Senate Bill (SB) 261 – Urban Water Efficiency[10]. These proposed bills will require a 10 percent reduction of urban water use by 2015 and 20 percent by 2020. However, these proposed bills will allow the use of non-potable or recycled water to count towards the progress in meeting these targets.

Water districts, in response to the drought, have also taken actions throughout the state such as: 1) asking for voluntary reductions; 2) imposing mandatory restrictions or declaring a local emergency; 3) imposing agricultural rationing; 4) imposing drought rates, surcharges and fines; 5) limiting new development and requiring water efficient landscaping; and, 6) implementing a conservation campaign. In addition, water shortages have prompted cities to begin infrastructure improvements to secure future water supplies. For example, the Los Angeles Department of Water and Power (LADWP), in conjunction with the West Basin Municipal Water District (WBMWD), is constructing the Harbor Refineries Recycled Water Pipeline Project (HRRWPP) to conserve potable water and instead produce and convey recycled water to multiple industrial and irrigation customers in the Los Angeles Harbor area[11].

The SWRCB, and the nine regional water quality control boards (RWQCB), are responsible for protecting surface and groundwater supplies in California. In particular, the SWRCB establishes water-related policies and approves water quality control plans, which are implemented and enforced by RWQCBs. Five RWQCBs have jurisdiction over areas within the boundaries of the SCAQMD. These agencies also regulate discharges to state waters through federal pre-treatment requirements enforced by the publicly-owned treatment works (POTWs).

Water quality of regional surface water and groundwater resources is affected by point source and non-point source discharges occurring throughout individual watersheds. Regulated point sources, such as wastewater treatment effluent discharges, usually involve single discharge into receiving waters. Non-point sources involve diffuse and non-specific runoff that enters receiving waters through storm drains or from unimproved natural landscaping. Within the regional Basin Plans, the RWQCBs establish water quality objectives for surface water and groundwater resources and designate beneficial uses for each identified body of water.

Much of the urbanized areas in Los Angeles County, where the majority of the facilities affected by the proposed project are located, is serviced by two large POTWs operating on the coast as follows: the City of Los Angeles Bureau of Sanitation Hyperion Facility and the Joint Outfall System of the Los Angeles County Sanitation District (LACSD). Each of these facilities discharges an average of over 250 million gallons per day (MMgal/day).

The City of Colton, where one facility (CPCC) affected by the proposed project is located[12], owns, operates and maintains a wastewater collection, pumping and treatment system referred to as the Colton Water Reclamation Facility (CWRF). The CWRF also serves the City of Grand Terrace and unincorporated County areas. The plant utilizes a conventional and extended aeration secondary treatment process to product-treated effluent in compliance with RWQCB regulations. In addition, a regional tertiary treatment plant serving both the Cities of Colton and

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9 http://info.sen.ca.gov/pub/09-10/bill/asm/ab_0001-0050/ab_49_bill_20090909_proposed.html

10 http://info.sen.ca.gov/pub/09-10/bill/sen/sb_0251-0300/sb_261_bill_20090713_amended_asm_v93.html

11 The EIR for HRRWPP, SCH No. 2008121093, was certified by the LADWP Board of Harbor Commissioners on October 20, 2009.

12 CPCC, located in San Bernardino County, does not discharge wastewater offsite.

San Bernardino treats the effluent from the wastewater treatment plant and returns the water to the Santa Ana River. The average daily flows at the CWRF are approximately 5.6 MMgal/day.

Transportation and Traffic

The transportation system in Southern California is a complex intermodal network designed to carry both people and goods. It consists of roads and highways, public transit, paratransit, bus and rail, freight railroads, airports, seaports and intermodal terminals. The regional highway system consists of an interconnected network of local streets, arterial streets, freeways, carpool lanes and toll roads. This highway network allows for the operation of private autos, carpools, private and public buses, and trucks. Non-motorized transportation modes, such as bicycles share many of these facilities. The regional public transit system includes local shuttles, municipal and area-wide public bus operations, rail rapid transit operations, regional commuter rail services, and inter-regional passenger rail service. The freight railroad network includes an extensive system of private railroads and several publicly owned freight rail lines serving industrial cargo and goods. The airport system consists of commercial, general, and military aviation facilities serving passenger, freight, business, recreational, and defense needs. The region's seaports support substantial international and interregional freight movement and tourist travel. Intermodal terminals consisting of freight processing facilities serve the function of transfer, storage and distribution of goods. The transportation system supports the region's economic needs as well as the demand for personal travel.

The regional transportation system is currently at capacity operations during peak periods. The highway system shows substantial freeway congestion in the morning and evening peak period, with random episodes of incident-related (e.g., accident) congestion throughout the day. The transit system is experiencing substantial overcrowding on a number of core urban bus routes with significant excess capacity on most off-peak and peripheral routes. Rail transit is very close to capacity during peak hours on the Metro Blue Line, Metro Red Line, and Metro Gold Line, while the Metro Green Line generally has some capacity available. Commuter rail service is at or near capacity during peak periods as the routes approach Union Station in downtown Los Angeles, but suburb-to-suburb capacity is available on most lines.

Summary of Chapter 4 - Environmental Impacts

CEQA Guidelines §15126(a) requires that a CEQA document shall identify and focus on the "significant environmental effects of the proposed project." Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects.

The Initial Study identified and described those environmental topics where the proposed project could cause significant adverse environmental impacts (i.e., aesthetics, air quality, energy, hazards and hazardous materials, hydrology and water quality, and, transportation and traffic). Analysis of these environmental topics revealed that potentially significant air quality impacts may result from construction activities resulting from installing new air pollution control equipment.

The type of emission reduction projects that may be undertaken to comply with PAR 2002 are the main focus of the analysis in this PEA. There are multiple source categories with multiple approaches to reducing SOx. With so many possibilities or permutations of how operators of SOx RECLAIM facilities could achieve actual SOx reductions, there is no way to predict what each facility operator will do. For this reason, the proposed project analysis is bifurcated into two options to illustrate the worst-case effects of applying the various SOx control technologies along with demonstrating the flexibility that is provided by the RECLAIM program to facility operators when it comes to choosing the methods for reducing SOx emissions. Both options focus on the installation and operation of SOx control technologies for FCCUs, SRU/TGUs, sulfuric acid plants, coke calciners, glass melting furnaces, cement manufacturers, and refinery boilers and heaters. The main differences between Option 1 and Option 2 are: 1) the type of SOx control technique that may be applied to the FCCU source category; and, 2) the environmental impacts that may result from having different SOx control techniques applied to the FCCU source category. However, the type of SOx controls and associated environmental impacts for the remaining source categories will be the same for both Option 1 and Option 2.

The following subsections briefly summarize the analysis of potential adverse environmental impacts from the implementation of the proposed project.

Aesthetics

Physical modifications may result as part of implementing the proposed project and will vary depending on the equipment source category/process. The analysis in this CEQA document is based on the assumption that new air pollution control equipment is expected to be installed and existing air pollution control equipment is expected to be modified as part of implementing the proposed project at 11 affected facilities. Aesthetic impacts associated with the installation of new SOx control equipment, in particular, wet gas scrubbers (WGSs), were determined in the NOP/IS to be potentially significant and, as such, are evaluated in this PEA. Specifically, for any installation of a WGS, operational aesthetic impacts resulting from a substantial visible steam (water vapor) plume that would emanate from the WGS stack were evaluated in this PEA. The size of each WGS and the height needed for the associated stack were also considered in the evaluation.

The analysis will show that if any WGS is installed as part of the proposed project at any of the affected facilities, the steam plume, though visible, is not expected to significantly adversely affect the visual continuity of the surrounding area of each affected facility because no scenic highways or corridors exist within the areas of the refineries, the coke calciner, the sulfuric acid plants and the glass melting plant. Further, the visual continuity of the surrounding area is not expected to be adversely impacted because each WGS, if constructed, will be built within the confines of industrial areas and would be visually consistent with the profiles of the existing affected facilities. Thus, even if each WGS could be visible, depending on the location within each property boundary, the aesthetic significance criteria would not be exceeded. Further, the analysis shows that the proposed project is not expected to create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. For these reasons, less than significant aesthetics impacts during operation are expected from the proposed project.

In addition, implementation of the proposed project is expected to result in construction activities at some or all of the affected facilities, which are complex industrial facilities. Due to the large size profiles of the affected equipment, the construction activities associated with installing control equipment are expected to require the use of heavy-duty construction equipment, such as cranes, which may temporarily change the skyline of the affected facilities, depending on where they are located within each facility's property. However, because each affected facility is located in a heavy industrial area, the construction equipment is not expected to be substantially discernable from what would be needed for routine operations and maintenance activities. For these reasons, the construction activities are expected to blend in with the existing industrial environment and thus, are not expected to affect the visual continuity of the surrounding areas.

Overall, the aesthetics impacts were determined to be less than significant during both construction and operation for the proposed project.

Air Quality

The proposed project is expected to result in anticipated reductions of at least 2.9 tons per day of SOx emissions by 2014 from 11 facilities. In order to achieve the overall net air quality benefit from implementing the proposed project, some of the affected facilities may choose to modify existing equipment by retrofitting with air pollution control technologies in order to comply with the shave of SOx RTCs.

The physical changes involved that may occur as a result of implementing the proposed project focus on the installation of new or the modification of existing control equipment on the following types of equipment and processes at SOx RECLAIM facilities: 1) petroleum coke calciner; 2) cement kilns; 3) coal-fired boiler (cogeneration); 4) container glass melting furnaces; 5) fluid catalytic cracking units (FCCUs); 6) refinery boilers/heaters[13]; 7) sulfur recovery units/tail gas treatment units; and, 8) sulfuric acid manufacturing. Table 1-2 summarizes the potential control technologies that may be considered as part of implementing the proposed project.

Construction activities associated with installing or modifying existing air pollution control equipment are expected and have the potential to generate significant adverse air quality impacts. In addition, operational activities due to periodic truck trips such as the delivery of supplies to support the operations of the various control technologies, the removal of waste, or the sale of elemental sulfur recovered from the control processes are also expected and have the potential to generate significant adverse air quality impacts for greenhouse gases.

Table 1-2
Potential Control Technologies per Equipment/Source Category

Equipment/Source Category	Potential Control Technology
FCCU	WGS or SOx Reducing Additives
Sulfur Recovery Units/ Tail Gas Treatment Units	WGS or Selective Oxidation Catalyst
Refinery Boilers/Heaters	FGT
Sulfuric Acid Manufacturing	WGS or Upgrade Existing Controls
Petroleum Coke Calciner	WGS
Container Glass Melting Furnace	WGS
Cement Kiln	DGS (Absorber)
Coal-fired Boiler (cogeneration)	DGS (Absorber)

Key: WGS = wet gas scrubber; FGT = fuel gas treatment; DGS = dry gas scrubber

Cumulative air quality impacts from the proposed project and all other AQMP control measures considered together are not expected to be significant because the amount of emission reductions to be achieved by the proposed project for SOx are expected to meet the emission reduction projections and commitments made by control measures in the 2007 AQMP. Even though the proposed project may cause a temporary and significant adverse increase in emissions during

[13] Although the proposed project does not establish a new BARCT level for refinery boilers/heaters, it is conceivable that certain existing refinery boilers/heaters that are not meeting current BARCT levels could be retrofit candidates for future reductions. Therefore, the refinery boiler/heater source category is included in this analysis.

construction, the temporary net increase in emissions combined with the total net accumulated emission reductions projected overall would not interfere with the air quality progress and attainment demonstration projected in the AQMP. Indeed, the 2007 AQMP indicated that, based on future anticipated overall reduction in emissions, the Basin would achieve the federal ozone ambient air quality standard by the year 2024 and the PM2.5 standard by 2015 (SCAQMD, 2007). Further, in accordance with the 2007 AQMP emission inventory trends, average annual daily CO and VOC emissions are projected to be reduced, which in spite of significant CO and VOC construction emissions for the proposed project, implementing the control measures in the 2007 AQMP will result in an overall net reduction in CO and VOC emissions. Therefore, cumulative air quality impacts from the proposed project and all other AQMP control measures, when considered together, are not expected to be significant because implementation of all AQMP control measures is expected to result in net emission reductions and overall air quality improvement.

With regard to GHG emissions, the proposed project involves combustion processes which could generate GHG emissions such as CO2, CH4, and N2O. However, the proposed project does not affect equipment or operations that have the potential to emit other GHGs such as SF6, HFCs or PFCs. Implementing the proposed project is expected to increase GHG emissions that exceed the SCAQMD's GHG significance threshold for industrial sources. In addition, implementing the proposed project is expected to generate significant adverse cumulative GHG air quality impacts.

Energy

Implementation of the proposed project is expected to increase the amount of energy needed to both construct and operate the new and modified air pollution control devices associated with the existing facilities affected by the proposed project. During construction, increased use of electricity, plus gasoline and diesel fuels are expected from on- and off-road vehicle and equipment use. Operational activities of the new and modified air pollution control equipment are expected to result in an overall decrease in the use of natural gas (a benefit), but an increase in electricity. In addition, an increased use of diesel fuel associated with supply delivery trips and waste removal trips is expected as part of day-to-day operations. Despite the potential increases in energy use overall as part of implementing the proposed project, the increases are not expected to exceed the energy significance thresholds.

Hazards and Hazardous Materials

Implementation of the proposed project may alter the hazards and hazardous materials associated with the existing facilities affected by the proposed project. Air pollution control equipment and related devices are expected to be installed or modified at affected facilities such that their operations may increase the quantity of materials used in the control equipment, some of which are hazardous. For example, the proposed project could result in the increased use of catalysts and SOx reducing additives, amine additives, and caustic agents; some of these materials are hazardous while others are not. Thus, the routine transport of hazardous materials, use, and disposal of hazardous materials may increase as a result of the proposed project. The hazards analysis focuses on the materials used that may be hazardous.

In addition, because operation of the new or modified air pollution control equipment, by design, is also expected to reduce SOx, which is an amalgam of multiple hazardous materials, the proposed project is expected to result in a corresponding reduction of hazardous materials. Thus, the hazards analysis also considers the benefits (i.e., the capture of more hazardous materials) of implementing the proposed project. The overall analysis concluded that the proposed project would generate less than significant adverse hazards/hazardous materials impacts.

Hydrology and Water Quality

Implementation of the proposed project may cause hydrology and water quality impacts associated with the existing facilities affected by the proposed project. Specifically, the installation of WGSs and DGSs (limestone absorbers), the installation of new or modification of existing FGT systems, and upgrading existing sulfuric acid plant controls all involve an increased demand for water and an increased amount of wastewater discharge. However, the use of selective oxidation catalyst and/or SOx reducing catalysts as part of implementing the proposed project, do not utilize water or generate wastewater and, therefore, are not expected to create hydrology and water quality impacts.

For water demand, there are three significance thresholds based on whether: 1) the total water demand of the proposed project is less than five million gallons per day; 2) the existing water supply has the capacity to meet the increased demands of the proposed project; and, 3) the potable water demand is a substantial use of water. The analysis shows that the increased potential demand for total water that may result from implementing the proposed project is not expected to exceed the significance threshold of five million gallons of total water demand per day. Further, based on discussions with the local water suppliers, the existing water supply is expected to have the capacity to meet the increased demands of the proposed project. However, because the entire state of California is in the midst of a severe drought, a water supply analysis relative to the current and future availability of potable water and the use of recycled water and industrial-use groundwater to satisfy some of the water demand needs of the proposed project was conducted. While the total water demand for the proposed project will not exceed the significance thresholds for total water, based on the definition of "water demand project" in CEQA Guidelines §15155, the potential increase in potable water demand may be considered a substantial use of potable water. Therefore, the proposed project may cause significant potable water demand impacts.

Relative to water quality, the analysis will also show that implementing the proposed project may increase the amount of wastewater discharged from certain affected facilities. However, the potential increases will not cause a permit revision to any affected facility's wastewater permit and as such, will not exceed the wastewater significance threshold. For this reason, the wastewater impacts from the proposed project are expected to be less than significant.

Transportation and Traffic

Implementation of the proposed project may cause adverse transportation and traffic impacts associated with the existing facilities affected by the proposed project. Specifically, construction-based traffic associated with the installation of WGSs and DGSs, the installation of new or modification of existing fuel gas treatment (FGT) systems, and upgrading existing sulfuric acid plant controls are expected from construction workers, delivery trucks and haul trucks. During operation of the proposed project, regular deliveries and waste disposal activities are expected to increase at each of the affected facilities. Despite the increases, the analysis shows that the transportation and traffic impacts, though adverse, are less than significant for the proposed project.

Potential Environmental Impacts Found Not To Be Significant

The Initial Study for the proposed project includes an environmental checklist of approximately 17 environmental topics to be evaluated for potential adverse impacts from a proposed project.

Review of the proposed project at the NOP/IS stage identified six topics, aesthetics, air quality, energy, hazards and hazardous materials, hydrology and water quality, and, transportation and traffic, for further review in the ~~Draft~~ Final PEA. Where the Initial Study concluded that the project would have no significant direct or indirect adverse effects on the remaining environmental topics, of the comments received on the NOP/IS or at the public meetings, none of the comments changed this conclusion. The screening analysis concluded that the following environmental areas would not be significantly adversely affected by the proposed project:

- agriculture resources
- biological resources
- cultural resources
- geology/soils
- land use and planning
- mineral resources
- noise
- population and housing
- public services
- recreation
- solid/hazardous waste

The NOP/IS for the proposed project was circulated for a 30-day review and comment period from June 19, 2009, to July 21, 2009. At the time the NOP/IS was circulated, the environmental checklist did not include impacts to forest lands as a topic to be evaluated as part of a CEQA document. However, subsequent to the release of the NOP/IS, amendments to the CEQA Guidelines adopted by the Natural Resources Agency became effective on March 18, 2010. These amendments also contained revisions to the environmental checklist, Appendix G; these revisions included the consideration of impacts to forestry lands in the environmental analysis. Specifically, the topic of "Agriculture Resources" in the checklist was revised and renamed as "Agriculture and Forest Resources" and questions were added to address the consideration of impacts to forest resources.

Although the NOP/IS did not include a preliminary analysis of forest resources, to make the analysis of environmental impacts consistent with the recent changes to the environmental checklist, a discussion of indirect impacts from the proposed project that could conflict with, or cause rezoning of forest land has been included in this section of the ~~Draft~~ Final PEA. No significant impacts on forest resources were identified.

Consistency

The Southern California Association of Governments (SCAG) and the SCAQMD have developed, with input from representatives of local government, the industry community, public health agencies, the USEPA-Region IX and the California Air Resources Board (CARB), guidance on how to assess consistency within the existing general development planning process in the Basin. Pursuant to the development and adoption of its Regional Comprehensive Plan Guide (RCPG), SCAG has developed an Intergovernmental Review Procedures Handbook (June 1, 1995). The SCAQMD also adopted criteria for assessing consistency with regional plans and the AQMP in its CEQA Air Quality Handbook. The proposed project is considered to be consistent with SCAG's RCPG because it does not interfere with achieving any of the goals identified in any of the RCPG policies.

Other CEQA Topics

CEQA documents are required to address the potential for irreversible environmental changes, growth-inducing impacts and inconsistencies with regional plans. Consistent with the Final Program Environmental Impact Report (EIR) prepared for the 2007 AQMP, additional analysis of the proposed project confirms that it would not result in irreversible environmental changes or the irretrievable commitment of resources, foster economic or population growth or the construction of additional housing, or be inconsistent with regional plans.

Summary Chapter 5 - Alternatives

Three alternatives to the proposed project are summarized in Table 1-3: Alternative A (No Project), Alternative B (AQMP), and Alternative C (Intermediate SOx Reductions). Pursuant to the requirements in CEQA Guidelines §15126.6 (b) to mitigate or avoid the significant effects that a project may have on the environment, a comparison of the potentially significant adverse air quality and hydrology (water demand) impacts from each of the project alternatives for the individual rule components that comprise the proposed project is provided in Table 1-4. The alternatives comparison in Table 1-4 also addresses the topics of aesthetics, energy, hazards and hazardous materials, water quality, and transportation/traffic. Aside from these topics, no other potentially significant adverse impacts were identified for the proposed project or any of the project alternatives. The proposed project is considered to provide the best balance between emission reductions and the adverse environmental impacts due to construction and operation activities while meeting the objectives of the project. Therefore, the proposed project is preferred over the project alternatives.

Table 1-3
Summary of PAR 2002 & Project Alternatives

Rule Components										
Basic Equipment	**BARCT**	**Proposed Project**	**SOx Reduction Potential** (tons/day)	**Alternative A:** No Project	**SOx Reduction Potential** (tons/day)	**Alternative B:** AQMP	**SOx Reduction Potential** (tons/day)	**Alternative C:** Intermediate SOx Reductions	**SOx Reduction Potential** (tons/day)
FCCU	WGS or SOx Reducing Additive	5 ppm SOx (3.25 lbs SOx/1000 bbl)	2.88[14]	No SOx limit	0	Same as Alternative A: No Project	0	Same as Proposed Project	2.88[~~12~~14]
SRU/TGU	WGS or Selective Oxidation Catalyst	5 ppm SOx (combusted tail gas) & 10 ppm H2S / 300 ppm non-H2S (non-combusted tail gas) (5.28 lbs SOx/hr)	0.73[15]	No SOx limit	0	Same as Alternative A: No Project	0	Same as Alternative A: No Project	0
Sulfuric Acid Mfg.	WGS or upgrade existing controls	10 ppm SOx (0.14 lbs SOx/ton acid)	1.03	No SOx limit	0	Same as Proposed Project	1.03	Same as Proposed Project	1.03
Coke Calciner	WGS	10 ppm SOx (0.07 lbs SOx/ton coke)	0.28	No SOx limit	0	Same as Proposed Project	0.28	Same as Proposed Project	0.28
Glass Melting Furnace	WGS	5 ppm SOx (0.03 lbs SOx/ton glass)	0.19	No SOx limit	0	Same as Proposed Project	0.19	Same as Proposed Project	0.19
Cement Kiln	Limestone Absorber	5 ppm SOx (0.04 lbs SOx/ton clinker)	0.25	No SOx limit	0	Same as Alternative A: No Project	0	Same as Proposed Project	0.25
Coal-fired Boiler	DGS or Limestone Absorber	5 ppm SOx	0[16]	No SOx limit	0	Same as Alternative A: No Project	0	Same as Alternative A: No Project	0
Refinery Boilers/ Heaters	FGT	40 ppm SOx (6.76 lbs SOx/mmscf)	0.85[17]	No SOx limit	0	Same as Alternative A: No Project	0	Same as Proposed Project	0.85[17]
Potential SOx Emission Reductions			**6.21**		**0**		**1.50**		**5.48**
Proposed RTC Shave			6.14		0		3.00		5.32
2005 Excess SOx RTCs			1.75		0		1.75		1.75
Minimum SOx Emission Reductions Needed[12]			**4.39**		**0**		**1.25**		**3.57**

Key: WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber; FGT = Fuel Gas Treatment

[14] The estimated amount of SOx potentially reduced excludes the data for Facility D because installing a WGS is not cost-effective for this facility. However, the estimated amount of SOx potentially reduced includes the data for Facility C because a WGS is already installed.

[15] The estimated amount of SOx potentially reduced excludes the data for Facility E and Facility G because installing a WGS or Emerachem unit is not cost-effective for these facilities.

[16] This equipment is currently not operating at Facility K.

[17] The proposed project neither establishes a new BARCT level for refinery boilers/heaters nor requires additional reductions from this source category. However, cost-effective emission reductions in the amount of 0.85 tons per day are potentially available from future retrofits in this source category and the environmental impacts from such controls are evaluated in this analysis but the potential emission reductions are excluded from the proposed RTC shave.

Table 1-4
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Aesthetics	Visible steam plumes and new, tall stacks from installing/operating 11 WGSs as follows: FCCU: 4 WGSs SRU/TGU: 3 WGSs Sulfuric Acid: 1 WGS Coke Calciner: 1 WGS Glass Melting: 2 WGSs	Visible steam plumes and new, tall stacks from installing/operating 7 WGSs as follows: SRU/TGU: 3 WGSs Sulfuric Acid: 1 WGS Coke Calciner: 1 WGS Glass Melting: 2 WGSs	No installation of WGS (i.e., no visible steam plumes and no new, tall stacks) expected.	Visible steam plumes and new, tall stacks from installing/operating 4 WGSs as follows: Sulfuric Acid: 1 WGS Coke Calciner: 1 WGS Glass Melting: 2 WGSs	Visible steam plumes and new, tall stacks from installing/operating 8 WGSs as follows: FCCU: 4 WGSs Sulfuric Acid: 1 WGS Coke Calciner: 1 WGS Glass Melting: 2 WGSs	Visible steam plumes and new, tall stacks from installing/operating 4 WGSs as follows: Sulfuric Acid: 1 WGS Coke Calciner: 1 WGS Glass Melting: 2 WGSs
Aesthetics Impacts Significant?	Less than significant, but more than the proposed project- Option 2.	Less than significant, but less than the proposed project - Option 1.	Not Significant	Less than significant, and less than the proposed project for both Options 1 and 2.	Less than significant, and less than the proposed project Option 1 and more than the proposed project Option 2.	Less than significant, and less than the proposed project for both Options 1 and 2.
Air Quality	• Decreases total operational SOx emissions by 6.21 tons/day (tpd) as follows: FCCU: 2.88 tpd SRU/TGU: 0.73 tpd Sulfuric Acid: 1.03 tpd Coke Calciner: 0.28 tpd Glass Melting: 0.19 tpd Cement Kiln: 0.25 tpd Coal-fired Boiler: 0 tpd Refinery Boilers/Heaters: 0.85 tpd	• Decreases total operational SOx emissions by 6.21 tpd as follows: FCCU: 2.88 tpd SRU/TGU: 0.73 tpd Sulfuric Acid: 1.03 tpd Coke Calciner: 0.28 tpd Glass Melting: 0.19 tpd Cement Kiln: 0.25 tpd Coal-fired Boiler: 0 tpd Refinery Boilers/Heaters: 0.85 tpd	No decreases in total operational SOx emissions.	• Decreases total operational SOx emissions by 1.50 tpd as follows: Sulfuric Acid: 1.03 tpd Coke Calciner: 0.28 tpd Glass Melting: 0.19 tpd	• Decreases total operational SOx emissions by 5.48 tpd as follows: FCCU: 2.88 tpd Sulfuric Acid: 1.03 tpd Coke Calciner: 0.28 tpd Glass Melting: 0.19 tpd Cement Kiln: 0.25 tpd Refinery Boilers/Heaters: 0.85 tpd	• Decreases total operational SOx emissions by 5.48 tpd as follows: FCCU: 2.88 tpd Sulfuric Acid: 1.03 tpd Coke Calciner: 0.28 tpd Glass Melting: 0.19 tpd Cement Kiln: 0.25 tpd Refinery Boilers/Heaters: 0.85 tpd

Table 1-4 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Air Quality (concluded)	• Increases total GHGs by: - 39,020 MT/yr without mitigation; and. - 38,771 MT/yr with mitigation. • Increases operational use of NaOH (a TAC) by 13.24 tpd. • Increases peak daily operation emissions as follows: VOC: 1 lb/day CO: 5 lb/day NOx: 15 lb/day PM10: 1 lb/day PM2.5: 1 lb/day • Increases peak daily construction emissions as follows: VOC: 89 lb/day CO: 461 lb/day NOx: 464 lb/day SOx: 1 lb/day PM10: 159 lb/day PM2.5: 53 lb/day	• Increases total GHGs by: - 19,662 MT/yr without mitigation; and. - 19,580 MT/yr with mitigation. • Increases operational use of NaOH (a TAC) by 8.79 tpd. • Increases peak daily operation emissions as follows: VOC: 1 lb/day CO: 4 lb/day NOx: 13 lb/day PM10: 1 lb/day PM2.5: 1 lb/day • Increases peak daily construction emissions as follows: VOC: 89 lb/day CO: 461 lb/day NOx: 464 lb/day SOx: 1 lb/day PM10: 159 lb/day PM2.5: 53 lb/day	No increases in any emissions.	• Increases total GHGs by: - 6,567 MT/yr without mitigation; and. - 6,522 MT/yr with mitigation. • Increases operational use of NaOH (a TAC) by 5.45 tpd. • Increases peak daily operation emissions as follows: NOx: 1 lb/day • Increases peak daily construction emissions as follows: VOC: 89 lb/day CO: 461 lb/day NOx: 464 lb/day SOx: 1 lb/day PM10: 159 lb/day PM2.5: 53 lb/day	• Increases total GHGs by: - 34,159 MT/yr without mitigation; and. - 33,911 MT/yr with mitigation. • Increases operational use of NaOH (a TAC) by 13.24 tpd. • Increases peak daily operation emissions as follows: VOC: 1 lb/day CO: 4 lb/day NOx: 13 lb/day PM10: 1 lb/day PM10: 1 lb/day PM2.5: 1 lb/day • Increases peak daily construction emissions as follows: VOC: 89 lb/day CO: 461 lb/day NOx: 464 lb/day SOx: 1 lb/day PM10: 159 lb/day PM2.5: 53 lb/day	• Increases total GHGs by: - 14,805 MT/yr without mitigation; and. - 14,723 MT/yr with mitigation. • Increases operational use of NaOH (a TAC) by 8.79 tpd. • Increases peak daily operation emissions as follows: VOC: 1 lb/day CO: 4 lb/day NOx: 11 lb/day PM10: 1 lb/day • Increases peak daily construction emissions as follows: VOC: 89 lb/day CO: 461 lb/day NOx: 464 lb/day SOx: 1 lb/day PM10: 159 lb/day PM2.5: 53 lb/day

Table 1-4 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Air Quality Impacts Significant?	• Less than significant, achieves equivalent SOx emission reductions during operation to the proposed project - Option 2. • Significant for GHGs, more than the proposed project - Option 2. • Less than significant for TACs use (NaOH) during operation, but more than the proposed project - Option 2. • Significant for NOx, VOC, and PM10 during construction and equivalent to the proposed project - Option 2. • Less than significant for VOC, CO, NOx, PM10 and PM2.5 during operation and more than the proposed project - Option 2.	• Less than significant, achieves equivalent SOx emission reductions during operation to the proposed project - Option 1. • Significant for GHGs, less than the proposed project - Option 1. • Less than significant for TACs use (NaOH) during operation, but less than the proposed project - Option 1. • Significant for NOx, VOC, and PM10 during construction and equivalent to the proposed project - Option 1. • Less than significant for VOC, CO, NOx, PM10 and PM2.5 during operation and less than the proposed project - Option 1.	Not significant for any pollutant during construction or operation but does not achieve required AQMP SOx emission reductions during operation.	• Less than significant, achieves the least amount of SOx emission reductions during operation than the proposed project for both Options 1 and 2. • Less than significant for GHGs, less than the proposed project for both Options 1 and 2. • Less than significant for TACs use (NaOH) during operation, and less than the proposed project for both Options 1 and 2.~~, but equivalent to the proposed project - Option 2.~~ • Significant for NOx, VOC, and PM10 during construction; equivalent to the proposed project for both Options 1 and 2. • Less than significant for VOC, CO, NOx, PM10 and PM2.5 during operation and less than the proposed project for both Options 1 and 2.	• Less than significant, achieves less SOx emission reductions during operation than the proposed project for both Options 1 and 2. • Significant for GHGs, but less than the proposed project - ~~for both~~ Option~~s~~ 1 and more than the proposed project - Option 2. • Less than significant for TACs use (NaOH) during operation, and equivalent to the proposed project - Option 1, and more than the proposed project - Option 2. • Significant for NOx, VOC, and PM10 during construction; equivalent to the proposed project for both Options 1 and 2. • Less than significant for VOC, CO, NOx, PM10 and PM2.5 during operation and less than the proposed project - Option 1 and equivalent to the proposed project – Option 2.	• Less than significant, achieves less SOx emission reductions during operation than the proposed project for both Options 1 and 2. • Significant for GHGs, but less than the proposed project for both Options 1 and 2. • Less than significant for TACs use (NaOH) during operation, and less than the proposed project - Option 1, but equivalent to the proposed project - Option 2. • Significant for NOx, VOC, and PM10 during construction; equivalent to the proposed project for both Options 1 and 2. • Less than significant for VOC, CO, NOx, PM10 and PM2.5 during operation and less than the proposed project for both Options 1 and 2.

Table 1-4 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Energy	• During operation, - Overall reduction in the use of natural gas by 4.1 mmBTU/day; - Overall increase in the use of electricity by 204 MWh/day; and, - Overall increase in the use of diesel by 2,403 gal/day. • During construction, - Overall increase in the use of gasoline by 1,354 ~~1,384~~ gal/day; and, - Overall increase in the use of diesel by 1,360 gal/day.	• During operation, - Overall reduction in the use of natural gas by 4.1 mmBTU/day; - Overall increase in the use of electricity by 101 MWh/day; and, - Overall increase in the use of diesel by 2,037 gal/day; • During construction, - Overall increase in the use of gasoline by 1,354 ~~1,384~~ gal/day; and, - Overall increase in the use of diesel by 1,360 gal/day.	During both operation and construction, no increases in energy uses.	• During operation, - No change in the use of natural gas; - Overall increase in the use of electricity by 33 MWh/day; and, - Overall increase in the use of diesel by 105 gal/day. • During construction, - Overall increase in the use of gasoline by 1,354 ~~1,384~~ gal/day; and, - Overall increase in the use of diesel by 1,360 gal/day.	• During operation, - Overall reduction in the use of natural gas by 34.25 mmBTU/day; - Overall increase in the use of electricity by 182 MWh/day; and, - Overall increase in the use of diesel by ~~1,703~~2,133 gal/day. • During construction, - Overall increase in the use of gasoline by 1,354 ~~1,384~~ gal/day; and, - Overall increase in the use of diesel by 1,360 gal/day.	• During operation, - Overall reduction in the use of natural gas by 34.25 mmBTU/day; - Overall increase in the use of electricity by 79 MWh/day; and, - Overall increase in the use of diesel by ~~1,330~~1,767 gal/day. • During construction, - Overall increase in the use of gasoline by 1,354 ~~1,384~~ gal/day; and, - Overall increase in the use of diesel by 1,360 gal/day.

Table 1-4 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Energy Impacts Significant?	Less than significant, more than the proposed project - Option 2 as follows: • The reduction in the use of natural gas is ~~not as much as the~~equivalent to the proposed project - Option 2; • The increase in the use of electricity is more than the proposed project - Option 2; • The total increase in the use of diesel is more than the proposed project - Option 2; and, • The increase in the use of gasoline is equivalent to the proposed project for both Options 1 and 2.	Less than significant, less than the proposed project - Option 1 as follows: • The reduction in the use of natural gas is ~~more than~~equivalent to the proposed project - Option 1; • The increase in the use of electricity is less than the proposed project - Option 1; • The total increase in the use of diesel is less than the proposed project - Option 1; and, • The increase in the use of gasoline is equivalent to the proposed project for both Options 1 and 2.	Not significant (no change)	Less than significant, less than the proposed project for both Options 1 and 2 as follows: • There is no change in the use of natural gas; • The increase in the use of electricity is less than the proposed project for both Options 1 and 2; • The total increase in the use of diesel is less than the proposed project for both Options 1 and 2; and, • The increase in the use of gasoline is equivalent to the proposed project for both Options 1 and 2.	Less than significant, less than the proposed project – Option 1 as follows: • The reduction in the use of natural gas is more than the proposed project for both Options 1 and 2; • The increase in the use of electricity is less than the proposed project - Option 1 and more than the proposed project - Option 2; • The total increase in the use of diesel is less than the proposed project for ~~both~~ Option~~s~~ 1 and more than the proposed project for Option 2; and, • The increase in the use of gasoline is equivalent to the proposed project for both Options 1 and 2.	Less than significant, less than the proposed project for both Options 1 and 2 as follows: • The reduction in the use of natural gas is more than the proposed project for both Options 1 and 2; • The increase in the use of electricity is less than the proposed project for both Options 1 and 2; • The total increase in the use of diesel is less than the proposed project for both Options 1 and 2; and, • The increase in the use of gasoline is equivalent to the proposed project for both Options 1 and 2.
Hazards & Hazardous Materials	Increased use of 13.24 tons/day of NaOH (a TAC) used during operation.	Increased use of 8.79 tons/day of NaOH (a TAC) used during operation.	No change to existing hazards and hazardous materials used.	Increased use of 5.45 tons/day of NaOH (a TAC) used during operation.	Increased use of 13.24 tons/day of NaOH (a TAC) used during operation.	Increased use of 8.79 tons/day of NaOH (a TAC) used during operation.

Table 1-4 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Hazards & Hazardous Materials Impacts Significant?	Less than significant, more than the proposed project - Option 2.	Less than significant, less than the proposed project - Option 1.	Not significant	Less than significant, less than the proposed project for both Options 1 and 2.	Less than significant, equivalent to the proposed project - Option 1.	Less than significant, equivalent to the proposed project - Option 2.
Hydrology & Water Quality	• During operation, increase in total water demand by 883,368 gal/day (of which up to 201,587 gal/day may be supplied by potable water); and, increase in the generation of wastewater by 270,532 gal/day. • During peak daily construction activities, increase in water demand by 52,272 gal/day.	• During operation, increase in total water demand by 642,272 gal/day (of which up to 108,436 gal/day may be supplied by potable water); and, increase in the generation of wastewater by 158,203 gal/day. • During peak daily construction activities, increase in water demand by 52,272 gal/day.	No change to existing water demand or wastewater discharge.	• During operation, increase in total water demand by 125,285 gal/day (of which up to 105,696 gal/day may be supplied by potable water); and, increase in the generation of wastewater by 40,669 gal/day. • During peak daily construction activities, increase in water demand by ~~52,272~~7,020 gal/day.	• During operation, increase in total water demand by 529,121 gal/day (of which up to 201,587 gal/day may be supplied by potable water); and, increase in the generation of wastewater by 199,573 gal/day. • During peak daily construction activities, increase in water demand by 52,272 gal/day.	• During operation, increase in total water demand by 288,025 gal/day (of which up to 108,436 gal/day may be supplied by potable water); and, increase in the generation of wastewater by 87,244 gal/day. • During peak daily construction activities, increase in water demand by 52,272 gal/day.
Hydrology & Water Quality Impacts Significant?	• Significant for water demand (based on potable water), more than the proposed project - Option 2. • Less than significant for wastewater discharge, more than the proposed project - Option 2.	• Less than significant for water demand (based on potable water), less than the proposed project - Option 1. • Less than significant for wastewater discharge, less than the proposed project - Option 1.	Not significant for water demand or wastewater discharge.	• Less than significant for water demand (based on potable water), less than the proposed project for both Options 1 and 2. • Less than significant for wastewater discharge, less than the proposed project for both Options 1 and 2.	• Significant for water demand (based on potable water), and less than the proposed project for both Options 1 and 2. • Less than significant for wastewater discharge, and less than the proposed project - Option 1 and more than the proposed project - Option 2.	• Less than significant for water demand (based on potable water), and less than the proposed project for both Options 1 and 2. • Less than significant for wastewater discharge, and less than the proposed project for both Options 1 and 2.

Table 1-4 (concluded)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Transportation & Traffic	Overall peak increase in transportation and traffic of 700 trips per day during construction and 33 trips per day during operation.	Overall peak increase in transportation and traffic of 700 trips per day during construction and 30 trips per day during operation.	No change to existing transportation and traffic.	Overall peak increase in transportation and traffic of 700 trips per day during construction and 5 trips per day during operation.	Overall peak increase in transportation and traffic of 700 trips per day during construction and 27 trips per day during operation.	Overall peak increase in transportation and traffic of 700 trips per day during construction and 20 trips per day during operation.
Transportation & Traffic Impacts Significant?	Less than significant, but equivalent to ~~more than~~ the proposed project – Option 2 for ~~both~~ construction and more than the proposed project – Option 2 for operation.	Less than significant, but equivalent to ~~less than~~ the proposed project – Option 1 for ~~both~~ construction and less than the proposed project – Option 1 for operation.	Not significant	Less than significant, but less than the proposed project for both Options 1 and 2.	Less than significant, but less than the proposed project for both Options 1 and 2.	Less than significant, but less than the proposed project for both Options 1 and 2.

CHAPTER 2

PROJECT DESCRIPTION

Project Location
Project Background
Project Objective
Project Description
Technology Overview

PROJECT LOCATION

The SCAQMD has jurisdiction over an area of 10,473 square miles (referred to hereafter as the District), consisting of the four-county South Coast Air Basin and the Riverside County portions of the Salton Sea Air Basin (SSAB) and the Mojave Desert Air Basin (MDAB). The Basin, which is a subarea of the SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The 6,745 square-mile Basin includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portion of the SSAB and MDAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of both Riverside County and the SSAB and is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (Figure 2-1).

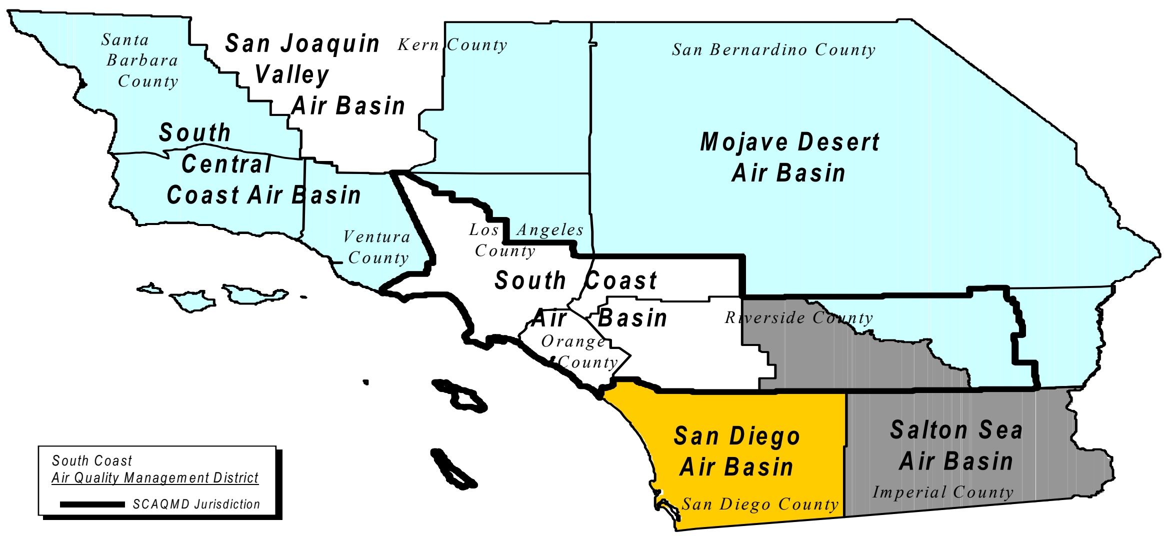

Figure 2-1
Boundaries of the South Coast Air Quality Management District

Of the 11 facilities affected by the proposed project, 10 facilities are located in Los Angeles County (in the cities of Los Angeles, Carson, Wilmington, El Segundo, Torrance, and Vernon) and one facility is located in San Bernardino county (in the city of Colton).

PROJECT BACKGROUND

Adopted in October 1993, Regulation XX – RECLAIM, is comprised of 11 rules which contain a declining cap and trade mechanism to reduce NOx and SOx emissions from the largest stationary sources in the Basin. The portion of Regulation XX that focuses on reducing NOx emissions is referred to as "NOx RECLAIM" while the portion that focuses on reducing SOx emissions is referred to as "SOx RECLAIM." Regulation XX contains applicability requirements, NOx and SOx facility allocations, general requirements, as well as monitoring, reporting, and recordkeeping requirements for NOx and SOx sources located at RECLAIM facilities. The

RECLAIM program started with 41 SOx facilities and 392 NOx facilities, but by the end of the 2005 compliance year, the program is populated with 33 SOx facilities and 304 NOx facilities. The reduction in the number of facilities participating in the RECLAIM program since inception has been primarily due to facility shutdowns.

Under the SOx RECLAIM program, the RECLAIM facilities were issued annual allocations of SOx emissions (also known as facility caps), which declined annually from 1993 until 2003 and remained constant after 2003. In 1993, annual allocations were issued to the RECLAIM facilities and the facility cap reflected BARCT in effect at that time. SCAQMD staff has since conducted a BARCT reassessment for NOx in 2005 which was incorporated into changes in facility allocations, but not for SOx. A BARCT reassessment is now necessary for SOx RECLAIM to assure that the participating facilities will continue to achieve emission reductions as expeditiously as possible. Under the RECLAIM program, the facilities have the flexibility to install air pollution control equipment, change method of operations, or purchase RTCs to meet BARCT levels.

PROJECT OBJECTIVE

There are four key goals of the proposed project. The primary focus of the proposed project is to bring the SOx RECLAIM program up-to-date with the latest BARCT requirements to achieve the maximum feasible reductions including, at a minimum, the proposed SOx emission reductions in CM #2007CMB-02 (at least 2.9 tons per day). Another objective of the proposed project is to establish procedures and criteria for reducing RTCs and RTC adjustment factors for year 2013 and later. The third objective is to comply with state law as promulgated in Health and Safety Code §39616 to provide equivalent or greater emission reductions with current command-and-control regulations. Lastly, a goal of the proposed project is to reduce SOx emissions to assist the SCAQMD with attaining and maintaining state and federal ambient air quality standards for PM10 and PM2.5.

PROJECT DESCRIPTION

The proposed project would affect the following types of equipment and processes at SOx RECLAIM facilities: 1) petroleum coke calciners; 2) cement kilns; 3) coal-fired boiler (cogeneration); 4) container glass melting furnace; 5) diesel combustion; 6) fluid catalytic cracking units; 7) refinery boilers/heaters; 8) sulfur recovery units/tail gas treatment units; and, 9) sulfuric acid manufacturing. The following is a summary of the key proposed amendments to Rule 2002. Other minor changes are also proposed for clarity and consistency throughout the rule. No other Regulation XX rules are affected by the currently proposed project. A copy of the proposed amended rule can be found in Appendix A.

Proposed Amended Rule 2002 – Allocations for Oxides of Nitrogen (NOx) and Oxides of Sulfur (SOx)

<u>Annual Allocations for NOx and SOx and Adjustments to RTC Holdings - subdivision (f)</u>

In accordance with the analysis prepared for Control Measure #2007CMB-02 in the 2007 AQMP which estimates an additional reduction in SOx RECLAIM emissions of 2.9 tons per day, new criteria, procedures, adjustment factors and equations for adjusting tradable/usable and non-tradable/non-usable SOx RTC holdings have been added to subdivision (f), specifically, subparagraphs (f)(1)(I-L) in order to achieve at least these projected emission reductions from

SOx RTC holders beginning in compliance year 2012 through compliance year 2019 and after. The actual amount of reductions varies and depends on the compliance year.

New subparagraph (f)(1)(M) establishes procedures for publishing SOx RTC adjustment factors. New subparagraph (f)(1)(N) establishes procedures for calculating a 12-month rolling average of SOx RTC prices. Subparagraph (f)(1)(O) contains new procedures for holding a public hearing in the event that SOx RTC prices exceed $50,000 per ton based on a 12-month rolling average.

New subparagraph (f)(1)(P) contains criteria for submitting the emission reductions obtained via the RTC Holdings adjustments to the SIP.

New subparagraph (f)(1)(Q) contains procedures for assigning SOx allocations to facilities that enter the RECLAIM program after the date of adoption of the proposed rule amendments.

Paragraph (f)(1) contains two clarifications: 1) that SOx Allocations for 2004 through 2011 are equal to the facility's 2003 Allocation; and, 2) that NOx RTC Allocations and holdings subsequent to the year 2006 and SOx Allocations and holdings subsequent to the year 2011 shall be adjusted to the nearest pound. Lastly, subparagraph (f)(1)(B) contains a clarification to include RTC swap transactions into the computation of rolling average prices.

<u>RECLAIM NOx 2011 Ending Emission Factors – Table 3</u>
Table 3 has been revised to extend the RECLAIM NOx ending emission factors from 2010 to 2011. This revision is an administrative change for consistency and continuity with the changes adopted in the January 2005 amendments to the NOx RECLAIM program.

<u>RECLAIM SOx Tier III Emission Factors – Table 4</u>
New Table 4 has been added to Rule 2002 to establish BARCT for petroleum coke calciners, cement kilns, coal-fired boilers, container glass melting furnaces, diesel combustion, fluid catalytic cracking units, refinery boilers and heaters, sulfur recovery units/tail gas treatment units, and sulfuric acid manufacturing.

<u>List of SOx RECLAIM Holders – Table 5</u>
New Table 5 has been added to Rule 2002 to identify the list of holders of SOx RECLAIM RTCs.

TECHNOLOGY OVERVIEW

<u>SOx Emission Sources</u>

The SOx RECLAIM program consists of 33 facilities as of the 2005 Compliance Year. Of these 33, 12 RECLAIM facilities represent the top emitters of SOx (i.e., emit 95 percent of the total SOx emissions from all RECLAIM facilities). However, one of the 12 facilities has permanently shutdown. For this reason, the analysis of the proposed project will focus on the 11 remaining facilities and reducing SOx emissions from these top emitters. The affected facilities are:

- Six refineries: BP (Carson location); ConocoPhillips (Wilmington and Carson locations); Chevron; ExxonMobil; Ultramar (also referred to as Valero); and, Tesoro (formerly referred to as Shell/Equilon/Texaco)
- Two sulfuric acid plants: Rhodia Inc. and ConocoPhillips (Wilmington location)

- One coke calciner plant: BP (Wilmington location)
- One cement manufacturing plant: CPCC[18]
- Two container glass manufacturing plants: Owens-Brockway Glass Container Inc. and Saint-Gobain Containers Inc.[19]

On an equipment/process basis, Table 2-1 shows the distribution of SOx emissions with respect to the equipment/processes at these top emitting SOx RECLAIM facilities. These source categories are responsible for 80 percent of the facility emissions.

Table 2-1
Distribution of SOx Emissions at RECLAIM Facilities By Equipment/Process

Equipment/Process	Percentage of Emissions
FCCUs	33%
Refinery Process Heaters and Boilers	31%
Sulfuric Acid Manufacturing	12%
Sulfur Recovery Units and Tail Gas Units	10%
Cement Kilns and Glass Melting Furnaces	7%
Other Miscellaneous Processes/Equipment	7%

Reference: Baseline emissions from Compliance Year 2005

Of the top emitting facilities, six refineries operate one FCCU each, one sulfur recovery and tail gas unit (SRU/TGU) each, and a multitude of refinery process heaters and boilers[20]. The quantity of SOx emissions from the six refineries alone comprise approximately 74 percent of the total SOx emitted from the top emitting RECLAIM facilities that will be affected by the proposed project. The remaining facilities emit 26 percent of the total.

To appreciate the mechanics of SOx control equipment and techniques, it is necessary to first understand how SOx emissions are generated from the equipment and processes listed in Table 1-1.

<u>FCCUs</u>

The purpose of an FCCU at a refinery is to convert or "crack" heavy oils (hydrocarbons), with the assistance of a catalyst, into gasoline and lighter petroleum products. Each FCCU consists of three main components: a reaction chamber, a catalyst regenerator and a fractionator. All six refineries each operate one FCCU.

The cracking process begins in the reaction chamber where fresh catalyst is mixed with pre-heated heavy oils (crude) known as the fresh feed. The catalyst typically used for cracking is a fine powder made up of tiny particles with surfaces covered by several microscopic pores. A high heat-generating chemical reaction occurs that converts the heavy oil liquid into a cracked hydrocarbon vapor mixed with catalyst. As the cracking reaction progresses, the cracked hydrocarbon vapor is routed to a distillation column or fractionator for further separation into

[18] On November 20, 2009, CPCC operators announced the shutdown of both cement kilns. CPCC operators indicated that the shutdown is not permanent to the extent that when the economy improves, they plan to bring the cement kilns back on-line.

[19] Saint-Gobain Glass Container has permanently shutdown their operations.

[20] There are approximately 300 refinery boilers and heaters operating at all of the refineries and approximately 15 of these units are considered top SOx emitters.

lighter hydrocarbon components than crude such as light gases, gasoline, light gas oil, and cycle oil.

Towards the end of the reaction, the catalyst surface becomes inactive or spent because the pores are gradually coated with a combination of heavy oil liquid residue and solid carbon (coke), thereby reducing its efficiency or ability to react with fresh heavy liquid oil in the feed. To prepare the spent catalyst for re-use, the remaining oil residue is removed by steam stripping. The spent catalyst is later cycled to the second component of the FCCU, the regenerator, where hot air burns the coke layer off of the surface of each catalyst particle to produce reactivated or regenerated catalyst. Subsequently, the regenerated catalyst is cycled back to the reaction chamber and mixed with more fresh heavy liquid oil feed. Thus, as the heavy oils enter the cracking process through the reaction chamber and exit the fractionator as lighter components, the catalyst continuously circulates between the reaction chamber and the regenerator.

During the regeneration cycle, large quantities of catalyst are lost in the form of catalyst fines or particulates thus making FCCUs a major source of primary particulate emissions at refineries. In addition, particulate precursor emissions such as SOx (because crude oil naturally contains sulfur) and NOx, additional secondary particulates (i.e., formed as a result of various chemical reactions), plus carbon monoxide (CO) and carbon dioxide (CO2) are produced due to coke burn-off during the regenerator process.

The potential available control technologies to reduce SOx emissions from a FCCU are:

1. Processing of low sulfur feed stocks;
2. Feed hydro-treating;
3. Flue gas scrubbing via wet gas scrubbers (WGSs);
4. Using SOx reducing catalyst; or,
5. Using a combination of these control technologies.

The type of SOx control option to be utilized in response to the proposed project for FCCUs will depend on each refinery's individual operations and the current control technologies and techniques in place. For example, all six refineries already process low sulfur feed stocks and utilize feed hydrotreating for their FCCUs. Thus, it is possible that each refinery may choose to rely on a WGSs or SOx reducing catalysts in order to comply with the BARCT requirements for the FCCU portion of the proposed project.

<u>Refinery Process Heaters and Boilers</u>

Refinery process heaters and boilers are used extensively throughout various processes in refinery operations such as distillation, hydrotreating, fluid catalytic cracking, alkylation, reforming, and delayed coking. There are approximately 300 refinery process heaters and boilers operating throughout the six aforementioned refineries and the top 16 emitters in this category collectively emitted about one ton per day of SOx in 2005. Refinery process heaters and boilers are primarily fueled by refinery gas, one of several products generated at a refinery. In addition, most refinery process heaters and boilers are designed to also operate on natural gas, but liquid or solid fuels are rarely used.

SOx is created from the combustion of fuel that contains sulfur or sulfur compounds. To reduce SOx emissions from these refinery process heaters and boilers, the refinery operators can opt to use lower sulfur-containing fuels to reduce the sulfur input on the front end (e.g., fuel gas treatment), or to install flue gas scrubber (wet scrubber) to reduce SOx emissions in the flue gas after it exits the refinery process heaters and boilers on the back end. Because the Consultants' Reports determined that utilizing a flue gas scrubber was not cost-effective for this source category, this ~~Draft~~ Final PEA (in Chapter 4) will evaluate the possibility that each refinery may rely on the fuel gas treatment control option in order to comply with the refinery process heaters and boilers portion of the proposed project.

Sulfur Recovery Units and Tail Gas Units (SRU/TGUs)

Because sulfur is a naturally occurring and undesirable component of crude oil, refineries employ a sulfur recovery system to maximize sulfur removal. A typical sulfur removal or recovery system will include a sulfur recovery unit (e.g., Claus unit) followed by a tail gas treatment unit (e.g., amine treating) for maximum removal of hydrogen sulfide (H2S). A Claus unit consists of a reactor, catalytic converters and condensers. Two chemical reactions occur in a Claus unit. The first reaction occurs in the reactor, where a portion of H2S reacts with air to form sulfur dioxide (SO2) followed by a second reaction in the catalytic converters where SO2 reacts with H2S to form liquid elemental sulfur. Side reactions producing carbonyl sulfide (COS) and carbon disulfide (CS2) can also occur. These side reactions are problematic for Claus plant operators because COS and CS2 cannot be easily converted to elemental sulfur and carbon dioxide. Liquid sulfur is recovered after the final condenser. The combination of two converters with two condensers in series will generally remove as much as 95 percent of the sulfur from the incoming acid gas. To increase removal efficiency, some newer sulfur recovery units may be designed with three to four sets of converters and condensers.

To recover the remaining sulfur compounds after the final pass through the last condenser, the gas is sent to a tail gas treatment process such as a SCOT or Wellman-Lord treatment process. For example, the SCOT tail gas treatment is a process where the tail gas is sent to a catalytic reactor and the sulfur compounds in the tail gas are converted to H2S. The H2S is absorbed by a solution of amine in the H2S absorber, steam-stripped from the absorbent solution in the H2S stripper, concentrated, and recycled to the front end of the sulfur recovery unit. This approach typically increases the overall sulfur recovery efficiency of the Claus unit to 99.8 percent or higher. However, the fresh acid gas feed rate to the sulfur recovery unit is reduced by the amount of recycled stream, which reduces the capacity of the sulfur recovery unit. The residual H2S in the treated gas from the absorber is typically vented to a thermal oxidizer where it is oxidized to sulfur dioxide (SO2) before venting to the atmosphere.

The Wellman-Lord tail gas treatment process is when the sulfur compounds in the tail gas are first incinerated to oxidize to SO2. After the incinerator, the tail gas enters a SO2 absorber, where the SO2 is absorbed in a sodium sulfite (Na2SO3) solution to form sodium bisulfite (NaHSO3) and sodium pyrosulfate (Na2S2O5). The absorbent rich in SO2 is then stripped, and the SO2 is recycled back to the beginning of the Claus unit. The residual sulfur compounds in the treated tail gas from the SO2 absorber are then vented to a thermal oxidizer where they are oxidized to SO2 before venting to the atmosphere.

There are three main strategies that can be employed to further reduce SO2 emissions from each SRU/TGU operating at the six refineries: 1) increase the efficiency of the sulfur recovery unit; 2) improve the efficiency of the tail gas treatment process; and, 3) install a wet gas scrubber as an alternative to the thermal oxidizer[21]. The type of SOx control option to be utilized in response to this portion of the proposed project will depend on each refinery's individual operations and

[21] All six refineries have thermal oxidizers at the end of their tail gas treatment units.

the current control technologies and techniques in place. Thus, this ~~Draft~~ Final PEA (in Chapter 4) will evaluate the possibility that each refinery may rely on the SOx control strategies identified above in order to comply with the sulfur recovery/tail gas treatment unit portion of the proposed project.

Sulfuric Acid Manufacturing

Sulfuric acid is a commodity chemical that is used in manufacturing phosphate and nitrogen fertilizers, detergents, paper, and rust removers. It is also used extensively in automobile manufacturing, metal smelting, water treatment and oil refining processes. There are two facilities in the Basin that manufacture sulfuric acid. The sulfuric acid manufacturing process includes three basic operations. First, the sulfur in the feedstock is oxidized to sulfur dioxide (SO2) in a furnace. The SO2 is then catalytically oxidized (using vanadium as the catalyst) to sulfur trioxide (SO3) in a multi-staged catalytic reactor (or converter). Lastly, the sulfur trioxide is absorbed (e.g., combined with water) to create a strong sulfuric acid (H2SO4) solution.

In a dual or two-stage absorption process, the SO3 gas formed from the primary converter is sent to a first absorber where most of the SO3 is removed to form H2SO4. The remaining unconverted SO2 and SO3 are directed to a secondary converter and absorber set to further remove H2SO4.

The conversion of SO2 to H2SO4 is an incomplete, exothermic reaction which means that there is always one to two percent of SO2 that does not get converted to H2SO4. The success of conversion is affected by the number of stages in the catalytic converter, the amount of catalyst used, temperature and pressure, and the concentrations of the reactants, SO2 and elemental oxygen (O2). The remaining SO2 in the exhaust gas stream from the absorbers is vented to ESPs, scrubbers, and mist eliminators to remove SO2 and acid mist prior to venting to the atmosphere. Because the conversion of SO2 to H2SO4 is exothermic (e.g., produces a great deal of heat), the heat is recovered and converted into useful energy for operating steam-driven compressors, waste heat boilers, and heat exchangers. This ~~Draft~~ Final PEA (in Chapter 4) will evaluate the possibility that the operators of the sulfuric acid manufacturing facilities may consider installing a WGSs or upgrading existing controls in order to comply with the BARCT requirements for this portion of the proposed project.

Container Glass Melting Furnace

A container glass melting furnace is the main equipment used for manufacturing glass products, such as bottles, glass wares, pressed and blown glass, tempered glass, and safety glass. The manufacturing process consists of four phases: 1) preparation of the raw materials; 2) melting the mixture of raw materials in the furnace; 3) forming the desired shape; and, 4) finishing the final product. Raw materials, such as sand, limestone, and soda ash, are crushed and mixed with cullets (recycled glass pieces) to ensure homogeneous melting. The raw materials mixture is then conveyed to a continuous regenerative side-port melting furnace. As the mixture enters the furnace through a feeder, it melts and blends with the molten glass already in the furnace, and eventually flows to a refiner section, forming machine, and annealing ovens. The final products undergo inspection, testing, packaging and storage. Any damaged or undesirable glass is transferred back to be recycled as cullets.

SOx is generated from a container glass melting furnace in two ways: 1) during the decomposition of the sulfates in the raw materials; and, 2) from combusting fuel (that contains sulfur) to generate high heating values in the furnace. The container glass melting furnace contributes over 99 percent of the total SOx emissions from a glass manufacturing plant.

SOx emissions from a container glass melting furnace are typically controlled by a scrubber followed by a dry electrostatic precipitator (ESP) to control particulates. Two glass melting facilities are in the SOx RECLAIM program, but only one of these facilities is currently operating. The type of SOx control option to be utilized in response to the proposed project will depend on this facility's individual operations and the current control technologies and techniques in place. Thus, this ~~Draft~~ Final PEA (in Chapter 4) will evaluate the possibility that operators of the glass melting facility may rely on WGS technology to further control SOx emissions in order to comply with the BARCT requirements for the FCCU portion of the proposed project.

Petroleum Coke Calciner

Petroleum coke, the heaviest portion of crude oil, cannot be recovered in the normal oil refining process. Instead, it is processed in a delayed coker unit to generate a carbonaceous solid referred to as "green coke," a commodity. To improve quality of the product, if the green coke has a low metals content, it will be sent to a calciner to make calcined petroleum coke. Calcined petroleum coke can be used to make anodes for the aluminum, steel, and titanium smelting industry. If the green coke has a high metals content, it is used as a fuel grade coke by the fuel, cement, steel, calciner and specialty chemicals industries.

The process of making calcined petroleum coke begins when the green coke feed from the delayed coker unit is screened and transported to the calciner unit where it is stored in a covered coke storage barn. The screened and dried green coke is introduced into the top end of a rotary kiln and is tumbled by rotation under high temperatures that range between 2,000 and 2,500 degrees Fahrenheit (^{o}F). The rotary kiln relies on gravity to move coke through the kiln countercurrent to a hot stream of combustion air produced by the combustion of natural gas or fuel oil. As the green coke flows to the bottom of the kiln, it rests in the kiln for approximately one additional hour to eliminate any remaining moisture, impurities, and hydrocarbons. Once discharged from the kiln, the calcined coke is dropped into a cooling chamber, where it is quenched with water, treated with de-dusting agents to minimize dust, and carried by conveyors to storage tanks. Eventually, the calcined coke is transported by truck to the Port of Long Beach for export, or is loaded onto railcars for shipping to domestic customers.

Because sulfur is a naturally occurring and undesirable component of crude oil, it remains a component of the green coke after it exits the delayed coking unit. As the green coke is processed under high heat conditions in the rotary kiln, SOx emissions are generated. SOx is also generated from combusting fuel oil (that contains sulfur) to generate high heating values in the rotary kiln.

There is only one petroleum coke calciner in the Basin and the SOx emissions from the unit are controlled by a dry scrubber. The existing control system also includes a spray dryer, a reverse-air baghouse, a slurry storage system, a slurry circulating system, and a pneumatic conveying system. Calcium hydroxide (CaOH) slurry is the absorbing medium for the existing SO2 control system. The type of SOx control option to be utilized in response to the proposed project will depend on this facility's individual operations and the current control technologies and techniques in place. Thus, this ~~Draft~~ Final PEA (in Chapter 4) will evaluate the possibility that operators of the petroleum coke calcining facility may rely on a WGS to better control SOx emissions in order to comply with the BARCT requirements for the petroleum coke calcining portion of the proposed project.

<u>Cement Kiln and Coal-Fired Boiler</u>
Of the two Portland cement manufacturing facilities located in the Basin, CPCC and TXI Riverside Cement Company (TXI), the quantity of SOx emissions from CPCC at 100.5 tons per year is substantially greater than TXI's SOx emissions at 0.7 ton per year for compliance year 2005. Because the proposed project is directed at reducing emissions from the top SOx emitters, the following discussion is limited to reducing SOx emissions at the CPCC facility.

CPCC manufactures gray Portland cement in two cement kilns and follows a four-step process of: 1) acquiring raw materials; 2) preparing the raw materials to be blended into a raw mix; 3) pyroprocessing of the raw mix to make clinker; and, 4) grinding and milling clinker into cement. The raw materials used for manufacturing cement include calcium, silica, alumina and iron, with calcium having the highest concentration. These raw materials are obtained from a limestone quarry for calcium, sand for silica; and shale and clay for alumina and silica.

The raw materials are crushed, milled, blended into a raw mix and stored. Primary, secondary and tertiary crushers are used to crush the raw materials until they are about ¾-inch or smaller in size. Raw materials are then conveyed to rock storage silos. Belt conveyors are typically used for this transport. Roller mills or ball mills are used to blend and pulverize raw materials into fine powder. Pneumatic conveyors are typically used to transport the fine raw mix to be stored in silos until it is ready to be pyroprocessed.

The pyroprocess in a kiln consists of three phases during which clinker is produced from raw materials undergoing physical changes and chemical reactions. The first phase in a kiln, the drying and pre-heating zone, operates at a temperature between 70 ^{o}F and 1650 ^{o}F and evaporates any remaining water in the raw mix of materials entering the kiln. Essentially this is the warm-up phase which stabilizes the temperature of the refractory fire brick inside the mouth opening of the kiln. The second phase, the calcining zone, operates at a temperature between 1100 ^{o}F and 1650 ^{o}F and converts the calcium carbonate from the limestone in the kiln feed into calcium oxide and releases carbon dioxide. During the third phase, the burning zone operates on average at 2200 ^{o}F to 2700 ^{o}F (though the flame temperature can exceed 3400 ^{o}F) during which several reactions and side reactions occur. The first reaction is calcium oxide (produced during the calcining zone) with silicate to form dicalcium silicate and the second reaction is the melting of calcium oxide with alumina and iron oxide to form the liquid phase of the materials. Despite the high temperatures, the constituents of the kiln feed do not combust during pyroprocessing. As the materials move towards the discharge end of the kiln, the temperature drops and eventually clinker nodules form and volatile constituents, such as sodium, potassium, chlorides, and sulfates, evaporate. Any excess calcium oxide reacts with dicalcium silicate to form tricalcium silicate. The red hot clinker exits the kiln, is cooled in the clinker cooler, passes through a crusher and is conveyed to storage for protection from moisture. Since clinker is water reactive, if it gets wet, it will set into concrete.

Heat used in CPCC's kilns is supplied through the combustion of different fuels such as coal, coke, oil, natural gas, and discarded automobile tires. The combustion gases are vented to a baghouse for dust control, and the collected dust is returned to the process or recycled if they meet certain criteria, or is discarded to landfills. Post-combustion control for SOx is not currently used at CPCC.

In addition to the cement kilns, another potential source of SOx emissions at CPCC could be from the coal-fired steam boiler due to the high sulfur content in coal. CPCC reported that the coal-fired steam boiler has not been in operation since 2002. In addition on November 20, 2009, CPCC operators shut down both of their cement kilns due to the economic downturn. CPCC operators indicated that they could begin operating their equipment again in the future if circumstances with the nation's economy improve.

SOx emissions from the cement kilns and coal-fired boiler are generated from the following: 1) combustion of sulfur in the fuel; and, 2) oxidation of sulfides (e.g., pyrites) in the raw materials entering the cement kiln. Fuel switching, process alterations, dry and wet scrubbers are commercially available control technologies to reduce SOx emissions. The type of scrubber to be utilized in response to the proposed project will depend on this facility's individual operations and how it will function with the current control technologies and techniques in place at CPCC (e.g., the baghouse). The control equipment considered for this facility has been analyzed by a contracted consultant (ETS Inc.) as part of the SOx RECLAIM rule development process[22] and ETS Inc. recommended that operators of CPCC may rely on dry gas scrubber technology to further control SOx emissions in order to comply with the BARCT requirements for the cement kiln and coal-fired boiler portion of the proposed project. Thus, this ~~Draft~~ Final PEA (in Chapter 4) will evaluate the possibility that a dry gas scrubber technology may be installed at CPCC.

SOx Control Technologies

On an equipment/process basis, Table 2-2 shows the control technologies that will be considered as part of the BARCT analysis for the proposed project. The following discussions will elaborate on the various technologies listed in Table 2-2.

Table 2-2
BARCT Control Technologies Under Consideration for SOx Emitting Equipment/Processes

Equipment/Process	BARCT Control Technology
FCCUs	1. WGS 2. SOx Reducing Additives
Sulfur Recovery Units/Tail Gas Units	1. WGS 2. Selective Oxidation Catalyst
Sulfuric Acid Manufacturing	WGS or Upgrade Existing Controls
Petroleum Coke Calciner	WGS
Cement Kilns and Coal-Fired Boiler	DGS (Limestone Absorber)
Container Glass Melting Furnaces	WGS
Refinery Process Heaters and Boilers	FGT

Wet Gas Scrubbers (WGSs)

Wet gas scrubbers are used to control both SOx and particulate emissions and can be installed on petroleum coke calciners, cement kilns and coal-fired boilers, container glass melting furnaces,

[22] On July 11, 2008, the SCAQMD Governing Board approved release of a Request for Proposal to obtain proposals from qualified contractors with technical expertise and experience in SOx emissions control technologies. Two qualified contractors, ETS Inc. and Nexidea Inc., were selected to conduct engineering evaluations and cost estimates on existing commercially viable control technologies to further reduce SOx emissions from 11 SOx RECLAIM facilities. These evaluations resulted in facility-specific information that assisted staff in identifying potential BARCT to be implemented to help the Basin attain the PM2.5 ambient air quality standards.

FCCUs, refinery process heaters and boilers, sulfuric acid manufacturing, and sulfur recovery units/tail gas units. There are two types of wet gas scrubbers: 1) caustic-based non-regenerative WGS; and, 2) regenerative WGS.

In non-regenerative wet gas scrubbing, caustic soda (sodium hydroxide - NaOH) or other alkaline reagents, such as soda ash, are used as an alkaline absorbing reagent (absorbent) to capture SO2 emissions. The absorbent captures SO2 and sulfuric acid mist (H2SO4) and converts it to various types of sulfites and sulfates (e.g., NaHSO3, Na2SO3, and Na2SO4). The absorbed sulfites and sulfates are later separated by a purge treatment system and the treated water, free of suspended solids, is either discharged or recycled.

One example of the caustic-based non-regenerative scrubbing system is the proprietary Electro Dynamic Venturi (EDV) scrubbing system offered by BELCO Technologies Corporation. An EDV scrubbing system consists of three main modules: 1) a spray tower module; 2) a filtering module; and, 3) a droplet separator module. The flue gas enters the spray tower module, which is an open tower with multiple layers of spray nozzles. The nozzles supply a high density stream of caustic water that is directed in a countercurrent flow to the gas flow and encircles, encompasses, wets, and saturates the flue gas. Multiple stages of liquid/gas absorption occur in the spray tower module and SO2 and acid mist are captured and converted to sulfites and sulfates. Large particles in the flue gas are also removed by impaction with the water droplets.

The flue gas saturated with heavy water droplets continues to move up the wet scrubber to the filtering module where the flue gas reaches super-saturation. At this point, water continues to condense and the fine particles in the gas stream begin to cluster together, to form larger and heavier groups of particles. Next, the flue gas, super-saturated with heavy water droplets, enters the droplet separator module causing the water droplets to impinge on the walls of parallel spin vanes and drain to the bottom of the scrubber.

The spent caustic water purged from the WGS is later processed in a purge treatment unit. The purge treatment unit contains a clarifier that removes suspended solids for disposal. The effluent from the clarifier is oxidized with agitated air to help convert sulfites to sulfates and also reduce the chemical oxygen demand (COD) so that the effluent can be safely discharged to a waste water system.

A regenerative WGS removes SO2 from the flue gas by using a buffer solution that can be regenerated. The buffer is then sent to a regenerative plant where the SO2 is extracted as concentrated SO2. The concentrated SO2 is then sent to a sulfur recovery unit (SRU) to recover the liquid SO2, sulfuric acid and elemental sulfur as a by-product. When the inlet SO2 concentrations are high, a substantial amount of sulfur-based by-products can be recovered and later sold as a commodity for use in the fertilizer, chemical, pulp and paper industries. For this reason, the use of a regenerative WGS is favored over a non-regenerative WGS.

One example of a regenerative scrubber is the proprietary LABSORB offered by BELCO Technologies Corporation [23, 24]. The LABSORB scrubbing process uses a patented non-organic

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[23] *Evaluating Wet Scrubbers*, Edwin H. Weaver of BELCO Technologies Corporation, Petroleum Technology Quarterly, Quarter 3, 2006.

[24] *A Logical and Cost Effective Approach for Reducing Refinery FCCU Emissions.* S.T. Eagleson, G. Billemeyer, N. Confuorto, and E. H. Weaver of BELCO, and S. Singhania and N. Singhania of Singhania Technical Services Pvt., India, Presented at PETROTECH 6th International Petroleum Conference in India, January 2005.

aqueous solution of sodium phosphate salts as a buffer. This buffer is made from two common available products, caustic and phosphoric acid. The LABSORB system consists of: 1) a quench pre-scrubber; 2) an absorber; and, 3) a regeneration section which typically includes a stripper and a heat exchanger.

In the scrubbing side of the regenerative scrubbing system, the quench pre-scrubber is used to wash out any large particles that are carried over, plus any acid components in the flue gas such as hydrofluoric acid (HF), hydrochloric acid (HCl), and SO3. The absorption of SO2 is carried out in the absorber. The absorber typically consists of one single, high-efficiency packed bed scrubber filled with high-efficiency structural packing material. However, if the inlet SO2 concentration is low, a multiple-staged packed bed scrubber, or a spray-and-plate tower scrubber, may be used instead to achieve an ultra-low outlet SO2 concentration.

The third step in the regenerative wet gas scrubbing system is the regenerative section in which the SO2-rich buffer stream is steam heated to evaporate the water from the buffer. The buffer stream is then sent to a stripper/condenser unit to separate the SO2 from the buffer. The buffer free of SO2 is returned to the buffer mixing tank while the condensed-SO2 gas stream is sent back to the SRU for further treatment.

<u>Dry Gas Scrubbers (DGS)</u>
Dry gas scrubbers are used to control SOx emissions and can be installed to control emissions from cement kilns and coal-fired boilers, container glass melting furnaces, and refinery boilers and heaters. In dry gas scrubbers, a dry calcium- and sodium-based alkaline powdered sorbent is used to absorb SO2 from the flue (outlet) gas stream. There are two types of DGSs: 1) spray dryer scrubbers; and, 2) dry injection scrubbers.

A spray dryer scrubber is configured so that the reaction between SO2 in the flue gas and the dry sorbent takes place in a separate, dedicated reactor (or scrubber). A dry injection scrubber is configured so that the sorbent is injected directly via multiple injection ports into the SO2-producing equipment or ducting system. Spray dryer scrubbers can achieve about 80 percent to 90 percent SO2 removal efficiency, while dry injection scrubbers can achieve about 50 percent to 80 percent SO2 removal efficiency.

DGSs require high temperatures in the range of 1,800 ^{o}F to 2,000 ^{o}F in order to decompose the sorbent into porous solids with high adsorbing surface area to ensure efficient SO2 removal. Because particulates are formed during the dry gas scrubbing process, cyclones and ESPs are additional control equipment units that are typically installed downstream of a dry scrubber.

<u>SOx Reducing Additives</u>
To help reduce condensable particulate matter from sulfur, SOx reducing additives (catalysts) are used for reducing the production of SOx by-products in FCCUs. SOx reducing catalyst is a metal oxide compound such as aluminum oxide (Al2O3), magnesium oxide (MgO), vanadium pentoxide (V2O5) or a combination of the three that is added to the FCCU catalyst as it circulates throughout the reactor. In the regenerator of the FCCU, sulfur bearing coke is burned and SO2, CO, and CO2 by-products are formed. A portion of SO2 will react with excess oxygen and form SO3 which will either stay in the flue gas or react with the metal oxide in the SOx reducing catalyst to form metal sulfate. In the FCCU reactor, the metal sulfate will react with hydrogen to form either metal sulfide and water, or more metal oxide. In the steam stripper section of the FCCU reactor, metal sulfide reacts with steam to form metal oxide and hydrogen

sulfide. The net effect of these reactions is that the quantity of SOx in the regenerator is typically reduced between 40 to 65 percent while the quantity of hydrogen sulfide (H2S) in the reactor is increased. Generally, the increase in H2S is handled by sulfur recovery processes located elsewhere within the refinery.

FCCUs operate with a primary or base catalyst injection system that maintains a continuous or semi-continuous addition of fresh catalyst to the catalyst inventory circulating between the regenerator and the reactor. The catalyst injection system typically includes a main catalyst source but it can also accommodate the injection of other additives such as SOx reducing catalysts. The main catalyst feed lines and the additive catalyst feed lines are connected to the FCCU by a process line equipped with a blower or air compressor to provide pressurized fluid, such as air, that is utilized to inject all of the various powdered catalysts into the FCCU.

To introduce the SOx reducing catalyst into an FCCU, an intermittent catalyst addition system can be used. The addition system will automatically inject catalyst via an addition hopper which is periodically fed by gravity from a storage hopper which is sealed off from the supply line. The addition hopper is then pressurized with air to discharge its contents to the carrier gas line which feeds the catalyst into the hydrocarbon conversion unit in the regenerator section of the FCCU. The catalyst addition can be controlled by an electronic timer or pneumatic (pressurized) valve system so as to inject the precise amount of catalyst required as evenly as possible over the course of each day.

The size (capacity) of the additive injection system varies from refinery to refinery and can range from one ton capacity to over 50 tons. Many refineries already have silos to hold bulk fresh catalyst and some systems are sized and designed to operate with additive shipping containers and bulk trucks.

<u>Fuel Gas Treatment (FGT)</u>

Currently, SCAQMD Rule 431.1 – Sulfur Content of Gaseous Fuels, limits the sulfur content in refinery fuel gas to 40 ppmv sulfur. This limit has already been incorporated in the SOx RECLAIM allocations and resulted in an emission factor of 6.76 pounds of SOx per million cubic feet of refinery gas. However, the sulfur content in refinery fuel gas may be further reduced to a range between 25 ppmv and 35 ppmv and the outlet SOx concentrations from refinery boilers and process heaters may also be limited to less than 20 ppmv by implementing efficiency improvements to fuel gas treatment.

Refinery fuel gas, commonly used for operating refinery process heaters and boilers, is treated in various acid gas processing units such as an amine, Merox[25] or Sulfinol[26] treating unit for removal of sour components such as hydrogen sulfide (H2S), carbonyl sulfide (COS), mercaptan, and ammonia. Lean amine is generally used as an absorbent. At the end of the process, the lean amine is regenerated to form rich amine, and H2S is recovered in acid gas which is then fed to the SRU/TGU for more processing. By improving the efficiency of the amine treating unit to recover more sulfur from the inlet acid gas stream, the sulfur content in the

[25] Merox is an acronym for mercapatan oxidation and the treatment process is a proprietary catalytic chemical process used for removing mercaptans from refinery fuel gas by converting them to liquid hydrocarbon disulfides. Merox treatment is an alkaline process that typically uses an aqueous solution of sodium hydroxide (NaOH) or caustic.

[26] The Sulfinol process uses an industrial solvent called sulfolane to remove H2S, CO2, COS and mercaptans from natural gas as well as separating high purity aromatic compounds from hydrocarbon mixtures.

refinery fuel gas at the outlet, and subsequently the SOx emissions from boilers and heaters that use these refinery fuel gases can be reduced.

Selective Oxidation Catalyst

EmeraChem Power LLC markets a proprietary catalytic gas treatment called selective oxidation catalyst “ESx” that is typically used as a sulfur reducing agent in conjunction with its “EMx NOx trap” catalyst to treat combustion exhaust gases from incinerators, process heaters, turbines and boilers. The ESx catalyst can also be used as part of SOx reduction for sulfur recovery units/tail gas treatment units. The ESx catalyst can reduce multiple sulfur species, including SO2, SO3, and H2S from the tail gas stream while also removing CO, VOC, and PM10 emissions. ESx catalyst is a platinum group metal catalyst that stores sulfur species and simultaneously assists in the catalytic oxidation of CO and VOCs. The ESx units are typically outfitted with multiple chambers such that at least one chamber is always in regeneration while the other units are working to store SOx. In the storage process, SO2 is oxidized to SO3 and is stored by EmeraChem’s sorber. The catalyst regeneration process releases sulfur as SO2.

CHAPTER 3

EXISTING SETTING

Introduction
Existing Setting
Aesthetics
Air Quality
Energy
Hazards and Hazardous Materials
Hydrology and Water Quality
Transportation and Traffic

INTRODUCTION

In order to determine the significance of the impacts associated with a proposed project, it is necessary to evaluate the project's impacts against the backdrop of the environment as it exists at the time the NOP/IS is published. The CEQA Guidelines define "environment" as "the physical conditions that exist within the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance" (CEQA Guidelines §15360; see also Public Resources Code §21060.5). Furthermore, a CEQA document must include a description of the physical environment in the vicinity of the project, as it exists at the time the NOP/IS is published, from both a local and regional perspective (CEQA Guidelines §15125). Therefore, the "environment" or "existing setting" against which a project's impacts are compared consists of the immediate, contemporaneous physical conditions at and around the project site (Remy, et al; 1996).

The following sections summarize the existing setting for aesthetics, air quality, energy, hazards and hazardous materials, hydrology and water quality, and transportation and traffic which are the only environmental areas identified in the NOP/IS that may be adversely affected by the proposed project. The Final Program EIR for the 2007 AQMP contains more comprehensive information on existing and projected environmental settings for all environmental areas discussed in this chapter. Copies of the referenced documents are available from the SCAQMD's Public Information Center by calling (909) 396-2039.

EXISTING SETTING

The proposed project will affect the following types of equipment and processes at the top emitting SOx RECLAIM facilities: 1) FCCUs; 2) SRU/TGUs; 3) sulfuric acid manufacturing; 4) petroleum coke calciners; 5) cement kiln and coal-fired boiler; 6) container glass melting furnace; and, 7) refinery boilers/heaters.

The SOx RECLAIM program consists of 33 facilities as of the 2005 Compliance Year. Of these 33, 11 RECLAIM facilities represent the top emitters of SOx (i.e., emit 95 percent of the total SOx emissions from all RECLAIM facilities). For this reason, the proposed project will focus on reducing SOx emissions from these top emitters. They are:

- Six FCCUs and six SRU/TGUs plus 15 refinery boilers and heaters operated at: BP Carson Refinery; ConocoPhillips; Chevron Refinery; ExxonMobil Refinery; Ultramar/Valero Refinery; Tesoro Refinery; and, ConocoPhillips Carson Plant.
- Two sulfuric acid plants: Rhodia Inc. and ConocoPhillips
- One coke calciner plant: BP Wilmington Plant
- One cement manufacturing plant (two cement kilns and one coal-fired boiler): CPCC
- One container glass manufacturing plant: Owens-Brockway Glass Container Inc.

On an equipment/process basis, Table 3-1 shows the distribution of SOx emissions with respect to the equipment/processes at these SOx RECLAIM facilities. These source categories are responsible for 80 percent of the facility emissions. Of the 11 affected facilities, the quantity of SOx emissions from all of the refineries comprise approximately 74 percent of the total SOx emitted from the RECLAIM facilities that will be affected by the proposed project. The remaining facilities emit 26 percent of the total. Table 3-2 summarizes on a facility-specific basis (referred to by facility identification number (ID) as Facilities A through K), the equipment or source category that may be potentially affected by the proposed project.

Table 3-1
Distribution of SOx Emissions at RECLAIM Facilities By Equipment/Process

Equipment/Process	Percentage of Emissions
FCCUs	33%
Refinery Process Heaters and Boilers	31%
Sulfuric Acid Manufacturing	12%
SRU/TGUs	10%
Cement Kilns and Glass Melting Furnaces	7%
Other Miscellaneous Processes/Equipment	7%

Reference: Baseline emissions from Compliance Year 2005

Table 3-2
Equipment/Source Category That May Be Affected by the Proposed Project

Facility ID	Potentially Affected Equipment/Source Category
A	1 FCCU 1 SRU/TGU 1 FGT
B	1 FCCU 1 SRU/TGU 1 FGT
C	1 FCCU 1 FGT 1 Sulfuric Acid Plant
D	1 FCCU 1 SRU/TGU 1 FGT
E	1 FCCU 1 SRU/TGU 1 FGT
F	1 FCCU 1 SRU/TGU 1 FGT
G	1 SRU/TGU 1 FGT
H	1 Calciner Plant
I	2 Glass Melting Furnaces
J	1 Sulfuric Acid Plant
K	2 Cement Kilns
11 facilities	6 FCCUs 6 SRU/TGUs 7 FGTs 2 Sulfuric Acid Plants 1 Calciner Plant 2 Glass Melting Furnaces 2 Cement Kilns

AESTHETICS

The following discussion describes the existing aesthetics setting for each of the affected facilities (refineries, sulfuric acid manufacturing plants, petroleum coke calcining plant, container glass manufacturing plant, and a Portland cement manufacturing plant) that are potentially affected by the proposed project:

1. BP Carson Refinery

The BP Carson Refinery is located at 1801 East Sepulveda Boulevard in the City of Carson, California. The BP Carson Refinery is bounded by Wilmington Avenue on the west, 223rd Street on the north, Alameda Street on the east, and Sepulveda Boulevard on the south (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=1801+East+Sepulveda+Boulevard,+Carson,+CA&sll=37.0625,-95.677068&sspn=44.388698,92.021484&ie=UTF8&ll=33.81777,-118.242073&spn=0.022855,0.044932&t=h&z=15&iwloc=A). The Dominguez Channel flows through the BP Carson Refinery, dividing the property into two sections: Northeastern and Southern. Industrial and commercial facilities and transportation corridors (e.g., 405 freeway and Alameda Corridor) surround the BP Carson Refinery. The BP Carson Refinery is comprised of large scale, industrial equipment that includes a FCCU, boilers, heaters, numerous above-ground storage tanks, process columns, and stacks reaching approximately 200 feet in height. The BP Carson Refinery is a 24-hour operation with existing light sources in place for nighttime operations.

To the east of the BP Carson Refinery is the Alameda Corridor and other industrial facilities including the BP Coke Barn, the Air Products Hydrogen Plant, and the Tesoro Sulfur Recovery Plant. Commercial and residential areas are located to the west. The ConocoPhillips Refinery, a cold storage warehouse facility and tank farms occupy the area south of the BP Carson Refinery. The BP Carson Refinery and all adjacent properties are zoned manufacturing heavy (MH). The closest residential area to the BP Carson Refinery is approximately 3,000 feet from the property line across Wilmington Avenue to the southwest of the Refinery.

2. ConocoPhillips Wilmington Refinery

The ConocoPhillips Wilmington Refinery occupies approximately 400 acres of land and is located at 1660 West Anaheim Street in Wilmington, California (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=1660+West+Anaheim+Street,+Wilmington,+Ca&sll=33.770729,-118.287048&sspn=0.023224,0.045276&ie=UTF8&ll=33.773618,-118.288829&spn=0.011612,0.022638&t=h&z=16). The City of Los Angeles has zoned the Wilmington Refinery property as M3 for heavy industrial land uses. The eastern part of the Wilmington Refinery borders a residential area, a roofing materials plant, and a portion of the Harbor 110 Freeway. The northern portion of the refinery borders Harbor Lake Park, Harbor College, Harbor Golf Course, and a small residential area. The western part of the refinery borders Gaffey Street which is adjacent to a gun firing range, vacant fields, recreational fields, and a United States Navy fuel storage facility. The southern portion of the site shares a border with warehouse facilities. The Wilmington Refinery is located on the eastern side of the Palos Verdes Peninsula, with the slope of the surrounding topography rising from east to west. To the west of the refinery, residential areas located on the hillsides above the facility have unobstructed views overlooking the Wilmington Refinery, port areas, and other portions of the Wilmington and Long Beach areas. The refinery is comprised of large scale, industrial equipment that includes a FCCU, boilers, heaters, numerous above-ground storage tanks, process columns, and stacks reaching approximately 200 feet in height. The ConocoPhillips Wilmington Refinery is a 24-hour operation with existing light sources in place for nighttime operations.

3. Chevron Refinery

The Chevron Refinery, which was constructed over 90 years ago, is located at 324 West El Segundo Boulevard in the City of El Segundo, California (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=324+West+El+Segundo+Boulevard,+El+Segundo,+California&sll=33.81777,-118.242073&sspn=0.022855,0.044932&ie=UTF8&ll=33.907519,-118.407297&spn=0.022831,0.044932&t=h&z=15&iwloc=A). The Refinery is located within Los Angeles County in an urbanized area that includes a substantial amount of industrial development, due to the proximity of Los Angeles International Airport (LAX). The Chevron Refinery is comprised of large scale, industrial equipment that includes a FCCU, boilers, heaters, numerous above-ground storage tanks, process columns, and stacks reaching approximately 200 feet in height. The Chevron Refinery is a 24-hour operation with existing light sources in place for nighttime operations.

Specifically, the Chevron Refinery is bounded by El Segundo Boulevard to the north, Sepulveda Boulevard to the east, Rosecrans Avenue to the south, and Vista Del Mar to the west. The Chevron Refinery is located in an area of mixed land uses, with industrial, recreational, residential, and commercial zoned areas nearby. Land use to the north of the Chevron Refinery is primarily residential, with a mix of commercial and light industrial zoning mixed in. The predominant adjacent land uses west of the Refinery are nearly all heavy industrial, or open space, which includes: Dockweiler State Beach, Manhattan Beach, and the El Segundo Generating Station, although a small parcel of land at the southwest corner of the Chevron property is made up of commercial areas and multiple-family residences.

Directly south of the Refinery, there is a single-family residential area bordering the entire length of the Refinery separated by Rosecrans Avenue. The corridor immediately east of the Refinery is comprised of a golf course at the corner of Sepulveda Boulevard and El Segundo Boulevard, with light commercial and heavy industrial zoning for the rest of the tract.

4. ExxonMobil Refinery

The ExxonMobil Refinery is located in Los Angeles County at 3700 West 190th Street, in the City of Torrance, California (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=3700+West+190th+Street,+Torrance,+CA&sll=33.907519,-118.407297&sspn=0.022831,0.044932&ie=UTF8&ll=33.853773,-118.333826&spn=0.011422,0.022466&t=h&z=16). The ExxonMobil Refinery was built in 1929 and occupies approximately 750 acres over an irregularly-shaped parcel of land, between 190th Street to the north, Van Ness Avenue to the east, railroad tracks and Del Amo Boulevard to the south, and Prairie Avenue to the west. A small portion of the refinery is located on the west side of Prairie Avenue. The refinery property is zoned by the City of Torrance as Heavy Manufacturing (M-2). The ExxonMobil Refinery is comprised of large scale, industrial equipment that includes a FCCU, boilers, heaters, numerous above-ground storage tanks, process columns, and stacks reaching approximately 200 feet in height. The ExxonMobil Refinery is a 24-hour operation with existing light sources in place for nighttime operations.

The closest residential area is across 190th Street to the north. Columbia Regional Park is located immediately across from the refinery in the northwest corner. Other land uses to the north, east, west, and south include industrial and commercial facilities, a BNSF railroad line, and a business park. The areas surrounding the refinery can be characterized as a blend of heavy and light industrial, commercial, medium and high-density residential, and industrial/manufacturing.

5. Ultramar/Valero Refinery

The Ultramar/Valero Refinery is located at 2402 East Anaheim Street, in the Wilmington district of the City of Los Angeles in the southern portion of Los Angeles County (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=2402+East+Anaheim+Street,+Los+Angeles,+ca&sll=33.853773,-118.333826&sspn=0.011422,0.022466&ie=UTF8&ll=33.786513,-118.230486&spn=0.011431,0.022466&t=h&z=16&iwloc=A). According to the Wilmington-Harbor City Plan (City of Los Angeles, 1999), the Ultramar/Valero Refinery is zoned heavy manufacturing (M3-1). The Wilmington district is generally urbanized and includes a substantial amount of industrial and port-related development. The Ports of Los Angeles and Long Beach are located along the coastal boundary of Wilmington. The Wilmington area is bordered by the Harbor Freeway (Interstate 110) on the west, the Long Beach Freeway (Interstate 710) on the east, the San Diego Freeway (Interstate 405) on the north and the Pacific Ocean on the south. The Dominguez Channel runs adjacent to the Refinery from the north to the south. Railroad tracks service the area along the western boundary of the Refinery and along Alameda Street. The Ultramar/Valero Refinery is comprised of large scale, industrial equipment that includes a FCCU, boilers, heaters, numerous above-ground storage tanks, process columns, and stacks reaching approximately 200 feet in height. The Ultramar/Valero Refinery is a 24-hour operation with existing light sources in place for nighttime operations.

The Ultramar/Valero Refinery is bounded to the north by Anaheim Street and industrial uses. Also northward of Anaheim Street is another major refinery complex. The Ultramar/Valero Refinery is bounded on the south by an area used previously for oil field production facilities and which is now developed for marine cargo transport and storage facilities and other Port of Long Beach related uses. A Hydrogen Plant is located adjacent to and immediately west of the Ultramar/Valero Refinery (west of the Dominguez Channel) on Henry Ford Avenue. To the west of Henry Ford Avenue are additional industrial and commercial uses and the Port of Los Angeles. To the east of the Ultramar/Valero Refinery are automobile storage yards, a cogeneration plant and a petroleum coke calcining plant (BP Wilmington Plant). The Terminal Island Freeway (State Route 103) runs through the Refinery's boundaries. Historically, there were oil production facilities scattered throughout this general area, none of which are currently producing. The closest residential area is about one mile northwest of the Refinery in the City of Wilmington.

6. Tesoro Refinery

The Tesoro Refinery is located at 2101 East Pacific Coast Highway in the Wilmington district of the City of Los Angeles, California (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=2101+East+Pacific+Coast+Highway,+Los+Angeles,+ca&sll=33.786513,-118.230486&sspn=0.011431,0.022466&ie=UTF8&ll=33.796357,-118.230679&spn=0.01143,0.022466&t=h&z=16). The Refinery occupies about 300 acres of land, with the larger portion located within the jurisdiction of the City of Los Angeles and the smaller portion located within the City of Carson. The Refinery is bounded to the north by Sepulveda Boulevard, to the west by Alameda Street, to the south by the Southern Pacific Railroad tracks, and to the east by the Dominguez Channel. The Refinery is bisected by Pacific

Coast Highway, with the larger portion of the Refinery to the north of Pacific Coast Highway and the smaller portion to the south.

The Tesoro Refinery is zoned for heavy industrial uses (M3-1). The land use in the vicinity of the Tesoro Refinery includes oil production facilities, refineries, hydrogen plants, coke handling facilities, automobile wrecking/dismantling facilities, and other industrial facilities. The nearest residential areas to the Refinery include a residential area in the City of Long Beach, about one-half mile east of the Refinery and residential areas of Wilmington about 0.17 mile west of the southern portion of the Refinery and about 0.25 mile west of the Refinery. The Alameda Corridor, a major port access arterial, is located west of the Refinery. Other industrial uses west of the Refinery include wrecking yards, storage tanks farms and container storage areas. Industrial facilities north of the Refinery include the BP Coke Barn, other refining activities, and storage tanks farms, and an intermodal container transfer facility (ICTF). Land to the east of the Refinery includes a rail yard, the Terminal Island Freeway, a residential neighborhood and light manufacturing facilities. Land uses south of the Refinery are predominately heavy industrial with wrecking yards, a truck terminal and storage tank facilities. No schools are located within 0.25 mile of the Refinery. The Tesoro Refinery is comprised of large scale, industrial equipment that includes a FCCU, boilers, heaters, numerous above-ground storage tanks, process columns, and stacks reaching approximately 200 feet in height. The Tesoro Refinery is a 24-hour operation with existing light sources in place for nighttime operations.

Tesoro also owns and operates a separate Sulfur Recovery Plant (SRP) north of the Refinery located at 23208 South Alameda Street in the City of Carson, California (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=23208+South+Alameda+Street,+carson,+ca&sll=33.796357,-118.230679&sspn=0.01143,0.022466&ie=UTF8&ll=33.810478,-118.230228&spn=0.011428,0.022466&t=h&z=16&iwloc=A). The SRP is zoned for heavy manufacturing uses (MH) by the City of Carson's Land Use element of its General Plan. Adjacent areas to the SRP are heavy industrial and include other refineries, a hydrogen plant, undeveloped lots, and container storage areas. The closest residential area is about 0.5 mile east of the SRP in the City of Long Beach. No schools are located within 0.25 mile of the SRP. The SRP is comprised of large scale, industrial equipment that includes numerous above-ground storage tanks, process columns, and stacks reaching approximately 200 feet in height. Like the Tesoro Refinery, the SRP is also a 24-hour operation with existing light sources in place for nighttime operations.

7. Rhodia Inc.

The Rhodia sulfuric acid plant is located at 20720 South Wilmington Avenue in the City of Carson, California (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=20720+South+Wilmington+Avenue,+carson,+ca&sll=33.810478,-118.230228&sspn=0.011428,0.022466&ie=UTF8&ll=33.843936,-118.230014&spn=0.011424,0.022466&t=h&z=16). The facility is bordered by South Wilmington Avenue on the west, East Dominguez Street to the south, East Del Amo Boulevard to the north, and South Alameda Street to the east. The Rhodia sulfuric acid plant is comprised of large scale, industrial equipment such as a reactor, scrubber, bulk loading and conveying, boilers, heaters, internal combustion (IC) engines, conveyors, and storage tanks. The Rhodia sulfuric acid plant is a 24-hour operation with existing light sources in place for nighttime operations. The Rhodia plant is 90 percent paved, and is located in an industrial and commercial area. The nearest residential neighborhoods are located 0.25 mile northwest and 0.5 mile southwest of the facility. The Dominguez Channel is located approximately 1.25 miles from the facility.

8. ConocoPhillips Carson Plant

The ConocoPhillips Carson Plant is located at 1520 East Sepulveda Boulevard in the City of Carson, California and occupies 245 acres (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=1520+East+Sepulveda+Boulevard,+carson,+ca&sll=33.843936,-118.230014&sspn=0.011424,0.022466&ie=UTF8&t=h&z=16). The Carson Plant is zoned for heavy manufacturing uses (MH). The Carson Plant is bounded on the north by Sepulveda Boulevard, on the west by Wilmington Avenue, on the south by a branch of the Atchison, Topeka and Santa Fe Railroad, and on the east by Alameda Street. Property to the north of the Carson Plant is occupied by the BP Carson Refinery. The western boundary of the plant borders a shipping and container facility. Property across Wilmington Avenue includes a residential neighborhood to the northwest and commercial uses to the southwest. Land uses to the south of the Carson Plant are designated as heavy industrial. Land south of Lomita Avenue is dominated by port-related activities. Land east of Alameda Street is occupied by a storage tank farm and the Tesoro Refinery. The ConocoPhillips Carson Plant is comprised of large scale, industrial equipment that includes numerous above-ground storage tanks, process columns, and stacks reaching approximately 200 feet in height. The ConocoPhillips Carson Plant is a 24-hour operation with existing light sources in place for nighttime operations.

9. BP Wilmington Calciner Plant

The BP Wilmington Calciner is located in Los Angeles County near the Port of Long Beach just north of Cerritos Channel, at 1175 Carrack Avenue in the City of Wilmington, California (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=1175+Carrack+Avenue,+Wilmington,+ca&sll=33.804192,-118.243762&sspn=0.011429,0.022466&g=1520+East+Sepulveda+Boulevard,+carson,+ca&ie=UTF8&ll=33.774028,-118.224864&spn=0.011433,0.022466&t=h&z=16). Pier B Street runs to the north and west of the Calciner Plant's boundaries. Pier A Way borders the south end of the Calciner Plant and Carrack Avenue borders the east side of the Calciner Plant. The BP Wilmington Calciner is comprised of large scale, industrial equipment that includes a long rotary kiln (13 feet, diameter x 270 feet, length), one of the largest of its kind, that produces approximately 400,000 (short) tons per year of calcined product. The BP Wilmington Calciner is a 24-hour operation with existing light sources in place for nighttime operations. There are no sensitive receptors within 1,000 feet or 0.25 mile radius of the BP Wilmington Calciner.

10. CPCC Plant

Currently, CPCC is the only company in the SCAQMD that manufactures Gray Portland Cement. The process involves injection of used tires into the cement kiln. CPCC is located in San Bernardino County at 695 South Rancho Avenue in the City of Colton, California (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=695+South+Rancho+Avenue,+Colton,+California&sll=33.774028,-118.224864&sspn=0.011433,0.022466&ie=UTF8&ll=34.061921,-117.338362&spn=0.011395,0.022466&t=h&z=16&iwloc=A). CPCC occupies 578 acres and is bounded by train tracks to the west operated by Union Pacific Railroads, the San Bernardino freeway (I-10) to the north, South Rancho Avenue to the east, and West Agua Mansa Road to the south. CPCC and adjacent properties to the north, east, west and southwest of CPCC are industrial zones. The adjacent property to the south of CPCC is open space that follows the Santa Ana River and is zoned as equestrian/agricultural. CPCC is a 24-hour operation with existing light sources in place for nighttime operations. CPCC operates two gray cement kilns, Kiln #1 and Kiln #2.

11. Owens-Brockway Glass Container Inc.

The Owens-Brockway Glass Container plant is located in Los Angeles County at 2901-23 Fruitland Avenue, in the City of Vernon, California (http://maps.google.com/maps?f=q&source=s_q&hl=en&geocode=&q=2901-23+Fruitland+Avenue,+Vernon,+CA&sll=37.0625,-95.677068&sspn=44.388698,92.021484&ie=UTF8&ll=33.99825,-118.215841&spn=0.005702,0.011233&t=h&z=17). The facility is bordered by South Soto Street on the west, Fruitland Avenue to the south, East 50th Street to the north, and State Street to the east. The Owens-Brockway Glass Container plant is comprised of large scale, industrial equipment such as glass melting kilns, glass forming machines, heat treating furnaces, scrubbers, bag houses, bulk loading, conveying and blending equipment, and storage tanks. The Owens-Brockway Glass Container plant is a 24-hour operation with existing light sources in place for nighttime operations.

AIR QUALITY

This section provides an overview of air quality in the District. A more detailed discussion of current and projected future air quality in the District, with and without additional control measures can be found in the Final Program EIR for the 2007 AQMP (Chapter 3).

It is the responsibility of the SCAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO2), particulate matter less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5) sulfur dioxide (SO2) and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards and in the case of PM10 and SO2, far more stringent. California has also established standards for sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride. The state and national ambient air quality standards for each of these pollutants and their effects on health are summarized in Table 3-3. The SCAQMD monitors levels of various criteria pollutants at 34 monitoring stations. The 2008 air quality data from SCAQMD's monitoring stations are presented in Table 3-4.

Table 3-3
State and Federal Ambient Air Quality Standards

AIR POLLUTANT	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
	CONCENTRATION, AVERAGING TIME		
Carbon Monoxide (CO)	20 ppm, 1-hour average > 9.0 ppm, 8-hour average >	35 ppm, 1-hour average > 9 ppm, 8-hour average >	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and, (d) Possible increased risk to fetuses.
Ozone (O3)	0.09 ppm, 1-hour average > 0.07 ppm, 8-hour average >	0.12 ppm, 1-hour average > 0.075 ppm, 8-hour average >	(a) Short-term exposures: 1) Pulmonary function decrements and localized lung edema in humans and animals; and, 2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; and, (d) Property damage.
Nitrogen Dioxide (NO2)	0.18 ppm, 1-hour average > 0.030 ppm, annual average >	0.0534 ppm, AAM >	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and, (c) Contribution to atmospheric discoloration.
Sulfur Dioxide (SO2)	0.25 ppm, 1-hour average > 0.04 ppm, 24-hour average >	0.03 ppm, AAM > 0.14 ppm, 24-hour average > 0.50 ppm, 3-hour average >	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
Suspended Particulate Matter (PM10)	20 $\mu g/m^3$, AAM > 50 $\mu g/m^3$, 24-hour average >	150 $\mu g/m^3$, 24-hour average >	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; and, (b) Excess seasonal declines in pulmonary function, especially in children.
Suspended Particulate Matter (PM2.5)	12 $\mu g/m^3$, AAM >	15 $\mu g/m^3$, AAM > 35 $\mu g/m^3$, 24-hour average >	(a) Increased hospital admissions and emergency room visits for heart and lung disease; (b) Increased respiratory symptoms and disease; and, (c) Decreased lung functions and premature death.
Lead	1.5 $\mu g/m^3$, 30-day average >=	0.15 $\mu g/m^3$, rolling three-month average >	(a) Increased body burden; and, (b) Impairment of blood formation and nerve conduction.

KEY:

ppm = parts per million parts of air, by volume	AAM = Annual Arithmetic Mean
$\mu g/m^3$ = micrograms per cubic meter	

Table 3-3 (concluded)
State and Federal Ambient Air Quality Standards

AIR POLLUTANT	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
	CONCENTRATION, AVERAGING TIME		
Sulfates (SOx)	25 µg/m^3, 24-hour average >=		(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; and, (f) Property damage.
Visibility-Reducing Particles	Insufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70 percent, 8-hour average (10am – 6pm PST)		Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent.
Vinyl Chloride	0.010 ppm, 24-hour average >=		Known carcinogen.
Hydrogen Sulfide	0.03 ppm, 1-hour average >=		Odor annoyance.

KEY:

ppm = parts per million parts of air, by volume	AAM = Annual Arithmetic Mean
µg/m^3 = micrograms per cubic meter	

Table 3-4
2008 Air Quality Data – South Coast Air Quality Management District

CARBON MONOXIDE (CO)						
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. ppm, 1-hour	Max. Conc. ppm, 8-hour	No. Days Standard Exceeded[a]	
					Federal > 9.0 ppm, 8-hour	State > 9.0 ppm, 8-hour
LOS ANGELES COUNTY (Co)						
1	Central Los Angeles	366	3	2.1	0	0
2	Northwest Coast Los Angeles Co	366	3	2.0	0	0
3	Southwest Coast Los Angeles Co	358	4	2.5	0	0
4	South Coastal Los Angeles Co1	366	3	2.6	0	0
4	South Coastal Los Angeles Co2	--	--	--	--	--
6	West San Fernando Valley	366	4	2.9	0	0
7	East San Fernando Valley	366	3	2.6	0	0
8	West San Gabriel Valley	366	3	2.1	0	0
9	East San Gabriel Valley 1	366	2	1.6	0	0
9	East San Gabriel Valley 2	366	3	3.0	0	0
10	Pomona/Walnut Valley	366	3	2.0	0	0
11	South San Gabriel Valley	357	3	2.1	0	0
12	South Central LA County	310*	6*	4.3*	0	0
13	Santa Clarita Valley	363	2	1.1	0	0
ORANGE COUNTY						
16	North Orange County	366	5	2.9	0	0
17	Central Orange County	366	4	3.6	0	0
18	North Coastal Orange County	366	3	2.0	0	0
19	Saddleback Valley	365	2	1.1	0	0
RIVERSIDE COUNTY						
22	Norco/Corona	--	--	--	--	--
23	Metropolitan Riverside County 1	366	3	2.0	0	0
23	Metropolitan Riverside County 2	366	7	2.0	0	0
23	Mira Loma	366	3	1.9	0	0
24	Perris Valley	--	--	--	--	--
25	Lake Elsinore	365	1	1.0	0	0
29	Banning Airport	--	--	--	--	--
30	Coachella Valley 1**	366	1	0.6	0	0
30	Coachella Valley 2**	--	--	--	--	--
SAN BERNARDINO COUNTY						
32	NW San Bernardino Valley	365	2	1.6	0	0
33	SW San Bernardino Valley	--	--	--	--	--
34	Central San Bernardino Valley 1	363	2	1.9	0	0
34	Central San Bernardino Valley 2	366	2	1.8	0	0
35	East San Bernardino Valley	--	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--	--
38	East San Bernardino Mountains	--	--	--	--	--
	DISTRICT MAXIMUM	366	7	4.3	0	0
	SOUTH COAST AIR BASIN		7	4.3	0	0

KEY:

ppm = parts per million parts of air, by volume	* Less than 12 full months of data. May not be representative.
-- = Pollutant not monitored	** Salton Sea Air Basin

a) The federal 8-hour standard (8-hour average CO > 9 ppm) and state 8-hour standard (8-hour average CO > 9.0 ppm) were not exceeded. The federal and state 1-hour standards (35 ppm and 20 ppm) were not exceeded, either.

Table 3-4 (continued)
2008 Air Quality Data – South Coast Air Quality Management District

Source/Receptor Area		No. Days of Data	Max. Conc. in ppm 1-hour	Max. Conc. in ppm 8-hour	Fourth High Conc. ppm 8-hour	No. Days Standard Exceeded					
						Health Advisory	Federal [b]			State [c]	
No.	Location					≥ 0.15 ppm 1-hour	> 0.12 ppm 1-hour	> 0.08 ppm 8-hour	> 0.075 ppm 8-hour	> 0.09 ppm 1-hour	> 0.070 ppm 8-hour
OZONE (O_3)											
LOS ANGELES COUNTY											
1	Central LA	356	0.109	0.090	0.073	0	0	1	3	3	7
2	Northwest Coastal LA County	366	0.11	0.097	0.073	0	0	1	2	3	8
3	Southwest Coastal LA County	360	0.086	0.075	0.065	0	0	0	0	0	1
4	South Coastal LA County 1	366	0.093	0.074	0.064	0	0	0	0	0	1
4	South Coastal LA County 2	--	--	--	--	--	--	--	--	--	--
6	West San Fernando Valley	366	0.123	0.103	0.095	0	0	14	25	23	40
7	East San Fernando Valley	366	0.133	0.109	0.092	0	1	8	17	20	35
8	West San Gabriel Valley	366	0.122	0.100	0.091	0	0	6	16	16	26
9	East San Gabriel Valley 1	366	0.135	0.111	0.101	0	7	14	28	34	39
9	East San Gabriel Valley 2	366	0.156	0.118	0.112	2	12	25	45	48	61
10	Pomona/Walnut Valley	366	0.141	0.110	0.100	0	5	19	35	32	47
11	South San Gabriel Valley	366	0.107	0.093	0.077	0	0	1	5	7	13
12	South Central LA County	310*	0.078*	0.060*	0.055*	0*	0*	0*	0*	0*	0*
13	Santa Clarita Valley	363	0.160	0.131	0.108	2	8	35	60	54	81
ORANGE COUNTY											
16	North Orange County	366	0.104	0.084	0.078	0	0	0	5	7	15
17	Central Orange County	366	0.105	0.086	0.076	0	0	1	4	2	10
18	North Coastal Orange County	366	0.094	0.079	0.075	0	0	0	3	0	6
19	Saddleback Valley	365	0.118	0.104	0.092	0	0	6	15	9	25
RIVERSIDE COUNTY											
22	Norco/Corona	--	--	--	--	--	--	--	--	--	--
23	Metropolitan Riverside County 1	366	0.146	0.116	0.111	0	8	38	64	54	88
23	Metropolitan Riverside County 2	--	--	--	--	--	--	--	--	--	--
23	Mira Loma	366	0.135	0.107	0.104	0	4	23	47	38	62
24	Perris Valley	366	0.142	0.114	0.106	0	4	41	77	65	94
25	Lake Elsinore	365	0.139	0.118	0.108	0	6	32	69	49	92
29	Banning Airport	365	0.149	0.120	0.108	0	10	45	74	57	95
30	Coachella Valley 1**	366	0.11	0.101	0.098	0	0	20	51	26	70
30	Coachella Valley 2**	355	0.12	0.092	0.090	0	0	11	27	11	44
SAN BERNARDINO COUNTY											
32	Northwest San Bernardino Valley	365	0.155	0.122	0.111	2	9	30	50	51	65
33	Southwest San Bernardino Valley	--	--	--	--	--	--	--	--	--	--
34	Central San Bernardino Valley 1	364	0.162	0.124	0.111	1	8	35	58	55	82
34	Central San Bernardino Valley 2	366	0.157	0.122	0.113	2	11	43	62	62	90
35	East San Bernardino Valley	366	0.154	0.120	0.112	1	12	50	75	72	100
37	Central San Bernardino Mountains	362	0.176	0.126	0.120	2	16	67	97	78	115
38	East San Bernardino Mountains	--	--	--	--	--	--	--	--	--	--
	DISTRICT MAXIMUM	366	0.176	0.131	0.120	2	17	75	97	79	115
	SOUTH COAST AIR BASIN		0.176	0.131	0.120	7	28	80	120	102	140

KEY:

ppm = parts per million parts of air, by volume	* Less than 12 full months of data. May not be representative.
-- = Pollutant not monitored	** Salton Sea Air Basin

b) The federal 1-hour ozone standard was revoked and replaced by the 8-hour average ozone standard effective June 15, 2005. USEPA has revised the federal 8-hour ozone standard from 0.084 ppm to 0.075 ppm, effective May 27, 2008.

c) The 8-hour average California ozone standard of 0.070 ppm was established effective May 17, 2006.

Table 3-4 (continued)
2008 Air Quality Data – South Coast Air Quality Management District

NITROGEN DIOXIDE (NO_2)				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc.[d] ppm, 1-hour	Annual Average[d] AAM Conc. ppm
LOS ANGELES COUNTY (Co)				
1	Central Los Angeles	343	0.12	0.0275
2	Northwest Coastal Los Angeles Co	364	0.09	0.0184
3	Southwest Coastal Los Angeles Co	359	0.10	0.0143
4	South Coastal Los Angeles Co1	366	0.13	0.0208
4	South Coastal Los Angeles Co2	--	--	--
6	West San Fernando Valley	366	0.09	0.0180
7	East San Fernando Valley	364	0.11	0.0285
8	West San Gabriel Valley	365	0.11	0.0235
9	East San Gabriel Valley 1	366	0.10	0.0230
9	East San Gabriel Valley 2	366	0.10	0.0182
10	Pomona/Walnut Valley	366	0.11	0.0302
11	South San Gabriel Valley	341	0.10	0.0263
12	South Central LA County	305*	0.12*	0.0301*
13	Santa Clarita Valley	363	0.07	0.0165
ORANGE COUNTY				
16	North Orange County	361	0.09	0.0206
17	Central Orange County	366	0.09	0.0203
18	North Coastal Orange County	365	0.08	0.0132
19	Saddleback Valley	--	--	--
RIVERSIDE COUNTY				
22	Norco/Corona	--	--	--
23	Metropolitan Riverside County 1	366	0.09	0.0192
23	Metropolitan Riverside County 2	70*	0.09*	0.0258*
23	Mira Loma	366	0.10	0.0174
24	Perris Valley	--	--	--
25	Lake Elsinore	362	0.06	0.0129
29	Banning Airport	366	0.08	0.0128
30	Coachella Valley 1**	366	0.05	0.0093
30	Coachella Valley 2**	--	--	--
SAN BERNARDINO COUNTY				
32	Northwest SB Valley	365	0.09	0.0235
33	Southwest SB Valley	--	--	--
34	Central SB Valley 1	364	0.10	0.0207
34	Central SB Valley 2	366	0.09	0.0217
35	East SB Valley	--	--	--
37	Central SB Mountains	--	--	--
38	East SB Mountains	--	--	--
	DISTRICT MAXIMUM		0.13	0.0302
	SOUTH COAST AIR BASIN		0.13	0.0302

KEY:

ppm = parts per million parts of air, by volume	* Less than 12 full months of data. May not be representative.
AAM = Annual Arithmetic Mean	** Salton Sea Air Basin
-- = Pollutant not monitored	

d) The federal standard is annual arithmetic mean NO2 > 0.534 ppm. CARB has revised the NO2 1-hour standard from 0.25 ppm to 0.18 ppm and has established a new annual standard of 0.030 ppm , effective March 20, 2008.

Table 3-4 (continued)
2008 Air Quality Data – South Coast Air Quality Management District

Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Maximum Conc.[e)] ppm, 1-hour	Maximum Conc.[e)] ppm, 24-hour	Annual Average, AAM ppm
SULFUR DIOXIDE (SO_2)					
LOS ANGELES COUNTY					
1	Central Los Angeles	366	0.01	0.002	0.0003
2	Northwest Coast Los Angeles County	--	--	--	--
3	Southwest Coast Los Angeles County	357	0.02	0.005	0.0014
4	South Coastal Los Angeles County 1	366	0.09	0.012	0.0022
4	South Coastal Los Angeles County 2	--	--	--	--
6	West San Fernando Valley	--	--	--	--
7	East San Fernando Valley	366	0.01	0.003	0.0008
8	West San Gabriel Valley	--	--	--	--
9	East San Gabriel Valley 1	--	--	--	--
9	East San Gabriel Valley 2	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--
11	South San Gabriel Valley	--	--	--	--
12	South Central LA County	--	--	--	--
13	Santa Clarita Valley	--	--	--	--
ORANGE COUNTY					
16	North Orange County	--	--	--	--
17	Central Orange County	--	--	--	--
18	North Coastal Orange County	366	0.01	0.003	0.0011
19	Saddleback Valley	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metropolitan Riverside County 1	366	0.01	0.003	0.0009
23	Metropolitan Riverside County 2	--	--	--	--
23	Mira Loma	--	--	--	--
24	Perris Valley	--	--	--	--
25	Lake Elsinore	--	--	--	--
29	Banning Airport	--	--	--	--
30	Coachella Valley 1**	--	--	--	--
30	Coachella Valley 2**	--	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	--	--	--	--
33	Southwest San Bernardino Valley	--	--	--	--
34	Central San Bernardino Valley 1	364	0.01	0.003	0.0018
34	Central San Bernardino Valley 2	--	--	--	--
35	East San Bernardino Valley	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--
38	East San Bernardino Mountains	--	--	--	--
	DISTRICT MAXIMUM		0.09	0.012	0.0022
	SOUTH COAST AIR BASIN		0.09	0.012	0.0022

KEY:

ppm = parts per million parts of air, by volume	* Less than 12 full months of data. May not be representative.
AAM = Annual Arithmetic Mean	** Salton Sea Air Basin
-- = Pollutant not monitored	

e) The state standards are 1-hour average SO_2 > 0.25 ppm and 24-hour average SO_2 > 0.04 ppm. The federal standards are annual arithmetic mean SO_2 > 0.03 ppm, 24-hour average > 0.14 ppm, and 3-hour average > 0.50 ppm. The federal and state SO_2 standards were not exceeded.

Table 3-4 (continued)
2008 Air Quality Data – South Coast Air Quality Management District

SUSPENDED PARTICULATE MATTER PM10 f),

Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. $\mu g/m^3$, 24-hour	No. (%) Samples Exceeding Standard: Federal > 150 $\mu g/m^3$, 24-hour	State > 50 $\mu g/m^3$, 24-hour	Annual Average[g)] AAM Conc. $\mu g/m^3$
LOS ANGELES COUNTY						
1	Central Los Angeles	42*	66*	0*	3(7%)*	32.2*
2	NW Coastal Los Angeles County	--	--	--	--	--
3	SW Coast Los Angeles County2	60	50	0	0(0%)	25.6
4	South Coastal Los Angeles County1	57	62	0	1(2%)	29.1
4	South Coastal Los Angeles County2	58	81	0	9(16%)	35.8
6	West San Fernando Valley	--	--	--	--	--
7	East San Fernando Valley	54	66	0	7(13%)	35.6
8	West San Fernando Valley	--	--	--	--	--
9	East San Gabriel Valley 1	49	98	0	13(27%)	35.3
9	East San Gabriel Valley 2	--	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--	--
11	South San Gabriel Valley	--	--	--	--	--
12	South Central LA County	--	--	--	--	--
13	Santa Clarita Valley	57	91	0	2(4%)	25.8
ORANGE COUNTY						
16	North Orange County	--	--	--	--	--
17	Central Orange County	58	61	0	3(5%)	28.6
18	North Coastal Orange County	--	--	--	--	--
19	Saddleback Valley	55	42	0	0(0%)	22.6
RIVERSIDE COUNTY						
22	Norco/Corona	61	86	0	9(15%)	34.4
23	Metropolitan Riverside County 1	119	115	0	49(41%)	47.0
23	Metropolitan Riverside County 2	61	135	0	35(57%)	57.4
23	Mira Loma	--	--	--	--	--
24	Perris Valley	45*	85*	0*	12(27%)*	38.3*
25	Lake Elsinore	--	--	--	--	--
29	Banning Airport	56	51	0	1(2%)	26.1
30	Coachella Valley 1**	52	75	0	4(8%)	24.0
30	Coachella Valley 2**	114	128	0	27(24%)	39.9
SAN BERNARDINO COUNTY-						
32	NW San Bernardino Valley	--	--	--	--	--
33	SW San Bernardino Valley	62	90	0	15(24%)	38.8
34	Central San Bernardino Valley 1	60	75	0	14(23%)	40.3
34	Central San Bernardino Valley 2	60	76	0	19(32%)	42.7
35	East San Bernardino Valley	61	58	0	4(7%)	29.0
37	Central San Bernardino Mountains	46	46	0	0(0%)	25.0
38	East San Bernardino Mountains	--	--	--	--	--
	DISTRICT MAXIMUM		135	0	59	57.4
	SOUTH COAST AIR BASIN		135	0	68	57.4

KEY:

$\mu g/m^3$ = micrograms per cubic meter of air	* Less than 12 full months of data. May not be representative.
AAM = Annual Arithmetic Mean	** Salton Sea Air Basin
-- = Pollutant not monitored	

f) PM10 samples were collected every 6 days at all sites except for Station Number 4144 and 4157 where samples were collected every 3 days.

g) Federal annual PM 10 standard (AAM > 50 $\mu g/m^3$) was revoked effective December 17, 2006. State standard is annual average (AAM) >20 µg/m3.

Table 3-4 (continued)
2008 Air Quality Data – South Coast Air Quality Management District

SUSPENDED PARTICULATE MATTER PM2.5 [h)]							
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. $\mu g/m^3$, 24-hour	98[th] Percentile Conc. in $\mu g/m^3$ 24-hr	No. (%) Samples Exceeding Federal Standard [i)]		Annual Averages[j)]
					Current > 35 $\mu g/m^3$, 24-hour	Old > 65 $\mu g/m^3$, 24-hour	AAM Conc. $\mu g/m^3$
LOS ANGELES COUNTY (Co)							
1	Central Los Angeles	337	78.3	40.4	10(3.0)	1(0.3)	15.7
2	Northwest Coastal Los Angeles Co	--	--	--	--	--	--
3	Southwest Coastal Los Angeles Co 2	--	--	--	--	--	--
4	South Coastal Los Angeles Co 1	346	57.2	38.9	8(2.3)	0	14.2
4	South Coastal Los Angeles County 2	349	60.9	36.4	7(2.0)	0	13.7
6	West San Fernando Valley	113	50.5	26.2	2(1.8)	0	11.9
7	East San Fernando Valley	116	57.5	34.6	2(1.7)	0	14.1
8	West San Gabriel Valley	118	66.0	32.1	2(1.7)	1(0.9)	12.9
9	East San Gabriel Valley 1	321	53.1	34.8	5(1.6)	0	14.1
9	East San Gabriel Valley 2	--	--	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--	--	--
11	South San Gabriel Valley	114.	47.3	38.0	4(3.5)	0	15.0
12	South Central LA County	118	44.2	36.5	3(2.5)	0	15.5
13	Santa Clarita Valley	--	--	--	--	--	--
ORANGE COUNTY							
16	North Orange County	--	--	--	--	--	--
17	Central Orange County	336	67.9	39.4	13(3.9)	1(0.3)	13.7
18	North Coastal Orange County	--	--	--	--	--	--
19	Saddleback Valley	120	32.6	27.1	0	0	10.4
RIVERSIDE COUNTY							
22	Norco/Corona	--	--	--	--	--	--
23	Metropolitan Riverside County 1	348	57.7	41.5	14(4.0)	0	16.4
23	Metropolitan Riverside County 2	116	43.0	39.1	4(3.4)	0	13.4
23	Mira Loma	111	50.9	47.1	10(9.0)	0	18.2
24	Perris Valley	--	--	--	--	--	--
25	Lake Elsinore	--	--	--	--	--	--
29	Banning Airport	--	--	--	--	--	--
30	Coachella Valley 1**	110	18.1	17.1	0	0	7.2
30	Coachella Valley 2**	113	21.6	18.8	0	0	8.4
SAN BERNARDINO COUNTY							
32	Northwest San Bernardino Valley	--	--	--	--	--	--
33	Southwest San Bernardino Valley	113	54.2	45.0	6(5.3)	0	15.8
34	Central San Bernardino Valley1	112	49.0	47.1	6(5.4)	0	15.4
34	Central San Bernardino Valley2	110	43.5	40.1	3(2.7)	0	13.5
35	East San Bernardino Valley	--	--	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--	--	--
38	East San Bernardino Mountains	58	36.8	33.3	1(1.7)	0	9.2
	DISTRICT MAXIMUM		78.3	47.1	14	1	18.2
	SOUTH COAST AIR BASIN		78.3	47.1	28	2	18.2

KEY:

$\mu g/m^3$ = micrograms per cubic meter of air	* Less than 12 full months of data. May not be representative.
AAM = Annual Arithmetic Mean	** Salton Sea Air Basin
-- = Pollutant not monitored	

h) PM2.5 samples were collected every 3 days at all sites except for the following sites: Station Numbers 060, 072, 077, 087, 3176, and 4144 where samples were taken every day, and Station Number 5818 where samples were taken every 6 days.

i) USEPA has revised the federal 24-hour PM2.5 standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$; effective December 17, 2006.

j) Federal PM2.5 standard is annual average (AAM) > 15 $\mu g/m^3$. State standard is annual average (AAM) > 12 $\mu g/m^3$.

Table 3-4 (continued)
2008 Air Quality Data – South Coast Air Quality Management District

TOTAL SUSPENDED PARTICULATES TSP [k)]				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. $\mu g/m^3$, 24-hour	Annual Average AAM Conc. $\mu g/m^3$
LOS ANGELES COUNTY (Co)				
1	Central Los Angeles	63	112	65.6
2	Northwest Coastal Los Angeles Co	56	88	45.9
3	Southwest Coastal Los Angeles Co	54	85	42.4
4	South Coastal Los Angeles Co 1	61	117	55.7
4	South Coastal Los Angeles Co 2	59	130	61.2
6	West San Fernando Valley	--	--	--
7	East San Fernando Valley	--	--	--
8	West San Gabriel Valley	55	108	46.7
9	East San Gabriel Valley 1	59	146	74.9
9	East San Gabriel Valley 2	--	--	--
10	Pomona/Walnut Valley	--	--	--
11	South San Gabriel Valley	57	119	63.2
12	South Central LA County	51	103	70.4
13	Santa Clarita Valley	--	--	--
ORANGE COUNTY				
16	North Orange County	--	--	--
17	Central Orange County	--	--	--
18	North Coastal Orange County	--	--	--
19	Saddleback Valley	--	--	--
RIVERSIDE COUNTY				
22	Norco/Corona	--	--	--
23	Metropolitan Riverside County 1	59	222	100.6
23	Metropolitan Riverside County 2	63	130	69.4
23	Mira Loma	--	--	--
24	Perris Valley	--	--	--
25	Lake Elsinore	--	--	--
29	Banning Airport	--	--	--
30	Coachella Valley 1**	--	--	--
30	Coachella Valley 2**	--	--	--
SAN BERNARDINO COUNTY				
32	NW San Bernardino Valley	54	87	52.2
33	SW San Bernardino Valley	--	--	--
34	Central San Bernardino Valley 1	57	139	80
34	Central San Bernardino Valley 2	59	166	83.6
35	East San Bernardino Valley	--	--	--
37	Central San Bernardino Mountains	--	--	--
38	East San Bernardino Mountains	--	--	--
	DISTRICT MAXIMUM		222	100.6
	SOUTH COAST AIR BASIN		222	100.6

KEY:

$\mu g/m^3$ = micrograms per cubic meter of air	-- = Pollutant not monitored
AAM = Annual Arithmetic Mean	** Salton Sea Air Basin

k) Total suspended particulates, lead, and sulfate were determined from samples collected every 6 days by the high volume sampler method, on glass fiber filter media.

Table 3-4 (concluded)
2008 Air Quality Data – South Coast Air Quality Management District

Source Receptor Area No.	Location of Air Monitoring Station	LEAD[k) Max. Monthly Average Conc[l) μg/m³	LEAD[k) Max. Quarterly Average Conc.[l) μg/m³	SULFATES (SOx)[k) Max. Conc. μg/m³, 24-hour	SULFATES (SOx)[k) No. (%) Samples Exceeding State Standard ≥ 25 μg/m³, 24-hour
LOS ANGELES COUNTY (Co)					
1	Central Los Angeles	0.02	0.02	14.4	0
2	Northwest Coastal Los Angeles Co	--	--	11.1	0
3	Southwest Coastal Los Angeles Co	0.01	0.01	14.0	0
4	South Coastal Los Angeles Co 1	0.01	0.01	11.0	0
4	South Coastal Los Angeles Co 2	0.01	0.01	13.2	0
6	West San Fernando Valley	--	--	--	--
7	East San Fernando Valley	--	--	--	--
8	West San Gabriel Valley	--	--	14.1	0
9	East San Gabriel Valley 1	--	--	18.7	0
9	East San Gabriel Valley 2	--	--	--	--
10	Pomona/Walnut Valley	--	--	--	--
11	South San Gabriel Valley	0.02	0.02	10.1	0
12	South Central LA County	0.03	0.02	10.6	0
13	Santa Clarita Valley	--	--	--	--
ORANGE COUNTY					
16	North Orange County	--	--	--	--
17	Central Orange County	--	--	--	--
18	North Coastal Orange County	--	--	--	--
19	Saddleback Valley	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metropolitan Riverside County 1	0.01	0.01	9.1	0
23	Metropolitan Riverside County 2	0.01	0.01	7.1	0
23	Mira Loma	--	--	--	--
24	Perris Valley	--	--	--	--
25	Lake Elsinore	--	--	--	--
29	Banning Airport	--	--	--	--
30	Coachella Valley 1**	--	--	--	--
30	Coachella Valley 2**	--	--	--	--
SAN BERNARDINO COUNTY					
32	NW San Bernardino Valley	0.01	0.01	8.4	0
33	SW San Bernardino Valley	--	--	--	--
34	Central San Bernardino Valley 1	--	--	9.5	0
34	Central San Bernardino Valley 2	0.02	0.02	8.6	0
35	East San Bernardino Valley	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM		0.03	0.02	18.7	0
SOUTH COAST AIR BASIN		0.03	0.02	18.7	0

KEY:

μg/m³ = micrograms per cubic meter of air	** Salton Sea Air Basin
-- = Pollutant not monitored	

l) - Federal lead standard is quarterly average > 1.5 μg/m³; and state standard is monthly average ≥ 1.5 μg/m³. USEPA has established the federal standard of 0.15 μg/m³, rolling 3-month average, as of October 15, 2008.

Criteria Pollutants

Carbon Monoxide

CO is a colorless, odorless, relatively inert gas. It is a trace constituent in the unpolluted troposphere, and is produced by both natural processes and human activities. In remote areas far from human habitation, carbon monoxide occurs in the atmosphere at an average background concentration of 0.04 ppm, primarily as a result of natural processes such as forest fires and the oxidation of methane. Global atmospheric mixing of CO from urban and industrial sources creates higher background concentrations (up to 0.20 ppm) near urban areas. The major source of CO in urban areas is incomplete combustion of carbon-containing fuels, mainly gasoline. In 2002, approximately 98 percent of the CO emitted into the Basin's atmosphere was from mobile sources. Consequently, CO concentrations are generally highest in the vicinity of major concentrations of vehicular traffic.

CO is a primary pollutant, meaning that it is directly emitted into the air, not formed in the atmosphere by chemical reaction of precursors, as is the case with ozone and other secondary pollutants. Ambient concentrations of CO in the Basin exhibit large spatial and temporal variations due to variations in the rate at which CO is emitted and in the meteorological conditions that govern transport and dilution. Unlike ozone, CO tends to reach high concentrations in the fall and winter months. The highest concentrations frequently occur on weekdays at times consistent with rush hour traffic and late night during the coolest, most stable portion of the day.

Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of worsening oxygen supply to the heart.

Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport by competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include patients with diseases involving heart and blood vessels, fetuses (unborn babies), and patients with chronic hypoxemia (oxygen deficiency) as seen in high altitudes.

Reductions in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels. These include pre-term births and heart abnormalities.

Carbon monoxide concentrations were measured at 25 locations in the Basin and neighboring SSAB areas in 2008. Carbon monoxide concentrations did not exceed the standards in 2008. The highest one-hour average carbon monoxide concentration recorded (7.0 ppm in the South Central Los Angeles County area) was 20 percent of the federal one-hour carbon monoxide standard of 35 ppm. The highest eight-hour average carbon monoxide concentration recorded (4.3 ppm in the South Central Los Angeles County area) was 48 percent of the federal eight-hour carbon monoxide standard of 9.0 ppm. The state one-hour standard is also 9.0 ppm. The highest eight-hour average carbon monoxide concentration is 35 percent of the state eight-hour carbon monoxide standard of 20 ppm.

The 2003 AQMP revisions to the SCAQMD's CO Plan served two purposes: it replaced the 1997 attainment demonstration that lapsed at the end of 2000; and, it provided the basis for a CO maintenance plan in the future. In 2004, the SCAQMD formally requested the USEPA to re-designate the Basin from non-attainment to attainment with the CO National Ambient Air Quality Standards. On February 24, 2007, USEPA published in the Federal Register its proposed decision to re-designate the Basin from non-attainment to attainment for CO. The comment period on the re-designation proposal closed on March 16, 2007 with no comments received by the USEPA. On May 11, 2007, USEPA published in the Federal Register its final decision to approve the SCAQMD's request for re-designation from non-attainment to attainment for CO, effective June 11, 2007.

Ozone

Ozone (O3), a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone transport is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (0.03-0.05 ppm).

While ozone is beneficial in the stratosphere because it filters out skin-cancer-causing ultraviolet radiation, it is a highly reactive oxidant. It is this reactivity which accounts for its damaging effects on materials, plants, and human health at the earth's surface.

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells and ambient ozone concentrations in the Basin are frequently sufficient to cause health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection.

Individuals exercising outdoors, children and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible subgroups for ozone effects. Short-term exposures (lasting for a few hours) to ozone at levels typically observed in southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in high ozone communities. Elevated ozone levels are also associated with increased school absences.

Ozone exposure under exercising conditions is known to increase the severity of the abovementioned observed responses. Animal studies suggest that exposures to a combination of pollutants which include ozone may be more toxic than exposure to ozone alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

In 2008, the SCAQMD regularly monitored ozone concentrations at 29 locations in the Basin and SSAB. All areas monitored were below the stage 1 episode level (0.20 ppm), but the maximum concentrations in the Basin exceeded the health advisory level (0.15 ppm). Maximum ozone concentrations in the SSAB areas monitored by the SCAQMD were lower than in the Basin and were below the health advisory level.

In 2008, the maximum ozone concentrations in the Basin continued to exceed federal standards by wide margins. Maximum one-hour and eight-hour average ozone concentrations were 0.176 ppm and 0.131 ppm (the maximum one-hour was recorded in Central San Bernardino Mountains area, the eight-hour maximum was recorded in Santa Clarita Valley). The federal one-hour ozone standard was revoked and replaced by the eight-hour average ozone standard effective June 15, 2005. USEPA has revised the federal eight-hour ozone standard from 0.84 ppm to 0.075 ppm, effective May 27, 2008. The maximum eight-hour concentration was 175 percent of the new federal standards. The maximum eight-hour concentration was 187 percent of the eight-hour state ozone standard of 0.070 ppm.

The objective of the 2007 AQMP is to attain and maintain ambient air quality standards. Based upon the modeling analysis described in the Program Environmental Impact Report for the 2007 AQMP implementation of all control measures contained in the 2007 AQMP is anticipated to bring the District into compliance with the federal eight-hour ozone standard by 2024 and the state eight-hour ozone standard beyond 2024.

Nitrogen Dioxide

NO2 is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N2) and oxygen (O2) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO2. NO2 is responsible for the brownish tinge of polluted air. The two gases, NO and NO2, are referred to collectively as NOx. In the presence of sunlight, NO2 reacts to form nitric oxide and an oxygen atom. The oxygen atom can react further to form ozone, via a complex series of chemical reactions involving hydrocarbons. Nitrogen dioxide may also react to form nitric acid (HNO3) which reacts further to form nitrates, components of PM2.5 and PM10.

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposures to NO2 at levels found in homes with gas stoves, which are higher than ambient levels found in southern California. Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma and/or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups. More recent studies have found associations between NO2 exposures and cardiopulmonary mortality, decreased lung function, respiratory symptoms and emergency room asthma visits.

In animals, exposure to levels of NO2 considerably higher than ambient concentrations results in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of ozone exposure increases when animals are exposed to a combination of ozone and NO2.

In 2008, nitrogen dioxide concentrations were monitored at 25 locations. No area of the Basin or SSAB exceeded the federal or state standards for nitrogen dioxide. The Basin has not exceeded the federal standard for nitrogen dioxide (0.0534 ppm) since 1991, when the Los Angeles County portion of the Basin recorded the last exceedance of the standard in any county within the United

States. In 2008, the maximum annual average concentration was recorded at 0.0302 ppm in the Pomona/Walnut Valley area.

In addition, the nitrogen dioxide state one-hour standard was not exceeded at any SCAQMD monitoring location in 2008. Effective March 20, 2008, CARB has revised the nitrogen dioxide one-hour standard from 0.25 ppm to 0.18 ppm and established a new annual standard of 0.30 ppm. The highest one-hour average concentration recorded (0.13 ppm in South Coastal Los Angeles County) was 72 percent of the new state one-hour standard. NOx emission reductions continue to be necessary because it is a precursor to both ozone and PM (PM2.5 and PM10) concentrations.

Sulfur Dioxide

SO2 is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H2SO4), which contributes to acid precipitation, and sulfates, which are components of PM10 and PM2.5. Most of the SO2 emitted into the atmosphere is produced by burning sulfur-containing fuels.

Exposure of a few minutes to low levels of SO2 can result in airway constriction in some asthmatics. All asthmatics are sensitive to the effects of SO2. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, is observed after acute higher exposure to SO2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO2.

Animal studies suggest that despite SO2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract.

Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO2 levels. In these studies, efforts to separate the effects of SO2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

No exceedances of federal or state standards for sulfur dioxide occurred in 2008 at any of the seven SCAQMD locations monitored. The maximum one-hour sulfur dioxide concentration was 0.09 ppm. The maximum 24-hour sulfur dioxide concentration was 0.012 ppm. The maximum annual average was 0.0022 ppm. All maximums were recorded in south Coastal Los Angeles County. The federal sulfur dioxide standards are 0.03 ppm for the annual arithmetic mean, 0.14 for the 24-hour average and 0.50 ppm for the three-hour average. The state standards are 0.25 ppm for the one-hour average and 0.04 ppm for the 24-hour average. Though sulfur dioxide concentrations remain well below the standards, sulfur dioxide is a precursor to sulfate, which is a component of fine particulate matter, PM10, and PM2.5. Standards for PM10 and PM2.5 were both exceeded in 2008. Sulfur dioxide was not measured at SSAB sites in 2008. Historical measurements showed concentrations to be well below standards and monitoring has been discontinued.

Particulate Matter (PM10 and PM2.5)

Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter less than about 10 micrometers in diameter) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM10 and PM2.5.

A consistent correlation between elevated ambient fine particulate matter (PM10 and PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long term exposure to air pollution dominated by fine particles (PM2.5) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in fine particulate matter concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children and to increased medication use in children and adults with asthma. Studies have also shown lung function growth in children is reduced with long-term exposure to particulate matter.

The elderly, people with pre-existing respiratory and/or cardiovascular disease and children appear to be more susceptible to the effects of PM10 and PM2.5.

The SCAQMD monitored PM10 concentrations at 21 locations in 2008. The federal 24-hour PM10 standard (150 µg/m3) was not exceeded at any of the locations monitored in 2008. The maximum 24-hour PM10 concentration of 135 µg/m3 was recorded in Metropolitan Riverside County. The maximum 24-hour PM10 concentration in Metropolitan Riverside County is 90 percent of the federal standards. The much more stringent state 24-hour PM10 standard (50 µg/m3) was exceeded in all but two of the 21 monitoring stations. The maximum annual average PM10 concentration of 57.4 µg/m3 was recorded in Metropolitan Riverside County. The maximum annual average PM10 concentration in Metropolitan Riverside County is 478 percent of the state standard. The federal annual PM10 standard has been revoked.

In 2008, PM2.5 concentrations were monitored at 20 locations throughout the District. USEPA revised the federal 24-hour PM2.5 standard from 65 µg/m3 to 35 µg/m3, effective December 17, 2006. In 2008, the maximum PM2.5 concentrations in the Basin exceeded the new federal 24-hour PM2.5 standards in all but three locations. The maximum 24-hour PM2.5 concentration of 78.3 µg/m3 was recorded in Central Los Angeles, which represents 138 percent of the federal standard of 35 µg/m3. The maximum annual average concentration of 18.2 µg/m3 was recorded in Mira Loma, which represents 121 percent of the federal standard of 15 µg/m3 and 151 percent of the state standard of 12 µg/m3.

Similar to PM10 concentrations, PM2.5 concentrations were higher in the inland valley areas of San Bernardino and Metropolitan Riverside counties. However, PM2.5 concentrations were also high in Central Los Angeles County. The high PM2.5 concentrations in Los Angeles County are mainly due to the secondary formation of smaller particulates resulting from mobile and stationary source activities. In contrast to PM10, PM2.5 concentrations were low in the Coachella Valley area of SSAB. PM10 concentrations are normally higher in the desert areas due to windblown and fugitive dust emissions.

Lead

Lead in the atmosphere is present as a mixture of a number of lead compounds. Leaded gasoline and lead smelters have been the main sources of lead emitted into the air. Due to the phasing out of leaded gasoline, there was a dramatic reduction in atmospheric lead in the Basin over the past 28 years.

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure.

Lead poisoning can cause anemia, lethargy, seizures, and death. It appears that there are no direct effects of lead on the respiratory system. Lead can be stored in the bone from early-age environmental exposure, and elevated blood lead levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland), and osteoporosis (breakdown of bony tissue). Fetuses and breast-fed babies can be exposed to higher levels of lead because of previous environmental lead exposure of their mothers.

The federal and state standards for lead were not exceeded in any area of the SCAQMD in 2008. There have been no violations of the standards at the SCAQMD's regular air monitoring stations since 1982, as a result of removal of lead from gasoline. The maximum quarterly average lead concentration (0.02 $\mu g/m^3$ at monitoring stations in Central Los Angeles, South San Gabriel Valley, South Central Los Angeles County, and Central San Bernardino Valley No. 2) was 1.3 percent of the federal quarterly average lead standard (1.5 $\mu g/m^3$). The maximum monthly average lead concentration (0.03 $\mu g/m^3$ in South Central Los Angeles County), measured at special monitoring sites immediately adjacent to stationary sources of lead was two percent of the state monthly average lead standard. No lead data were obtained at SSAB and Orange County stations in 2008, and because historical lead data showed concentrations in SSAB and Orange County areas to be well below the standard, measurements have been discontinued.

On November 12, 2008, USEPA published new national ambient air quality standards for lead, which became effective January 12, 2009. The existing national lead standard, 1.5 $\mu g/m^3$, was reduced to 0.15 $\mu g/m^3$, averaged over a rolling three-month period. The new federal standard was not exceeded at any source/receptor location in 2008. Nevertheless, USEPA has proposed to designate the Los Angeles County portion of the Basin as non-attainment for the new lead standard, based on emissions from two battery recycling facilities. The proposed designation is expected to become final in October 2010. However, the SCAQMD is in the process of adopting Proposed Rule 1420.1 to ensure that lead emissions do not exceed the new federal standard.

Sulfates

Sulfates (SOx) are chemical compounds which contain the sulfate ion and are part of the mixture of solid materials which make up PM10. Most of the sulfates in the atmosphere are produced by oxidation of SO2. Oxidation of sulfur dioxide yields sulfur trioxide (SO3) which reacts with water to form sulfuric acid, which contributes to acid deposition. The reaction of sulfuric acid with basic substances such as ammonia yields sulfates, a component of PM10 and PM2.5.

Most of the health effects associated with fine particles and SO2 at ambient levels are also associated with SOx. Thus, both mortality and morbidity effects have been observed with an increase in ambient SOx concentrations. However, efforts to separate the effects of SOx from the effects of other pollutants have generally not been successful.

Clinical studies of asthmatics exposed to sulfuric acid suggest that adolescent asthmatics are possibly a subgroup susceptible to acid aerosol exposure. Animal studies suggest that acidic particles such as sulfuric acid aerosol and ammonium bisulfate are more toxic than non-acidic particles like ammonium sulfate. Whether the effects are attributable to acidity or to particles remains unresolved.

In 2008, the state 24-hour sulfate standard (25 $\mu g/m^3$) was not exceeded in any of the monitoring locations in the Basin. No sulfate data were obtained at SSAB and Orange County stations in 2008. Historical sulfate data showed concentrations in the SSAB and Orange County areas to be well below the standard; thus, measurements in these areas have been discontinued. There are no federal sulfate standards.

Visibility Reducing Particles

Since deterioration of visibility is one of the most obvious manifestations of air pollution and plays a major role in the public's perception of air quality, the state of California has adopted a standard for visibility or visual range. Until 1989, the standard was based on visibility estimates made by human observers. The standard was changed to require measurement of visual range using instruments that measure light scattering and absorption by suspended particles.

The visibility standard is based on the distance that atmospheric conditions allow a person to see at a given time and location. Visibility reduction from air pollution is often due to the presence of sulfur and nitrogen oxides, as well as particulate matter. Visibility degradation occurs when visibility reducing particles are produced in sufficient amounts such that the extinction coefficient is greater than 0.23 inverse kilometers (to reduce the visual range to less than 10 miles) at relative humidity less than 70 percent, 8-hour average (10am - 6pm) according to the state standard. Future-year visibility in the Basin is projected empirically using the results derived from a regression analysis of visibility with air quality measurements. The regression data set consisted of aerosol composition data collected during a special monitoring program conducted concurrently with visibility data collection (prevailing visibility observations from airports and visibility measurements from District monitoring stations). A full description of the visibility analysis is given in Technical Report V-C of the 1994 AQMP.

With future year reductions of PM2.5 from implementation of all proposed emission controls for 2015, the annual average visibility would improve from 12 miles (calculated for 2005) to over 20 miles at Rubidoux, for example. Visual range in 2021 at all other Basin sites is expected to equal or exceed the Rubidoux visual range. Visual range is expected to double from the 2005 baseline due to reductions of secondary PM2.5, directly emitted PM2.5 (including diesel soot) and lower nitrogen dioxide concentrations as a result of 2007 AQMP controls.

Vinyl Chloride

Vinyl chloride is a colorless compound that is highly toxic and a known carcinogen that causes a rare cancer of the liver (USEPA, 2001). At room temperature, vinyl chloride is a gas with a sickly sweet odor that is easily condensed. However, it is stored as a liquid. Due to the hazardous nature of vinyl chloride to human health there are no end products that use vinyl chloride in its monomer form. Vinyl chloride is a chemical intermediate, not a final product. It is an important industrial chemical chiefly used to produce polymer polyvinyl chloride (PVC). The process involves vinyl chloride liquid fed to polymerization reactors where it is converted from a monomer to a polymer PVC. The final product of the polymerization process is PVC in either a flake or pellet form. Billions of pounds of PVC are sold on the global market each year. From its flake or pellet form PVC is sold to companies that heat and mold the PVC into end products such as PVC pipe and bottles. The SCAQMD does not monitor for vinyl chloride at their air monitoring stations.

Volatile Organic Compounds

It should be noted that there are no state or national ambient air quality standards for VOCs because they are not classified as criteria pollutants. VOCs are regulated, however, because limiting VOC emissions reduces the rate of photochemical reactions that contribute to the formation of ozone. VOCs are also transformed into organic aerosols in the atmosphere, contributing to higher PM10 and lower visibility levels.

Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOCs because of interference with oxygen uptake. In general, ambient VOC concentrations in the atmosphere are suspected to cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis, even at low concentrations. Some hydrocarbon components classified as VOC emissions are thought or known to be hazardous. Benzene, for example, one hydrocarbon component of VOC emissions, is known to be a human carcinogen.

<u>Non-Criteria Pollutants</u>

Although the SCAQMD's primary mandate is attaining the State and National Ambient Air Quality Standards for criteria pollutants within the District, SCAQMD also has a general responsibility pursuant to HSC §41700 to control emissions of air contaminants and prevent endangerment to public health. Additionally, state law requires the SCAQMD to implement airborne toxic control measures (ATCM) adopted by CARB, and to implement the Air Toxics "Hot Spots" Act. As a result, the SCAQMD has regulated pollutants other than criteria pollutants such as TACs, greenhouse gases and stratospheric ozone depleting compounds. The SCAQMD has developed a number of rules to control non-criteria pollutants from both new and existing sources. These rules originated through state directives, CAA requirements, or the SCAQMD rulemaking process.

In addition to promulgating non-criteria pollutant rules, the SCAQMD has been evaluating AQMP control measures as well as existing rules to determine whether or not they would affect, either positively or negatively, emissions of non-criteria pollutants. For example, rules in which VOC components of coating materials are replaced by a non-photochemically reactive chlorinated substance would reduce the impacts resulting from ozone formation, but could increase emissions of toxic compounds or other substances that may have adverse impacts on human health.

The following sections summarize the existing setting for the two major categories of non-criteria pollutants: compounds that contribute to ozone depletion and global warming, and TACs.

Greenhouse Gases

The SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the AQMP. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

- phase out the use and corresponding emissions of chlorofluorocarbons (CFCs), methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;

- phase out the large quantity use and corresponding emissions of hydrochlorofluorocarbons (HCFCs) by the year 2000;
- develop recycling regulations for HCFCs;
- develop an emissions inventory and control strategy for methyl bromide; and,
- support the adoption of a California greenhouse gas emission reduction goal.

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs), comparable to a greenhouse, which captures and traps radiant energy. GHGs are emitted by natural processes and human activities. The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature. Global warming is the observed increase in average temperature of the earth's surface and atmosphere. The primary cause of global warming is an increase of GHGs in the atmosphere. The six major GHGs are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), and perfluorocarbon (PFCs). The GHGs absorb longwave radiant energy emitted by the Earth, which warms the atmosphere. The GHGs also emit longwave radiation both upward to space and back down toward the surface of the Earth. The downward part of this longwave radiation emitted by the atmosphere is known as the "greenhouse effect." Emissions from human activities such as electricity production and vehicles have elevated the concentration of these gases in the atmosphere.

CO2 is an odorless, colorless natural greenhouse gas. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic (human caused) sources of CO2 are from burning coal, oil, natural gas, and wood. CO2 emissions in the Basin were determined for the year 2002, which was the base year used in determining GHG emissions for the 2007 AQMP. The total CO2 emissions in the SCAB were estimated to be about 153 million metric tons (SCAQMD, 2007 AQMP) of which:

- 48 percent was contributed by on-road mobile sources;
- 34 percent was contributed by point sources;
- 12 percent was contributed by area sources; and
- 6 percent was contributed off-road mobile sources.

CH4 is a flammable gas and is the main component of natural gas. N2O, also known as laughing gas, is a colorless greenhouse gas. Some industrial processes such as fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions also contribute to the atmospheric load of N2O. HFCs are synthetic man-made chemicals that are used as a substitute for chlorofluorocarbons (whose production was stopped as required by the Montreal Protocol) for automobile air conditioners and refrigerants. The two main sources of PFCs are primary aluminum production and semiconductor manufacture. SF6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Scientific consensus, as reflected in recent reports issued by the United Nations Intergovernmental Panel on Climate Change, is that the majority of the observed warming over the last 50 years can be attributable to increased concentration of GHGs in the atmosphere due to human activities. Industrial activities, particularly increased consumption of fossil fuels (e.g., gasoline, diesel, wood, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. As reported by the California Energy Commission (CEC), California contributes 1.4 percent of the global and 6.2 percent of the national GHGs emissions (CEC, 2006). The most recent GHG inventory for California is presented in Table 3-5 (CARB, 2007). Approximately 80 percent of GHGs in California are from fossil fuel combustion and over 70 percent of GHG-CO2 equivalent emissions are CO2 emissions (see Table 3-5).

Table 3-5
California GHG Emissions and Sinks Summary
(Million MTCO2eq)

Categories Included in the Inventory	1990	2004
ENERGY	**386.41**	**420.91**
Fuel Combustion Activities	**381.16**	**416.29**
Energy Industries	157.33	166.43
Manufacturing Industries & Construction	24.24	19.45
Transport	150.02	181.95
Other Sectors	48.19	46.29
Non-Specified	1.38	2.16
Fugitive Emissions from Fuels	**5.25**	**4.62**
Oil and Natural Gas	2.94	2.54
Other Emissions from Energy Production	2.31	2.07
INDUSTRIAL PROCESSES & PRODUCT USE	**18.34**	**30.78**
Mineral Industry	4.85	5.90
Chemical Industry	2.34	1.32
Non-Energy Products from Fuels & Solvent Use	2.29	1.37
Electronics Industry	0.59	0.88
Product Uses as Substitutes for Ozone Depleting Substances	0.04	13.97
Other Product Manufacture & Use Other	3.18	1.60
Other	5.05	5.74
AGRICULTURE, FORESTRY, & OTHER LAND USE	**19.11**	**23.28**
Livestock	11.67	13.92
Land	0.19	0.19
Aggregate Sources & Non-CO_2 Emissions Sources on Land	7.26	9.17
WASTE	**9.42**	**9.44**
Solid Waste Disposal	6.26	5.62
Wastewater Treatment & Discharge	3.17	3.82
EMISSION SUMMARY		
Gross California Emissions	**433.29**	**484.4**
Sinks and Sequestrations	**-6.69**	**-4.66**
Net California Emissions	**426.60**	**479.74**

Source: CARB, 2007

In June 2005, Governor Schwarzenegger signed Executive Order #S-3-05 which established the following greenhouse gas reduction targets:

- By 2010, reduce GHGs to 2000 emission levels,
- By 2020, reduce GHGs to 1990 emission levels, and
- By 2050, reduce GHGs to 80 percent below 1990 emission levels.

On September 27, 2006, Assembly Bill (AB) 32, the California Global Warming Solutions Act, of 2006 was enacted by the State of California and signed by Governor Schwarzenegger. AB 32 expanded on Executive Order #S-3-05. The legislature stated that "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." AB 32 represents the first enforceable state-wide program in the United States to cap all GHG emissions from major industries that includes penalties for non-compliance. While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB 32 lays out a program to inventory and reduce greenhouse gas emissions in California and from power generation facilities located outside the state that serve California residents and businesses.

AB 32 requires CARB to:

- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions by January 1, 2008;
- Adopt mandatory reporting rules for significant sources of GHG by January 1, 2008;
- Adopt an emissions reduction plan by January 1, 2009, indicating how emissions reductions will be achieved via regulations, market mechanisms, and other actions; and
- Adopt regulations to achieve the maximum technologically feasible and cost-effective reductions of GHG by January 1, 2011.

The combination of Executive Order #S-3-05 and AB 32 will require significant development and implementation of energy efficient technologies and shifting of energy production to renewable sources.

Consistent with the requirement to develop an emission reduction plan, CARB prepared a Scoping Plan indicating how GHG emission reductions will be achieved through regulations, market mechanisms, and other actions. The Scoping Plan was released for public review and comment in October 2008 and approved by CARB on December 11, 2008. The Scoping Plan calls for reducing greenhouse gas emissions to 1990 levels by 2020. This means cutting approximately 30 percent from business-as-usual (BAU) emission levels projected for 2020, or about 15 percent from today's levels. Key elements of CARB staff's recommendations for reducing California's greenhouse gas emissions to 1990 levels by 2020 contained in the Scoping Plan include the following:

- Expansion and strengthening of existing energy efficiency programs and building and appliance standards;
- Expansion of the Renewables Portfolio Standard to 33 percent;
- Development of a California cap-and-trade program that links with other Western Climate Initiative (WCI) Partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gases and pursuing policies and incentives to achieve those targets;
- Adoption and implementation of existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Targeted fees, including a public good charge on water use, fees on high global warming potential (GWP) gases and a fee to fund the state's long-term commitment to AB 32 administration.

In response to the comments received on the Draft Scoping Plan and at the November 2008 public hearing, CARB made a few changes to the Draft Scoping Plan, primarily to:

- State that California "will transition to 100 percent auction" of allowances and expects to "auction significantly more [allowances] than the Western Climate Initiative minimum;"
- Make clear that allowance set-asides could be used to provide incentives for voluntary renewable power purchases by businesses and individuals and for increased energy efficiency;

- Make clear that allowance set-asides can be used to ensure that voluntary actions, such as renewable power purchases, can be used to reduce greenhouse gas emissions under the cap;
- Provide allowances are not required from carbon neutral projects; and
- Mandate that commercial recycling be implemented to replace virgin raw materials with recyclables.

On August 24, 2007, Governor Schwarzenegger signed into law Senate Bill (SB) 97 – CEQA: Greenhouse Gas Emissions stating, "This bill advances a coordinated policy for reducing greenhouse gas emissions by directing the Office of Planning and Research (OPR) and the Resources Agency to develop CEQA guidelines on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions." Specifically, SB 97 requires OPR, by July 1, 2009, to prepare, develop, and transmit guidelines to the Resources Agency for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions, as required by CEQA, including, but not limited to, effects associated with transportation or energy consumption. The Resources Agency would be required to certify and adopt those guidelines by January 1, 2010. The OPR would be required to periodically update the guidelines to incorporate new information or criteria established by the CARB pursuant to the California Global Warming Solutions Act of 2006. SB 97 also identifies a limited number of types of projects that would be exempt under CEQA from analyzing GHG emissions. Finally, SB 97 will be repealed on January 1, 2010.

Consistent with SB 97, on June 19, 2008, OPR released its "Technical Advisory on CEQA and Climate Change," which was developed in cooperation with the Resources Agency, the California Environmental Protection Agency (CalEPA), and the CARB. According to OPR, the "Technical Advisory" offers the informal interim guidance regarding the steps lead agencies should take to address climate change in their CEQA documents, until CEQA guidelines are developed pursuant to SB 97 on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions.

According to OPR, lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source. Second, the lead agency must assess whether those emissions are individually or cumulatively significant. When assessing whether a project's effects on climate change are "cumulatively considerable" even though its GHG contribution may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.

On July 30, 2008, USEPA released a draft Advance Notice of Proposed Rulemaking (ANPR) "Regulating Greenhouse Gas Emissions Under the Clean Air Act." The ANPR solicits public comments, which must be received on or before November 28, 2008, and presents the following relevant information:

- Reviews the various CAA provisions that may be applicable to regulate GHGs;
- Examines the issues that regulating GHGs under those provisions may raise;
- Provides information regarding potential regulatory approaches and technologies for reducing GHG emissions; and

- Raises issues relevant to possible legislation and the potential for overlap between legislation and CAA regulation.

The SCAQMD has established a policy, adopted by the SCAQMD Governing Board at its September 5, 2008 meeting, to actively seek opportunities to reduce emissions of criteria, toxic, and climate change pollutants. The policy includes the intent to assist businesses and local governments implementing climate change measures, decrease the agency's carbon footprint, and provide climate change information to the public. The SCAQMD will take the following actions:

1. Work cooperatively with other agencies/entities to develop quantification protocols, rules, and programs related to greenhouse gases;
2. Share experiences and lessons learned relative to the Regional Clean Air Incentives Market (RECLAIM) to help inform state, multi-state, and federal development of effective, enforceable cap-and-trade programs. To the extent practicable, staff will actively engage in current and future regulatory development to ensure that early actions taken by local businesses to reduce greenhouse gases will be treated fairly and equitably. SCAQMD staff will seek to streamline administrative procedures to the extent feasible to facilitate the implementation of AB 32 measures;
3. Review and comment on proposed legislation related to climate change and greenhouse gases, pursuant to the 'Guiding Principles for SCAQMD Staff Comments on Legislation Relating to Climate Change' approved at the Board Special Meeting in April 2008;
4. Provide higher priority to funding Technology Advancement Office (TAO) projects or contracts that also reduce greenhouse gas emissions;
5. Develop recommendations through a public process for an interim greenhouse gas CEQA significance threshold, until such time that an applicable and appropriate statewide greenhouse gas significance level is established. Provide guidance on analyzing greenhouse gas emissions and identify mitigation measures. Continue to consider GHG impacts and mitigation in SCAQMD lead agency documents and in comments when SCAQMD is a responsible agency;
6. Revise the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning to include information on greenhouse gas strategies as a resource for local governments. The Guidance Document will be consistent with state guidance, including CARB's Scoping Plan;
7. Update the Basin's greenhouse gas inventory in conjunction with each Air Quality Management Plan. Information and data used will be determined in consultation with CARB, to ensure consistency with state programs. Staff will also assist local governments in developing greenhouse gas inventories;
8. Bring recommendations to the Board on how the agency can reduce its own carbon footprint, including drafting a Green Building Policy with recommendations regarding SCAQMD purchases, building maintenance, and other areas of products and services. Assess employee travel as well as other activities that are not part of a GHG inventory and determine what greenhouse gas emissions these activities represent, how they could be reduced, and what it would cost to offset the emissions;
9. Provide educational materials concerning climate change and available actions to reduce greenhouse gas emissions on the SCAQMD website, in brochures, and other venues to help cities and counties, businesses, households, schools, and others learn about ways to reduce their electricity and water use through conservation or other

efforts, improve energy efficiency, reduce vehicle miles traveled, access alternative mobility resources, utilize low emission vehicles and implement other climate friendly strategies; and

10. Conduct conferences, or include topics in other conferences, as appropriate, related to various aspects of climate change, including understanding impacts, technology advancement, public education, and other emerging aspects of climate change science.

On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. SCAQMD's recommended interim GHG significance threshold proposal uses a tiered approach to determining significance. Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA. Tier 2 consists of determining whether or not the project is consistent with a GHG reduction plan that may be part of a local general plan, for example. Tier 3 establishes a screening significance threshold level to determine significance using a 90 percent emission capture rate approach, which corresponds to 10,000 metric tons of CO2 equivalent emissions per year (MTCO2eq/yr). Tier 4, to be based on performance standards, is yet to be developed. Under Tier 5 the project proponent would allow offsets to reduce GHG emission impacts to less than the proposed screening level. If CARB adopts statewide significance thresholds, SCAQMD staff plans to report back to the Governing Board regarding any recommended changes or additions to the SCAQMD's interim threshold.

On April 13, 2009, OPR submitted to the Natural Resources Agency its proposed amendments to the CEQA Guidelines for GHG emissions. The proposed amendments provided guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The Natural Resources Agency conducted a formal rulemaking process and on December 20, 2009, they adopted amendments to the CEQA Guidelines for GHG emissions as directed by SB97. On February 16, 2010, the Office of Administrative Law approved the amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations (CCR). The amendments became effective on March 18, 2010.

Climate Change

Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages. Some data indicate that the current temperature record differs from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change constructed several emission trajectories of greenhouse gases needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of greenhouse gases at 400 to 450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below two degrees Celsius, which is assumed to be necessary to avoid dangerous climate change.

The potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems (i.e., heat rash and heat stroke). In addition, climate sensitive diseases may increase, such as those spread by mosquitoes and other disease carrying insects. Those diseases include malaria, dengue fever, yellow fever, and encephalitis. Extreme events such as flooding and hurricanes can displace people and agriculture, which would have negative consequences. Drought in some areas may increase, which would decrease water and food availability. Global warming may also contribute to air quality problems from increased frequency of smog and particulate air pollution.

The impacts of climate change will also affect projects in various ways. Effects of climate change are specifically mentioned in AB 32 such as rising sea levels and changes in snow pack. The extent of climate change impacts at specific locations remains unclear. However, it is expected that California agencies will more precisely quantify impacts in various regions of the State. As an example, it is expected that the DWR will formalize a list of foreseeable water quality issues associated with various degrees of climate change. Once state government agencies make these lists available, they could be used to more precisely determine to what extent a project creates global climate change impacts.

Toxic Air Contaminants

On March 17, 2000, the SCAQMD Governing Board approved "An Air Toxics Control Plan for the Next Ten Years." The Air Toxics Control Plan identifies potential strategies to reduce toxic levels in the Basin over the ten years following adoption. To the extent the strategies are implemented by the relevant agencies, the plan will improve public health by reducing health risks associated with both mobile and stationary sources. Exposure to toxic air contaminants (TACs) can increase the risk of contracting cancer or result in other deleterious health effects which target such systems as cardiovascular, reproductive, hematological, or nervous. The health effects may be through short-term, high-level or "acute" exposure or long-term, low-level or "chronic" exposure.

Historically, the SCAQMD has regulated criteria air pollutants using either a technology-based or an emissions limit approach. The technology-based approach defines specific control technologies that may be installed to reduce pollutant emissions. The emission limit approach establishes an emission limit, and allows industry to use any emission control equipment, as long as the emission requirements are met. The regulation of toxic air contaminants (TACs) often uses a health risk-based approach, but may also require a regulatory approach similar to criteria pollutants, as explained in the following subsections.

Control of TACs Under the TAC Identification and Control Program

California's TAC identification and control program, adopted in 1983 as AB1807, is a two-step program in which substances are identified as TACs, and ATCMs are adopted to control emissions from specific sources. CARB has adopted a regulation designating all 188 federal hazardous air pollutants (HAPs) as TACs.

ATCMs are developed by CARB and implemented by the SCAQMD and other air districts through the adoption of regulations of equal or greater stringency. Generally, the ATCMs reduce emissions to achieve exposure levels below a determined health threshold. If no such threshold levels are determined, emissions are reduced to the lowest level achievable through the best available control technology unless it is determined that an alternative level of emission reduction is adequate to protect public health.

Under California law, a federal National Emission Standard for Hazardous Air Pollutants (NESHAP) automatically becomes a state ATCM, unless CARB has already adopted an ATCM for the source category. Once a NESHAP becomes an ATCM, CARB and each air pollution control or air quality management district have certain responsibilities related to adoption or implementation and enforcement of the NESHAP/ATCM.

Control of TACs Under the Air Toxics "Hot Spots" Act

The Air Toxics Hot Spots Information and Assessment Act of 1987 (AB2588) establishes a state-wide program to inventory and assess the risks from facilities that emit TACs and to notify the public about significant health risks associated with the emissions. Facilities are phased into the AB2588 program based on their emissions of criteria pollutants or their occurrence on lists of toxic emitters compiled by the SCAQMD. Phase I consists of facilities that emit over 25 tons per year of any criteria pollutant and facilities present on the SCAQMD's toxics list. Phase I facilities entered the program by reporting their air TAC emissions for calendar year 1989. Phase II consists of facilities that emit between 10 and 25 tons per year of any criteria pollutant, and submitted air toxic inventory reports for calendar year 1990 emissions. Phase III consists of certain designated types of facilities which emit less than 10 tons per year of any criteria pollutant, and submitted inventory reports for calendar year 1991 emissions. Inventory reports are required to be updated every four years under the state law.

In October 1992, the SCAQMD Governing Board adopted public notification procedures for Phase I and II facilities. These procedures specify that AB2588 facilities must provide public notice when exceeding the following risk levels:

- Maximum Individual Cancer Risk: greater than 10 in 1 million (10×10^{-6})
- Total Hazard Index: greater than 1.0 for TACs except lead, or > 0.5 for lead

Public notice is to be provided by letters mailed to all addresses and all parents of children attending school in the impacted area. In addition, facilities must hold a public meeting and provide copies of the facility risk assessment in all school libraries and a public library in the impacted area.

The SCAQMD continues to complete its review of the health risk assessments submitted to date and may require revision and resubmission as appropriate before final approval. Notification will be required from facilities with a significant risk under the AB2588 program based on their initial approved health risk assessments and will continue on an ongoing basis as additional and subsequent health risk assessments are reviewed and approved.

Control of TACs With Risk Reduction Audits and Plans

Senate Bill (SB) 1731, enacted in 1992 and codified at HSC §44390 et seq., amended AB2588 to include a requirement for facilities with significant risks to prepare and implement a risk reduction plan which will reduce the risk below a defined significant risk level within specified time limits. SCAQMD Rule 1402 - Control of Toxic Air Contaminants From Existing Sources, was adopted on April 8, 1994, to implement the requirements of SB 1731.

In addition to the TAC rules adopted by SCAQMD under authority of AB 1807 and SB 1731, the SCAQMD has adopted source-specific TAC rules, based on the specific level of TAC emitted and the needs of the area. These rules are similar to the state's ATCMs because they are source-specific and only address emissions and risk from specific compounds and operations.

Cancer Risks from Toxic Air Contaminants

New and modified sources of toxic air contaminants in the District are subject to Rule 1401 - New Source Review of Toxic Air Contaminants and Rule 212 - Standards for Approving Permits. Rule 212 requires notification of the SCAQMD's intent to grant a permit to construct a significant project, defined as a new or modified permit unit located within 1000 feet of a school (a state law requirement under AB 3205), a new or modified permit unit posing an maximum individual cancer risk of one in one million (1×10^{-6}) or greater, or a new or modified facility with criteria pollutant emissions exceeding specified daily maximums. Distribution of notice is required to all addresses within a 1/4-mile radius, or other area deemed appropriate by the SCAQMD. Rule 1401 currently controls emissions of carcinogenic and non-carcinogenic (health effects other than cancer) air contaminants from new, modified and relocated sources by specifying limits on cancer risk and hazard index (explained further in the following discussion), respectively.

Health Effects

One of the primary health risks of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of causing cancer. It is currently estimated that about one in four deaths in the United States is attributable to cancer. About two percent of cancer deaths in the United States may be attributable to environmental pollution (Doll and Peto 1981). The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods.

Non-Cancer Health Risks from Toxic Air Contaminants

Unlike carcinogens, for most TAC non-carcinogens it is believed that there is a threshold level of exposure to the compound below which it will not pose a health risk. CalEPA's Office of Environmental Health Hazard Assessment (OEHA) develops Reference Exposure Levels (RELs) for TACs which are health-conservative estimates of the levels of exposure at or below which health effects are not expected. The non-cancer health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index (HI).

Baseline Emission Inventory

The SOx RECLAIM program started in 1993 with 41 facilities but by the end of the 2005 compliance year, participation in the program dropped to 33 facilities. The reduction in the number of facilities participating in the RECLAIM program since inception has been primarily due to facility shutdowns.

Under the SOx RECLAIM program, the RECLAIM facilities were issued annual allocations of SOx emissions (also known as facility caps), which declined annually from 1993 until 2003 and remained constant after 2003. In 2005, the top 11 SOx RECLAIM facilities reported approximately 7.5 tons of SOx emissions per day; 95 percent of these emissions were generated by the top 11 facilities belonging to the following seven source categories.

- Fluid catalytic cracking units (FCCUs);
- Sulfur recovery and tail gas treatment units (SRU/TGUs);
- Boilers and heaters using refinery gas;
- Sulfuric acid manufacturing plants;
- Container glass melting furnace;

- Petroleum coke calciner;
- Cement kilns and a coal steam boiler at a cement manufacturing facility.

These facilities were issued an overall allocation of approximately 9.82 tons per day for the 2000 compliance year and 6.41 tons per day for the 2003 compliance year as shown in Table 3-6.

Table 3-6
SOx RECLAIM Allocations and Reported Emissions for Top Seven Source Categories

Source Category	SOx RECLAIM Allocations (tons/day)		SOx Reported Emissions (tons/day)
	Compliance Year 2000	Compliance Year 2003	Compliance Year 2005
FCCUs	2.17	1.42	3.55
Refinery Boilers/Heaters	0.89 [1]	0.58 [1]	0.91 [2]
SRU/TGUs	1.61	1.05	0.96
Sulfuric Acid Manufacturing	2.53	1.65	1.16
Container Glass Manufacturing	1.01	0.66	0.32
Petroleum Coke Calciner	1.28	0.84	0.35
Portland Cement Manufacturing	0.33	0.22	0.27
Total	**9.82**	**6.41**	**7.53**

[1] Represents the emissions from all boilers and heaters operated at all of the refineries.
[2] Represents the top seven emitters at all of the refineries.

ENERGY

This section provides an overview of energy in the District. A more detailed discussion of current and projected future energy profile in the District can be found in the Final Program EIR for the 2007 AQMP (Chapter 3).

Statewide Energy Trends

Figure 3-1 shows California's major sources of energy (electricity data for 2008, natural gas data for 2007, and crude oil data for 2008)[27].

[27] http://www.energyalmanac.ca.gov/overview/energy_sources.html (Last updated April 7, 2009).

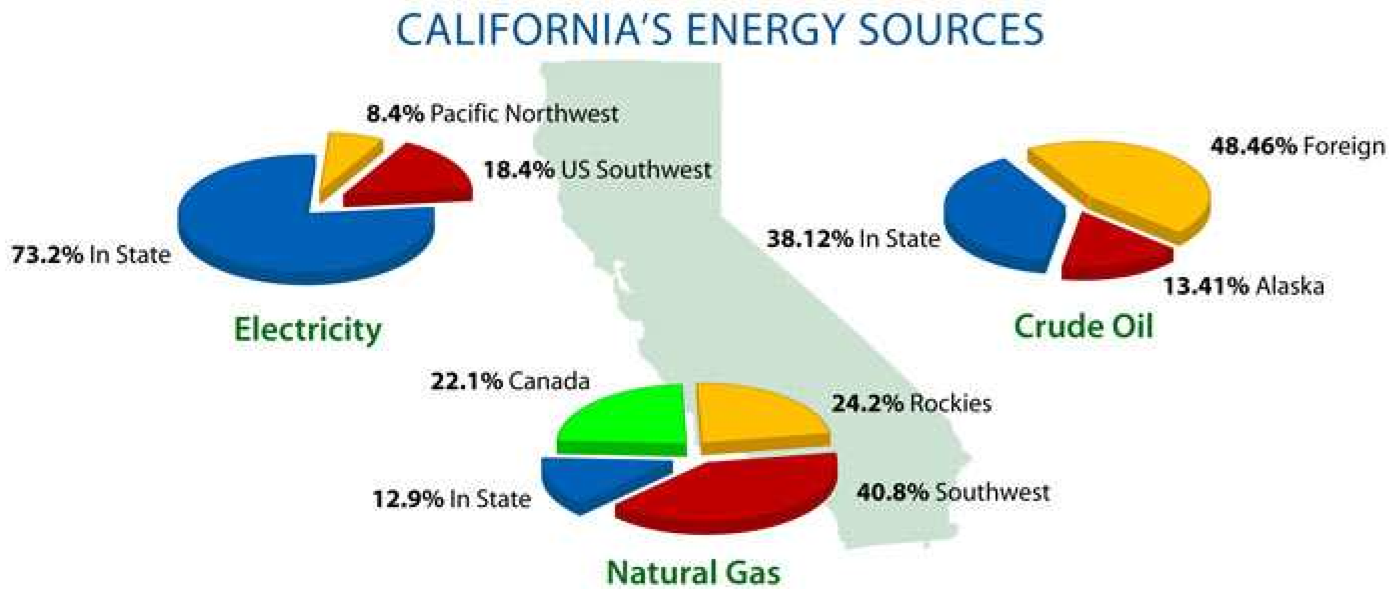

Figure 3-1

In 2008, 38.12 percent of the crude oil came from in-state, with 13.41 percent coming from Alaska, and 48.46 percent being supplied by foreign sources. Also in 2008, 73.2 percent of the electricity came from in-state sources, while 26.8 percent was imported into the state. The total electricity imported in 2008 was 306,577 gWh, with 23,945 gWh coming from the Pacific Northwest and 74,113 gWh from the Southwest (CEC, 2009)[28]. (Note: One gW is equal to one million kW). For natural gas in 2007, 40.8 percent came from the Southwest, 22.1 percent from Canada, 12.9 percent from in-state, and 24.2 percent from the Rockies (CEC, 2008).

Electricity

Power plants in California provided approximately 73.2 percent of the in-state electricity demand in 2008. Hydroelectric power from the Pacific Northwest provides another 8.4 percent, and power plants in the Southwestern United States provide another 18.4 percent. The relative contribution of in-state and out-of-state power plants depends upon, among other factors, the precipitation that occurred in the previous year and the corresponding amount of hydroelectric power that is available. Two of the largest power plants in California are located in southern California: Alamitos and Redondo Beach. Both of these plants consume natural gas to produce electricity. San Onofre, the state's largest power plant in terms of net capability, is nuclear powered and is located in San Diego County. In addition, in Southern California, a significant percentage of our imported power comes from plants that are generally coal-fired facilities.

Local electricity distribution service is provided to customers within southern California by one of two privately owned utilities – either Southern California Edison (SCE) or San Diego-based Sempra Energy – or by a publicly-owned utility, such as the LADWP.

SCE is the largest electricity utility in southern California with a service area that covers all or nearly all of Orange, San Bernardino, and Ventura counties, and most of Los Angeles and Riverside counties. SCE provides approximately 70 percent of the total electricity demand in southern California. SCE currently supplies electricity to six of the seven refineries affected by the proposed project and supplies more than 101,000 gWh per year of electricity to all of its

[28] http://www.energy.ca.gov/2009publications/CEC-200-2009-010/CEC-200-2009-010.PDF

customers. SCE expects that they will be able to annually increase its output and has made projections that over 121,000 megawatts (MW) will be available in 2012 (CEC, 2002).

The LADWP is the largest of the public-owned electric utilities in southern California and provides approximately 20 percent of the total electricity demand in the District and 15,063 million kilowatt-hours (kWh) to its nonresidential customers located in Los Angeles county.[29]

Table 3-7 shows the amount of electricity delivered to residential and nonresidential entities in Los Angeles and San Bernardino Counties in 2007 (CEC, 2009)[30].

Table 3-7
Electricity Utility Deliveries for Los Angeles and San Bernardino Counties in 2007[31]

County	RESIDENTIAL Electricity Delivered (kWh)[1]	NON-RESIDENTIAL Electricity Delivered (kWh)	TOTAL Electricity Delivered (kWh)
Los Angeles	20,636	47,484	68,120
San Bernardino	4,815	9,617	14,432

[1] The kilowatt-hour (kWh) is a commonly used unit of measure for describing the amount of electricity consumed over a period of time. One kWh is equal to 1000 watts of electricity supplied in one hour.

The following discussion describes the existing electricity gas setting for each of the affected facilities (refineries, sulfuric acid manufacturing plants, petroleum coke calcining plant, container glass manufacturing plant, and a Portland cement manufacturing plant) that are potentially affected by the proposed project:

1. BP Carson Refinery

The BP Carson Refinery receives almost all of its electrical power from its existing on-site Watson Cogeneration Plant. The Watson Cogeneration Plant has a generation capacity of over 320 MW and supplies the Refinery with approximately 727,000 MW-hours (MWh) per year. BP's operators also purchase approximately 257 MWh per year from SCE[32].

2. ConocoPhillips Wilmington Refinery

Most of the electricity supplied to the ConocoPhillips Wilmington Refinery is provided by an existing onsite 50 MW cogeneration plant that currently generates 43MW. However, the LADWP supplies additional electricity as needed to handle routing electricity fluctuations[33].

3. Chevron Refinery

The Chevron Refinery currently operates a multi-train cogeneration plant (three existing cogeneration units) to supply most of the electricity and steam used by refinery processing equipment. To supplement electrical needs, approximately 20 MW of electricity is purchased from SCE. Chevron is in the process of expanding their existing cogeneration facility by an

[29] California 2001 Electric Utility Retail Deliveries, California Energy Commission, 2001.
[30] Of the 11 facilities affected by the proposed project, 10 are located in Los Angeles County and one is located in San Bernardino County.
[31] California Energy Commission, Energy Consumption Data Management System, Electricity Consumption by County, http://www.ecdms.energy.ca.gov/elecbycounty.asp
[32] SCAQMD, Final Environmental Impact Report for the Proposed BP Carson Refinery – Safety, Compliance and Optimization Project (Appendix A: NOP/IS); SCH No. 2005111057; September 2006.
[33] SCAQMD, Final Environmental Impact Report for the ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Projects; SCH No. 2006111138; April 2007.

additional 49.9 MW. The new 49.9 MW Cogen Train D includes a natural gas and refinery gas-fired turbine electric generator, a new steam-driven turbine electrical generator, feed gas compressors, knockout and surge pots, waste heat boilers (including duct burners) to generate steam, a carbon monoxide (CO) oxidation catalyst unit, and a selective catalytic reduction (SCR) unit to control NOx emissions. Expansion of the cogeneration plant will decrease the Chevron's need for offsite sources of electricity[34]. The expansion of Chevron's cogeneration facility is expected to be completed by the end of 2010.

4. ExxonMobil Refinery

ExxonMobil derives its energy needs from a SCE sub-station that was specifically built to accommodate the electrical demands of the ExxonMobil Refinery and does not either contribute to other facilities, or rely upon other facilities in the area for electrical power[35].

5. Ultramar/Valero Refinery

Electricity is supplied to the Ultramar/Valero Refinery entirely by LADWP.

6. Tesoro Refinery

Tesoro currently operates a cogeneration system that supplies a portion of electricity and steam used by the process equipment at their refinery, while supplementing onsite generation by purchasing electricity from the LADWP. However, Tesoro has plans to upgrade the Refinery's cogeneration system and steam boilers[36]. Specifically, Tesoro is proposing to replace the two 30 MW existing cogeneration units (Cogens A and B) and their associated selective catalytic reduction (SCR) Units with one new 61.02 MW cogeneration system (Cogen C) (including NOx control technology such as an SCR Unit). A new emergency IC Engine will also be installed to supply power to the instruments and auxiliary equipment in the gas turbine which will allow the boilers to continue to operate and provide sufficient steam as necessary, and while maintaining a safe shutdown and start up of the Refinery during a power outage. The new emergency IC Engine will only be constructed as part of the installation of Cogen C. The proposed new cogeneration system would increase the maximum electrical generating capacity at their refinery by about one MW while reducing NOx emissions.

Currently the existing cogeneration systems and four steam boilers (Boilers 7, 8, 9, and 10) generate steam at a total rate of 734.16 million British Thermal Units per hour (mmBtu/hr) for multiple processes at the refinery. Tesoro will replace the four existing boilers with two new boilers (Boilers 11 and 12), each with total heat input rating of no more than 400 mmBtu/hr. The new boilers will burn refinery fuel gas or natural gas and will be equipped with new SCR Units to reduce NOx emissions.

7. Rhodia Inc.

Electricity is supplied to Rhodia by SCE.

8. ConocoPhillips Carson Plant

Electricity is supplied to the ConocoPhillips Carson Plant entirely by SCE.

[34] SCAQMD, Final Environmental Impact Report for: Chevron Products Company El Segundo Refinery Product Reliability and Optimization Project; SCH No. 2007081057; May 2008.

[35] SCAQMD, Final Environmental Impact Report for ExxonMobil Rule 1105.1 Compliance Project (Appendix A – NOP/IS); SCH No. 2006091112; March 2007.

[36] SCAQMD, Final Environmental Impact Report for the Tesoro Reliability Improvement and Regulatory Compliance Project; SCH No. 2008021099; April 2009.

9. BP Wilmington Calciner Plant

The BP Wilmington Calciner Plant operates a cogeneration facility with a maximum electrical design capacity of 35 MW but operates at 25 MW. The BP Wilmington Calciner Plant internally uses four MW for its operations and sells 21 MW back to SCE's grid. In addition, SCE provides supplementary power, backup power, maintenance power, and/or interruptible power service to the BP Wilmington Calciner Plant if the cogeneration plant is shutdown.

10. CPCC Plant

The majority of the electricity demand is supplied to CPCC Plant by Constellation New Energy. CPCC Plant also operates a cogeneration unit that supplies approximately four MW of electricity from their waste heat boilers for use elsewhere in the plant. Peak electrical demand at CPCC Plant is approximately 22 MW.

11. Owens-Brockway Glass Container Inc.

Electricity is supplied to Owens-Brockway Glass Container by the City of Vernon.

Natural Gas

Four regions supply California with natural gas. Three of these regions, the Southwestern United States, the Rocky Mountains, and Canada, supplied 87 percent of all the natural gas consumed in California in 2007. The remainder is produced in California. In 2006, approximately 43 percent of all the natural gas consumed in California was used to generate electricity. Residential consumption represented approximately 22 percent of California's natural gas use with the balance consumed by the industrial, resource extraction, transportation, and commercial sectors.

Southern California Gas Company, a privately-owned utility company, provides natural gas service throughout the District, except for the City of Long Beach, the southern portion of Orange County, and portions of San Bernardino County. The service area for the Long Beach Gas & Electric Department, a municipal utility owned and operated by the City of Long Beach, includes the cities of Long Beach and Signal Hill, and sections of surrounding communities, including Lakewood, Bellflower, Compton, Seal Beach, Paramount, and Los Alamitos. San Diego Gas & Electric Company provides natural gas service to the southern portion of Orange County. In San Bernardino County, Southwest Gas Corporation provides natural gas service to Victorville, Big Bear, Barstow, and Needles (SCAG, 2005) (CEC, 2006a).

Table 3-8 provides the estimated use of natural gas in California by residential, commercial and industrial sectors. In 2006, about 66 percent of the natural gas consumed in California was for industrial and electric generation purposes.

Table 3-8
California Natural Gas Demand in 2006[37]
(Million Cubic Feet per Day – MMcfd)

Sector	Demand (MMcfd)
Residential	1,300
Commercial	573
Industrial	1,392
Electric Generation	2,613
Transportation	25
Net Storage/Loss	129
Total	**6,032**

The following discussion describes the existing natural gas setting for each of the affected facilities (six refineries, two sulfuric acid manufacturing plants, one petroleum coke calcining plant, one container glass manufacturing plant, and one Portland cement manufacturing plant) that are potentially affected by the proposed project:

1. <u>BP Carson Refinery</u>
Natural gas is supplied from BP Carson's existing utility system.

2. <u>ConocoPhillips Wilmington Refinery</u>
Natural gas is supplied to the ConocoPhillips Wilmington Refinery by Southern California Gas Company.

3. <u>Chevron Refinery</u>
Natural gas is supplied to the Chevron Refinery by the Southern California Gas Company and is used in conjunction with refinery fuel gas generated on-site at the Chevron Refinery.

4. <u>ExxonMobil Refinery</u>
Natural gas is supplied to the ExxonMobil Refinery by the Southern California Gas Company.

5. <u>Ultramar/Valero Refinery</u>
Natural gas is supplied to the Ultramar/Valero Refinery by the Southern California Gas Company.

6. <u>Tesoro Refinery</u>
Natural gas is supplied to the Tesoro Refinery by the Southern California Gas Company.

7. <u>Rhodia Inc.</u>
Natural gas is supplied to Rhodia by Coral Energy Resources. In addition, the transmission and metering of the natural gas to the Rhodia plant is provided by the Southern California Gas Company.

8. <u>ConocoPhillips Carson Plant</u>
Natural gas is supplied to the ConocoPhillips Carson Plant by Southern California Gas Company.

[37] CEC, http://energyalmanac.ca.gov/naturalgas/demand_by_sector.html.

9. BP Wilmington Calciner Plant

Natural gas is supplied to the BP Wilmington Calciner Plant by Southern California Gas Company.

10. CPCC Plant

Natural gas is supplied to the CPCC Plant by Occidental Petroleum.

11. Owens-Brockway Glass Container Inc.

Natural gas is supplied to the Owens-Brockway Glass Container Inc. by Shell Energy.

Table 3-9 summarizes the sources of energy for each of the affected facilities.

Table 3-9
Facility-Specific Existing Setting Summary for Energy

Facility Name	ENERGY	
	Electricity Source	**Natural Gas Source**
BP Carson Refinery	1. Self-generates 727,000 MWh/yr from BP's on-site Watson Cogeneration Plant 2. Purchases approximately 257 MWh/yr from SCE	Self-generates from BP's existing utility system
ConocoPhillips Wilmington Refinery	1. Existing onsite cogeneration plant 2. Purchases additional electricity as needed from LADWP	Southern California Gas Company
Chevron Refinery	1. Existing onsite cogeneration plant[38] 2. Purchases additional electricity as needed from SCE	1. Self-generates refinery fuel gas 2. Purchases natural gas from Southern California Gas Company
ExxonMobil Refinery	Purchases electricity from SCE sub-station that solely serves ExxonMobil	Southern California Gas Company
Ultramar/Valero Refinery	LADWP	Southern California Gas Company
Tesoro Refinery	1. Existing onsite cogeneration plant[39] 2. Purchases additional electricity as needed from LADWP	Southern California Gas Company
Rhodia Inc.	SCE	1. Coral Energy Resources for natural gas 2. Southern California Gas Company for transmission/metering
ConocoPhillips Carson Plant	SCE	Southern California Gas Company
BP Wilmington Calciner Plant	1. Self-generates 25 MW from BP's on-site cogeneration plant and sells 21 MW to SCE 2. Purchases additional electricity as needed from SCE if cogeneration unit is offline	Southern California Gas Company
CPCC	1. Self-generates 4 MW from on-site cogeneration plant for use within plant 2. Purchases additional electricity from Constellation New Energy	Occidental Petroleum
Owens-Brockway Glass Container Inc.	City of Vernon	Shell Energy

[38] Chevron is in the process of expanding their existing cogeneration facility by an additional 49.9 MW to be completed by the end of 2010. Once the project is completed, the need for purchasing additional electricity may be reduced or eliminated.

[39] Tesoro has plans to upgrade their cogeneration system and steam boilers by replacing two 30 MW existing cogeneration units (Cogens A and B) with one new 61.02 MW cogeneration system (Cogen C).

Liquid Petroleum Fuels

California is currently ranked fourth in the nation among oil producing states, behind Louisiana, Texas, and Alaska, respectively. Crude oil production in California averaged 684,912 barrels per day (bpd) in 2008[40]. Statewide oil production has declined to levels not seen since 1943. In 2008, the total receipts to refineries of roughly 656 million barrels came from in-state oil production (38.1 percent), combined with oil from Alaska (13.4 percent), and foreign sources (48.4 percent)[41]. In 2006, California ranked second in the United States in petroleum consumption[42].

A large network of crude oil pipelines connect producing areas with refineries that are located in the San Francisco Bay area, Los Angeles area and the Central Valley. Major ports in northern and southern California receive Alaska North Slope and foreign crude oil for processing in many of the state's 20 operable refineries[43].

Most gasoline and diesel fuel sold in California for on-road motor vehicles is refined in California to meet state-specific formulations required by CARB. Major petroleum refineries in California are concentrated in three counties: Contra Costa County in northern California, Kern County in central California, and Los Angeles County in southern California. In Los Angeles County, petroleum refineries are located mostly in the southern portion of the county.

In 2006, Californians used nearly 42 million gallons of gasoline and eight million gallons of diesel every day[44]. California refineries produce these fuels and other products from crude oil and blending components. Transportation fuel production in California depends on the availability and quality of the crude oils used by refineries in the state. The supply of crude oil to California refineries has changed substantially in the last 10 years. Most notably, receipts of foreign crude oil have increased as production sources from California and Alaska have continued to decline.

In the last two decades, California refineries have been running increasingly closer to capacity levels. Southern California refineries have also shown an increasing level of crude oil imports during this same period. In addition, refineries are also required to meet new diesel regulations promulgated by the USEPA and CARB. The USEPA lowered the allowable amount of sulfur in on-road diesel fuel from less than 500 ppm to less than 15 ppm. This requirement became effective in 2006. The sulfur content and American Petroleum Institute (API) gravity of crude oil input to a refinery in conjunction with the complexity of process units will affect the quantity of ultra-low sulfur diesel (ULSD) produced by a refinery. The hydrocracking and hydrotreater units are utilized to recover sulfur during the oil refining process. Recovered sulfur is converted into elemental sulfur for commercial sale. Hydrocracking units also break hydrocarbon molecules into lighter compounds in the presence of hydrogen. Refineries throughout the United States. have upgraded their desulfurization processes in order to meet the new diesel sulfur standards. This upgrade typically involves techniques such as changing the catalyst in the hydrotreater or installing booster pumps to force more feedstock through the unit. Both hydrocrackers and hydrotreaters also remove heavy metals and aromatics from the feedstock.

[40] One barrel is equal to 42 gallons.
[41] http://www.energyalmanac.ca.gov/petroleum/statistics/crude_oil_receipts.html
[42] http://www.eia.doe.gov/emeu/states/sep_sum/plain_html/rank_use_per_cap.html
[43] http://tonto.eia.doe.gov/dnav/pet/pet_pnp_cap1_dcu_SCA_a.htm
[44] http://energyalmanac.ca.gov/gasoline/gasoline_by_county.html

This is particularly important in California where lower aromatic standards are required along with the new ULSD standards.

Regulatory Background

Federal and state agencies regulate energy use and consumption through various programs. On the federal level, the DOT, the DOE, and the USEPA are three agencies with substantial influence over energy policies and programs.

Generally, federal agencies influence transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy related research and development projects, and through funding for transportation infrastructure projects. On the state level, the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC) are two agencies with authority over different aspects of energy. The CPUC regulates privately-owned utilities in the energy, rail, telecommunications, and water fields. The CEC collects and analyzes energy-related data, prepares state-wide energy policy recommendations and plans, promotes and funds energy efficiency programs, and regulates the power plant siting process. California is preempted under federal law from setting state fuel economy standards for new on-road motor vehicles. Some of the more relevant federal and state transportation-energy-related laws and plans are discussed in the following subsections.

Federal Regulations

Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the United States would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the DOT, is responsible for establishing additional vehicle standards and for revising existing standards. Since 1990, the fuel economy standard for new passenger cars has been 27.5 miles per gallon (mpg). Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is not determined for each individual vehicle model, but rather, compliance is determined on the basis of each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States. The Corporate Average Fuel Economy (CAFE) program, which is administered by USEPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The USEPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the DOT is authorized to assess penalties for noncompliance.

In late 2007, CAFE standards received their first overhaul in more than 30 years. On December 19, President Bush signed into law the Clean Energy Act of 2007, which requires in part that automakers boost fleetwide gas mileage to 35 mpg by the year 2020. This requirement applies to all passenger automobiles, including "light trucks." The bill signed into law December 2007 was an 822-page document changing United States energy policy in many areas. Key provisions were:

- Improved vehicle fuel economy.

- Increased CAFE standards. Automakers are required to boost fleetwide gas mileage to 35 mpg (14.8 kilometers per liter) by 2020. This applies to all passenger automobiles, including "light trucks."
- Improved vehicle technology and transportation electrification. Incentives for the development of plug-in hybrids.
- New conservation requirements for federal vehicle fleets.
- Increased production of biofuels. The total amount of biofuels added to gasoline is required to increase to 36 billion gallons by 2022, from the 4.7 billion gallons in 2007. The Energy Act specifies that 21 billion gallons of the 2022 total must be derived from non-cornstarch products (e.g., sugar or cellulose).

Light-Duty Vehicle GHG Emission Standards and Corporate Average Fuel Economy (CAFE) Standards

On May 7, 2010, the USEPA and the National Highway Traffic and Safety Administration (NHTSA) published GHG and CAFE standards for light-duty vehicles. This program applies to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. In addition, these vehicles are required to meet an estimated combined average emissions level of 250 grams per mile of CO2, equivalent to 35.5 miles per gallon (MPG) if the automobile industry were to meet this CO2 level solely through fuel economy improvements. Together, these standards will cut GHG emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program for model years 2012-2016.

Intermodal Surface Transportation Efficiency Act

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) promoted the development of inter-modal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. ISTEA contained factors that Metropolitan Planning Organizations (MPOs), such as SCAG, were to address in developing transportation plans and programs, including some energy-related factors. To meet the new ISTEA requirements, MPOs adopted explicit policies defining the social, economic, energy, and environmental values that were to guide transportation decisions in that metropolitan area. The planning process for specific projects would then address these policies. Another requirement was to consider the consistency of transportation planning with federal, state, and local energy goals. Through this requirement, energy consumption was expected to become a decision criterion, along with cost and other values that determine the best transportation solution.

Transportation Equity Act for the 21st Century

The Transportation Equity Act for the 21st Century (TEA-21) was signed into law in 1998 and builds upon the initiatives established in the ISTEA legislation, discussed above. TEA-21 authorizes highway, highway safety, transit, and other surface transportation programs. TEA-21 continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of good transportation decisions. TEA-21 also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment of Intelligent Transportation Systems, to help improve operations and management of transportation systems and vehicle safety. Congress is currently developing various amendments to continue surface transportation programs.

Clean Cities Program

The DOE's Clean Cities Program promotes voluntary, locally-based government/industry partnerships for the purpose of expanding the use of alternatives to gasoline and diesel fuel by accelerating the deployment of alternative fuel vehicles (AFVs) and building a local AFV refueling infrastructure. The Clean Cities Program has created more than 70 partnerships in communities throughout the country. Six of these partnerships have been established in the southern California region: Coachella Valley, Lancaster, Long Beach, Los Angeles, Northwest Riverside, and one administered by SCAG (SCAG, 2005).

State Regulations

State of California Integrated Energy Policy Report

In 2002, the Legislature reconstituted the state's responsibility to develop an integrated energy plan for electricity, natural gas, and transportation fuels. On November 1, 2003, and every two years thereafter, the CEC, in consultation with other State energy agencies, must provide an overview of the major energy trends and issues facing California, including supply, demand, price, reliability, and efficiency. It must assess the impacts of these trends and issues on public health and safety, the economy, resources, and the environment. Finally, it must make policy recommendations to the Governor and the Legislature that are based on an in-depth and integrated analysis of the most current and pressing energy issues facing California (SCAG, 2005).

Reducing California's Petroleum Dependence

The CEC and CARB produced a joint report "Reducing California's Petroleum Dependence" to highlight petroleum consumption and to establish a performance based goal to reduce petroleum consumption in California over the next thirty years. The report includes the following recommendations to the Governor and Legislature regarding petroleum:

- Adopt the recommended statewide goal of reducing demand for on-road gasoline and diesel to 15 percent below the 2003 demand level by 2020 and maintaining that level for the foreseeable future.
- Work with the California delegation and other states to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles.
- Establish a goal to increase the use of non-petroleum fuels to 20 percent of on-road fuel consumption by 2020, and 30 percent by 2030.

The CEC will use these recommendations when developing its series of recommendations to the Governor and Legislature for the integrated energy plan for electricity, natural gas, and transportation fuels (SCAG, 2005).

Renewables Portfolio Standard

California's renewables portfolio standard (RPS) requires retail sellers of electricity to increase their procurement of eligible renewable energy resources by at least one percent per year so that 20 percent of their retail sales are procured from eligible renewable energy resources by 2014. If a seller falls short in a given year, they must procure more renewables in succeeding years to make up the shortfall. Once a retail seller reaches 20 percent, they need not increase their procurement in succeeding years. The CEC and the CPUC are jointly implementing the standard. In addition, California lawmakers are currently developing legislation to increase the current 20 percent by 2010 RPS to 33 percent by 2020[45]. The CEC and CPUC have endorsed this change and it is a key GHG reduction strategy in the CARB's AB 32 Scoping Plan.

California Environmental Quality Act
Appendix F of the CEQA Guidelines describes the types of information and analyses related to energy conservation that are to be included in EIRs that are prepared pursuant to the CEQA. In Appendix F of the CEQA Guidelines, energy conservation is described in terms of decreased per capita energy consumption, decreased reliance on natural gas and oil, and increased reliance on renewable energy sources. To assure that energy implications are considered in project decisions, EIRs must include a discussion of the potentially significant energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy.

HAZARDS AND HAZARDOUS MATERIALS

The use, storage and transport of hazardous materials are subject to numerous laws and regulations at all levels of government. The most relevant existing hazardous materials laws and regulations include hazardous materials management planning, hazardous materials transportation, hazardous materials worker safety requirements, hazardous waste handling requirements and emergency response to hazardous materials and waste incidents. Potential risk of upset is a factor in the production, use, storage and transportation of hazardous materials. Risk of upset concerns are related to the risks of explosions or the release of hazardous substances in the event of an accident or upset conditions.

Hazardous Materials Management Planning

State law requires detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of to prevent or mitigate injury to health or the environment in the event that such materials are accidentally released. Federal laws, such as the Emergency Planning and Community-Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act (SARA), Title III) impose similar requirements. These requirements are enforced by the California Office of Emergency Services.

The Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act) requires that any business or government agency that handles hazardous materials prepare a business plan, which must include the following (HSC §25504):

- details, including floor plans, of the facility and business conducted at the site;
- an inventory of hazardous materials that are handled or stored on the site;
- an emergency response plan; and
- a training program in safety procedures and emergency response for new employees, and an annual refresher course in the same topics for all employees.

These requirements are generally administered by the local fire departments.

Hazardous Materials Transportation

The DOT has the regulatory responsibility for the safe transportation of hazardous materials between states and to foreign countries. DOT regulations govern all means of transportation, except for those packages shipped by mail, which are covered by the United States Postal

[45] http://www.cpuc.ca.gov/PUC/energy/Renewables/hot/33implementation.htm

Service (USPS) regulations. DOT regulations are contained in the Code of Federal Regulations, Title 49 (49 CFR); USPS regulations are in 39 CFR.

Every package type used by a hazardous materials shipper must undergo tests which imitate some of the possible rigors of travel. While not every package must be put through every test, most packages must be able to meet the following generic test criteria: the ability to be (a) kept under running water for one-half hour without leaking; (b) dropped, fully loaded, onto a concrete floor; (c) compressed from both sides for a period of time; (d) subjected to low and high pressure; and (e) frozen and heated alternately.

Common carriers are licensed by the California Highway Patrol (CHP) pursuant to the California Vehicle Code, §32000, which requires licensing of every motor (common) carrier who transports, for a fee, in excess of 500 pounds of hazardous materials at one time and every carrier, if not for hire, who carries more than 1,000 pounds of hazardous material of the type requiring placards. Common carriers conduct a large portion of their business in the delivery of hazardous materials.

Under the federal Resource Conservation and Recovery Act (RCRA) of 1976, the USEPA set standards for transporters of hazardous waste. In addition, the State of California regulates the transportation of hazardous waste originating or passing through the state; state regulations are contained in the CCR, Title 13. Hazardous materials are regularly removed from generating sites by licensed hazardous waste transporters. Transported materials must be accompanied by hazardous waste manifests.

Two state agencies have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies: the CHP and the California Department of Transportation (Caltrans).

The CHP enforces hazardous materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an accident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of CHP, which conducts regular inspections of licensed transporters to assure regulatory compliance. Caltrans has emergency chemical spill identification teams at 72 locations throughout the state.

Hazardous Material Worker Safety Requirements

The California Occupational Safety and Health Administration (CalOSHA) and the Federal Occupational Safety and Health Administration (FedOSHA) are the agencies responsible for assuring worker safety in the handling and use of chemicals in the workplace. In California, CalOSHA assumes primary responsibility for developing and enforcing workplace safety regulations.

Under the authority of the Occupational Safety and Health Act of 1970, FedOSHA has adopted numerous regulations pertaining to worker safety (contained in 29 CFR – Labor). These regulations set standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries. Some OSHA regulations contain standards relating to hazardous materials handling, including workplace conditions, employee protection requirements, first aid, and fire protection, as well as material handling and storage. Because California has a federally-approved OSHA program, it is required to adopt regulations that are at least as stringent as those found in 29 CFR.

CalOSHA regulations concerning the use of hazardous materials in the workplace (which are detailed in CCR, Title 8) include requirements for employee safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. CalOSHA enforces hazard communication program regulations, which contain training and information requirements, including procedures for identifying and labeling hazardous substances as well as communicating hazard information related to hazardous substances and their handling. The hazard communication program also requires that MSDSs be available to employees and that employee information and training programs be documented. These regulations also require preparation of emergency action plans (escape and evacuation procedures, rescue and medical duties, alarm systems, and emergency evacuation training).

Both federal and state laws include special provisions for hazard communication to employees in research laboratories, including training in chemical work practices. The training must include methods in the safe handling of hazardous materials, an explanation of MSDSs, use of emergency response equipment and supplies, and an explanation of the building emergency response plan and procedures.

Chemical safety information must also be available. More detailed training and monitoring is required for the use of carcinogens, ethylene oxide, lead, asbestos, and certain other chemicals listed or defined in 29 CFR. Emergency equipment and supplies, such as fire extinguishers, safety showers, and eye washes, must also be kept in accessible places. Compliance with these regulations reduces the risk of accidents, worker health effects, and emissions.

National Fire Codes (NFC), Title 45 (published by the National Fire Protection Association) contains standards for laboratories using chemicals, which are not requirements, but are generally employed by organizations in order to protect workers. These standards provide basic protection of life and property in laboratory work areas through prevention and control of fires and explosions, and also serve to protect personnel from exposure to non-fire health hazards.

While NFC Standard 45 is regarded as a nationally recognized standard, the California Fire Code (24 CCR) contains state standards for the use and storage of hazardous materials and special standards for buildings where hazardous materials are found. Some of these regulations consist of amendments to NFC Standard 45. State Fire Code regulations require emergency pre-fire plans to include training programs in first aid, the use of fire equipment, and methods of evacuation.

Hazardous Waste Handling Requirements

The RCRA created a major new federal hazardous waste regulatory program that is administered by the USEPA. Under RCRA, the USEPA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste from “cradle to grave.”

RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the “cradle-to-grave” system of regulating hazardous wastes. HSWA specifically prohibits the use of certain techniques for the disposal of some hazardous wastes.

Under RCRA, individual states may implement their own hazardous waste programs in lieu of RCRA as long as the state program is at least as stringent as federal RCRA requirements. The USEPA approved California’s program to implement federal regulations as of August 1, 1992.

The Hazardous Waste Control Law (HWCL) is administered by the CalEPA's DTSC. Under HWCL, the DTSC has adopted extensive regulations governing the generation, transportation, and disposal of hazardous wastes. HWCL differs little from RCRA; both laws impose "cradle to grave" regulatory systems for handling hazardous wastes in a manner that protects human health and the environment. Regulations implementing HWCL are generally more stringent than regulations implementing RCRA.

Regulations implementing HWCL list over 780 hazardous chemicals as well as 20 to 30 more common materials that may be hazardous; establish criteria for identifying, packaging and labeling hazardous wastes; prescribe management practices for hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal and transportation; and identify hazardous wastes that cannot be disposed of in landfills.

Under both RCRA and HWCL, hazardous waste manifests must be retained by the generator for a minimum of three years. Hazardous waste manifests list a description of the waste, its intended destination and regulatory information about the waste. A copy of each manifest must be filed with DTSC. The generator must match copies of hazardous waste manifests with certification notices from the treatment, disposal, or recycling facility.

Emergency Response to Hazardous Materials and Wastes Incidents

Pursuant to the Emergency Services Act, the State has developed an Emergency Response Plan to coordinate emergency services provided by federal, state, and local government agencies and private persons. Response to hazardous materials incidents is one part of this plan. The Plan is administered by the state Office of Emergency Services (OES), which coordinates the responses of other agencies including USEPA, CHP, the Department of Fish and Game, the RWQCB, and local fire departments. (See *California Government Code* §8550.)

In addition, pursuant to the Hazardous Materials Release Response Plans and Inventory Law of 1985 (the Business Plan Law), local agencies are required to develop "area plans" for response to releases of hazardous materials and wastes. These emergency response plans depend to a large extent on the business plans submitted by persons who handle hazardous materials. An area plan must include pre-emergency planning of procedures for emergency response, notification and coordination of affected government agencies and responsible parties, training, and follow-up.

Existing Hazards and Hazardous Waste Setting

The following discussion describes the existing hazards and hazardous waste setting for the equipment/source categories that may be affected by the proposed project. Due to the heavy industrial nature of each affected facility, the existing hazards setting is widely varied and voluminous. Since the proposed project is focused on controlling SOx emissions from FCCUs, SRU/TGUs, refinery boilers/heaters, sulfuric acid manufacturing, petroleum coke calcining container glass manufacturing, and cement manufacturing, the existing setting for hazards/hazardous materials for these source categories will focus on the current hazardous materials used by the applicable source categories at the affected facilities.

<u>1. BP Carson Refinery</u>

There are three source categories at the BP Carson Refinery that may be affected by the proposed project: the FCCU, the SRU/TGU, and the FGT for amine absorbers in their fuel gas system. The materials used in these existing units and whether they are hazardous are identified in the following paragraphs.

FCCU: The ESP catalyst fines from the FCCU at the BP Carson Refinery are loaded into a truck and either transported to a local cement plant or transported to a landfill for disposal. The catalyst fines material is classified as non-hazardous waste. In 2008, the BP Carson Refinery disposed of approximately 1,700 tons of ESP catalyst fines. Hazardous waste generated by the BP Carson Refinery is regulated by the DTSC. However, the BP Carson Refinery is not subject to a solid waste discharge permit.

SRU/TGU: The Sulfur Plant currently converts H2S and ammonia-rich acid gases into elemental sulfur, water, and nitrogen via a partial combustion (Claus) reaction. The Sulfur Plant utilizes sour water strippers for removal of H2S and NH3 from water, Claus Units for the conversion of H2S to elemental sulfur and the destruction of NH3, and TGUs via amine absorbers to recover any unconverted H2S. The amine used in this process is methyl diethanol amine (MDEA). MDEA is not considered a TAC or hazardous compound per SCAQMD's Rule 1401 and California Accidental Release Prevention (CalARP) Program as published in the California Code of Regulations (CCR), Title 19, Division 2, Chapter 4.5. NH3 and H2S are TACs and hazardous compounds per SCAQMD Rule 1401 and CalARP. Commercial grade sulfur is not considered a TAC or hazardous compound per SCAQMD's Rule 1401 and CalARP, but it may form a flammable or explosive mixture if any sulfur particles (dust) are allowed to mix with air.

FGT: Fuel gas is treated by amine absorbers that use MDEA to remove H2S from fuel gas. While MDEA is not considered a TAC or hazardous compound per SCAQMD's Rule 1401 and CalARP, H2S is a TAC and hazardous compound per SCAQMD Rule 1401 and CalARP.

2. ConocoPhillips Wilmington Refinery

There are three source categories at the ConocoPhillips Wilmington Refinery that may be affected by the proposed project: the FCCU, FGT and sulfuric acid plant. The materials used in these existing units and whether they are hazardous are identified in the following paragraphs.

FCCU: The ESP catalyst fines from the FCCU at the ConocoPhillips Wilmington Refinery are loaded into a truck and transported to a local cement plant for use as an ingredient in the manufacture of cement. The approximate quantity of catalyst fines generated is 526 tons per year. The catalyst fines material is not classified as a hazardous waste since it is recycled. Hazardous waste generated by the ConocoPhillips Wilmington Refinery is regulated by the DTSC and the Los Angeles County Fire Department.

FGT: The amine absorbers use monoethanolamine (MEA) to remove sulfur compounds from the refinery fuel gas. MEA is not considered a hazardous compound per SCAQMD's Rule 1401 and CalARP.

Sulfuric Acid Plant: The sulfuric acid plant takes the sulfur in the feedstock (spent sulfuric acid from other processes plus fresh sulfur) and oxidizes it to SO2 in a furnace. The SO2 is then oxidized to SO3 in a catalytic converter. Lastly, the SO3 is combined with water to create a strong H2SO4 solution. H2SO4 and SO3 are regulated, hazardous compounds per SCAQMD's Rule 1401 and CalARP, under certain conditions.

3. Chevron Refinery

There are three source categories at the Chevron Refinery that may be affected by the proposed project: the FCCU, the SRU/TGU, and the FGT for amine absorbers in their fuel gas system. The materials used in these existing units and whether they are hazardous are identified in the following paragraphs.

FCCU: The ESP catalyst fines are comprised of base catalyst plus SOx reducing additives from the FCCU at the Chevron Refinery are loaded into a pneumatic tanker truck and transported to a local cement plant for use as an ingredient in the manufacture of cement. In 2008, the Chevron Refinery shipped approximately 409 tons for recycling. The catalyst fines material is not classified as a hazardous waste since it is recycled.

FGT: The absorbers use diethanolamine (DEA) to remove sulfur compounds (e.g., H2S) from the refinery fuel gas. H2S and DEA are TACs and are considered hazardous compounds per SCAQMD's Rule 1401 and CalARP.

SRU/TGU: The SRU/TGU uses catalyst to convert ammonia (NH3), H2S and nitrogen compounds from the sour water feed stream to commercial grade sulfur along with nitrogen and water that is exhausted to the atmosphere. NH3 and H2S are TACs and hazardous compounds per SCAQMD Rule 1401 and CalARP. Commercial grade sulfur is not considered a TAC or hazardous compound per SCAQMD's Rule 1401 and CalARP, but it may form a flammable or explosive mixture if any sulfur particles (dust) are allowed to mix with air. Similar to the catalyst used in the FCCU, the catalyst in the SRU/TGU is loaded into a pneumatic tanker truck and transported to a local cement plant for use as an ingredient in the manufacture of cement. The spent catalyst used in this process is not classified as a hazardous waste since it is recycled.

4. ExxonMobil Refinery

There are three source categories at the ExxonMobil Refinery that may be affected by the proposed project: the FCCU, the SRU/TGU, and the FGT. The materials used in these existing units and whether they are hazardous are identified in the following paragraphs.

FCCU: The ESP catalyst fines from the FCCU at the ExxonMobil Refinery are loaded into a truck and transported to a local cement plant for use as an ingredient in the manufacture of cement. The approximate quantity of catalyst fines generated is 150 tons per year. The catalyst fines material is not classified as a hazardous waste since it is recycled. Hazardous waste generated by the ExxonMobil Refinery is regulated by the DTSC and/or the local CUPA.

SRU/TGU: The Sulfur Plant currently converts H2S and ammonia-rich acid gases into elemental sulfur, water, and nitrogen via a partial combustion (Claus) reaction. The Sulfur Plant utilizes Claus Units for the conversion of H2S to elemental sulfur and the destruction of NH3, and TGUs via amine absorbers to recover any unconverted H2S. A proprietary amine is used in the TGU. NH3 and H2S are TACs and hazardous compounds per SCAQMD Rule 1401 and CalARP. Commercial grade sulfur is not considered a TAC or hazardous compound per SCAQMD's Rule 1401 and CalARP, but it may form a flammable or explosive mixture if any sulfur particles (dust) are allowed to mix with air.

FGT: To reduce mercaptans (ethyl- and methyl-), DEA is used to treat most of the refinery fuel gas, other than coker off-gas, which is treated with MEA and NaOH. NaOH and DEA are both TACs and are considered hazardous compounds per SCAQMD's Rule 1401 and CalARP. MEA is not considered a hazardous compound per SCAQMD's Rule 1401 and CalARP.

5. Ultramar/Valero Refinery

There are three source categories at the Chevron Refinery that may be affected by the proposed project: the FCCU, the SRU/TGU, and the FGT for amine absorbers in their fuel gas system. The materials used in these existing units and whether they are hazardous are identified in the following paragraphs.

FCCU: The ESP catalyst fines from the FCCU at the Ultramar/Valero Refinery are currently collected in hoppers below the ESP structure. The ESP catalyst fines, comprised of base catalyst and SOx reducing additives, are currently shipped to a local cement plant to be used as an ingredient in the manufacture of cement. The quantity of catalyst fines generated in 2008 was approximately 729 tons and it was classified as non-hazardous waste. The solid waste regulator for this facility is the Department of Toxic Substances Control (DTSC).

SRU/TGU: The Sulfur Plant currently converts H2S and ammonia-rich acid gases into elemental sulfur, water, and nitrogen via a partial combustion (Claus) reaction. The Sulfur Plant utilizes Claus Units for the conversion of H2S to elemental sulfur and the destruction of NH3, and TGUs via amine absorbers to recover any unconverted H2S. The amine used in the TGU is a hybrid mixture of MDEA and a special amine additive (TG-10). While MDEA, TG-10, and carbonyl sulfide are not considered TACs or hazardous compounds per SCAQMD's Rule 1401 and CalARP, H2S, NaOH and mercaptans are TACs and hazardous compounds per SCAQMD Rule 1401 and CalARP. Commercial grade sulfur is not considered a TAC or hazardous compound per SCAQMD's Rule 1401 and CalARP, but it may form a flammable or explosive mixture if any sulfur particles (dust) are allowed to mix with air.

FGT: Fuel gas is treated by amine absorbers to remove H2S from fuel gas. The FGT unit uses a fiber contactor system to treat fuel gas with a circulating stream of amine (MDEA) and caustic (NaOH) to remove H2S, carbonyl sulfide, and mercaptans. While MDEA and carbonyl sulfide are not considered TACs or hazardous compounds per SCAQMD's Rule 1401 and CalARP, H2S, NaOH and mercaptans are TACs and hazardous compounds per SCAQMD Rule 1401 and CalARP.

6. Tesoro Refinery

There are three source categories at the Chevron Refinery that may be affected by the proposed project: the FCCU, the SRU/TGU, and the FGT for amine absorbers in their fuel gas system. The materials used in these existing units and whether they are hazardous are identified in the following paragraphs.

FCCU: The ESP catalyst fines from the FCCU at the Tesoro Refinery, comprised of base catalyst and SOx reducing additives, are loaded into a truck and transported to a local cement plant CPCC for use as an ingredient in the manufacture of cement. The approximate quantity of catalyst fines generated is 360 tons per year. The catalyst fines material is not classified as a hazardous waste since it is recycled. Hazardous waste generated by the Tesoro Refinery is regulated by the DTSC.

SRU/TGU: The Sulfur Plant currently converts H2S and ammonia-rich acid gases into elemental sulfur, water, and nitrogen via a partial combustion (Claus) reaction. The Sulfur Plant utilizes Claus Units for the conversion of H2S to elemental sulfur and the destruction of NH3, and TGUs via MDEA amine absorbers to recover any unconverted H2S. Commercial grade sulfur is not considered a TAC or hazardous compound per SCAQMD's Rule 1401 and CalARP, but it may form a flammable or explosive mixture if any sulfur particles (dust) are allowed to mix with air. MDEA is not considered a TAC or hazardous compound per SCAQMD's Rule 1401 and CalARP.

FGT: Fuel gas is treated by amine absorbers that use DEA to remove H2S from fuel gas. DEA is a TAC and is considered a hazardous compound per SCAQMD's Rule 1401 and CalARP.

<u>7. Rhodia Inc.</u>
Rhodia has only one source category, sulfuric acid manufacturing, that may be affected by the proposed project. The sulfuric acid plant takes the sulfur in the feedstock (spent sulfuric acid from other facilities plus fresh sulfur) and oxidizes it to SO2 in a furnace. The SO2 is then oxidized to sulfur trioxide (SO3) in a catalytic converter. Lastly, the SO3 is combined with water to create a strong sulfuric acid (H2SO4) solution. H2SO4 and SO3 are regulated, hazardous compounds per SCAQMD's Rule 1401 and CalARP, under certain conditions. In addition, Rhodia is a generator of hazardous waste and local oversight of this waste stream is under the jurisdiction of the Los Angeles County Fire Department as the Certified Unified Program Agency (CUPA). At the state level, hazardous waste generated by Rhodia is regulated by the DTSC and CalEPA and at the federal level, it is regulated by the USEPA.

<u>8. ConocoPhillips Carson Plant</u>
There are two source categories at the ConocoPhillips Carson Plant that may be affected by the proposed project: the SRU/TGU and the FGT for amine absorbers in their fuel gas system. The materials used in these existing units and whether they are hazardous are identified in the following paragraphs.

SRU/TGU: The Sulfur Plant currently converts H2S and ammonia-rich acid gases into elemental sulfur, water, and nitrogen via a partial combustion (Claus) reaction. The Sulfur Plant utilizes Claus Units for the conversion of H2S to elemental sulfur and the destruction of NH3, and TGUs via amine absorbers to recover any unconverted H2S. The amine used in the TGU is a hybrid mixture of MDEA and a special amine additive (TG-10). While MDEA, TG-10, and carbonyl sulfide are not considered TACs or hazardous compounds per SCAQMD's Rule 1401 and CalARP, H2S, NaOH and mercaptans are TACs and hazardous compounds per SCAQMD Rule 1401 and CalARP. Commercial grade sulfur is not considered a TAC or hazardous compound per SCAQMD's Rule 1401 and CalARP, but it may form a flammable or explosive mixture if any sulfur particles (dust) are allowed to mix with air.

FGT: The fuel gas is treated with MEA and NaOH to reduce mercaptans (ethyl- and methyl-) and carbonyl sulfur. NaOH is a TAC and is considered a hazardous compound per SCAQMD's Rule 1401 and CalARP. MEA is not considered a hazardous compound per SCAQMD's Rule 1401 and CalARP.

The ConocoPhillips Carson Plant is a generator of hazardous waste and local oversight of this waste stream is under the jurisdiction of the DTSC and the Los Angeles County Fire Department.

<u>9. BP Wilmington Calciner Plant</u>
The calciner at BP Wilmington is the only source category that may be affected by the proposed project. The SOx emissions from the unit are controlled by a dry scrubber. The existing control system also includes a spray dryer, a reverse-air baghouse, a slurry storage system, a slurry circulating system, and a pneumatic conveying system. Calcium hydroxide (CaOH) slurry is the absorbing medium for the existing SO2 control system. CaOH is not considered a hazardous compound per SCAQMD's Rule 1401 and CalARP.

The BP Wilmington Calciner Plant does not operate an FCCU so there are no catalyst fines from this type of equipment in their solid waste stream. However, approximately 175 tons per day of non-hazardous waste is produced by the dry scrubber and baghouse operated at the BP Wilmington Calciner Plant, which is sold and shipped to a local cement plant for recycling. Other non-hazardous wastes produced are sent to some waste facilities as either a waste or a commodity that is sold to the waste facility as a sludge solidifier.

The primary Certified Unified Program Agencies[46] (CUPAs) for the BP Wilmington Calciner Plant are the Long Beach Fire Department and the Los Angeles City Fire Department. In addition, the CUPA permits for the BP Wilmington Calciner Plant are specifically for hazardous waste and hazardous materials. The BP Wilmington Calciner Plant has an USEPA identification number and meets the criteria as a small quantity generator[47].

10. CPCC Plant

The two cement kilns operating at the CPCC Plant are the only units that may be affected by the proposed project. The raw materials used for manufacturing cement include calcium, silica, alumina and iron, with calcium having the highest concentration. These raw materials are obtained from a limestone quarry for calcium, sand for silica; and shale and clay for alumina and silica. None of these materials are considered hazardous per SCAQMD's Rule 1401 and CalARP. In addition, the CPCC Plant receives catalyst fines and other non-hazardous waste from several facilities to be used in the cement manufacturing process[48]. The solid waste regulators for the CPCC Plant are the California Integrated Waste Management Board and the County of San Bernardino Fire Department CUPA for hazardous wastes.

11. Owens-Brockway Glass Container Inc.

The two glass melting furnaces and corresponding scrubbers at Owens-Brockway Glass Container are the only equipment that may be affected by the proposed project. Limestone, soda ash, and glass cullet are the main feedstocks to the furnaces. The scrubbers use trona, a rare sodium-rich mineral, as a scrubbing agent. Trona is also the main component in the manufacture of soda ash. Limestone, soda ash, trona and glass cullet are not considered hazardous compounds per SCAQMD's Rule 1401 and CalARP.

Owens-Brockway Glass Container Inc. collects particulates in their electrostatic precipitators (ESPs) and re-uses a majority of the dust in the glass-making process. The amount of dust that cannot be recycled in this manner is sent to be disposed of as hazardous waste. Owens-Brockway Glass Container Inc. qualifies as a large quantity generator[49] of solid waste.

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[46] Senate Bill 1082, passed in 1993, created the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program), which requires the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a Certified Unified Program Agency.

[47] A small quantity generator is allowed to generate less than 2,200 pounds of hazardous waste in any calendar month. All hazardous waste generated by the small quantity generator that is not treated onsite must be manifested to an offsite treatment, storage and disposal facility permitted to handle hazardous waste or to an approved designated facility (e.g., recycling facility).

[48] On November 20, 2009, CPCC operators shutdown both of its cement kilns and as such, indicated to SCAQMD staff that they will not be receiving catalyst fines for recycling until further notice. CPCC operators indicated that catalyst fines will be diverted to another cement plant located outside of the jurisdiction of SCAQMD.

[49] A large quantity generator generates 2,200 pounds or more of hazardous waste or more than 2.2 pounds of acute hazardous waste per calendar month. All hazardous waste generated by the large quantity generator that is not treated onsite must be manifested and sent to an offsite treatment, storage and disposal facility permitted to handle hazardous waste, or sent to an approved designated facility (e.g., a recycling facility).

HYDROLOGY AND WATER QUALITY

Water Quality

The USEPA is the federal agency responsible for water quality management and administration of the federal Clean Water Act (CWA). The USEPA has delegated most of the administration of the CWA in California to the California State Water Resources Control Board (SWRCB). The SWRCB was established through the California Porter-Cologne Water Quality Act of 1969 and is the primary agency responsible for water quality management issues in California. Much of the responsibility for implementation of the SWRCB's policies is delegated to the nine RWQCBs. Section 402 of the CWA established the National Pollutant Discharge Elimination System (NPDES) to regulate discharges into "navigable waters" of the United States. The USEPA authorized the SWRCB to issue NPDES permits in the State of California in 1974. The NPDES permit establishes discharge pollutant thresholds and operational conditions for industrial facilities and wastewater treatment plants. For point source discharges (e.g., wastewater treatment facilities), the RWQCBs prepare specific effluent limitations for constituents of concern such as toxic substances, total suspended solids (TSS), bio-chemical oxygen demand (BOD), and organic compounds. The limitations are based on the Basin Plan objectives and are tailored to the specific receiving waters, allowing some discharges, for instance deep water outfalls in the Pacific Ocean, more flexibility with certain constituents due to the ability of the receiving waters to accommodate the effluent without significant impact.

Non-point source NPDES permits are also required for municipalities and unincorporated communities of populations greater than 100,000 to control urban stormwater runoff. These municipal permits include Storm Water Management Plans (SWMPs). A key part of the SWMP is the development of Best Management Practices (BMPs) to reduce pollutant loads. Certain businesses and projects within the jurisdictions of these municipalities are required to prepare Storm Water Pollution Prevention Plans (SWPPPs) which establish the appropriate BMPs to gain coverage under the municipal permit. On October 29, 1999, the USEPA finalized the Storm Water Phase II rule which requires smaller urban communities with a population less than 100,000 to acquire individual storm water discharge permits. The Phase II rule also requires construction activities on one to five acres to be permitted for storm water discharges. Individual storm water NPDES permits are required for specific industrial activities and for construction sites greater than five acres. State-wide general storm water NPDES permits have been developed to expedite discharge applications. They include the state-wide industrial permit and the state-wide construction permit. A prospective applicant may apply for coverage under one of these permits and receive Waste Discharge Requirements (WDRs) from the appropriate RWQCB. WDRs establish the permit conditions for individual dischargers.

Section 303(d) of the CWA requires the SWRCB to list impaired water bodies in the State and determine total maximum daily loads (TMDLs) for pollutants or other stressors impacting water quality. Even though the Section 303(d) list was completed in March 1999, TMDLs have yet to be determined for most of the identified impaired water bodies, although a priority schedule has been developed to complete the process in the region within 13 years. The RWQCBs will be responsible for ensuring that total discharges do not exceed TMDLs for individual water bodies as well as for entire watersheds.

The RWQCBs also coordinate the State Water Quality Certification program pursuant to Section 401 of the CWA. According to Section 401, states have the authority to review any federal permit or license that will result in a discharge or disruption to wetlands and other waters under state jurisdiction, to ensure that the actions will be consistent with the state's water quality requirements. This program is most often associated with §404 of the CWA which obligates the United States Army Corps of Engineers to issue permits for the movement of dredge and fill material into and from "waters of the United States."

Water quality of regional surface water and groundwater resources is affected by point source and non-point source discharges occurring throughout individual watersheds. Regulated point sources, such as wastewater treatment effluent discharges, usually involve a single discharge into receiving waters. Non-point sources involve diffuse and non-specific runoff that enters receiving waters through storm drains or from unimproved natural landscaping. Common non-point sources include urban runoff, agriculture runoff, resource extraction (on-going and historical), and natural drainage. Within the regional Basin Plans, the RWQCBs establish water quality objectives for surface water and groundwater resources and designate beneficial uses for each identified body of water.

California Water Code, Division 7, Chapter 5.6 established a comprehensive program within the SWRCB to protect the existing and future beneficial uses of California's enclosed bays and estuaries. The Bay Protection and Toxic Cleanup Plan (BPTCP) has provided a new focus on the SWRCB and the RWQCBs' efforts to control pollution of the state's bays and estuaries by establishing a program to identify toxic hot spots and plan for their cleanup. In June 1999, the SWRCB published a list of known toxic hot spots in estuaries, bays, and coastal waters.

Other state-wide programs run by the SWRCB to monitor water quality include the California State Mussel Watch Program and the Toxic Substances Monitoring Program. The Department of Fish and Game collects water and sediment samples for the SWRCB for both these programs and provides extensive state-wide water quality data reports annually. In addition, the RWQCBs conduct water sampling for Water Quality Assessments required by the CWA and for specific priority areas under restoration programs such as the Santa Monica Bay Restoration Program.

Water Supply

The Federal Safe Drinking Water Act, enacted in 1974 and implemented by the USEPA, imposes water quality and infrastructure standards for potable water delivery systems nation-wide. The California Safe Drinking Water Act was enacted in 1976. Potable water supply is managed through local agencies and water districts, the State Department of Water Resources (DWR), the Department of Health Services (DHS), the State Water Resources Control Board (SWRCB), the USEPA, and the United States Bureau of Reclamation. The DWR manages the State Water Project (SWP), and compiles planning information on supply and demand within California.

The DWR divides the state into ten hydrologic regions. Some regions contain a great deal of water, while other regions are very dry and must have their water imported by aqueducts. The South Coast Air Basin lies within the South Coast Hydrologic Region. The cities of Los Angeles, Long Beach, Santa Ana, and Riverside are among the many urban areas in this hydrologic region. The Santa Clara, Los Angeles, San Gabriel, and Santa Ana Rivers are among the area's hydrologic features. Most lakes in this area are actually reservoirs, made to hold imported water.

Imported sources of water (including the Colorado River Aqueduct (CRA), the State Water Project's California Aqueduct, and the Los Angeles Aqueduct) have, in previous years, supplied more than six million acre-feet[50] or two trillion gallons of water to the southern California region

[50] One acre-foot is equivalent to 325,851 gallons.

annually. Imported sources have accounted for approximately 74 percent of the total water used in the region.

Local sources of water account for approximately 26 percent of the total volume consumed annually in the SCAG area. Local sources include surface water runoff and groundwater.

The largest surface water sources in the region are the Colorado, the Santa Ana, and the Santa Clara River systems. Major groundwater basins in the region include the Central, Raymond, San Fernando, and San Gabriel basins (Los Angeles County); the Upper Santa Ana Valley Basin system (San Bernardino and Riverside counties); the Coastal Plain Basin (Orange County); and the Coachella Valley Basin (Riverside County).

Local water resources are fully developed and historically have remained relatively stable on a region-wide basis. However, local water supplies may decline in certain localized areas and increase in others. Several groundwater basins in the region are threatened by overdraft conditions, increasing levels of salinity, and contamination by agricultural land to urban development, thereby reducing the land surface available for groundwater recharge. Increasing demand for groundwater may also be limited by water quality, since levels of salinity in sources currently used for irrigation could be unacceptably high for domestic use without treatment.

Available water supplies provided by the Metropolitan Water District (MWD) are diverse and include State Water Project (SWP) deliveries, Colorado River deliveries (according to Federal apportionments and guidelines), water transfers and exchanges, storage and groundwater banking programs, and State and Federal initiatives (such as the California Water Use Plan for the Colorado River and Delta Improvements) (MWD, 2002).

Historically, the demand forecasts and supply capabilities have been compared over the next 20 years and under varying hydrologic conditions. These comparisons determine the supplies that can be reasonably relied upon to meet projected supplemental demands and to provide resource reserves that can provide a margin of safety to mitigate against uncertainties in demand projections and risks in implementing supply programs (MWD, 2002). Current practices allow MWD to bring water supplies on-line at least ten years in advance of demand with a very high degree of reliability. If all imported water supply programs and local projects proceed as planned, with no change in demand projections, reliability could be assured beyond twenty years (MWD, 2002).

The SWRCB, and the nine Regional Water Quality Control Boards (RWQCB), are responsible for protecting surface and groundwater supplies in California. In particular, the SWRCB establishes water-related policies and approves water quality control plans, which are implemented and enforced by RWQCBs. Five RWQCBs have jurisdiction over areas within the boundaries of the SCAQMD. These agencies also regulate discharges to state waters through federal pre-treatment requirements enforced by the publicly-owned treatment works (POTWs).

However, back-to-back dry years and low reservoir levels have put California in a statewide drought. In late 2008, the state's major reservoirs were at about one-third of capacity, at a time when they would typically be at about two-thirds. As a result, the DWR has allocated only 15 percent of requested amounts of water to be delivered to the SWP in 2009. This allocation is the second lowest in the history of the project. Adding to California's water woes is a federal judge's restrictions on pumping in the Sacramento-San Joaquin Delta, ordered in 2007 to protect the threatened Delta smelt. These restrictions reduced water deliveries by as much as 30 percent in 2008 to 25 million Californians in the San Francisco Bay Area, the Central Coast, the San Joaquin Valley, and Southern California. Because of the drought, local water resources, which include groundwater and captured surface water runoff, are not expected to be stable in the future on a region-wide basis. Further, several groundwater basins in the region are threatened by overdraft conditions, increasing levels of salinity, and contamination by agricultural land to urban development, thereby reducing the land surface available for groundwater recharge. Increasing demand for groundwater may also be limited by water quality, since levels of salinity in sources currently used for irrigation could be unacceptably high for domestic use without treatment.

On June 4, 2008, Governor Arnold Schwarzenegger issued Executive Order S-06-08 and declared an official drought for California[51]. Further, California Water Code §71460 et seq. states that a water district may restrict the use of water during any emergency caused by drought, or other threatened or existing water shortage, and may prohibit the use of water during such periods for any purpose other than household uses or such other restricted uses as determined to be necessary. The water district may also prohibit the use of water during such periods for specific uses which it finds to be nonessential. On February 27, 2009, Governor Schwarzenegger proclaimed a state of emergency regarding the drought and the availability and future sustainability of California's water resources[52]. The proclamation directed all state government agencies to utilize their resources, implement a state emergency plan and provide assistance for people, communities and businesses impacted by the drought. The proclamation further requested that all urban water users immediately increase their water conservation activities in an effort to reduce their individual water use by 20 percent.

In response to the Governor's proclamation, the California legislature has proposed Assembly Bill (AB) 49 – Water Efficiency[53] and Senate Bill (SB) 261 – Urban Water Efficiency[54]. These proposed bills will require a 10 percent reduction of urban water use by 2015 and 20 percent by 2020. However, these proposed bills will allow the use of non-potable or recycled water to count towards the progress in meeting these targets. On January 27, 2010, AB 49 was moved to the inactive file. On August 27, 2009, a hearing was set for SB 261 and then canceled. These are the last times any actions were taken on these bills.

Water districts, in response to the drought, have taken several actions throughout the state such as: 1) asking for voluntary reductions; 2) imposing mandatory restrictions or declaring a local emergency; 3) imposing agricultural rationing; 4) imposing drought rates, surcharges and fines; 5) limiting new development and requiring water efficient landscaping; and, 6) implementing a conservation campaign. In addition, water shortages have prompted cities to begin infrastructure improvements to secure future water supplies. For example, the LADWP, in conjunction with the WBMWD, are proposing the Harbor Refineries Recycled Water Pipeline Project (HRRWPP) to conserve potable water and instead produce and convey recycled water to multiple industrial and irrigation customers in the Los Angeles Harbor area[55].

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[51] http://gov.ca.gov/press-release/9796
[52] http://gov.ca.gov/press-release/11556/
[53] http://info.sen.ca.gov/pub/09-10/bill/asm/ab_0001-0050/ab_49_bill_20090909_proposed.html
[54] http://info.sen.ca.gov/pub/09-10/bill/sen/sb_0251-0300/sb_261_bill_20090713_amended_asm_v93.html
[55] http://www.ladwp.com/ladwp/cms/ladwp011486.jsp

Groundwater
Groundwater provides most of the region's local (i.e., non-imported) supply of fresh water. Many cities within the area augment imported water supplies with groundwater from underlying groundwater basins. Groundwater basins are recharged through local precipitation and through imported water applied through injection wells or percolation ponds. Groundwater basins in California are generally not managed by government authorities such that overlying property owners are allowed to extract water to the extent that other users are not impaired. However, through court decisions, several basins in the South Coast area have become adjudicated. Adjudicated groundwater basins are managed through a watermaster assigned by the court. The watermaster manages the distribution of extracted water and is responsible for maintaining water quality.

Recent efforts to store recycled water and surplus water in groundwater basins for use during drought periods have proven successful. These conjunctive use projects, in place of surface reservoirs, promise to play a major role in future water management planning.

The general quality of groundwater in the District has degraded substantially from historic levels. Much of the degradation has been attributed to land uses. For example, fertilizers and pesticides typically used on agricultural lands can infiltrate and degrade groundwater. Further, septic systems and leaking underground storage tanks can also impact groundwater quality. Urban runoff has been proven to be a significant source of pollutants. Pollutants in urban runoff include urban debris, suspended solids, bacteria, viruses, heavy metals, pesticides, petroleum hydrocarbons, and other organic compounds. In addition, when increased withdrawals from groundwater basins exceed safe yields, salt water intrusion from the ocean further degrades groundwater quality. Conversely, as impervious surfaces in urban areas increase, the rate of natural surface recharge declines.

Surface Runoff
Surface runoff augments groundwater and surface water supplies. However, the regional demand far surpasses the potential natural recharge capacity. The arid climate, drought, and increased urbanization contribute to the inadequate natural recharge. Urban and agricultural runoff can contain pollutants, which decrease the quality of local water supplies. Runoff captured in storage reservoirs varies widely from year to year depending on local precipitation, averaging 130,000 acre-feet per year within the MWD service area. Within the desert regions, the amount is considerably less, given the low annual rainfall and the relatively few surface reservoirs.

Water Demand
Estimating total water use in the District is difficult because the boundaries of supplemental water purveyors' service areas bear little relation to the boundaries of the District and there are dozens of individual water retailers within the District. Water demand in California can generally be divided between urban, agricultural, and environmental uses. In the SCAG area, 74 percent of potable water is provided from imported sources. Annual water demand fluctuates in relation to available supplies. During prolonged periods of drought, water demand can be reduced significantly through conservation measures.

Increases in California's water demand are due primarily to the increases in population. According the DWR Bulletin 160-98[56], urban water demand for 2020 is projected to increase

[56] http://www.dpla2.water.ca.gov/publications/b160/1998/esch4.pdf

from 1995 base levels by about 3.2 million acre-feet in average water years and by about 3.4 million acre-feet in drought years. However, agricultural water demand is forecast to be reduced by 2.3 million acre-feet (one acre-foot equals approximately 325,850 gallons) by 2020 due to anticipated increases in water use efficiency and reductions in irrigated agricultural acreage. Environmental water demand[57] will increase only slightly by 2020. Measures to ensure an adequate water supply include conservation programs, recycling, and increased storage facilities (SCAG, 2001).

The MWD monitors demographics in its service area using official SCAG and San Diego Association of Governments (SANDAG) growth projections. In MWD's service area, the population increased approximately seven percent from 1995 through 2000. This is an increase of about 211,000 people per year over a five-year period. Based on official SCAG and SANDAG growth projections, the population in MWD service area is expected to be 21.3 million people by 2020, reflecting an annual increase of 223,000 per year (MWD, 2002).

In 1998, 3.5 million acre-feet of water was used in the MWD service area. Of this total, 3.2 million acre-feet (91 percent) were used for municipal and industrial purposes (M&I), and 0.3 million acre-feet (nine percent) were used for agricultural purposes. Due to urbanization and market factors, including the price of water, agricultural water use has declined as the relative share of M&I water use has increased over time. Agricultural water use has declined from 14 percent in 1980 to 8.3 percent in 1997 (MWD, 2002).

Based on official SCAG and SANDAG growth projections, total water use is expected to grow from a projected 3.8 million acre-feet in 2000 to 4.8 million acre-feet in 2020. All water demand projections reflect demands under normal weather conditions. The water demand forecasts account for projected implementation of California's conservation best management practices (BMPs), water savings resulting from plumbing codes, and savings due to price effects. Per capita water demand in MWD's service area has decreased significantly since the 1980s, but is expected to remain relatively constant as rising affluence and growth in hot and dry areas dampen the effects of intense conservation efforts (MWD, 2002).

Nonresidential water use represents about 25 percent of the total M&I demand in the MWD's service area. The nonresidential sector represents water that is used by businesses, services, government, institutions (such as hospitals and schools), and industrial (or manufacturing) establishments. Within the commercial/institutional category, the top water users include schools, hospitals, hotels, amusement parks, colleges, laundries, and restaurants. In southern California, the major industrial users include electronics, aircraft, petroleum refining, beverages, food processing, and other industries that use water as a major component of the manufacturing process (MWD, 2002).

For 2009, MWD's current water demands are 2.23 million acre-feet per year. MWD's Colorado River supplies provide approximately 1.05 million acre-feet per year; therefore, MWD's SWP supplies combined with existing system storage make up the remaining 1.18 million acre-feet per year. However, the biological opinion on the Delta smelt issued by the US Fish and Wildlife Service imposed a 30 percent restriction on water deliveries which will severely affect MWD's

[57] Environmental water demand is the sum of the following: 1) dedicated flows in state and federal wild and scenic rivers; 2) Instream flow requirements established by water right permits, DFG agreements, court actions, or other administrative documents; 3) Bay-Delta outflows required by SWRCB; and, 4) Applied water demands of managed freshwater wildlife areas.

ability to deliver reliable water supplies that meet current and future water demands. For example, demand for MWD's SWP water is 1.5 million acre-feet per year, which exceeds available supplies of 0.75 million acre-feet per year in normal years. To handle the water deficit, MWD has been removing and will continue to remove water from existing storage reserves to meet demands in eight out of 10 years. MWD's storage reserves are at critically low levels, with one million acre-feet of supply in a five million acre-feet capacity system, with MWD drawing 350,000 acre-feet per year. Thus, shrinking supplies due to drought and the Delta smelt combined with increased demand due to regional growth has caused MWD to cut deliveries to Los Angeles by 10 percent.

Proposed Project

Much of the urbanized areas in Los Angeles County, where the majority of the facilities affected by the proposed project are located, is serviced by two large POTWs operating on the coast as follows: the City of Los Angeles Bureau of Sanitation Hyperion Facility and the Joint Outfall System of the Los Angeles County Sanitation District (LACSD). Each of these facilities discharges an average of over 250 MMgal/day.

The City of Colton, where one facility (CPCC) affected by the proposed project is located[58], owns, operates and maintains a wastewater collection, pumping and treatment system referred to as the Colton Water Reclamation Facility (CWRF). The CWRF also serves the City of Grand Terrace and unincorporated County areas. The plant utilizes a conventional and extended aeration secondary treatment process to product-treated effluent in compliance with RWQCB regulations. In addition, a regional tertiary treatment plant serving both the Cities of Colton and San Bernardino treats the effluent from the wastewater treatment plant and returns the water to the Santa Ana River. The average daily flows at the CWRF are approximately 5.6 MMgal/day.

The following discussion describes the existing water demand and wastewater setting for each of the affected facilities (six refineries, two sulfuric acid manufacturing plants, one petroleum coke calcining plant, one container glass manufacturing plant, and one Portland cement manufacturing plant) that are potentially affected by the proposed project. Unless otherwise noted, the data was provided by the facility operators:

<u>1. BP Carson Refinery</u>

The baseline water use at the BP Carson Refinery is approximately 12.5 MMgal/day. Operators of the BP Carson Refinery purchase approximately 5.8 MMgal/day of potable water and 2.8 MMgal/day of recycled water from the California Water Service (CWS). The CWS is a retailer that purchases water at wholesale rates from the West Basin Municipal Water District (WBMWD). In addition, operators of the BP Carson Refinery currently pump approximately 3.9 MMgal/day from their three onsite groundwater wells and their permit allows pumping up to 4.7 MMgal/day. The BP Carson Refinery is not limited to an amount of water it can purchase.

The BP Carson Refinery operates a wastewater treatment system that has a maximum capacity of 8,000 gallons per minute (gpm) or 11.5 MMgal/day, but discharges an average of 4,000 gpm or 5.76 MMgal/day. However, during wet weather, the discharge limit is 5,200 gpm or 7.49 MMgal/day. The Los Angeles County Sanitation District (LACSD) permit allows the BP Carson Refinery to discharge wastewater into the Dominguez Channel.

[58] The facility that is located in Riverside County, CPCC, does not discharge wastewater offsite.

2. ConocoPhillips Wilmington Refinery
The baseline water use at the ConocoPhillips Wilmington Refinery is approximately 7.85 MMgal/day. Operators of the ConocoPhillips Wilmington Refinery purchase approximately 5.47 MMgal/day of potable water from the LADWP. In addition, operators of the ConocoPhillips Wilmington Refinery currently pump approximately 2.38 MMgal/day from their one onsite groundwater well. This facility does not currently have access to recycled water. The ConocoPhillips Wilmington Refinery is not limited to an amount of water it can purchase.

The ConocoPhillips Wilmington Refinery operates a wastewater treatment system that discharges approximately of 2.69 MMgal/day. The Los Angeles City Bureau of Sanitation District (LACBS) permit allows the ConocoPhillips Wilmington Refinery to discharge wastewater into the city's sewer system which drains to LACBS's Terminal Island Water Reclamation Plant for treatment.

3. Chevron Refinery
The baseline water use by the Chevron Refinery is approximately 10.75 MMgal/day (2.6 million gallons of potable water and 8.15 million gallons of recycled water). Operators of the Chevron Refinery currently purchase their water from the City of El Segundo (a retailer). The City of El Segundo is a retailer that purchases water at wholesale rates from the WBMWD. Chevron also receives: 1) boiler feed water from secondary-treated effluent from the Hyperion Wastewater Treatment plant that has been further processed by filtration, chlorination, and demineralization by reverse osmosis; and 2) cooling tower water from secondary–treated effluent from the Hyperion Wastewater Treatment Plant that has been further processed by filtration, chlorination, and de-nitrification. Improvements as part of their ongoing Project Reliability and Optimization Project at WBMWD, located nearby, include increasing reverse osmosis and de-nitrification water production facilities. Chevron is not limited to an amount of water it can purchase. Further, Chevron does not have any groundwater well sources.

The Chevron Refinery operates two wastewater treatment systems. The first system operates at a flow rate of 5,000 gpm or 7.2 MMgal/day and the second system has a flow rate limit of 2,000 gpm or 2.88 MMgal/day and operates at an average flow rate of 1,800 gpm or 2.59 MMgal/day. The Chevron Refinery discharges an average of 7.2 MMgal/day of wastewater and is permitted to discharge 8.8 MMgal/day when weather conditions are dry and up to 23 MMgal/day during wet weather. Their National Pollutant Discharge Elimination System (NPDES) permit allows Chevron to discharge into the Santa Monica Bay.

4. ExxonMobil Refinery
The baseline water use at the ExxonMobil Refinery is approximately 10.32 MMgal/day. Operators of the ExxonMobil Refinery purchase approximately 3.19 MMgal/day of potable water and 6.0 MMgal/day of recycled water from the City of Torrance. The City of Torrance, the water purveyor, purchases recycled water at wholesale rates from the WBMWD. The ExxonMobil Refinery is not limited to an amount of water it can purchase. In addition, operators of the ExxonMobil Refinery currently pump approximately 1.13 MMgal/day of non-potable water from their six onsite groundwater wells and their permit allows pumping up to 2.39 MMgal/day.

The ExxonMobil Refinery operates one wastewater treatment system with a maximum capacity of 3,500 gpm or 5.04 MMgal/day but currently discharges at an average flow rate of 3,000 gpm or 4.32 MMgal/day. ExxonMobil's LACSD permit limits the discharge at 10,000 gpm or 14.4 MMgal/day during dry weather and 5,300 gpm or 7.63 MMgal/day during wet weather. The

LACSD permit allows the ExxonMobil Refinery to discharge wastewater into the Dominguez Channel.

5. Ultramar/Valero Refinery

The baseline water use at the Ultramar/Valero Refinery is approximately 2.57 MMgal/day. The majority of the water purchased by the operators of the Ultramar/Valero Refinery is potable water supplied by the LADWP with a small amount (e.g., 0.75 MMgal/day) of reverse osmosis (RO) water supplied by the Air Products Company. The Ultramar/Valero Refinery does not have any groundwater wells. This facility does not currently have access to recycled water. The Ultramar/Valero Refinery is not limited to an amount of water it can purchase.

The Ultramar/Valero Refinery does not have wastewater treatment facility. Two discharge permits, one from LACSB and one from LACSD, contain the same wastewater discharge limit of 1.14 MMgal/day. The wastewater discharges to LACSB's pipe which is connected to LACSD's mainline. Ultramar/Valero's LACSD permit limits the discharge at 2,000 gpm and 1,000 gpm during wet weather.

6. Tesoro Refinery

The baseline water use at Tesoro is approximately 5.76 MMgal/day. Operators of the Tesoro Refinery purchase approximately 1.3 MMgal/day of potable water from the LADWP. The Tesoro Refinery is not limited to an amount of water it can purchase. In addition, operators of the Tesoro Refinery currently pump approximately 4.46 MMgal/day from their three onsite groundwater wells (two wells are located at the refinery and one well is located at the sulfur plant). Because Tesoro's groundwater pumping permit only allows pumping up to 3.06 MMgal/day, Tesoro operators obtain permission to pump the additional 1.4 MMgal/day through lease agreements. This facility does not purchase recycled water.

The Tesoro Refinery operates one wastewater treatment system with a maximum capacity of 6,000 gpm or 8.64 MMgal/day but currently discharges at an average flow rate of 2,215 gpm or 3.19 MMgal/day in dry weather and 2,260 gpm or 3.25 MMgal/day in wet weather. Tesoro's LACSD permit limits the discharge at 10,000 gpm or 14.4 MMgal/day during dry weather and 5,300 gpm or 7.63 MMgal/day during wet weather. The LACSD permit allows the Tesoro Refinery to discharge wastewater into the LACSD Carson Treatment Plant.

7. Rhodia Inc.

The baseline water use at Rhodia is approximately 0.73 MMgal/day. Rhodia purchases approximately 0.58 MMgal/day from CWS with 85 percent going to cooling towers and 15 percent to other water users. The CWS is a retailer that purchases water at wholesale rates from the WBMWD. Rhodia is not limited to an amount of water it can purchase. However, this facility does not purchase recycled water. Rhodia has one groundwater well with water pumping rights of 521 acre-feet per year (169.7 million gallons per year or 0.47 MMgal/day). In Fiscal Year 2008-2009, Rhodia pumped 0.15 MMgal/day of non-potable water from its wells.

Rhodia has an on-site elementary neutralization unit where all wastewater from the facility is pumped into above-ground agitated tanks and sodium hydroxide is added to elevate the pH to above 6.0. This system is jointly regulated by the LACSD and the Los Angeles County Department of Public Works (LADPW) and the wastewater permit is jointly issued by both agencies. For the fiscal year ending June 30, 2008 the peak flow wastewater discharge rate was 387 gpm and the average flow rate was 175 gpm. The wastewater is discharged to the LACSD's sewerage system.

8. ConocoPhillips Carson Plant

The baseline water use at the ConocoPhillips Carson Plant is approximately 2.88 MMgal/day. Operators of the ConocoPhillips Carson plant can pump up to 2.59 MMgal/day from their one operational onsite groundwater well which provides non-potable water[59]. Operators of the ConocoPhillips Carson Plant purchase approximately 0.3 MMgal/day of potable water from the CWS. The CWS is a retailer that purchases water at wholesale rates from the WBMWD. This facility does not purchase recycled water. The ConocoPhillips Carson Plant is not limited to an amount of water it can purchase.

The ConocoPhillips Carson Plant operates a wastewater treatment system that discharges an average of 2.88 MMgal/day. The LACSD permit allows the ConocoPhillips Carson Plant to discharge wastewater to LACSD's sewerage system.

9. BP Wilmington Calciner Plant

The BP Wilmington Calciner Plant purchases approximately 1.08 MMgal/day from the Port of Long Beach. There is no limit on the amount of water the operators of the BP Wilmington Calciner Plant can purchase. The BP Wilmington Calciner Plant has no groundwater wells. This facility does not have access to recycled water.

The BP Wilmington Calciner Plant has an on-site basin to adjust the pH of the wastewater stream. The peak flow wastewater discharge permit limit is 125 gpm and the average flow rate is approximately 93,775 gallons per day. The wastewater is discharged to the LACSB and LACSD's sewerage systems.

10. CPCC Plant

The baseline water use at the CPCC plant is approximately 3.29 MMgal/day. The potable water purchased by the operators of CPCC is supplied by the Riverside Highland Water Company. CPCC is not limited to an amount of water it can purchase. In addition, CPCC has five groundwater wells that pump industrial-use groundwater (non-potable) at a rate of approximately 1.9 MMgal/day. This facility does not have access to recycled water.

CPCC does not have a wastewater treatment plant. Potable waste water is untreated and discharged to septic tank systems on site. Process industrial wastewater is untreated and discharged to percolation ponds on site. The RWQCB for the Santa Ana Region is the wastewater regulator for CPCC. CPCC's wastewater discharge permit allows: 1) 1.05 MMgal/day of cooling water wastes discharged to percolation ponds; 2) 0.45 MMgal/day of slurry wastes to evaporation ponds; and, 3) 8,000 gallons per day of sanitary wastes to subsurface disposal systems (septic tanks).

11. Owens-Brockway Glass Container Inc.

The baseline water use at the Owens-Brockway Glass Container Inc. (Owens-Brockway) is approximately 126,000 gallons per day. The water purchased by the operators of Owens-Brockway is supplied by the City of Vernon. Owens-Brockway does not have any groundwater wells. Owens-Brockway is not limited to an amount of water it can purchase. This facility does not have access to recycled water. Owens-Brockway treats their wastewater by passing it through skimmers to eliminate excess oil. The wastewater discharges to LACSD via the sanitary sewer line under a joint permit issued by the City of Vernon and LACSD. The current wastewater discharge rate is approximately 250 gpm or 360,000 gallons per day.

[59] There are two other non-operational wells at this facility.

Tables 3-10 and 3-11 summarize the water supply sources and wastewater processing data, respectively for each of the affected facilities.

Table 3-10
Facility-Specific Existing Setting Summary for Water Demand

Facility Name	**Purchased Water Supplier**	**Total Baseline Water Use**[1] (MMgal/day)	**Potable Water Use** (MMgal/day)	**Recycled Water Use** (MMgal/day)	**Groundwater Use** (MMgal/day)	**Groundwater Pumping Permit Allows?** (MMgal/day)
BP Carson Refinery[2]	CWS (retailer); WBMWD (wholesaler)	12.5	5.8	2.8	3.9	4.74
ConocoPhillips Wilmington Refinery[3]	LADWP	7.85	5.47	0 (No current access)	2.38	Not provided by the facility
Chevron Refinery	City of El Segundo (retailer); WBMWD (wholesaler)	10.75	2.6	8.15	0 (No wells)	Not applicable
ExxonMobil Refinery[4]	City of Torrance (purveyor); WBMWD (recycled wholesaler)	10.32	3.19	6.0	1.13 (non-potable treated prior to use)	2.29
Ultramar/ Valero Refinery[5]	LADWP (potable); Air Products Company (RO water[6])	2.5	1.75	0.75 (No current access but purchases non-pipelined recycled water)	0 (No wells)	Not applicable
Tesoro Refinery	LADWP	5.76	1.3	0 (No current access)	4.46 (non-potable)	3.06 [7]
Rhodia Inc.	CWS (retailer); WBMWD (wholesaler)	0.73	0.58	0 (No current access)	0.15 (non-potable)	0.47
ConocoPhillips Carson Plant	CWS (retailer); WBMWD (wholesaler)	2.88	0.30	0 (No current access)	2.59 (non-potable treated prior to use)	Not provided by the facility
BP Wilmington Calciner Plant	Port of Long Beach	1.08	1.08	0 (No access)	0 (No wells)	Not applicable
CPCC	Riverside Highland Water Co (potable)	3.29	1.39	0 (No access)	1.9 (industrial, non-potable)	No limit
Owens-Brockway Glass Container Inc.	City of Vernon	0.13	0.13	0 (No access)	0 (No wells)	Not applicable

1 Total Baseline Water Use = Potable Water Use + Recycled Water Use + Groundwater Use. Baseline data provided by facility operators, unless otherwise noted.
2 Baseline data from *Final Mitigated Negative Declaration for BP Carson Refinery Compliance and Safety Project*, SCH No. 2005051150, certified July 13, 2005, p. 2-55. (http://www.aqmd.gov/ceqa/documents/2005/nonaqmd/BP-MND/bp_fmnd.html)
3 Baseline data from *Final Environmental Impact Report for ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Projects*, SCH No. 2006111138, certified June 12, 2007, Appendix A, p. 2-30. (http://www.aqmd.gov/ceqa/documents/2007/nonaqmd/cp/NOP_IS.pdf)
4 Baseline data from *Final Environmental Impact Report for Mobil California Air Resources Board (CARB) Phase 3 – Reformulated Gasoline Project*, SCH No. 2000081105, certified October 12, 2001, p. 3-57. (http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/mobil/final/mobil_f.html)
5 Baseline data from: 1) *Final Environmental Impact Report for: Ultramar Inc. - Valero Wilmington Refinery Alkylation Improvement Project*, SCH No. 20030536, certified December 16, 2004, p. 4-40. (http://www.aqmd.gov/ceqa/documents/2004/nonaqmd/valero/final/valero_FEIR.html); and, 2) *Addendum to the Final Environmental Impact Report for the Ultramar Inc. – Valero Wilmington Refinery Akylation Improvement Project*, SCH No. 20030536, certified December 7, 2005, p. 18. (http://www.aqmd.gov/ceqa/documents/2005/nonaqmd/valero/addendum.doc).
6 RO = reverse osmosis
7 Tesoro obtains additional groundwater beyond permitted pumping amount through lease agreements.

Table 3-11
Facility-Specific Existing Setting Summary for Wastewater

Facility Name	Wastewater Regulator	Wastewater Discharge Point	Current Discharge Amount (MMgal/day)	Discharge Limit (MMgal/day)	On-site Treatment System?	On-site Treatment Capacity? (MMgal/day)
BP Carson Refinery	LACSD	LACSD	5.76	11.52 (max.); 7.49 (wet weather)	Yes	11.52 (max.); 5.76 (avg.)
ConocoPhillips Wilmington Refinery[1]	LACBS	Terminal Island via LACBS	2.69	No limit	Yes	2.69 (avg.); 7.2 (max)
Chevron Refinery	RWQCB	Santa Monica Bay	6.91	8.8 (dry weather); 27 (wet weather)	Yes – Two systems	1. 7.2 (max.); 4.32 (avg.) 2. 2.88 (max.; 2.59 (avg.)
ExxonMobil Refinery	LACSD	LACSD	4.32	14.4 (dry weather); 7.63 (wet weather)	Yes	5.04 (max.); 4.32 (avg.)
Ultramar/ Valero Refinery	LACSB & LACSD	LACSD via LACSB	1.14	2.88 (peak); 1.44 (wet weather)	No	N/A
Tesoro Refinery	LACSD	LACSD	3.19 (dry weather); 3.25 (wet weather)	14.4 (dry weather); 7.63 (wet weather)	Yes	8.64 (max.); 3.19 (avg. dry weather); 3.25 (avg. wet weather)
Rhodia Inc.	LACSD & LADPW	LACSD	0.56 (peak); 0.25 (avg.)	0.61 (peak); 0.21 (avg.)	Yes	0.21 (24-hr avg.)[2]
ConocoPhillips Carson Plant	LACSD	LACSD	2.88	2.88 (avg.)	Yes	7.20
BP Wilmington Calciner Plant	LACSD & LACSB	LACSD via LACSB	0.09	0.18	Yes, for pH adjustments	0.18
CPCC	RWQCB	On-site septic system for sanitary wastewater & on-site percolation ponds for industrial wastewater	Not provided by the facility	1.05 (cooling water wastes to percolation ponds); 0.45 (slurry wastes to evaporation ponds); & 3) 0.008 (sanitary wastes to septic tanks)	No	N/A
Owens-Brockway Glass Container Inc.	City of Vernon and LACSD	LACSD	0.36	Not provided by the facility	Yes, oil skimmers	Not provided by the facility

[1] Discharge data from *Final Environmental Impact Report for ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Projects*, SCH No. 2006111138, certified June 12, 2007, p.4-21. (http://www.aqmd.gov/ceqa/documents/2007/nonaqmd/cp/ch4.pdf)
[2] Rhodia is also subject to a 425 gallon per minute (gpm) five-minute peak limit.

TRANSPORTION AND TRAFFIC

The transportation system in Southern California is a complex intermodal network designed to carry both people and goods. It consists of roads and highways, public transit, paratransit, bus and rail, freight railroads, airports, seaports and intermodal terminals. The regional highway system consists of an interconnected network of local streets, arterial streets, freeways, carpool lanes and toll roads. This highway network allows for the operation of private autos, carpools, private and public buses, and trucks. Non-motorized transportation modes, such as bicycles share many of these facilities. The regional public transit system includes local shuttles, municipal and area-wide public bus operations, rail rapid transit operations, regional commuter rail services, and inter-regional passenger rail service. The freight railroad network includes an extensive system of private railroads and several publicly owned freight rail lines serving industrial cargo and goods. The airport system consists of commercial, general, and military aviation facilities serving passenger, freight, business, recreational, and defense needs. The region's seaports support substantial international and interregional freight movement and tourist travel. Intermodal terminals consisting of freight processing facilities serve the function of transfer, storage and distribution of goods. The transportation system supports the region's economic needs as well as the demand for personal travel.

The regional transportation system is currently at capacity operations during peak periods. The highway system shows substantial freeway congestion in the morning and evening peak period, with random episodes of incident-related (i.e. accident) congestion throughout the day. The transit system is experiencing substantial overcrowding on a number of core urban bus routes with significant excess capacity on most off-peak and peripheral routes. Rail transit is very close to capacity during peak hours on the Metro Blue Line, Metro Red Line, and Metro Gold Line, while the Metro Green Line generally has some capacity available. Commuter rail service is at or near capacity during peak periods as the routes approach Union Station in downtown Los Angeles, but suburb-to-suburb capacity is available on most lines.

A state statute requires a Congestion Management Program (CMP) to be developed, adopted, and updated biennially for every county that includes an urbanized area, and shall include every city and the county government within that county. A CMP links transportation, land use, and air quality decisions for one of the most complex urban areas in the country. A CMP also addresses the impact of local growth on the regional transportation system. Elements of the CMP include Highway and Roadway System monitoring, multi-modal system performance analysis, the Transportation Demand Management program, the Land Use Analysis program, and local conformance for all the county's jurisdictions.

In the SCAG region, the CMP is comprised of the combined activities of the Regional Transportation Plan (RTP), the CMP and the Regional Transportation Improvement Program (RTIP). Under California law, CMPs are prepared and maintained by the Congestion Management Agencies (CMAs). The Los Angeles County Metropolitan Transportation Authority (Metro), Orange County Transportation Authority (OCTA), Riverside County Transportation Commission (RCTC), and San Bernardino Associated Governments (SANBAG), are the designated CMAs of each county in the District and are subject to state requirements.

In addition to SCAG's RTP and RTIP, the key elements of the federal Congestion Management Process are addressed through the counties CMPs. Because the magnitude of congestion and degree of urbanization differ among the counties, each CMP differs in form and local procedure. By state law, all CMPs perform the monitoring and management functions shown below which also fulfill the federal CMP requirements.

- Highway Performance – Each CMA monitors the performance of an identified highway system. This monitoring allows each county to track how their system, and its individual components, is performing against established standards, and how performance changes over time.
- Multi-Modal Performance – In addition to highway performance, each CMP contains an element to evaluate the performance of other transportation modes including transit.
- Transportation Demand Management (TDM) – Each CMP contains a TDM component geared at reducing travel demand and promoting alternative transportation methods.

The magnitude of traffic volumes on a particular street represents but one element of hierarchy in an overall circulation system. The system provides a balanced linkage between high traffic corridors and low volume streets. Traffic circulation systems typically consist of local streets, collector streets, secondary arterials, major arterials and freeways. There are a myriad of other categories or names for the components of a circulation system. However, it should be recognized that the classification is not as important as the function to be fulfilled.

The functions of the street categories are as follows:

- **Local Streets** principally provide vehicular, pedestrian, and bicycle access to property abutting the public right-of-way with movement of traffic acting only as a secondary function.
- **Collector Streets** are intended to serve as the intermediate route to handle traffic between local streets and arterials. In addition, collector streets provide access to abutting property.
- **Major and Secondary Arterials** function to connect traffic from collectors to the major freeway system. They move large volumes of automobiles, trucks and buses, and link the principal elements within a city to other adjacent regions.
- **Freeways** are controlled access, high speed roadways with grade separated interchanges intended to expedite movement between distant areas in a metropolitan community or region.

The basic principles of network circulation, using these various functional street types, is important because it establishes the rationale by which the existing circulation systems are evaluated, and by which new proposals should be evaluated in the future. The variety of street types is designed for a specific function to provide adequate service to the community.

In addition to the desired function within the circulation system, the differing roadway classifications should be designed to carry differing amounts of traffic volumes. The capacity of a specific roadway section will be affected by a number of factors, including street width, number of travel lanes, number of crossing arterials and collectors, the number and type of signals, amount of parking, and the number of driveways.

Most of the facilities affected by the proposed project are located within Los Angeles County in the cities of Carson, El Segundo, Torrance, Vernon, and Los Angeles (in the Wilmington district) while one facility is located within San Bernardino County in the City of Colton. In cooperation with these county's CMPs, the individual cities where the affected facilities are located can also establish specific objectives and goals for traffic management.

The following contains a brief description of the existing roadways setting for each of the cities where the affected facilities are located.

City of Carson[60]

The City of Carson is served by the existing network of roadways which is essentially a modified grid system of north/south and east/west roadways. The primary north/south roadways are Figueroa Street, Broadway, Main Street, Avalon Boulevard, Central Avenue, Wilmington Avenue, Alameda Street, and Santa Fe Avenue. The primary east/west streets are Alondra Boulevard, Gardena Boulevard, Artesia Boulevard, Albertoni Street, Walnut Street, Victoria Street, University Drive, Del Amo Boulevard, Carson Street, 223rd Street, Sepulveda Boulevard and Lomita Boulevard. The Artesia Freeway, also referred to as State Route (SR) 91 to the north, the Long Beach Freeway (I-710) to the east, the Harbor Freeway (I-110) to the west and the San Diego Freeway (I-405) provide regional access to the City of Carson. Access to the freeways is provided via an extensive freeway ramp system connecting the City of Carson's major arterials to the freeways.

While the majority of roadways in the City of Carson operate at level of service (LOS) "D" or better, the following three roadway segments currently operate at LOS E or F:

- Wilmington Avenue from 223rd Street to I-405 Freeway (AM/PM Peak);
- Wilmington Avenue from Carson Street to 213th Street (AM Peak);
- 223rd Street from Wilmington Avenue to Alameda Street (PM Peak).

City of Colton[61, 62]

The City of Colton is primarily served by the following two freeways:

- San Bernardino Freeway (I-10) – The San Bernardino Freeway travels east-west across the southern edge of Valley Region in San Bernardino County. This facility provides access to Los Angeles to the west and Arizona and beyond to the east.
- Interstate 215 (I-215) – Interstate 215 provides an alternative route to I-15 through San Bernardino County by splitting from I-15 near Devore and reconnecting south in Riverside County.

The majority of roadways in the City of Colton operate at LOS "D" or better, though there are some roadway segments that currently operate at LOS E or F. The City of Colton is primarily served by the following roadways. The LOS is identified in the AM/PM format.

- Agua Mansa Road – This secondary arterial travels through the southern portion of the City of Colton and provides a connection into Riverside County. (LOS A/A-D)
- Burton Road / Washington Street / Brookside Avenue / Citrus Avenue – This corridor begins at La Cadena Drive in the city of Grand Terrace and continues eastward along the border between the cities of Colton and San Bernardino, where its name is changed to Washington Street. (LOS B-C/C-F)

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[60] City of Carson, 2004. City of Carson General Plan Update, Chapter 4 – Transportation and Infrastructure Element. October 11, 2004. http://ci.carson.ca.us/content/files/pdfs/GenPlan/Chapter04.Transportation.pdf

[61] City of Colton, 1993. City of Colton, General Plan, Circulation Element, January, 1993. http://www.ci.colton.ca.us/Documents/Community%20Development/GP%203.0%20Circulation%20Element.pdf

[62] County of San Bernardino, 2007. San Bernardino County 2076 General Plan Program, Final Environmental Impact Report, SCH# 2005101038. http://www.co.san-bernardino.ca.us/landuseservices/General%20Plan%20Update/Environmental%20Review/FEIR.pdf

- Colton Avenue / Inland Center Drive – This primary arterial is located between the cities of San Bernardino and Colton. (LOS B/C)
- San Bernardino Avenue / 4th Street – This roadway extends across a large portion of San Bernardino County and travels through the cities of Montclair, Ontario (as 4th Street), Rancho Cucamonga, unincorporated San Bernardino County, Fontana and Rialto before ending in the City of Colton. (LOS A-D/B-D)
- Valley Boulevard – This facility is a primary arterial that runs parallel to the I-10 Freeway to the north. Beginning just east of Etiwanda Avenue, this roadway continues east through unincorporated San Bernardino County and the Cities of Fontana and Rialto before terminating at Mount Vernon Avenue in the City of Colton. (LOS C-F/C-F)
- La Cadena Drive – La Cadena Drive splits from Mount Vernon Avenue in the City of Colton and continues south to I-10. From I-10, this roadway continues southwest until merging with I-215 at the Riverside County Line. (LOS B-C/C-D)
- Mount Vernon Avenue – Mount Vernon Avenue begins as a secondary arterial at Highland Avenue and travels south through the cities of San Bernardino, Colton and Grand Terrace before entering Riverside County. (LOS A-C/A-D)
- Pepper Avenue – Pepper Avenue begins Baseline Street as a minor arterial in the City of San Bernardino and continues south to Foothill Boulevard where it becomes a secondary arterial. This classification holds for its entire remaining length to Slover Avenue in the City of Colton. (LOS B-D/B-D)
- Reche Canyon Road – This secondary arterial extends southeast from Barton Road in the City of Colton into Riverside County. (LOS F/F)

There are two Class I freight railroads that operate lines in San Bernardino County and that serve the City of Colton as follows: 1) the BNSF Railway (owned by the Burlington Northern Santa Fe Corporation); and, 2) the Union Pacific (UP) Railroad. In addition, there are two Class III railroads are currently operating in San Bernardino County: 1) the Trona Railway; and 2) Arizona & California Railroad. Traffic along the Trona Railway covers over 31 total miles of track, operates near the Town of Trona in the northwestern portion of San Bernardino County. The Arizona & California Railroad covers 134 miles of track and operates along a branch line from the main BNSF Railway line that carries cargo to the Phoenix metropolitan area.

City of El Segundo[63]

The City of El Segundo is served by the existing network of roadways which is essentially a grid system of north/south and east/west roadways. The primary north/south roadways are Aviation Boulevard, Douglas Street, Nash Street, Sepulveda Boulevard, Center Street, Main Street, and Vista Del Mar. The primary east/west streets are Imperial Highway, Imperial Avenue, Maple Avenue, Mariposa Avenue, Grand Avenue, El Segundo Boulevard, and Rosecrans Avenue.

Daily operating conditions of El Segundo's street network were analyzed on each of the arterials designated on the City's Master Plan of Roadways by comparing the average daily traffic volume for each arterial to the estimated daily capacity and developing a corresponding LOS estimate of operating conditions. Most roadways in the City of El Segundo operate at LOS "C" or better while several roadway links operate at LOS "D," which is considered marginally acceptable. These are:

- Aviation Boulevard between Hawaii Street and Rosecrans Avenue

[63] City of El Segundo, 1992. El Segundo General Plan, Chapter - Circulation Element, 2004. http://www.elsegundo.org/civica/filebank/blobdload.asp?BlobID=3023

- Imperial Highway between Main Street and California Street
- Sepulveda Boulevard between El Segundo Boulevard and Rosecrans Avenue
- Sepulveda Boulevard between Mariposa Avenue and Grand Avenue

The following roadway segments operate at LOS "E," which is considered unacceptable:

- Sepulveda Boulevard between Imperial Avenue and Mariposa Avenue
- Rosecrans Avenue between Douglas Street and Aviation Boulevard

While no traffic volumes on any of the roadways in the City of El Segundo exceed LOS E traffic volume thresholds, portions of Rosecrans Avenue and Sepulveda Boulevard carry traffic volumes very close to the threshold.

In addition, several intersections within the City of El Segundo currently operate at unacceptable Levels of Service (LOS). The following intersections currently operate at LOS "E" or "F" during the AM or PM peak hour:

- Sepulveda Boulevard at Imperial Highway (LOS E AM Peak only)
- Sepulveda Boulevard at Mariposa Avenue (LOS E in AM Peak only)
- Sepulveda Boulevard at Grand Avenue (LOS E in both AM and PM Peak)
- Sepulveda Boulevard at El Segundo Boulevard (LOS E in AM Peak, LOS F in PM Peak)
- Sepulveda Boulevard at Rosecrans Avenue (LOS F in PM Peak only)
- Rosecrans Avenue at Aviation Boulevard (LOS E in AM Peak, LOS F in PM Peak)
- Aviation Boulevard at El Segundo Boulevard (LOS E in AM and PM Peak)

During the AM and PM peak hours, at least one movement carries higher volumes than the available capacity at the unsignalized intersection of Douglas Street at Utah Avenue.

City of Los Angeles – Wilmington District

The Wilmington district, based on its established boundaries when incorporated into the City of Los Angeles, is bounded by Lomita Boulevard, the City of Long Beach, the Port of Los Angeles, Gaffey Street and Normandie Avenue. A major freeway in the Wilmington district is the Harbor Interstate 110 Freeway which runs north-south and carries approximately 84,000 vehicles per day. The Harbor Interstate 110 Freeway also provides access to other major freeways including the San Diego Interstate 405 Freeway, the Riverside 91 Freeway, the Santa Ana Interstate 5 Freeway, and the Santa Monica Interstate 10 Freeway. Major streets in the Wilmington district area include Anaheim Street, Pacific Coast Highway, Sepulveda Boulevard and Alameda Street. Alameda Street has been upgraded, expanded and modified to provide a dedicated roadway system for trucks and railcars leaving the Port of Los Angeles and the Port of Long Beach to provide more efficient movement of goods and materials into and out of the port areas. In addition to the freeway system, railroad facilities service the Wilmington district. The area is served by the Union Pacific, and Atchison, Topeka, and Santa Fe Railroads.

The City of Los Angeles prepared a Transportation Improvement and Mitigation Program (TIMP) for the Wilmington-Harbor City Community Plan through an analysis of the land use impacts on transportation. The TIMP establishes a program of specific measures, which are recommended to be undertaken during the life of the Community Plan. The Wilmington-Harbor City Community Plan provides specific objectives and goals for traffic in the area. The City of Los Angeles has a policy that the traffic LOS on the street system in the community should not exceed LOS E and most of the Wilmington-Harbor City's major street intersections are in compliance with this policy. The City of Los Angeles has also prepared a Transportation Demand Management (TDM) program for the Wilmington area that includes: 1) encouragement of the formation of Transportation Management Associations in order to assist employers in creating and managing trip reduction programs; 2) participation in local and regional TDM programs; 3) continued implementation of the Wilmington-Harbor City TDM which calls for several measures to be taken in developments to achieve trip reduction targets; 4) implementation of the recommendations in the Master Plan for bikeways for the area; 5) encouragement of telecommuting to minimize traffic; 6) encouragement of the development of pedestrian oriented areas; and, 7) development of a parking management strategy[64].

City of Torrance[65]
There are ten CMP intersections in Torrance: Artesia Boulevard at Crenshaw Boulevard and Hawthorne Boulevard, Hawthorne Boulevard at 190th Street and Sepulveda Boulevard, Pacific Coast Highway at Crenshaw Boulevard, Hawthorne Boulevard, and Palos Verdes Boulevard, and Western Avenue at 190th Street, Carson Street, and Sepulveda Boulevard.

The City of Torrance prepared a citywide traffic study and determined that 122 of the 171 study intersections operate at or are forecast to operate at an acceptable LOS D or better during weekend and weekday morning, mid-day and evening peak hours. For intersections that are operated at or are forecast to operate at a deficient LOS, recommended improvements to achieve acceptable LOS are included a part of the City of Torrance's Circulation and Infrastructure Element Implementation Program.

City of Vernon[66]
The City of Vernon lies two miles southeast of the industrial areas of downtown Los Angeles, and both the local roadway and freeway systems directly connect the industrial businesses in Vernon with industrial development in adjacent communities. Key connections include:

- Downtown Los Angeles, via Alameda Street and Santa Fe Avenue;
- The Boyle Heights district of the City of Los Angeles, via Soto Street, Washington Boulevard, and Downey Road;
- The City of Commerce, via Washington Boulevard, Interstate 710, and Atlantic Boulevard;
- The City of Bell, via Bandini Boulevard and Interstate 710;
- The City of Maywood, via Atlantic Boulevard;
- The City of Huntington Park, via Slauson Avenue, Soto Street, Pacific Boulevard, Santa Fe Avenue, and Alameda Street;
- Portions of the City of Los Angeles south of downtown, connected by many streets across the shared boundary of Alameda Street, including Vernon Avenue and Santa Fe Avenue.

Interstate 710 provides a direct connection from the City of Vernon to the ports of Long Beach and Los Angeles. Although less than half a mile of this freeway traverses Vernon, that portion contains the very busy Atlantic Boulevard/Bandini Boulevard interchange. This frequently congested interchange carries a substantial amount of truck traffic from Vernon, particularly from the adjacent Hobart Rail Yard.

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[64] City of Los Angeles, 1999. Wilmington-Harbor City Community Plan, A Part of the City of Los Angeles, General Plan, July 1999. http://cityplanning.lacity.org/complan/pdf/wlmcptxt.pdf
[65] City of Torrance, 2010. City of Torrance Draft General Plan, Chapter 2 – Circulation and Infrastructure Element, February, 2010. http://www.ci.torrance.ca.us/PDF/2_CirculationInfrastructure_Element.pdf
[66] City of Vernon, 2009. Vernon General Plan, Circulation and Infrastructure Element, February 2009. http://www.cityofvernon.org/assets/docs/General_plan.pdf

CHAPTER 4

ENVIRONMENTAL IMPACTS

Introduction
Potential Environmental Impacts and Mitigation Measures
Potential Environmental Impacts Found Not to be Significant
Significant Irreversible Environmental Changes
Potential Growth-Inducing Impacts
Consistency

INTRODUCTION

The CEQA Guidelines require environmental documents to identify significant environmental effects that may result from a proposed project [CEQA Guidelines §15126.2(a)]. Direct and indirect significant effects of a project on the environment should be identified and described, with consideration given to both short- and long-term impacts. The discussion of environmental impacts may include, but is not limited to: the resources involved; physical changes; alterations of ecological systems; health and safety problems caused by physical changes; and other aspects of the resource base, including water, scenic quality, and public services. If significant adverse environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible [CEQA Guidelines §15126.4].

CEQA Guidelines indicate that the degree of specificity required in a CEQA document depends on the type of project being proposed [CEQA Guidelines §15146]. The detail of the environmental analysis for certain types of projects cannot be as great as for others. For example, the environmental document for projects, such as the adoption or amendment of a comprehensive zoning ordinance or a local general plan, should focus on the secondary effects that can be expected to follow from the adoption or amendment, but the analysis need not be as detailed as the analysis of the specific construction projects that might follow. As a result, this ~~Draft~~ Final PEA analyzes impacts on a regional level and impacts on the level of individual industries or individual facilities only where feasible.

The categories of environmental impacts to be studied in a CEQA document are established by CEQA [Public Resources Code, §21000 et seq.], and the CEQA Guidelines, as promulgated by the State of California Secretary of Resources. Under the CEQA Guidelines, there are approximately 17 environmental categories in which potential adverse impacts from a project are evaluated. Projects are evaluated against the environmental categories in an Environmental Checklist and those environmental categories that may be adversely affected by the proposed project are further analyzed in the appropriate CEQA document.

POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Pursuant to CEQA, an Initial Study, including an environmental checklist, was prepared for this project (see Appendix C). Of the 17 potential environmental impact categories, six (aesthetics, air quality, energy, hydrology and water quality, hazards and hazardous materials, and transportation/traffic) were identified as being potentially adversely affected by the proposed project. Three comment letters were received on the Initial Study. These comment letters and responses to the comments can be found in Appendix D of this document.

The six environmental impact areas that were identified as potentially significant in the Initial Study are further evaluated in detail in this ~~Draft~~ Final PEA. The environmental impact analysis for each environmental topic incorporates a "worst-case" approach. This approach entails the premise that whenever the analysis requires that assumptions be made, those assumptions that result in the greatest adverse impacts are typically chosen. This method ensures that all potential effects of the proposed project are documented for the decision-makers and the public. Accordingly, the following analyses use a conservative "worst-case" approach for analyzing the potentially significant adverse environmental impacts associated with the implementation of the proposed project.

While the proposed project is based on reducing SOx RTC holdings from most SOx RECLAIM facilities, the likely possibility is that the affected source categories will reduce actual SOx emissions via physical modifications to FCCUs, SRU/TGUs, sulfuric acid plants, coke calciners, glass melting furnaces, cement manufacturers, and refinery boilers and heaters. SOx controls for FCCUs, SRU/TGUs, refinery boilers and heaters, sulfuric acid manufacturing process, container glass manufacturing process, coke calcining and, cement manufacturing are expected to involve physical changes associated with installing new or modifying existing SOx control equipment at the top 11 SOx-emitting RECLAIM facilities to reduce SOx emissions. These physical changes may cause potentially significant adverse impacts on aesthetics, air quality, energy, hazards and hazardous materials, hydrology and water quality, and transportation/traffic.

Table 4-1 summarizes the equipment/source categories at the affected facilities and shows the proposed SOx emission reductions as they correspond to the proposed BARCT and SOx emission limits in PAR 2002.

Table 4-1
Summary of Key Components in PAR 2002

Equipment/ Source Category	**BARCT**	**Proposed SOx Limit**	**Potential SOx Emission Reductions** (tons/day)
FCCU	WGS or SOx Reducing Additive	5 ppm SOx (3.25 lbs SOx/1000 bbl)	2.88[67]
SRU/TGU	WGS or Selective Oxidation Catalyst	5 ppm SOx (combusted tail gas) & 10 ppm H2S / 300 ppm non-H2S (non-combusted tail gas) (5.28 lbs SOx/hr)	0.73[68]
Sulfuric Acid Mfg.	WGS or Cansolv Unit Upgrade	10 ppm SOx (0.14 lbs SOx/ton acid)	1.03
Coke Calciner	WGS	10 ppm SOx (0.07 lbs SOx/ton coke)	0.28
Glass Melting Furnace	WGS	5 ppm SOx (0.03 lbs SOx/ton glass)	0.19
Cement Kiln	DGS (Limestone Absorber)	5 ppm SOx (0.04 lbs SOx/ton clinker)	0.25
Coal-fired Boiler	DGS (Limestone Absorber)	5 ppm SOx	0[69]
Refinery Boilers/ Heaters	FGT	40 ppm SOx (6.76 lbs SOx/mmscf)	0.85
Total Potential SOx Emission Reductions			**6.21**

Key: WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber; FGT = Fuel Gas Treatment

67 The estimated amount of SOx potentially reduced excludes the data for Facility D because installing a WGS is not cost-effective for this facility. However, the estimated amount of SOx potentially reduced includes the data for Facility C because a WGS is already installed.

68 The estimated amount of SOx potentially reduced excludes the data for Facility E and Facility G because installing a WGS or Selective Oxidation Catalyst system is not cost-effective for these facilities.

69 This equipment is currently not operating at Facility K.

As shown in Table 4-1, implementation of PAR 2002 is expected to contribute to the overall improvement of air quality in the region by reducing SOx emissions by approximately 6.21 tons per day from affected sources. With the affected sources meeting the requirements of PAR 2002, the proposed project will be consistent with the overall goals and objectives of the 2007 Final AQMP to improve air quality in the Basin and satisfy specific reduction commitments in Control Measure CMB-02: Further SOx Reduction for RECLAIM (CM #2007CMB-02). Therefore, PAR 2002 will contribute to the emission reduction goals of the AQMP and will assist the Basin in maintaining the state and national ambient air quality standards for SO2 and sulfates (SOx) and attaining the state and national ambient air quality standards for PM10 and PM2.5.

There are multiple source categories with multiple approaches to reducing SOx. With so many possibilities or permutations of how operators of SOx RECLAIM facilities could achieve actual SOx reductions, there is no way to predict what each facility operator will do. For this reason, the proposed project analysis is bifurcated into two options to illustrate the worst-case effects of applying the various SOx control technologies along with demonstrating the flexibility that is provided by the RECLAIM program to facility operators when it comes to choosing the methods for reducing SOx emissions. Both options focus on the installation and operation of SOx control technologies for FCCUs, SRU/TGUs, sulfuric acid plants, coke calciners, glass melting furnaces, cement manufacturers, and refinery boilers and heaters. The main differences between Option 1 and Option 2 are: 1) the type of SOx control technique that may be applied to the FCCU source category; and, 2) the environmental impacts that may result from having different SOx control techniques applied to the FCCU source category. However, the type of SOx controls and associated environmental impacts for the remaining source categories will be the same for both Option 1 and Option 2.

The type of emission reduction projects that may be undertaken to comply with PAR 2002 are the main focus of the analysis in this ~~Draft~~ Final PEA. Table 4-2 summarizes the potential SOx control technologies by facility and equipment/source category. It also identifies the facilities and technologies that have been excluded from the proposed project. The types of control equipment (new and modified) considered for each affected source category and facility (referred to by Facility ID number as Facilities A through K) have been compiled based on the facility-specific SOx control engineering studies and analyses conducted by two contracted consultants (ETS Inc. and Nexidea Inc.) as part of the SOx RECLAIM rule development process[70].

[70] On July 11, 2008, the SCAQMD Governing Board approved release of a Request for Proposal to obtain proposals from qualified contractors with technical expertise and experience in SOx emissions control technologies. Two qualified contractors, ETS Inc. and Nexidea Inc., were selected to conduct engineering evaluations and cost estimates on existing commercially viable control technologies to further reduce SOx emissions from 11 SOx RECLAIM facilities. These evaluations resulted in facility-specific information that assisted staff in identifying potential BARCT to be implemented to help the Basin attain the PM2.5 ambient air quality standards.

Table 4-2
Potential SOx Control Technology By Equipment/Source Category

	Included in Proposed Project		Excluded From Proposed Project	
Equipment/ Source Category	**No. of Included Facilities** (Facility ID)	**Number & Type of Potential SOx Control Technologies to be Installed or Modified**	**No. of Excluded Facilities** (Facility ID)	**Reason for Exclusion**
FCCUs (Option 1)	4 (A, B, E & F)	WGSs (4 New)	2 (C & D)	1. Facility C already meets the proposed 5 ppm SOx limit; 2. It is not cost effective to install a WGS at Facility D
FCCUs (Option 2)	5 (A, B, D, E & F)	SOx Reducing Additive (1 new hopper and 4 modified hoppers)	1 (C)	1. Facility C already meets the proposed 5 ppm SOx limit.
SRU/TGUs	3 (A, B, & D)	WGSs (3 New) & Selective Oxidation Catalyst (1 New)	4 (E, F, & G)	1. It is not cost effective to install a Selective Oxidation Catalyst system at Facility E; 2. Facility F currently meets the proposed 5 ppm SOx limit; 3. It is not cost effective to install a WGS at Facility G.
Refinery Boilers/Heaters	6 (A, C, D, E, F, & G)	FGT by Sulfinol Conversion (3 Existing) FGT by Merox Treatment (2 Existing) FGT by Amine Additive (1 Existing)	1 (B)	FGT by Sulfinol Conversion is not cost-effective for Facility B.
Coke Calciner	1 (H)	WGS (1 New)	0	N/A
Glass Melting Furnaces	1 (I)	WGSs (2 New)	0	N/A
Sulfuric Acid Manufacturing	2 (C & J)	WGS (1 New) Cansolv Upgrade (1 Existing)	0	N/A
Cement Kilns	1 (K)	DGS (2) (Limestone Absorber)	0	N/A
Coal-fired Boiler	0	N/A	1 (K)	The coal-fired boiler is not in operation at Facility K.

Table 4-3 summarizes the potential SOx control technologies per source category for each option and Table 4-4 summarizes the potential SOx control technologies per facility for each option.

Table 4-3
Potential SOx Control Technology per Source-Category

Equipment/ Source Category	Proposed Project: Option 1	Proposed Project: Option 2
FCCU	• 4 WGSs for 4 facilities (new)	• SOx Reducing Additives for 5 facilities (1 new and 4 modified)
SRU/TGU	• 3 WGSs for 2 facilities (new) • 1 Selective Oxidation Catalyst system for 1 facility (new)	• 3 WGSs for 2 facilities (new) • 1 Selective Oxidation Catalyst system for 1 facility (new)
Sulfuric Acid Mfg.	• 1 WGS for 1 facility (new) • 1 Upgrade to Existing Cansolv Unit for 1 facility (modified)	• 1 WGS for 1 facility (new) • 1 Upgrade to Existing Cansolv Unit for 1 facility (modified)
Coke Calciner	• 1 WGS for 1 facility (new)	• 1 WGS for 1 facility (new)
Glass Melting Furnace	• 2 WGSs for 1 facility (new)	• 2 WGSs for 1 facility (new)
Cement Kiln	• 2 DGS (Limestone Absorber) for 1 facility (new)	• 2 DGS (Limestone Absorber) for 1 facility (new)
Coal-fired Boiler	Not Applicable	Not Applicable
Refinery Boilers/ Heaters	• 3 FGTs by Sulfinol Conversion for 3 facilities (modified) • 2 FGTs by Merox Treatment Upgrades for 2 facilities (modified) • 1 FGT by Amine Additive for 1 facility (modified)	• 3 FGTs by Sulfinol Conversion for 3 facilities (modified) • 2 FGTs by Merox Treatment Upgrades for 2 facilities (modified) • 1 FGT by Amine Additive for 1 facility (modified)
	• **NEW:** 11 WGSs, 2 DGSs, & 1 Selective Oxidation Catalyst system • **MODIFIED**: 1 Cansolv Unit, 3 FGTs by Sulfinol Conversion, 2 FGTs by Merox Treatment Upgrades, and 1 FGT by Amine Additive	• **NEW:** 7 WGSs, 2 DGSs, 1 SOx Reducing Additive Hopper, & 1 Selective Oxidation Catalyst system • **MODIFIED**: 4 SOx Reducing Additive Hoppers, 1 Cansolv Unit, 3 FGTs by Sulfinol Conversion, 2 FGTs by Merox Treatment Upgrades, and 1 FGT by Amine Additive

Key: WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber; FGT = Fuel Gas Treatment

Table 4-4
Potential SOx Control Technology per Facility

Facility ID	Proposed Project: Option 1	Proposed Project: Option 2
A	• 1 WGS for FCCU (new) • 1 Selective Oxidation Catalyst system for SRU/TGU (new) • 1 FGT by Sulfinol Conversion (modified)	• 1 SOx Reducing Additive Hopper for FCCU (modified) • 1 Selective Oxidation Catalyst system for SRU/TGU (new) • 1 FGT by Sulfinol Conversion (modified)
B	• 1 WGS for FCCU (new) • 2 WGSs for SRU/TGU (new)	• 1 SOx Reducing Additive Hopper for FCCU (modified) • 2 WGSs for SRU/TGU (new)
C	• 1 FGT by Sulfinol Conversion (modified) • 1 Upgrade to Existing Cansolv Unit for 1 facility	• 1 FGT by Sulfinol Conversion (modified) • 1 Upgrade to Existing Cansolv Unit for 1 facility
D	• 1 WGS for SRU/TGU (new) • 1 FGT by Merox Treatment Upgrade (modified)	• 1 SOx Reducing Additive Hopper for FCCU (new) • 1 WGS for SRU/TGU (new) • 1 FGT by Merox Treatment Upgrade (modified)
E	• 1 WGS for FCCU (new) • 1 FGT by Sulfinol Conversion (modified)	• 1 SOx Reducing Additive Hopper for FCCU (modified) • 1 FGT by Sulfinol Conversion (modified)
F	• 1 WGS for FCCU (new) • 1 FGT by Amine Additive (modified)	• 1 SOx Reducing Additive Hopper for FCCU (modified) • 1 FGT by Amine Additive (modified)
G	• 1 FGT by Merox Treatment Upgrade (modified)	• 1 FGT by Merox Treatment Upgrade (modified)
H	• 1 WGS for calciner (new)	• 1 WGS for calciner (new)
I	• 2 WGSs for glass melting furnaces (new)	• 2 WGSs for glass melting furnaces (new)
J	• 1 WGS for sulfuric acid unit (new)	• 1 WGS for sulfuric acid unit (new)
K	• 2 DGSs for cement kilns (new)	• 2 DGSs for cement kilns (new)
TOTAL: 11 facilities	• **NEW:** 11 WGSs, 2 DGSs, & 1 Selective Oxidation Catalyst system • **MODIFIED**: 1 Cansolv Unit, 3 FGTs by Sulfinol Conversion, 2 FGTs by Merox Treatment Upgrades, and 1 FGT by Amine Additive	• **NEW:** 7 WGSs, 2 DGSs, 1 SOx Reducing Additive Hopper, & 1 Selective Oxidation Catalyst system • **MODIFIED**: 4 SOx Reducing Additive Hoppers, 1 Cansolv Unit, 3 FGTs by Sulfinol Conversion, 2 FGTs by Merox Treatment Upgrades, and 1 FGT by Amine Additive

AESTHETICS

Significance Criteria
The proposed project impacts on aesthetics will be considered significant if:
- The project will block views from a scenic highway or corridor.
- The project will adversely affect the visual continuity of the surrounding area.
- The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors.

Project-Specific Construction Impacts: Implementation of the proposed project is expected to result in construction activities at all of the 11 affected facilities, which are complex industrial facilities. The physical changes that are expected focus on the installation of new or the modification of existing control equipment at the following stationary sources of SOx: petroleum coke calciner, cement kilns, container glass melting furnaces, FCCUs, refinery boilers and process heaters, SRU/TGUs, and sulfuric acid manufacturing facilities. As previously summarized in Table 4-2, Option 1 of the proposed project is expected to result in the installation of the following new SOx air pollution control equipment: 11 WGSs, two DGSs, and one Selective Oxidation Catalyst system. In addition, Option 1 of the proposed project is expected to result in the modification of the following existing SOx air pollution control equipment: one Cansolv unit, three FGTs by Sulfinol conversion, two FGTs by Merox treatment upgrades, and one FGT by amine additive. Option 2 of the proposed project is expected to result in the installation of the following new SOx air pollution control equipment: seven WGSs, two DGSs, one SOx reducing additive hopper, and one Selective Oxidation Catalyst system. In addition, Option 2 of the proposed project is expected to result in the modification of the following existing SOx air pollution control equipment: four SOx reducing additive hoppers, one Cansolv unit, three FGTs by Sulfinol conversion, two FGTs by Merox treatment upgrades, and one FGT by amine additive.

Due to the large size profiles of the affected equipment involved for both Options 1 and 2, the construction activities that may be associated with installing new or modifying existing SOx control equipment are expected to require the use of heavy-duty construction equipment, such as cranes, which may be visible to the surrounding areas and temporarily change the skyline of the affected facilities, depending on where they are located within each facility's property. Except for the use of cranes, the majority of the construction equipment is expected to be low in height and not substantially visible to the surrounding area due to existing fencing along the property lines and existing structures currently within the facilities that would buffer the views of the construction activities.

Because each affected facility is located in heavy industrial areas, the construction equipment is not expected to be substantially discernable from what exists on-site for routine operations and maintenance activities. Further, the construction activities are not expected to adversely impact views and aesthetics resources since most of the heavy equipment and activities are expected to occur within the confines of each existing facility and are expected to introduce only minor visual changes to areas outside each facility, if at all, depending on the location of the construction activities within the facility.

Lastly, the construction activities are expected to be temporary in nature and will cease following completion of the equipment installation or modifications. All construction equipment will be removed following completion of the proposed project. For these reasons, the construction activities are not expected to affect the visual continuity of the surrounding areas. Thus, adverse visual continuity aesthetics impacts during construction are expected to be less than significant.

There are no components in the proposed project that would require construction activities to occur at night. Therefore, no additional lighting at the affected facilities would be required as a result of complying with the proposed project. However, if facility operators determine that the construction schedule requires nighttime activities, temporary lighting may be required. Nonetheless, since construction of the proposed project would be completely located within the boundaries of each affected facility, additional temporary lighting is not expected to be discernable from the existing permanent night lighting. Therefore, less than significant impacts to light and glare during construction are expected from the proposed project.

Overall, the aesthetics impacts are expected to be less than significant during construction for the proposed project.

Project-Specific Operation Impacts: Of the technologies proposed as BARCT for SOx control, only WGSs were identified as having the potential to generate adverse aesthetic operational impacts. WGS technology is potentially BARCT for four FCCUs under Option 1 but not for Option 2 which relies on SOx reducing additives. For both Options 1 and 2, WGS technology is also potentially BARCT for three SRU/TGUs, one sulfuric acid manufacturing plant, one coke calciner plant, and one container glass manufacturing plant. Under Option 1 of the proposed project, a maximum of 11 new WGSs could potentially be installed. Similarly, under Option 2, of the proposed project, a maximum of seven new WGSs could potentially be installed.

DGSs, FGTs, SOx reducing additives, and selective oxidation catalyst injection systems that, if installed (or modified) and operated, would be expected to blend in with the existing industrial profile at the affected facilities. However, operation of one WGS is expected to generate a substantial, continuous steam plume that is white in appearance. A steam plume is generated as the result of using water to reduce particulate emissions in the WGS, and consists of water vapor and clean, but warm flue gas in the exit stream of the scrubber. As a result of atmospheric changes in temperature and humidity, the vapor plume is expected to be smaller on warm, dry days and larger on cool, damp days. Under certain atmospheric conditions, the steam plume from a WGS could extend as much as 1,500 feet in length from a relatively high flue gas stack at approximately 200 feet above grade. As the vapor travels away from the stack, the plume will eventually evaporate and become clear.

As a point of comparison, other equipment operating at these industrial facilities routinely generates steam plumes on a similar scale as part of their day-to-day operations (e.g., cooling towers, cogeneration plants, etc.). In addition, the refineries, the coke calciner and the sulfuric acid plants are located near the Ports of Los Angeles and Long Beach whose facilities, such as the Harbor Cogeneration Plant and the Long Beach SERRF, routinely generate multiple steam plumes. If any WGS is installed as part of the proposed project under Option 1 or Option 2 at any of the affected facilities, the steam plume, though visible, is not expected to significantly adversely affect the visual continuity of the surrounding area of each affected facility because no scenic highways or corridors exist within the areas of the refineries, the coke calciner, the sulfuric acid plants and the glass melting plant. Further, the visual continuity of the surrounding area is not expected to be adversely impacted because each WGS, if constructed, will be built within the confines of industrial areas and would be visually consistent with the profiles of the existing affected facilities. Thus, even if each WGS could be visible, depending on the location within each property boundary, the aesthetic significance criteria would not be exceeded.

Additional permanent light sources may be installed on any installation of new equipment, to provide illumination for operations personnel at night, in accordance with applicable safety standards. Similarly, any existing equipment that would be modified as part of the proposed project are located in existing structures or areas that already have lighting systems in place for the same reasons. These additional light sources are not expected to create an impact because each component of the proposed project will be located within an existing industrial facility that operates up to 24 hours per day and the equipment is not restricted to operate during a specific time of day. The proposed project contains no provisions that would require the affected equipment to operate differently during existing daytime or nighttime operations. Further, any new lighting that will be installed on the proposed equipment will be consistent in intensity and type with the existing lighting on equipment and other structures within each affected facility. While residential areas are located near some of the affected facilities, any additional lighting will be placed by and focused on the new equipment. For the aforementioned reasons, the proposed project is not expected to create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. Therefore, less than significant impacts to light and glare during operation are expected from the proposed project.

Overall, the aesthetics impacts are expected to be less than significant during operation for the proposed project.

Project-Specific Mitigation: No significant adverse impacts associated with aesthetics are expected from the proposed project during construction or operation, so no mitigation measures are required.

Level of Significance After Mitigation: The analysis concluded that the aesthetic impacts from implementing the proposed project are considered to be adverse, but not significant because even though they may be visible to the surrounding community depending on their location, the new WGSs structures and corresponding steam plume will be consistent with the heavy industrial surroundings and profile at each of the affected facilities.

Cumulative Aesthetics Impacts: Because the project-specific aesthetic impacts do not exceed any applicable significance thresholds, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative aesthetics impacts.
Cumulative Mitigation Measures: None required.

AIR QUALITY

Significance Criteria

To determine whether air quality impacts from adopting and implementing the proposed project are significant, impacts will be evaluated and compared to the following criteria. If impacts exceed any of the significance thresholds in Table 4-5, they will be considered significant. All feasible mitigation measures will be identified and implemented to reduce significant impacts to the maximum extent feasible. The proposed project will be considered to have significant adverse air quality impacts if any one of the thresholds in Table 4-5 are equaled or exceeded.

The SCAQMD makes significance determinations for construction impacts based on the maximum or peak daily emissions during the construction period, which provides a "worst-case" analysis of the construction emissions. Similarly, significance determinations for operational emissions are based on the maximum or peak daily allowable emissions during the operational phase.

Air Quality Impacts

While the proposed project is based on reducing SOx RTC holdings from most SOx RECLAIM facilities, the possibility that the affected source categories may reduce actual SOx emissions via physical modifications to FCCUs, SRU/TGUs, sulfuric acid plants, coke calciners, glass melting furnaces, cement manufacturers, and refinery boilers and heaters must also be considered. Thus, the portion of the proposed project that is the main focus of this analysis is bifurcated into two options, with both options primarily focusing on the installation and operation of SOx control technologies for FCCUs, SRU/TGUs, sulfuric acid plants, coke calciners, glass melting furnaces, cement manufacturers, and refinery boilers and heaters. The main difference between Option 1 and Option 2 is the type of SOx control that may be applied to the FCCU source category. The remaining source categories and the type of SOx controls will be the same for both Option 1 and Option 2. Tables 4-3 and 4-4 summarize the potential SOx control technologies per source category and per facility, respectively, for each option.

Potentially significant impacts that may result from implementing the proposed project are related to the construction activities associated with installing the SOx controls for these equipment/source categories. Specifically, the physical changes involved with the type of construction activities that may occur focus mainly on the modification of existing equipment by installing new SOx controls or modifying existing SOx controls. Under Option 1 of the proposed project, 11 new WGSs, two new DGSs, and one new selective oxidation catalyst system could be installed and seven existing SOx control systems by converting existing FGT amine absorbers to using Sulfinol, treating coker gas with Merox, supplementing existing amine additives with other proprietary amines, or upgrading an existing Cansolv unit could be modified.

Similarly, under Option 2 of the proposed project, seven new WGSs, two new DGSs, one new SOx reducing additive hopper, and one new selective oxidation catalyst system could be installed. In addition, Option 2 of the proposed project could result in the modification of four SOx reducing additive hoppers. Lastly, as is the case under Option 1, the following existing SOx air pollution control equipment will be modified under Option 2 of the proposed project: one Cansolv unit, three FGTs by Sulfinol conversion, two FGTs by Merox treatment upgrades, and one FGT by amine additive.

Table 4-5
SCAQMD Air Quality Significance Thresholds[71]

Mass Daily Thresholds		
Pollutant	**Construction**	**Operation**
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants and Odor Thresholds		
Toxic Air Contaminants (TACs) Accidental Release of Acutely Hazardous Materials (AHMs)	MICR ≥ 10 in 1 million ; HI ≥ 1.0 (project increment) CAA §112(r) threshold quantities	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants [(a)]		
NO2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.25 ppm (state) 0.053 ppm (federal)	
PM10 24-hour average annual geometric average annual arithmetic mean	10.4 μg/m³ (construction)[(b)] & 2.5 μg/m³ (operation) 1.0 μg/m³ 20 μg/m³	
PM2.5 24-hour average	10.4 μg/m³ (construction)[(b)] & 2.5 μg/m³ (operation)	
Sulfate 24-hour average	1 ug/m³	
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) 9.0 ppm (state/federal)	

(a) Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
(b) Ambient air quality threshold based on SCAQMD Rule 403.

KEY: MICR = maximum individual cancer risk; HI = Hazard Index; ug/m³ = microgram per cubic meter; ppm = parts per million; AHM = acutely hazardous material; TAC = toxic air contaminant

[71] CEQA Air Quality Handbook, SCAQMD, November 1993.

Of the differing control equipment likely to be installed or modified, preliminary analysis showed that WGS installation had the greatest potential for generating potentially significant adverse impacts for an individual project. Thus, construction of a WGS is considered the worst-case scenario and is the primary focus of construction analysis in this ~~Draft~~ Final PEA.

Based on the proposed SOx emission limits as outlined in Table 4-1 and the facility-specific data in Table 4-4, either Option 1 or Option 2 of the proposed project could potentially reduce up to 6.21 tons per day of SOx emissions from four FCCUs via Option 1 or five FCCUs via Option 2; three SRU/TGUs; one sulfuric acid plant; one coke calciner; two glass melting furnaces; and, 15 refinery boilers and heaters. In order to achieve the overall net air quality benefit from implementing the proposed project, some of the affected facility operators may choose to modify existing equipment by retrofitting with air pollution control equipment or modifying existing control equipment in order to comply with the SOx emission standards.

Consequently, reducing SOx emissions from the affected facilities will provide an air quality benefit in the near- and long-term. Direct air quality impacts from the proposed project are expected to result in a reduction of SOx at the affected facilities, which will provide air quality and human health benefits to the public.

The environmental analysis assumes that installation of SOx control technologies for the affected sources will reduce SOx emissions overall, but construction activities associated with both the installation of new control devices and the modification of existing control devices will create secondary air quality impacts (e.g., emissions), which can adversely affect local and regional air quality. A project generates emissions both during the period of its construction and through ongoing daily operations. During installation or modification of add-on air pollution control devices, emissions may be generated by onsite construction equipment and by offsite vehicles used for worker commuting. After construction activities are completed, emissions may be generated by the operation of the add-on air pollution control devices (as greenhouse gases) and offsite vehicles used for delivering fresh materials needed for operations (e.g., fresh catalyst, caustic, amine, etc.) and hauling away solid waste for disposal or recycling (e.g., spent catalyst).

The air quality analysis in this document focuses on the installation of new WGS equipment as most of the affected facilities are expected to install WGSs (11 new units are assumed under Option 1 and seven are assumed under Option 2). Also, when compared to the other potential control technologies that may be employed (DGS, FGT, SOx reducing catalyst, or selective oxidation catalyst), WGS installation is expected to result in the greatest amount of construction emissions for an individual project. To estimate the "worst-case" construction- and operational-related emissions associated with installing WGSs in order to implement the proposed project, assumptions were made that are mostly based on one local refinery's experience with installing a WGS on its FCCU, to estimate combustion emissions from construction emissions onsite, off-site on-road emissions from worker trips and deliveries, on-site fugitive dust emissions, and operational emissions[72]. Refer to Appendix B for the assumptions used to estimate secondary construction- and operational-related air quality impacts.

Implementation of the proposed project is expected to result in direct air quality benefits from the anticipated SOx emission reductions of approximately 6.21 tons per day by 2019. In order to

[72] ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Projects, Final Environmental Impact Report, SCH No. 2006111138, April 2007.

achieve these benefits, construction associated with the installation of new SOx control equipment or the modifications of existing SOx control equipment would be expected to occur anytime between the adoption of the proposed project in 2010 and January 1, 2019. From a construction point of view, the installation of a WGS is a rather complex process. If a facility operator chooses to install a WGS, 18 months will be needed for pre-construction/advance planning activities such as engineering analysis of the affected equipment, engineering design of the potential control equipment, contracting with a vendor, securing financing, ordering and purchasing the equipment, obtaining permits and clearances, and lining up contractors and workers.

To physically build a WGS, an additional 18 months would be needed. Depending on where the new WGS will be sited will determine if any demolition activities would be required. For this analysis, to be conservative, one month of demolition activities is assumed to occur at each affected facility and an additional 17 months is assumed for site preparation, assembly and installation of the unit and ancillary support equipment, preparation of the affected unit for a turnaround/shutdown, and tying-in the new WGS to the affected equipment.

The decision when construction would commence between 2010 and 2019 is also dependent upon the turnaround schedule of the affected equipment; once construction of the control equipment is completed, it will need to be "tied-in" to the main equipment prior to start-up which typically occurs during a scheduled turnaround period.

The overall objective of the proposed project is to reduce SOx emissions. However, in consideration of the complexity involved with operating FCCUs, SRU/TGUs, refinery boilers and heaters, sulfuric acid manufacturing, container glass manufacturing process, coke calcining, and, portland cement manufacturing, the equipment operators utilize a combination of various emission control equipment and techniques to control not only SOx, but NOx, CO, PM10, PM2.5, and ammonia slip, as applicable, while maintaining overall efficiency. As there is no way to fully predict on a case-by-case basis what each facility operator will do to comply with the proposed project, the estimates in this analysis will be based on the estimates provided by the consultant reports prepared for each affected facility combined with the assumptions applied to the ConocoPhillips WGS project because controlling SOx emissions via a WGS has been shown to result in the greatest amount of construction and operational emissions and, thus, represents the "worst-case." Further, if a particular technology was identified as having a cost that exceeds $50,000 per ton for a particular facility, this CEQA analysis excluded the emission estimates for that facility.

For any facility operator that plans to undergo construction to install SOx control equipment, and prior to receiving any permit to construct from the SCAQMD, a site-specific CEQA analysis in addition to this ~~Draft~~ Final PEA may also be necessary depending on how much the construction (i.e., demolition, site grading, etc.) would be involved and if the analysis varies from the assumptions in this document. For these reasons, the timing of constructing four WGSs is conservatively estimated to occur over the same 18-month period, at the earliest in 2012. This means that any on-road or off-road emission factors applied to calculate construction and operational impacts will be for fleet year 2012.

However, since it is difficult to predict what each facility owner/operator will do, in reality, the actual number of SOx control equipment installed for the entire project may be less. Each facility operator will need to conduct a case-by-case analysis to determine the best approach for their facility and affected equipment. Further, the potential for installing new equipment will depend on available space, location of the affected equipment and the proximity to the proposed control equipment and utilities distribution infrastructure. Lastly, facility operators will need to take into account the turnaround schedule of each affected equipment to appropriately time construction and operational tie-in activities. Ultimately, the action taken and type of SOx control equipment to be installed in response to the proposed project will depend on each facility's individual operational needs.

To conduct a conservative "worst-case" analysis, this document examines the possibility that the affected facility operators will install SOx control equipment, including but not limited to exhaust stacks, cooling units, injection support equipment for catalyst, amine, or sorbents including the associated storage vessels, associated piping designs, pumps, plus other ancillary equipment, as applicable. As a practical matter, construction activities that are anticipated to occur as a result of implementing the proposed project would likely occur prior to a scheduled maintenance (e.g., turnaround) of the affected unit.

Typically construction projects have staggered construction schedules which take into account design and engineering, ordering, purchasing and delivery of equipment, permitting and environmental review, availability of construction crews, budgeting, and any other construction projects on site. However, due to the lengthy construction time necessary to build one WGS (18 months), the construction activities of other WGSs at other affected facilities could overlap. However, because of widely varying turnaround schedules of affected equipment within any given facility and based on past construction projects involving major construction equipment where the SCAQMD was the lead agency, the analysis in this PEA includes a conservative assumption that up to four WGSs could be installed within the same 18-month timeframe.

<u>Assumptions</u>
As part of installing a WGS, heavy-duty construction activities or equipment, major construction activities and operational maintenance requirements are anticipated. To estimate what the impacts would be for installing a WGS, the following general assumptions were made to determine the peak daily construction emissions:

- Under Option 1, 11 units may be retrofitted with one WGS each at eight facilities by December 31, 2018.
- Under Option 2, seven units may be retrofitted with one WGS each at five facilities by December 31, 2018
- Two units may be retrofitted with two DGSs at one facility by December 31, 2018. (For the construction air quality analysis, the assumptions relied upon for WGSs will also be applied to DGSs.)
- Under Option 1, one facility may have a maximum of three WGSs installed and two facilities may have a maximum of two WGSs installed at each facility.
- Under Option 2, two facilities may have a maximum of two WGSs installed at each facility.
- Installation of one WGS is estimated to take 18 months (one month for demolition plus 17 months for construction).
- For a "worst-case" analysis, four WGSs will be installed within in the same 18-month timeframe.

- For all other construction activities associated with installing a new selective oxidation catalyst system, modifying an existing Cansolv system, or modifying FGTs by Sulfinol, Merox or amine upgrades, the peak daily construction emissions associated with each these individual activities or overlapping are assumed to be less than the peak daily construction emissions associated with installing four WGS during the same 18-month period.
- As a practical matter, the earliest construction could begin would be approximately 18 months after adoption of the proposed project, in construction year 2012. Therefore, for a conservative construction analysis, the on-road and off-road emission factors will be based on the 2012 fleet year.

In addition, based on past experience with construction and operational data from previously analyzed projects, the following assumptions were made for the construction and operational phases:

Assumptions for Phase I – Demolition

The site where the new SOx control equipment may be located could be occupied by other equipment on-site. To remove any existing equipment or structures and prepare the site for the new equipment, the following assumptions are made with regard to demolition activities:

- Demolition activities are assumed to take approximately one month (five days per week at 10 hours per day) with a crew of 50 workers.
- Demolition activities are assumed to require the use of: one crane, one front-end loader, one forklift, one demolition hammer, one water truck, and one medium-duty flatbed truck.
- To provide a "worst-case" analysis, it is assumed that each facility will have its own demolition crew and equipment.

Assumptions for Phase II – Construction of One WGS

- Construction activities are assumed to take approximately 17 months (five days per week at 10 hours per day) with a crew of 175 workers. This construction schedule also includes the time needed for installing ancillary support equipment.
- The construction of each WGS is assumed to require the use of: one backhoe, two cranes, three manlifts, one forklift, one generator, three diesel welding machines, one medium-duty flatbed truck, one medium-duty dump truck, and one cement mixer.
- To provide a "worst-case" analysis, it is assumed that each facility will have its own construction crew and equipment.
- In addition to the WGS, the following ancillary equipment will also be installed: one 10,000 gallon caustic storage tank, one 9,000 gallon clarifier tank, one 11,000 gallon oxidation tank, one 8,000 gallon wet fines tank, one 100 gallon sump, and multiple pumps and piping connections.

Assumptions for Phase III – Operation of One New WGS

- The WGS will need a turnaround once every five years.
- The caustic tank will need refilling one truck load per week. The capacity of one caustic tank truck is approximately 6,000 gallons per delivery. The caustic is 50 percent aqueous and arrives as a pre-mixed liquid.

- Wet solids collected from the wet fines tank will be off-loaded into a vacuum truck that will be emptied twice a week. The collected wet solids will be sent either to a cement plant for recycling or a Class III landfill for disposal.
- Dry solids will be collected in roll-off bins that will be emptied once a week. The collected dry solids will either be sent to a cement plant for recycling or a Class III landfill for disposal.

Construction Emissions

Construction-related emissions can be distinguished as either onsite or offsite. Onsite emissions generated during construction principally consist of exhaust emissions (NOx, SOx, CO, VOC, PM2.5 and PM10) from heavy-duty construction equipment operation, fugitive dust (primarily as PM10) from disturbed soil, and VOC emissions from asphaltic paving and painting. Offsite emissions during the construction phase normally consist of exhaust emissions and entrained paved road dust (primarily as PM10) from worker commute trips, material delivery trips, and haul truck material trips to and from the construction site.

In general, limited construction emissions from site preparation activities, which may include earthmoving/grading, are anticipated because the sites, typically, have already been graded and paved. Further, operators at each affected facility who construct a new caustic storage tank will need to build a containment berm large enough to hold 110 percent of the tank capacity in the event of an accidental release. Because of space limitations within each affected facility, installation of a new WGS is likely to occupy the space of previous equipment. Therefore, demolition activities would be expected prior to the installation of the WGS to remove any existing equipment or structures (as applicable), remove the old piping and electrical connections, and break up the old foundation with a demolition hammer. For these reasons, digging, earthmoving, grading, slab pouring, or paving activities are anticipated.

The type of construction-related activities attributable to installing a new WGS would consist predominantly of deliveries of steel, piping, wiring, caustic solution, and other materials, maneuvering the materials within the site via a crane, forklift or truck, and welding. If a new foundation is not needed, to establish footings or structure supports, some concrete cutting and digging may be necessary in order to re-pour new footings prior to building above the existing foundation.

PROJECT-SPECIFIC CONSTRUCTION IMPACTS: The implementation of the proposed project is anticipated to trigger construction activities associated with the installation of new WGSs. Construction activities associated with the proposed project would result in emissions of VOC, NOx, SOx, CO PM10, and PM2.5. Significance determinations are based on the maximum peak daily emissions during the construction period for four WGSs being built within the same 18-month period, which provides a "worst-case" analysis of the anticipated construction emissions. Construction emissions are expected from the following equipment and processes:

Construction equipment (i.e., fork lifts, man lifts, cranes, front end loaders, generators, backhoes, cement trucks, jack hammers and welders, etc.)
Equipment delivery and on-site travel (includes fugitive dust associated with travel on paved roads)
Heavy-duty diesel trucks
Construction workers commuting
Fugitive dust associated with building caustic containment berms

Using a 1.0 average vehicle ridership, the construction worker labor force would be approximately 50 workers for demolition and 175 workers for construction activities associated with the installation of one WGS. Each worker would generate two one-way vehicle trips per day. Construction worker's travel emissions are based on assuming an estimated 30-mile round trip each day per vehicle (two start-ups per day). The total peak daily emissions that would be attributed to all construction-related activities for the installation of one WGS are approximately 22 pounds of VOC, 115 pounds of CO, 116 pounds of NOx, 40 pounds of PM10, and 13 pounds of PM2.5 (see Table 4-6). These numbers include the truck emissions associated with delivering the 50 percent caustic solution to initially fill the storage tank. Peak construction emissions from the proposed project are calculated based on on-road and off-road vehicle fleet year 2012 because this is the earliest possible year construction could occur when taking into consideration the timing of adopting the proposed project combined with the substantial lead time necessary to engineer the design of a WGS for an affected facility. Should construction occur in later years, the emission factors will not be as conservative as would be for year 2012, since newer fleets are expected to have reduced emissions when compared to older fleets.

Table 4-6 presents the results of the SCAQMD staff's construction air quality analysis and lists the total daily construction emissions from construction worker trips and use of equipment for the installation of one WGS and the overlapping construction of four WGSs, respectively. For the installation of one WGS, the calculations show the total daily construction emissions exceed the SCAQMD's CEQA air quality significance threshold of 100 pounds of NOx per day. For the simultaneous construction of four WGSs, the calculations show the total daily construction emissions exceed the SCAQMD's CEQA air quality significance thresholds of 100 pounds of NOx per day, 75 pounds of VOC per day, and 150 pounds of PM10 per day. Appendix B contains the spreadsheets with the results, assumptions, and methodologies used by the SCAQMD staff for this analysis.

Table 4-6
Peak Daily "Worst-Case" Construction Emissions
from the Installation of WGS Technology in 2012 or later

Peak Construction Activity	VOC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM10[1] (lbs/day)	PM2.5[1] (lbs/day)
Phase I: Demolition	6	32	40	0	2	2
Phase II: Construction	16	83	76	0	38	11
Total for 1 WGS Installation	**22**	**115**	**116**	**0**	**40**	**13**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**
Phase I: Demolition	24	129	161	0	9	8
Phase II: Construction	65	332	303	1	150	45
Total for 4 WGS Installations	**89**	**461**	**464**	**1**	**159**	**53**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**

[1] The fugitive dust analysis for PM10 and PM2.5 assumes watering disturbed sites two times per day to comply with SCAQMD Rule 403 – Fugitive Dust.

PROJECT-SPECIFIC CONSTRUCTION MITIGATION: The VOC, NOx, and PM10 emissions exceed the applicable significance thresholds during construction. As a result, the proposed project is expected to have significant adverse construction air quality impacts. If significant adverse environmental impacts are identified in a CEQA document, the CEQA document shall describe feasible measures that could minimize the significant adverse impacts (CEQA Guidelines §15126.4). Mitigation measures focus on the construction emissions of VOC, NOx, and PM10 emissions. Therefore, feasible mitigation measures to reduce emissions associated with construction activities at the affected facilities are necessary to control emissions from heavy construction equipment and worker travel. The following construction mitigation measures are required for each of the affected facilities.

<u>On-Road Mobile Sources</u>

AQ-1 Develop a Construction Emission Management Plan for each affected facility to minimize emissions from vehicles including, but not limited to: consolidating truck deliveries; scheduling deliveries to avoid peak hour traffic conditions; describing truck routing; describing deliveries including logging delivery times; describing entry/exit points; identifying locations of parking; identifying construction schedule; and prohibiting truck idling in excess of five consecutive minutes or another time-frame as allowed by the California Code of Regulations, Title 13 §2485 - CARB's Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.

Off-Road Mobile Sources

AQ-2 Suspend all construction activities that generate air pollutant emissions during first stage smog alerts.

AQ-3 Prohibit construction equipment from idling longer than five minutes.

AQ-4 Use electricity or alternate fuels for on-site mobile equipment instead of diesel equipment to the extent feasible.

AQ-5 Tune-up construction equipment and maintain a two- to four-degree retard diesel engine timing, to the extent feasible.

AQ-6 Use electric welders to avoid emissions from gasoline or diesel welders in portions of the project sites where electricity is available.

AQ-7 Use on-site electricity rather than temporary power generators in portions of the project sites where electricity is available.

AQ-8 Prior to use in construction, each project applicant will evaluate the feasibility of retrofitting the large off-road construction equipment that will be operating for substantial periods. Retrofit technologies such as particulate traps, selective catalytic reduction, oxidation catalysts, air enhancement technologies, etc., will be included in the evaluation. These technologies will be required if they are certified by CARB and/or USEPA and are commercially available and can feasibly be retrofitted onto construction equipment.

Operational Emissions

PROJECT-SPECIFIC OPERATIONAL IMPACTS: The objective of the proposed project is to reduce SOx emissions from equipment operated by the top RECLAIM emitters. The benefits of full implementation of the proposed project (i.e., after construction activities are completed) are the decrease of SOx emissions by approximately 6.21 tons per day by the year 2019. Implementation is expected to be achieved by either installing new SOx control equipment (e.g., WGS, DGS, or a selective oxidation catalyst system) or modifying existing equipment (e.g., Cansolv unit and existing FGT systems).

The operational-related activities are simultaneously expected to reduce SOx emissions while generating emissions from specific mobile sources and stationary source equipment. As no additional employees are anticipated to be needed to operate any new or modified SOx control equipment, the existing work force per affected facility is expected to be sufficient. As such, no workers' travel emissions are anticipated for the operation of the new or modified SOx control equipment. However, there will be haul truck emissions associated with hauling away solid waste (i.e., collected wet fines) and delivering supplies (i.e., fresh catalyst and caustic solution to refill the storage tanks) on a regular basis.

The offsite truck hauling and deliveries principally consist of exhaust emissions (NOx, SOx, CO, VOC, PM10, and PM2.5) from the operation of hauling and delivery vehicles to and from each affected facility. Once constructed, all of the affected facilities will have some sort of operational truck trips associated with hauling additional solid waste away, or delivering additional supplies. For example, truck trips would be needed to have additional fresh catalyst delivered, wet fines hauled for disposal or recycling, and caustic storage tanks refilled. The worst-case annual mileage has been estimated based on the consultants' projections of solid waste disposal and the varying fresh supply needs for each facility and converted to peak daily values.

The proposed project will result in an increase of VOC, CO, NOx, PM10 and PM2.5 operational emissions produced from additional truck hauling and deliveries necessary to accommodate the additional solid waste generation and increased use of supplies such as catalyst and caustic. Table 4-7 summarizes the increase in peak operational emissions due to the anticipated increase in truck hauling and deliveries as a result of implementing either Option 1 or Option 2 of the proposed project. Based on the assumption that the earliest construction can occur would be in 2012 and with 18 months needed for construction, the peak operational emission increases are assumed to occur in 2013 at the earliest and all operational emission increases are expected to occur by the end of year 2018 because the compliance date of the proposed project is January 1, 2019.

The total daily operational emissions do not exceed any of SCAQMD's CEQA air quality operation emissions significance thresholds. In addition, based on the fact that the proposed project overall is expected to generate a net reduction in SOx emissions during operation, less than significant adverse air quality impacts are expected as a result of implementing the proposed project. Appendix B contains the spreadsheets for the proposed project with the results based on the assumptions used by the SCAQMD staff for this analysis.

Table 4-7
Summary of Peak Daily "Worst-Case" Operational Emissions for Options 1 and 2

Operational Activity	VOC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
OPTION 1: Offsite Truck Delivery of Fresh Supplies & Removal of Solid Waste	1	5	15	0	1	1
SIGNIFICANCE THRESHOLD	55	550	55	150	150	55
SIGNIFICANT?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
OPTION 2: Offsite Truck Delivery of Fresh Supplies & Removal of Solid Waste	**1**	**4**	**13**	**0**	**1**	**1**
SIGNIFICANCE THRESHOLD	**55**	**550**	**55**	**150**	**150**	**55**
SIGNIFICANT?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Emission sources associated with the operational-related activities as a result of implementing the proposed project may emit toxic air contaminants. For example, caustic is used in the operation of a WGS and some FGT applications. With the potential for the installation of 11 WGSs plus two FGT modifications under Option 1 and seven WGSs plus two FGT modifications under Option 2, that means a maximum of 13 caustic storage tanks under Option 1 and nine caustic storage tanks under Option 2 may be installed. There are several types of caustic solutions that can be used in WGS operations, but sodium hydroxide (NaOH) is the most commonly used. NaOH is a toxic air contaminant (TAC) that is a non-cancerous but acutely hazardous substance. For "worst-case" operations, 13.24 tons per day of NaOH (50 percent solution, by weight) is estimated to be needed to operate eight of the 11 total WGSs plus two FGTs for Option 1 and 8.79 tons per day of NaOH is estimated to be needed to operate four of the seven total WGSs plus two FGTs for Option 2. Three of the 11 WGSs under Option 1 and there of the seven WGSs under Option 2 are expected to use a caustic solution other than NaOH.

Even though the facilities that may be affected by the proposed project may already use NaOH elsewhere in their facilities, for the purpose of conducting a "worst-case" construction analysis, one 10,000 gallon storage tank for caustic solution was assumed to be constructed for every WGS installed. However, of the 11 facilities affected by the proposed project overall, only nine facilities were projected to have an increased demand in NaOH use for WGS operations or FGT modifications under Option 1 and only five facilities were projected to have an increased demand in NaOH use for WGS operations or FGT modifications under Option 2. The remaining facilities were projected to have an increased demand in caustic that is made of sodium carbonate (Na2CO3) which is commonly known as soda ash, a non-toxic, non-cancerous, and non-hazardous substance. As summarized in Tables 4-8 and 4-9, for each facility that was projected to increase the use in the acutely hazardous substance NaOH under Options 1 and 2, respectively, the filling loss and the working loss of each NaOH tank were calculated, added together, and that sum was compared to the most stringent Rule 1401 Screening Emission Level for NaOH (0.004 pounds per hour at the nearest receptor distance of 25 meters). None of the total hourly loss projections exceeded the acute screening level for NaOH for any of the affected facilities for either option. It is important to note that the toxics analysis is a localized analysis and because of the distances between the affected facility locations, the NaOH emission impacts would not overlap. Thus, because the screening level for NaOH was not exceeded for any of the affected facilities for either option, no significant air quality operational impacts with respect to toxics are expected from the proposed project. NaOH is not classified as a carcinogen, so a cancer risk analysis was not performed.

Table 4-8
Summary of Filling and Working Losses for NaOH Storage Tanks for Option 1

Facility ID	Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM10) Filling Loss (lb/hr)	B: Hourly NaOH (as PM10) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM10) Losses (lb/hr)	NaOH Acute Screening Level at 25 meters (lb/hr)	Do Total Hourly Losses Exceed Acute Screening Level For NaOH? (Yes/No)
A	0.81	1.82E-04	5.46E-04	7.28E-04	4.00E-03	NO
B	1.17	2.64E-04	7.93E-04	1.06E-03	4.00E-03	NO
C	0.00	0	0	0	4.00E-03	NO
D	0.44	9.90E-05	2.97E-04	3.96E-04	4.00E-03	NO
E	0.45	1.01E-04	3.04E-04	4.06E-04	4.00E-03	NO
F	2.02	4.57E-04	1.37E-03	1.83E-03	4.00E-03	NO
G	2.90	6.56E-04	1.97E-03	2.62E-03	4.00E-03	NO
H	3.37	7.60E-04	2.28E-03	3.04E-03	4.00E-03	NO
I	0.79	1.78E-04	5.35E-04	7.14E-04	4.00E-03	NO
J	1.30	2.93E-04	8.78E-04	1.17E-03	4.00E-03	NO
K	0	0	0	0	4.00E-03	NO
Total	13.24					

Table 4-9
Summary of Filling and Working Losses for NaOH Storage Tanks for Option 2

Facility ID	Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM10) Filling Loss (lb/hr)	B: Hourly NaOH (as PM10) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM10) Losses (lb/hr)	NaOH Acute Screening Level at 25 meters (lb/hr)	Do Total Hourly Losses Exceed Acute Screening Level For NaOH? (Yes/No)
A	0	0	0	0	4.00E-03	NO
B	0	0	0	0	4.00E-03	NO
C	0	0	0	0	4.00E-03	NO
D	0.44	9.90E-05	2.97E-04	3.96E-04	4.00E-03	NO
E	0	0	0	0	4.00E-03	NO
F	0	0	0	0	4.00E-03	NO
G	2.90	6.56E-04	1.97E-03	2.62E-03	4.00E-03	NO
H	3.37	7.60E-04	2.28E-03	3.04E-03	4.00E-03	NO
I	0.79	1.78E-04	5.35E-04	7.14E-04	4.00E-03	NO
J	1.30	2.93E-04	8.78E-04	1.17E-03	4.00E-03	NO
K	0	0	0	0	4.00E-03	NO
Total	**8.79**					

As indicated in the analyses of potentially overlapping construction and operational air quality impacts, even though the proposed project will cause a temporary increase in emissions during construction, the net effect overall is a reduction in SOx emissions.

ODOR IMPACTS

Implementation of both Options 1 and 2 of the proposed project is designed to reduce SOx emissions by 6.21 tons per day and the majority of the SOx reductions would be achieved by WGSs. Under normal operating and permitted conditions for a WGS, the absorbent used in WGS operations captures sulfur dioxide (SO2) and sulfuric acid mist (H2SO4) and converts it to sodium bisulfate (NaHSO3), sodium sulfite (Na2SO3), and sodium sulfate (Na2SO4). Sulfur dioxide is nonflammable, colorless gas with a very strong, pungent odor. Most people can smell sulfur dioxide at levels of 0.3 to 1.0 ppm. The odor threshold is five times lower than the OSHA permissible exposure limit (PEL) of 5 ppm. Similarly, sulfuric acid is a clear, colorless, oily liquid that is very corrosive. An odor threshold of sulfuric acid in air has been reported to be one milligram per cubic meter of air (mg/m^3). If you are exposed to concentrated sulfuric acid in air, your nose will be irritated and it may seem like sulfuric acid has a pungent odor.

While sulfur dioxide, sodium bisulfate and sulfuric acid may have a pungent odor, sodium sulfite, and sodium sulfate are mostly odorless. Overall, based on the chemical composition and the odor thresholds of the resulting products when compared to the odor thresholds of sulfur dioxide and sulfuric acid, the overall SOx reductions that may result from the proposed project may also have the potential to reduce odor emissions.

In addition, some of the main equipment units affected by the proposed project such as sulfur recovery units are by design intended to capture sulfur compounds, including and especially malodorous H2S, and convert them into less odorous, elemental sulfur. Thus, any additional improvements (i.e. switching amine solutions) that may be implemented to reduce SOx emissions further from these units will only improve the ability to capture SOx (especially H2S) and reduce sulfur-based odors beyond what is being currently achieved. For these reasons, implementation of the proposed project is expected to reduce odor emissions from sulfurous compounds. Thus, odor impacts are expected to be less than significant.

PROJECT-SPECIFIC OPERATIONAL MITIGATION: The analysis indicates that there will be an overall reduction in SOx emissions during the operational phase of the proposed project. Further, no pollutant emissions exceed the applicable significance thresholds during operation for the proposed project. Thus, there are no adverse significant air quality impacts with the operational phase of the proposed project and as such, no mitigation measures are required.

REMAINING AIR QUALITY IMPACTS: The air quality analysis concluded that significant adverse construction air quality impacts could be created by the proposed project because the construction activities will produce emissions that would exceed the SCAQMD's significance thresholds of 75 pounds per day of VOC, 100 pounds per day of NOx, and 150 pounds per day of PM10. To minimize the significant air quality impacts associated with the aforementioned construction activities, feasible construction mitigation measures are required to control emissions from heavy construction equipment and worker travel (e.g., off-road and on-road mobile sources. While these mitigation measures may reduce emissions associated with construction activities at the affected facilities to the maximum extent feasible, none are mitigation measures that will avoid the significant impact or reduce the impact to less than significant.

The analysis also indicates that there will be an overall reduction in SOx emissions and slight increases in VOC, CO, NOx, PM10 and PM2.5 emissions during the operational phase of the proposed project. None of these pollutants exceed the SCAQMD's significance thresholds for operation. Therefore, no operational mitigation measures are required.

It is concluded that the proposed project overall has the potential to generate significant adverse air quality impacts for construction. As a result, a Statement of Findings and a Statement of Overriding Considerations will be prepared for the Governing Board's consideration and approval prior to the public hearing for the proposed project.

CUMULATIVE AIR QUALITY IMPACTS: In general, the preceding analysis concluded that air quality impacts from any construction activities would be significant from implementing the proposed project because the SCAQMD's significance thresholds for construction will be exceeded for VOC, NOx, and PM10. Thus, the air quality impacts due to construction are considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, generate significant adverse cumulative air quality impacts. It should be noted, however, that the air quality analysis is a conservative, "worst-case" analysis so the actual construction impacts are not expected to be as great as estimated here. Further, the construction activities are temporary when compared to the permanent projected emission reductions of SOx as a result of the proposed project.

The analysis also indicates that, in addition to the overall reduction in SOx emissions, the proposed project will result in less than significant increases of VOC, CO, NOx, PM10 and PM2.5 emissions during the operational phase of the proposed project. Because operational emissions do not exceed the project-specific air quality significance thresholds, which also serve as the cumulative significance thresholds, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)). Further, the amount of emission reductions to be achieved by the proposed project for SOx will, at the very least, meet the emission reduction projections and commitments made in the AQMP. Even though the proposed project will cause a temporary and significant adverse increase in air emissions during the construction phase and less than significant increases in air emissions during the operation phase, the temporary net increase in construction emissions combined with the total permanent emission reductions projected overall during operation would not interfere with the air quality progress and attainment demonstration projected in the AQMP. Further, based on regional modeling analyses performed for the 2007 AQMP, implementing control measures contained in the 2007 AQMP, in addition to the air quality benefits of the existing rules, is anticipated to bring the District into attainment with all national and most state ambient air quality standards by the year 2023. Therefore, cumulative operational air quality impacts from the proposed project, previous amendments and all other AQMP control measures considered together, are not expected to be significant because implementation of all AQMP control measures is expected to result in net emission reductions and overall air quality improvement. This determination is consistent with the conclusion in the 2007 AQMP Final Program EIR that cumulative air quality impacts from all AQMP control measures are not expected to be significant (SCAQMD, 2007). Therefore, there will be no significant cumulative adverse operational air quality impacts from implementing the proposed project.

Though the proposed project involves combustion processes which could generate GHG emissions such as CO2, CH4, and N2O, the proposed project does not affect equipment or operations that have the potential to emit other GHGs such as SF6, HFCs or PFCs. Relative to GHGs, implementing the proposed project is expected to increase GHG emissions that exceed the SCAQMD's GHG significance threshold for industrial sources. In addition, implementing the proposed project is expected to generate significant adverse cumulative GHG air quality impacts. The GHG analysis for the proposed project can be found in the "Global Climate Change Impacts" section of this chapter.

CUMULATIVE MITIGATION MEASURES: The analysis indicates that, in addition to the overall reduction in SOx emissions, the proposed project will result in slight increases of VOC, CO, NOx, PM10 and PM2.5 emissions during the operational phase of the proposed project. However, no pollutant emissions exceed the applicable significance thresholds during operation for the proposed project. Thus, there are no adverse significant cumulative air quality impacts with the operational phase of the proposed project and as such, no cumulative mitigation measures for operation are required.

The analysis also indicates that the VOC, NOx, and PM10 emissions will exceed the applicable significance thresholds during construction. As a result, the proposed project is expected to have significant cumulative adverse construction air quality impacts. Mitigation measures that focus on the VOC, NOx, and PM10 emissions that may be generated during construction are required to minimize the significant air quality impacts associated with construction activities. Therefore, feasible mitigation measures to reduce emissions associated with construction activities at the affected facilities are necessary to control emissions from heavy construction equipment and worker travel. While the mitigation measures may reduce emissions associated with construction activities at the affected facilities to the maximum extent feasible, none will avoid the significant impact or reduce the impact to less than significant.

The following construction mitigation measures are required for construction activities from the proposed project:

<u>On-Road Mobile Sources</u>

AQ-1 Develop a Construction Emission Management Plan for each affected facility to minimize emissions from vehicles including, but not limited to: consolidating truck deliveries; scheduling deliveries to avoid peak hour traffic conditions; describing and truck routing; describing deliveries including logging delivery times; describing entry/exit points; identifying locations of parking; identifying construction schedule; and prohibiting truck idling in excess of five consecutive minutes or another time-frame as allowed by the California Code of Regulations, Title 13 §2485 - CARB's Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.

<u>Off-Road Mobile Sources</u>

AQ-2 Suspend all construction activities that generate air pollutant emissions during first stage smog alerts.

AQ-3 Prohibit construction equipment from idling longer than five minutes.

AQ-4 Use electricity or alternate fuels for on-site mobile equipment instead of diesel equipment to the extent feasible.

AQ-5 Tune-up construction equipment and maintain a two- to four-degree retard diesel engine timing, to the extent feasible.

AQ-6 Use electric welders to avoid emissions from gasoline or diesel welders in portions of the project sites where electricity is available.

AQ-7 Use on-site electricity rather than temporary power generators in portions of the project sites where electricity is available.

AQ-8 Prior to use in construction, each project applicant will evaluate the feasibility of retrofitting the large off-road construction equipment that will be operating for substantial periods. Retrofit technologies such as particulate traps, selective catalytic reduction, oxidation catalysts, air enhancement technologies, etc., will be included in the evaluation. These technologies will be required if they are certified by CARB and/or USEPA and are commercially available and can feasibly be retrofitted onto construction equipment.

GLOBAL CLIMATE CHANGE IMPACTS

Significant changes in global climate patterns have recently been associated with global warming, an average increase in the temperature of the atmosphere near the Earth's surface, attributed to accumulation of GHG emissions in the atmosphere. GHGs trap heat in the atmosphere, which in turn heats the surface of the Earth. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities. The emission of GHGs through the combustion of fossil fuels (i.e., fuels containing carbon) in conjunction with other human activities, appears to be closely associated with global warming. State law defines GHG to include the following: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6) (HSC §38505(g)). The most common GHG that results from human activity is CO2, followed by CH4 and N2O.

Traditionally, GHGs and other global warming pollutants are perceived as solely global in their impacts and that increasing emissions anywhere in the world contributes to climate change anywhere in the world. A study conducted on the health impacts of CO2 "domes" that form over urban areas cause increases in local temperatures and local criteria pollutants, which have adverse health effects[73].

The analysis of GHGs is a much different analysis than the analysis of criteria pollutants for the following reasons. For criteria pollutants, the significance thresholds are based on daily emissions because attainment or non-attainment is primarily based on daily exceedances of applicable ambient air quality standards. Further, several ambient air quality standards are based on relatively short-term exposure effects on human health (e.g., one-hour and eight-hour standards). Since the half-life of CO2 is approximately 100 years, for example, the effects of GHGs occur over a longer term which means they affect the global climate over a relatively long time frame. As a result, the SCAQMD's current position is to evaluate the effects of GHGs over a longer timeframe than a single day (i.e., annual emissions). GHG emissions are typically

[73] Jacobsen, Mark Z. "Enhancement of Local Air Pollution by Urban CO2 Domes," Environmental Science and Technology, as describe in Stanford University press release on March 16, 2010 available at: http://news.stanford.edu/news/2010/march/urban-carbon-domes-031610.html.

considered to be cumulative impacts because they contribute to global climate effects. GHG emission impacts from implementing the proposed project were calculated at the project-specific level for both Options 1 and 2. For example, installation of SOx control equipment such as WGSs and DGSs has the potential to increase the electricity, fuel, and water use which will in turn increase CO2 emissions.

The SCAQMD has convened a "Greenhouse Gas CEQA Significance Threshold Working Group" to consider a variety of benchmarks and potential significance thresholds to evaluate GHG impacts. On December 5, 2008, the SCAQMD adopted an interim CEQA GHG Significance Threshold for projects where SCAQMD is the lead agency (SCAQMD, 2008). This interim threshold is set at 10,000 metric tons of CO2 equivalent emissions (MTCO2eq) per year. The SCAQMD prepared a "Draft Guidance Document – Interim CEQA GHG Significance Thresholds" that outlined the approved tiered approach to determine GHG significance of projects (SCAQMD, 2008, pg. 3-10). The first two tiers involve: 1) exempting the project because of potential reductions of GHG emissions allowed under CEQA; and, 2) demonstrating that the project's GHG emissions are consistent with a local general plan. Tier 3 proposes a limit of 10,000 MTCO2eq per year as the incremental increase signifying significance for industrial projects where SCAQMD is the lead agency (SCAQMD, 2008, pg. 3-11). Tier 4 (performance standards) is yet to be developed. Tier 5 allows offsets that would reduce the GHG impacts to below the Tier 3 brightline threshold. Projects with incremental increases below this threshold will not be cumulatively considerable.

As indicated in Chapter 3, combustion processes generate GHG emissions in addition to criteria pollutants. The following analysis mainly focuses on directly emitted CO2 because this is the primary GHG pollutant emitted during the combustion process and is the GHG pollutant for which emission factors are most readily available. CO2 emissions were estimated using emission factors from CARB's EMFAC2007 and Offroad2007 models and USEPA's AP-42. In addition, CH4 and N20 emissions were also estimated and are included in the overall GHG calculations. No other GHGs are expected to be emitted because the proposed project does not affect equipment or operations that have the potential to emit other GHGs such as SF6, HFCs or PFCs.

Installation of SOx control equipment as part of implementing the proposed project is expected to generate construction-related CO2 emissions. In addition, based on the type and size of equipment affected by the proposed project, CO2 emissions from the operation of the SOx control equipment are likely to increase from current levels due to electricity, fuel and water use. The proposed project will also result in an increase of GHG operational emissions produced from additional truck hauling and deliveries necessary to accommodate the additional solid waste generation and increased use of supplies such as catalyst and caustic.

For the purposes of addressing the GHG impacts of the proposed project, the overall impacts of CO2eq emissions from the project were estimated and evaluated from the earliest possible initial implementation of the proposed project with construction beginning in 2012. Once the proposed project is fully implemented, the potential SOx emission reductions would continue through the end of the useful life of the equipment. The analysis estimated CO2eq emissions from all sources subject to the proposed project (construction and operation) from the beginning of the proposed project (2012) to the end of the project (2019). The beginning of the proposed project was assumed to be no sooner than 2012, since installing SOx control equipment such as a WGS takes considerable advance planning and engineering. Full implementation of the proposed project is expected to occur by the end of 2018 since all the affected facilities would be required to comply with the proposed project by January 1, 2019, such that any installed or modified SOx controls would be constructed and operational by the final compliance date. Thus, once construction is complete and the equipment is operational, no further changes in CO2eq emissions are anticipated.

For Options 1 and 2 respectively, Tables 4-10 and 4-12 summarize the CO2eq impacts from both construction activities and operation activities per facility and Tables 4-11 and 4-13 summarize the same CO2eq impacts per source category. In all of these tables, the CO2eq impacts from construction were amortized over a 30-year period. The peak operational emissions are based on the operations of the SOx control equipment plus the anticipated increase in truck hauling and deliveries as a result of maintaining the SOx control equipment. Though the peak operational emissions are assumed to occur as early as 2013, all operational emissions are expected to occur by the end of year 2018 because the compliance date of the proposed project is January 1, 2019.

Table 4-10
Option 1: Overall CO2eq Increases Due to Construction and Operation Activities per Facility (metric tons/year)[1]

Facility ID	**Temporary Construction Activities (diesel and gasoline fuel use)[2]** (MT/yr)	**Operational Natural Gas Use** (MT/yr) [3]	**Operational Electricity Use** (MT/yr)	**Operational Water Use/ Conveyance** (MT/yr)	**Operational Wastewater Generation** (MT/yr)	**Operational Truck Trips (diesel fuel use)** (MT/yr)	**Total CO2eq** (MT/yr)
A	78	477	6,174	10	5	30	6,773
B	233	0	8,702	28	8	29	9,000
C	78	-55	238	12	4	40	317
D	78	24	1,480	29	7	16	1,633
E	78	-790	4,828	85	44	62	4,307
F	78	107	3,733	59	30	24	4,030
G	78	158	1,719	2	2	27	1,985
H	78	0	3,225	55	23	8	3,389
I	155	0	1,037	79	17	1	1,289
J	78	0	1,759	26	15	1	1,879
K	155	0	4,240	14	0	5	4,415
TOTAL	**1,168**	**-80**	**37,134**	**399**	**154**	**244**	**39,020**

1 1 metric ton = 2,205 pounds
2 GHGs from temporary construction activities are amortized over 30 years.
3 A negative number means a reduction in usage or demand.

Table 4-11
Option 1: Overall CO2eq Increases Due to Construction and Operation Activities per Source Category (metric tons/year)[1]

Equipment/ Source Category	Temporary Construction Activities (diesel and gasoline fuel use)[2] (MT/yr)	Operational Natural Gas Use (MT/yr) [3]	Operational Electricity Use (MT/yr)	Operational Water Use/ Conveyance (MT/yr)	Operational Wastewater Generation (MT/yr)	Operational Truck Trips (diesel fuel use) (MT/yr)	Total CO2eq (MT/yr)
FCCUs	310	0	18,794	144	68	53	19,370
SRU/TGUs	233	588	3,955	45	9	27	4,858
Refinery Boilers/Heaters	155	-668	4,124	27	23	149	3,809
Coke Calciner	78	0	3,225	55	23	8	3,389
Glass Melting Furnaces	155	0	1,037	79	17	1	1,289
Sulfuric Acid Manufacturing	78	0	1,759	35	15	1	1,887
Cement Kilns	155	0	4,240	14	0	5	4,415
TOTAL	**1,168**	**-80**	**37,134**	**399**	**154**	**244**	**39,020**

[1] 1 metric ton = 2,205 pounds
[2] GHGs from temporary construction activities are amortized over 30 years.
[3] A negative number means a reduction in usage or demand.

Table 4-12
Option 2: Overall CO2eq Increases Due to Construction and Operation Activities per Facility (metric tons/year)[1]

Facility ID	Temporary Construction Activities (diesel and gasoline fuel use)[2] (MT/yr)	Operational Natural Gas Use (MT/yr) [3]	Operational Electricity Use (MT/yr)	Operational Water Use/ Conveyance (MT/yr)	Operational Wastewater Generation (MT/yr)	Operational Truck Trips (diesel fuel use) (MT/yr)	Total CO2eq (MT/yr)
A	0	477	1,233	1	1	23	1,734
B	155	0	2,193	18	4	19	2,389
C	78	-55	238	12	4	40	317
D	78	24	1,480	29	7	19	1,636
E	0	-790	1,207	18	15	59	509
F	0	107	10	0	0	4	121
G	78	158	1,719	2	2	27	1,985
H	78	0	3,225	55	23	8	3,389
I	155	0	1,037	79	17	1	1,289
J	78	0	1,759	26	15	1	1,879
K	155	0	4,240	14	0	5	4,415
TOTAL	**854**	**-80**	**18,340**	**255**	**87**	**207**	**19,662**

[1] 1 metric ton = 2,205 pounds
[2] GHGs from temporary construction activities are amortized over 30 years.
[3] A negative number means a reduction in usage or demand.

Table 4-13
Option 2: Overall CO2eq Increases Due to Construction and Operation Activities per Source Category (metric tons/year)[1]

Equipment/ Source Category	Temporary Construction Activities (diesel and gasoline fuel use)[2] (MT/yr)	Operational Natural Gas Use (MT/yr) [3]	Operational Electricity Use (MT/yr)	Operational Water Use/ Conveyance (MT/yr)	Operational Wastewater Generation (MT/yr)	Operational Truck Trips (diesel fuel use) (MT/yr)	Total CO2eq (MT/yr)
FCCUs	0	0	0	0	0	15	15
SRU/TGUs	233	588	3,955	45	9	27	4,858
Refinery Boilers/Heaters	155	-668	4,124	27	23	149	3,809
Coke Calciner	78	0	3,225	55	23	8	3,389
Glass Melting Furnaces	155	0	1,037	79	17	1	1,289
Sulfuric Acid Manufacturing	78	0	1,759	35	15	1	1,887
Cement Kilns	155	0	4,240	14	0	5	4,415
TOTAL	**854**	**-80**	**18,340**	**255**	**87**	**207**	**19,662**

1 1 metric ton = 2,205 pounds
2 GHGs from temporary construction activities are amortized over 30 years.
3 A negative number means a reduction in usage or demand.

As demonstrated in Tables 4-10 and 4-12, none of the affected facilities individually exceed the industrial GHG significance threshold of 10,000 MT/day. However, the GHG emissions from the project as a whole under Options 1 and 2, respectively, exceed the threshold and therefore, the proposed project is considered to have adverse significant GHG impacts. Because the proposed project is expected to generate construction-related CO2 emissions, and the operational phase of the proposed project is also expected to generate additional GHG emissions, adverse significant GHG cumulative impacts from the proposed project are expected.

GHG MITIGATION: If the proposed project gets implemented, the analysis indicates that there will be a significant increase in GHG emissions. Because, there are adverse significant GHG impacts from the proposed project and as such, feasible GHG mitigation measures are required.

GHG mitigation measures for industrial sources are under development. However, there are some existing GHG reducing protocols that have been approved or adopted by various organizations and some of these are already used in the SCAQMD's SoCal Climate Solutions Exchange, a voluntary program where facilities in the district can undertake projects to voluntarily reduce GHG emissions in advance of any regulatory requirement. In order to participate in the exchange, the GHG reductions need to be real, additional (surplus), quantifiable, verifiable, permanent over a specific time, and enforceable. These early reductions can be helpful to facilities that would need offsets for GHG mitigation.

The California Climate Action Registry (CCAR) is currently developing the following protocols: 1) bus rapid transit; 2) blended cement; 3) tidal wetland sequestration (farms converting to wetlands). CCAR is also evaluating several categories for potential protocol development, including waste diversion, local government operations, boiler efficiency; and truck stop electrification. CCAR has been asked to look at other areas, such as waste water biogas, natural gas pipelines, agricultural soil sequestration, and CO2 capture and storage, and those will be evaluated in the future.

In addition, the California Air Pollution Control Officers Association (CAPCOA) has suggested that lead agencies develop a "Green List of Projects" (Green List) to be consistent with and achieve the goals of AB 32 and to encourage projects that can provide overall GHG emission reduction benefits. Of the Green List projects, especially in consideration that compliance with the proposed project could result in the installation of water-intensive scrubbers, recycled water projects and the utilization of recycled water seem to be among the most direct ways to mitigate GHG emissions for the proposed project. Specifically, the energy it would take to treat and convey reclaimed water to a facility (e.g., 1,200 kWh/MMgallons[74]) is approximately 10 times less than the amount of energy it would take for potable water (e.g., 12,700 kWh/MMgallons[75]) to be supplied, conveyed and distributed. Thus, for each facility that will have future access to recycled water and uses reclaimed wastewater to satisfy the water demands for the proposed project and in turn, mitigate CO2eq emissions, less GHG emissions would be generated for the operational water use/conveyance and operational wastewater generation portions of the proposed project.

Based on the preceding discussion, the following mitigation measure will apply to the proposed project:

GHG-1 When SOx control equipment is installed and water is required for its operation, the facility operator is required to use recycled water, if available, to satisfy the water demand for the SOx control equipment.

GHG-2 In the event that recycled water cannot be delivered to the affected facility, the facility operator is required to submit a written declaration with the application for a Permit to Construct for the SOx control equipment, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.

For Options 1 and 2 respectively, Tables 4-14 and 4-16 summarize the mitigated CO2eq impacts from both construction activities and operation activities per facility and Tables 4-15 and 4-17 summarize the same CO2eq impacts per source category. Thus, utilizing recycled water to mitigate GHG emissions from the proposed project would result in a savings of GHG emissions of 597 MT/year for Option 1 and 430 MT/year for Option 2.

As demonstrated in Tables 4-14 and 4-16, none of the affected facilities individually exceed the GHG industrial significance threshold of 10,000 MT/yr before or after mitigation. However, the GHG emissions from the project as a whole under Options 1 and 2, respectively, exceed the threshold and therefore, the proposed project is considered to have adverse significant GHG impacts after mitigation. Because the proposed project is expected to generate construction-related CO2eq emissions, and the operational phase of the proposed project is also expected to

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[74] California's Water – Energy Relationship, Table 1-2, Page 9, California Energy Commission, Final Staff Report, CEC-700-2005-011-SF, November 2005. http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF

[75] California's Water – Energy Relationship, Table 1-3, Page 11, California Energy Commission, Final Staff Report, CEC-700-2005-011-SF, November 2005. http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF

generate additional GHG emissions, cumulative GHG adverse impacts after mitigation from the proposed project are considered significant.

Table 4-14
Option 1: Overall Mitigated CO2eq Increases Due to Construction and Operation Activities per Facility (metric tons/year)[1]

Facility ID	**Temporary Construction Activities (diesel and gasoline fuel use)[2]** (MT/yr)	**Operational Natural Gas Use [3]** (MT/yr)	**Operational Electricity Use** (MT/yr)	**Operational Water Use/ Conveyance** (MT/yr)	**Operational Wastewater Generation** (MT/yr)	**Operational Truck Trips (diesel fuel use)** (MT/yr)	**Total CO2eq** (MT/yr)
A	78	477	6,174	10	5	30	6,773
B	233	0	8,702	28	8	29	9,000
C	78	-55	238	1	0	40	302
D	78	24	1,480	29	7	16	1,633
E	78	-790	4,828	8	4	62	4,190
F	78	107	3,733	6	3	24	3,950
G	78	158	1,719	2	2	27	1,985
H	78	0	3,225	55	23	8	3,389
I	155	0	1,037	79	17	1	1,289
J	78	0	1,759	2	1	1	1,841
K	155	0	4,240	14	0	5	4,415
TOTAL	**1,168**	**-80**	**37,134**	**234**	**71**	**244**	**38,771**

1 1 metric ton = 2,205 pounds
2 GHGs from temporary construction activities are amortized over 30 years.
3 A negative number means a reduction in usage or demand.

Table 4-15
Option 1: Overall Mitigated CO2eq Increases Due to Construction and Operation Activities per Source Category (metric tons/year)[1]

Equipment/ Source Category	**Temporary Construction Activities (diesel and gasoline fuel use)[2]** (MT/yr)	**Operational Natural Gas Use** (MT/yr) [3]	**Operational Electricity Use** (MT/yr)	**Operational Water Use/ Conveyance** (MT/yr)	**Operational Wastewater Generation** (MT/yr)	**Operational Truck Trips (diesel fuel use)** (MT/yr)	**Total CO2eq** (MT/yr)
FCCUs	314	0	18,794	31	14	53	19,202
SRU/TGUs	233	588	3,955	45	9	27	4,858
Refinery Boilers/Heaters	155	-668	4,124	7	6	149	3,772
Coke Calciner	78	0	3,225	55	23	8	3,389
Glass Melting Furnaces	155	0	1,037	79	17	1	1,289
Sulfuric Acid Manufacturing	78	0	1,759	3	1	1	1,842
Cement Kilns	155	0	4,240	14	0	5	4,415
TOTAL	**1,168**	**-80**	**37,134**	**234**	**71**	**244**	**38,771**

1 1 metric ton = 2,205 pounds
2 GHGs from temporary construction activities are amortized over 30 years.
3 A negative number means a reduction in usage or demand.

Table 4-16
Option 2: Overall Mitigated CO2eq Increases Due to Construction and Operation Activities per Facility (metric tons/year)[1]

Facility ID	Temporary Construction Activities (diesel and gasoline fuel use)[2] (MT/yr)	Operational Natural Gas Use (MT/yr) [3]	Operational Electricity Use (MT/yr)	Operational Water Use/ Conveyance (MT/yr)	Operational Wastewater Generation (MT/yr)	Operational Truck Trips (diesel fuel use) (MT/yr)	Total CO2eq (MT/yr)
A	0	477	1,233	1	1	23	1,734
B	155	0	2,193	18	4	19	2,389
C	78	-55	238	1	0	40	302
D	78	24	1,480	29	7	19	1,636
E	0	-790	1,207	2	1	59	479
F	0	107	10	0	0	4	121
G	78	158	1,719	2	2	27	1,985
H	78	0	3,225	55	23	8	3,389
I	155	0	1,037	79	17	1	1,289
J	78	0	1,759	2	1	1	1,841
K	155	0	4,240	14	0	5	4,415
TOTAL	**854**	**-80**	**18,340**	**203**	**57**	**207**	**19,580**

1 1 metric ton = 2,205 pounds
2 GHGs from temporary construction activities are amortized over 30 years.
3 A negative number means a reduction in usage or demand.

Table 4-17
Option 2: Overall Mitigated CO2eq Increases Due to Construction and Operation Activities per Source Category (metric tons/year)[1]

Equipment/ Source Category	Temporary Construction Activities (diesel and gasoline fuel use)[2] (MT/yr)	Operational Natural Gas Use (MT/yr) [3]	Operational Electricity Use (MT/yr)	Operational Water Use/ Conveyance (MT/yr)	Operational Wastewater Generation (MT/yr)	Operational Truck Trips (diesel fuel use) (MT/yr)	Total CO2eq (MT/yr)
FCCUs	0	0	0	0	0	15	15
SRU/TGUs	233	588	3,955	45	9	27	4,858
Refinery Boilers/Heaters	155	-668	4,124	7	6	149	3,772
Coke Calciner	78	0	3,225	55	23	8	3,389
Glass Melting Furnaces	155	0	1,037	79	17	1	1,289
Sulfuric Acid Manufacturing	78	0	1,759	3	1	1	1,842
Cement Kilns	155	0	4,240	14	0	5	4,415
TOTAL	**854**	**-80**	**18,340**	**203**	**57**	**207**	**19,580**

1 1 metric ton = 2,205 pounds
2 GHGs from temporary construction activities are amortized over 30 years.
3 A negative number means a reduction in usage or demand.

While there may be additional measures that could eventually be imposed upon sources with potential increases in GHG emissions, CARB is adopting measures pursuant to AB 32 that would require the maximum technically feasible and cost-effective GHG emission reductions from most of the industry categories affected by the proposed project. CEQA Guidelines §15364 defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time…" Specifically, CARB's adopted "early action measures" include a measure to limit methane emissions from landfills, which SCAQMD staff will enforce. CARB also has adopted a Low Carbon Fuel Standard for motor vehicle fuels. As of this writing, it is expected that CARB will adopt in October 2010 a GHG reduction cap and trade program that will apply to projects that will need to receive permits, including any projects that may occur as a result of amending the SOx RECLAIM program. CARB greenhouse gas reduction measures are required to "achieve the maximum technologically feasible and cost-effective greenhouse gas reductions from sources or categories of sources" (Health & Safety Code §38560). CARB has published a scoping plan, as required by Health and Safety Code §38561, that identifies additional measures CARB intends to adopt that will reduce GHG emissions. The scoping plan is required to identify measures that will achieve "the maximum feasible and cost-effective reductions of greenhouse gas emissions by 2020." (Health and Safety Code §38561(b)).

All CARB GHG measures are required to meet the "maximum feasible and cost-effective" reductions test. This test is equally as stringent as the CEQA definition of "feasible." Given that CARB has been working on this statutory mandate for four years, and has an entire office and staff devoted to GHG rulemaking, it would not be feasible for SCAQMD staff to develop generally applicable GHG reduction measures that go beyond CARB measures. Thus, application of CARB rules will require the maximum feasible GHG reductions for existing sources.

SCAQMD rules do not currently require BACT for GHGs, except GHGs that are also ozone depleters. (See SCAQMD Rule 1303(a)(1).) However, by 2011, SCAQMD will be required under federal law to specify GHG BACT for larger sources of GHG emissions. On June 3, 2010, EPA published in the Federal Register its Greenhouse Gas Tailoring Rule (75 FR 31513).

EPA has stated that because there is no national ambient air quality standard for CO2, or any of the other primary GHGs, and EPA does not plan to promulgate any, the "nonattainment" NSR program that applies to criteria pollutants will not apply to GHGs[76]. However, for a NSR program that applies to attainment pollutants, prevention of significant deterioration (PSD) will also apply. PSD applies to any "major stationary source" of pollutants subject to regulation under the federal CAA. Accordingly, because EPA has promulgated its GHG reduction rules for motor vehicles, GHGs will become a pollutant subject to regulation under the federal Clean Air Act. EPA has issued its interpretation that GHGs become regulated pollutants as of the time the motor vehicle rule becomes effective (i.e., January 2011). SCAQMD staff concludes it would not be feasible to begin requiring GHG BACT prior to January 2011, because it would be necessary to amend the agency's rules in order to do so.

Under the federal CAA, the PSD definition of major source includes facilities with the potential to emit 250 tons per year of the relevant pollutant, or 100 tons per year for certain specified types of facilities. At these thresholds of GHG emissions, EPA estimated that there would be approximately 80,000 additional PSD permit actions annually nationwide. In addition, the Title V permit program for existing sources is also triggered when a pollutant becomes regulated under the federal Clean Air Act, and its threshold is 100 tons per year. At that threshold of GHG

[76] "Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule; Proposed Rule" ("Tailoring Rule Proposal") 74 FR 55292, 55297 (October 27, 2009).

emissions, EPA estimated that there would be an additional six million Title V permits nationwide. Since the SCAQMD encompasses about five percent of the nation's population, SCAQMD would be expected to experience at least 300,000 additional Title V permits added to its system. By way of contrast, SCAQMD has currently about 600 Title V permits. Thus, the permit inventory would increase by 500 times. It is not feasible for SCAQMD to issue and enforce 500 times as many Title V permits as it already has. Because of the anticipated burdens on permitting agencies and facilities from applying the federal CAA thresholds literally, EPA proposed to use the doctrines of administrative necessity and absurd results to support establishing a different threshold for BACT (PSD) and Title V applicability. EPA's initial proposal was a threshold of 25,000 MT/yr GHG for applicability, and a significance threshold for modifications triggering PSD in the range of 10,000 to 25,000 MT/yr. In the final rule, EPA recognized that it had substantially underestimated the impacts of applying the Title V and PSD programs at the 25,000 MT/yr level and decided to adopt a phased-in approach.

In Step 1, which begins January 2, 2011, only facilities that would already be subject to Title V or PSD would be subject to GHG requirements under these programs. In addition, a facility modification would only trigger PSD for GHGs if the modification resulted in an increase of 75,000 MT/yr CO2eq. Therefore, SCAQMD would begin to require GHG BACT for sources already subject to PSD and having a GHG increase of 75,000 MT/yr or more, effective January 2, 2011.

In Step 2, which begins July 1, 2011, facilities with a potential to emit 100,000 MT/yr CO2eq or more would be subject to Title V and PSD, regardless of whether they would otherwise be subject to these programs as a result of emissions of other pollutants. Therefore, SCAQMD would begin to require GHG BACT for all new and modified facilities having the potential to emit 100,000 MT/yr CO2eq and having an increase of at least 75,000 MT/yr CO2eq effective July 1, 2011.

For future phases of the program, EPA has committed to a further rulemaking to be completed in 2012 which will consider whether it is feasible to further lower the thresholds for GHG coverage under these programs. However, it is unknown at this time whether the thresholds will be further lowered. EPA has, however, committed that the threshold will not be lowered below 50,000 MT/yr CO2eq until at least May 1, 2016.

Although the definition of federal BACT for PSD sources is somewhat different from the definition of BACT that SCAQMD uses for nonattainment NSR, this definition is still at least as stringent as the CEQA definition of feasible. Pursuant to federal CAA §169(3) (42 U.S.C. §7479(3)), the term "best available control technology" means in pertinent part "an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this chapter emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant." Therefore, GHG BACT is at least as stringent as CEQA's definition of feasible mitigation, which similarly allows consideration of economic, technological and environmental factors. Thus, application of BACT will require the maximum feasible reductions of GHGs at new or modified sources.

All 11 facilities that may be affected by the proposed project are Title V facilities and nine of the 11 facilities currently hold PSD permits. However, because the potential GHG increases at each affected facility are individually well below EPA's tiered thresholds, GHG BACT would not be required for any of the individual facilities making facility modifications to comply with the proposed project.

Further, in light of the uncertainty associated with the effects of the proposed project on individual facilities whose operators have not submitted any applications for permits to construct as a result of the proposed project, the adoption and implementation of feasible mitigation beyond the requirement of using recycled water when available will not reduce significant air quality and climate change impacts to a less-than-significant level. In other words, it would not be feasible for the SCAQMD to attempt to develop and impose additional GHG mitigation measures for the myriad of source categories that may be affected by the proposed project. Accordingly, the project-level and cumulative impacts identified as significant in this chapter cannot feasibly be mitigated to a less-than-significant level and remain significant and unavoidable.

ENERGY IMPACTS

Significance Criteria

Impacts to energy and mineral resources will be considered significant if any of the following criteria are met:

- The project conflicts with adopted energy conservation plans or standards.
- The project results in substantial depletion of existing energy resource supplies.
- An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities[77].
- The project uses non-renewable resources in a wasteful and/or inefficient manner.

Project-Specific Construction and Operation Impacts: In order to achieve the overall net air quality benefit (SOx emission reductions) from implementing the proposed project, the affected facility operators may choose to modify existing equipment by retrofitting with air pollution control equipment or modifying existing control equipment. As part of these modifications, electricity could be utilized to operate certain construction equipment, such as welders, if access to electricity is available. (In fact, utilizing electricity for welders, in lieu of diesel welders is encouraged and required as part of mitigation for air quality construction emissions.) Further, after installation of any SOx control equipment to comply with the proposed project, increased operational demand for energy used for operating the main control equipment plus ancillary equipment such as pumps, controllers, et cetera is expected.

Any additional electricity that may be needed as part of implementing the proposed project is typically supplied by each affected facility's local electrical utility and if applicable, supplemented by the facility's own cogeneration unit. Similarly, any additional natural gas that may be needed is typically supplied by each affected facility's local natural gas utility, unless the facility self-generates fuel on-site. Table 4-18 summarizes the energy sources and local utility service providers for the 11 affected facilities.

[77] SCAQMD's Energy Threshold is considered an increase at or above one percent of available supply.

Energy information as it relates to construction and operational activities was derived as part of the air quality analysis in this chapter and the calculations are shown in Appendix B of this ~~Draft~~ Final PEA. If the potential SOx controls are installed and operated on a per facility and per source category basis, respectively, Tables 4-19 and 4-20 summarize the estimated impacts on operational natural gas and electricity use for Option 1. Similarly, Tables 4-21 and 4-22 summarize the estimated impacts on operational natural gas and electricity use for Option 2.

Table 4-18
Facility-Specific Sources of Energy

Facility ID	ENERGY	
	Electricity Source	**Natural Gas Source**
A	1. Existing onsite cogeneration plant 2. SCE	1. Self-generates refinery fuel gas 2. Southern California Gas Company
B	1. Existing onsite cogeneration plant 2. SCE	Self-generates natural gas from existing utility system
C	1. Existing onsite cogeneration plant 2. LADWP	Southern California Gas Company
D	SCE	Southern California Gas Company
E	1. Existing onsite cogeneration plant 2. LADWP	Southern California Gas Company
F	LADWP	Southern California Gas Company
G	SCE	Southern California Gas Company
H	1. Existing onsite cogeneration plant 2. SCE	Southern California Gas Company
I	City of Vernon	Shell Energy
J	SCE	1. Coral Energy Resources 2. Southern California Gas Company for transmission/metering
K	1. Existing onsite cogeneration plant 2. Constellation New Energy	Occidental Petroleum

Table 4-19
Option 1: Operational Energy Use By Facility

Facility ID	Potential SOx Control per Equipment/Source Category	Natural Gas (MMBTU/day)	Electricity (kWh/day)
A	1 WGS for FCCU (new) 1 Selective Oxidation Catalyst system for SRU/TGU (new) 1 FGT by Sulfinol Conversion (modified)	0 + 30.14 + - 5.70 **24.44**	27,136 + 2,973 + 3,797 **33,906**
B	1 WGS for FCCU (new) 2 WGSs for SRU/TGU (new)	0 + 0 **0**	35,749 + 12,043 **47,791**
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Cansolv unit/sulfuric acid unit (modified)	**-2.82**+ 0 **-2.82**	**1,306**+ 0 **1,306**
D	1 WGS for SRU/TGU (new) 1 FGT by Merox Treatment Upgrade (modified)	0 + 1.21 **1.21**	6,705 + 1,422 **8,128**
E	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	0 + -40.49 **-40.49**	19,887 + 6,626 **26,514**
F	1 WGS for FCCU (new) 1 FGT by Amine Additive (modified)	0 + 5.48 **5.48**	20,445 + 55 **20,500**
G	1 FGT by Merox Treatment Upgrade (modified)	**8.08**	**9,443**
H	1 WGS for calciner (new)	**0**	**17,711**
I	2 WGSs for glass melting furnaces (new)	**0**	**5,694**
J	1 WGS for sulfuric acid unit (new)	**0**	**9,659**
K	2 DGSs for cement kilns (new)	**0**	**23,288**
	TOTAL	**-4.1***	**203,938**

* A negative number means a reduction in usage or demand.

Table 4-20
Option 1: Operational Energy Use By Source Category

Equipment/ Source Category	Natural Gas (MMBTU/day)	Electricity (kWh/day)
FCCUs	0	103,217
SRU/TGUs	30	21,721
Refinery Boilers/Heaters	-34*	22,649
Petroleum Coke Calciner	0	17,711
Glass Melting Furnaces	0	5,694
Sulfuric Acid Manufacturing	0	9,659
Cement Kilns	0	23,288
TOTAL	**-4.1***	**203,938**

* A negative number means a reduction in usage or demand.

Table 4-21
Option 2: Operational Energy Use By Facility

Facility ID	Potential SOx Control per Equipment/Source Category	Natural Gas (MMBTU/day)	Electricity (kWh/day)
A	1 SOx Reducing Additive Hopper for FCCU (modified) 1 Selective Oxidation Catalyst system for SRU/TGU (new) 1 FGT by Sulfinol Conversion (modified)	0 + 30.14 + - 5.70 **24.44**	0 + 2,973 + 3,797 **6,769**
B	1 SOx Reducing Additive Hopper for FCCU (modified) 2 WGSs for SRU/TGU (new)	0 + 0 **0**	0 + 12,043 **12,043**
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Cansolv unit/sulfuric acid unit (modified)	**-2.82**+ 0 **-2.82**	**1,306**+ 0 **1,306**
D	1 SOx Reducing Additive Hopper for FCCU (new) 1 WGS for SRU/TGU (new) 1 FGT by Merox Treatment Upgrade (modified)	0 + 0 + 1.21 **1.21**	0 + 6,705 + 1,422 **8,128**
E	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + -40.49 **-40.49**	0 + 6,626 **6,626**
F	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Amine Additive (modified)	0 + 5.48 **5.48**	0 + 55 **55**
G	1 FGT by Merox Treatment Upgrade (modified)	**8.08**	**9,443**
H	1 WGS for calciner (new)	**0**	**17,711**
I	2 WGSs for glass melting furnaces (new)	**0**	**5,694**
J	1 WGS for sulfuric acid unit (new)	**0**	**9,659**
K	2 DGSs for cement kilns (new)	**0**	**23,288**
	TOTAL	**-4.1***	**100,721**

* A negative number means a reduction in usage or demand.

Table 4-22
Option 2: Operational Energy Use By Source Category

Equipment/ Source Category	Natural Gas (MMBTU/day)	Electricity (kWh/day)
FCCUs	0	0
SRU/TGUs	30	21,721
Refinery Boilers/Heaters	-34*	22,649
Petroleum Coke Calciner	0	17,711
Glass Melting Furnaces	0	5,694
Sulfuric Acid Manufacturing	0	9,659
Cement Kilns	0	23,288
TOTAL	**-4.1***	**100,721**

* A negative number means a reduction in usage or demand.

For Option 1, the analysis shows an overall decrease in natural gas demand of approximately 4.1 MMBTU per day (equivalent to 0.004 MMcf/day) and an overall increase in electricity demand of 203,938 kWh/day (equivalent to 204 MWh/day) for the affected source categories. For Option 2, the analysis shows an overall decrease in natural gas demand of approximately 4.1 MMBTU/day (equivalent to 0.004 MMcf/day) and an overall increase in electricity demand of 100,721 kWh/day (equivalent to 101 MWh/day) for the affected source categories.

In addition, as part of operation for some WGSs, NaOH caustic soda solution is required. For Option 1 of the proposed project, 13.24 tons per day of NaOH is estimated to be needed and for Option 2, 8.79 tons per day of NaOH may be needed. NaOH is produced locally by several chemical processing companies and as such, is locally available for transport. Further, it is likely that the existing local caustic manufacturers can handle the proposed increase in caustic for the entire project. To accommodate the estimated increase in caustic demand, the chemical processing companies may need to increase production, which, in turn, will use more electricity. It takes approximately 2,500 kWh to produce one metric ton of NaOH. Thus, the approximate amount of additional electricity that may be needed to produce additional caustic to meet the needs of Option 1 and Option 2 of the proposed project, are 30,023 kWh/day and 19,932 kWh/day, respectively, and are calculated as follows:

Option 1:

$$\frac{13.24 \text{ tons NaOH}}{\text{Day}} \times \frac{2{,}000 \text{ lbs}}{\text{Ton}} \times \frac{1 \text{ metric ton}}{2{,}205 \text{ lbs}} \times \frac{2{,}500 \text{ kWh}}{1 \text{ metric ton of NaOH produced}} = \mathbf{30{,}023 \text{ kWh/day}}$$

Option 2:

$$\frac{8.79 \text{ tons NaOH}}{\text{Day}} \times \frac{2{,}000 \text{ lbs}}{\text{Ton}} \times \frac{1 \text{ metric ton}}{2{,}205 \text{ lbs}} \times \frac{2{,}500 \text{ kWh}}{1 \text{ metric ton of NaOH produced}} = \mathbf{19{,}932 \text{ kWh/day}}$$

The overall electricity needed to implement both Options 1 and 2 of the proposed project as summarized in Tables 4-19, 4-20, 4-21 and 4-22 include the amount of electricity that may be needed to produce additional NaOH. To determine if the operational energy use is significant for Options 1 and 2, the total for natural gas and electricity was compared to the threshold fuel supply as shown in Table 4-23. California utilities and non-utilities have the ability to receive approximately 9,330 MMcf/day of natural gas[78], [79], [80]. Since both Options 1 and 2 of the proposed project do not exceed the SCAQMD's energy threshold of one percent of supply for both natural gas and electricity, the proposed project is expected to have less than significant energy impacts. Further, because the increase in electricity demand for both Options 1 and 2 is below the SCAQMD's energy significance threshold of one percent above available supplies, any increased demand that may result from either Option 1 or 2 of the proposed project can be met with the existing electrical capacity at each of the affected facilities. Lastly, based on this analysis, it is not anticipated that new or substantially altered power utility systems will need to be built to accommodate any additional electricity demands created by either Option 1 or 2 of the proposed project.

[78] Natural Gas Infrastructure – Draft Staff Paper, California Energy Commission, CEC-200-2009-004-SD, May 2009. http://www.energy.ca.gov/2009publications/CEC-200-2009-004/CEC-200-2009-004-SD.PDF

[79] 2008 California Gas Report, Prepared by the California Gas and Electric Utilities. http://www.energy.ca.gov/2008publications/GAS-1000-2008-020/GAS-1000-2008-020.PDF

[80] An Overview of Natural Gas in California, California Energy Commission, CEC-180-2008-005, April 2008. http://www.energy.ca.gov/2008publications/CEC-180-2008-005/CEC-180-2008-005.PDF

Table 4-23
Total Projected Natural Gas and
Electricity Impacts for Operation Activities

Operation Activity	Total Energy Usage per Activity	
	Natural Gas[a]	**Electricity**
Option 1	-0.004 MMcf	204 MWh/day = 8.5 MW (instantaneous)
Threshold Fuel Supply	9,330 MMcf [b]	8,362 MW [c] (instantaneous)
% of Fuel Supply	-0.00004 %	0.1%
Significant (Yes/No) [d]	No	No
Option 2	-0.004 MMcf	101 MWh/day = 4.2 MW (instantaneous)
Threshold Fuel Supply	9,330 MMcf [b]	8,362 MW [c] (instantaneous)
% of Fuel Supply	-0.00004 %	0.05%
Significant (Yes/No) [d]	No	No

a A negative number is a reduction in the use of natural gas consumption.
b Natural Gas Infrastructure Draft Staff Paper, California Energy Commission, May 2009 (CEC-200-2009-004-SD). http://www.energy.ca.gov/2009publications/CEC-200-2009-004/CEC-200-2009-004-SD.PDF
c California Energy Demand 2008-2018 Staff Revised Forecast, Staff Final Report, California Energy Commission, , November 2007 (CEC-200-2007-015-SF2). See Form 1.4 b, Peak Demand by LSE: summer Peak Demand Coincident with Planning Area Peak for the following agencies/areas: SCE (Anaheim, Azusa, Banning, Colton, Metropolitan Water District, Rancho Cucamonga, Riverside and Vernon), Cities of Burbank, Glendale and Pasadena, and LADWP. http://www.energy.ca.gov/2007publications/CEC-200-2007-015/CEC-200-2007-015-SF2.PDF
d SCAQMD's Energy Threshold for both Natural Gas and Electricity is 1% of Supply.

KEY: MMcf = million standard cubic feet
MW(Megawatt) = 1 MW = 1,000 kilowatts (KW)

In addition, Table 4-24 presents a summary of the total projected fuel usage (i.e., diesel and gasoline) for both construction and operational activities for both Options 1 and 2 of the proposed project. For Option 1, the analysis shows an overall increase in diesel and gasoline use of approximately 3,763 gallons per day and 1,354 gallons per day, respectively. Similarly for Option 2, the analysis shows an overall increase in diesel and gasoline use of approximately 3,397 gallons per day and 1,354 gallons per day, respectively.

Since neither Option 1 nor Option 2 of the proposed project exceeds the SCAQMD's energy threshold of one percent of supply for both diesel and gasoline fuels, both Option 1 and Option 2 of the proposed project are expected to have less than significant energy impacts due to fuel use. Further, once construction is completed, the fuel use projected during the temporary phases (e.g., Phase I: Demolition and Phase II: Construction) will end and only the fuel use for truck trips associated with chemical deliveries and solid waste removal activities during Phase III: Operations will continue. Thus, any potential adverse fuel impacts will be less than what has been analyzed during the peak for the proposed project.

Table 4-24
Total Projected Fuel Usage

Activity	Total Fuel Usage per Activity (gallons/day)	
	Diesel	**Gasoline**
Proposed Project - Option 1: Phase I - Demolition Overlapping with Phase II - Construction at Four Facilities (Construction Equipment and Workers Vehicles)	1,360	1,354
Proposed Project - Option 1: Phase III: Operation (Chemical Deliveries & Solid Waste Removal)	2,403	0
Total Usage for Proposed Project - Option 1:	3,763	1,354
Threshold Fuel Supply[a]	1,086,000,000	6,469,000,000
% of Fuel Supply	0.0003%	0.00002%
Significant (Yes/No)[b]	No	No
Proposed Project - Option 2: Phase I - Demolition Overlapping with Phase II - Construction at Four Facilities (Construction Equipment and Workers Vehicles)	1,360	1,354
Proposed Project - Option 2: Phase III: Operation (Chemical Deliveries & Solid Waste Removal)	2,037	0
Total Usage for Proposed Project - Option 2:	3,397	1,354
Threshold Fuel Supply[a]	1,086,000,000	6,469,000,000
% of Fuel Supply	0.0003%	0.00002%
Significant (Yes/No)[b]	No	No

[a] Year 2000 California Energy Commission (CEC) projections. Construction activities in future years would yield similar results.
[b] SCAQMD's energy threshold for both diesel and gasoline is 1% or more of supply.

The proposed project is not subject to any existing energy conservation plans. If any facility that is subject to the proposed project is also subject to energy conservation plans, it is not expected that the proposed project will affect in any way or interfere with that individual facility's ability to comply with its energy conservation plan or energy standards. Further, project construction and operation activities will not utilize non-renewable resources in a wasteful or inefficient manner. Lastly, it is expected that the installation and operation of any equipment used to comply with the proposed project will also comply with all applicable existing energy standards.

In summary, the energy impacts from both Option 1 and Option 2 of the proposed project are concluded to be less than significant.

Project-Specific Mitigation: Less than significant adverse impacts associated with energy are expected from the proposed project during both construction and operation, so no mitigation measures are required.

Level of Significance After Mitigation: The analysis concluded that the energy impacts from implementing the proposed project are considered to be adverse, but less than significant. Therefore, mitigation measures are not required.

Cumulative Energy Impacts: Because the project-specific energy impacts do not exceed any applicable significance thresholds, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative energy impacts.

Cumulative Mitigation Measures: None required.

HAZARDS AND HAZARDOUS MATERIALS IMPACTS

The NOP/IS (see Appendix A) determined that the proposed project has the potential to generate significant adverse hazards and hazardous materials impacts. The hazard and hazardous materials impacts associated with the operation of the proposed project are potentially significant and the impacts are evaluated in this section.

Hazards and Hazardous Materials Significance Criteria

The impacts associated with hazards and hazardous materials will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association (NFPA) standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

PROJECT-SPECIFIC IMPACTS - HAZARD ANALYSIS: Several components with regard to reducing SOx emissions by installing new or modifying existing SOx controls or by using SOx reducing additives as part of implementing the proposed project may affect the use, storage and transport of hazards and hazardous materials during operational-related activities. Thus, the routine transport of hazardous materials, use, and disposal of hazardous materials may increase as a result of implementing the proposed project.

The key effects of implementing the proposed project and the determination of which aspects involve hazards and hazardous materials focus on: 1) the anticipated increase of substances used to operate the new SOx controls and the anticipated replacement and/or supplement of substances used to modify or upgrade existing SOx control systems; and, 2) the increased capture of hazardous substances as part of the overall SOx reduction effort. For example, with FCCU source category, Option 1 of the proposed project may involve the use of NaOH caustic, a TAC, to operate WGSs and Option 2 may involve an anticipated increase of catalyst use (e.g., as SOx reducing additives) and the catalyst fines collected overall (comprised of PM10) may qualify as either a hazardous material or hazardous waste. In addition, implementation of the various control techniques for multiple source categories may have the effect of reducing hazardous components of SOx, such as capturing more SO2, SO3, H2S, COS, and ethyl- and methyl-mercaptans. Table 4-25 contains a summary of the substances that may be used, stored and transported as part of implementing the proposed project.

Table 4-25
Substances Used by SOx Control Technologies

Equipment/ Source Category	Current SOx Control Technology	Substances Currently Used for SOx Control	Proposed SOx Control Technology	Proposed Substances To Be Used/Increased for SOx Control
FCCU	SOx Reducing Additives	Specialty Catalyst	Option 1: WGSs Option 2: Increase amount of SOx Reducing Additives	Option 1: NaOH Caustic Option 2: Specialty Catalyst
SRU/TGU	Sour Water Strippers, Claus Units with Tail Gas Treatment, Amine Absorbers	Catalyst and Amines (MDEA and TG-10)	3 WGSs for 2 facilities (new)	Soda Ash Caustic
SRU/TGU	Sour Water Strippers	Catalyst	1 Selective Oxidation Catalyst system for 1 facility (new)	ESx Catalyst
Sulfuric Acid	Catalytic Converter	Catalyst	1 WGS for 1 facility (new)	NaOH Caustic
Sulfuric Acid	Cansolv Unit	Cansolv amine	1 Upgrade to Existing Cansolv Unit for 1 facility (modified)	Water
Coke Calciner	DGS	CaOH absorbent	1 WGS for 1 facility (new)	NaOH Caustic
Glass Melting Furnace	DGSs	Trona	2 WGSs for 1 facility (new)	NaOH Caustic
Cement Kiln	None	None	2 DGS (Limestone Absorber) for 1 facility (new)	Limestone
Refinery Boilers/ Heaters	Amine Absorbers	Amines (MEA & DEA)	3 FGTs by Sulfinol Conversion for 3 facilities (modified)	Sulfolane and DIPA
Refinery Boilers/ Heaters	Amine Absorbers	Amine (MEA) & Caustic (NaOH)	2 FGTs by Merox Treatment Upgrades for 2 facilities (modified)	1. Merox Catalyst 2. NaOH Caustic
Refinery Boilers/ Heaters	Amine Absorbers	Amine (MDEA)	1 FGT by Amine Additive for 1 facility (modified)	TG-10 amine

Key: WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber; FGT = Fuel Gas Treatment

Hazard Safety Regulations

Notwithstanding implementation of the proposed project, operators of each affected facility must comply or continue to comply with various regulations, including Occupational Safety and Health Administration (OSHA) regulations (29 Code of Federal Regulations (CFR) Part 1910) that require the preparation of a fire prevention plan, and 20 CFR Part 1910 and CCR Title 8 that require prevention programs to protect workers who handle toxic, flammable, reactive, or explosive materials. In addition, §112 (r) of the CAA Amendments of 1990 [42 United States Code (USC) 7401 et. seq.] and Article 2, Chapter 6.95 of the California HSC require facilities that handle listed regulated substances to develop Risk Management Programs (RMPs) to prevent accidental releases of these substances. If any of the affected facilities has already prepared an RMP, it may need to be revised to incorporate any changes that may be associated with the proposed project. The Hazardous Materials Transportation Act is the federal legislation that regulates transportation of hazardous materials.

A number of physical or chemical properties may cause a substance to be hazardous. With respect to determining whether any material identified in Table 4-25 is hazardous, each Material Safety Data Sheet (MSDS) has also been consulted for the National Fire Protection Association (NFPA) 704 hazard rating system (i.e. NFPA 704). NFPA 704 is a "standard (that) provides a readily recognized, easily understood system for identifying specific hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative hazards of a material. It addresses the health, flammability, instability, and related hazards that may be presented as short-term, acute exposures that are most likely to occur as a result of fire, spill, or similar emergency[81]." In addition, the hazard ratings per NFPA 704 are used by emergency personnel to quickly and easily identify the risks posed by nearby hazardous materials in order to help determine what, if any, specialty equipment should be used, procedures followed, or precautions taken during the first moments of an emergency response. The scale is divided into four color-coded categories, with blue indicating level of health hazard, red indicating the flammability hazard, yellow indicating the chemical reactivity, and white containing special codes for unique hazards such as corrosivity and radioactivity. Each hazard category is rated on a scale from 0 (no hazard; normal substance) to 4 (extreme risk). Table 4-26 summarizes what the codes mean for each hazards category.

It is expected that the operators of affected facilities will comply with all applicable design codes and regulations, conform to NFPA standards, and conform to policies and procedures concerning leak detection containment and fire protection. Therefore, no significant adverse offsite hazard impacts are expected as explained in the following sections.

[81] National Fire Protection Association, FAQ for Standard 704. http://www.nfpa.org/faq.asp?categoryID=928&cookie%5Ftest=1#23057

Table 4-26
NFPA 704 Hazards Rating Codes

Hazard Rating Code	Health (Blue)	Flammability (Red)	Reactivity (Yellow)	Special (White)
4 = Extreme	Very short exposure could cause death or major residual injury (extreme hazard)	Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will burn readily. Flash point below 73°F.	Readily capable of detonation or explosive decomposition at normal temperatures and pressures.	**~~W~~** = Reacts with water in an unusual or dangerous manner.
3 = High	Short exposure could cause serious temporary or moderate residual injury	Liquids and solids that can be ignited under almost all ambient temperature conditions. Flash point between 73°F and 100°F.	Capable of detonation or explosive decomposition but requires a strong initiating source, must be heated under confinement before initiation, reacts explosively with water, or will detonate if severely shocked.	**OXY** = Oxidizer
2 = Moderate	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.	Must be moderately heated or exposed to relatively high ambient temperature before ignition can occur. Flash point between 100°F and 200°F.	Undergoes violent chemical change at elevated temperatures and pressures, reacts violently with water, or may form explosive mixtures with water.	**SA** = Simple asphyxiant gas (includes nitrogen, helium, neon, argon, krypton and xenon).
1 = Slight	Exposure would cause irritation with only minor residual injury.	Must be heated before ignition can occur. Flash point over 200°F.	Normally stable, but can become unstable at elevated temperatures and pressures	
0 = Insignificant	Poses no health hazard, no precautions necessary	Will not burn	Normally stable, even under fire exposure conditions, and is not reactive with water.	

Hazard Impacts on Water Quality

A spill of any hazardous material that is used and stored at any of the affected facilities could occur under upset conditions such as an earthquake, tank rupture, or tank overflow. Spills could also occur from corrosion of containers, piping and process equipment; and leaks from seals or gaskets at pumps and flanges. A major earthquake would be a potential cause of a large spill. Other causes could include human or mechanical error. Construction of the vessels and foundations in accordance with the Uniform Building Code Zone 4 requirements helps structures to resist major earthquakes without collapse, but may result in some structural and non-structural damage following a major earthquake. Any facility with storage tanks on-site is currently required to have emergency spill containment equipment and would implement spill control measures in the event of an earthquake. Storage tanks typically have secondary containment such as a berm which would be capable of containing 110 percent of the contents of the storage tanks. Therefore, should a rupture occur, the contents of the tank would be collected within the containment system and pumped to an appropriate storage tank.

Spills at the affected facilities would generally be collected within containment areas. Large spills outside of containment areas at the affected facilities are expected to be captured by the process water system where they could be collected and controlled. Spilled material would be collected and pumped to an appropriate tank or sent off-site if the materials cannot be used on-site. Because of the containment system design, spills are not expected to migrate from the spill site and as such, potential adverse water quality hazard impacts are considered to be less than significant.

Project Specific Impacts

The following discussion describes the hazards profile for each substance involved with proposed SOx control equipment or techniques.

Hazard Impacts from SOx Reducing Additives

FCCUs are operated at six refineries in the Basin (e.g., at Facilities A through F). Operation of FCCUs is reliant on a catalyst, sometimes referred to as a "base catalyst" or an "equilibrium catalyst" in order to function. FCCU operators may also mix in additives (also catalysts) to change the composition of the flue gas to reduce emissions such as NOx and SOx. As shown in Table 4-27, four of the six facilities that operate FCCUs currently use SOx reducing additives.

Table 4-27
Summary of Current SOx Reducing Additive Use for FCCUs at Affected Refineries

	Refinery					
	A	**B**	**C**	**D**	**E**	**F**
Uses SOx Reducing Additive?	Yes	Yes	No	No	Yes	Yes

The amount of SOx reducing additives introduced into each FCCU varies from unit to unit, depends on the inlet concentration of SO2, and is typically a percentage of the fresh base catalyst addition rate, which can range between five and 10 weight percent, but can go as high as 20 weight percent for handling SOx emission spikes. As with the base catalyst, eventually the SOx reducing additives cannot be regenerated and as such, need to be replaced with a fresh supply. The constant replenishment of base catalyst and SOx reducing additives means a constant generation of solid waste in the form of catalyst fines. The composition of the catalyst fines in the solid waste is mostly comprised of base catalyst with a small portion (approximately two to ten weight percent) attributed to SOx reducing additives.

Nonetheless, for any additional increase in the use of SOx reducing catalysts in any FCCU, a directly proportional reduction in the amount of FCCU base catalyst used would be expected because the capacity of the FCCU regenerator vessel is a fixed volume. This means that the total amount of catalysts (FCCU base catalyst plus SOx reducing catalyst) used is expected to remain about the same. Thus, the amount of catalyst-based solid waste generated and disposed of or recycled from the FCCU process as part of utilizing additional SOx reducing catalyst is also expected to remain about the same. To accommodate the increased amount of SOx reducing additives that may be needed for the proposed project (up to 500 pounds per day per affected facility), there will be a slight increase in the frequency of truck transportation trips (one trip per day) to deliver fresh SOx reducing additives to each affected facility.

SOx reducing additives are made up of a mixture of metal oxide compounds such as aluminum oxide, magnesium oxide, cerium oxide, ceric oxide, magnesium aluminate, magnesium vanadate, cerium vanadium oxide, calcium aluminate, and ferric oxide. There are two manufacturers of SOx reducing additives for FCCUs: Grace Davison and Intercat. Grace Davison manufacturers a product called "Super DeSOx" and Intercat's products are called "SOxGetter" and "Super SOxGetter." While these products vary from each other, in general, they are similar in composition to FCCU "base catalyst" in that they are made of metal oxide compounds and that they are compatible with SOx reducing additives. Located on the MSDS for Intercat's SOx reducing additives (e.g., "SOxGetter" and "Super SOxGetter"), the hazards ratings are as follows: health is rated 1 (slightly hazardous), flammability is rated 0 (none) and reactivity is rated 0 (none). Similarly, the hazard ratings for Grace Davison's "Super DESOX" additive are: health is rated 2 (moderately hazardous), flammability is rated 0 (none) and reactivity is rated 0 (none).

The particular composition of the catalyst used (base plus additives), combined with the metals content of the flue gas, will determine the hazard rating and whether the spent catalyst mixture is considered a hazardous material or hazardous waste. For example, if nickel is deposited on the catalyst, the hazard rating is 2 for health (moderately toxic), 4 (extreme fire hazard) for flammability, 1 for reactivity (slightly hazardous if heated or exposed to water). In this example, the spent catalyst may qualify as a hazardous material, but if it can be recycled or reused by another industry (such as manufacturing Portland cement), then it would not be considered as hazardous waste. However, spent catalyst that is considered hazardous waste must be disposed of in a Class III landfill.

Survey responses from each of the affected refineries have indicated that none of the catalyst-based solid waste generated is classified as hazardous. For this reason, any increase in the use of SOx reducing additives would not be expected to substantially change the composition of the current waste generated. There are two facilities that current do not use SOx reducing additives, Facilities C and D. Facility C no longer uses SOx reducing additives because the facility's current SOx control system can achieve the five ppm SOx levels at the outlet. Should operators of Facility D decide to start using SOx reducing additives, based on the experience with the other refineries, it is unlikely that the composition of the solid waste generated would change from non-hazardous waste to hazardous waste. (Facility D currently sends its catalyst fines to a cement plant for recycling.)

Spent catalyst fines from FCCUs can be transported to a Class III landfill for disposal as non-hazardous waste. However, due to the heavy metal content and relatively high cost of catalysts, recycling can be more lucrative than disposal. As such, the catalyst fines currently collected from the FCCUs at each of these affected facilities are loaded into a truck and transported to a local cement plant for recycling. Thus, any increase or new use of SOx reducing additives as a result of the proposed project is not expected to substantially change the profile of the catalysts fines in a way that would prevent the spent catalyst mixture from continuing to be recycled. For this reason, the affected facilities are expected to continue to recycle the spent catalyst that may be generated as a result of the proposed project.

Although recycling may be the more popular consideration, it is possible that facilities may choose to dispose of the spent catalyst in a landfill. The composition and type of the catalyst will determine the type of landfill that would be eligible to handle the disposal. For example, catalysts with a metal structure would be considered a metal waste, like copper pipes, and not a hazardous waste. Therefore, metal structure catalysts would not be a regulated waste requiring disposal in a Class I landfill unless it is friable or brittle. As ceramic-based catalysts contain a fiber-binding material, they are not considered friable or brittle and, thus, would not be a regulated waste requiring disposal in a Class I landfill. Furthermore, typical catalyst materials are not considered to be water soluble, which also means they would not require disposal in a Class I landfill. In both cases, spent catalyst would not require disposal in a Class I landfill.

Based on the aforementioned information, it is likely that spent catalysts would be considered a "designated waste," which is characterized as a non-hazardous waste consisting of, or containing pollutants that, under ambient environmental conditions, could be released at concentrations in excess of applicable water objectives, or which could cause degradation of the waters of the state (California Code of Regulations, Title 23, Chapter 3, Subparagraph 2522(a)(1)). Depending on its actual waste designation, spent catalysts would likely be disposed of in a Class II landfill or a Class III landfill that is fitted with liners. According to the Final Program EIR for the 2007 AQMP (SCAQMD, 2007), total Class III landfill waste disposal capacity in the District is approximately 97,269 tons per day, many of which have liners and can handle Class II and Class III wastes.

Disposal of spent catalyst would typically involve crushing the material and encasing it in concrete prior to disposal. Since it is expected that most spent catalysts will be recycled and regenerated, it is anticipated that there will be sufficient landfill capacity in the District to accommodate disposal of any spent catalyst materials.

In conclusion, the hazards and hazardous materials impacts due to the use of SOx reducing additives and the handling of the spent catalyst for recycling or disposal as non-hazardous waste is expected to be less than significant for the proposed project.

<u>Caustic</u>

For any operator that chooses to install a WGS, hazardous materials may be needed to operate the WGSs depending on the source category and additional solid waste is expected to be generated. Caustic is a key ingredient needed for the operation of a WGS; it is the most widely used substance for several SOx control applications spanning multiple equipment/source categories. While there are several types of caustic solutions that can be used in WGS operations, caustic made from sodium hydroxide (NaOH) is the most commonly used for WGSs for FCCUs, sulfuric acid units, coke calciners, and glass melting furnaces.

For WGSs that may be installed to control SOx from SRU/TGUs, the caustic used in the WGS is made from soda ash, instead of NaOH. Soda ash is the common name for sodium carbonate (Na2CO3), a non-toxic, non-cancerous, and non-hazardous substance. Located on the MSDS for Na2CO3, the hazards ratings are as follows: health is rated 2 (moderate), flammability is rated 0 (none) and reactivity is rated 0 (none).

NaOH caustic is also used with Merox catalyst treatment for FGT of refinery boilers and heaters. (For a discussion on Merox systems, see the "Amines" discussion in the following section.) NaOH is a toxic air contaminant (TAC); it is also a non-cancerous but acutely hazardous substance. Located on the MSDS for NaOH (50 percent by weight), the hazards ratings are as follows: health is rated 3 (highly hazardous), flammability is rated 0 (none) and reactivity is rated 1 (slightly hazardous).

As previously analyzed in the Air Quality discussion, for "worst-case" operations, 13.24 tons per day of NaOH (50 percent solution, by weight) is estimated to be needed to operate eight of the 11 total WGSs plus two FGTs for Option 1 and 8.79 tons per day of NaOH is estimated to be needed to operate four of the seven total WGSs plus two FGTs for Option 2. In addition, even though the facilities that may be affected by the proposed project may already use NaOH elsewhere in their facilities, for the purpose of conducting a "worst-case" construction analysis, one 10,000 gallon storage tank for caustic solution was assumed to be constructed for every WGS installed or FGT system using Merox catalyst. However, of the 11 facilities affected by the proposed project overall, only nine facilities were projected to have an increased demand in NaOH use for WGS operations or FGT modifications under Option 1 and only five facilities were projected to have an increased demand in NaOH use for WGS operations or FGT modifications under Option 2.

As previously summarized in Tables 4-8 and 4-9, for each facility that was projected to increase the use in the acutely hazardous substance NaOH under Options 1 and 2, respectively, the filling loss and the working loss of each NaOH tank was calculated, added together, and that sum was compared to the most stringent Rule 1401 Screening Emission Level for NaOH (0.004 pounds per hour at the nearest receptor distance of 25 meters). None of the total hourly loss projections exceeded the acute screening level for NaOH for any of the affected facilities for either option. Because the screening level for NaOH was not exceeded for any of the affected facilities for either option, no significant hazards and hazardous materials impacts with respect to NaOH uses are expected from the proposed project. NaOH is not classified as a carcinogen, so a cancer risk analysis was not performed.

It is expected that the affected facilities will receive NaOH from a local supplier located in the greater Los Angeles area. Deliveries of NaOH (50 percent by weight) would be made by tanker truck via public roads. The maximum capacity of a NaOH tanker truck is approximately 6,000 gallons. The projected onsite storage capacity and consumption rates of NaOH are summarized in Tables 4-8 and 4-9 and the projected annual deliveries are summarized in Tables 4-28 and 4-29. Based on the annual deliveries estimates, each facility is not expected to exceed the peak daily of one delivery per day per facility. However, the "worst-case" assumption for a peak daily delivery frequency from a supplier would be to deliver 6,000 gallons of NaOH to each of four facilities to fill four new NaOH tanks on the same day. Regulations for the transport of hazardous materials by public highway are described in 49 CFR §§ 173 and 177.

To accommodate the increased demand in NaOH, there will be an increase in truck deliveries to supply NaOH to the facilities that need it. Tables 4-28 and 4-29 summarize the annual and peak daily truck deliveries needed to supply NaOH for Options 1 and 2 of the proposed project, respectively. Based on the volume of NaOH solution (50 percent by weight) needed, the calculations assume that one 10,000 gallon capacity storage tank will be installed at each affected facility for NaOH storage. The amount of annual deliveries is based on the assumption that one delivery truck can hold 6,000 gallons per truck load. While the number of annual NaOH deliveries will vary based on each facility's needs, the peak daily truck deliveries would be one truck per day per facility.

Table 4-28
Option 1: Summary of NaOH Deliveries

Facility ID	Daily Increase in NaOH Demand (tons/day)	Annual Increase in NaOH Demand (tons/year)	Annual NaOH Deliveries [1] (truck trips/year)
A	0.81	294	8
B	1.17	427	12
C	0	0	0
D	0.44	160	5
E	0.45	164	5
F	2.02	738	20
G	2.90	1,060	28
H	3.37	1,228	32
I	0.79	289	8
J	1.30	473	13
K	0	0	0
Total	**13.24**	**4,833**	**131**

[1] Annual NaOH deliveries are calculated based on one delivery truck holding 6,000 gallons per truck load. For example, for Facility A: 294 tons/yr NaOH x 2,000 lbs/ ton = 328,000 lbs/yr x 1 gal NaOH @ 50%/12.77 lbs = 46,045 gal/year x 1 truck/6,000 gallons = 8 trucks/year.

Table 4-29
Option 2: Summary of NaOH Deliveries

Facility ID	Daily Increase in NaOH Demand (tons/day)	Annual Increase in NaOH Demand (tons/year)	Annual NaOH Deliveries [1] (truck trips/year)
A	0	0	0
B	0	0	0
C	0	0	0
D	0.44	160	5
E	0	0	0
F	0	0	0
G	2.90	1,060	28
H	3.37	1,228	32
I	0.79	289	8
J	1.30	473	13
K	0	0	0
Total	**8.79**	**3,210**	**86**

[1] Annual NaOH deliveries are calculated based on one delivery truck holding 6,000 gallons per truck load. For example, for Facility A: 294 tons/yr NaOH x 2,000 lbs/ ton = 328,000 lbs/yr x 1 gal NaOH @ 50%/12.77 lbs = 46,045 gal/year x 1 truck/6,000 gallons = 8 trucks/year.

All of the refineries (Facilities A through G) currently receive NaOH from local suppliers located in the greater Los Angeles area. For the remaining facilities that do not currently use NaOH, but will begin using it, the local suppliers are expected to be able to accommodate the additional demand. As is currently the case with existing NaOH deliveries, deliveries of additional NaOH would be made to each facility by tanker truck via public roads. NaOH is typically delivered in 6,000 gallon trucks, so the proposed project would not introduce any new transportation hazards for NaOH.

The onsite storage and handling of NaOH creates the possibility of an accidental spill and release of NaOH. However, because NaOH has such a low vapor pressure (6.33 mm Hg at 40 ^{o}C or 104

^{o}F) when compared to water (55.3 mm Hg at 40 ^{o}C or 104 ^{o}F) at the same temperature, any spill of NaOH would not be expected to evaporate faster than water. Thus any spill of NaOH would be expected to stay in liquid form and would not likely exceed the ERPG-2 vapor concentration of five milligrams per cubic meter for NaOH. Further, operators at each affected facility who construct a new NaOH storage tank will need to build a containment berm large enough to hold 110 percent of the tank capacity in the event of an accidental release due to tank rupture. Thus, any spill of NaOH would not be expected to migrate beyond the boundaries of the berm on-site. Thus, any spill of NaOH is not expected to present a potential offsite public and sensitive receptor exposure. Lastly, since NaOH is not a flammable compound, other types of heat-related hazard impacts such as fires, explosions, boiling liquid – expanding vapor explosion (BLEVE) are not expected to occur and, therefore, will not be evaluated as part of this hazards analysis.

In conclusion, the hazards and hazardous materials impacts due to the use, tank rupture and the accidental release of NaOH will be less than significant for the proposed project.

<u>Limestone</u>

In DGSs, a dry calcium- and sodium-based alkaline powdered sorbent is used to absorb SO2 from the flue (outlet) gas stream. Only one source category, cement kilns located at Facility K, may be retrofitted with two DGSs to comply with the proposed project. The sorbent expected to be used in the DGSs will be limestone. Limestone is an existent component needed for manufacturing cement and Facility K is located adjacent to its own limestone quarry. Thus, the additional limestone that would be needed to operate the DGSs (approximately three tons per day under both Options 1 and 2 of the proposed project) is expected to also be supplied by the quarry. Limestone, also known as calcium carbonate (CaCO3), is a non-toxic, non-cancerous, and non-hazardous substance. The NFPA has not assigned a rating for calcium carbonate.

As the limestone absorbs the sulfur compounds in the flue gas, a solid waste by-product is produced that is comprised of 90 percent calcium sulfate (CaSO4) and 10 percent calcium sulfite (CaSO3). Both CaSO4 and CaSO3 are non-toxic, non-cancerous, and non-hazardous substances. Located on the MSDSs for CaSO4 and CaSO3, the NFPA hazards ratings are the same for both compounds, as follows: health is rated 1 (slightly hazardous), flammability is rated 0 (none) and reactivity is rated 0 (none).

Operation of the DGSs is expected to generate approximately two tons per day of this by-product mixture. Since CaSO4 is stable at high temperatures and since most of the by-product is comprised of CaSO4, the by-product can be re-introduced into the kiln with the raw feed to manufacture cement. Even though some SO2 may be liberated from the CaSO3 portion of the by-product as it enters the kiln feed, the DGS will be able to re-capture the SO2. Any portion of the solid waste by-product generated that cannot be re-introduced into the kiln, can either be sent to a landfill, used for agricultural purposes, or mixed in with aggregate. In any case, the solid waste by-products that may be generated from this process would not be considered hazardous waste.

In conclusion, the hazards and hazardous materials impacts due to the use of limestone and the recycling or disposal of its solid, non-hazardous waste by-product mixture of CaSO4 and CaSO3, is expected to be less than significant for the proposed project.

Selective Oxidation Catalyst

The proposed project may result in the replacement of an existing catalytic emission reduction system with a selective oxidation catalyst system to treat flue gas from a SRU/TGU. The selective oxidation catalyst, ESx, is a proprietary product manufactured by EmeraChem. ESx, is a platinum- and titanium-based catalyst that is manufactured in module form. The modules consist of six inch-by-six inch coated ceramic blocks that are stacked in a fixed bed. The amount of blocks that are needed depends on the amount of exhaust gas being treated and the amount of sulfur in the exhaust. The ESx catalyst acts as a sulfur trap and is continuously regenerated. At the end of its useful life, the spent ESx modules are replaced with fresh modules. The precious metals in the spent catalyst are reclaimed from the modules and the remaining material is crushed, and then recycled or disposed of in a landfill as non-hazardous waste. The NFPA has not assigned a rating for the ESx catalyst, but the MSDS for ESx indicates that it is non-hazardous according to the definition for "health hazard" and "physical hazard" provided in the OSHA Hazard Communication Law (29 CFR Part 1910).

Only one facility, Facility A, may consider using ESx catalyst, the equivalent to 400 pounds per year, for its SRU/TGU system. Delivery of the catalyst modules can be accomplished in one truck trip. In conclusion, the hazards and hazardous materials impacts due to the use of ESx catalyst and the recycling or disposal of the spent catalyst modules, is expected to be less than significant for the proposed project.

Sulfuric Acid

There are two facilities that manufacture sulfuric acid (H2SO4) in the Basin (Facilities C and J). H2SO4 is a considered a hazardous substance because it is a poisonous, corrosive liquid that is highly reactive with water. H2S04 has proposed risk values for both cancer/chronic and acute effects per SCAQMD Rule 1401. The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). However, this classification applies only to mists containing sulfuric acid, and not to sulfuric acid or sulfuric acid solutions. H2SO4 is also a regulated substance pursuant to CalARP threshold under certain conditions. Located on the MSDSs for H2SO4 solution (52 to 100 percent, weight), the NFPA hazards ratings are as follows: health is rated 3 (highly hazardous), flammability is rated 0 (none), reactivity is rated 2 (moderately hazardous), and the special category is rated as water reactive.

Implementation of the proposed project may result in operators of Facility C upgrading their existing Cansolv unit by increasing the amount of steam throughput and operators of Facility J installing a WGS to further reduce SOx from their H2SO4 processes. While the nature of this source category involves the manufacture of a highly hazardous substance, the amount of H2SO4 produced is limited by the amount of available feedstock and the permit limits in place. Thus, the possible changes that may occur at the back-end of each of the affected facilities to reduce SOx are not anticipated to increase the production of H2SO4. Therefore, no changes to the existing hazards setting with respect to H2SO4 production is expected to result from the proposed project

Cansolv is a proprietary hydroxyalkyamine mixture that contains the following hazardous materials: 1,4-dioxane, acetaldehyde, formaldehyde, ethylene glycol, and ethylene oxide. All of these substances are regulated hazardous substances though the NFPA has not assigned hazards ratings to Cansolv. Acetaldehyde, ethylene glycol, and ethylene oxide are assigned chronic/cancer risk values while 1,4-dioxane and formaldehyde are assigned risk values for both chronic/cancer and acute exposures pursuant to SCAQMD Rule 1401. In addition, all of these substances except ethylene glycol are regulated by CalARP.

Though Cansolv is considered a hazardous material, it is important to note that the potential modifications to the Cansolv Unit at Facility C will focus on increasing the amount of steam input to the existing amine regenerator tower. The amount of steam introduced into the unit is inversely proportional to the amount of SO2 in the exhaust stream (i.e., more steam in, less SO2 in the exhaust gas). The increase in steam to the amine regenerator tower will not change the amount of Cansolv amine currently used in the process and further, is not expected to involve the use of any new hazardous substance or increase any hazardous waste that may already be generated by the unit.

Lastly, the installation of a WGS at Facility J will increase the amount of NaOH caustic, a hazardous material. However, the hazards analysis for the increased use of NaOH for the sulfuric acid source category along with the other source categories that may employ WGSs is previously addressed in the "Caustic" discussion in this section.

In conclusion, installing new controls and upgrading existing controls for sulfuric acid manufacturing units will not entail the use of hazardous materials or require any disposal of hazardous waste. Thus, based on the preceding analysis, the hazards and hazardous materials impacts are expected to be less than significant for the proposed project.

Amines

Amine absorbers are currently utilized for reducing SOx emissions as part of FGT or as part of SRU/TGU systems operated at refineries. The type of amine used in these absorbers varies from process to process and sometimes the amines are paired up with a proprietary catalyst such as Merox for additional SOx control. The most common amines are DEA, MDEA, and MEA and their use is limited to removing H2S and CO2 from gas streams. While none of these amines can remove mercaptans, DEA and MEA can be used to remove COS.

Of these three amines, DEA is the only amine that is a TAC and carcinogenic. DEA is regulated as a hazardous compound/regulated substance per SCAQMD's Rule 1401. Located on the MSDSs for DEA, the NFPA hazards ratings are follows: health is rated 1 (slightly hazardous), flammability is rated 1 (slightly flammable) and reactivity is rated 0 (none). Located on the MSDSs for MEA, the NFPA hazards ratings are follows: health is rated 3 (highly hazardous), flammability is rated 2 (moderately flammable) and reactivity is rated 0 (none). The NFPA has not assigned a rating for MDEA.

The proposed project may entail modifications to FGT systems at five refineries. These modifications are summarized in Table 4-30.

Table 4-30
Summary of Potential FGT Modifications Per Facility

Facility ID	FGT Modification
A	Convert two DEA absorbers to Sulfinol
C	Convert all MEA absorbers to Sulfinol
D	Add Merox treatment to existing MEA and NaOH treatment of coker off-gas
E	Convert all DEA absorbers to Sulfinol
F	Add TG-10 to existing MDEA amine in the absorber
G	Add Merox treatment to existing MEA and NaOH treatment of coker off-gas

Sulfinol
The Sulfinol process is a proprietary mixed solvent process that removes H2S, CO2, COS, mercaptans and other organic sulfur compounds from gas streams. Sulfinol is the combination of two proprietary solvents mixed with water (25 percent by weight): 1) Sulfolane (tetrahydrothiopene dioxide) (25 percent by weight); and, 2) di-isopropanolamine (DIPA) (50 percent by weight). Neither Sulfolane nor DIPA are regulated substances pursuant to SCAQMD Rule 1401 or CalARP. Located on the MSDSs for Sulfolane, the NFPA hazards ratings are as follows: health is rated 1 (slightly hazardous), flammability is rated 1 (slightly flammable) and reactivity is rated 0 (none). Similarly, the NFPA hazards ratings for DIPA are as follows: health is rated 3 (highly hazardous), flammability is rated 1 (slightly flammable) and reactivity is rated 0 (none).

Operators of three facilities (Facilities A, C and E) may consider implementing a solvent change out to Sulfinol. If implemented, each of these facilities may use their existing amine storage tanks to store Sulfinol instead.

Facility A currently uses approximately 127,000 gallons per year of DEA for two absorbers. By switching over to Sulfinol for these units, the DEA will no longer be necessary and instead the usage of Sulfinol will be approximately 131,000 gallons per year. Since DEA is a regulated TAC with chronic/cancer risks, the Sulfinol change out at Facility A may reduce the existing toxics hazards for DEA amine use in their two absorbers.

Facility C currently uses approximately 288,000 gallons per year of MEA for their absorbers. By switching over to Sulfinol for these units, the MEA will no longer be necessary and instead the usage of Sulfinol will be approximately 278,000 gallons per year. While the solvent change out from MEA to Sulfinol is not expected to change existing health hazard, it is expected to reduce the flammability from moderately flammable to slightly flammable.

Facility E currently uses approximately 375,000 gallons per year of DEA for their absorbers. By switching over to Sulfinol for these units, the DEA will no longer be necessary and instead the usage of Sulfinol will be approximately 385,000 gallons per year. Since DEA is a regulated TAC with chronic/cancer risks, the Sulfinol change out at Facility E may reduce the existing toxics hazards for DEA amine use in their absorbers.

Implementing FGT modifications at three facilities by employing a Sulfinol amine swap is expected to reduce the hazards profile of the affected units because Sulfinol is less hazardous (e.g., less toxic when compared to DEA and less flammable when compared to MEA) than the existing amines currently used in these units. Thus, based on the preceding analysis, the hazards and hazardous materials impacts relative to the use of Sulfinol are expected to be less than significant for the proposed project.

Merox

Merox is a proprietary caustic scrubbing technology used for removing mercaptans and residual H2S from fuel gas. A Merox unit will typically consist of a column with three sections: 1) pre-wash; 2) extraction; and, 3) water wash. Feedstock enters the bottom of the column in the prewash section. The gas flows upward in the column where NaOH caustic is injected into the extraction section; the caustic acts as an absorbing agent to capture the mercaptans and convert them to sodium mercaptides. The spent caustic solution is regenerated by an oxidizer unit with catalyst injection to convert the mercaptides to disulfide oil. The disulfide oil is separated and sent elsewhere within the refinery for further processing while the regenerated caustic soda is returned to the extraction section of the column.

The addition of a Merox system to an existing absorber system means that the current amine solution will continue to be used. For example, in the cases of Facility D and G, MEA amine and NaOH caustic are currently used to treat the coker off-gas. Even if a Merox system is installed at each facility, MEA and NaOH will continue to be used and the amount of MEA needed will remain unchanged. The amount of NaOH needed will increase. It is important to note that Facility D and G already use NaOH in their FGT systems. However, the conversion to Merox technology will increase the amount of NaOH needed at these facilities. The analysis for the potential increases in NaOH for FGT are addressed in the previous discussion in the “Caustic” section. Lastly, Merox catalyst will be needed, approximately eight pounds per day or 3,000 pounds per year per facility, for the caustic regeneration portion of the Merox process.

Merox catalyst is comprised of a proprietary, cobalt-based reagent (a trade secret cobalt phthalocyanine sulfonate compound) that contains mostly water. The MSDS for Merox catalyst indicates that none of the ingredients in the catalyst have components that are classified or regulated by OSHA or by the United States National Toxicology Program (NTP). However, all of the ingredients in the catalyst are registered on the Toxic Substances Control Act (TSCA) Chemical Substance Inventory. Cobalt compounds are also specified as toxic chemicals under SARA Section 313 and may be subject to the Toxic Release Inventory (TRI) reporting requirements under 40 CFR 372. In addition, cobalt compounds are regulated pursuant to the State of California’s Proposition 65 noticing requirements. Cobalt and cobalt compounds are not regulated by SCAQMD Rule 1401 or CalARP. The NFPA has not assigned a rating for Merox catalyst. Lastly, Merox catalyst is not listed in the USEPA’s RCRA regulations because it does not possess any of the four identifying characteristics of hazardous waste (e.g., ignitibility, corrosivity, reactivity or toxicity).

Implementing FGT modifications at two facilities by installing Merox treatment systems is not expected to change the hazards profile of the affected units because Merox is not regulated as a hazardous substance. Thus, based on the preceding analysis, the hazards and hazardous materials impacts relative to the use of Merox are expected to be less than significant for the proposed project. .

TG-10
TG-10 is a proprietary amine additive that is specifically designed for meeting a 10 ppmv H2S specification in tail gas treating applications. Operators of Facility F may consider adding TG-10 to the existing MDEA amine used in their absorber. Facility F is estimated to need approximately 11 gallons per day or 4,000 gallons per year of TG-10 to mix in with the MDEA for their absorber.

As previously mentioned, MDEA is not a TAC and it is not a regulated substance pursuant to SCAQMD Rule 1401 or CalARP. The NFPA has not assigned a rating for MDEA. Located on the MSDS for TG-10, the NFPA hazards ratings are follows: health is rated 1 (slightly hazardous), flammability is rated 1 (slightly flammable) and reactivity is rated 0 (none). TG-10 is not considered hazardous according to DOT Guidelines and it contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

Implementing FGT modifications at one facility by adding TG-10 to the existing MDEA amine is not expected to change the hazards profile of the affected unit because TG-10 contains mostly MDEA, which is not regulated as a hazardous substance. Thus, based on the preceding analysis, the hazards and hazardous materials impacts relative to the use of the MDEA/TG-10 blend are expected to be less than significant for the proposed project.

In conclusion, implementing the various FGT modifications at six facilities is not expected to make the existing hazards setting worse at the affected units. Thus, based on the preceding analysis, the hazards and hazardous materials impacts relative to the use of amines and Merox catalyst are expected to be less than significant for the proposed project.

<u>Reduction of SOx Emissions</u>
In addition, implementation of the proposed project is designed to reduce overall SOx emissions by up to 6.21 tons per day. Components of the SOx reductions are SO2, SO3, H2S, COS and mercaptans (ethyl- and methyl-). The following is a brief discussion of whether the components of SOx are hazardous.

SO2
SO2 is not a carcinogen or a TAC, but it is a regulated compound per CalARP. Located on the MSDSs for SO2, the NFPA hazards ratings are as follows: health is rated 3 (serious hazard), flammability is rated 0 (none) and reactivity is rated 0 (none). A reduction of SO2 would be beneficial because it would result in a reduction in a serious health hazard.

SO3
SO3 is a TAC with proposed risk values for cancer or non-cancer that are pending approval. SO3 is also a regulated compound per CalARP. The NFPA hazards ratings for SO3 are as follows: health is rated 3 (serious hazard), flammability is rated 0 (none) and reactivity is rated 2 (moderately reactive). A reduction of SO3 would be beneficial because it would result in a reduction of a toxic compound and a serious health hazard.

H2S

H2S is a carcinogen and a TAC with cancer/chronic and acute risk values per SCAQMD Rule 1401. H2S is also a regulated compound per CalARP. The NFPA hazards ratings for H2S are as follows: health is rated 4 (severely hazardous), flammability is rated 4 (severely flammable) and reactivity is rated 0 (none). H2S is listed as an extremely hazardous substance (EHS) subject to state and local reporting under Section 304 of SARA Title III. A reduction of H2S would be beneficial because it would result in a reduction of a toxic, carcinogenic compound and a severely hazardous health and flammability hazard.

COS

COS is not a carcinogen or a TAC, but it is a regulated compound per CalARP. Located on the MSDSs for COS, the NFPA hazards ratings are as follows: health is rated 2 (moderately hazardous), flammability is rated 0 (none) and reactivity is rated 1 (slightly reactive). A reduction of COS would be beneficial because it would result in a reduction of a moderate health hazard.

Mercaptans

Ethyl- and methyl-mercaptans are not carcinogenic or TACs, but they are regulated compounds per CalARP. The NFPA hazards ratings for ethyl-mercaptan are as follows: health is rated 1 (slightly hazardous), flammability is rated 4 (severely flammable) and reactivity is rated 1 (slightly reactive). The NFPA hazards ratings for methyl-mercaptan are as follows: health is rated 3 (highly hazardous), flammability is rated 4 (severely flammable) and reactivity is rated 0 (none). A reduction of mercaptans would be beneficial because it would result in a reduction of a severely flammable hazard for both ethyl- and methyl-mercaptans and a reduction of a high health hazard for methyl-mercaptan.

Elemental Sulfur

As part of reducing SOx in FGT and SRU/TGUs, additional elemental sulfur is expected to be captured and sold as a commodity from Facilities A, C, D, E, F and G. Table 4-31 summarizes that additional sulfur that may be collected and sold as a result of implementing the proposed project. Some commercial uses of sulfur are primarily in manufacturing sulfuric acid, fertilizers, gunpowder, matches, insecticides and fungicides. However, because sulfur dust may form flammable or explosive mixtures with air, each of the affected facilities is currently equipped with sulfur pits that are specifically designed to handle this potential explosion hazard. The capacity of these existing sulfur pits is expected to be able to handle the additional increase in collected elemental sulfur.

Elemental sulfur is not a regulated substance pursuant to SCAQMD Rule 1401 or CalARP. The NFPA hazards ratings for elemental sulfur are as follows: health is rated 2 (moderately hazardous), flammability is rated 1 (slightly flammable) and reactivity is rated 0 (none). Therefore, the capture and sale of additional elemental sulfur is not expected in change the existing hazards setting at each affected facility.

Table 4-31
Amount of Potential Increase in Sulfur Sales

Facility ID	Affected Source Category	SOx Control Technology	Amount of Sulfur Collected (lbs/day)	Amount of Sulfur Collected (long tons/year)*
A	SRU/TGU	New Selective Oxidation Catalyst system	145.2	23.7
C	FGT	Convert all MEA absorbers to Sulfinol	40.4	6.6
D	FGT	Convert MEA and NaOH treatment of coker off-gas to Merox	67.5	11
E	FGT	Convert all DEA absorbers to Sulfinol	347.1	56.6
F	FGT	Add TG-10 to existing MDEA amine in the absorber	63.5	10.4
G	FGT	Convert MEA and NaOH treatment of coker off-gas to Merox	288.4	47
		TOTAL	**952.2**	**155.1**

* 1 long ton = 2,240 pounds

In conclusion, implementing the proposed project is expected to reduce SOx which will, in turn, reduce the hazardous component of SOx. Thus, based on the preceding analysis, the hazards and hazardous materials impacts from reducing SOx in flue gas exhaust streams are expected to be a benefit, and as such, less than significant for the proposed project.

Transportation Release

The transportation of hazardous materials can result in offsite releases through accidents or equipment failure. The proposed project is expected to increase the amount of NaOH, a hazardous material transported to or from the affected facilities. Refer to the "Caustic" discussion for this analysis.

Additional soda ash, catalyst and SOx reducing additives are expected to be delivered to some of the affected facilities, but no increase in transportation hazards is expected as none of these materials are considered to be hazardous. Further, limestone will be removed from an existing quarry on the property of Facility K and trucked within the location of the facility's boundaries, but no increase in transportation hazards is expected as limestone is not considered to be a hazardous substance

Lastly, additional amines (e.g., Sulfinol) may be delivered to some of the affected facilities causing the elimination or reduction of other amines (e.g., MEA and DEA) deliveries, but no increase in transportation hazards is expected as Sulfinol is considered to be less hazardous overall when compared to the existing amine deliveries.

Solid Waste

Each affected facility operator was asked to complete a survey about their solid waste and how it is currently handled. Table 4-32 summarizes the results of the survey. If the proposed project is implemented, additional solid waste may be generated. Tables 4-33 and 4-34 summarize the increased amount of solid waste expected to be generated for implementation of Option 1 (i.e., if WGSs are installed) and Option 2 (i.e., if additional SOx reduction additives are used), respectively. In both cases, neither Option 1 nor Option 2 will result in the generation of solid hazardous waste.

Table 4-32
Current Amount of Solid Waste Generated

Facility ID	**Current Amount of Solid Waste Generated** (tons/day)	**Type of Solid Waste**	**Is Solid Waste Hazardous?**	**Solid Waste is trucked to:**
A	1.12	Catalyst Fines	NO	Cement Plant for Recycling
B	4.66	Catalyst Fines	NO	1. Cement Plant for Recycling; or, 2. Class III landfill for disposal as non- hazardous waste
C	2.16	Catalyst Fines	NO	Cement Plant for Recycling
D	0.41	Catalyst Fines	NO	Cement Plant for Recycling
E	0.99	Catalyst Fines	NO	Cement Plant for Recycling
F	2.00	Catalyst Fines	NO	Cement Plant for Recycling
G	Not reported	Catalyst Fines	NO	Cement Plant for Recycling
H	175	Baghouse fines	NO	Cement Plant for Recycling
I	Not reported	ESP fines	Not reported	Most of the waste is reused on site, but some is sent to a Class III landfill for disposal.
J	Not reported	Not reported	Not reported	Not reported
K	Not reported	Not reported	Not reported	Most of the waste is reused on site, but some is sent to a Class III landfill for disposal.
Total	**186.34**			

Table 4-33
Option 1: Potential Increase in Solid Waste

Facility ID	**Current Amount of Solids Collected by Existing Controls** (tons/day)	**Proposed Increase in Amount of Solids Collected Due to New SOx Controls** (tons/day)	**Is the proposed increase in Solid Waste Hazardous?**	**Solid Waste will be trucked to:**
A	1.12	0.77	NO	Cement Plant for Recycling
B	4.66	2.47	NO	Cement Plant for Recycling
C	2.16	0	NO	Not Applicable
D	0.41	1.18	NO	Cement Plant for Recycling
E	0.99	0.44	NO	Cement Plant for Recycling
F	2.00	1.89	NO	Cement Plant for Recycling
G	Not reported	2.03	NO	Cement Plant for Recycling
H	175	0.44	NO	Cement Plant for Recycling
I	Not reported	0.05	NO	1. Cement Plant for Recycling; or, 2. Class III landfill for disposal as non- hazardous waste
J	Not reported	0	NO	Not Applicable
K	Not reported	2.49	NO	Reused on-site
Total	**186.34**	**11.75**		

Table 4-34
Option 2: Potential Increase in Solid Waste

Facility ID	Current Amount of Solids Collected by Existing Controls (tons/day)	Proposed Increase in Amount of Solids Collected Due to New SOx Controls (tons/day)	Is the proposed increase in Solid Waste Hazardous?	Solid Waste will be trucked to:
A	1.12	0	NO	Not Applicable
B	4.66	1.37	NO	Cement Plant for Recycling
C	2.16	0	NO	Not Applicable
D	0.41	1.18	NO	Cement Plant for Recycling
E	0.99	0	NO	Not Applicable
F	2.00	0	NO	Not Applicable
G	Not reported	2.03	NO	Cement Plant for Recycling
H	175	0.44	NO	Cement Plant for Recycling
I	Not reported	0.05	NO	1. Cement Plant for Recycling; or, 2. Class III landfill for disposal as non- hazardous waste
J	Not reported	0	NO	Not Applicable
K	Not reported	2.49	NO	Reused on-site
Total	**186.34**	**7.56**		

<u>Sensitive Receptors</u>

None of the affected units operating at the existing facilities that may be altered by the proposed project are located within 1,000 feet or one-quarter mile of a sensitive receptor, including individuals at hospitals, nursing facilities, daycare centers, schools, and elderly intensive care facilities, as well as residential and off-site occupational areas. Therefore, no adverse significant impacts from hazardous emissions onsite or the handling of acutely hazardous materials, substances and wastes on sensitive receptors is expected from the proposed project.

<u>Summary</u>

Table 4-35 summarizes the substances that may be involved in the various processes at the affected facilities. Some of the substances listed are considered hazardous while others are not. Of the substances listed in Table 4-35, the only net increase in the use of a hazardous material will be for NaOH and the effects of this potential increase has been previously analyzed in the "Caustic" discussion. For the remaining substances identified, there will be either a decrease in use or no change from the existing setting. Thus, none of the changes to the existing setting is expected to result in a significant adverse impact for hazards and hazardous materials.

Table 4-35
Substances that May Be Affected By The Proposed Project

Substance	Potential Overall Increase, Decrease, or No Change from Existing Setting?	Contains TAC(s) per SCAQMD Rule 1401?	Hazardous per CalARP?	NFPA Rating: Health (Blue)	NFPA Rating: Flammability (Red)	NFPA Rating: Reactivity (Yellow)	NFPA Rating: Special (White)
DIPA	Increase	No	No	3	1	0	None
ESx Catalyst	Increase	No	No	N/A	N/A	N/A	N/A
Limestone (calcium carbonate)	Increase	No	No	N/A	N/A	N/A	N/A
Merox Catalyst	Increase	No	No	N/A	N/A	N/A	N/A
NaOH Caustic (50% by weight)	Increase	Yes, Acute (non-cancer)	Yes	3	0	1	None
Soda Ash Caustic (sodium carbonate)	Increase	No	No	2	0	0	None
SOxGetter/ Super SOxGetter Catalyst	Increase	No	No	1	0	0	None
Sulfur (Elemental)	Increase	No	No	2	1	0	None
Sulfolane	Increase	No	No	1	1	0	None
Super DeSOx Catalyst	Increase	No	No	2	0	0	None
TG-10	Increase	No	No	1	1	0	None
Sulfuric Acid	No Change	Yes, cancer/ chronic & acute	Yes	3	0	2	Water Reactive
Cansolv	No Change	Yes, cancer/ chronic & acute	Yes	N/A	N/A	N/A	N/A
MDEA	No Change	No	No	N/A	N/A	N/A	N/A
COS	Decrease	No	Yes	2	0	1	None
DEA	Decrease	Yes, cancer/ chronic	No	1	1	0	None
Ethyl-Mercaptan	Decrease	No	Yes	1	4	1	None
H2S	Decrease	Yes, cancer/ chronic & acute	Yes	4	4	0	None
MEA	Decrease	No	No	3	2	0	None
Methyl Mercaptan	Decrease	No	Yes	3	4	0	None
SO2	Decrease	No	Yes	3	0	0	None
SO3	Decrease	Yes, cancer/ chronic & acute (pending)	Yes	3	0	2	None

NFPA Hazard Code Key: 4 = Extreme; 3 = High; 2 = Moderate; 1 = Slight; 0 = Insignificant; N/A = NFPA hazard is not assigned.

Project-Specific Impacts – Conclusion: Based on the preceding description of hazards and hazardous materials impacts, the proposed project is expected to generate less than significant adverse impacts related to any of the substances listed in Table 4-35. The analysis of hazard impacts has relied on information from past similar projects (i.e., installing new, or retrofitting existing equipment to comply with SCAQMD rules and regulations and installation of associated NaOH storage tanks) where the SCAQMD was the lead agency responsible for preparing an environmental analysis pursuant to CEQA. To the extent that future projects to install new or modify existing SOx controls conform with the hazard analysis in this PEA, no further hazard analysis may be necessary. However, if site-specific characteristics are involved with future projects that are outside the scope of this analysis, further hazards analysis may be warranted.

Project-Specific Mitigation: Less than significant adverse impacts associated with hazards and hazardous materials are expected from the proposed project during both construction and operation, so no mitigation measures are required.

Level of Significance After Mitigation: The analysis concluded that the hazards and hazardous materials impacts from implementing the proposed project are considered to be adverse, but less than significant. Therefore, mitigation measures are not required.

Cumulative Hazards and Hazardous Materials Impacts: Because the project-specific hazards and hazardous materials impacts do not exceed any applicable significance thresholds, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative hazards and hazardous materials impacts.

Cumulative Mitigation Measures: None required.

HYDROLOGY AND WATER QUALITY IMPACTS

Significance Criteria

Potential impacts on water resources will be considered significant if any of the following criteria apply:

<u>Water Demand:</u>

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water. For the purposes of this analysis, substantial amount of potable water demand is defined as the amount of water necessary to supply 500 dwelling units or approximately 133,911 to 223,186 gallons of potable water per day.
- The project increases demand for water by more than five million gallons per day.

<u>Water Quality:</u>

- The project will cause degradation or depletion of groundwater resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.

- The project results in alterations to the course or flow of floodwaters.

Project-Specific Construction Impacts

Construction Background

Implementation of the proposed project is expected to result in construction activities associated with installing new or modifying existing SOx control equipment at the affected facilities, which are complex, well-established and mostly paved, industrial facilities. Depending on the proposed location within each facility's boundaries for the siting of any new control equipment that may be installed as a result of implementing the proposed project, construction activities such as digging, earthmoving, grading, slab pouring, or paving could occur if the proposed site for the new equipment is not suitable in its present form (e.g., graded with a foundation slab). Tables 4-36 and 4-37 contain a summary of the estimates of plot space needed per facility for Option 1 and Option 2 of the proposed project.

Based on the consultant's surveys of the affected facilities, if all affected facilities conduct site preparation activities, the total amount of disturbed area for all of the facilities combined is estimated to be 48,126 square feet (1.1 acres) for Option 1 and 40,976 square feet (0.9 acre) for Option 2. However, even if all affected facilities intend to conduct site preparation, not much overlap of site preparation activities would be expected since there are several years between the proposed rule amendment date (2010) and the proposed compliance date (January 1, 2019) and because the plot spaces are relatively small. Further, depending on the scale, site preparation typically can take anywhere from two weeks to one month. Therefore, it is unlikely that all affected facilities will do site preparation both in the same month of the same year. The largest parcel of land to be potentially disturbed at any one facility for both Options 1 and 2 of the proposed project could occur at Facility D and is approximately 11,930 square feet which represents approximately 25 percent of the total area to be disturbed for Option 1 and 29 percent of the total area to be disturbed for Option 2. On average, 4,384 square feet may be disturbed per facility under Option 2 and 3,725 square feet may be disturbed per facility under Option 2. Consistent with the assumption that, as a worst-case, up to four facilities could conduct overlapping site preparation activities, then the potential peak area that could be disturbed at any one time would be 33,836 square feet under Option 1 and 31,836 square feet under Option 2.

Under either option, the amount of area to be disturbed is relatively small such that one backhoe should be sufficient for site preparation activities. Since one backhoe can trench approximately 0.1 acre per day or 4,356 square feet per day, earthmoving activities at Facility D would take approximately three days under either Option 1 or Option 2. Even if four facilities conduct overlapping site preparation, earthmoving activities would take about the same amount of time since each plot space is relatively small (i.e., a ¼-acre plot or smaller) and there would be one backhoe in operation at each of the four facilities.

Table 4-36
Option 1: Potential Plot Space Needed For Proposed Control Technologies

Facility ID	**Option 1: Potential SOx Control per Equipment/Source Category**	**Plot Space Needed for Proposed Controls** (square feet)
A	1 WGS for FCCU (new) 1 Selective Oxidation Catalyst system for SRU/TGU (new) 1 FGT by Sulfinol Conversion (modified)	2,000 + 2,500 + 100 **4,600**
B	1 WGS for FCCU (new) 2 WGSs for SRU/TGU (new)	2,000 + 7,906 **9,906**
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit (modified)	**6,000+** 0 **6,000**
D	1 WGS for SRU/TGU (new) 1 FGT by Merox Treatment Upgrade (modified)	5,930 + 6,000 **11,930**
E	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	1,575 + 100 **1,675**
F	1 WGS for FCCU (new) 1 FGT by Amine Additive (modified)	1,575 + 100 **1,675**
G	1 FGT by Merox Treatment Upgrade (modified)	**6,000**
H	1 WGS for calciner (new)	**1,200**
I	2 WGSs for glass melting furnaces (new)	**640**
J	1 WGS for sulfuric acid unit (new)	**500**
K	2 DGSs for cement kilns (new)	**4,000**
	TOTAL	**48,126**

Table 4-37
Option 2: Potential Plot Space Needed For Proposed Control Technologies

Facility ID	Option 2: Potential SOx Control per Equipment/Source Category	Plot Space Needed for Proposed Controls (square feet)
A	1 SOx Reducing Additive Hopper for FCCU (modified) 1 Selective Oxidation Catalyst system for SRU/TGU (new) 1 FGT by Sulfinol Conversion (modified)	0 + 2,500 + 100 **2,600**
B	1 SOx Reducing Additive Hopper for FCCU (modified) 2 WGSs for SRU/TGU (new)	0 + 7,906 **7,906**
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit (modified)	**6,000**+ 0 **6,000**
D	1 SOx Reducing Additive Hopper for FCCU (new) 1 WGS for SRU/TGU (new) 1 FGT by Merox Treatment Upgrade (modified)	0 + 5,930 + 6,000 **11,930**
E	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + 100 **100**
F	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Amine Additive (modified)	0 + 100 **100**
G	1 FGT by Merox Treatment Upgrade (modified)	**6,000**
H	1 WGS for calciner (new)	**1,200**
I	2 WGSs for glass melting furnaces (new)	**640**
J	1 WGS for sulfuric acid unit (new)	**500**
K	2 DGSs for cement kilns (new)	**4,000**
	TOTAL	**40,976**

Construction Water Demand

To comply with the dust suppression requirements in SCAQMD Rule 403 – Fugitive Dust, during site preparation activities, some water is expected to be used. For example, one water truck per affected facility may be needed for dust suppression activities during the initial site preparation/earth moving portion of the proposed project. One water truck can hold approximately 6,000 gallons for dust control and it can be refilled over the course of the day if more than 6,000 gallons is needed. By applying one gallon of water per square foot of disturbed area, at a minimum of two times per day as required to minimize fugitive dust, the total amount of water expected to be used for dust suppression is approximately 8,712 gallons per facility per day. However, if four facilities conduct overlapping watering, then the maximum amount of water that could be used for site preparation is 34,848 gallons per day. On windy days, it may be necessary to conduct a third water application. Thus, the total peak amount of water that could be used for dust suppression is approximately 13,068 gallons per facility per day. Again, if four facilities conduct overlapping watering, at a watering rate of three applications per day, then the peak amount of water that could be used for site preparation is 52,272 gallons per day.

Due to the need to quickly construct a proper foundation for the proposed control equipment, earth moving activities during site preparation are expected to be of a short duration lasting from two to three days to no longer than one month per facility. As such, the corresponding dust control activities are also not expected to last longer than one month per facility. Further, water used for dust suppression does not have to be of potable quality, but can be recycled water. Recycled water is currently available at three of the affected facilities and non-potable industrial-use groundwater is currently available at one additional facility. Additional recycled water availability is expected to expand to five other facilities by Summer 2013[82].

Since the earliest year when construction activities could begin would be in 2012, nine facilities are expected to have access to recycled or industrial-use groundwater for use during site preparation. There are three facilities (Facilities G, H and I) that do not currently have access to recycled or industrial-use groundwater and are not expected to have future access in 2012 or later. However, the amount of site preparation that would need to occur at these two facilities is expected to be about 7,840 square feet which would require approximately 15,680 gallons of water (at a watering rate of twice each day) to 23,520 gallons of water (at a watering rate of three times each day) for dust suppression activities during windy days.

Table 4-38 identifies the current water suppliers, the type of water currently supplied to each affected facility, and whether the facility currently buys recycled water. When surveyed, all of the responses from the affected facilities indicated that there is no limit to how much potable water they can purchase. Three facilities currently have pipeline access to and purchase recycled water and one facility has recycled water trucked in.

Table 4-39 identifies whether the affected facilities will have future access to recycled water pursuant to the LADWP's HRRWPP project. In addition to the three facilities that already have pipeline access to and purchase recycled water, the LADWP and WBMWD, as part of the HRRWPP project, are currently working with four facilities that would be affected by the proposed project to reach an agreement that would also have them start using recycled water. Staff at both the LADWP and WBMWD is working cooperatively to negotiate with these facilities to craft a Memorandum of Understanding that would encourage the installation of the necessary water conveyance infrastructure along with attractive pricing subsidies to access and maximize the use of recycled water while minimizing groundwater pumping and imported water use in oil refinery operations. Negotiations to supply recycled water to facilities affected by the proposed project are independent of, and do not rely on the proposed amendments to Regulation XX.

There are four facilities (G, H, I and K) identified in Table 4-39 that would not be able to have future or increased access to recycled water but only three facilities would be expected to

[82] Future access to recycled water for these five facilities is dependent upon the completion of the Harbor Refineries Recycled Water Pipeline Project (HRRWPP) by Summer 2013 (SCH No. 2008121093, certified on October 20, 2009). The HRRWPP will conserve potable water and instead produce and convey recycled water to multiple industrial and irrigation customers in the Los Angeles Harbor area (http://www.ladwp.com/ladwp/cms/ladwp011486.jsp). Proponents of the HRRWPP are working with each of the affected facilities to negotiate construction of a new water conveyance at their site in order to tie-into the recycled water pipeline.

continue to rely on potable water (G, H and I) during construction of the proposed project. Though the water used is not recycled, Facility K has access to non-potable industrial-use groundwater from their owner-operated groundwater wells and therefore, would not be expected to increase its existing use of potable water during construction of the proposed project.

Table 4-38
Current Water Supply Sources and Baseline Water Use at Affected Facilities

Facility ID	Purchases Potable Water From?	Potable Water Baseline (MMgal/day)	Pumps from Groundwater Wells?	Groundwater Pumping Baseline (MMgal/day)	Purchases Recycled Water From?	Recycled Water Use Baseline (MMgal/day)	Total Baseline Water Use[1] (MMgal/day)
A	City of El Segundo via WBMWD	2.60	No wells	0	City of El Segundo via WBMWD	8.15	10.75
B	CWS via WBMWD	5.80	Yes	3.90	CWS via WBMWD	2.80	12.50
C	LADWP	5.47	Yes	2.38	No Access	0	7.85
D	City of Torrance	3.19	Yes (non-potable)	1.13	City of Torrance via WBMWD	6.00	10.32
E	LADWP	1.30	Yes (non-potable)	4.46	No Access	0	5.76
F	LADWP	1.75	No wells	0	Air Products Company	0.75	2.50
G	CWS via WBMWD	0.30	Yes (non-potable)	2.59	No Access	0	2.88
H	Port of Long Beach via Long Beach Water Department	1.08	No wells	0	No Access	0	1.08
I	City of Vernon	0.13	No wells	0	No Access	0	0.13
J	CWS via WBMWD	0.58	Yes (non-potable)	0.15	No Access	0	0.73
K	Riverside Highland Water Co	1.39	Yes (non-potable)	1.90	No Access	0	3.29
	TOTAL	**23.59**	**TOTAL**	**16.51**	**TOTAL**	**17.70**	**57.79**

[1] Total Baseline Water Use = Potable Water Baseline + Groundwater Pumping Baseline + Recycled Water Use Baseline

Table 4-39
Future Facility-Specific Water Supply Sources

Facility ID	Will Continue to Purchase Potable Water From?	Will Continue to Pump from Groundwater Wells?	Will Have Access to Recycled Water per the HRRWPP Project?
A	City of El Segundo via WBMWD	No wells	Yes, increased access via WBMWD
B	CWS via WBMWD	Yes	Yes, increased access via WBMWD
C	LADWP	Yes	Yes, new access via WBMWD by Summer 2013
D	City of Torrance	Yes (non-potable)	Yes, increased access via WBMWD
E	LADWP	Yes (non-potable)	Yes, new access via WBMWD by Summer 2013
F	LADWP	No wells	Yes, new access via WBMWD by Summer 2013
G	CWS via MWD	Yes (non-potable)	No
H	Port of Long Beach via Long Beach Water Department	No wells	No
I	City of Vernon	No wells	No
J	CWS via WBMWD	Yes (non-potable)	Yes, new access via WBMWD by Summer 2013
K	Riverside Highland Water Co	Yes (non-potable)	No

Instead of installing new equipment, there are a few facility operators that may choose to modify or upgrade their existing SOx control equipment. In these cases, site preparation activities are not expected because the existing foundation and the existing equipment are expected to be reused in their current location and current plot space. Therefore, no water for dust suppression purposes is expected to be needed for any construction upgrades to existing SOx control equipment.

Once constructed, but prior to operation, additional water is expected to be used to hydrostatically (pressure) test all vessels and pipelines to ensure each structure's integrity and wastewater may be created during the testing. Pressure testing is typically a one-time event, unless a leak is found. Similar to dust suppression, water used for pressure testing does not have to be of potable quality, but can be recycled water.

Even though the potential increase in water use for both Option 1 and Option 2 of the proposed project is below the SCAQMD's five million gallons per day significance threshold for total water, it may be helpful to consider other criteria for evaluating what would be considered a substantial use of potable water, especially since California is in a State of Emergency for Drought. For example, CEQA Guidelines §15155 – City or County Consultation With Water Agencies, defines a "water demand" project in several ways. While the criteria for defining water demand are not significance thresholds per se, the criteria can provide some insight as to how city or county lead agencies evaluate water demand impacts. Most of the criteria in this part of the CEQA Guidelines do not have a numerical criterion or direct methodology to correlate the criteria in terms of gallons per day for use as a significance threshold specific to potable water use. However, CEQA Guidelines §15155 (a)(1)(G) defines a water demand project as: "A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project." To estimate what this means in terms of quantifying how much potable water could be used by a 500 dwelling unit (DU) project, the California Department of Water resources relies on a conversion factor range of 0.3 to 0.5 acre-feet of potable water per year per DU as shown in the following calculation[83]:

$$(500\text{ DUs}) \times \frac{(0.3 - 0.5\text{ acre-feet/year})}{(1\text{ DU})} \times \frac{(325{,}851\text{ gallons})}{(1\text{ acre-foot})} \text{ X } \frac{(1\text{ year})}{(365\text{ days})} = \text{133,911 gallons/day to 223,186 gallons/day}$$

Thus, the amount of water that would be needed during construction for dust suppression and pressure testing activities: 1) would not be considered a substantial use of potable water since several facilities are currently using or will have future access to recycled water; and 2) is less than the overall water demand significance threshold of five million gallons per day. Further, watering activities for dust suppression and pressure-testing are temporary and occur on a short-term basis. For these reasons, less than significant water demand/water use impacts are expected during construction of the proposed project.

<u>Construction Water Quality</u>
Any wastewater generated from pressure testing is expected to flow to each affected facility's wastewater treatment or collection system and recycled or discharged after treatment with process wastewater. Thus, wastewater generation from pressure testing activities is not expected to affect groundwater quality. Further, the volume of wastewater that will be generated from pressure testing is expected to be minimal and within the capacity of each facility's wastewater treatment and collection systems.

Further, because the total amount of disturbed area for all of the facilities combined is estimated to be 48,126 square feet (1.1 acres) for Option 1 and 40,976 square feet (0.9 acre) for Option 2 with the peak amount of area to be disturbed at Facility D at 11,930 square feet, the proposed construction activities will disturb less than 0.25 acre under Option 1 and 0.29 acre under Option 2 at each of the remaining facilities. This means that a NPDES General Permit for Storm Water Discharges Associated with Construction Activity, also referred to as a Storm Water Construction Permit, would not be required for any of the affected facilities. Because the proposed project is expected to disturb substantially less than one acre per facility, on-site collection of storm water in each facility's storm water collection system is expected to be about the same as the amount currently collected. Therefore, no significant impacts are expected from storm water during construction.

<u>Construction Conclusion</u>
In summary, less than significant adverse water demand and wastewater impacts are expected during construction of the proposed project.

[83] Draft Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001 to assist water suppliers, cities, and counties in integrating water and land use planning, California Department of Water Resources, September 2002, p.3

Project-Specific Operation Impacts

Operation Background

Facilities affected by the proposed project are expected to install new or modify their existing air pollution control equipment in order to comply with the proposed project. Additional water demand and wastewater generation are expected to result from the operation of most of the proposed control technologies. Table 4-40 identifies the proposed control technologies that use water and generate wastewater during operations for Options 1 and 2 of the proposed project, respectively. The majority of the proposed SOx control technologies listed in these tables utilizes water and generates wastewater. It is important to note that the quality of water that may be used in the various SOx control technologies does not have to be potable as recycled or industrial-use groundwater can be utilized instead.

Table 4-40
Proposed Control Technologies and Their Corresponding Potential Operational Water Use and Wastewater Generation

Main Equipment	Proposed Control Technology	Proposed Control Technology Uses Water?	Proposed Control Technology Generates Wastewater?
FCCU	WGS	Yes	Yes
FCCU	SOx Reducing Catalyst	No	No
SRU/TGU	WGS	Yes	Yes
SRU/TGU	Selective Oxidation Catalyst	No	No
Refinery Boilers/Heaters	FGT (Merox Treatment or Convert Amine Absorbers to Sulfinol)	Yes	Yes
Refinery Boilers/Heaters	FGT (Additive to Existing Amine System)	No	No
Coke Calciner	WGS	Yes	Yes
Glass Melting Furnaces	WGS	Yes	Yes
Sulfuric Acid Mfg.	WGS	Yes	Yes
Sulfuric Acid Mfg.	Upgrade Existing Cansolv Unit	Yes	No[1]
Cement Kilns	DGS	Yes	No[2]

[1] More water (as steam) is required to complete the upgrade. However, the steam is evaporated during the process so there is no wastewater stream generated.

[2] All of the injected water is evaporated during the process so there is no wastewater stream generated.

Tables 4-41 and 4-42 quantify the potential increases in operational water use and wastewater generation as a result of installing new or upgrading existing SOx controls to comply with Options 1 and 2 of the proposed project, respectively. If all of the proposed control technologies are installed or upgraded, the potential increase in water use is estimated to be approximately 0.88 MMgal/day under Option 1 and 0.64 MMgal/day under Option 2. Further, if all of the proposed control technologies are installed or upgraded, the potential increase in wastewater generated would be approximately 0.27 MMgal/day under Option 1 and 0.16 MMgal/day under

Option 2. Hydrology and water quality impacts from the proposed project are discussed in detail in the following sections.

Table 4-41
Option 1: Potential Increases in Operational Water Demand and Wastewater Generation

Main Equipment	**Proposed Control Technology**	**No. of Facilities to Install or Upgrade Controls**	**No. of Units Expected to Be Installed or Upgraded**	**Potential Increase in Operational Water Demand** (gal/day)	**Potential Increase in Wastewater Generation** (gal/day)
FCCU	WGS	4	4	241,096	112,329
SRU/TGU	WGS	2	3	354,247	70,959
Refinery Boilers/Heaters	FGT (Merox Treatment or Convert Amine Absorbers to Sulfinol)	5	5	52,055	46,575
Coke Calciner	WGS	1	1	40,896	16,992
Glass Melting Furnaces	WGS	1	2	58,464	12,877
Sulfuric Acid	WGS	1	1	19,589	10,800
Sulfuric Acid	Upgrade Existing Cansolv Unit	1	1	6,336	0[1]
Cement Kilns	DGS	1	2	110,685	0[2]
		Total	**19**	**883,368**	**270,532**

[1] More water (as steam) is required to complete the upgrade. However, the steam is evaporated during the process so there is no wastewater stream generated.

[2] All of the injected water is evaporated during the process so there is no wastewater stream generated.

Table 4-42
Option 2: Potential Increases in Operational Water Demand and Wastewater Generation

Main Equipment	Proposed Control Technology	No. of Facilities to Install or Upgrade Controls	No. of Units Expected to Be Installed or Upgraded	Potential Increase in Operational Water Demand (gal/day)	Potential Increase in Wastewater Generation (gal/day)
FCCU	SOx Reducing Catalyst	5	5	0	0
SRU/TGU	WGS	2	3	354,247	70,959
Refinery Boilers/Heaters	FGT (Merox Treatment or Convert Amine Absorbers to Sulfinol)	5	5	52,055	46,575
Coke Calciner	WGS	1	1	40,896	16,992
Glass Melting Furnaces	WGS	1	2	58,464[1]	12,877
Sulfuric Acid	WGS	1	1	19,589	10,800
Sulfuric Acid	Upgrade Existing Cansolv Unit	1	1	6,336	0[1]
Cement Kilns	DGS	1	2	110,685	0[2]
		Total	**19**	**642,272**	**158,203**

1 More water (as steam) is required to complete the upgrade. However, the steam is evaporated during the process so there is no wastewater stream generated.
2 All of the injected water is evaporated during the process so there is no wastewater stream generated.

Water Demand

As summarized in Tables 4-43 and 4-44, each affected facility provided its water demand baseline and these water usage rates were compared to each facility's estimated potential increase in water demand that may result from implementing Option 1 or Option 2 of the proposed project. For both Option 1 and Option 2, the peak percentage increase from baseline levels when compared to the proposed project was approximately 45 percent (Facility I) but most of the affected facilities have a potential increase in water demand from one to four percent above each facility's baseline. The overall increase in water demand for Option 1 is 1.53 percent above the total water use baseline for all of the affected facilities combined. Similarly, the overall increase in water demand for Option 2 is 1.11 percent above the total water use baseline for all of the affected facilities combined.

Table 4-43
Option 1: Potential Increases in Operational Water Demand per Facility

Facility ID	Option 1: Proposed Control Technology	Potential Increase in Water Use (MMgal/day)	Current Facility Water Use (MMgal/day)	Percentage Increase Above Baseline
A	1 WGS for FCCU (new) 1 Selective Oxidation Catalyst system for SRU/TGU (new) 1 FGT by Sulfinol Conversion (modified)	0.071 + 0 + 0.008 **0.079**	10.75	0.73%
B	1 WGS for FCCU (new) 2 WGSs for SRU/TGU (new)	0.077 + 0.140 **0.217**	12.5	1.74%
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	**0.003**+ 0.006 **0.009**	7.85	0.11%
D	1 WGS for SRU/TGU (new) 1 FGT by Merox Treatment Upgrade (modified)	0.214 + 0.014 **0.228**	10.32	2.21%
E	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	0.049 + 0.014 **0.063**	5.76	1.09%
F	1 WGS for FCCU (new) 1 FGT by Amine Additive (modified)	0.044 + 0 **0.044**	2.5	1.76%
G	1 FGT by Merox Treatment Upgrade (modified)	**0.014**	2.88	0.49%
H	1 WGS for calciner (new)	**0.041**	1.08	3.79%
I	2 WGSs for glass melting furnaces (new)	**0.058**	0.13	44.62%
J	1 WGS for sulfuric acid unit (new)	**0.020**	0.73	2.74%
K	2 DGSs for cement kilns (new)	**0.111**	3.29	3.37%
	TOTAL	**0.883**	**57.79**	**1.53%**

Table 4-44
Option 2: Potential Increases in Operational Water Demand per Facility

Facility ID	Option 2: Proposed Control Technology	Potential Increase in Water Use (MMgal/day)	Current Facility Water Use (MMgal/day)	Percentage Increase Above Baseline
A	1 SOx Reducing Additive Hopper for FCCU (modified) 1 Selective Oxidation Catalyst system for SRU/TGU (new) 1 FGT by Sulfinol Conversion (modified)	0 + 0 + 0.008 **0.008**	10.75	0.07%
B	1 SOx Reducing Additive Hopper for FCCU (modified) 2 WGSs for SRU/TGU (new)	0 + 0.14 **0.14**	12.50	1.12%
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	**0.003**+ 0.006 **0.009**	7.85	0.11%
D	1 SOx Reducing Additive Hopper for FCCU (new) 1 WGS for SRU/TGU (new) 1 FGT by Merox Treatment Upgrade (modified)	0 + 0.214 + 0.014 **0.228**	10.32	2.21%
E	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + 0.014 **0.014**	5.76	0.24%
F	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Amine Additive (modified)	0 + 0 **0**	2.50	0%
G	1 FGT by Merox Treatment Upgrade (modified)	**0.014**	2.88	0.49%
H	1 WGS for calciner (new)	**0.041**	1.08	3.79%
I	2 WGSs for glass melting furnaces (new)	**0.058**	0.13	44.62%
J	1 WGS for sulfuric acid unit (new)	**0.020**	0.73	2.74%
K	2 DGSs for cement kilns (new)	**0.111**	3.29	3.37%
	TOTAL	**0.642**	**57.79**	**1.11%**

To have a better understanding about the availability of water and the source (i.e., potable versus non-potable recycled or industrial-use groundwater), SCAQMD staff contacted each supplier of water used for industrial applications for each of the affected facilities[84], and all of the suppliers indicated that they would be able to accommodate the additional operational water demand if the proposed project goes forward. In addition, each water supplier specified whether the additional water to be supplied will be recycled water or potable water. In the case of recycled water, the water supplier indicated whether the recycled water is currently available or whether it would be available in the future pursuant to the aforementioned HRRWPP project.

As part of making the determination if water supplies will be sufficient for the proposed project, the availability of recycled or industrial-use groundwater is an important factor. Seven facilities are expected to have either increased access (e.g., Facilities A, B and D) or new future access (e.g., Facilities C, E, F and J) to recycled water upon completion of the HRRWPP[85]. The

[84] Facility K is the only facility that does not purchase water for its industrial operations; instead, the industrial-use water (non-potable) is supplied by the facility-owned wells.

[85] The future availability of recycled water applies to certain facilities that do not currently have access to obtain recycled water for their processes but that will have access after completion of the LADWP's HRRWPP project (certified on October 20, 2009) by Summer 2013 (http://www.ladwp.com/ladwp/cms/ladwp011486.jsp). In addition, future access to recycled water is contingent upon each facility within the HRRWPP project area constructing a new water conveyance at their site in order to tie-into the recycled water pipeline.

HRRWPP is a project shared by the LADWP and WBMWD to conserve potable water and instead produce and convey recycled water to multiple industrial and irrigation customers in the Los Angeles Harbor area. Construction of the HRRWPP began on October 26, 2009 and is estimated to be completed by Summer 2013. However, even if the pipeline and meter is installed, these facilities will need to make modifications to handle the potential increase in recycled water or install the water conveyance infrastructure piping to tie-in to the recycled water pipeline.

Tables 4-45 and 4-46 identify the amount and availability status of using non-potable[86] and potable water to supply the potential increased water use as a result of Option 1 and Option 2 of the proposed project, respectively. The amount of non-potable water that can currently be used under Option 1 of the proposed project is 681,781 gallons per day plus the future availability of non-potable water (to be available beginning Summer 2013) of 102,227 gallons per day for a total of 784,008 gallons per day. Of the proposed increase of total water at 883,368 gallons per day under Option 1, 89 percent may be supplied by recycled or non-potable groundwater. The remaining amount of increased potential water demand under Option 1 of the proposed project is estimated to be 11 percent or 99,360 gallons per day and is expected to be satisfied by potable water.

Similarly, the amount of non-potable water that can currently be used under Option 2 of the proposed project is 533,836 gallons per day plus the future availability of non-potable water (to be available beginning Summer 2013) is 9,076 gallons per day for a total of 542,912 gallons per day. Of the proposed increase of total water at 642,272 gallons per day under Option 2, 84 percent may be supplied by recycled or non-potable groundwater. The remaining amount of increased potential water demand under Option 2 of the proposed project is estimated to be 16 percent or 99,360 gallons per day and is expected to be satisfied by potable water.

[86] Non-potable water can be either recycled water or industrial-use groundwater.

Table 4-45
Option 1: Potential Increases in Non-Potable and Potable Water Use

Main Equipment	Proposed Control Technology	Potentially Available Non-Potable Water Use		Potentially Available Potable Water Use (gal/day)	Total Potential Increase in Water Use (gal/day)
		Current [1] (gal/day)	Future[2] (gal/day)		
FCCU	WGS	147,945	93,151	0	241,096
SRU/TGU	WGS	354,247	0	0	354,247
Refinery Boilers/Heaters	FGT (Merox Treatment or Convert Amine Absorbers to Sulfinol)	49,315	2,740	0	52,055
Coke Calciner	WGS	0	0	40,896	40,896
Glass Melting Furnaces	WGS	0	0	58,464	58,464
Sulfuric Acid Mfg.	WGS	19,589	0	0	19,589
Sulfuric Acid Mfg.	Upgrade Existing Cansolv Unit	0	6,336	0	6,336
Cement Kilns	DGS	110,685	0	0	110,685
	Total	**681,781**	**102,227**	**99,360**	**883,368**

[1] The current availability of non-potable water values assumes that the facilities which currently obtain recycled or industrial-use groundwater for their processes will continue to do so if there is a need to increase water use as part of the proposed project.
[2] The future availability of non-potable water values applies to certain facilities that do not currently have access to obtain recycled or industrial-use groundwater for their processes but that will have access after completion of the LADWP's HRRWPP project by Summer 2013.

Table 4-46
Option 2: Potential Increases in Non-Potable and Potable Water Use

Main Equipment	Proposed Control Technology	Potentially Available Non-Potable Water Use		Potentially Available Potable Water Use (gal/day)	Total Potential Increase in Water Use (gal/day)
		Current [1] (gal/day)	Future[2] (gal/day)		
FCCU	SOx Reducing Additive	0		0	0
SRU/TGU	WGS	354,247	0	0	354,247
Refinery Boilers/Heaters	FGT (Merox Treatment or Convert Amine Absorbers to Sulfinol)	49,315	2,740	0	52,055
Coke Calciner	WGS	0	0	40,896	40,896
Glass Melting Furnaces	WGS	0	0	58,464	58,464
Sulfuric Acid	WGS	19,589	0	0	19,589
Sulfuric Acid	Upgrade Existing Cansolv Unit	0	6,336	0	6,336
Cement Kilns	DGS	110,685	0	0	110,685
	Total	**533,836**	**9,076**	**99,360**	**642,272**

[1] The current availability of non-potable water values assumes that the facilities which currently obtain recycled or industrial-use groundwater for their processes will continue to do so if there is a need to increase water use as part of the proposed project.
[2] The future availability of non-potable water values applies to certain facilities that do not currently have access to obtain recycled or industrial-use groundwater for their processes but that will have access after completion of the LADWP's HRRWPP project by Summer 2013.

Table 4-47 summarizes the projected increases of potable water, recycled water (both current and projected future availability) and industrial-use groundwater that is estimated to implement both Option 1 and Option 2 of the proposed project at the affected facilities.

Table 4-47
Distribution of Projected Water Demand by Water Type

	Option 1		Option 2	
Type of Water	**Projected Increase in Water Use** (gal/day)	**Percent of Total Water Demand**	**Projected Increase in Water Use** (gal/day)	**Percent of Total Water Demand**
Potable	99,360	11%	99,360	16%
Recycled (non-potable)	659,624	75%	418,528	65%
Industrial-Use Groundwater (non-potable)	124,384	14%	124,384	19%
TOTAL	**883,368**	**100%**	**642,272**	**100%**

Option 1 of the proposed project has been shown to potentially increase total water demand by approximately 883,368 gallons per day and 11 percent or 99,360 gallons per day of the total water demand would need to be supplied by potable water if all projected recycled water becomes available. Similarly, Option 2 of the proposed project has been shown to potentially increase total water demand by approximately 642,272 gallons per day and 16 percent or 99,360 gallons per day of the total water demand would need to be supplied by potable water.

Thus, the amount of water that would qualify as a water demand project can be adjusted to separate the potable water from the current and future uses of recycled water and industrial-use groundwater needed for the proposed project. Thus, to establish whether the proposed project qualifies as a water demand project, the potential increase in water use can be interpreted to mean the potential increase of potable water only (in this case, 99,360 gallons per day for both Option 1 and Option 2). Since the projected increase of potable water would be less than the estimated range of water that would be needed for a 500 DU project (e.g., 133,911 to 223,186 gallons per day), neither Option 1 nor Option 2 of the proposed project would qualify as a water demand project.

However, the projections for new or increased future access to recycled water are 102,227 gallons per day under Option 1 and 9,076 gallons per day under Option 2 and the availability of future access to recycled water is not guaranteed. In the event that the future access to recycled water does not occur as planned by Summer 2013 in accordance with the HRRWPP, the potential increase in potable water needed for the proposed project would need to be adjusted to include the amount of future recycled water. As such, the amount of potable water demand could increase to 201,587 gallons per day under Option 1 and 108,436 gallons per day under Option 2. In the event that future access to recycled water does not occur as planned, the distribution between potable and recycled water demand shifts as summarized in Table 4-48.

Table 4-48
Adjusted Distribution of Projected Water Demand by Water Type if Future Supplies of Recycled Water Are Not Available

Type of Water	Option 1		Option 2	
	Adjusted Projected Increase in Water Use (gal/day)	**Percent of Total Water Demand**	**Adjusted Projected Increase in Water Use** (gal/day)	**Percent of Total Water Demand**
Potable	201,587	23%	108,436	17%
Recycled (non-potable)	557,397	63%	409,452	64%
Industrial-Use Groundwater (non-potable)	124,384	14%	124,384	19%
TOTAL	**883,368**	**100%**	**642,272**	**100%**

The adjusted estimate for increased potable water demand under Option 1 at 201,587 gallons per day is within the range between 133,911 gallons per day and 223,186 gallons per day based on the 500 DU water demand calculations. By applying the 500 DU water demand criteria to use as a significance threshold for potable water demand, Option 1 of the proposed project may qualify as a water demand project and thus, may result in significant adverse water demand impacts.

However, under Option 2, the adjusted estimate for increased potable water demand would be 102,227 gallons per day, which is below the minimum amount of potable water needed to qualify for as a water demand project per the 500 DU calculations (e.g., 133,911 gallons per day). Thus, for this reason, Option 2 of the proposed project is expected to contribute to less than significant adverse water demand impacts.

Lastly, to investigate whether the existing water supply has the capacity to meet the increased water demand of the proposed project, SCAQMD staff has been coordinating with various water suppliers (e.g., LADWP, MWD, WBMWD, Long Beach Water Department, City of Vernon etc.) to the affected facilities. Water suppliers for all of the facilities that either currently use recycled water or are expected to have future use of recycled water have indicated that there will be sufficient supply of recycled water for the proposed project. In addition, the water suppliers for Facilities G, H and I have indicated that they can supply the estimated additional potable water needed for operating WGSs. Lastly, Facility K operates its own groundwater wells to pump non-potable industrial-use groundwater for their day-to-day operations. Because Facility K's groundwater pumping permit does not limit the amount of water that can be pumped from the wells, any additional water needed to implement the proposed project is expected to be available.

Water Quality

As summarized in Tables 4-49 and 4-50, each affected facility provided their wastewater discharge limits and these limits were compared to each facility's estimated potential increase in wastewater that may result from implementing Option 1 and Option 2 of the proposed project, respectively. The peak percentage increase from baseline levels when compared to the proposed project was approximately 12 percent (Facility F) under Option 1 and nine percent (Facility H) under Option 2. An increase of 25 percent would trigger a permit revision and would be considered a significant adverse wastewater impact. Since all of the affected facilities have been shown under both options of the proposed project to have a potential wastewater increase less than 25 percent, no modifications to any existing wastewater discharge permits are anticipated as a result of the proposed project. Thus, the operational impacts of the proposed project on each affected facility's wastewater discharge and the Industrial Wastewater Discharge Permit are expected to be less than significant.

Changes to each affected facility's storm water collection systems are expected to be less than significant since most of the changes will occur within existing units (i.e., installing control equipment on existing equipment or upgrading existing control equipment). Further, typically most of the areas likely to be affected by the proposed project are currently paved and are expected to remain paved. Any new units constructed will be curbed and the existing units will remain curbed to contain any runoff. Any runoff occurring will continue to be handled by each affected facility's wastewater system and sent to an on-site wastewater treatment system prior to discharge. The surface water runoff is expected to be handled with each facility's current wastewater collection or treatment system. Storm water runoff will be collected and discharged in accordance with each facility's discharge permit terms and conditions.

The proposed project is expected to involve construction activities located within the confines of existing facilities and does not include the construction of any new housing so it would not place new housing within a 100-year flood hazard area. It is likely that most affected facilities are not located within a 100-year flood hazard area. Any affected facilities that may be located in a 100-year flood area could impede or redirect 100-year flood flows, but this would be considered part of the existing setting and not an effect of the proposed project. The proposed project would not require locating new facilities within a flood zone, so it is not expected to expose people or property to any known water-related flood hazards.

Table 4-49
Option 1: Potential Increases in Wastewater Generation per Facility

Facility ID	Option 1: Proposed Control Technology	Potential Increase in Wastewater Generation (MMgal/day)	Wastewater Permit Discharge Limit[1] (MMgal/day)	Percentage Increase Above Discharge Limit	Greater than 25% Increase? (Exceeds CEQA Significance Threshold?)
A	1 WGS for FCCU (new) 1 Selective Oxidation Catalyst system for SRU/TGU (new) 1 FGT by Sulfinol Conversion (modified)	0.033 + 0 + 0.005 **0.038**	7.5	0.51%	NO
B	1 WGS for FCCU (new) 2 WGSs for SRU/TGU (new)	0.036 + 0.028 **0.064**	8.8	0.72%	NO
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	0.003+ 0 **0.003**	7.6	0.04%	NO
D	1 WGS for SRU/TGU (new) 1 FGT by Merox Treatment Upgrade (modified)	0.043 + 0.014 **0.057**	15	0.38%	NO
E	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	0.022 + 0.011 **0.033**	1.1	2.99%	NO
F	1 WGS for FCCU (new) 1 FGT by Amine Additive (modified)	0.022 + 0 **0.022**	0.18	12.18%	NO
G	1 FGT by Merox Treatment Upgrade (modified)	**0.014**	2.88	0.49%	NO
H	1 WGS for calciner (new)	**0.017**	0.18	9.44%	NO
I	2 WGSs for glass melting furnaces (new)	**0.013**	0.36	3.58%	NO
J	1 WGS for sulfuric acid unit (new)	**0.011**	0.21	5.14%	NO
K	2 DGSs for cement kilns (new)	**0**	No Limit	0%	NO
		0.271	**43.81**	**0.62%**	

[1] Wastewater limits were obtained from each facility's wastewater permit(s). For any facility that has multiple discharge limits (i.e. dry weather, wet weather, etc.), the most conservative limit will be used for the purposes of this comparison.

Table 4-50
Option 2: Potential Increases in Wastewater Generation per Facility

Facility ID	Option 2: Proposed Control Technology	Potential Increase in Wastewater Generation (MMgal/day)	Wastewater Permit Discharge Limit[1] (MMgal/day)	Percentage Increase Above Discharge Limit	Greater than 25% Increase? (Exceeds CEQA Significance Threshold?)
A	1 SOx Reducing Additive Hopper for FCCU (modified) 1 Selective Oxidation Catalyst system for SRU/TGU (new) 1 FGT by Sulfinol Conversion (modified)	0 + 0 + 0.005 **0.005**	7.5	0.07%	NO
B	1 SOx Reducing Additive Hopper for FCCU (modified) 2 WGSs for SRU/TGU (new)	0 + 0.028 **0.028**	8.8	0.32%	NO
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	0.003+ 0 **0.003**	7.6	0.04%	NO
D	1 SOx Reducing Additive Hopper for FCCU (new) 1 WGS for SRU/TGU (new) 1 FGT by Merox Treatment Upgrade (modified)	0 + 0.043 + 0.014 **0.057**	15	0.38%	NO
E	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + 0.011 **0.011**	1.1	1.00%	NO
F	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Amine Additive (modified)	0+ 0 **0**	0.18	0%	NO
G	1 FGT by Merox Treatment Upgrade (modified)	**0.014**	2.88	0.49%	NO
H	1 WGS for calciner (new)	**0.017**	0.18	9.44%	NO
I	2 WGSs for glass melting furnaces (new)	**0.013**	0.36	3.58%	NO
J	1 WGS for sulfuric acid unit (new)	**0.011**	0.21	5.14%	NO
K	2 DGSs for cement kilns (new)	**0**	No Limit	0%	NO
		0.158	**43.81**	**0.36%**	

[1] Wastewater limits were obtained from each facility's wastewater permit(s). For any facility that has multiple discharge limits (i.e. dry weather, wet weather, etc.), the most conservative limit will be used for the purposes of this comparison.

The proposed project does not require construction of new facilities in areas that could be affected by tsunamis. Of the facilities affected by the proposed project, some are located near the Ports of Long Beach and Los Angeles. However, the port areas are protected from tsunamis by the construction of breakwaters. Construction of breakwaters combined with the distance of each facility from the water is expected to minimize the potential impacts of a tsunami or seiche so that no significant impacts are expected. The proposed project does not require construction of facilities in areas that are susceptible to mudflows (e.g., hillside or slope areas). Existing affected facilities that are currently located on hillsides or slope areas may be susceptible to mudflow, but this would be considered part of the existing setting. As a result, the proposed project is not expected to generate significant adverse mudflow impacts.

Lastly, the proposed project is not expected to significantly adversely affect the quantity or quality of groundwater in the area of each affected facility. No significant adverse impacts to groundwater quality are expected from the proposed project because: 1) wastewater will continue to be collected and treated in each of the affected facility's wastewater treatment systems or in compliance with the current wastewater discharge permits, as applicable; 2) no underground storage tanks are expected to be constructed as part of the proposed project; 3) containment berms will be required or may already exist around the new or modified units to minimize the potential for spills to contaminate soil and groundwater; and, 4) any new storage tanks that may be proposed will be required to comply with BACT and other safety requirements such as double bottom and monitoring requirements.

<u>Water Demand and Water Quality Conclusion</u>
The water demand impacts that may result from the proposed project have been shown to require approximately 883,368 gallons per day of total water under Option 1 of the proposed project and 642,272 gallons per day of total water under Option 2 of the proposed project. Under Option 1 of the proposed project, approximately 75 percent of the total water demand is expected to be satisfied with current and future supplies of recycled water, 14 percent is expected to be supplied by industrial-use groundwater, and the remaining 11 percent is expected to be supplied by potable water. However, if future access to recycled water does not occur, then approximately 63 percent of the total water demand is expected to be satisfied with current supplies of recycled water, 14 percent is expected to be supplied by industrial-use groundwater, and the remaining 23 percent is expected to be supplied by potable water under Option 1.

Similarly under Option 2 of the proposed project, approximately 65 percent of the total water demand is expected to be satisfied with current and future supplies of recycled water, 19 percent is expected to be supplied by industrial-use groundwater, and the remaining 16 percent is expected to be supplied by potable water. Again, if future access to recycled water does not occur, then approximately 63 percent of the total water demand is expected to be satisfied with current supplies of recycled water, 14 percent is expected to be supplied by industrial-use groundwater, and the remaining 17 percent is expected to be supplied by potable water under Option 2.

Based on the preceding analysis, neither Option 1 nor Option 2 of the proposed project is expected to exceed SCAQMD's significance threshold of five million gallons of total water per day. If future supplies of recycled water become available, neither Option 1 nor Option 2 of the proposed project is expected to require a substantial amount of potable water as calculated pursuant to the water demand project criteria. However, in the event that future supplies of recycled water do not become available, only the potable water demand under Option 1 may require a substantial amount of potable water as calculated pursuant to the water demand project criteria. Further, the water suppliers have indicated that there will be an adequate supply of water (current and future supplies of recycled water plus potable water) for the proposed project under both Option 1 and Option 2. Therefore, the water demand impacts are concluded to be significant under Option 1 and less than significant under Option 2.

Lastly, based on the aforementioned considerations, the potential groundwater, wastewater discharge and storm water discharge impacts that may result from both Option 1 and Option 2 of the proposed project are expected to be less than significant.

Project-Specific Mitigation: Significant adverse impacts associated with water demand under Option 1 are expected from the proposed project during operation. However, for any facility that installs a WGS as part of the proposed project under either Option 1 or Option 2, SCAQMD staff requires that the facility operators utilize both current supplies and future supplies of recycled water in accordance with the California Water Code, and if available, pursuant to the HRRWPP Project, for operation of a WGS.

Based on the preceding discussion, the following mitigation measures will apply to the proposed project:

HWQ-1 When SOx control equipment is installed and water is required for its operation, the facility operator is required to use recycled water, if available, to satisfy the water demand for the SOx control equipment.

HWQ-2 In the event that recycled water cannot be delivered to the affected facility, the facility operator is required to submit a written declaration with the application for a Permit to Construct for the SOx control equipment, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.

Level of Significance After Mitigation: The analysis shows that proposed increase in total water use under both Option 1 and Option 2 cannot be fully supplied with recycled water (either currently or in the future) and non-potable groundwater and that some potable water may still be required for certain facilities. While the potentially adverse water impacts can be reduced to below significance if facility operators are required to use current and future supplies of recycled water, if available, there is no absolute guarantee at the time of this writing that future supplies of recycled water will be available to the affected facilities included in the HRRWPP Project. While the use of recycled water can help substantially reduce the water demand impacts, the overall water demand will not be completely mitigated. Therefore, the proposed project will remain significant after mitigation for water demand.

The analysis also concluded that the water quality impacts from implementing the proposed project are considered to be adverse, but not significant.

Cumulative Hydrology and Water Quality Impacts: Because the project-specific water demand impacts under Option 1 have been concluded to be significant due to the 500 DU potable water demand criteria and in consideration of California's on-going drought and that 100 percent of the potential increase in water use cannot be supplied by recycled water, it could be argued that the proposed project is cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1). Therefore, the proposed project is expected to generate significant adverse cumulative water demand impacts.

However, because the project-specific water quality impacts do not exceed any applicable significance thresholds, they are not considered to be cumulatively considerable pursuant to

CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative water quality impacts.

Cumulative Mitigation Measures: The potentially adverse water impacts can be reduced further than initial estimates if recycled water is employed for WGS installations. Even with the use of recycled water as part of the implementing the proposed project, the analysis shows that 100 percent of the proposed increase in total water demand cannot be fully offset by the use of recycled water. While the use of recycled water can help substantially reduce the water demand impacts, the overall total water demand will not be completely mitigated. Therefore, the proposed project will remain cumulatively significant after mitigation for water demand.

With regard to water quality impacts, because the proposed project is not expected to generate significant adverse cumulative water quality impacts, no cumulative water quality mitigation measures are required.

TRANSPORTATION/TRAFFIC

Significance Criteria

Impacts on transportation/traffic will be considered significant if any of the following criteria apply:

- Peak period levels on major arterials are disrupted to a point where the LOS is reduced to D, E or F for more than one month.
- An intersection's volume to capacity ratio increase by 0.02 (two percent) or more when the LOS is already D, E or F.
- A major roadway is closed to all through traffic, and no alternate route is available.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.
- The need for more than 350 permanent employees during operation.
- An increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round trips per day during operation
- Increase customer traffic by more than 700 visits per day during operation.

Construction activities resulting from implementing the proposed project may generate a slight, albeit temporary, increase in traffic in the areas of each affected facility associated with construction workers, construction equipment, and the delivery of construction materials. However, the proposed project is not expected to cause a significant increase in traffic relative to the existing traffic load and capacity of the street systems surrounding the affected facilities. Also, the proposed project is not expected to exceed, either individually or cumulatively, the current LOS of the areas surrounding the affected facilities during construction as explained in the following paragraph.

As previously noted in the section that discusses "Air Quality," the maximum construction workforce during any six-month construction period is expected to be approximately 175 workers per facility. For a worst-case analysis, four facilities which may need a total of up to 700 workers were assumed to undergo overlapping construction activities. Even if it is assumed that all 700 construction workers drive alone (which represents an average vehicle ridership equal to 1.0) not all of the workers would be driving to the same facility. It is unlikely that these vehicle trips would substantially affect the LOS at any intersection because the trips will be somewhat dispersed over a large area and the workers would not all arrive at the site at the exact same time. Therefore, the work force at each affected facility is not expected to significantly increase as a result of the proposed project. Further, the conclusion of no significant transportation impacts based on the workforce is consistent with the transportation analyses in the CEQA documents prepared for six refineries in accordance with the CARB Phase III Reformulated Gasoline requirements[87]. Specifically, the number of construction workers for each of the six projects ranged from approximately 200 to 700 daily construction worker trips and each of these projects was concluded to have no significant transportation impacts.

The operation-related traffic will be primarily for deliveries of NaOH, SOx reducing additives, soda ash, limestone, ESx catalyst, TG-10 blend, Sulfinol, Merox catalyst, and elemental sulfur and for hauling away of solid waste to be recycled or disposed of in a Class III landfill. Table 4-51 contains a summary of the delivery and haul away distances and frequencies for each substance that is associated with the proposed project. Of the substances listed for deliveries, all but five are available from local suppliers within the District. For the local suppliers, a round-trip delivery distance of 50 miles was assumed. This distance is expected to be conservative as most suppliers are located closer to the affected facilities. However, suppliers for SOx Reducing Additives, ESx Catalyst, Merox Catalyst, TG-10 and Sulfinol are all located out of state. Thus, deliveries of these materials are assumed to be trucked into the District from out of state and the delivery mileage assumptions reflect the round-trip distance from the state line, either at the Arizona/California border (e.g., 400 miles) or the Nevada/California border (e.g., 500 miles). For solid waste disposal, facility operators will have three options: 1) disposal of solid waste in a landfill located within the District or recycling of solid waste at a cement plant located within the District (e.g., 162 round-trip miles); 2) recycling of solid waste at a cement plant located outside of the District but within California (e.g., 264 round-trip miles); and, 3) recycling of solid waste at a cement plant located outside of the District and outside of California (e.g., 400 round-trip miles). For a worst-case analysis of solid waste disposal trips, the maximum mileage of 400 round-trip miles was assumed.

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[87] 1. Final EIR for Chevron El Segundo CARB Phase 3 Clean Fuels Project, certified November 30, 2001. (http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/chevron/final/chev_f.html)
2. Final Environmental Impact Report for: Proposed Ultramar Wilmington Refinery - CARB Phase 3 Project, certified December 19, 2001. (http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/ultramar/final/ultEIR_f.html)
3. Final Environmental Impact Report for: Proposed Equilon Enterprises LLC CARB Phase 3 Reformulated Gasoline Project, certified October 15, 2001. (http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/equilon/final/equEIR_f.html)
4. Final Environmental Impact Report for: Mobil CARB Phase 3 Reformulated Gasoline Project, certified October 12, 2001. (http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/mobil/final/mobil_f.html)
5. Final Environmental Impact Report for: ARCO CARB Phase 3/MTBE Phase-out Project, certified May 15, 2001. (http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/arco/finalEIR/arcoFEIR.html)
6. Final Environmental Impact Report for: Proposed Tosco Los Angeles Refinery - Phase 3 Reformulated Fuels Project, certified April 5, 2001. (http://www.aqmd.gov/ceqa/documents/2001/nonaqmd/tosco_rfp/final/toscoEIR_f.html)

Table 4-51
Delivery and Hauling Away Truck Types and Driving Distances

Substance	Travels as a:	Truck Type	Delivery Area	Peak Round-trip Mileage per Delivery	Delivery Status
ESx Catalyst	Fine powder	25-ton Heavy-duty Truck	Outside SCAQMD	400	Increase
Limestone	Aggregate	25-ton Heavy-duty Truck	Within SCAQMD	1	Increase
Merox Catalyst	Pre-mixed liquid	6,000 gallon tanker truck	Outside SCAQMD	500	Increase
NaOH (50% by weight)	Pre-mixed liquid	6,000 gallon tanker truck	Within SCAQMD	50	Increase
Soda ash	Fine powder	25-ton Heavy-duty Truck	Within SCAQMD	50	Increase
Solid Waste	Varies	25-ton Heavy-duty Truck	Within or Outside SCAQMD	1. 162 for in-District recycling or disposal; 2. 264 for out-of-District but in-state recycling; or, 3. 400 for out of state recycling (worst-case)	Increase
SOx Reducing Additives	Fine powder	25-ton Heavy-duty Truck	Outside SCAQMD	400	Increase
Sulfinol	Pre-mixed liquid	6,000 gallon tanker truck	Outside SCAQMD	500	Increase
Sulfur (Elemental)	Pre-mixed liquid	6,000 gallon tanker truck	Within SCAQMD	50	Increase
TG-10	Pre-mixed liquid	6,000 gallon tanker truck	Outside SCAQMD	400	Increase
MDEA	Pre-mixed liquid	6,000 gallon tanker truck	Within SCAQMD	50	No Change
DEA	Pre-mixed liquid	6,000 gallon tanker truck	Within SCAQMD	50	Decrease
MEA	Pre-mixed liquid	6,000 gallon tanker truck	Within SCAQMD	50	Decrease

A summary of the estimated truck trips of these substances per facility is provided in Tables 4-52 and 4-53 for Options 1 and 2 of the proposed project, respectively.

Table 4-52
Option 1: Potential Increases in Truck Trips per Facility

Facility ID	Option 1: Proposed Control Technology	Substances Delivered (D) or Hauled Away (H)	Peak Daily Truck Trips (round trips/day)	Peak Daily Round Trip Driving Distance (miles/day)	Annual Truck Trips (round trips/year)	Annual Round Trip Driving Distance (miles/day)
A	1 WGS for FCCU (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	8 + 12 **20**	400 + 4,800 **5,200**
A	1 Selective Oxidation Catalyst system for SRU/TGU (new)	1. Elemental Sulfur (H) 2. ESx Catalyst (D)	1 + 1 **2**	50 + 400 **450**	2 + 1 **3**	100 + 400 **500**
A	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. DEA (D)	1 + -1 **0**	500 + -50 **450**	22 + - 22 **0**	11,000 + -1,100 **9,900**
		Subtotal: Facility A	**4**	**1,350**	**23**	**15,600**
B	1 WGS for FCCU (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	12 + 16 **28**	600 + 6,400 **7,000**
B	2 WGSs for SRU/TGU (new)	1. Soda Ash (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	8 + 20 **28**	400 + 8,000 **8,400**
		Subtotal: Facility B	**4**	**900**	**56**	**15,400**
C	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. MEA (D) 3. Elemental Sulfur (H)	1 + -1 + 1 **1**	500 + - 50 + 50 **500**	47 + - 48 + 1 **0**	23,500 - 2,400+ 50 **21,150**
C	1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	None	**0**	**0**	**0**	**0**
		Subtotal: Facility C	**1**	**500**	**0**	**21,150**
D	1 WGS for SRU/TGU (new)	1. Soda Ash (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	5 + 13 **18**	250 + 5,200 **5,450**
D	1 FGT by Merox Treatment Upgrade (modified)	1. NaOH (D) 2. Merox catalyst (D) 3. Elemental Sulfur (H) 4. Solid Waste (H)	1 + 1+ 1 + 1 + **4**	50 + 500 + 50 + 400 **1,000**	5 + 1+ 1 + 5 + **12**	250 + 500 + 50 + 2,000 **2,800**
		Subtotal: Facility D	**6**	**1,450**	**30**	**8,250**

Table 4-52 (concluded)
Option 1: Potential Increases in Truck Trips per Facility

Facility ID	Option 1: Proposed Control Technology	Substances Delivered (D) or Hauled Away (H)	Peak Daily Truck Trips* (round trips/day)	Peak Daily Round Trip Driving Distance* (miles/day)	Annual Truck Trips* (round trips/year)	Annual Round Trip Driving Distance* (miles/day)
E	1 WGS for FCCU (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	5 + 7 **12**	250 + 2,800 **3,050**
E	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. DEA (D) 3. Elemental Sulfur (H)	1 + - 1 + 1 **1**	500 + - 50 + 50 **500**	65 + -63 + 3 **5**	32,500 + -3,150 150 **29,500**
		Subtotal: Facility E	**3**	**950**	**17**	**32,550**
F	1 WGS for FCCU (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	20 + 28 **48**	1,000 + 11,200 **12,200**
F	1 FGT by Amine Additive (modified)	1. TG-10 (D) 2. Elemental Sulfur (H)	1 + 1 **2**	400 + 50 **450**	1 + 1 **2**	400 + 50 **450**
		Subtotal: Facility F	**4**	**900**	**50**	**12,650**
G	1 FGT by Merox Treatment Upgrade (modified)	1. NaOH (D) 2. Merox catalyst (D) 3. Elemental Sulfur (H) 4. Solid Waste (H)	1 + 1+ 1 + 1 + **4**	50 + 500 + 50 + 400 **1,000**	28 + 1+ 2 + 30 + **61**	1,400 + 500 + 100 + 12,000 **14,000**
		Subtotal: Facility G	**4**	**1,000**	**61**	**14,000**
H	1 WGS for calciner (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	32 + 7 **39**	1,600 + 2,800 **4,400**
		Subtotal: Facility H	**2**	**450**	**39**	**4,400**
I	2 WGSs for glass melting furnaces (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 133 **183**	8 + 1 **9**	400 + 133 **533**
		Subtotal: Facility I	**2**	**183**	**9**	**533**
J	1 WGS for sulfuric acid unit (new)	NaOH (D)	**1**	**50**	**13**	**650**
		Subtotal: Facility J	**1**	**50**	**13**	**650**
K	2 DGSs for cement kilns (new)	1. Limestone (D) 2. Solid Waste (H)	1 + 1 **2**	1 + 142 **143**	27 + 37 **64**	27 + 2,558 **2,585**
		Subtotal: Facility K	**2**	**143**	**64**	**2,585**
		TOTAL: OPTION 1	**33**	**7,876**	**363**	**127,768**

* A negative number means a reduction in trips and mileage driven.

Table 4-53
Option 2: Potential Increases in Truck Trips per Facility

Facility ID	Option 2: Proposed Control Technology	Substances Delivered (D) or Hauled Away (H)	Peak Daily Truck Trips* (round trips/day)	Peak Daily Round Trip Driving Distance* (miles/day)	Annual Truck Trips* (round trips/year)	Annual Round Trip Driving Distance* (miles/day)
A	1 SOx Reducing Additive Hopper for FCCU (modified)	SOx Reducing Additives (D)	**1**	**400**	**4**	**1,600**
A	1 Selective Oxidation Catalyst system for SRU/TGU (new)	1. Elemental Sulfur (H) 2. ESx Catalyst (D)	1 + 1 **2**	50 + 400 **450**	2 + 1 **3**	100 + 400 **500**
A	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. DEA (D)	1 + -1 **0**	500 + -50 **450**	22 + - 22 **0**	11,000+ -1,100 **9,900**
		Subtotal: Facility A	**3**	**1,300**	**7**	**12,000**
B	1 SOx Reducing Additive Hopper for FCCU (modified)	SOx Reducing Additives (D)	**1**	**400**	**4**	**1,600**
B	2 WGSs for SRU/TGU (new)	1. Soda Ash (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	8 + 20 **28**	400 + 8,000 **8,400**
		Subtotal: Facility B	**3**	**850**	**32**	**10,000**
C	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. MEA (D) 3. Elemental Sulfur (H)	1 + -1 + 1 **1**	500 + - 50 + 50 **500**	47 + - 48 + 1 **0**	23,500 - 2,400+ 50 **21,150**
C	1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	None	**0**	**0**	**0**	**0**
		Subtotal: Facility C	**1**	**500**	**0**	**21,150**
D	1 SOx Reducing Additive Hopper for FCCU (new)	SOx Reducing Additives (D)	**1**	**400**	**4**	**1,600**
D	1 WGS for SRU/TGU (new)	1. Soda Ash (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	5 + 13 **18**	250 + 5,200 **5,450**
D	1 FGT by Merox Treatment Upgrade (modified)	1. NaOH (D) 2. Merox catalyst (D) 3. Elemental Sulfur (H) 4. Solid Waste (H)	1 + 1+ 1 + 1 + **4**	50 + 500 + 50 + 400 **1,000**	5 + 1+ 1 + 5 + **12**	250 + 500 + 50 + 2,000 **2,800**
		Subtotal: Facility D	**7**	**1,850**	**34**	**9,850**

Table 4-53 (concluded)
Option 2: Potential Increases in Truck Trips per Facility

Facility ID	Option 2: Proposed Control Technology	Substances Delivered (D) or Hauled Away (H)	Peak Daily Truck Trips* (round trips/day)	Peak Daily Round Trip Driving Distance* (miles/day)	Annual Truck Trips* (round trips/year)	Annual Round Trip Driving Distance* (miles/day)
E	1 SOx Reducing Additive Hopper for FCCU (modified)	SOx Reducing Additives (D)	**1**	**400**	**4**	**1,600**
E	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. DEA (D) 3. Elemental Sulfur (H)	1 + - 1 + 1 **1**	500 + - 50 + 50 **500**	65 + -63 + 3 **5**	32,500 + -3,150 150 **29,500**
		Subtotal: Facility E	**2**	**900**	**9**	**31,100**
F	1 SOx Reducing Additive Hopper for FCCU (modified)	SOx Reducing Additives (D)	**1**	**400**	**4**	**1,600**
F	1 FGT by Amine Additive (modified)	1. TG-10 (D) 2. Elemental Sulfur (H)	1 + 1 **2**	400 + 50 **450**	1 + 1 **2**	400 + 50 **450**
		Subtotal: Facility F	**3**	**850**	**6**	**2,050**
G	1 FGT by Merox Treatment Upgrade (modified)	1. NaOH (D) 2. Merox catalyst (D) 3. Elemental Sulfur (H) 4. Solid Waste (H)	1 + 1+ 1 + 1 + **4**	50 + 500 + 50 + 400 **1,000**	28 + 1+ 2 + 30 + **61**	1,400 + 500 + 100 + 12,000 **14,000**
		Subtotal: Facility G	**4**	**1,000**	**61**	**14,000**
H	1 WGS for calciner (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	32 + 7 **39**	1,600 + 2,800 **4,400**
		Subtotal: Facility H	**2**	**450**	**39**	**4,400**
I	2 WGSs for glass melting furnaces (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 133 **183**	8 + 1 **9**	400 + 133 **533**
		Subtotal: Facility I	**2**	**183**	**9**	**533**
J	1 WGS for sulfuric acid unit (new)	NaOH (D)	**1**	**50**	**13**	**650**
		Subtotal: Facility J	**1**	**50**	**13**	**650**
K	2 DGSs for cement kilns (new)	1. Limestone (D) 2. Solid Waste (H)	1 + 1 **2**	1 + 142 **143**	27 + 37 **64**	27 + 2,558 **2,585**
		Subtotal: Facility K	**2**	**143**	**64**	**2,585**
		TOTAL: OPTION 2	**30**	**8,076**	**275**	**108,318**

* A negative number means a reduction in trips and mileage driven.

The amount of peak daily truck trips associated with the proposed project is 33 for Option 1 and 30 for Option 2. Since neither option is expected to have an increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round trips per day, less than significant transportation impacts are expected from implementation of the proposed project. Further, taking into consideration the "worst-case" delivery and hauling transportation schedule, delivery and hauling trips associated with the proposed project are not expected to exceed, either individually or cumulatively, the current LOS of the areas surrounding the affected facilities during operations. Thus, the projected increase of traffic due to construction and operational activities is expected to be minimal and thus, the traffic impacts are expected to be less than significant for the proposed project.

Though some of the facilities that will be affected by the proposed project are located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, actions that would be taken to comply with the proposed project, such as installing new air pollution control equipment, are not expected to significantly influence or alter air traffic patterns. Further, the size and type of air pollution control devices that would be installed would not be expected to affect navigable air space because they would not be substantially taller than other equipment at affected facilities. Thus, the proposed project would not result in a change in air traffic patterns, an increase in traffic levels or a change in location that results in substantial safety risks.

The siting of each existing affected facility is consistent with surrounding land uses and traffic/circulation in the surrounding areas of the affected facilities. Thus, the proposed project is not expected to substantially increase traffic hazards or create incompatible uses at or adjacent to the affected facilities. Aside from the temporary effects due to a slight increase in truck traffic when facilities undergo construction activities, the proposed project is not expected to alter the existing long-term circulation patterns. The proposed project is not expected to require a modification to circulation, thus, no long-term impacts on the traffic circulation system are expected to occur. The proposed project does not involve construction of any roadways, so there would be no increase in roadway design feature that could increase traffic hazards. Emergency access at each affected facility is not expected to be impacted by the proposed project. Further, each affected facility is expected to continue to maintain its existing emergency access gates.

Each affected facility will be expected to provide parking for the construction workers, as applicable, either on or within close proximity to each facility. No additional parking will be needed after completion of the construction phase because the work force at each facility is not expected to significantly increase as a result of the proposed project.

Lastly, construction and operation activities resulting from the proposed project are not expected to conflict with policies supporting alternative transportation since the proposed project does not involve or affect alternative transportation modes (e.g., bicycles or buses) because the construction and operation activities related to the proposed project will occur solely in existing industrial, commercial, and institutional areas. Based upon these considerations, significant transportation/traffic impacts are not expected from the implementation of the proposed project.

Project-Specific Mitigation: No significant adverse impacts associated with transportation/traffic impacts are expected from the proposed project during construction or operation, so no mitigation measures are required.

Level of Significance After Mitigation: The analysis concluded that the transportation/traffic impacts from implementing the proposed project are considered to be adverse, but not significant. Therefore, mitigation measures are not required.

Cumulative Transportation/Traffic Impacts: Because the project-specific transportation/traffic impacts do not exceed any applicable significance thresholds, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative transportation/traffic impacts.

Cumulative Mitigation Measures: None required.

POTENTIAL ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

While all the environmental topics required to be analyzed under CEQA were reviewed to determine if the proposed project would create significant impacts, the screening analysis concluded that the following environmental areas would not be significantly adversely affected by the proposed project: agriculture and forest resources, biological resources, cultural resources, geology/soils, land use and planning, mineral resources, noise, population and housing, public services, recreation, and solid/hazardous waste. One comment was received on the NOP/IS that disputed the conclusions of less than significant for the topics of Noise, Land Use, and Solid/Hazardous Waste. For the topics of Noise and Land Use, there was no supporting evidence to justify a conclusion of significance. Further, when compared to other CEQA documents prepared for projects with similar construction activities, the topics of Noise and Land Use were concluded to have less than significant effects. In addition, projected solid waste data obtained by the consultant from each affected facility indicated that the solid waste that may be generated by the proposed project is expected to be a commodity and is not expected to be disposed of in a landfill. Instead the solid waste will either be sent to a cement plant for recycling or re-used on site. In any case, even if the entire amount of solid waste generated was sent to a landfill, it would not exceed the capacity of the designated landfills. Refer to Appendix B for the solid waste data. Therefore, the solid/hazardous waste impacts that may result from implementing the proposed project are expected to be less than significant.

The following is a brief discussion of each topic found not to be significant in the NOP/IS.

Agriculture and Forest Resources

All construction and operational activities that would occur as a result of implementing the proposed project are expected to occur within the confines of the existing affected facilities. The proposed project would be consistent with the industrial or heavy manufacturing zoning requirements for the various facilities and there are no agricultural or forest resources or operations on or near the affected facilities. No agricultural resources including Williamson Act contracts are located within or would be impacted by construction activities at the affected facilities. Therefore, the proposed project would not result in any new construction of buildings or other structures that would convert farmland to non-agricultural use or conflict with zoning for agricultural use or a Williamson Act contract.

The proposed project would also not result in any new construction of buildings or other structures that would cause the loss of forest land or conversion of forest land to non-forest use. Because there are no forestry resources or operations on or near the affected facilities, the proposed project would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined by Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code §51104 (g).

Lastly, since the proposed project would not substantially change the facility or process for which the SOx control equipment are utilized, there are no provisions in the proposed project that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements relative to agriculture and forest resources will be altered by the proposed project.

Therefore, for these aforementioned reasons, the proposed project is not expected to create significant adverse agriculture and forest resource impacts.

Biological Resources
The proposed project would only affect 14 units operating at 11 existing facilities located throughout the District. The physical changes involved that may occur focus on the installation of SOx control equipment such as WGSs, and DGSs as well as the use of selective oxidation catalyst or SOx reducing catalyst to reduce SOx emissions at the affected facilities. All of the affected units operating at existing facilities are located primarily in industrial areas, which have already been greatly disturbed. In general, these areas currently do not support riparian habitat, federally protected wetlands, or migratory corridors. Additionally, special status plants, animals, or natural communities are not expected to be found within close proximity to the affected facilities. Therefore, the proposed project would have no direct or indirect impacts that could adversely affect plant or animal species or the habitats on which they rely in the SCAQMD's jurisdiction. The current and expected future land use development to accommodate population growth is primarily due to economic considerations or local government planning decisions. A conclusion in the Final Program EIR for the 2007 AQMP was that population growth in the region would have greater adverse effects on plant species and wildlife dispersal or migration corridors in the basin than SCAQMD regulatory activities, (e.g., air quality control measures or regulations). The current and expected future land use development to accommodate population growth is primarily due to economic considerations or local government planning decisions.

Further, the proposed project is not envisioned to conflict with local policies or ordinances protecting biological resources or local, regional, or state conservation plans. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by the proposed project. Additionally, the proposed project will not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan, and would not create divisions in any existing communities because all activities associated with complying with the proposed project will occur at existing industrial facilities. Therefore, the proposed project is not expected to create significant adverse biological resource impacts.

Cultural Resources
There are existing laws in place that are designed to protect and mitigate potential impacts to cultural resources. Since construction-related activities associated with the implementation of the proposed project are expected to be confined within the existing footprint of the affected facilities, no impacts to historical resources are expected to occur as a result of implementing the proposed project.

Installing add-on controls and other associated equipment to comply with the proposed project may require disturbance of previously disturbed areas, i.e., existing industrial facilities. However, since construction-related activities are expected to be confined within the existing footprint of the affected facilities, the proposed project is not expected to require physical changes to the environment, which may disturb paleontological or archaeological resources. Furthermore, it is envisioned that these areas are already either devoid of significant cultural resources or whose cultural resources have been previously disturbed. Therefore, the proposed project has no potential to cause a substantial adverse change to a historical or archaeological resource, directly or indirectly destroy a unique paleontological resource or site or unique geologic feature, or disturb any human remains, including those interred outside a formal cemeteries. The proposed project is, therefore, not anticipated to result in any activities or promote any programs that could have a significant adverse impact on cultural resources in the District. The proposed project is, therefore, not anticipated to result in any activities or promote any programs that could have a significant adverse impact on cultural resources in the District.

Geology and Soils

Since the proposed project would result in construction activities in industrial settings to install SOx control equipment at the affected facilities, little site preparation is anticipated that could adversely affect geophysical conditions in the jurisdiction of the SCAQMD. Southern California is an area of known seismic activity. Since the proposed project would result in construction activities in industrial settings to install SOx control equipment, little site preparation is anticipated that could adversely affect geophysical conditions in the jurisdiction of the SCAQMD. Accordingly, the installation of add-on controls at existing affected facilities to comply with the proposed project is expected to conform with the Uniform Building Code and all other applicable state and local building codes. As part of the issuance of building permits, local jurisdictions are responsible for assuring that the Uniform Building Code is adhered to and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represents the foundation condition at the site. The Uniform Building Code requirements also consider liquefaction potential and establish stringent requirements for building foundations in areas potentially subject to liquefaction. Thus, the proposed project would not alter the exposure of people or property to geological hazards such as earthquakes, landslides, mudslides, ground failure, or other natural hazards. As a result, substantial exposure of people or structures to the risk of loss, injury, or death is not anticipated.

Since add-on controls will likely be installed at existing facilities, during construction of the proposed project, a slight possibility exists for temporary erosion resulting from excavating and grading activities, if required. These activities are expected to be minor since the existing facilities are generally flat and have previously been graded. Appendix B contains the air quality analysis estimating fugitive PM10 emissions from activities such as grading, trenching, stockpile loading, wind erosion, and truck filling and dumping in order to install SOx control equipment. Further, this analysis confirms that wind erosion is not expected to occur to any appreciable extent, because operators at dust generating sites would be required to comply with the Best Available Control Measure (BACM) requirements of SCAQMD Rule 403 – Fugitive Dust. In general, operators must control fugitive dust through a number of soil stabilizing measures such as watering the site, using chemical soil stabilizers, revegetating inactive sites, etc. As the proposed project may involve the installation of add-on SOx control equipment, some grading or excavation could be required to provide stable foundation footings. Potential air quality impacts related to grading are addressed elsewhere in this Air Quality section of this ~~Draft~~ Final PEA. No unstable earth conditions or changes in geologic substructures are expected to result from the proposed project.

Since the proposed project will affect existing facilities, it is expected that the soil types present at the affected facilities will not be further susceptible to expansion or liquefaction. Furthermore, subsidence is not anticipated to be a problem since few excavation, grading, or filling activities are expected occur at affected facilities. Additionally, the affected areas are not envisioned to be prone to landslides or have unique geologic features since the affected facilities are existing facilities that are typically located in industrial areas.

In addition, since the proposed project will affect existing facilities located in industrial, heavy manufacturing zones, it is expected that people or property will not be exposed to expansive soils or soils incapable of supporting water disposal. Further, typically each affected facility has some degree of existing wastewater treatment systems that will continue to be used. Sewer systems and in the case of the cement manufacturing facility, septic tank systems and percolation ponds, are available to handle wastewater produced and treated by each affected facility. Each existing facility affected by the proposed project does not require installation of new septic tanks or alternative wastewater disposal systems. As a result, the proposed project will not require operators to build new septic systems or alternative wastewater disposal systems. Thus, the proposed project will not adversely affect soils associated with constructing a new septic system or alternative wastewater disposal system.

Based upon the aforementioned considerations, significant geology and soils impacts are not expected from the implementation of the proposed project.

Land Use and Planning

The proposed project does not require construction of new facilities, but any physical effects will occur at existing facilities and, thus, it will not result in physically dividing any established communities. There are no provisions in the proposed project that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by the proposed project. Further, the proposed project would be consistent with the typical industrial, heavy manufacturing zoning of the affected facilities. All proposed modifications are expected to occur within the confines of the existing facilities. The proposed project would not affect in any way habitat conservation or natural community conservation plans, agricultural resources or operations, and would not create divisions in any existing communities. Further, no new development or alterations to existing land designations will occur as a result of the implementation of the proposed project. Therefore, present or planned land uses in the region will not be affected as a result of the proposed project. Based upon these considerations, significant land use planning impacts are not expected from the implementation of the proposed project.

Mineral Resources

There are no provisions of the proposed project that would result in the loss of availability of a known mineral resource of value to the region and the residents of the state such as aggregate, coal, clay, shale, et cetera, or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Noise

Modifications or changes associated with the implementation of the proposed project will take place at existing facilities that are located in industrial, heavy manufacturing settings. The existing noise environment at each of the affected facilities is typically dominated by noise from existing equipment onsite, vehicular traffic around the facilities, and trucks entering and exiting each facility premises. Construction activities for the proposed project may generate some noise associated with the use of construction equipment and construction-related traffic in the event that grading for the installation of the SOx control equipment, for example, is necessary. However, noise from the proposed project, whether from construction or operation activities, is not expected to produce noise in excess of current operations measurable at the property line of each of the existing facilities. If SOx control equipment is installed, the operations phase of the proposed project may add new sources of noise to each affected facility. However, it is expected that each facility affected will comply with all existing noise control laws or ordinances. Further, Occupational Safety and Health Administration (OSHA) and California-OSHA (CalOSHA) have established noise standards to protect worker health. These potential noise increases are not expected to be noticeable at the property line and further, are expected within the allowable noise levels established by the local noise ordinances for industrial areas, and thus are expected to be less than significant.

Though some of the facilities affected by the proposed project are located at sites within an airport land use plan, or within two miles of a public airport, the addition of SOx control equipment would not expose people residing or working in the project area to an additional degree of excessive noise levels associated with airplanes. All noise producing equipment must comply with local noise ordinances and applicable OSHA or CalOSHA workplace noise reduction requirements. Based upon the aforementioned considerations, significant noise impacts are not expected from the implementation of the proposed project.

Population and Housing

The construction activities associated with the proposed project at each affected facility are not expected to involve the relocation of individuals, require new housing or commercial facilities, or change the distribution of the population. The reason for this conclusion is that operators of affected facilities who need to perform any construction activities to comply with the proposed project can draw from the existing labor pool in the local southern California area. For example, the analysis of air quality impacts for the proposed project assumed 50 construction workers would be necessary to install one WGS or DGS. The "worst-case" analysis further assumed that up to four units could be under construction during any six-month construction period. This translates to the need of 200 construction workers during any six-month construction period. Construction crews comprising of 200 individuals can easily be drawn from the local labor force.

Further, it is not expected that the installation of the SOx control equipment will require new employees during operation of the equipment. In the event that new employees are hired, it is expected that the number of new employees at any one facility would be small. Human population within the jurisdiction of the SCAQMD is anticipated to grow regardless of implementing the proposed project. As a result, the proposed project is not anticipated to generate any significant adverse effects, either direct or indirect, on population growth in the District or population distribution.

Because the proposed project includes modifications and/or changes at existing facilities located in industrial, heavy manufacturing settings, the proposed project is not expected to result in the creation of any industry that would affect population growth, directly or indirectly induce the construction of single- or multiple-family units, or require the displacement of people or housing elsewhere in the District. Based upon these considerations, significant population and housing impacts are not expected from the implementation of the proposed project.

Public Services

Implementation of the proposed project is expected to cause facility operators to install SOx control devices, all the while continuing current operations at existing affected facilities. The proposed project may result in a greater demand for catalyst and scrubbing agents, which will need to be transported to the affected facilities that install SOx controls and stored onsite prior to use. In the event of an accidental release, fire departments are typically first responders for control and clean-up and police may be need to be available to maintain perimeter boundaries. The proposed project is not expected to have a significantly adverse affect on fire or police departments because of the low probability of accidents during transport as explained below.

The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, driver training, and weather. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality and some accidents result in little or no property damage or personal injury. Additionally, not every truck accident results in an explosion or a release of hazardous substances.

Every time hazardous materials are moved from the site of generation, there is the potential for accidental release. A study conducted by the USEPA indicates that the expected number of hazardous materials spills per mile shipped ranges from one in 100 million to one in one million, depending on the type of road and transport vehicle used. The USEPA analyzed accident and traffic volume data from New Jersey, California, and Texas, using the Resource Conservation and Recovery Act Risk/Cost Analysis Model and calculated the accident rates presented in Table 4-54. This information was summarized from the Los Angeles County Hazardous Waste Management Plan (Los Angeles County, 1988).

In the study completed by USEPA, cylinders, cans, glass, plastic, fiber boxes, tanks, metal drum/parts, and open metal containers were identified as usual container types. For each container type, the expected fractional release en route was calculated. The study concluded that the release rate for tank trucks is much lower than for any other container type (Los Angeles County, 1988).

Table 4-54
Truck Accident Rates For Cargo On Highways

Highway Type	Accidents Per 1,000,000 miles
Interstate	0.13
Federal and State Highways	0.45
Urban Roadways	0.73
Composite*	0.28

Source: USEPA, 1984.
* Average number for transport on interstates, highways, and urban roadways.

Based on the low probability of accidents occurring, as shown in Table 4-54, the proposed project is not expected to increase the need or demand for additional public services (e.g., fire departments, police departments, schools, parks, government, et cetera) above current levels.

As noted in the previous "Population and Housing" discussion, the proposed project is not expected to induce population growth in any way because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any construction activities that may be necessary at affected facilities and operation of new or modified equipment is not expected to require additional employees. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

The proposed project is expected to result in the installation of SOx control equipment. Besides permitting the equipment or altering permit conditions by the SCAQMD, there is no need for other types of government services. The proposed project would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives. There will be no increase in population and, therefore, no need for physically altered government facilities. Based upon these considerations, significant public services impacts are not expected from the implementation of the proposed project.

Recreation

As discussed previously under "Land Use," there are no provisions to the proposed project that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments; no land use or planning requirements are expected to be altered by the proposed project. Further, the proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities or include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment because the proposed project is not expected to induce population growth. Based upon these considerations, significant recreation impacts are not expected from the implementation of the proposed project.

Solid/Hazardous Waste

Construction activities associated with installing SOx control equipment such as WGSs, demolition and site preparation/grading/excavating could generate solid waste as result of implementing the proposed project. Demolition activities could generate demolition waste while site preparation, grading, and excavating could uncover contaminated soils since the facilities affected by the proposed project are located in existing industrial areas. Excavated soil, which may be contaminated, will need to be characterized, treated, and disposed of offsite in accordance with applicable regulations. Where appropriate, the soil will be recycled if it is considered or classified as non-hazardous waste or it can be disposed of at a landfill that accepts non-hazardous waste. Otherwise, the material will need to be disposed of at a hazardous waste facility. (Potential soil contamination is addressed in the Hazards/Hazardous Materials discussion in Section VIII. d.)

Solid or hazardous wastes generated from construction-related activities would consist primarily of materials from the demolition of existing air pollution control equipment and construction associated with new or modified air pollution control equipment. Construction-related waste would be disposed of at a Class II (industrial) or Class III (municipal) landfill. There are 48 Class II/Class III landfills within the SCAQMD's jurisdiction. Based on a search of the

California Integrated Waste Management Board's Solid Waste Information System (SWIS) on May 16, 2007, the landfills that accept construction waste in Los Angeles, Orange, Riverside and San Bernardino counties have a combined remaining disposal capacity of approximately 750,846,000 cubic yards (1,250,367,507 tons).

Solid waste is expected to be generated from operational activities associated with implementation of the proposed project. Of the potential SOx control technologies, the largest amount of solid waste is expected to be generated from the operation of WGSs. Table 4-55 summarizes the potential generation of solid waste per source category that may be generated by either Option 1 or Option 2 of the proposed project.

Tab1e 4-55
Summary of Potential Operational Increases in Solid Waste Generation by Source Category

Source Category	Option 1: Proposed Control Technology	Option 1: Potential Increase in Solid Waste to be Generated (tons/day)	Option 2: Proposed Control Technology	Option 2: Potential Increase in Solid Waste to be Generated (tons/day)
FCCU	WGS	4.19	SOx Reducing Additives	0
SRU/TGU	WGS	2.25	WGS	2.25
Refinery Boilers/Heaters	FGT	2.33	FGT	2.33
Coke Calciner	WGS	0.44	WGS	0.44
Glass Melting Furnaces	WGS	0.05	WGS	0.05
Sulfuric Acid Mfg.	WGS	0	WGS	0
Sulfuric Acid Mfg.	Upgrade Existing Cansolv Unit	0	Upgrade Existing Cansolv Unit	0
Cement Kilns	DGS	2.49	DGS	2.49
	Option 1 Total	**11.75**	**Option 2 Total**	**7.56**

Based on the composition of the solid waste that may be generated, most of the solid waste would be considered a commodity and is expected to be transported to a cement plant for recycling while some will be reused on site, depending on the facility. Tables 4-56 and 4-57 summarize the amount of waste that may be generated and how it may be handled for both Options 1 and 2 of the proposed project.

The generation of catalyst fines and any other solid waste is expected to be captured by the control equipment as wet solids. In most cases, these wet solids can be collected for recycling for use in manufacturing cement. For the purpose of this analysis, this practice would be expected to continue if the proposed project is implemented because all but one of the refineries operating FCCUs currently send their spent catalyst to a local cement plant for reuse in the cement manufacturing process. In addition, for reducing SOx from SRU/TGUs during operation, the use of selective oxidation catalyst may be used at Facility A. However, the precious metal content (platinum) and relatively high cost of the catalyst, recycling, instead of disposal, is expected to occur with this product.

For these reasons, the projected solid waste data obtained by the consultant from each affected facility indicated that the waste may be treated as a commodity and is not expected to be disposed of in a landfill. Instead the solid waste will either be sent to a cement plant for recycling or re-used on site. In any case, even if the entire amount of solid waste generated was sent to a landfill, it would not exceed the capacity of the designated landfills. Refer to Appendix B for the solid waste data. Therefore, less than significant adverse impacts to non-hazardous waste disposal facilities are expected from operational activities associated with the proposed project.

Table 4-56
Option 1: Summary of Potential Operational Increases in Solid Waste Generation by Facility

Facility ID	Option 1: Proposed Control Technology	Potential Increase in Solid Waste to be Generated from Proposed Project (tons/day)	How will Solid Waste be handled?
A	1 WGS for FCCU (new) 1 Selective Oxidation Catalyst system for SRU/TGU (new) 1 FGT by Sulfinol Conversion (modified)	0.77	Recycled at Cement Plant
B	1 WGS for FCCU (new) 2 WGSs for SRU/TGU (new)	2.47	Recycled at Cement Plant
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	0	N/A
D	1 WGS for SRU/TGU (new) 1 FGT by Merox Treatment Upgrade (modified)	1.18	Recycled at Cement Plant
E	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	0.44	Recycled at Cement Plant
F	1 WGS for FCCU (new) 1 FGT by Amine Additive (modified)	1.89	Recycled at Cement Plant
G	1 FGT by Merox Treatment Upgrade (modified)	2.03	Recycled at Cement Plant
H	1 WGS for calciner (new)	0.44	Recycled at Cement Plant
I	2 WGSs for glass melting furnaces (new)	0.05	Recycled at Cement Plant
J	1 WGS for sulfuric acid unit (new)	0	N/A
K	2 DGSs for cement kilns (new)	2.49	Will remain on-site for reuse
	TOTAL	**11.76**	

Table 4-57
Option 2: Summary of Potential Operational Increases in Solid Waste Generation by Facility

Facility ID	Option 2: Proposed Control Technology	Potential Increase in Solid Waste to be Generated from Proposed Project (tons/day)	How will Solid Waste be handled?
A	1 SOx Reducing Additive Hopper for FCCU (modified) 1 Selective Oxidation Catalyst system for SRU/TGU (new) 1 FGT by Sulfinol Conversion (modified)	0	Recycled at Cement Plant
B	1 SOx Reducing Additive Hopper for FCCU (modified) 2 WGSs for SRU/TGU (new)	1.37	Recycled at Cement Plant
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	0	N/A
D	1 SOx Reducing Additive Hopper for FCCU (new) 1 WGS for SRU/TGU (new) 1 FGT by Merox Treatment Upgrade (modified)	1.18	Recycled at Cement Plant
E	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0	Recycled at Cement Plant
F	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Amine Additive (modified)	0	Recycled at Cement Plant
G	1 FGT by Merox Treatment Upgrade (modified)	2.03	Recycled at Cement Plant
H	1 WGS for calciner (new)	0.44	Recycled at Cement Plant
I	2 WGSs for glass melting furnaces (new)	0.05	Recycled at Cement Plant
J	1 WGS for sulfuric acid unit (new)	0	N/A
K	2 DGSs for cement kilns (new)	2.49	Will remain on-site for reuse
	TOTAL	**7.56**	

However, it is expected that some affected facilities may address the increase in waste through existing waste minimization plans. In addition, other affected facilities that have existing catalyst-based operations currently regenerate, reclaim or recycle the catalysts, in lieu of disposal. Moreover, due to the heavy metal content and its relatively high cost, catalyst recycling can be a lucrative choice.

Although it is expected that spent catalysts would be reclaimed and recycled, it is possible that spent catalysts could be disposed of. The composition of the catalyst will determine in which type of landfill a catalyst would be disposed. There are two main types of catalysts: one in which the catalyst is coated onto a metal structure and a ceramic-based catalyst onto which the catalyst components are calcified.

A catalyst with a metal structure would not normally be considered a hazardous waste. Instead, it would be considered a metal waste, like copper pipes, and, therefore, would not be a regulated waste requiring disposal in a Class I landfill unless it is friable or brittle. Ceramic-based catalysts are not considered friable or brittle because they typically include a fiber binding material in the catalyst material. In both cases, spent catalyst would not require disposal in a Class I landfill. Furthermore, typical catalyst materials are not considered to be water soluble, which also means they would not require disposal in a Class I landfill.

Based on the aforementioned information, it is likely that spent catalysts would be considered a "designated waste," which is characterized as a non-hazardous waste consisting of, or containing pollutants that, under ambient environmental conditions, could be released at concentrations in excess of applicable water objectives, or which could cause degradation of the waters of the state (CCR, Title 23, Chapter 3, Subparagraph 2522(a)(1)). Depending on their actual waste designation, spent catalysts would likely be disposed of in a Class II landfill or a Class III landfill that is fitted with liners. According to the Final Program EIR for the 2007 AQMP (SCAQMD, 2007), total Class III landfill waste disposal capacity in the District is approximately 93,979 tons per day, many of which have liners and can handle Class II and Class III wastes.

Disposal of spent catalyst would typically involve crushing the material and encasing it in concrete prior to disposal. Since it is expected that most spent catalysts will be recycled and regenerated, it is anticipated that there will be sufficient landfill capacity in the District to accommodate disposal of any spent catalyst materials. Thus, the potential increase of solid waste generated by the air pollution control equipment may not necessarily be disposed of and, therefore, is not expected to exceed the capacity of designated landfills available to each affected facility. Further, implementing the proposed project is not expected to hinder in any way any affected facility's ability to comply with existing federal, state, and local regulations related to solid and hazardous wastes. Based upon these considerations, significant solid/hazardous waste impacts are not expected from the implementation of the proposed project.

SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA Guidelines §15126(c) requires an environmental analysis to consider "any significant irreversible environmental changes which would be involved if the proposed action should be implemented." This PEA identified the topic of air quality as the environmental area potentially adversely affected by the proposed project. The NOP/IS also identified aesthetics, energy, hydrology and water quality, hazards and hazardous materials, and transportation/traffic as significant, but after further analysis, these topics were determined to have less than significant impacts. Significant adverse impacts from GHGs generated from both construction and operation activities may be considered irreversible. Facility operators that install new SOx controls or modify existing units are likely to operate these systems for the lifetime of the equipment.

POTENTIAL GROWTH-INDUCING IMPACTS

CEQA Guidelines §15126(d) requires an environmental analysis to consider the "growth-inducing impact of the proposed action." Implementing the proposed project will not, by itself, have any direct or indirect growth-inducing impacts on businesses in the SCAQMD's jurisdiction because it is not expected to foster economic or population growth or the construction of additional housing and primarily affects existing facilities.

CONSISTENCY

CEQA Guidelines §15125(d) requires an EIR to discuss any inconsistencies between a proposed project and any applicable general plans or regional plans. SCAG and the SCAQMD have developed, with input from representatives of local government, the industry community, public health agencies, the USEPA - Region IX and CARB, guidance on how to assess consistency within the existing general development planning process in the Basin. Pursuant to the development and adoption of its Regional Comprehensive Plan Guide (RCPG), SCAG has developed an Intergovernmental Review Procedures Handbook (June 1, 1995). The SCAQMD also adopted criteria for assessing consistency with regional plans and the AQMP in its CEQA Air Quality Handbook. The following sections address the consistency between the proposed project and relevant regional plans pursuant to the SCAG Handbook and SCAQMD Handbook.

Consistency with Regional Comprehensive Plan and Guide (RCPG) Policies

The RCPG provides the primary reference for SCAG's project review activity. The RCPG serves as a regional framework for decision making for the growth and change that is anticipated during the next 20 years and beyond. The Growth Management Chapter (GMC) of the RCPG contains population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies, shall be used by SCAG in all phases of implementation and review. It states that the overall goals for the region are to: 1) re-invigorate the region's economy; 2) avoid social and economic inequities and the geographical isolation of communities; and, 3) maintain the region's quality of life.

Consistency with Growth Management Chapter (GMC) to Improve the Regional Standard of Living

The Growth Management goals are to develop urban forms that enable individuals to spend less income on housing cost, that minimize public and private development costs, and that enable firms to be more competitive, strengthen the regional strategic goal to stimulate the regional economy. The proposed project in relation to the GMC would not interfere with the achievement of such goals, nor would it interfere with any powers exercised by local land use agencies. Further, the proposed project will not interfere with efforts to minimize red tape and expedite the permitting process to maintain economic vitality and competitiveness.

Consistency with Growth Management Chapter (GMC) to Provide Social, Political and Cultural Equity

The Growth Management goals to develop urban forms that avoid economic and social polarization promotes the regional strategic goals of minimizing social and geographic disparities and of reaching equity among all segments of society. Consistent with the Growth Management goals, local jurisdictions, employers and service agencies should provide adequate training and retraining of workers, and prepare the labor force to meet the challenges of the regional economy. Growth Management goals also includes encouraging employment development in job-poor localities through support of labor force retraining programs and other economic development measures. Local jurisdictions and other service providers are responsible to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection. Implementing the proposed project has no effect on and, therefore, is not expected to interfere with the goals of providing social, political and cultural equity.

Consistency with Growth Management Chapter (GMC) to Improve the Regional Quality of Life

The Growth Management goals also include attaining mobility and clean air goals and developing urban forms that enhance quality of life, accommodate a diversity of life styles, preserve open space and natural resources, are aesthetically pleasing, preserve the character of communities, and enhance the regional strategic goal of maintaining the regional quality of life. The RCPG encourages planned development in locations least likely to cause environmental impacts, as well as supports the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals. While encouraging the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites, the plan discourages development in areas with steep slopes, high fire, flood and seismic hazards, unless complying with special design requirements. Finally, the plan encourages mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources, measures that would reduce exposure to seismic hazards, minimize earthquake damage, and develop emergency response and recovery plans. The proposed project implements an AQMP control measure, which results in improving air quality in the region. Therefore, in relation to the GMC, the proposed project is not expected to interfere, but rather help with attaining and maintaining the air quality portion of these goals.

Consistency with Regional Mobility Element (RMP) and Congestion Management Plan (CMP)

The proposed project is consistent with the RMP and CMP since less than significant adverse impacts to transportation/circulation will result from installing SOx control equipment at affected facilities. There will be an increase of one-way truck transport trips to deliver fresh catalyst and dispose of, or recycle spent catalyst, and to deliver NaOH and other substances as a result of the proposed project. The peak daily truck transport trips associated with these activities would be 33 under Option 1 and 30 under Option 2 of the proposed project. Because these trips would not likely all occur on the same day and because they would be dispersed over a wide area, the proposed project is not expected to significantly adversely affect circulation patterns or congestion management.

CHAPTER 5

ALTERNATIVES

INTRODUCTION

This ~~Draft~~ Final PEA provides a discussion of alternatives to the proposed project as required by CEQA. Alternatives include measures for attaining objectives of the proposed project and provide a means for evaluating the comparative merits of each alternative. A 'no project' alternative must also be evaluated. The range of alternatives must be sufficient to permit a reasoned choice, but need not include every conceivable project alternative. CEQA Guidelines §15126.6(c) specifically notes that the range of alternatives required in a CEQA document is governed by a 'rule of reason' and only necessitates that the CEQA document set forth those alternatives necessary to permit a reasoned choice. The key issue is whether the selection and discussion of alternatives fosters informed decision making and meaningful public participation. A CEQA document need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative. SCAQMD Rule 110 (the rule which implements the SCAQMD's certified regulatory program) does not impose any greater requirements for a discussion of project alternatives in an environmental assessment than is required for an EIR under CEQA.

Three alternatives to the proposed project are summarized in Table 5-1: Alternative A (No Project), Alternative B (AQMP), and Alternative C (Intermediate SOx Reductions). Pursuant to the requirements in CEQA Guidelines §15126.6 (b) to mitigate or avoid the significant effects that a project may have on the environment, a comparison of the potential air quality impacts from each of the project alternatives for the individual rule components that comprise the proposed project is provided in Table 5-2. The alternatives comparison in Table 5-2 also addresses the topics of aesthetics, energy, hazards and hazardous materials, hydrology and water quality, and transportation/traffic. Aside from these topics, no other significant adverse impacts were identified for the proposed project or any of the project alternatives. The proposed project is considered to provide the best balance between emission reductions and the adverse environmental impacts due to construction and operation activities while meeting the objectives of the project. Therefore, the proposed project is preferred over the project alternatives.

Table 5-1
Summary of PAR 2002 & Project Alternatives

Rule Components: Basic Equipment	Rule Components: BARCT	Proposed Project	SOx Reduction Potential (tons/day)	Alternative A: No Project	SOx Reduction Potential (tons/day)	Alternative B: AQMP	SOx Reduction Potential (tons/day)	Alternative C: Intermediate SOx Reductions	SOx Reduction Potential (tons/day)
FCCU	WGS or SOx Reducing Additive	5 ppm SOx (3.25 lbs SOx/1000 bbl)	2.88[88]	No SOx limit	0	Same as Alternative A: No Project	0	Same as Proposed Project	2.88[88]
SRU/TGU	WGS or Selective Oxidation Catalyst	5 ppm SOx (combusted tail gas) & 10 ppm H2S / 300 ppm non-H2S (non-combusted tail gas) (5.28 lbs SOx/hr)	0.73[89]	No SOx limit	0	Same as Alternative A: No Project	0	Same as Alternative A: No Project	0
Sulfuric Acid Mfg.	WGS or upgrade existing controls	10 ppm SOx (0.14 lbs SOx/ton acid)	1.03	No SOx limit	0	Same as Proposed Project	1.03	Same as Proposed Project	1.03
Coke Calciner	WGS	10 ppm SOx (0.07 lbs SOx/ton coke)	0.28	No SOx limit	0	Same as Proposed Project	0.28	Same as Proposed Project	0.28
Glass Melting Furnace	WGS	5 ppm SOx (0.03 lbs SOx/ton glass)	0.19	No SOx limit	0	Same as Proposed Project	0.19	Same as Proposed Project	0.19
Cement Kiln	Limestone Absorber	5 ppm SOx (0.04 lbs SOx/ton clinker)	0.25	No SOx limit	0	Same as Alternative A: No Project	0	Same as Proposed Project	0.25
Coal-fired Boiler	DGS or Limestone Absorber	5 ppm SOx	0[90]	No SOx limit	0	Same as Alternative A: No Project	0	Same as Alternative A: No Project	0
Refinery Boilers/ Heaters	FGT	40 ppm SOx (6.76 lbs SOx/mmscf)	0.85[91]	No SOx limit	0	Same as Alternative A: No Project	0	Same as Proposed Project	0.85[91]
Potential SOx Emission Reductions			**6.21**		**0**		**1.50**		**5.48**
Proposed RTC Shave			6.14		0		3.00		5.32
2005 Excess SOx RTCs			1.75		0		1.75		1.75
Minimum SOx Emission Reductions Needed[88]			**4.39**		**0**		**1.25**		**3.57**

Key: WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber; FGT = Fuel Gas Treatment

88 The estimated amount of SOx potentially reduced excludes the data for Facility D because installing a WGS is not cost-effective for this facility. However, the estimated amount of SOx potentially reduced includes the data for Facility C because a WGS is already installed.

89 The estimated amount of SOx potentially reduced excludes the data for Facility E and Facility G because installing a WGS or Emerachem unit is not cost-effective for these facilities.

90 This equipment is currently not operating at Facility K.

91 The proposed project neither establishes a new BARCT level for refinery boilers/heaters nor requires additional reductions from this source category. However, cost-effective emission reductions in the amount of 0.85 tons per day are potentially available from future retrofits in this source category and the environmental impacts from such controls are evaluated in this analysis but the potential emission reductions are excluded from the proposed RTC shave.

Table 5-2
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Aesthetics	Visible steam plumes and new, tall stacks from installing/operating 11 WGSs as follows: FCCU: 4 WGSs SRU/TGU: 3 WGSs Sulfuric Acid: 1 WGS Coke Calciner: 1 WGS Glass Melting: 2 WGSs	Visible steam plumes and new, tall stacks from installing/operating 7 WGSs as follows: SRU/TGU: 3 WGSs Sulfuric Acid: 1 WGS Coke Calciner: 1 WGS Glass Melting: 2 WGSs	No installation of WGS (i.e., no visible steam plumes and no new, tall stacks) expected.	Visible steam plumes and new, tall stacks from installing/operating 4 WGSs as follows: Sulfuric Acid: 1 WGS Coke Calciner: 1 WGS Glass Melting: 2 WGSs	Visible steam plumes and new, tall stacks from installing/operating 8 WGSs as follows: FCCU: 4 WGSs Sulfuric Acid: 1 WGS Coke Calciner: 1 WGS Glass Melting: 2 WGSs	Visible steam plumes and new, tall stacks from installing/operating 4 WGSs as follows: Sulfuric Acid: 1 WGS Coke Calciner: 1 WGS Glass Melting: 2 WGSs
Aesthetics Impacts Significant?	Less than significant, but more than the proposed project- Option 2.	Less than significant, but less than the proposed project - Option 1.	Not Significant	Less than significant, and less than the proposed project for both Options 1 and 2.	Less than significant, and less than the proposed project Option 1 and more than the proposed project Option 2.	Less than significant, and less than the proposed project for both Options 1 and 2.
Air Quality	• Decreases total operational SOx emissions by 6.21 tpd as follows: FCCU: 2.88 tpd SRU/TGU: 0.73 tpd Sulfuric Acid: 1.03 tpd Coke Calciner: 0.28 tpd Glass Melting: 0.19 tpd Cement Kiln: 0.25 tpd Coal-fired Boiler: 0 tpd Refinery Boilers/Heaters: 0.85 tpd	• Decreases total operational SOx emissions by 6.21 tpd as follows: FCCU: 2.88 tpd SRU/TGU: 0.73 tpd Sulfuric Acid: 1.03 tpd Coke Calciner: 0.28 tpd Glass Melting: 0.19 tpd Cement Kiln: 0.25 tpd Coal-fired Boiler: 0 tpd Refinery Boilers/Heaters: 0.85 tpd	No decreases in total operational SOx emissions.	• Decreases total operational SOx emissions by 1.50 tpd as follows: Sulfuric Acid: 1.03 tpd Coke Calciner: 0.28 tpd Glass Melting: 0.19 tpd	• Decreases total operational SOx emissions by 5.48 tpd as follows: FCCU: 2.88 tpd Sulfuric Acid: 1.03 tpd Coke Calciner: 0.28 tpd Glass Melting: 0.19 tpd Cement Kiln: 0.25 tpd Refinery Boilers/Heaters: 0.85 tpd	• Decreases total operational SOx emissions by 5.48 tpd as follows: FCCU: 2.88 tpd Sulfuric Acid: 1.03 tpd Coke Calciner: 0.28 tpd Glass Melting: 0.19 tpd Cement Kiln: 0.25 tpd Refinery Boilers/Heaters: 0.85 tpd

Table 5-2 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Air Quality (concluded)	• Increases total GHGs by: - 39,020 MT/yr without mitigation; and. - 38,771 MT/yr with mitigation. • Increases operational use of NaOH (a TAC) by 13.24 tpd. • Increases peak daily operation emissions as follows: VOC: 1 lb/day CO: 5 lb/day NOx: 15 lb/day PM10: 1 lb/day PM2.5: 1 lb/day • Increases peak daily construction emissions as follows: VOC: 89 lb/day CO: 461 lb/day NOx: 464 lb/day SOx: 1 lb/day PM10: 159 lb/day PM2.5: 53 lb/day	• Increases total GHGs by: - 19,662 MT/yr without mitigation; and. - 19,580 MT/yr with mitigation. • Increases operational use of NaOH (a TAC) by 8.79 tpd. • Increases peak daily operation emissions as follows: VOC: 1 lb/day CO: 4 lb/day NOx: 13 lb/day PM10: 1 lb/day PM2.5: 1 lb/day • Increases peak daily construction emissions as follows: VOC: 89 lb/day CO: 461 lb/day NOx: 464 lb/day SOx: 1 lb/day PM10: 159 lb/day PM2.5: 53 lb/day	No increases in any emissions.	• Increases total GHGs by: - 6,567 MT/yr without mitigation; and. - 6,522 MT/yr with mitigation. • Increases operational use of NaOH (a TAC) by 5.45 tpd. • Increases peak daily operation emissions as follows: NOx: 1 lb/day • Increases peak daily construction emissions as follows: VOC: 89 lb/day CO: 461 lb/day NOx: 464 lb/day SOx: 1 lb/day PM10: 159 lb/day PM2.5: 53 lb/day	• Increases total GHGs by: - 34,159 MT/yr without mitigation; and. - 33,911 MT/yr with mitigation. • Increases operational use of NaOH (a TAC) by 13.24 tpd. • Increases peak daily operation emissions as follows: VOC: 1 lb/day CO: 4 lb/day NOx: 13 lb/day PM10: 1 lb/day PM10: 1 lb/day PM2.5: 1 lb/day • Increases peak daily construction emissions as follows: VOC: 89 lb/day CO: 461 lb/day NOx: 464 lb/day SOx: 1 lb/day PM10: 159 lb/day PM2.5: 53 lb/day	• Increases total GHGs by: - 14,805 MT/yr without mitigation; and. - 14,723 MT/yr with mitigation. • Increases operational use of NaOH (a TAC) by 8.79 tpd. • Increases peak daily operation emissions as follows: VOC: 1 lb/day CO: 4 lb/day NOx: 11 lb/day PM10: 1 lb/day • Increases peak daily construction emissions as follows: VOC: 89 lb/day CO: 461 lb/day NOx: 464 lb/day SOx: 1 lb/day PM10: 159 lb/day PM2.5: 53 lb/day

Table 5-2 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Air Quality Impacts Significant?	• Less than significant, achieves equivalent SOx emission reductions during operation to the proposed project - Option 2. • Significant for GHGs, more than the proposed project - Option 2. • Less than significant for TACs use (NaOH) during operation, but more than the proposed project - Option 2. • Significant for NOx, VOC, and PM10 during construction and equivalent to the proposed project - Option 2. • Less than significant for VOC, CO, NOx, PM10 and PM2.5 during operation and more than the proposed project - Option 2.	• Less than significant, achieves equivalent SOx emission reductions during operation to the proposed project - Option 1. • Significant for GHGs, less than the proposed project - Option 1. • Less than significant for TACs use (NaOH) during operation, but less than the proposed project - Option 1. • Significant for NOx, VOC, and PM10 during construction and equivalent to the proposed project - Option 1. • Less than significant for VOC, CO, NOx, PM10 and PM2.5 during operation and less than the proposed project - Option 1.	Not significant for any pollutant during construction or operation but does not achieve required AQMP SOx emission reductions during operation.	• Less than significant, achieves the least amount of SOx emission reductions during operation than the proposed project for both Options 1 and 2. • Less than significant for GHGs, less than the proposed project for both Options 1 and 2. • Less than significant for TACs use (NaOH) during operation, and less than the proposed project for both~~-~~ Options 1 and 2.~~, but equivalent to the proposed project - Option 2.~~ • Significant for NOx, VOC, and PM10 during construction; equivalent to the proposed project for both Options 1 and 2. • Less than significant for VOC, CO, NOx, PM10 and PM2.5 during operation and less than the proposed project for both Options 1 and 2.	• Less than significant, achieves less SOx emission reductions during operation than the proposed project for both Options 1 and 2. • Significant for GHGs, but less than the proposed project - ~~for both~~ Option~~s~~ 1 and more than the proposed project – Option 2. • Less than significant for TACs use (NaOH) during operation, and equivalent to the proposed project - Option 1, and more than the proposed project - Option 2. • Significant for NOx, VOC, and PM10 during construction; equivalent to the proposed project for both Options 1 and 2. • Less than significant for VOC, CO, NOx, PM10 and PM2.5 during operation and less than the proposed project - Option 1 and equivalent to the proposed project – Option 2.	• Less than significant, achieves less SOx emission reductions during operation than the proposed project for both Options 1 and 2. • Significant for GHGs, but less than the proposed project for both Options 1 and 2. • Less than significant for TACs use (NaOH) during operation, and less than the proposed project - Option 1, but equivalent to the proposed project - Option 2. • Significant for NOx, VOC, and PM10 during construction; equivalent to the proposed project for both Options 1 and 2. • Less than significant for VOC, CO, NOx, PM10 and PM2.5 during operation and less than the proposed project for both Options 1 and 2.

Table 5-2 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Energy	• During operation, - Overall reduction in the use of natural gas by 4.1 mmBTU/day; - Overall increase in the use of electricity by 204 MWh/day; and, - Overall increase in the use of diesel by 2,403 gal/day. • During construction, - Overall increase in the use of gasoline by 1,354 ~~1,384~~ gal/day; and, - Overall increase in the use of diesel by 1,360 gal/day.	• During operation, - Overall reduction in the use of natural gas by 4.1 mmBTU/day; - Overall increase in the use of electricity by 101 MWh/day; and, - Overall increase in the use of diesel by 2,037 gal/day; • During construction, - Overall increase in the use of gasoline by 1,354 ~~1,384~~ gal/day; and, - Overall increase in the use of diesel by 1,360 gal/day.	During both operation and construction, no increases in energy uses.	• During operation, - No change in the use of natural gas; - Overall increase in the use of electricity by 33 MWh/day; and, - Overall increase in the use of diesel by 105 gal/day. • During construction, - Overall increase in the use of gasoline by 1,354 ~~1,384~~ gal/day; and, - Overall increase in the use of diesel by 1,360 gal/day.	• During operation, - Overall reduction in the use of natural gas by 34.25 mmBTU/day; - Overall increase in the use of electricity by 182 MWh/day; and, - Overall increase in the use of diesel by ~~1,703~~2,133 gal/day. • During construction, - Overall increase in the use of gasoline by 1,354 ~~1,384~~ gal/day; and, - Overall increase in the use of diesel by 1,360 gal/day.	• During operation, - Overall reduction in the use of natural gas by 34.25 mmBTU/day; - Overall increase in the use of electricity by 79 MWh/day; and, - Overall increase in the use of diesel by ~~1,330~~1,767 gal/day. • During construction, - Overall increase in the use of gasoline by 1,354 ~~1,384~~ gal/day; and, - Overall increase in the use of diesel by 1,360 gal/day.

Table 5-2 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Energy Impacts Significant?	Less than significant, more than the proposed project - Option 2 as follows: • The reduction in the use of natural gas is ~~not as much as~~equivalent to the proposed project - Option 2; • The increase in the use of electricity is more than the proposed project - Option 2; • The total increase in the use of diesel is more than the proposed project - Option 2; and, • The increase in the use of gasoline is equivalent to the proposed project for both Options 1 and 2.	Less than significant, less than the proposed project - Option 1 as follows: • The reduction in the use of natural gas is ~~more than~~ equivalent to the proposed project - Option 1; • The increase in the use of electricity is less than the proposed project - Option 1; • The total increase in the use of diesel is less than the proposed project - Option 1; and, • The increase in the use of gasoline is equivalent to the proposed project for both Options 1 and 2.	Not significant (no change)	Less than significant, less than the proposed project for both Options 1 and 2 as follows: • There is no change in the use of natural gas; • The increase in the use of electricity is less than the proposed project for both Options 1 and 2; • The total increase in the use of diesel is less than the proposed project for both Options 1 and 2; and, • The increase in the use of gasoline is equivalent to the proposed project for both Options 1 and 2.	Less than significant, less than the proposed project – Option 1 as follows: • The reduction in the use of natural gas is more than the proposed project for both Options 1 and 2; • The increase in the use of electricity is less than the proposed project - Option 1 and more than the proposed project - Option 2; • The total increase in the use of diesel is less than the proposed project for ~~both~~ Option~~s~~ 1 and more than the proposed project for Option 2; and, • The increase in the use of gasoline is equivalent to the proposed project for both Options 1 and 2.	Less than significant, less than the proposed project for both Options 1 and 2 as follows: • The reduction in the use of natural gas is more than the proposed project for both Options 1 and 2; • The increase in the use of electricity is less than the proposed project for both Options 1 and 2; • The total increase in the use of diesel is less than the proposed project for both Options 1 and 2; and, • The increase in the use of gasoline is equivalent to the proposed project for both Options 1 and 2.
Hazards & Hazardous Materials	Increased use of 13.24 tons/day of NaOH (a TAC) used during operation.	Increased use of 8.79 tons/day of NaOH (a TAC) used during operation.	No change to existing hazards and hazardous materials used.	Increased use of 5.45 tons/day of NaOH (a TAC) used during operation.	Increased use of 13.24 tons/day of NaOH (a TAC) used during operation.	Increased use of 8.79 tons/day of NaOH (a TAC) used during operation.

Table 5-2 (continued)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Hazards & Hazardous Materials Impacts Significant?	Less than significant, more than the proposed project - Option 2.	Less than significant, less than the proposed project - Option 1.	Not significant	Less than significant, less than the proposed project for both Options 1 and 2.	Less than significant, equivalent to the proposed project - Option 1.	Less than significant, equivalent to the proposed project - Option 2.
Hydrology & Water Quality	• During operation, increase in total water demand by 883,368 gal/day (of which up to 201,587 gal/day may be supplied by potable water); and, increase in the generation of wastewater by 270,532 gal/day. • During peak daily construction activities, increase in water demand by 52,272 gal/day.	• During operation, increase in total water demand by 642,272 gal/day (of which up to 108,436 gal/day may be supplied by potable water); and, increase in the generation of wastewater by 158,203 gal/day. • During peak daily construction activities, increase in water demand by 52,272 gal/day.	No change to existing water demand or wastewater discharge.	• During operation, increase in total water demand by 125,285 gal/day (of which up to 105,696 gal/day may be supplied by potable water); and, increase in the generation of wastewater by 40,669 gal/day. • During peak daily construction activities, increase in water demand by ~~52,272~~7,020 gal/day.	• During operation, increase in total water demand by 529,121 gal/day (of which up to 201,587 gal/day may be supplied by potable water); and, increase in the generation of wastewater by 199,573 gal/day. • During peak daily construction activities, increase in water demand by 52,272 gal/day.	• During operation, increase in total water demand by 288,025 gal/day (of which up to 108,436 gal/day may be supplied by potable water); and, increase in the generation of wastewater by 87,244 gal/day. • During peak daily construction activities, increase in water demand by 52,272 gal/day.
Hydrology & Water Quality Impacts Significant?	• Significant for water demand (based on potable water), more than the proposed project - Option 2. • Less than significant for wastewater discharge, more than the proposed project - Option 2.	• Less than significant for water demand (based on potable water), less than the proposed project - Option 1. • Less than significant for wastewater discharge, less than the proposed project - Option 1.	Not significant for water demand or wastewater discharge.	• Less than significant for water demand (based on potable water), less than the proposed project for both Options 1 and 2. • Less than significant for wastewater discharge, less than the proposed project for both Options 1 and 2.	• Significant for water demand (based on potable water), and less than the proposed project for both Options 1 and 2. • Less than significant for wastewater discharge, and less than the proposed project - Option 1 and more than the proposed project - Option 2.	• Less than significant for water demand (based on potable water), and less than the proposed project for both Options 1 and 2. • Less than significant for wastewater discharge, and less than the proposed project for both Options 1 and 2.

Table 5-2 (concluded)
Comparison of Adverse Environmental Impacts of the Alternatives

Category	Proposed Project – Option 1	Proposed Project – Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C: Intermediate SOx Reductions – Option 1	Alternative C: Intermediate SOx Reductions – Option 2
Transportation & Traffic	Overall peak increase in transportation and traffic of 700 trips per day during construction and 33 trips per day during operation.	Overall peak increase in transportation and traffic of 700 trips per day during construction and 30 trips per day during operation.	No change to existing transportation and traffic.	Overall peak increase in transportation and traffic of 700 trips per day during construction and 5 trips per day during operation.	Overall peak increase in transportation and traffic of 700 trips per day during construction and 27 trips per day during operation.	Overall peak increase in transportation and traffic of 700 trips per day during construction and 20 trips per day during operation.
Transportation & Traffic Impacts Significant?	Less than significant, but equivalent to more than the proposed project – Option 2 for both construction and more than the proposed project – Option 2 for operation.	Less than significant, but equivalent to less than the proposed project – Option 1 for both construction and less than the proposed project – Option 1 for operation.	Not significant	Less than significant, but less than the proposed project for both Options 1 and 2.	Less than significant, but less than the proposed project for both Options 1 and 2.	Less than significant, but less than the proposed project for both Options 1 and 2.

ALTERNATIVES REJECTED AS INFEASIBLE

A CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and explain the reasons underlying the lead agency's determination [CEQA Guidelines §15126.6(c)]. No alternative was specifically rejected as being infeasible.

LOWEST TOXIC ALTERNATIVE

In accordance with SCAQMD's policy document Environmental Justice Program Enhancements for FY 2002-03, Enhancement II-1 recommends that all SCAQMD CEQA assessments include a feasible project alternative with the lowest air toxics emissions. In other words, for any major equipment or process type under the scope of the proposed project that creates a significant environmental impact, at least one alternative, where feasible, shall be considered from a "least harmful" perspective with regard to hazardous air emissions. With respect to the proposed project, a lowest air toxics alternative would be to use SOx control technology that uses the least amount of toxic materials. The main SOx reduction technology considered for the proposed project is based on employing WGSs, but other types of SOx controls, such as SOx reducing additives and DGSs, may also be employed. The analysis shows that of the proposed SOx controls, only WGSs may increase the use of toxic materials. Specifically, some WGSs, but not all, rely on the use of sodium hydroxide (NaOH) caustic solution as the scrubbing agent. NaOH is a toxic air contaminant (TAC) that is a non-cancerous but acutely hazardous substance and is used in WGSs for controlling SOx emissions from FCCUs, coke calciners, sulfuric acid manufacturing and glass melting.

As a point of contrast, WGSs employed for controlling SOx from SRU/TGUs use sodium carbonate (Na2CO3) which is commonly known as soda ash, a non-toxic, non-cancerous, and non-hazardous substance, as the scrubbing agent. Further, DGSs employed for controlling SOx from cement kilns utilize limestone, also a non-toxic, non-cancerous, and non-hazardous substance, as the scrubbing agent. If SOx reducing additives (catalyst) are employed in lieu of WGSs for FCCUs, the catalyst is also non-toxic, non-cancerous, and non-hazardous substance.

Lastly, FGT for refinery boilers and heaters will vary from process-to-process and facility-to-facility, but none would require WGS technology. FGT, does involve the use of various substances, depending on the process, such as NaOH caustic, amines, and specialty catalysts. As demonstrated in the hazards discussion in Chapter 4 of this PEA, only the NaOH caustic employed for FGT is hazardous. Table 5-3 contains a summary of the substances used per process per source category and indicates if the substance is toxic.

Table 5-3
Potential Increase in Substances Used in SOx Control Technologies

Equipment/Source Category	Control Technology	Substances	Is the substance a toxic air contaminant (TAC)?
FCCU	WGS	NaOH	**Yes**
FCCU	SOx Reducing Additive	Proprietary catalyst blend	No
SRU/TGU	WGS	Soda Ash	No
SRU/TGU	Selective Oxidation Catalyst	Proprietary catalyst blend	No
Sulfuric Acid Mfg.	WGS	NaOH	**Yes**
Coke Calciner	WGS	NaOH	**Yes**
Glass Melting Furnace	WGS	NaOH	**Yes**
Cement Kiln	DGS	Limestone	No
Coal-fired Boiler	DGS	Limestone	No
Refinery Boilers/ Heaters	FGT	NaOH, proprietary catalyst blend or amines	**Yes, for NaOH**

Based on Table 5-3, the use of NaOH defines which portions of the project and various alternatives are toxic. In addition, each facility that was projected to increase the use in the acutely hazardous substance NaOH under Alternatives B and C, the filling loss and the working loss of each NaOH tank was calculated, added together, and that sum was compared to the most stringent Rule 1401 Screening Emission Level for NaOH (0.004 pounds per hour at the nearest receptor distance of 25 meters). None of the total hourly loss projections exceeded the acute screening level for NaOH for any of the affected facilities for any of the alternatives. Because the screening level for NaOH was not exceeded for any of the affected facilities, no significant air quality operational impacts with respect to toxics are expected from any of the alternatives. NaOH is not classified as a carcinogen, so a cancer risk analysis for each of the alternatives was not performed.

To determine the lowest toxic alternative, Table 5-4 contains a comparison of the proposed project and each alternative relative to the amount of NaOH that may be used per source category.

Table 5-4
Summary of Potential NaOH Use per Source Category

Projected Increased Amount of NaOH To Be Used (tons/day)							
Equipment/ Source Category	**Control Technology that Uses NaOH**	**Proposed Project: Option 1**	**Proposed Project: Option 2**	**Alternative A: No Project**	**Alternative B: AQMP**	**Alternative C: Intermediate SOx Reductions – Option 1**	**Alternative C: Intermediate SOx Reductions – Option 2**
FCCU	WGS	4.45	0*	0	0*	4.45	0*
Sulfuric Acid	WGS	1.30	1.30	0	1.30	1.30	1.30
Coke Calciner	WGS	3.37	3.37	0	3.37	3.37	3.37
Glass Melting Furnace	WGS	0.79	0.79	0	0.79	0.79	0.79
Refinery Boilers & Heaters	FGT	3.34	3.34		0	3.34	3.34
	TOTAL	**13.24**	**8.79**	**0**	**5.45**	**13.24**	**8.79**

*The Proposed Project- Option 2, Alternative B and Alternative C – Option 2 are based on the assumption that SOx reducing additives will be used in lieu of WGS technology for FCCUs.

As shown in Table 5-4, Alternative A has least amount of toxics involved because no NaOH would be used. However, because Alternative A is the 'no project alternative,' it does not achieve the goals of the proposed project because it does not implement the AQMP control measure. Therefore, Alternative A cannot be considered the lowest toxic alternative. Of the alternatives that achieve the goals of the AQMP control measure, Alternative B uses the least amount of NaOH (5.45 tons per day) when compared to the Proposed Project (e.g., 13.24 tons per day under Option 1 and 8.79 tons per day under Option 2). Therefore, when compared to the Proposed Project and the other alternatives under consideration that also rely on the use of NaOH for compliance, Alternative B can be considered the lowest toxic alternative.

DESCRIPTION OF ALTERNATIVES

The following proposed alternatives were developed by modifying specific components of the proposed project. The rationale for selecting and modifying specific components of the proposed project to generate feasible alternatives for the analysis is based on CEQA's requirement to present "realistic" alternatives; that is, alternatives that can actually be implemented.

The initial analysis of the proposed project in the NOP/IS determined that, of the amendments proposed, only the components that pertain to the lowered SOx emission limits could entail physical modifications to the affected equipment that could have potential adverse significant impacts. As such, the following three alternatives were developed by identifying and modifying major components of the proposed project. Specifically, the primary components of the proposed alternatives that have been modified are the source categories that may be affected, and the manner in which compliance with the proposed SOx emission limits may be achieved. The alternatives, summarized in Table 5-1 and described in the following subsections, include the following: Alternative A (No Project), Alternative B (AQMP), and Alternative C (Intermediate SOx Reductions). Unless otherwise specifically noted, all other components of the project alternatives are identical to the components of the proposed project. The following subsections provide a brief description of each alternative.

Alternative A - No Project

Alternative A or 'no project' means that the proposed project would not be adopted and the current universe of equipment will continue to be maintained at their current operations without being required to further reduce SOx emissions. However, by not adopting the SOx emission limits for each source category as proposed, the current version of Rule 2002 would not implement AQMP Control Measure CMB-02: Further SOx Reduction for RECLAIM (CM #2007CMB-02). In summary, Alternative A, the 'no project' alternative, does not achieve the goals of the proposed project because it does not implement the AQMP control measure. While no significant adverse secondary environmental impacts would result from the 'no project' alternative, it is not necessarily the environmentally superior alternative in accordance with CEQA Guidelines §15126.6(e)(2) because SOx emissions would continue to be emitted at current levels, thus, not improving air quality in the District.

Alternative B – AQMP

Alternative B is the AQMP alternative with the top three most cost-effective SOx emission reduction targets that focus on the following equipment/source categories: 1) sulfuric acid manufacturing; 2) coke calciner; and, 3) glass melting furnaces. Under Alternative B, less add-on control equipment (e.g., four WGSs) would be expected to be installed in order to achieve SOx emission reductions as compared to the proposed project (e.g., 11 WGSs plus two DGSs under Option 1 and seven WGSs plus two DGSs under Option 2). The reduced number of add-on controls to be installed under Alternative B when compared to the proposed project can be attributed to the exclusion of the following source categories: FCCU, SRU/TGU, cement kiln, and refinery boilers/heaters. Having equivalent SOx emission limits implemented on only the most cost-effective source categories means that the overall SOx emission reductions attributable to Alternative B will be much less than the proposed project for both Options 1 and 2. Significant adverse air quality impacts for criteria pollutants during construction would result from implementing Alternative B. Because of the potential for four WGSs to be constructed simultaneously under Alternative B, the peak daily construction emissions would be equivalent to the proposed project for both Options 1 and 2. However, because less add-on control equipment would be installed overall under Alternative B when compared to the proposed project, the operation GHG emissions would be less than significant and substantially less than the proposed project for both Options 1 and 2. In addition, less than significant adverse secondary impacts for aesthetics, energy, hazards and hazardous materials, hydrology and water quality, and transportation and traffic are expected to result from implementing Alternative B, but these impacts would also be less than the proposed project.

Alternative C – Intermediate SOx Reductions

Alternative C would impose the same SOx limits on fewer equipment/source categories when compared to both Options 1 and 2 of the proposed project. Specifically, five equipment/source categories comprise Alternative C: FCCUs, sulfuric acid manufacturing, coke calciner, glass melting furnaces, and cement kilns. Like the proposed project, there are two SOx control approaches that can be applied to FCCUs under Alternative C. For this reason, Alternative C has been bifurcated into two options: Option 1 assumes that WGSs will be the control approach for FCCUs; and, Option 2 assumes that SOx reducing additives will be the control approach for FCCUs. The remaining source categories and their respective control approaches applicable to Alternative C will be the same for both Option 1 and Option 2.

Under Alternative C, less add-on control equipment (e.g., eight WGSs plus two DGSs under Option 1 and four WGSs plus two DGSs under Option 2) would be expected to be installed under Alternative C in order to achieve the lowered SOx emission limits as compared to the Proposed Project compared to the proposed project (e.g., 11 WGSs plus two DGSs under Option 1 and seven WGSs plus two DGSs under Option 2). The reduced number of add-on control equipment to be installed under Option 2 can be attributed to the assumption that SOx reduction catalysts could be utilized in the FCCUs. Having equivalent SOx emission limits applied to fewer source categories means that the overall SOx emission reductions attributable to Alternative C will be less than the proposed project (e.g., 5.48 tons per day versus 6.21 tons per day). Significant adverse air quality impacts for criteria pollutants during construction and GHGs during operation would result from implementing Alternative C for both Options 1 and 2. Like the proposed project, the simultaneous construction of four WGSs is assumed to occur under both Options 1 and 2 for Alternative C. Thus, the peak daily construction emissions for both Options 1 and 2 of Alternative C would be equivalent to the both Options 1 and 2 of the proposed project. However, because less WGSs would be installed overall under Alternative C when compared to the proposed project, the operation GHG emissions would be less than both Options 1 and 2 of the proposed project. In addition, less than significant adverse secondary impacts for aesthetics, energy, hazards and hazardous materials, hydrology and water quality, and transportation and traffic are expected to result from implementing Alternative C, but these impacts would also be less than both Options 1 and 2 of the proposed project.

COMPARISON OF THE ALTERNATIVES

The Environmental Checklist (see Chapter 2 of the Initial Study in Appendix C) identified only aesthetics, air quality, energy, hazards and hazardous materials, hydrology and water quality, and transportation and traffic as the environmental areas that could be significantly adversely affected by the proposed project. Further evaluation of potential impacts in Chapter 4 of this Environmental Assessment determined that the proposed project for both Options 1 and 2 would not generate significant adverse project-specific impacts for aesthetics, energy, hazards and hazardous materials, , and transportation and traffic. Instead, only the project-specific air quality impacts and hydrology (water demand) impacts were concluded to be significant.

The following sections describe the potential adverse impacts that may be generated by each project alternative. Potential adverse impacts for the environmental topics are quantified where sufficient data are available. A comparison of the environmental impacts for each project alternative is provided in Table 5-2. No other environmental topics other than air quality were determined to be significantly adversely affected by implementing any project alternative.

AESTHETICS

Alternative A - No Project

The project-specific aesthetic impacts associated with the installation of multiple WGSs would be eliminated under Alternative A, the no project alternative, since no construction activities would occur and no new equipment would be installed at any of the affected facilities. Under Alternative A, the aesthetic impacts would remain unchanged from the existing setting and therefore, would be less than significant.

Alternative B – AQMP

Alternative B contains the same SOx emission reduction targets as the proposed project but only for the following equipment/source categories: sulfuric acid manufacturing, coke calciner, and glass melting furnace. As with the proposed project, Alternative B would result in the installation of multiple WGSs that would generate multiple visible steam plumes and would require new, tall stacks for each WGS creating adverse aesthetics impacts. However, because less source categories are included in Alternative B, less WGSs would be installed when compared to the proposed project (e.g., four WGSs versus 11 WGSs for Option 1 and seven WGSs for Option 2). The reduced number of WGSs to be installed under Alternative B when compared to the proposed project can be primarily attributed to the exclusion of the FCCU and SRU/TGU source categories and focusing on the top three most cost-effective SOx reduction targets. The aesthetics impacts associated with the proposed project for both Options 1 and 2 were considered to be less than significant because the new WGSs to be installed would occur within existing heavy industrial areas. While less WGSs would be installed under Alternative B, aesthetics impacts are expected to occur but they will be less than the proposed project. Thus, Alternative B is considered to have less than significant aesthetics impacts.

Alternative C – Intermediate SOx Reductions

Alternative C would impose the same SOx limits on fewer equipment/source categories when compared to the proposed project. Specifically, five equipment/source categories comprise Alternative C: FCCUs, sulfuric acid manufacturing, coke calciner, glass melting furnaces, and cement kilns. As with the proposed project, Alternative C would result in the installation of multiple WGSs that would generate visible steam plumes and would require new, tall stacks for each WGS creating adverse aesthetics impacts. However, less WGSs (e.g., four) would be installed under Alternative C (e.g., eight WGSs under Option 1 and four WGSs under Option 2) when compared to the proposed project (e.g., 11 WGSs under Option 1 and seven WGSs under Option 2). The reduced number of WGSs to be installed under Alternative C – Option 2 can be attributed to the assumption that SOx reduction catalysts could be utilized in the FCCUs thus eliminating the need for add-on control equipment for this source category. The aesthetics impacts associated with both Options 1 and 2 of the proposed project were considered to be less than significant because the new WGSs to be installed would occur within existing heavy industrial areas. While less WGSs would be installed under both Options 1 and 2 of Alternative C, aesthetics impacts are expected to occur but they will be less than the proposed project. Thus, Alternative C is considered to have less than significant aesthetics impacts.

AIR QUALITY

Alternative A - No Project

Unlike the proposed project, it is not anticipated that Alternative A would generate significant adverse impacts during construction or operational activities because the owners/operators of affected equipment/source categories would not be expected to modify their operations in a way that could generate construction and operation emissions. Instead, owners/operators of the affected equipment/source categories would continue existing operations in compliance with the current SOx RECLAIM program as well as complying with all applicable SCAQMD, CARB and USEPA requirements. By not adopting the proposed project, current operations mean that each facility can continue to operate their SOx emitting equipment in accordance with their annual SOx allocations and SOx RTCs. This means that there would be SOx reductions and health benefits from reducing overall SOx emissions will not be realized. Further, by not implementing

SOx emission reductions, AQMP Control Measure CMB-02: Further SOx Reduction for RECLAIM (CM #2007CMB-02, would not be implemented. In summary, Alternative A, the 'no project' alternative, does not achieve the goals of the proposed project because it does not implement the AQMP control measure or comply with state law to implement all feasible mitigation measures.

Alternative B – AQMP

Because Alternative B applies the same SOx emission reduction targets as the proposed project but to fewer equipment/source categories (e.g., sulfuric acid manufacturing, coke calciner, and glass melting furnace), less emission reductions (i.e., 1.5 tons per day for Alternative B versus 6.2 tons per day for the proposed project) would be realized for less affected equipment (i.e., the installation of four WGSs for Alternative B versus 11 WGSs plus two DGSs for Option 1 of the proposed project or seven WGSs plus two DGSs for Option 2 of the proposed project). Due to the limited focus of Alternative B, fewer WGSs will be installed. Further, because there will be fewer WGSs installed that also utilize NaOH, less operational emissions associated with NaOH deliveries and use will occur with Alternative B when compared to the proposed project. Similar to the proposed project, it is anticipated that the installation of WGSs in accordance with Alternative B would generate significant adverse construction and operational air quality impacts, but these impacts would be less than the proposed project because less add-on control equipment would be installed.

In summary, if Alternative B were implemented, less SOx reductions would be achieved and less health benefits from reducing SOx overall will be realized. Alternative B does not achieve as great of SOx emission reduction benefits as the proposed project. Table 5-1 summarizes the SOx emission reduction benefits per day for Alternative B (i.e., approximately 1.5 tons per day).

Table 5-5 presents the results of the SCAQMD staff's construction air quality analysis for the proposed project and lists the peak daily construction emissions from construction worker trips and use of equipment for the installation of one WGS and the overlapping construction of four WGSs, respectively. For construction, Alternative B is equivalent to the proposed project, because both assume the peak daily construction of four WGSs. For the installation of one WGS, the calculations show the total daily construction emissions exceed the SCAQMD's CEQA air quality significance threshold of 100 pounds of NOx per day. For the simultaneous construction of four WGSs, the calculations show the total daily construction emissions exceed the SCAQMD's CEQA air quality significance thresholds of 100 pounds of NOx per day, 75 pounds of VOC per day, and 150 pounds of PM10 per day. Appendix B contains the spreadsheets with the results and assumptions used by the SCAQMD staff for this analysis.

Table 5-5
Alternative B: Peak Daily "Worst-Case" Construction Emissions from the Installation of WGS Technology in 2012 or later

Peak Construction Activity	VOC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Phase I: Demolition	6	32	40	0	2	2
Phase II: Construction	16	83	76	0	38	11
Total for 1 WGS Installation	**22**	**115**	**116**	**0**	**40**	**13**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**
Phase I: Demolition	24	129	161	0	9	8
Phase II: Construction	65	332	303	1	150	45
Total for 4 WGS Installations	**89**	**461**	**464**	**1**	**159**	**53**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**

With regard to greenhouse gas emissions, Tables 5-6 and 5-7 summarize the CO2 impacts from both construction activities and operation activities associated with the installation of four WGS for Alternative B on a source category and facility-by-facility basis, respectively. The CO2 impacts from construction were amortized over a 30-year period. The peak operational emissions are based on the operations of the SOx control equipment plus the anticipated increase in truck hauling and deliveries as a result of maintaining the SOx control equipment. Though the peak operational emissions are assumed to occur no sooner than 2012, all operational emissions are expected to occur by the end of year 2018 because the compliance date of the proposed project is January 1, 2019.

Table 5-6
Alternative B: Overall CO2eq Increases Due to Construction and Operation Activities per Source Category (metric tons/year)[1]

Equipment/ Source Category	**Temporary Construction Activities (diesel and gasoline fuel use)[2]** (MT/yr)	**Operational Natural Gas Use** (MT/yr)	**Operational Electricity Use** (MT/yr)	**Operational Water Use/ Conveyance** (MT/yr)	**Operational Wastewater Generation** (MT/yr)	**Operational Truck Trips (diesel fuel use)** (MT/yr)	**Total CO2eq** (MT/yr)
FCCUs	0	0	0	0	0	0	0
SRU/TGUs	0	0	0	0	0	0	0
Refinery Boilers/Heaters	0	0	0	0	0	0	0
Coke Calciner	78	0	3,225	55	23	8	3,389
Glass Melting Furnaces	155	0	1,037	79	17	1	1,289
Sulfuric Acid Manufacturing	78	0	1,759	35	15	1	1,887
Cement Kilns	0	0	0	0	0	0	0
TOTAL	**312**	**0**	**6,020**	**169**	**55**	**11**	**6,567**

[1] 1 metric ton = 2,205 pounds
[2] GHGs from temporary construction activities are amortized over 30 years.

Table 5-7
Alternative B: Overall CO2eq Increases Due to Construction and Operation Activities by Facility (metric tons/year)[1]

Facility ID	**Temporary Construction Activities (diesel and gasoline fuel use)[2]** (MT/yr)	**Operational Natural Gas Use** (MT/yr)	**Operational Electricity Use** (MT/yr)	**Operational Water Use/ Conveyance** (MT/yr)	**Operational Wastewater Generation** (MT/yr)	**Operational Truck Trips (diesel fuel use)** (MT/yr)	**Total CO2eq** (MT/yr)
A	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0
C	0	0	0	9	0	0	9
D	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0
H	78	0	3,225	55	23	8	3,389
I	155	0	1,037	79	17	1	1,289
J	78	0	1,759	26	15	1	1,879
K	0	0	0	0	0	0	0
TOTAL	**312**	**0**	**6,020**	**169**	**55**	**11**	**6,567**

[1] 1 metric ton = 2,205 pounds
[2] GHGs from temporary construction activities are amortized over 30 years.

Even though Alternative B is expected to generate construction-related CO2 emissions, and the operational phase of the proposed project is also expected to generate additional GHG emissions, none of the affected facilities individually exceed the GHG industrial significance threshold of 10,000 MT/day. Further, the collective GHG emissions from the three source categories under

Alternative B do not exceed the threshold. Therefore, Alternative B is expected to have less than significant GHG impacts.

Emission sources associated with the operational-related activities as a result of implementing Alternative B may emit TACs because caustic is used in the operation of certain WGS. With the potential for the installation of four WGS under Alternative B, that means a maximum of four caustic storage tanks may be installed. There are several types of caustic solutions that can be used in WGS operations, but sodium hydroxide (NaOH) is the most commonly used. NaOH is a toxic air contaminant that is a non-cancerous but acutely hazardous substance. For "worst-case" operations, 5.45 tons per day of NaOH (50 percent solution, by weight) is estimated to be needed to operate four WGSs under Alternative B. Even though the facilities that may be affected by Alternative B may currently use NaOH elsewhere in their facilities, for the purpose of conducting a "worst-case" construction analysis, one 10,000 gallon storage tank for caustic solution was assumed to be constructed for every WGS installed. Of the four facilities that would be affected by Alternative B, three were projected to have an increased demand in NaOH use for WGS operations. As summarized in Table 5-8, for each facility that was projected to increase the use of the acutely hazardous substance NaOH, the filling loss and the working loss of each NaOH tank was calculated, added together, and that sum was compared to the most stringent Rule 1401 Screening Emission Level for NaOH (0.004 pounds per hour at the nearest receptor distance of 25 meters). None of the total hourly loss projections exceeded the acute screening level for NaOH for any of the affected facilities. Because the screening level for NaOH was not exceeded for any of the affected facilities, no significant air quality operational impacts with respect to toxics are expected from the proposed project. NaOH is not classified as a carcinogen, so a cancer risk analysis was not performed.

Table 5-8
Alternative B: Summary of Filling and Working Losses for NaOH Storage Tanks

Facility ID	Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM10) Filling Loss (lb/hr)	B: Hourly NaOH (as PM10) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM10) Losses (lb/hr)	NaOH Acute Screening Level at 25 meters (lb/hr)	Do Total Hourly Losses Exceed Acute Screening Level For NaOH? (Yes/No)
A	0	0	0	0	4.00E-03	NO
B	0	0	0	0	4.00E-03	NO
C	0	0	0	0	4.00E-03	NO
D	0	0	0	0	4.00E-03	NO
E	0	0	0	0	4.00E-03	NO
F	0	0	0	0	4.00E-03	NO
G	0	0	0	0	4.00E-03	NO
H	3.37	7.60E-04	2.28E-03	3.04E-03	4.00E-03	NO
I	0.79	1.78E-04	5.35E-04	7.14E-04	4.00E-03	NO
J	1.30	2.93E-04	8.78E-04	1.17E-03	4.00E-03	NO
K	0	0	0	0	4.00E-03	NO
Total	**5.45**					

Alternative C – Intermediate SOx Reductions

Alternative C proposes the same SOx emission reduction targets as the proposed project for the following equipment/source categories: FCCUs, sulfuric acid manufacturing, coke calciner, glass melting furnace, and cement kilns. Like the proposed project, there are two SOx control approaches that can be applied to FCCUs under Alternative C. For this reason, Alternative C has been bifurcated into two options: Option 1 assumes that WGSs will be the control approach for FCCUs; and, Option 2 assumes that SOx reducing additives will be the control approach for FCCUs. The remaining source categories and their respective control approaches applicable to Alternative C will be the same for both Option 1 and Option 2.

Because less add-on control equipment would be expected to be installed under Alternative C (i.e., eight WGSs plus two DGSs under Option 1 and four WGSs plus two DGSs under Option 2) in order to achieve the proposed SOx emission limits as compared to the proposed project (i.e., 11 WGSs plus two DGSs for Option 1 and seven WGSs plus to DGSs under Option 2), Alternative C would result in less emission reductions (i.e., 5.48 tons per day for Alternative C versus 6.21 tons per day for the proposed project). The reduced number of add-on control equipment to be installed under Option 2 can be attributed to the assumption that SOx reduction catalysts could be utilized in the FCCUs in lieu of WGSs.

Further, there will be the same number of WGSs that utilize NaOH installed, so equivalent operational emissions associated with NaOH deliveries will occur under Alternative C when compared to the proposed project for both options. Similar to the proposed project, it is anticipated that the installation of add-on control equipment in accordance with Alternative C would generate significant adverse construction and operational air quality impacts, but these impacts would be less than the both Options 1 and 2 of the proposed project because less control equipment would be installed.

In summary, if Alternative C were implemented, less SOx reductions would be achieved and less health benefits from reducing SOx overall will be realized. Alternative C achieves less SOx emission reduction benefits as both Options 1 and 2 of the proposed project. Table 5-1 summarizes the SOx emission reduction benefits per day for Alternative C (e.g., approximately 5.48 tons per day).

Table 5-9 presents the results of the SCAQMD staff's construction air quality analysis for the proposed project and lists the peak daily construction emissions from construction worker trips and use of equipment for the installation of one WGS and the overlapping construction of four WGSs, respectively. For construction, Alternative C is equivalent to the proposed project, because both assume the peak daily construction of four WGSs, even though the total number of add-on controls to be installed under Alternative C is 10 ~~eight~~ for Option 1 (eight ~~six~~ WGSs plus two DGSs) and six for Option 2 (four WGSs plus two DGSs). For the installation of one WGS, the calculations show the total daily construction emissions exceed the SCAQMD's CEQA air quality significance threshold of 100 pounds of NOx per day. For the simultaneous construction of four WGSs, the calculations show the total daily construction emissions exceed the SCAQMD's CEQA air quality significance thresholds of 100 pounds of NOx per day, 75 pounds of VOC per day, and 150 pounds of PM10 per day. Appendix B contains the spreadsheets with the results and assumptions used by the SCAQMD staff for this analysis.

Table 5-9
Alternative C: Peak Daily "Worst-Case" Construction Emissions from the Installation of WGS Technology in 2012 or later

Peak Construction Activity	VOC (lbs/day)	CO (lbs/day)	NOx (lbs/day)	SOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Phase I: Demolition	6	32	40	0	2	2
Phase II: Construction	16	83	76	0	38	11
Total for 1 WGS Installation	**22**	**115**	**116**	**0**	**40**	**13**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**
Phase I: Demolition	24	129	161	0	9	8
Phase II: Construction	65	332	303	1	150	45
Total for 4 WGS Installations	**89**	**461**	**464**	**1**	**159**	**53**
SIGNIFICANCE THRESHOLD	75	550	100	150	150	55
SIGNIFICANT?	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**

With regard to greenhouse gas emissions, Tables 5-10 and 5-11 summarize the CO2eq impacts from both construction activities and operation activities associated with the installation of eight WGSs plus two DGSs under Option 1 of Alternative C on a source category and facility-by-facility basis, respectively. Similarly, Tables 5-12 and 5-13 summarize the CO2eq impacts from both construction activities and operation activities associated with the installation of four WGSs plus two DGSs under Option 2 of Alternative C on a source category and facility-by-facility basis, respectively. For both Options 1 and 2, the CO2eq impacts from construction were amortized over a 30-year period. The peak operational emissions are based on the operations of the SOx control equipment plus the anticipated increase in truck hauling and deliveries as a result of maintaining the SOx control equipment. Though the peak operational emissions are assumed to occur no sooner than 2012, all operational emissions are expected to occur by the end of year 2018 because the compliance date of the proposed project is January 1, 2019.

Table 5-10
Alternative C – Option 1: Overall CO2eq Increases Due to Construction and Operation Activities per Source Category (metric tons/year)[1]

Equipment/ Source Category	**Temporary Construction Activities (diesel and gasoline fuel use)[2]** (MT/yr)	**Operational Natural Gas Use [3]** (MT/yr)	**Operational Electricity Use** (MT/yr)	**Operational Water Use/ Conveyance** (MT/yr)	**Operational Wastewater Generation** (MT/yr)	**Operational Truck Trips (diesel fuel use)** (MT/yr)	**Total CO2eq** (MT/yr)
FCCUs	310	0	18,794	144	68	53	19,370
SRU/TGUs	0	0	0	0	0	0	0
Refinery Boilers/Heaters	155	-668	4,124	27	23	149	3,809
Coke Calciner	78	0	3,225	55	23	8	3,389
Glass Melting Furnaces	155	0	1,037	79	17	1	1,289
Sulfuric Acid Manufacturing	78	0	1,759	35	15	1	1,887
Cement Kilns	155	0	4,240	14	0	5	4,415
TOTAL	**932**	**-668**	**33,179**	**371**	**162**	**217**	**34,159**

[1] 1 metric ton = 2,205 pounds
[2] GHGs from temporary construction activities are amortized over 30 years.
[3] A negative number means a reduction in usage or demand.

Table 5-11
Alternative C – Option 1: Overall CO2eq Increases Due to Construction and Operation Activities by Facility (metric tons/year)[1]

Facility ID	**Temporary Construction Activities (diesel and gasoline fuel use)[2]** (MT/yr)	**Operational Natural Gas Use [3]** (MT/yr)	**Operational Electricity Use** (MT/yr)	**Operational Water Use/ Conveyance** (MT/yr)	**Operational Wastewater Generation** (MT/yr)	**Operational Truck Trips (diesel fuel use)** (MT/yr)	**Total CO2eq** (MT/yr)
A	39	-111	5,632	10	5	29	5,604
B	78	0	6,509	10	5	13	6,615
C	78	-55	238	12	4	40	317
D	39	24	259	2	2	5	330
E	78	-790	4,828	85	44	62	4,307
F	78	107	3,733	59	30	24	4,030
G	78	158	1,719	2	2	27	1,985
H	78	0	3,225	55	23	8	3,389
I	155	0	1,037	79	17	1	1,289
J	78	0	1,759	26	15	1	1,879
K	155	0	4,240	14	0	5	4,415
TOTAL	**932**	**-668**	**33,179**	**354**	**145**	**217**	**34,159**

[1] 1 metric ton = 2,205 pounds
[2] GHGs from temporary construction activities are amortized over 30 years.
[3] A negative number means a reduction in usage or demand.

Table 5-12
Alternative C – Option 2: Overall CO2eq Increases Due to Construction and Operation Activities per Source Category (metric tons/year)[1]

Equipment/ Source Category	**Temporary Construction Activities (diesel and gasoline fuel use)[2]** (MT/yr)	**Operational Natural Gas Use [3]** (MT/yr)	**Operational Electricity Use** (MT/yr)	**Operational Water Use/ Conveyance** (MT/yr)	**Operational Wastewater Generation** (MT/yr)	**Operational Truck Trips (diesel fuel use)** (MT/yr)	**Total CO2eq** (MT/yr)
FCCUs	0	0	0	0	0	15	15
SRU/TGUs	0	0	0	0	0	0	0
Refinery Boilers/Heaters	155	-668	4,124	27	23	149	3,809
Coke Calciner	78	0	3,225	55	23	8	3,389
Glass Melting Furnaces	155	0	1,037	79	17	1	1,289
Sulfuric Acid Manufacturing	78	0	1,759	35	15	1	1,887
Cement Kilns	155	0	4,240	14	0	5	4,415
TOTAL	**621**	**-668**	**14,385**	**210**	**77**	**180**	**14,805**

[1] 1 metric ton = 2,205 pounds
[2] GHGs from temporary construction activities are amortized over 30 years.
[3] A negative number means a reduction in usage or demand.

Table 5-13
Alternative C – Option 2: Overall CO2eq Increases Due to Construction and Operation Activities by Facility (metric tons/year)[1]

Facility ID	**Temporary Construction Activities (diesel and gasoline fuel use)[2]** (MT/yr)	**Operational Natural Gas Use [3]** (MT/yr)	**Operational Electricity Use** (MT/yr)	**Operational Water Use/ Conveyance** (MT/yr)	**Operational Wastewater Generation** (MT/yr)	**Operational Truck Trips (diesel fuel use)** (MT/yr)	**Total CO2eq** (MT/yr)
A	20	-111	691	1	1	22	624
B	0	0	0	0	0	3	3
C	78	-55	238	12	4	40	317
D	20	24	259	2	2	8	314
E	0	-790	1,207	18	15	59	509
F	0	107	10	0	0	4	121
G	78	158	1,719	2	2	27	1,985
H	78	0	3,225	55	23	8	3,389
I	155	0	1,037	79	17	1	1,289
J	78	0	1,759	26	15	1	1,879
K	155	0	4,240	14	0	5	4,415
TOTAL	**621**	**-668**	**14,385**	**210**	**77**	**180**	**14,805**

[1] 1 metric ton = 2,205 pounds
[2] GHGs from temporary construction activities are amortized over 30 years.
[3] A negative number means a reduction in usage or demand.

While none of the affected facilities individually exceed the GHG industrial significance threshold of 10,000 MT/day under Option 1 or Option 2, the collective GHG emissions under

Alternative C exceed the threshold for both options. Therefore, Alternative C is expected to have adverse significant GHG impacts. Because Alternative C is expected to generate construction-related CO2 emissions, and the operational phase of the proposed project is also expected to generate additional GHG emissions, cumulative GHG adverse impacts from Alternative C are considered significant.

Emission sources associated with the operational-related activities as a result of implementing the Alternative C may emit TACs because caustic is used in the operation of a WGS. With the potential for the installation of eight WGSs under Option 1 and four WGSs under Option 2 for Alternative C, that means a maximum of eight caustic storage tanks under Option 1 and four caustic storage tanks under Option 2 may be installed to supply the WGSs. There are several types of caustic solutions that can be used in WGS operations, but sodium hydroxide (NaOH) is the most commonly used. NaOH is a toxic air contaminant that is a non-cancerous but acutely hazardous substance. In addition, two more NaOH storage tanks would be needed under both Option 1 and Option 2 to support the operations of two FGT modifications for the refinery boiler/heater source category at two facilities.

Of the facilities affected by the Alternative C, seven facilities were projected to have an increased demand in NaOH use for WGS operations plus two for FGT for refinery boilers and heaters under Option 1 and three facilities were projected to have an increased demand in NaOH use for WGS operations plus two for FGT for refinery boilers and heaters under Option 2.

For "worst-case" operations under Alternative C, 13.24 tons per day of NaOH (50 percent solution, by weight) is estimated to be needed to operate eight WGSs plus two FGTs for refinery boilers and heaters under Option 1 and 8.79 tons per day of NaOH (50 percent solution, by weight) is estimated to be needed to operate four WGSs plus two FGTs for refinery boilers and heaters under Option 2. For the purpose of conducting a "worst-case" construction analysis, one 10,000 gallon storage tank for caustic solution was assumed to be constructed for every WGS installed and for every FGT modification that utilizes NaOH. As summarized in Tables 5-14 and 5-15, for each facility that was projected to increase the use in the acutely hazardous substance NaOH, the filling loss and the working loss of each NaOH tank was calculated, added together, and that sum was compared to the most stringent Rule 1401 Screening Emission Level for NaOH (0.004 pounds per hour at the nearest receptor distance of 25 meters). None of the total hourly loss projections exceeded the acute screening level for NaOH for any of the affected facilities under Option 1 or Option 2 for Alternative C. Because the screening level for NaOH was not exceeded for any of the affected facilities, no significant air quality operational impacts with respect to toxics are expected from Alternative C. NaOH is not classified as a carcinogen, so a cancer risk analysis was not performed for Alternative C.

Table 5-14
Alternative C – Option 1: Summary of Filling and Working Losses for NaOH Storage Tanks

Facility ID	Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM10) Filling Loss (lb/hr)	B: Hourly NaOH (as PM10) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM10) Losses (lb/hr)	NaOH Acute Screening Level at 25 meters (lb/hr)	Do Total Hourly Losses Exceed Acute Screening Level For NaOH? (Yes/No)
A	0.81	1.82E-04	5.46E-04	7.28E-04	4.00E-03	NO
B	1.17	2.64E-04	7.93E-04	1.06E-03	4.00E-03	NO
C	0	0	0	0	4.00E-03	NO
D	0.44	9.90E-05	2.97E-04	3.96E-04	4.00E-03	NO
E	0.45	1.01E-04	3.04E-04	4.06E-04	4.00E-03	NO
F	2.02	4.57E-04	1.37E-03	1.83E-03	4.00E-03	NO
G	2.90	6.56E-04	1.97E-03	2.62E-03	4.00E-03	NO
H	3.37	7.60E-04	2.28E-03	3.04E-03	4.00E-03	NO
I	0.79	1.78E-04	5.35E-04	7.14E-04	4.00E-03	NO
J	1.30	2.93E-04	8.78E-04	1.17E-03	4.00E-03	NO
K	0	0	0	0	4.00E-03	NO
Total	13.24					

Table 5-15
Alternative C – Option 2: Summary of Filling and Working Losses for NaOH Storage Tanks

Facility ID	Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM10) Filling Loss (lb/hr)	B: Hourly NaOH (as PM10) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM10) Losses (lb/hr)	NaOH Acute Screening Level at 25 meters (lb/hr)	Do Total Hourly Losses Exceed Acute Screening Level For NaOH? (Yes/No)
A	0	0	0	0	4.00E-03	NO
B	0	0	0	0	4.00E-03	NO
C	0	0	0	0	4.00E-03	NO
D	0.44	9.90E-05	2.97E-04	3.96E-04	4.00E-03	NO
E	0	0	0	0	4.00E-03	NO
F	0	0	0	0	4.00E-03	NO
G	2.90	6.56E-04	1.97E-03	2.62E-03	4.00E-03	NO
H	3.37	7.60E-04	2.28E-03	3.04E-03	4.00E-03	NO
I	0.79	1.78E-04	5.35E-04	7.14E-04	4.00E-03	NO
J	1.30	2.93E-04	8.78E-04	1.17E-03	4.00E-03	NO
K	0	0	0	0	4.00E-03	NO
Total	**8.79**					

ENERGY

Alternative A - No Project

The project-specific energy impacts associated with the installation of multiple SOx control devices (e.g., WGSs and DGSs) would be eliminated under Alternative A, the no project alternative, since no construction activities would occur and no new equipment would be installed at any of the affected facilities that would need additional electricity, natural gas, gasoline or diesel. Under Alternative A, the energy impacts would remain unchanged from the existing setting and therefore, would be less than significant.

Alternative B – AQMP

Because Alternative B applies the same SOx emission reduction targets as the proposed project but to less equipment/source categories (i.e., sulfuric acid manufacturing, coke calciner, and glass melting furnace), less add-on control equipment will be installed (i.e., four WGSs) such that less additional electricity, natural gas, gasoline or diesel would be needed for construction and operation activities. The following analysis will demonstrate that the projected increases in energy demand associated with Alternative B will be less than significant because the amount of additional electricity, natural gas, gasoline, and diesel needed to install and operate the new SOx controls was well below the applicable energy significance criteria. While fewer WGSs would be installed under Alternative B, adverse energy impacts are expected to occur but they will be less than the proposed project.

Energy information as it relates to construction and operational activities under Alternative B was derived as part of the air quality analysis in Chapter 4 and the calculations are shown in Appendix B of this ~~Draft~~ Final PEA. If the potential SOx controls are installed and operated on a per facility and per source category basis, respectively, Tables 5-16 and 5-17 summarize the estimated impacts on operational natural gas and electricity use for Alternative B on a facility and source category basis, respectively.

Table 5-16
Alternative B: Operational Energy Use By Facility

Facility ID	Potential SOx Control	Natural Gas (MMBTU/day)	Electricity (kWh/day)
A	Not applicable to Alternative B	**0**	**0**
B	Not applicable to Alternative B	**0**	**0**
C	1 Upgrade to Cansolv/sulfuric acid unit (modified)	**0**	**0**
D	Not applicable to Alternative B	**0**	**0**
E	Not applicable to Alternative B	**0**	**0**
F	Not applicable to Alternative B	**0**	**0**
G	Not applicable to Alternative B	**0**	**0**
H	1 WGS for calciner (new)	**0**	**17,711**
I	2 WGSs for glass melting furnaces (new)	**0**	**5,694**
J	1 WGS for sulfuric acid unit (new)	**0**	**9,659**
K	Not applicable to Alternative B	**0**	**0**
	TOTAL	**0**	**33,064**

* A negative number means a reduction in usage or demand.

Table 5-17
Alternative B: Operational Energy Use By Source Category

Equipment/ Source Category	**Natural Gas** (MMBTU/day)	**Electricity** (kWh/day)
FCCUs	0	0
SRU/TGUs	0	0
Refinery Boilers/Heaters	0	0
Coke Calciner	0	17,711
Glass Melting Furnaces	0	5,694
Sulfuric Acid Manufacturing	0	9,659
Cement Kilns	0	0
TOTAL	**0**	**33,064**

The overall electricity needed to implement Alternative B includes the amount of electricity that may be needed to produce additional NaOH needed to operate certain WGSs. To determine if the operational energy use is significant for Alternative B, the total for natural gas and electricity was compared to the threshold fuel supply as shown in Table 5-18. California utilities and non-utilities have the ability to receive approximately 9,330 MMcf/day of natural gas[92], [93], [94]. Since Alternative B does not exceed the SCAQMD's energy threshold of one percent of supply for both natural gas and electricity, Alternative B is expected to have less than significant energy impacts. Further, because the increase in electricity demand for Alternative B is below the SCAQMD's energy significance threshold of one percent above available supplies as shown in Table 5-18 below, any increased demand that may result from Alternative B can likely be met with the existing electrical capacity at each of the affected facilities. Lastly, based on this analysis, it is not anticipated that new or substantially altered power utility systems will need to be built to accommodate any additional electricity demands created by Alternative B.

[92] Natural Gas Infrastructure – Draft Staff Paper, California Energy Commission, CEC-200-2009-004-SD, May 2009. http://www.energy.ca.gov/2009publications/CEC-200-2009-004/CEC-200-2009-004-SD.PDF

[93] 2008 California Gas Report, Prepared by the California Gas and Electric Utilities. http://www.energy.ca.gov/2008publications/GAS-1000-2008-020/GAS-1000-2008-020.PDF

[94] An Overview of Natural Gas in California, California Energy Commission, CEC-180-2008-005, April 2008. http://www.energy.ca.gov/2008publications/CEC-180-2008-005/CEC-180-2008-005.PDF

Table 5-18
Alternative B: Total Projected Natural Gas and Electricity Impacts for Operation Activities

Operation Activity	Total Energy Usage per Activity	
	Natural Gas	Electricity
Alternative B	0 MMcf	33.1 MWh/day = 1.38 MW (instantaneous)
Threshold Fuel Supply	9,330 MMcf [a]	8,362 MW [b] (instantaneous)
% of Fuel Supply	0 %	0.016%
Significant (Yes/No) [c]	No	No

[a] Natural Gas Infrastructure Draft Staff Paper, California Energy Commission, May 2009 (CEC-200-2009-004-SD). http://www.energy.ca.gov/2009publications/CEC-200-2009-004/CEC-200-2009-004-SD.PDF

[b] California Energy Demand 2008-2018 Staff Revised Forecast, Staff Final Report, California Energy Commission, , November 2007 (CEC-200-2007-015-SF2). See Form 1.4 b, Peak Demand by LSE: summer Peak Demand Coincident with Planning Area Peak for the following agencies/areas: SCE (Anaheim, Azusa, Banning, Colton, Metropolitan Water District, Rancho Cucamonga, Riverside and Vernon), Cities of Burbank, Glendale and Pasadena, and LADWP. http://www.energy.ca.gov/2007publications/CEC-200-2007-015/CEC-200-2007-015-SF2.PDF

[c] SCAQMD's Energy Threshold for both Natural Gas and Electricity is 1% of Supply.

KEY: MMcf = million standard cubic feet
MW(Megawatt) = 1 MW = 1,000 kilowatts (KW)

In addition, Table 5-19 presents a summary of the total projected fuel usage (i.e., diesel and gasoline) for both construction and operational activities for Alternative B. The analysis shows an overall increase in diesel and gasoline use of approximately 1,465 gallons per day and 1,354 gallons per day, respectively. Since Alternative B does not exceed the SCAQMD's energy threshold of one percent of supply for both diesel and gasoline fuels as shown in Table 5-19 below, Alternative B is expected to have less than significant energy impacts due to fuel use. Further, once construction is completed, the fuel use projected during the temporary phases (e.g., Phase I: Demolition and Phase II: Construction) will end and only the fuel use for truck trips associated with chemical deliveries and solid waste removal activities during Phase III: Operations will continue. Thus, any potential adverse fuel impacts will likely be less than what has been analyzed during the peak for the proposed project.

Table 5-19
Alternative B: Total Projected Fuel Usage

Activity	**Total Fuel Usage per Activity** (gallons/day)	
	Diesel	**Gasoline**
Phase I - Demolition Overlapping with Phase II - Construction at Four Facilities (Construction Equipment and Workers Vehicles)	1,360	1,354
Phase III: Operation (Chemical Deliveries & Solid Waste Removal)	105	0
Total Usage for Alternative B	1,465	1,354
Threshold Fuel Supply[a]	1,086,000,000	6,469,000,000
% of Fuel Supply	0.0001%	0.00002%
Significant (Yes/No)[b]	No	No

[a] Year 2000 California Energy Commission (CEC) projections. Construction activities in future years would yield similar results.
[b] SCAQMD's energy threshold for both diesel and gasoline is 1% or more of supply.

Like the proposed project, Alternative B is not subject to any existing energy conservation plans. If any facility that is subject to Alternative B is also subject to energy conservation plans, it is not expected that Alternative B will affect in any way or interfere with that individual facility's ability to comply with its energy conservation plan or energy standards. Further, construction and operation activities under Alternative B will not utilize non-renewable resources in a wasteful or inefficient manner. Lastly, it is expected that the installation and operation of any equipment used to comply with Alternative B will also comply with all applicable existing energy standards. In summary, the energy impacts from Alternative B are concluded to be less than significant.

Alternative C – Intermediate SOx Reductions

Alternative C proposes the same SOx emission reduction targets as the proposed project for the following equipment/source categories: FCCUs, sulfuric acid manufacturing, coke calciner, glass melting furnace, and cement kilns. Like the proposed project, there are two SOx control approaches that can be applied to FCCUs under Alternative C. For this reason, Alternative C has been bifurcated into two options: Option 1 assumes that WGSs will be the control approach for FCCUs; and, Option 2 assumes that SOx reducing additives will be the control approach for FCCUs. The remaining source categories and their respective control approaches applicable to Alternative C will be the same for both Option 1 and Option 2.

Because less add-on control equipment would be expected to be installed under Alternative C (i.e., eight WGSs plus two DGSs under Option 1 and four WGSs plus two DGSs under Option 2) in order to achieve the proposed SOx emission limits as compared to the proposed project (i.e., 11 WGSs plus two DGSs for Option 1 and seven WGSs plus to DGSs under Option 2), the following analysis shows that both Options 1 and 2 under Alternative C would result in less demand for energy when compared to the proposed project. While less SOx add-on controls would be installed under Alternative C for both Options 1 and 2, adverse energy impacts are expected to occur but they will be less than the proposed project.

Energy information as it relates to construction and operational activities was derived as part of the air quality analysis in Chapter 4 and the calculations are shown in Appendix B of this ~~Draft~~ Final PEA. If the potential SOx controls are installed and operated on a per facility and per source category basis for Option 1 under Alternative C, respectively, Tables 5-20 and 5-21 summarize the estimated impacts on operational natural gas and electricity use for Option 1. Similarly, Tables 5-22 and 5-23 summarize the estimated impacts on operational natural gas and electricity use for Alternative C - Option 2.

Table 5-20
Alternative C - Option 1: Operational Energy Use By Facility

Facility ID	**Potential SOx Control**	**Natural Gas** (MMBTU/day)	**Electricity** (kWh/day)
A	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	0 + - 5.70 **- 5.70**	27,136 + 3,797 **30,933**
B	1 WGS for FCCU (new)	**0**	**35,749**
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Cansolv/sulfuric acid unit (modified)	-2.82+ 0 **-2.82**	1,306+ 0 **1,306**
D	1 FGT by Merox Treatment Upgrade (modified)	**1.21**	**1,423**
E	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	0 + -40.49 **-40.49**	19,887 + 6,626 **26,514**
F	1 WGS for FCCU (new) 1 FGT by Amine Additive (modified)	0 + 5.48 **5.48**	20,445 + 55 **20,500**
G	1 FGT by Merox Treatment Upgrade (modified)	**8.08**	**9,443**
H	1 WGS for calciner (new)	**0**	**17,711**
I	2 WGSs for glass melting furnaces (new)	**0**	**5,694**
J	1 WGS for sulfuric acid unit (new)	**0**	**9,659**
K	2 DGSs for cement kilns (new)	**0**	**23,288**
	TOTAL	**-34.25***	**182,218**

* A negative number means a reduction in usage or demand.

Table 5-21
Alternative C - Option 1: Operational Energy Use By Source Category

Equipment/ Source Category	**Natural Gas** (MMBTU/day)	**Electricity** (kWh/day)
FCCUs	0	103,217
SRU/TGUs	0	0
Refinery Boilers/Heaters	-34.25*	22,649
Coke Calciner	0	17,711
Glass Melting Furnaces	0	5,694
Sulfuric Acid Manufacturing	0	9,659
Cement Kilns	0	23,288
TOTAL	**-34.25***	**182,218**

* A negative number means a reduction in usage or demand.

Table 5-22
Alternative C - Option 2: Operational Energy Use By Facility

Facility ID	**Potential SOx Control**	**Natural Gas** (MMBTU/day)	**Electricity** (kWh/day)
A	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + - 5.70 **- 5.70**	0 + 3,797 **3,797**
B	1 SOx Reducing Additive Hopper for FCCU (modified)	**0**	**0**
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Cansolv/sulfuric acid unit (modified)	-2.82+ 0 **-2.82**	1,306+ 0 **1,306**
D	1 SOx Reducing Additive Hopper for FCCU (new) 1 FGT by Merox Treatment Upgrade (modified)	0 + 1.21 **1.21**	0 + 1,423 **1,423**
E	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + -40.49 **-40.49**	0 + 6,626 **6,626**
F	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Amine Additive (modified)	0 + 5.48 **5.48**	0 + 55 **55**
G	1 FGT by Merox Treatment Upgrade (modified)	**8.08**	**9,443**
H	1 WGS for calciner (new)	**0**	**17,711**
I	2 WGSs for glass melting furnaces (new)	**0**	**5,694**
J	1 WGS for sulfuric acid unit (new)	**0**	**9,659**
K	2 DGSs for cement kilns (new)	**0**	**23,288**
	TOTAL	**-34.25***	**79,000**

* A negative number means a reduction in usage or demand.

Table 5-23
Alternative C - Option 2: Operational Energy Use By Source Category

Equipment/ Source Category	**Natural Gas** (MMBTU/day)	**Electricity** (kWh/day)
FCCUs	0	0
SRU/TGUs	0	0
Refinery Boilers/Heaters	-34.25*	22,649
Coke Calciner	0	17,711
Glass Melting Furnaces	0	5,694
Sulfuric Acid Manufacturing	0	9,659
Cement Kilns	0	23,288
TOTAL	**-34.25***	**79,000**

* A negative number means a reduction in usage or demand.

For Alternative C - Option 1, the analysis shows an overall decrease in natural gas demand of approximately 34.25 MMBTU per day (equivalent to 0.034 MMcf/day) and an overall increase in electricity demand of 182,218 kWh/day (equivalent to 182 MWh/day) for the affected source categories. For Alternative C - Option 2, the analysis shows the same overall decrease in natural gas demand as Alternative C – Option 1, approximately 34.25 MMBTU/day (equivalent to 0.034 MMcf/day) and an overall increase in electricity demand of 79,000 kWh/day (equivalent to 79 MWh/day) for the affected source categories.

In addition, as part of operation for some WGSs and FGTs, NaOH caustic soda solution is required. For Alternative C - Option 1, 13.24 tons per day of NaOH is estimated to be needed and for Alternative C - Option 2, 8.79 tons per day of NaOH may be needed. NaOH is produced locally by several chemical processing companies and as such, is locally available for transport. Further, it is likely that the existing local caustic manufacturers can handle the proposed increase in caustic for the entire project. To accommodate the estimated increase in caustic demand, the chemical processing companies may need to increase production, which, in turn, will use more electricity. It takes approximately 2,500 kWh to produce one metric ton of NaOH. Thus, the approximate amount of additional electricity that may be needed to produce additional caustic to meet the needs of Option 1 and Option 2 under Alternative C, are 30,023 kWh/day and 19,940 kWh/day, respectively, and are calculated as follows:

Alternative C - Option 1:

$$\frac{13.24 \text{ tons NaOH}}{\text{Day}} \times \frac{2{,}000 \text{ lbs}}{\text{Ton}} \times \frac{1 \text{ metric ton}}{2{,}205 \text{ lbs}} \times \frac{2{,}500 \text{ kWh}}{1 \text{ metric ton of NaOH produced}} = \mathbf{30{,}023\ kWh/day}$$

Alternative C - Option 2:

$$\frac{8.79 \text{ tons NaOH}}{\text{Day}} \times \frac{2{,}000 \text{ lbs}}{\text{Ton}} \times \frac{1 \text{ metric ton}}{2{,}205 \text{ lbs}} \times \frac{2{,}500 \text{ kWh}}{1 \text{ metric ton of NaOH produced}} = \mathbf{19{,}932\ kWh/day}$$

The overall electricity needed to implement both Options 1 and 2 under Alternative C as summarized in Tables 5-20, 5-21, 5-22 and 5-23 include the amount of electricity that may be needed to produce additional NaOH. To determine if the operational energy use is significant for Options 1 and 2 under Alternative C, the total for natural gas and electricity was compared to the threshold fuel supply as shown in Table 5-24. California utilities and non-utilities have the ability to receive approximately 9,330 MMcf/day of natural gas[95], [96], [97]. Since both Options 1 and 2 under Alternative C do not exceed the SCAQMD's energy threshold of one percent of supply for both natural gas and electricity, Alternative C is expected to have less than significant energy impacts. Further, because the increase in electricity demand for both Options 1 and 2 under Alternative C is below the SCAQMD's energy significance threshold of one percent above available supplies, any increased demand that may result from either Option 1 or 2 under Alternative C can likely be met with the existing electrical capacity at each of the affected facilities. Lastly, based on this analysis, it is not anticipated that new or substantially altered power utility systems will need to be built to accommodate any additional electricity demands created by either Option 1 or 2 under Alternative C.

Table 5-24
Alternative C: Total Projected Natural Gas and Electricity Impacts for Operation Activities

Operation Activity	Total Energy Usage per Activity	
	Natural Gas[a]	Electricity
Alternative C -Option 1	-0.034 MMcf	182 MWh/day = 7.6 MW (instantaneous)
Threshold Fuel Supply	9,330 MMcf [b]	8,362 MW [c] (instantaneous)
% of Fuel Supply	-0.0004 %	0.09%
Significant (Yes/No) [d]	No	No
Alternative C - Option 2	-0.034 MMcf	79 MWh/day = 3.3 MW (instantaneous)
Threshold Fuel Supply	9,330 MMcf [b]	8,362 MW [c] (instantaneous)
% of Fuel Supply	-0.0004 %	0.04%
Significant (Yes/No) [d]	No	No

[a] A negative number is a reduction in the use of natural gas consumption.
[b] Natural Gas Infrastructure Draft Staff Paper, California Energy Commission, May 2009 (CEC-200-2009-004-SD). http://www.energy.ca.gov/2009publications/CEC-200-2009-004/CEC-200-2009-004-SD.PDF
[c] California Energy Demand 2008-2018 Staff Revised Forecast, Staff Final Report, California Energy Commission, , November 2007 (CEC-200-2007-015-SF2). See Form 1.4 b, Peak Demand by LSE: summer Peak Demand Coincident with Planning Area Peak for the following agencies/areas: SCE (Anaheim, Azusa, Banning, Colton, Metropolitan Water District, Rancho Cucamonga, Riverside and Vernon), Cities of Burbank, Glendale and Pasadena, and LADWP. http://www.energy.ca.gov/2007publications/CEC-200-2007-015/CEC-200-2007-015-SF2.PDF
[d] SCAQMD's Energy Threshold for both Natural Gas and Electricity is 1% of Supply.

KEY: MMcf = million standard cubic feet
MW(Megawatt) = 1 MW = 1,000 kilowatts (KW)

In addition, Table 5-25 presents a summary of the total projected fuel usage (i.e., diesel and gasoline) for both construction and operational activities for both Options 1 and 2 under

[95] Natural Gas Infrastructure – Draft Staff Paper, California Energy Commission, CEC-200-2009-004-SD, May 2009. http://www.energy.ca.gov/2009publications/CEC-200-2009-004/CEC-200-2009-004-SD.PDF

[96] 2008 California Gas Report, Prepared by the California Gas and Electric Utilities. http://www.energy.ca.gov/2008publications/GAS-1000-2008-020/GAS-1000-2008-020.PDF

[97] An Overview of Natural Gas in California, California Energy Commission, CEC-180-2008-005, April 2008. http://www.energy.ca.gov/2008publications/CEC-180-2008-005/CEC-180-2008-005.PDF

Alternative C. For Alternative C - Option 1, the analysis shows an overall increase in diesel and gasoline use of approximately 3,493 ~~2,410~~ gallons per day and 1,354 ~~1,384~~ gallons per day, respectively. Similarly for Alternative C - Option 2, the analysis shows an overall increase in diesel and gasoline use of approximately ~~2,180~~ 3,127 gallons per day and 1,354 ~~1,384~~ gallons per day, respectively.

Since neither Option 1 nor Option 2 under Alternative C exceeds the SCAQMD's energy threshold of one percent of supply for both diesel and gasoline fuels as shown in Table 5-25 below, both Options 1 and 2 under Alternative C are expected to have less than significant energy impacts due to fuel use. Further, once construction is completed, the fuel use projected during the temporary phases (e.g., Phase I: Demolition and Phase II: Construction) will end and only the fuel use for truck trips associated with chemical deliveries and solid waste removal activities during Phase III: Operations will continue. Thus, any potential adverse fuel impacts will likely be less than what has been analyzed during the peak under Alternative C.

Table 5-25
Alternative C: Total Projected Fuel Usage

Activity	Total Fuel Usage per Activity (gallons/day)	
	Diesel	**Gasoline**
Alternative C - Option 1: Phase I - Demolition Overlapping with Phase II - Construction at Four Facilities (Construction Equipment and Workers Vehicles)	1,360	1,354
Alternative C - Option 1: Phase III: Operation (Chemical Deliveries & Solid Waste Removal)	2,133~~1,703~~	0
Total Usage for Alternative C - Option 1:	3,493~~3,063~~	1,354
Threshold Fuel Supply[a]	1,086,000,000	6,469,000,000
% of Fuel Supply	0.0003%	0.00002%
Significant (Yes/No)[b]	No	No
Alternative C - Option 2: Phase I - Demolition Overlapping with Phase II - Construction at Four Facilities (Construction Equipment and Workers Vehicles)	1,360	1,354
Alternative C - Option 2: Phase III: Operation (Chemical Deliveries & Solid Waste Removal)	1,767~~1330~~	0
Total Usage for Alternative C - Option 2:	3,127~~2,690~~	1,354
Threshold Fuel Supply[a]	1,086,000,000	6,469,000,000
% of Fuel Supply	0.0003~~2~~%	0.00002%
Significant (Yes/No)[b]	No	No

[a] Year 2000 California Energy Commission (CEC) projections. Construction activities in future years would yield similar results.
[b] SCAQMD's energy threshold for both diesel and gasoline is 1% or more of supply.

Like the proposed project, neither Option 1 nor Option 2 under Alternative C is subject to any existing energy conservation plans. If any facility that is subject to Alternative C is also subject to energy conservation plans, it is not expected that Alternative C will affect in any way or interfere with that individual facility's ability to comply with its energy conservation plan or energy standards. Further, construction and operation activities under Alternative C will not utilize non-renewable resources in a wasteful or inefficient manner. Lastly, it is expected that the installation and operation of any equipment used to comply with Alternative C will also comply with all applicable existing energy standards. In summary, the energy impacts from both Option 1 and Option 2 under Alternative C are concluded to be less than significant.

HAZARDS AND HAZARDOUS MATERIALS

Alternative A - No Project

Alternative A is not expected to generate significant adverse hazards and hazardous materials impacts primarily because the owners/operators of the affected sources would not have to install new or modify existing control equipment (i.e., WGSs, DGSs, SOx-reducing additives, et cetera) whereby no additional SOx emissions would be reduced and no new hazards regarding the handling of hazardous materials would be needed, such as deliveries of NaOH. Further, Alternative A is not expected to alter the deliveries, use and amounts of NaOH at the affected facilities. Instead, owners/operators of affected facilities would continue existing operations that would comply with all applicable existing SCAQMD, CARB and USEPA requirements. By not adopting the proposed project, with respect to hazards and hazardous materials, current operations at each facility would be expected to continue to emit SOx at the levels allowed by the current version of Regulation XX without impacting the deliveries, quantities, and use (or disposal) of hazardous materials (NaOH).

Alternative B – AQMP

Because Alternative B applies the same SOx emission reduction targets as the proposed project but to less equipment/source categories (i.e., sulfuric acid manufacturing, coke calciner, and glass melting furnace), less add-on control equipment will be installed (i.e., four WGSs). Table 5-26 summarizes the substances that are currently used and that may be used in response to Alternative B.

Table 5-26
Alternative B: Substances To Be Used by SOx Control Technologies

Equipment/ Source Category	Current SOx Control Technology	Substances Currently Used for SOx Control	Proposed SOx Control Technology	Proposed Substances To Be Used/Increased for SOx Control
Sulfuric Acid	Catalytic Converter	Catalyst	1 WGS for 1 facility (new)	NaOH Caustic
Sulfuric Acid	Cansolv Unit	Cansolv amine	1 Upgrade to Existing Cansolv Unit for 1 facility (modified)	Water
Coke Calciner	DGS	CaOH absorbent	1 WGS for 1 facility (new)	NaOH Caustic
Glass Melting Furnace	DGSs	Trona	2 WGSs for 1 facility (new)	NaOH Caustic

Key: WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber

Table 5-27 summarizes the substances that may be involved in the various processes at the affected facilities under Alternative B. Some of the substances listed are considered hazardous while others are not. Of the substances listed, the only net increase in the use of a hazardous material will be for NaOH. For the remaining substances identified, there will be either a decrease in use or no change from the existing setting under Alternative B.

Table 5-27
Alternative B: Substances that May Be Affected By The Proposed Project

Substance	Potential Overall Increase, Decrease, or No Change from Existing Setting?	Contains TAC(s) per SCAQMD Rule 1401?	Hazardous per CalARP?	NFPA Rating: Health (Blue)	NFPA Rating: Flammability (Red)	NFPA Rating: Reactivity (Yellow)	NFPA Rating: Special (White)
NaOH Caustic (50% by weight)	Increase	Yes, Acute (non-cancer)	Yes	3	0	1	None
Sulfuric Acid	No Change	Yes, cancer/ chronic & acute	Yes	3	0	2	Water Reactive
Cansolv	No Change	Yes, cancer/ chronic & acute	Yes	N/A	N/A	N/A	N/A
COS	Decrease	No	Yes	2	0	1	None
H2S	Decrease	Yes, cancer/ chronic & acute	Yes	4	4	0	None
SO2	Decrease	No	Yes	3	0	0	None
SO3	Decrease	Yes, cancer/ chronic & acute (pending)	Yes	3	0	2	None

NFPA Hazard Code Key: 4 = Extreme; 3 = High; 2 = Moderate; 1 = Slight; 0 = Insignificant; N/A = NFPA hazard is not assigned.

Emission sources associated with the operational-related activities as a result of implementing Alternative B may emit TACs because NaOH caustic is used to operate WGSs for the affected source categories. With the potential for the installation of four WGS under Alternative B, that means a maximum of four NaOH storage tanks may be installed. As previously analyzed in the air quality discussion, NaOH is a toxic air contaminant that is a non-cancerous but acutely hazardous substance. For "worst-case" operations, 5.45 tons per day of NaOH (50 percent solution, by weight) is estimated to be needed to operate four WGSs under Alternative B. Even though the facilities that may be affected by Alternative B may currently use NaOH elsewhere in their facilities, for the purpose of conducting a "worst-case" construction analysis, one 10,000 gallon storage tank for caustic solution was assumed to be constructed for every WGS installed. Of the four facilities that would be affected by Alternative B, three were projected to have an increased demand in NaOH use for WGS operations. As summarized in Table 5-28, for each facility that was projected to increase the use in the acutely hazardous substance NaOH, the filling loss and the working loss of each NaOH tank was calculated, added together, and that sum was compared to the most stringent Rule 1401 Screening Emission Level for NaOH (0.004 pounds per hour at the nearest receptor distance of 25 meters). None of the total hourly loss projections exceeded the acute screening level for NaOH for any of the affected facilities. Because the screening level for NaOH was not exceeded for any of the affected facilities, no significant air quality operational impacts with respect to toxics are expected from the proposed project. NaOH is not classified as a carcinogen, so a cancer risk analysis was not performed.

Table 5-28
Alternative B: Summary of Filling and Working Losses for NaOH Storage Tanks

Facility ID	Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM10) Filling Loss (lb/hr)	B: Hourly NaOH (as PM10) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM10) Losses (lb/hr)	NaOH Acute Screening Level at 25 meters (lb/hr)	Do Total Hourly Losses Exceed Acute Screening Level For NaOH? (Yes/No)
A	0.00	0	0	0	4.00E-03	NO
B	0.00	0	0	0	4.00E-03	NO
C	0.00	0	0	0	4.00E-03	NO
D	0.00	0	0	0	4.00E-03	NO
E	0.00	0	0	0	4.00E-03	NO
F	0.00	0	0	0	4.00E-03	NO
G	0	0	0	0	4.00E-03	NO
H	3.37	7.60E-04	2.28E-03	3.04E-03	4.00E-03	NO
I	0.79	1.78E-04	5.35E-04	7.14E-04	4.00E-03	NO
J	1.30	2.93E-04	8.78E-04	1.17E-03	4.00E-03	NO
K	0	0	0	0	4.00E-03	NO
Total	**5.45**					

To accommodate the increased demand in NaOH, there will be an increase in truck deliveries to supply NaOH to the facilities that need it. It is expected that the affected facilities will receive NaOH from a local supplier located in the greater Los Angeles area. Deliveries of NaOH (50 percent by weight) would be made by tanker truck via public roads. The maximum capacity of a NaOH tanker truck is approximately 6,000 gallons. The projected onsite storage capacity and consumption rates of NaOH as well as the projected annual deliveries are summarized in Table 5-29. Based on the annual deliveries estimates, each facility is not expected to exceed the peak daily of one delivery per day per facility. However, the "worst-case" assumption for a peak daily delivery frequency from a supplier would be to deliver 6,000 gallons of NaOH to each of four facilities to fill four new NaOH tanks on the same day. Regulations for the transport of hazardous materials by public highway are described in 49 CFR §§ 173 and 177.

Table 5-29
Alternative B: Summary of NaOH Deliveries

Facility ID	Daily Increase in NaOH Demand (tons/day)	Annual Increase in NaOH Demand (tons/year)	Annual NaOH Deliveries [1] (truck trips/year)
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0
F	0	0	0
G	0	0	0
H	3.37	1,228	32
I	0.79	289	8
J	1.30	473	13
K	0	0	0
Total	**5.45**	**1,990**	**53**

[1] Annual NaOH deliveries are calculated based on one delivery truck holding 6,000 gallons per truck load. For example, for Facility H: 1,228 tons/yr NaOH x 2,000 lbs/ ton = 328,000 lbs/yr x 1 gal NaOH @ 50%/12.77 lbs = 192,326 gal/year x 1 truck/6,000 gallons = 32 trucks/year.

The onsite storage and handling of NaOH creates the possibility of an accidental spill and release of NaOH. However, because NaOH has such a low vapor pressure (6.33 mm Hg at 40 ^{o}C or 104 ^{o}F) when compared to water (55.3 mm Hg at 40 ^{o}C 104 ^{o}F) at the same temperature, any spill of NaOH would not be expected to evaporate faster than water. Thus any spill of NaOH would be expected to stay in liquid form and would not likely exceed the ERPG-2 vapor concentration of five milligrams per cubic meter for NaOH. Further, operators at each affected facility who construct a new NaOH storage tank will need to build a containment berm large enough to hold 110 percent of the tank capacity in the event of an accidental release due to tank rupture. Thus, any spill of NaOH would not be expected to migrate beyond the boundaries of the berm on-site. Thus, any spill of NaOH is not expected to present a potential offsite public and sensitive receptor exposure. Lastly, since NaOH is not a flammable compound, other types of heat-related hazard impacts such as fires, explosions, boiling liquid – expanding vapor explosion (BLEVE) are not expected to occur and, therefore, will not be evaluated as part of this hazards analysis.

In conclusion, the hazards and hazardous materials impacts due to the use, tank rupture and the accidental release of NaOH will be less than significant for Alternative B.

Alternative C – Intermediate SOx Reductions

Alternative C proposes the same SOx emission reduction targets as the proposed project for the following equipment/source categories: FCCUs, sulfuric acid manufacturing, coke calciner, glass melting furnace, and cement kilns. Like the proposed project, there are two SOx control approaches that can be applied to FCCUs under Alternative C. For this reason, Alternative C has been bifurcated into two options: Option 1 assumes that WGSs will be the control approach for FCCUs; and, Option 2 assumes that SOx reducing additives will be the control approach for

FCCUs. The remaining source categories and their respective control approaches applicable to Alternative C will be the same for both Option 1 and Option 2.

Because less add-on control equipment would be expected to be installed under Alternative C (i.e., eight WGSs plus two DGSs under Option 1 and four WGSs plus two DGSs under Option 2) in order to achieve the proposed SOx emission limits as compared to the proposed project (i.e., 11 WGSs plus two DGSs for Option 1 and seven WGSs plus to DGSs under Option 2), less hazardous materials would needed under Alternative C. Table 5-30 summarizes the substances that are currently used and that may be used in response to Alternative C.

Table 5-30
Alternative C: Substances To Be Used by SOx Control Technologies

Equipment/ Source Category	Current SOx Control Technology	Substances Currently Used for SOx Control	Proposed SOx Control Technology	Proposed Substances To Be Used/Increased for SOx Control
FCCU	SOx Reducing Additives	Specialty Catalyst	Option 1: WGSs Option 2: Increase amount of SOx Reducing Additives	Option 1: NaOH Caustic Option 2: Specialty Catalyst
Sulfuric Acid	Catalytic Converter	Catalyst	1 WGS for 1 facility (new)	NaOH Caustic
Sulfuric Acid	Cansolv Unit	Cansolv amine	1 Upgrade to Existing Cansolv Unit for 1 facility (modified)	Water
Coke Calciner	DGS	CaOH absorbent	1 WGS for 1 facility (new)	NaOH Caustic
Glass Melting Furnace	DGSs	Trona	2 WGSs for 1 facility (new)	NaOH Caustic
Cement Kiln	None	None	2 DGS (Limestone Absorber) for 1 facility (new)	Limestone
Refinery Boilers/ Heaters	Amine Absorbers	Amines (MEA & DEA)	3 FGTs by Sulfinol Conversion for 3 facilities (modified)	Sulfolane and DIPA
Refinery Boilers/ Heaters	Amine Absorbers	Amine (MEA) & Caustic (NaOH)	2 FGTs by Merox Treatment Upgrades for 2 facilities (modified)	1. Merox Catalyst 2. NaOH Caustic
Refinery Boilers/ Heaters	Amine Absorbers	Amine (MDEA)	1 FGT by Amine Additive for 1 facility (modified)	TG-10 amine

Key: WGS = Wet Gas Scrubber; DGS = Dry Gas Scrubber; FGT = Fuel Gas Treatment

Table 5-31 summarizes the substances that may be involved in the various processes at the affected facilities under Alternative C. Some of the substances listed are considered hazardous while others are not. Of the substances listed in Table 5-31, the only net increase in the use of a hazardous material will be for NaOH. For the remaining substances identified, there will be either a decrease in use or no change from the existing setting under Alternative C.

Table 5-31
Alternative C: Substances that May Be Affected By The Proposed Project

Substance	Potential Overall Increase, Decrease, or No Change from Existing Setting?	Contains TAC(s) per SCAQMD Rule 1401?	Hazardous per CalARP?	NFPA Rating: Health (Blue)	NFPA Rating: Flammability (Red)	NFPA Rating: Reactivity (Yellow)	NFPA Rating: Special (White)
DIPA	Increase	No	No	3	1	0	None
Limestone (calcium carbonate)	Increase	No	No	N/A	N/A	N/A	N/A
Merox Catalyst	Increase	No	No	N/A	N/A	N/A	N/A
NaOH Caustic (50% by weight)	Increase	Yes, Acute (non-cancer)	Yes	3	0	1	None
SOxGetter/ Super SOxGetter Catalyst	Increase	No	No	1	0	0	None
Sulfur (Elemental)	Increase	No	No	2	1	0	None
Sulfolane	Increase	No	No	1	1	0	None
Super DeSOx Catalyst	Increase	No	No	2	0	0	None
TG-10	Increase	No	No	1	1	0	None
Sulfuric Acid	No Change	Yes, cancer/ chronic & acute	Yes	3	0	2	Water Reactive
Cansolv	No Change	Yes, cancer/ chronic & acute	Yes	N/A	N/A	N/A	N/A
MDEA	No Change	No	No	N/A	N/A	N/A	N/A
COS	Decrease	No	Yes	2	0	1	None
DEA	Decrease	Yes, cancer/ chronic	No	1	1	0	None
Ethyl-Mercaptan	Decrease	No	Yes	1	4	1	None
H2S	Decrease	Yes, cancer/ chronic & acute	Yes	4	4	0	None
MEA	Decrease	No	No	3	2	0	None
Methyl Mercaptan	Decrease	No	Yes	3	4	0	None
SO2	Decrease	No	Yes	3	0	0	None
SO3	Decrease	Yes, cancer/ chronic & acute (pending)	Yes	3	0	2	None

NFPA Hazard Code Key: 4 = Extreme; 3 = High; 2 = Moderate; 1 = Slight; 0 = Insignificant; N/A = NFPA hazard is not assigned.

Emission sources associated with the operational-related activities as a result of implementing the Alternative C may emit TACs because NaOH caustic is used in the operation of the WGSs. With the potential for the installation of eight WGSs under Option 1 and four WGSs under Option 2 for Alternative C, that means a maximum of eight NaOH caustic storage tanks under Option 1 and four NaOH caustic storage tanks under Option 2 may be installed to supply the WGSs. NaOH is a toxic air contaminant that is a non-cancerous but acutely hazardous substance. In addition, two more NaOH storage tanks would be needed under both Option 1 and

Option 2 to support the operations of two FGT modifications for the refinery boiler/heater source category at two facilities.

Of the facilities affected by the Alternative C, seven facilities were projected to have an increased demand in NaOH use for WGS operations plus two for FGT for refinery boilers and heaters under Option 1 and three facilities were projected to have an increased demand in NaOH use for WGS operations plus two for FGT for refinery boilers and heaters under Option 2.

For "worst-case" operations under Alternative C, 13.24 tons per day of NaOH (50 percent solution, by weight) is estimated to be needed to operate eight WGSs plus two FGTs for refinery boilers and heaters under Option 1 and 8.79 tons per day of NaOH (50 percent solution, by weight) is estimated to be needed to operate four WGSs plus two FGTs for refinery boilers and heaters under Option 2. For the purpose of conducting a "worst-case" construction analysis, one 10,000 gallon storage tank for caustic solution was assumed to be constructed for every WGS installed and for every FGT modification that utilizes NaOH. As summarized in Tables 5-32 and 5-33, for each facility that was projected to increase the use in the acutely hazardous substance NaOH, the filling loss and the working loss of each NaOH tank was calculated, added together, and that sum was compared to the most stringent Rule 1401 Screening Emission Level for NaOH (0.004 pounds per hour at the nearest receptor distance of 25 meters). None of the total hourly loss projections exceeded the acute screening level for NaOH for any of the affected facilities under Option 1 or Option 2 for Alternative C. Because the screening level for NaOH was not exceeded for any of the affected facilities, no significant air quality operational impacts with respect to toxics are expected from Alternative C. NaOH is not classified as a carcinogen, so a cancer risk analysis was not performed for Alternative C.

Table 5-32
Alternative C – Option 1: Summary of Filling and Working Losses for NaOH Storage Tanks

Facility ID	Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM10) Filling Loss (lb/hr)	B: Hourly NaOH (as PM10) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM10) Losses (lb/hr)	NaOH Acute Screening Level at 25 meters (lb/hr)	Do Total Hourly Losses Exceed Acute Screening Level For NaOH? (Yes/No)
A	0.81	1.82E-04	5.46E-04	7.28E-04	4.00E-03	NO
B	1.17	2.64E-04	7.93E-04	1.06E-03	4.00E-03	NO
C	0.00	0	0	0	4.00E-03	NO
D	0.44	9.90E-05	2.97E-04	3.96E-04	4.00E-03	NO
E	0.45	1.01E-04	3.04E-04	4.06E-04	4.00E-03	NO
F	2.02	4.57E-04	1.37E-03	1.83E-03	4.00E-03	NO
G	2.90	6.56E-04	1.97E-03	2.62E-03	4.00E-03	NO
H	3.37	7.60E-04	2.28E-03	3.04E-03	4.00E-03	NO
I	0.79	1.78E-04	5.35E-04	7.14E-04	4.00E-03	NO
J	1.30	2.93E-04	8.78E-04	1.17E-03	4.00E-03	NO
K	0	0	0	0	4.00E-03	NO
Total	13.24					

Table 5-33
Alternative C – Option 2: Summary of Filling and Working Losses for NaOH Storage Tanks

Facility ID	Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM10) Filling Loss (lb/hr)	B: Hourly NaOH (as PM10) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM10) Losses (lb/hr)	NaOH Acute Screening Level at 25 meters (lb/hr)	Do Total Hourly Losses Exceed Acute Screening Level For NaOH? (Yes/No)
A	0	0	0	0	4.00E-03	NO
B	0	0	0	0	4.00E-03	NO
C	0	0	0	0	4.00E-03	NO
D	0.44	9.90E-05	2.97E-04	3.96E-04	4.00E-03	NO
E	0	0	0	0	4.00E-03	NO
F	0	0	0	0	4.00E-03	NO
G	2.90	6.56E-04	1.97E-03	2.62E-03	4.00E-03	NO
H	3.37	7.60E-04	2.28E-03	3.04E-03	4.00E-03	NO
I	0.79	1.78E-04	5.35E-04	7.14E-04	4.00E-03	NO
J	1.30	2.93E-04	8.78E-04	1.17E-03	4.00E-03	NO
K	0	0	0	0	4.00E-03	NO
Total	**8.79**					

To accommodate the increased demand in NaOH, there will be an increase in truck deliveries to supply NaOH to the facilities that need it. It is expected that the affected facilities will receive NaOH from a local supplier located in the greater Los Angeles area. Deliveries of NaOH (50 percent by weight) would be made by tanker truck via public roads. The maximum capacity of a NaOH tanker truck is approximately 6,000 gallons. The projected onsite storage capacity and consumption rates of NaOH as well as the projected annual deliveries are summarized in Tables 5-34 and 5-35 for Options 1 and 2 of Alternative C, respectively. Based on the annual deliveries estimates, each facility is not expected to exceed the peak daily of one delivery per day per facility. However, the "worst-case" assumption for a peak daily delivery frequency from a supplier would be to deliver 6,000 gallons of NaOH to each of four facilities to fill four new NaOH tanks on the same day. Regulations for the transport of hazardous materials by public highway are described in 49 CFR §§ 173 and 177.

Table 5-34
Alternative C - Option 1: Summary of NaOH Deliveries

Facility ID	Daily Increase in NaOH Demand (tons/day)	Annual Increase in NaOH Demand (tons/year)	Annual NaOH Deliveries [1] (truck trips/year)
A	0.81	294	8
B	1.17	427	12
C	0	0	0
D	0.44	160	5
E	0.45	164	5
F	2.02	738	20
G	2.90	1,060	28
H	3.37	1,228	32
I	0.79	289	8
J	1.30	473	13
K	0	0	0
Total	**13.24**	**4,833**	**131**

[1] Annual NaOH deliveries are calculated based on one delivery truck holding 6,000 gallons per truck load. For example, for Facility A: 294 tons/yr NaOH x 2,000 lbs/ ton = 328,000 lbs/yr x 1 gal NaOH @ 50%/12.77 lbs = 46,045 gal/year x 1 truck/6,000 gallons = 8 trucks/year.

Table 5-35
Alternative C - Option 2: Summary of NaOH Deliveries

Facility ID	Daily Increase in NaOH Demand (tons/day)	Annual Increase in NaOH Demand (tons/year)	Annual NaOH Deliveries [1] (truck trips/year)
A	0	0	0
B	0	0	0
C	0	0	0
D	0.44	160	5
E	0	0	0
F	0	0	0
G	2.90	1,060	28
H	3.37	1,228	32
I	0.79	289	8
J	1.30	473	13
K	0	0	0
Total	**8.79**	**3,210**	**86**

[1] Annual NaOH deliveries are calculated based on one delivery truck holding 6,000 gallons per truck load. For example, for Facility A: 294 tons/yr NaOH x 2,000 lbs/ ton = 328,000 lbs/yr x 1 gal NaOH @ 50%/12.77 lbs = 46,045 gal/year x 1 truck/6,000 gallons = 8 trucks/year.

The onsite storage and handling of NaOH creates the possibility of an accidental spill and release of NaOH. However, because NaOH has such a low vapor pressure (6.33 mm Hg at 40 ^{o}C or 104 ^{o}F) when compared to water (55.3 mm Hg at 40 ^{o}C 104 ^{o}F) at the same temperature, any spill of NaOH would not be expected to evaporate faster than water. Thus any spill of NaOH would be expected to stay in liquid form and would not likely exceed the ERPG-2 vapor concentration of five milligrams per cubic meter for NaOH. Further, operators at each affected facility who construct a new NaOH storage tank will need to build a containment berm large enough to hold 110 percent of the tank capacity in the event of an accidental release due to tank rupture. Thus, any spill of NaOH would not be expected to migrate beyond the boundaries of the berm on-site.

Thus, any spill of NaOH is not expected to present a potential offsite public and sensitive receptor exposure. Lastly, since NaOH is not a flammable compound, other types of heat-related hazard impacts such as fires, explosions, boiling liquid – expanding vapor explosion (BLEVE) are not expected to occur and, therefore, will not be evaluated as part of this hazards analysis.

In conclusion, the hazards and hazardous materials impacts due to the use, tank rupture and the accidental release of NaOH will be less than significant for Alternative C.

HYDROLOGY AND WATER QUALITY

Alternative A - No Project

The project-specific hydrology and water quality impacts associated with the installation of multiple SOx control devices (e.g., WGSs and DGSs) would be eliminated under Alternative A, the no project alternative, since no construction activities would occur and no new equipment would be installed at any of the affected facilities that would need additional water or would generate additional wastewater. Under Alternative A, the hydrology and water quality impacts would remain unchanged from the existing setting and therefore, would be less than significant.

Alternative B – AQMP

Because Alternative B applies the same SOx emission reduction targets as the proposed project but to less equipment/source categories (e.g., sulfuric acid manufacturing, coke calciner, and glass melting furnace), less add-on control equipment will be installed (i.e., four WGSs) such that less water demand and wastewater generation would occur. The following analysis will demonstrate that the projected increases in water demand and wastewater generation associated with Alternative B will be less than significant because the amount of additional water demand and wastewater generation associated with the installation and operation of the new SOx controls are below the applicable hydrology and water quality significance criteria. While less WGSs would be installed under Alternative B, adverse hydrology and water quality impacts are expected to occur but they will be less than the proposed project.

Water demand and wastewater generation information as it relates to construction and operational activities under Alternative B was derived as part of the hydrology and water quality analysis in Chapter 4 and the calculations are shown in Appendix B of this ~~Draft~~ Final PEA.

Construction Water Demand

Implementation of Alternative B is expected to result in construction activities associated with installing new or modifying existing SOx control equipment at the affected facilities, which are complex, well-established and mostly paved, industrial facilities. Depending on the proposed location within each facility's boundaries for the siting of any new control equipment that may be installed as a result of implementing Alternative B, construction activities such as digging, earthmoving, grading, slab pouring, or paving could occur if the proposed site for the new equipment is not suitable in its present form (e.g., graded with a foundation slab). Table 5-36 contains a summary of the estimates of plot space needed per facility under Alternative B.

Table 5-36
Alternative B: Potential Plot Space Needed For Proposed Control Technologies

Facility ID	Potential SOx Control	Plot Space Needed for Proposed Controls (square feet)
A	Not applicable to Alternative B	**0**
B	Not applicable to Alternative B	**0**
C	1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	**0**
D	Not applicable to Alternative B	**0**
E	Not applicable to Alternative B	**0**
F	Not applicable to Alternative B	**0**
G	Not applicable to Alternative B	**0**
H	1 WGS for calciner (new)	**1,200**
I	2 WGSs for glass melting furnaces (new)	**640**
J	1 WGS for sulfuric acid unit (new)	**500**
K	Not applicable to Alternative B	**0**
	TOTAL	**2,340**

Based on the consultant's surveys of the affected facilities, if all affected facilities conduct site preparation activities, the total amount of disturbed area for all of the facilities combined is estimated to be 2,340 square feet (0.05 acre) under Alternative B. However, even if all affected facilities intend to conduct site preparation, not much overlap of site preparation activities would be expected since there are several years between the proposed rule amendment date (2010) and the proposed compliance date (January 1, 2019) and because the plot spaces are small. Further, depending on the scale, site preparation typically can take anywhere from two weeks to one month. Therefore, it is unlikely that all affected facilities will do site preparation both in the same month of the same year. The largest parcel of land to be potentially disturbed at any one facility under Alternative B could occur at Facility H and is approximately 1,200 square feet which represents approximately 51 percent of the total area to be disturbed under Alternative B. Assuming that all three facilities conduct overlapping site preparation activities as a worst-case, then the potential peak area that could be disturbed at any one time would be 2,340 square feet under Alternative B.

In any case, the amount of area to be disturbed is small such that one backhoe should be sufficient for site preparation activities under Alternative B. Since one backhoe can trench approximately 0.1 acre per day or 4,356 square feet per day, earthmoving activities at Facility H would take approximately one day under Alternative B. Even if all three facilities conduct overlapping site preparation, earthmoving activities would take about the same amount of time since each plot space is relatively small (i.e., a ¼-acre plot or smaller) and there would be one backhoe in operation at each of the three facilities.

To comply with the dust suppression requirements in SCAQMD Rule 403 – Fugitive Dust, during site preparation activities, some water is expected to be used. For example, one water truck per affected facility may be needed for dust suppression activities during the initial site preparation/earth moving portion of the proposed project. One water truck can hold approximately 6,000 gallons for dust control and it can be refilled over the course of the day if more than 6,000 gallons is needed. By applying one gallon of water per square foot of disturbed area, at a minimum of two times per day as required to minimize fugitive dust, the total amount of water expected to be used for dust suppression is approximately 4,680 gallons per day under Alternative B. On windy days, it may be necessary to conduct a third water application. Thus, the total peak amount of water that could be used for dust suppression is approximately 7,020 gallons per day under Alternative B. In any case, one water truck would be sufficient, but it would need to be refilled to accommodate the additional 1, 020 gallons of water needed for dust suppression on windy days.

Due to the need to quickly construct a proper foundation for the proposed control equipment, earth moving activities during site preparation is expected to be a short duration lasting from two to three days to no longer than one month per facility. As such, the corresponding dust control activities are also not expected to last longer than one month per facility. Further, water used for dust suppression does not have to be of potable quality, but can be recycled water.

For the three facilities that may undergo site preparation activities, recycled water is not currently available. However, recycled water availability is expected to expand to Facility J by Summer 2013[98]. Thus, if site preparation activities occur after Summer 2013 at Facility J, then recycled water may be available to supply the peak 1,500 gallons per day that may be needed for dust suppression at that location.

Instead of installing new equipment, one facility operator (Facility C) may choose to modify or upgrade their existing SOx control equipment. In these cases, site preparation activities are not expected because the existing foundation and the existing equipment are expected to be reused in its current location and current plot space. Therefore, no water for dust suppression purposes is expected to be needed for any construction upgrades to existing SOx control equipment at Facility C.

Once constructed, but prior to operation, additional water is expected to be used to hydrostatically (pressure) test all vessels and pipelines to ensure each structure's integrity and wastewater may be created during the testing. Pressure testing is typically a one-time event, unless a leak is found. Similar to dust suppression, water used for pressure testing does not have to be of potable quality, but can be recycled water.

Even though the potential increase in water use under Alternative B is below the SCAQMD's five million gallons per day significance threshold for total water, it may be helpful to consider other criteria for evaluating what would be considered a substantial use of potable water, especially since California is in a State of Emergency for Drought. For example, CEQA Guidelines §15155 – City or County Consultation With Water Agencies, defines a "water demand" project in several ways. While the criteria for defining water demand are not significance thresholds per se, the criteria can provide some insight as to how city or county lead agencies evaluate water demand impacts. Most of the criteria in this part of the CEQA Guidelines do not have a numerical criterion or direct methodology to correlate the criteria in

98 Future access to recycled water for these five facilities is dependent upon the completion of the Harbor Refineries Recycled Water Pipeline Project (HRRWPP) by Summer 2013 (SCH No. 2008121093, certified on October 20, 2009). The HRRWPP will conserve potable water and instead produce and convey recycled water to multiple industrial and irrigation customers in the Los Angeles Harbor area (http://www.ladwp.com/ladwp/cms/ladwp011486.jsp). Proponents of the HRRWPP are working with each of the affected facilities to negotiate construction of a new water conveyance at their site in order to tie-into the recycled water pipeline.

terms of gallons per day for use as a significance threshold specific to potable water use. However, CEQA Guidelines §15155 (a)(1)(G) defines a water demand project as: "A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project." To estimate what this means in terms of quantifying how much potable water could be used by a 500 dwelling unit (DU) project, the California Department of Water resources relies on a conversion factor range of 0.3 to 0.5 acre-feet of potable water per year per DU as shown in the following calculation[99]:

$$(500\text{ DUs}) \times \frac{(0.3 - 0.5\text{ acre-feet/year})}{(1\text{ DU})} \times \frac{(325{,}851\text{ gallons})}{(1\text{ acre-foot})} \times \frac{(1\text{ year})}{(365\text{ days})} = 133{,}911\text{ gallons/day to } 223{,}186\text{ gallons/day}$$

Thus, the amount of water that would be needed during construction for dust suppression and pressure testing activities: 1) would not be considered a substantial use of potable water since the amount of plot space that would undergo site preparation and dust suppression activities is so small and the peak amount of water needed for these activities is small; and 2) is substantially less than the overall water demand significance threshold of five million gallons per day. Further, watering activities for dust suppression and pressure-testing are temporary and occur on a short-term basis. For these reasons, less than significant water demand/water use impacts are expected during construction of the proposed project.

Construction Water Quality

Any wastewater generated from pressure testing is expected to flow to each affected facility's wastewater treatment or collection system and recycled or discharged after treatment with process wastewater. Thus, wastewater generation from pressure testing activities is not expected to affect groundwater quality. Further, the volume of wastewater that will be generated from pressure testing is expected to be minimal and within the capacity of each facility's wastewater treatment and collection systems.

With the total amount of disturbed area for all of the facilities combined is estimated to be 2,340 square feet (0.05 acre) under Alternative B with the peak amount of area to be disturbed at Facility H at 1,230 square feet, a NPDES General Permit for Storm Water Discharges Associated with Construction Activity, also referred to as a Storm Water Construction Permit, would not be required for any of the affected facilities. Because Alternative B is expected to disturb substantially less than one acre per facility, on-site collection of storm water in each facility's storm water collection system is expected to be about the same as the amount currently collected. Therefore, no significant impacts are expected from storm water during construction.

Construction Conclusion

In summary, less than significant adverse water demand and wastewater impacts are expected during construction of Alternative B.

Operational Water Demand

Table 5-37 quantifies the potential increases in operational water use and wastewater generation that may occur as a result of installing new or upgrading existing SOx controls under Alternative B. If all of the proposed control technologies are installed or upgraded, the potential increase in water use is estimated to be approximately 0.12 MMgal/day under Alternative B. Further, if all

[99] Draft Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001 to assist water suppliers, cities, and counties in integrating water and land use planning, California Department of Water Resources, September 2002, p.3

of the proposed control technologies are installed or upgraded, the potential increase in wastewater generated would be approximately 0.04 MMgal/day under Alternative B. Hydrology and water quality impacts from Alternative B are discussed in detail in the following sections.

Table 5-37
Alternative B: Potential Increases in Operational Water Demand and Wastewater Generation

Main Equipment	Proposed Control Technology That Utilizes Water	No. of Facilities to Install or Upgrade Controls	No. of Units Expected to Be Installed or Upgraded	Potential Increase in Operational Water Demand (gal/day)	Potential Increase in Wastewater Generation (gal/day)
FCCU	WGS	0	0	0	0
SRU/TGU	WGS	0	0	0	0
Refinery Boilers/Heaters	FGT	0	0	0	0
Coke Calciner	WGS	1	1	40,896	16,992
Glass Melting Furnaces	WGS	1	2	58,464	12,877
Sulfuric Acid	WGS	1	1	19,589	10,800
Sulfuric Acid	Upgrade Existing Cansolv Unit	1	1	6,336	0[1]
Cement Kilns	DGS	0	0	0	0
		Total	**5**	**125,285**	**40,669**

[1] More water (as steam) is required to complete the upgrade. However, the steam is evaporated during the process so there is no wastewater stream generated.

As summarized in Table 5-38, each affected facility provided their water demand baseline; these water usage rates were compared to each facility's estimated potential increase in water demand that may result from implementing Alternative B. The peak percentage increase from baseline levels when compared to Alternative B was approximately 45 percent (Facility I) but most of the affected facilities have a potential increase in water demand from one to four percent above each facility's baseline. The overall increase in water demand under Alternative B is approximately 1.28 percent above the total water use baseline for all of the affected facilities combined.

To have a better understanding about the availability of water and the source (i.e., potable versus non-potable recycled or industrial-use groundwater), SCAQMD staff contacted each supplier of water used for industrial applications for each of the affected facilities[100], and all of the suppliers indicated that they would be able to accommodate the additional operational water demand if the proposed project goes forward. In addition, each water supplier specified whether the additional water to be supplied will be recycled water or potable water. In the case of recycled water, the water supplier indicated whether the recycled water is currently available or whether it would be available in the future pursuant to the aforementioned HRRWPP project.

[100] Facility K is the only facility that does not purchase water for its industrial operations; instead, the industrial-use water (non-potable) is supplied by the facility-owned wells.

Table 5-38
Alternative B: Potential Increases in Operational Water Demand per Facility

Facility ID	Proposed Control Technology	Potential Increase in Water Use (MMgal/day)	Current Facility Water Use (MMgal/day)	Percentage Increase Above Baseline
A	Not applicable to Alternative B	0	10.75	0%
B	Not applicable to Alternative B	0	12.50	0%
C	1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	0.006	7.85	0.08%
D	Not applicable to Alternative B	0	10.32	0%
E	Not applicable to Alternative B	0	5.76	0%
F	Not applicable to Alternative B	0	2.50	0%
G	Not applicable to Alternative B	0	2.88	0%
H	1 WGS for calciner (new)	0.041	1.08	3.79%
I	2 WGSs for glass melting furnaces (new)	0.058	0.13	44.62%
J	1 WGS for sulfuric acid unit (new)	0.020	0.73	2.74%
K	Not applicable to Alternative B	0	3.29	0%
	TOTAL	**0.125**	**9.79***	**1.28%***

* This total is based on the current facility water use for only those facilities affected by Alternative B (e.g., Facilities C, H, I and J).

As part of making the determination if water supplies will be sufficient for Alternative B, the availability of recycled or industrial-use groundwater is an important factor. Seven facilities are expected to have either increased access (e.g., Facilities A, B and D) or new future access (e.g., Facilities C, E, F and J) to recycled water upon completion of the HRRWPP[101], but of these, only Facilities C and J would be affected by Alternative B . The HRRWPP is a project shared by the LADWP and WBMWD to conserve potable water and instead produce and convey recycled water to multiple industrial and irrigation customers in the Los Angeles Harbor area. Construction of the HRRWPP began on October 26, 2009 and is estimated to be completed by Summer 2013. However, even if the pipeline and meter is installed, these facilities will need to make modifications to handle the potential increase in recycled water or install the water conveyance infrastructure piping to tie-in to the recycled water pipeline.

Table 5-39 identifies the amount and availability status of using non-potable[102] and potable water to supply the potential increased water use under Alternative B. The amount of non-potable water that can currently be used under Alternative B plus the future availability of non-potable water (to be available beginning Summer 2013) is 25,925 gallons per day. Of the proposed increase of total water at 125,285 gallons per day under Alternative B, 21 percent may be supplied by recycled or non-potable water. The remaining amount of increased potential water demand under Alternative B is estimated to be 79 percent or 99,360 gallons per day and is expected to be satisfied by potable water.

[101] The future availability of recycled water applies to certain facilities that do not currently have access to obtain recycled water for their processes but that will have access after completion of the LADWP's HRRWPP project (certified on October 20, 2009) by Summer 2013 (http://www.ladwp.com/ladwp/cms/ladwp011486.jsp). In addition, future access to recycled water is contingent upon each facility within the HRRWPP project area constructing a new water conveyance at their site in order to tie-into the recycled water pipeline.

[102] Non-potable water can be either recycled water or industrial-use well water.

Table 5-39
Alternative B: Potential Increases in Non-Potable and Potable Water Use

Main Equipment	Proposed Control Technology That Utilizes Water	Potentially Available Non-Potable Water Use		Potentially Available Potable Water Use (gal/day)	Total Potential Increase in Water Use (gal/day)
		Current [1] (gal/day)	Future[2] (gal/day)		
FCCU	WGS	0	0	0	0
SRU/TGU	WGS	0	0	0	0
Refinery Boilers/Heaters	FGT	0	0	0	0
Coke Calciner	WGS	0	0	40,896	40,896
Glass Melting Furnaces	WGS	0	0	58,464	58,464
Sulfuric Acid	WGS	19,589	0	0	19,589
Sulfuric Acid	Upgrade Existing Cansolv Unit	0	6,336	0	6,336
Cement Kilns	DGS	0	0	0	0
	Total	**19,589**	**6,336**	**99,360**	**125,285**

[1] The current availability of non-potable water values assumes that the facilities which currently obtain recycled or industrial-use groundwater for their processes will continue to do so if there is a need to increase water use as part of the proposed project.
[2] The future availability of non-potable water values applies to certain facilities that do not currently have access to obtain recycled or industrial-use groundwater for their processes but that will have access after completion of the LADWP's HRRWPP project by Summer 2013.

Table 5-40 summarizes the projected increases of potable water, recycled water (both current and future availability) and industrial-use groundwater that is estimated to implement Alternative B at the affected facilities.

Table 5-40
Alternative B: Distribution of Projected Water Demand by Water Type

Type of Water	Projected Increase in Water Use (gal/day)	Percent of Total Water Demand
Potable	99,360	79%
Recycled (non-potable)	25,925	21%
Industrial-Use Groundwater (non-potable)	0	0%
TOTAL	**125,285**	**100%**

Alternative B has been shown to potentially increase total water demand by approximately 125,285 gallons per day and 79 percent of this total water demand would need to be supplied by potable water because the facilities that would be affected by Alternative B (Facilities C, H, I and J), only Facilities C and J have access to non-potable water. Also, the potential increases in total water demand rely on the future availability of recycled water for Facility C.

Thus, the amount of water that would qualify as a water demand project can be adjusted to separate the potable water from the current and future uses of recycled water and industrial-use groundwater needed for Alternative B. To establish whether Alternative B qualifies as a water demand project, the potential increase in water use can be interpreted to mean the potential increase of potable water only (in this case, 99,360 gallons per day). Since the projected increase of potable water and total water would be less than the estimated range of water that would be needed for a 500 DU project (e.g., 133,911 to 223,186 gallons per day), Alternative B would not qualify as a water demand project.

However, the projections for new or increased future access to recycled water are 6,336 gallons per day under Alternative B and the availability of future access to recycled water is not guaranteed. In the event that the future access to recycled water does not occur as planned by Summer 2013 in accordance with the HRRWPP, the potential increase in potable water needed for Alternative B would need to be adjusted to include the amount of future recycled water. As such, the amount of potable water demand could increase to 105,696 gallons per day under Alternative B. In the event that future access to recycled water does not occur as planned, the distribution between potable and recycled water demand shifts as summarized in Table 5-41.

Table 5-41
Alternative B: Adjusted Distribution of Projected Water Demand by Water Type if Future Supplies of Recycled Water Are Not Available

Type of Water	**Adjusted Projected Increase in Water Use** (gal/day)	**Percent of Total Water Demand**
Potable	105,696	84%
Recycled (non-potable)	19,589	16%
Industrial-Use Groundwater (non-potable)	0	0%
TOTAL	**125,285**	**100%**

Under Alternative B, the adjusted estimate for increased potable water demand would be 105,696 gallons per day, which is below the minimum amount of potable water needed to qualify for as a water demand project per the 500 DU calculations (e.g., 133,911 gallons per day). Thus, for this reason, Alternative B would not qualify as a water demand project and as such, is expected to contribute to less than significant adverse water demand impacts.

Lastly, to investigate whether the existing water supply has the capacity to meet the increased water demand of Alternative B, SCAQMD staff has been coordinating with various water suppliers (e.g., LADWP, MWD, WBMWD, Long Beach Water Department, City of Vernon etc.) to the affected facilities. Water suppliers for all of the facilities that either currently use recycled water or are expected to have future use of recycled water have indicated that there will be sufficient supply of recycled water for Alternative B. In addition, the water suppliers for Facilities H and I have indicated that they can supply the estimated additional potable water needed for operating WGSs under Alternative B.

Water Quality

As summarized in Table 5-42, each affected facility provided their wastewater discharge limits and these limits were compared to each facility's estimated potential increase in wastewater that may result from implementing Alternative B. The peak percentage increase from baseline levels is approximately nine percent (Facility H) under Alternative B. An increase of 25 percent would trigger a permit revision and would be considered a significant adverse wastewater impact. Since all of the affected facilities have been shown under Alternative B to have a potential wastewater increase less than 25 percent, no modifications to any existing wastewater discharge permits are anticipated under Alternative B. Thus, the operational impacts of Alternative B on each affected facility's wastewater discharge and the Industrial Wastewater Discharge Permit are expected to be less than significant.

Changes to each affected facility's storm water collection systems are expected to be less than significant since most of the changes will occur within existing units (i.e., installing control equipment on existing equipment or upgrading existing control equipment). Further, typically most of the areas likely to be affected by Alternative B are currently paved and are expected to remain paved. Any new units constructed will be curbed and the existing units will remain curbed to contain any runoff. Any runoff occurring will continue to be handled by each affected facility's wastewater system and sent to an on-site wastewater treatment system prior to discharge. The surface water runoff is expected to be handled with each facility's current wastewater collection or treatment system. Storm water runoff will be collected and discharged in accordance with each facility's discharge permit terms and conditions.

Alternative B is expected to involve construction activities located within the confines of existing facilities and does not include the construction of any new housing so it would not place new housing within a 100-year flood hazard area. It is likely that most affected facilities are not located within a 100-year flood hazard area. Any affected facilities that may be located in a 100-year flood area could impede or redirect 100-year flood flows, but this would be considered part of the existing setting and not an effect of Alternative B. Further, Alternative B would not require locating new facilities within a flood zone, so it is not expected to expose people or property to any known water-related flood hazards.

Table 5-42
Alternative B: Potential Increases in Wastewater Generation per Facility

Facility ID	**Proposed Control Technology**	**Potential Increase in Wastewater Generation** (MMgal/day)	**Wastewater Permit Discharge Limit**[1] (MMgal/day)	**Percentage Increase Above Discharge Limit**	**Greater than 25% Increase? (Exceeds CEQA Significance Threshold?)**
A	Not applicable to Alternative B	0	7.5	0%	NO
B	Not applicable to Alternative B	0	8.8	0%	NO
C	1 Upgrade to Existing Cansolv Unit (modified)	0	7.6	0%	NO
D	Not applicable to Alternative B	0	15	0%	NO
E	Not applicable to Alternative B	0	1.1	0%	NO
F	Not applicable to Alternative B	0	0.18	0%	NO
G	Not applicable to Alternative B	0	2.88	0%	NO
H	1 WGS for calciner (new)	0.017	0.18	9.44%	NO
I	2 WGSs for glass melting furnaces (new)	0.013	0.36	3.58%	NO
J	1 WGS for sulfuric acid unit (new)	0.011	0.21	5.14%	NO
K	2 DGSs for cement kilns (new)	0	No Limit	0%	NO
		0.041	**0.75**[2]	**5.47%**[2]	

[1] Wastewater limits were obtained from each facility's wastewater permit(s). For any facility that has multiple discharge limits (i.e. dry weather, wet weather, etc.), the most conservative limit will be used for the purpose of this comparison.

[2] This total is based on the current facility wastewater permit for only those facilities with wastewater impacts affected by Alternative B (e.g., Facilities H, I and J).

Alternative B does not require construction of new facilities in areas that could be affected by tsunamis. Of the facilities affected by Alternative B, some are located near the Ports of Long Beach and Los Angeles. However, the port areas are protected from tsunamis by the construction of breakwaters. Construction of breakwaters combined with the distance of each facility from the water is expected to minimize the potential impacts of a tsunami or seiche so that no significant impacts are expected. Alternative B does not require the construction of facilities in areas that are susceptible to mudflows (e.g., hillside or slope areas). Existing affected facilities that are currently located on hillsides or slope areas may be susceptible to mudflow, but this would be considered part of the existing setting. As a result, Alternative B is not expected to generate significant adverse mudflow impacts.

Lastly, Alternative B is not expected to significantly adversely affect the quantity or quality of groundwater in the area of each affected facility. No significant adverse impacts to groundwater quality are expected from Alternative B because: 1) wastewater will continue to be collected and treated in each of the affected facility's wastewater treatment systems or in compliance with the current wastewater discharge permits, as applicable; 2) no underground storage tanks are expected to be constructed as part of the proposed project; 3) containment berms will be required or may already exist around the new or modified units to minimize the potential for spills to contaminate soil and groundwater; and, 4) any new storage tanks that may be proposed will be required to comply with BACT and other safety requirements such as double bottom and monitoring requirements.

<u>Water Demand and Water Quality Conclusion</u>

The water demand impacts that may result from Alternative B have been shown to require approximately 125,285 gallons per day of total water with approximately 21 percent to be satisfied with current and future supplies of recycled water and the remaining 79 percent to be supplied by potable water. However, if future access to recycled water does not occur, then approximately 16 percent of the total water demand is expected to be satisfied with current supplies of recycled water and the remaining 84 percent is expected to be supplied by potable water under Alternative B.

Based on the preceding analysis, Alternative B is not expected to exceed SCAQMD's significance threshold of five million gallons of total water per day. Whether future supplies of recycled water become available or not, Alternative B is not expected to require a substantial amount of potable water as calculated pursuant to the water demand project criteria. Further, the water suppliers have indicated that there will be an adequate supply of water (current and future supplies of recycled water plus potable water) for Alternative B. Therefore, the water demand impacts for Alternative B are concluded to be less than significant.

Based on the aforementioned considerations, the potential groundwater, wastewater discharge and storm water discharge impacts that may result from Alternative B are expected to be less than significant. Less than significant adverse impacts associated with water demand and water quality are expected from Alternative B, so no mitigation measures are required. Because the water demand and water quality impacts from Alternative B do not exceed any applicable significance thresholds, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, do not generate significant adverse cumulative water demand and water quality impacts.

Alternative C – Intermediate SOx Reductions

Alternative C would impose the same SOx limits on fewer equipment/source categories when compared to both Options 1 and 2 of the proposed project. Specifically, five equipment/source categories comprise Alternative C: FCCUs, sulfuric acid manufacturing, coke calciner, glass melting furnaces, and cement kilns. Like the proposed project, there are two SOx control approaches that can be applied to FCCUs under Alternative C. For this reason, Alternative C has been bifurcated into two options: Option 1 assumes that WGSs will be the control approach for FCCUs; and, Option 2 assumes that SOx reducing additives will be the control approach for FCCUs. The remaining source categories and their respective control approaches applicable to Alternative C will be the same for both Option 1 and Option 2.

Under Alternative C, less add-on control equipment (i.e., eight WGSs plus two DGSs under Option 1 and four WGSs plus two DGSs under Option 2) would be expected to be installed under Alternative C and as such, less water demand and wastewater generation would occur when compared to the proposed project. Further, the reduced number of add-on control equipment to be installed under Alternative C - Option 2 can be attributed to the assumption that SOx reduction catalysts could be utilized in the FCCUs. Like the proposed project, both Options 1 and 2 of Alternative C would need additional water and would generate additional wastewater for installation and operation activities associated with the add-on control equipment.

The following analysis will demonstrate that the projected increases in water demand and wastewater generation associated with Alternative C will be less than significant because the amount of additional water demand and wastewater generation associated with the installation and operation of the new SOx controls are below the applicable hydrology and water quality significance criteria. While fewer WGSs would be installed under Alternative C for both Options 1 and 2, adverse hydrology and water quality impacts are expected to occur but they will be less than the proposed project.

Water demand and wastewater generation information as it relates to construction and operational activities under Alternative C was derived as part of the hydrology and water quality analysis in Chapter 4 and the calculations are shown in Appendix B of this ~~Draft~~ Final PEA.

Construction Water Demand

Implementation of Alternative C is expected to result in construction activities associated with installing new or modifying existing SOx control equipment at the affected facilities, which are complex, well-established and mostly paved, industrial facilities. Depending on the proposed location within each facility's boundaries for the siting of any new control equipment that may be installed as a result of implementing Alternative C, construction activities such as digging, earthmoving, grading, slab pouring, or paving could occur if the proposed site for the new equipment is not suitable in its present form (e.g., graded with a foundation slab). Tables 5-43 and 5-44 contain a summary of the estimates of plot space needed per facility for Option 1 and Option 2 of Alternative C.

Based on the consultant's surveys of the affected facilities, if all affected facilities conduct site preparation activities, the total amount of disturbed area for all of the facilities combined is estimated to be 31,790 square feet (0.7 acre) for Option 1 and 24,640 square feet (0.6 acre) for Option 2. However, even if all affected facilities intend to conduct site preparation, not much overlap of site preparation activities would be expected since there are several years between the proposed rule amendment date (2010) and the proposed compliance date (January 1, 2019) and because the plot spaces are relatively small. Further, depending on the scale, site preparation typically can take anywhere from two weeks to one month. Therefore, it is unlikely that all affected facilities will do site preparation both in the same month of the same year. The largest parcel of land to be potentially disturbed is 6,000 square feet at three facilities (Facilities C, D and G) for both Options 1 and 2 of Alternative C and which represents approximately 19 percent of the total area to be disturbed for Option 1 and 24 percent of the total area to be disturbed for Option 2. Consistent with the assumption that, as a worst-case, up to four facilities conduct overlapping site preparation activities, then the potential peak area that could be disturbed at any one time would be 22,000 square feet for either Option 1 or 2.

Under either option, the amount of area to be disturbed is relatively small such that one backhoe should be sufficient for site preparation activities. Since one backhoe can trench approximately 0.1 acre per day or 4,356 square feet per day, earthmoving activities at either Facility C, D or G would take approximately two days for either Option 1 or Option 2 under Alternative C. Even if four facilities conduct overlapping site preparation, earthmoving activities would take about the same amount of time since each plot space is relatively small (i.e., a ¼-acre plot or smaller) and there would be one backhoe in operation at each of the four facilities.

Table 5-43
Alternative C - Option 1: Potential Plot Space Needed For Proposed Control Technologies

Facility ID	**Option 1: Potential SOx Control per Equipment/Source Category**	**Plot Space Needed for Proposed Controls** (square feet)
A	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	2,000 + 100 **2,100**
B	1 WGS for FCCU (new)	**2,000**
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	6,000+ 0 **6,000**
D	1 FGT by Merox Treatment Upgrade (modified)	**6,000**
E	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	1,575 + 100 **1,675**
F	1 WGS for FCCU (new) 1 FGT by Amine Additive (modified)	1,575 + 100 **1,675**
G	1 FGT by Merox Treatment Upgrade (modified)	**6,000**
H	1 WGS for calciner (new)	**1,200**
I	2 WGSs for glass melting furnaces (new)	**640**
J	1 WGS for sulfuric acid unit (new)	**500**
K	2 DGSs for cement kilns (new)	**4,000**
	TOTAL	**31,790**

Table 5-44
Alternative C - Option 2: Potential Plot Space Needed For Proposed Control Technologies

Facility ID	Option 2: Potential SOx Control per Equipment/Source Category	Plot Space Needed for Proposed Controls (square feet)
A	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + 100 **100**
B	1 SOx Reducing Additive Hopper for FCCU (modified)	**0**
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	6,000+ 0 **6,000**
D	1 SOx Reducing Additive Hopper for FCCU (new) 1 FGT by Merox Treatment Upgrade (modified)	0 + 6,000 **6,000**
E	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + 100 **100**
F	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Amine Additive (modified)	0 + 100 **100**
G	1 FGT by Merox Treatment Upgrade (modified)	**6,000**
H	1 WGS for calciner (new)	**1,200**
I	2 WGSs for glass melting furnaces (new)	**640**
J	1 WGS for sulfuric acid unit (new)	**500**
K	2 DGSs for cement kilns (new)	**4,000**
	TOTAL	**24,640**

Construction Water Demand

To comply with the dust suppression requirements in SCAQMD Rule 403 – Fugitive Dust, during site preparation activities, some water is expected to be used. For example, one water truck per affected facility may be needed for dust suppression activities during the initial site preparation/earth moving portion of the proposed project. One water truck can hold approximately 6,000 gallons for dust control and it can be refilled over the course of the day if more than 6,000 gallons is needed. By applying one gallon of water per square foot of disturbed area, at a minimum of two times per day as required to minimize fugitive dust, the total amount of water expected to be used for dust suppression is approximately 8,712 gallons per facility per day.~~can range from 1,000 gallons per day up to 12,000 gallons per day, depending on the facility.~~ However, if four facilities with the largest plot spaces disturbed conduct overlapping watering, then the maximum amount of water that could be used for site preparation is 34,848 ~~44,000~~ gallons per day. On windy days, it may be necessary to conduct a third water application. Thus, the total peak amount of water that could be used for dust suppression can range from 1,500 gallons per day to 13,068 ~~18,000~~ gallons per day, depending on the facility. Again, if the four facilities with the largest plot spaces disturbed conduct overlapping watering, at a watering rate of three applications per day, then the peak amount of water that could be used for site preparation is 52,272 ~~66,000~~ gallons per day.

Due to the need to quickly construct a proper foundation for the proposed control equipment, earth moving activities during site preparation are expected to be of a short duration lasting from two to three days to no longer than one month per facility. As such, the corresponding dust control activities are also not expected to last longer than one month per facility. Further, water used for dust suppression does not have to be of potable quality, but can be recycled water. Recycled water is currently available at three of the affected facilities and non-potable industrial-use groundwater is currently available at one additional facility. Additional recycled water availability is expected to expand to five other facilities by Summer 2013[103].

Since the earliest year when construction activities could begin would be in 2012, eight facilities are expected to have access to recycled or industrial-use groundwater for use during site preparation. There are three facilities (Facilities G, H and I) that do not currently have access to recycled or industrial-use groundwater and are not expected to have future access in 2012 or later. However, the amount of site preparation that would need to occur at these three facilities is expected to be about 7,840 square feet which would require approximately 15,680 gallons of water (at a watering rate of twice each day) to 23,520 gallons of water (at a watering rate of three times each day) for dust suppression activities during windy days.

Instead of installing new equipment, there are a few facility operators that may choose to modify or upgrade their existing SOx control equipment. In these cases, site preparation activities are not expected because the existing foundation and the existing equipment are expected to be reused in its current location and current plot space. Therefore, no water for dust suppression purposes is expected to be needed for any construction upgrades to existing SOx control equipment.

Once constructed, but prior to operation, additional water is expected to be used to hydrostatically (pressure) test all vessels and pipelines to ensure each structure's integrity and wastewater may be created during the testing. Pressure testing is typically a one-time event, unless a leak is found. Similar to dust suppression, water used for pressure testing does not have to be of potable quality, but can be recycled water.

Even though the potential increase in water use for both Option 1 and Option 2 of Alternative C is below the SCAQMD's five million gallons per day significance threshold for total water, it may be helpful to consider other criteria for evaluating what would be considered a substantial use of potable water, especially since California is in a State of Emergency for Drought. For example, CEQA Guidelines §15155 – City or County Consultation With Water Agencies, defines a "water demand" project in several ways. While the criteria for defining water demand

[103] Future access to recycled water for these five facilities is dependent upon the completion of the Harbor Refineries
Recycled Water Pipeline Project (HRRWPP) by Summer 2013 (SCH No. 2008121093, certified on October 20, 2009). The HRRWPP will conserve potable water and instead produce and convey recycled water to multiple industrial and irrigation customers in the Los Angeles Harbor area (http://www.ladwp.com/ladwp/cms/ladwp011486.jsp). Proponents of the HRRWPP are working with each of the affected facilities to negotiate construction of a new water conveyance at their site in order to tie-into the recycled water pipeline.

are not significance thresholds per se, the criteria can provide some insight as to how city or county lead agencies evaluate water demand impacts. Most of the criteria in this part of the CEQA Guidelines do not have a numerical criterion or direct methodology to correlate the criteria in terms of gallons per day for use as a significance threshold specific to potable water use. However, CEQA Guidelines §15155 (a)(1)(G) defines a water demand project as: "A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project." To estimate what this means in terms of quantifying how much potable water could be used by a 500 dwelling unit (DU) project, the California Department of Water resources relies on a conversion factor range of 0.3 to 0.5 acre-feet of potable water per year per DU as shown in the following calculation[104]:

$$(500 \text{ DUs}) \times \frac{(0.3 - 0.5 \text{ acre-feet/year})}{(1 \text{ DU})} \times \frac{(325{,}851 \text{ gallons})}{(1 \text{ acre-foot})} \times \frac{(1 \text{ year})}{(365 \text{ days})} = \begin{matrix} 133{,}911 \text{ gallons/day to} \\ 223{,}186 \text{ gallons/day} \end{matrix}$$

Thus, the amount of water that would be needed during construction for dust suppression and pressure testing activities: 1) would not be considered a substantial use of potable water since several facilities are currently using or will have future access to recycled water; and 2) is less than the overall water demand significance threshold of five million gallons per day. Further, watering activities for dust suppression and pressure-testing are temporary and occur on a short-term basis. For these reasons, less than significant water demand/water use impacts are expected during construction of the proposed project.

<u>Construction Water Quality</u>
Any wastewater generated from pressure testing is expected to flow to each affected facility's wastewater treatment or collection system and recycled or discharged after treatment with process wastewater. Thus, wastewater generation from pressure testing activities is not expected to affect groundwater quality. Further, the volume of wastewater that will be generated from pressure testing is expected to be minimal and within the capacity of each facility's wastewater treatment and collection systems.

Further, because the total amount of disturbed area for all of the facilities combined is estimated to be 31,790 square feet (0.7 acre) for Option 1 and 24,640 square feet (0.6 acre) for Option 2 with the peak amount of area to be disturbed at Facilities C, D and G at 6,000 square feet each, the proposed construction activities will disturb less than 0.13 acre under Option 1 and 0.16 acre under Option 2 at each of the remaining facilities. This means that a NPDES *General Permit for Storm Water Discharges Associated with Construction Activity*, also referred to as a Storm Water Construction Permit, would not be required for any of the affected facilities. Because Alternative C is expected to disturb substantially less than one acre total, on-site collection of storm water in each facility's storm water collection system is expected to be about the same as the amount currently collected. Therefore, no significant impacts are expected from storm water during construction.

<u>Construction Conclusion</u>
In summary, less than significant adverse water demand and wastewater impacts are expected during construction of both Options 1 and 2 of Alternative C.

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[104] Draft Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001 to assist water suppliers, cities, and counties in integrating water and land use planning, California Department of Water Resources, September 2002, p.3

Operational Water Demand

Tables 5-45 and 5-46 quantify the potential increases in operational water use and wastewater generation as a result of installing new or upgrading existing SOx controls to comply with Options 1 and 2 of Alternative C, respectively. If all of the proposed control technologies are installed or upgraded, the potential increase in water use is estimated to be approximately 0.5 MMgal/day under Option 1 and 0.3 MMgal/day under Option 2. Further, if all of the proposed control technologies are installed or upgraded, the potential increase in wastewater generated would be approximately 0.2 MMgal/day under Option1 and 0.09 MMgal/day under Option 2. Hydrology and water quality impacts from Alternative C are discussed in detail in the following sections.

Table 5-45
Alternative C - Option 1: Potential Increases in Operational Water Demand and Wastewater Generation

Main Equipment	**Proposed Control Technology**	**No. of Facilities to Install or Upgrade Controls**	**No. of Units Expected to Be Installed or Upgraded**	**Potential Increase in Operational Water Demand** (gal/day)	**Potential Increase in Wastewater Generation** (gal/day)
FCCU	WGS	4	4	241,096	112,329
SRU/TGU	WGS	0	0	0	0
Refinery Boilers/Heaters	FGT (Merox Treatment or Convert Amine Absorbers to Sulfinol)	5	5	52,055	46,575
Coke Calciner	WGS	1	1	40,896	16,992
Glass Melting Furnaces	WGS	1	2	58,464	12,877
Sulfuric Acid	WGS	1	1	19,589	10,800
Sulfuric Acid	Upgrade Existing Cansolv Unit	1	1	6,336	0[1]
Cement Kilns	DGS	1	2	110,685	0[2]
		Total	**16**	**529,121**	**199,573**

[1] More water (as steam) is required to complete the upgrade. However, the steam is evaporated during the process so there is no wastewater stream generated.

[2] All of the injected water is evaporated during the process so there is no wastewater stream generated.

Table 5-46
Alternative C - Option 2: Potential Increases in Operational Water Demand and Wastewater Generation

Main Equipment	Proposed Control Technology	No. of Facilities to Install or Upgrade Controls	No. of Units Expected to Be Installed or Upgraded	Potential Increase in Operational Water Demand (gal/day)	Potential Increase in Wastewater Generation (gal/day)
FCCU	SOx Reducing Catalyst	5	5	0	0
SRU/TGU	WGS	0	0	0	0
Refinery Boilers/Heaters	FGT (Merox Treatment or Convert Amine Absorbers to Sulfinol)	5	5	52,055	46,575
Coke Calciner	WGS	1	1	40,896	16,992
Glass Melting Furnaces	WGS	1	2	58,464	12,877
Sulfuric Acid	WGS	1	1	19,589	10,800
Sulfuric Acid	Upgrade Existing Cansolv Unit	1	1	6,336	0[1]
Cement Kilns	DGS	1	2	110,685	0[2]
		Total	**17**	**288,025**	**87,244**

[1] More water (as steam) is required to complete the upgrade. However, the steam is evaporated during the process so there is no wastewater stream generated.
[2] All of the injected water is evaporated during the process so there is no wastewater stream generated.

Water Demand

As summarized in Tables 5-47 and 5-48, each affected facility provided their water demand baseline and these water usage rates were compared to each facility's estimated potential increase in water demand that may result from implementing Option 1 or Option 2 of Alternative C. For both Option 1 and Option 2 under Alternative C, the peak percentage increase from baseline levels was approximately 45 percent (Facility I) but most of the affected facilities have a potential increase in water demand from less than one to four percent above each facility's baseline. The overall increase in water demand for Option 1 is 0.92 percent above the total water use baseline for all of the affected facilities combined. Similarly, the overall increase in water demand for Option 2 is 0.50 percent above the total water use baseline for all of the affected facilities combined.

Table 5-47
Alternative C - Option 1: Potential Increases in Operational Water Demand per Facility

Facility ID	Proposed Control Technology	Potential Increase in Water Use (MMgal/day)	Current Facility Water Use (MMgal/day)	Percentage Increase Above Baseline
A	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	0.071 + 0.008 **0.079**	10.75	0.73%
B	1 WGS for FCCU (new)	**0.077**	12.50	0.62%
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	0.003 + 0.006 **0.009**	7.85	0.11%
D	1 FGT by Merox Treatment Upgrade (modified)	**0.014**	10.32	0.14%
E	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	0.049 + 0.014 **0.063**	5.76	1.09%
F	1 WGS for FCCU (new) 1 FGT by Amine Additive (modified)	0.044 + 0 **0.044**	2.50	1.76%
G	1 FGT by Merox Treatment Upgrade (modified)	**0.014**	2.88	0.49%
H	1 WGS for calciner (new)	**0.041**	1.08	3.79%
I	2 WGSs for glass melting furnaces (new)	**0.058**	0.13	44.62%
J	1 WGS for sulfuric acid unit (new)	**0.020**	0.73	2.74%
K	2 DGSs for cement kilns (new)	**0.111**	3.29	3.37%
	TOTAL	**0.529**	**57.79**	**0.92%**

Table 5-48
Alternative C - Option 2: Potential Increases in Operational Water Demand per Facility

Facility ID	Option 2: Proposed Control Technology	Potential Increase in Water Use (MMgal/day)	Current Facility Water Use (MMgal/day)	Percentage Increase Above Baseline
A	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + 0.008 **0.008**	10.75	0.07%
B	1 SOx Reducing Additive Hopper for FCCU (modified)	**0**	12.50	0%
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	0.003+ 0.006 **0.009**	7.85	0.11%
D	1 SOx Reducing Additive Hopper for FCCU (new) 1 FGT by Merox Treatment Upgrade (modified)	0 + 0.014 **0.014**	10.32	0.14%
E	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + 0.014 **0.014**	5.76	0.24%
F	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Amine Additive (modified)	0 + 0 **0**	2.50	0%
G	1 FGT by Merox Treatment Upgrade (modified)	**0.014**	2.88	0.49%
H	1 WGS for calciner (new)	**0.041**	1.08	3.79%
I	2 WGSs for glass melting furnaces (new)	**0.058**	0.13	44.62%
J	1 WGS for sulfuric acid unit (new)	**0.020**	0.73	2.74%
K	2 DGSs for cement kilns (new)	**0.111**	3.29	3.37%
	TOTAL	**0.288**	**57.79**	**0.50%**

To have a better understanding about the availability of water and the source (i.e., potable versus non-potable recycled or industrial-use groundwater), SCAQMD staff contacted each supplier of water used for industrial applications for each of the affected facilities[105], and all of the suppliers indicated that they would be able to accommodate the additional operational water demand if Alternative C goes forward. In addition, each water supplier specified whether the additional water to be supplied will be recycled water or potable water. In the case of recycled water, the water supplier indicated whether the recycled water is currently available or whether it would be available in the future pursuant to the aforementioned HRRWPP project.

As part of making the determination if water supplies will be sufficient for Alternative C, the availability of recycled or industrial-use groundwater is an important factor. Seven facilities are expected to have either increased access (e.g., Facilities A, B and D) or new future access (e.g., Facilities C, E, F and J) to recycled water upon completion of the HRRWPP[106]. The HRRWPP is a project shared by the LADWP and WBMWD to conserve potable water and instead produce and convey recycled water to multiple industrial and irrigation customers in the Los Angeles

[105] Facility K is the only facility that does not purchase water for its industrial operations; instead, the industrial-use water (non-potable) is supplied by the facility-owned wells.

[106] The future availability of recycled water applies to certain facilities that do not currently have access to obtain recycled water for their processes but that will have access after completion of the LADWP's HRRWPP project (certified on October 20, 2009) by Summer 2013 (http://www.ladwp.com/ladwp/cms/ladwp011486.jsp). In addition, future access to recycled water is contingent upon each facility within the HRRWPP project area constructing a new water conveyance at their site in order to tie-into the recycled water pipeline.

Harbor area. Construction of the HRRWPP began on October 26, 2009 and is estimated to be completed by Summer 2013. However, even if the pipeline and meter is installed, these facilities will need to make modifications to handle the potential increase in recycled water or install the water conveyance infrastructure piping to tie-in to the recycled water pipeline.

Tables 5-49 and 5-50 identify the amount and availability status of using non-potable[107] and potable water to supply the potential increased water use as a result of Option 1 and Option 2 of Alternative C, respectively. The amount of non-potable water that can currently be used under Option 1 of Alternative C plus the future availability of non-potable water by Summer 2013 is 429,761 gallons per day. Of the total proposed increase of 529,121 gallons per day under Alternative C - Option 1, 81 percent may be supplied by recycled or non-potable water. The remaining amount of increased potential water demand under Alternative C - Option 1 is estimated to be 19 percent or 99,360 gallons per day and is expected to be satisfied by potable water.

Similarly, the amount of non-potable water that can currently be used under Alternative C - Option 2 plus the future availability of non-potable water by Summer 2013 is 188,665 gallons per day. Of the total proposed increase of 288,025 gallons per day under Alternative C - Option 2, 65 percent may be supplied by recycled or non-potable water. The remaining amount of increased potential water demand under Alternative C - Option 2 is estimated to be 35 percent or 99,360 gallons per day and is expected to be satisfied by potable water.

Table 5-49
Alternative C - Option 1: Potential Increases in Non-Potable and Potable Water Use

Main Equipment	**Proposed Control Technology**	**Potentially Available Non-Potable Water Use**		**Potentially Available Potable Water Use** (gal/day)	**Total Potential Increase in Water Use** (gal/day)
		Current [1] (gal/day)	**Future**[2] (gal/day)		
FCCU	WGS	147,945	93,151	0	241,096
SRU/TGU	WGS	0	0	0	0
Refinery Boilers/Heaters	FGT (Merox Treatment or Convert Amine Absorbers to Sulfinol)	49,315	2,740	0	52,055
Coke Calciner	WGS	0	0	40,896	40,896
Glass Melting Furnaces	WGS	0	0	58,464	58,464
Sulfuric Acid Mfg.	WGS	19,589	0	0	19,589
Sulfuric Acid Mfg.	Upgrade Existing Cansolv Unit	0	6,336	0	6,336
Cement Kilns	DGS	110,685	0	0	110,685
	Total	**327,534**	**102,227**	**99,360**	**529,121**

[1] The current availability of non-potable water values assumes that the facilities which currently obtain recycled or industrial-use groundwater for their processes will continue to do so if there is a need to increase water use as part of the proposed project.
[2] The future availability of non-potable water values applies to certain facilities that do not currently have access to obtain recycled or industrial-use groundwater for their processes but that will have access after completion of the LADWP's HRRWPP project by Summer 2013.

[107] Non-potable water can be either recycled water or industrial-use well water.

Table 5-50
Alternative C - Option 2: Potential Increases in Non-Potable and Potable Water Use

Main Equipment	Proposed Control Technology	Potentially Available Non-Potable Water Use		Potentially Available Potable Water Use (gal/day)	Total Potential Increase in Water Use (gal/day)
		Current [1] (gal/day)	Future[2] (gal/day)		
FCCU	SOx Reducing Additive	0	0	0	0
SRU/TGU	WGS	0	0	0	0
Refinery Boilers/Heaters	FGT (Merox Treatment or Convert Amine Absorbers to Sulfinol)	49,315	2,740	0	52,055
Coke Calciner	WGS	0	0	40,896	40,896
Glass Melting Furnaces	WGS	0	0	58,464	58,464
Sulfuric Acid	WGS	19,589	0	0	19,589
Sulfuric Acid	Upgrade Existing Cansolv Unit	0	6,336	0	6,336
Cement Kilns	DGS	110,685	0	0	110,685
	Total	**179,589**	**9,076**	**99,360**	**288,025**

[1] The current availability of non-potable water values assumes that the facilities which currently obtain recycled or industrial-use groundwater for their processes will continue to do so if there is a need to increase water use as part of the proposed project.
[2] The future availability of non-potable water values applies to certain facilities that do not currently have access to obtain recycled or industrial-use groundwater for their processes but that will have access after completion of the LADWP's HRRWPP project by Summer 2013.

Table 5-51 summarizes the projected increases of potable water, recycled water (both current and future availability) and industrial-use groundwater that is estimated to implement both Option 1 and Option 2 of Alternative C at the affected facilities.

Table 5-51
Alternative C: Distribution of Projected Water Demand by Water Type

Type of Water	Option 1		Option 2	
	Projected Increase in Water Use (gal/day)	**Percent of Total Water Demand**	**Projected Increase in Water Use** (gal/day)	**Percent of Total Water Demand**
Potable	99,360	19%	99,360	35%
Recycled (non-potable)	305,377	58%	64,281	22%
Industrial-Use Groundwater (non-potable)	124,384	23%	124,384	43%
TOTAL	**529,121**	**100%**	**288,025**	**100%**

Option 1 of Alternative C has been shown to potentially increase total water demand by approximately 529,121 gallons per day and 19 percent or 99,360 gallons per day of the total water demand would need to be supplied by potable water. Similarly, Option 2 of Alternative C has been shown to potentially increase total water demand by approximately 288,025 gallons per day and 35 percent or 99,360 gallons per day of the total water demand would need to be supplied by potable water.

Thus, the amount of water that would qualify as a water demand project can be adjusted to separate the potable water from the current and future uses of recycled water and industrial-use groundwater needed for Alternative C. To establish whether Alternative C qualifies as a water demand project, the potential increase in water use can be interpreted to mean the potential increase of potable water only (in this case, 99,360 gallons per day for both Option 1 and Option 2). Since the projected increase of potable water would be less than the estimated range of water that would be needed for a 500 DU project (e.g., 133,911 to 223,186 gallons per day), neither Option 1 nor Option 2 of Alternative C would qualify as a water demand project.

However, the projections for new or increased future access to recycled water for Alternative C are 102,227 gallons per day under Option 1 and 9,076 gallons per day under Option 2 and the availability of future access to recycled water is not guaranteed. In the event that the future access to recycled water does not occur as planned by Summer 2013 in accordance with the HRRWPP, the potential increase in potable water needed for Alternative C would need to be adjusted to include the amount of future recycled water. As such, the amount of potable water demand for Alternative C could increase to 201,587 gallons per day under Option 1 and 108,436 gallons per day under Option 2. In the event that future access to recycled water does not occur as planned, the distribution between potable and recycled water demand shifts as summarized in Table 5-52.

Table 5-52
Alternative C: Adjusted Distribution of Projected Water Demand by Water Type if Future Supplies of Recycled Water Are Not Available

	Option 1		**Option 2**	
Type of Water	**Adjusted Projected Increase in Water Use** (gal/day)	**Percent of Total Water Demand**	**Adjusted Projected Increase in Water Use** (gal/day)	**Percent of Total Water Demand**
Potable	201,587	38%	108,436	38%
Recycled (non-potable)	203,150	38%	55,205	19%
Industrial-Use Groundwater (non-potable)	124,384	24%	124,384	43%
TOTAL	**529,121**	**100%**	**288,025**	**100%**

The adjusted estimate for increased potable water demand for Alternative C under Option 1 at 201,587 gallons per day is within the range between 133,911 gallons per day and 223,186 gallons per day based on the 500 DU water demand calculations. By applying the 500 DU water demand criteria to use as a significance threshold for potable water demand, Option 1 of the Alternative C may qualify as a water demand project and thus, may result in significant adverse water demand impacts.

However, for Alternative C - Option 2, the adjusted estimate for increased potable water demand would be 108,436 gallons per day, which is below the minimum amount of potable water needed to qualify for as a water demand project per the 500 DU calculations (e.g., 133,911 gallons per day). Thus, for this reason, Option 2 of Alternative C is expected to contribute to less than significant adverse water demand impacts.

Lastly, to investigate whether the existing water supply has the capacity to meet the increased water demand of the proposed project, SCAQMD staff has been coordinating with various water suppliers (e.g., LADWP, MWD, WBMWD, Long Beach Water Department, City of Vernon etc.) to the affected facilities. Water suppliers for all of the facilities that either currently use recycled water or are expected to have future use of recycled water have indicated that there will be sufficient supply of recycled water for the proposed project. In addition, the water suppliers for Facilities G, H and I have indicated that they can supply the estimated additional potable water needed for operating WGSs. Lastly, Facility K operates its own groundwater wells to pump non-potable industrial-use groundwater for their day-to-day operations. Because Facility K's groundwater pumping permit does not limit the amount of water that can be pumped from the wells, any additional water needed to implement the proposed project is expected to be available.

Water Quality

As summarized in Tables 5-53 and 5-54, each affected facility provided their wastewater discharge limits and these limits were compared to each facility's estimated potential increase in wastewater that may result from implementing Option 1 and Option 2 of Alternative C, respectively. The peak percentage increase from baseline levels for Alternative C was approximately 12 percent (Facility F) under Option 1 and nine percent (Facility H) under Option 2. An increase of 25 percent would trigger a permit revision and would be considered a significant adverse wastewater impact. Since all of the affected facilities have been shown under both options of Alternative C to have a potential wastewater increase less than 25 percent, no modifications to any existing wastewater discharge permits are anticipated as a result of implementing Alternative C. Thus, the operational impacts of Alternative C on each affected facility's wastewater discharge and the Industrial Wastewater Discharge Permit are expected to be less than significant.

Changes to each affected facility's storm water collection systems are expected to be less than significant since most of the changes will occur within existing units (i.e., installing control equipment on existing equipment or upgrading existing control equipment). Further, typically most of the areas likely to be affected by Alternative C are currently paved and are expected to remain paved. Any new units constructed will be curbed and the existing units will remain curbed to contain any runoff. Any runoff occurring will continue to be handled by each affected facility's wastewater system and sent to an on-site wastewater treatment system prior to discharge. The surface water runoff is expected to be handled with each facility's current wastewater collection or treatment system. Storm water runoff will be collected and discharged in accordance with each facility's discharge permit terms and conditions.

Alternative C is expected to involve construction activities located within the confines of existing facilities and does not include the construction of any new housing so it would not place new housing within a 100-year flood hazard area. It is likely that most affected facilities are not located within a 100-year flood hazard area. Any affected facilities that may be located in a 100-year flood area could impede or redirect 100-year flood flows, but this would be considered part of the existing setting and not an effect of Alternative C. Further, Alternative C would not require locating new facilities within a flood zone, so it is not expected to expose people or property to any known water-related flood hazards.

Table 5-53
Alternative C - Option 1: Potential Increases in Wastewater Generation per Facility

Facility ID	**Proposed Control Technology**	**Potential Increase in Wastewater Generation** (MMgal/day)	**Wastewater Permit Discharge Limit**[1] (MMgal/day)	**Percentage Increase Above Discharge Limit**	**Greater than 25% Increase? (Exceeds CEQA Significance Threshold?)**
A	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	0.033 + 0.005 **0.038**	7.5	0.51%	NO
B	1 WGS for FCCU (new)	**0.036**	8.8	0.40%	NO
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	0.003+ 0 **0.003**	7.6	0.04%	NO
D	1 FGT by Merox Treatment Upgrade (modified)	**0.014**	15	0.09%	NO
E	1 WGS for FCCU (new) 1 FGT by Sulfinol Conversion (modified)	0.022 + 0.011 **0.033**	1.1	2.99%	NO
F	1 WGS for FCCU (new) 1 FGT by Amine Additive (modified)	0.022 + 0 **0.022**	0.18	12.18%	NO
G	1 FGT by Merox Treatment Upgrade (modified)	**0.014**	2.88	0.49%	NO
H	1 WGS for calciner (new)	**0.017**	0.18	9.44%	NO
I	2 WGSs for glass melting furnaces (new)	**0.013**	0.36	3.58%	NO
J	1 WGS for sulfuric acid unit (new)	**0.011**	0.21	5.14%	NO
K	2 DGSs for cement kilns (new)	**0**	No Limit	0%	NO
		0.200	**43.81**	**0.46%**	

[1] Wastewater limits were obtained from each facility's wastewater permit(s). For any facility that has multiple discharge limits (i.e. dry weather, wet weather, etc.), the most conservative limit will be used for the purposes of this comparison.

Table 5-54
Alternative C - Option 2: Potential Increases in Wastewater Generation per Facility

Facility ID	**Proposed Control Technology**	**Potential Increase in Wastewater Generation** (MMgal/day)	**Wastewater Permit Discharge Limit**[1] (MMgal/day)	**Percentage Increase Above Discharge Limit**	**Greater than 25% Increase? (Exceeds CEQA Significance Threshold?)**
A	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + 0.005 **0.005**	7.5	0.07%	NO
B	1 SOx Reducing Additive Hopper for FCCU (modified)	**0**	8.8	0.32%	NO
C	1 FGT by Sulfinol Conversion (modified) 1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	0.003+ 0 **0.003**	7.6	0.04%	NO
D	1 SOx Reducing Additive Hopper for FCCU (new) 1 FGT by Merox Treatment Upgrade (modified)	0+ 0.014 **0.014**	15	0.09%	NO
E	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Sulfinol Conversion (modified)	0 + 0.011 **0.011**	1.1	1.00%	NO
F	1 SOx Reducing Additive Hopper for FCCU (modified) 1 FGT by Amine Additive (modified)	0+ 0 **0**	0.18	0%	NO
G	1 FGT by Merox Treatment Upgrade (modified)	**0.014**	2.88	0.49%	NO
H	1 WGS for calciner (new)	**0.017**	0.18	9.44%	NO
I	2 WGSs for glass melting furnaces (new)	**0.013**	0.36	3.58%	NO
J	1 WGS for sulfuric acid unit (new)	**0.011**	0.21	5.14%	NO
K	2 DGSs for cement kilns (new)	**0**	No Limit	0%	NO
		0.087	**43.81**	**0.20%**	

[1] Wastewater limits were obtained from each facility's wastewater permit(s). For any facility that has multiple discharge limits (i.e. dry weather, wet weather, etc.), the most conservative limit will be used for the purposes of this comparison.

Alternative C does not require construction of new facilities in areas that could be affected by tsunamis. Of the facilities affected by Alternative C, some are located near the Ports of Long Beach and Los Angeles. However, the port areas are protected from tsunamis by the construction of breakwaters. Construction of breakwaters combined with the distance of each facility from the water is expected to minimize the potential impacts of a tsunami or seiche so that no significant impacts are expected. Alternative C does not require construction of facilities in areas that are susceptible to mudflows (e.g., hillside or slope areas). Existing affected facilities that are currently located on hillsides or slope areas may be susceptible to mudflow, but this would be considered part of the existing setting. As a result, Alternative C is not expected to generate significant adverse mudflow impacts.

Lastly, Alternative C is not expected to significantly adversely affect the quantity or quality of groundwater in the area of each affected facility. No significant adverse impacts to groundwater quality are expected from Alternative C because: 1) wastewater will continue to be collected and treated in each of the affected facility's wastewater treatment systems or in compliance with the current wastewater discharge permits, as applicable; 2) no underground storage tanks are expected to be constructed as part of Alternative C; 3) containment berms will be required or may already exist around the new or modified units to minimize the potential for spills to contaminate soil and groundwater; and, 4) any new storage tanks that may be proposed will be required to comply with BACT and other safety requirements such as double bottom and monitoring requirements.

<u>Water Demand and Water Quality Conclusion</u>
The water demand impacts that may result from Alternative C have been shown to require approximately 529,121 gallons per day of total water under Option 1 and 288,025 gallons per day of total water under Option 2. Under Option 1 of Alternative C, approximately 58 percent of the total water demand is expected to be satisfied with current and future supplies of recycled water, 23 percent is expected to be supplied by industrial-use groundwater, and the remaining 19 percent is expected to be supplied by potable water. However, if future access to recycled water does not occur, then approximately 38 percent of the total water demand is expected to be satisfied with current supplies of recycled water, 24 percent is expected to be supplied by industrial-use groundwater, and the remaining 33 percent is expected to be supplied by potable water under Alternative C - Option 1.

Similarly under Alternative C - Option 2, approximately 22 percent of the total water demand is expected to be satisfied with current and future supplies of recycled water, 43 percent is expected to be supplied by industrial-use groundwater, and the remaining 35 percent is expected to be supplied by potable water. Again, if future access to recycled water does not occur, then approximately 19 percent of the total water demand is expected to be satisfied with current supplies of recycled water, 43 percent is expected to be supplied by industrial-use groundwater, and the remaining 38 percent is expected to be supplied by potable water under Alternative C - Option 2.

Based on the preceding analysis, neither Option 1 nor Option 2 of Alternative C is expected to exceed SCAQMD's significance threshold of five million gallons of total water per day. If future supplies of recycled water become available, neither Option 1 nor Option 2 of the proposed project is expected to require a substantial amount of potable water as calculated pursuant to the water demand project criteria. However, in the event that future supplies of recycled water do not become available, only the potable water demand under Option 1 may require a substantial amount of potable water as calculated pursuant to the water demand project criteria. Further, the water suppliers have indicated that there will be an adequate supply of water (current and future supplies of recycled water plus potable water) for Alternative C under both Option 1 and Option 2. Therefore, the water demand impacts are concluded to be significant for Alternative C - Option 1 and less than significant for Alternative C - Option 2.

Lastly, based on the aforementioned considerations, the potential groundwater, wastewater discharge and storm water discharge impacts that may result from both Option 1 and Option 2 of Alternative C are expected to be less than significant.

When compared to the proposed project, the water demand impacts from both Option 1 and Option 2 of Alternative C are similar, but less than what was analyzed for the proposed project. Thus, any mitigation measures applied to the proposed project will also be applied to Alternative C. Further since the proposed project was concluded to have cumulatively considerable water demand impacts, while less than the proposed project, Alternative C is also considered to have cumulatively considerable water demand impacts. Therefore, Alternative C is expected to generate significant adverse cumulative water demand impacts.

TRAFFIC AND TRANSPORTATION

Alternative A - No Project

The project-specific traffic and transportation impacts associated with the installation of multiple SOx control devices (e.g., WGSs and DGSs) or modifying existing controls would be eliminated under Alternative A, the no project alternative, since no construction activities would occur and no new equipment would be installed at any of the affected facilities that would need additional trips associated with construction workers, supply deliveries, and waste removal/hauling. Under Alternative A, the traffic and transportation impacts would remain unchanged from the existing setting and therefore, would be less than significant.

Alternative B – AQMP

Because Alternative B applies the same SOx emission reduction targets as the proposed project but to fewer equipment/source categories (i.e., sulfuric acid manufacturing, coke calciner, and glass melting furnace), less add-on control equipment will be installed (i.e., four WGSs) such that fewer trips would be associated with construction and operation activities. The following analysis will demonstrate that the projected increases in trips associated with Alternative B will be less than significant because the amount of peak daily trips needed to install and operate the new SOx controls was well below the applicable trips significance criteria. While fewer WGSs would be installed with fewer trips under Alternative B, adverse traffic and transportation impacts are expected to occur but they will be less than the proposed project.

Under Alternative B, construction activities resulting from implementing the proposed project may generate a slight, albeit temporary, increase in traffic in the areas of each affected facility associated with construction workers, construction equipment, and the delivery of construction materials. However, Alternative B is not expected to cause a significant increase in traffic relative to the existing traffic load and capacity of the street systems surrounding the affected facilities. Also, Alternative B is not expected to exceed, either individually or cumulatively, the current LOS of the areas surrounding the affected facilities during construction as explained in the following paragraph.

As previously noted in the section that discusses "Air Quality," the maximum construction workforce during any six-month construction period is expected to be approximately 175 workers per facility. For a worst-case analysis under Alternative B, all four facilities may need a total of up to 700 workers, if they were assumed to undergo overlapping construction activities. Even if it is assumed that all 700 construction workers drive alone (which represents an average vehicle ridership equal to 1.0) not all of the workers would be driving to the same facility. It is unlikely that these vehicle trips would substantially affect the LOS at any intersection because the trips will be somewhat dispersed over a large area and the workers would not all arrive at the same site at the exactly the same time. Therefore, the work force at each affected facility is not expected to significantly increase as a result of Alternative B. Further, the conclusion of no significant transportation impacts based on the workforce is consistent with the transportation analyses in the Environmental Impact Reports prepared for six refineries in accordance with the CARB Phase III Reformulated Gasoline requirements. Specifically, the number of construction workers for each of the six projects ranged from approximately 200 to 700 daily construction worker trips and each of these projects was concluded to have no significant transportation impacts.

The operation-related traffic will be primarily for deliveries of NaOH and for hauling away of solid waste to be recycled or disposed of in a Class III landfill. Table 5-55 contains a summary of the delivery and haul away distances and frequencies for these materials. Since NaOH is available from local suppliers within the District, a round-trip delivery distance of 50 miles was assumed. This distance is expected to be conservative as most suppliers may be located closer to the affected facilities. For solid waste disposal, facility operators will have three options: 1) disposal of solid waste in a landfill located within the District or recycling of solid waste at a cement plant located within the District (i.e., 162 round-trip miles); 2) recycling of solid waste at a cement plant located outside of the District but within California (i.e., 264 round-trip miles); and, 3) recycling of solid waste at a cement plant located outside of the District and outside of California (i.e., 400 round-trip miles). For a worst-case analysis of solid waste disposal trips, the maximum mileage of 400 round-trip miles was assumed.

Table 5-55
Alternative B: Delivery and Hauling Away Truck Types and Driving Distances

Substance	Travels as a:	Truck Type	Delivery Area	Peak Round-trip Mileage per Delivery	Delivery Status
NaOH (50% by weight)	Pre-mixed liquid	6,000 gallon tanker truck	Within SCAQMD	50	Increase
Solid Waste	Varies	25-ton Heavy-duty Truck	Within or Outside SCAQMD	1. 162 for in-District recycling or disposal; 2. 264 for out-of-District but in-state recycling; or, 3. 400 for out of state recycling (worst-case)	Increase

A summary of the estimated truck trips of these substances per facility is provided in Table 5-56.

Table 5-56
Alternative B: Potential Increases in Truck Trips per Facility

Facility ID	Proposed Control Technology	Substances Delivered (D) or Hauled Away (H)	Peak Daily Truck Trips (round trips/day)	Peak Daily Round Trip Driving Distance (miles/day)	Annual Truck Trips (round trips/year)	Annual Round Trip Driving Distance (miles/day)
C	1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	None	**0**	**0**	**0**	**0**
		Subtotal: Facility C	**0**	**0**	**0**	**0**
H	1 WGS for calciner (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	32 + 7 **39**	1,600 + 2,800 **4,400**
		Subtotal: Facility H	**2**	**450**	**39**	**4,400**
I	2 WGSs for glass melting furnaces (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 133 **183**	8 + 1 **9**	400 + 133 **533**
		Subtotal: Facility I	**2**	**183**	**9**	**533**
J	1 WGS for sulfuric acid unit (new)	NaOH (D)	**1**	**50**	**13**	**650**
		Subtotal: Facility J	**1**	**50**	**13**	**650**
		ALTERNATIVE B TOTAL	**5**	**683**	**61**	**5,583**

The amount of peak daily truck trips associated with Alternative B is five. Since Alternative B is not expected to have an increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round trips per day, less than significant transportation impacts are expected from implementation of Alternative B. Further, taking into consideration the "worst-case" delivery and hauling transportation schedule, delivery and hauling trips associated with Alternative B are not expected to exceed, either individually or cumulatively, the current LOS of the areas surrounding the affected facilities during operations. Thus, the projected increase of traffic due to construction and operational activities is expected to be minimal and thus, the traffic impacts are expected to be less than significant for Alternative B.

Though some of the facilities that will be affected by the proposed project are located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, actions that would be taken to comply with Alternative B, such as installing new air pollution control equipment, are not expected to significantly influence or alter air traffic patterns. Further, the size and type of air pollution control devices that would be installed would not be expected to affect navigable air space because they would not be substantially taller than other equipment at affected facilities. Thus, Alternative B would not result in a change in air traffic patterns, an increase in traffic levels or a change in location that results in substantial safety risks.

The siting of each existing affected facility is consistent with surrounding land uses and traffic/circulation in the surrounding areas of the affected facilities. Thus, Alternative B is not expected to substantially increase traffic hazards or create incompatible uses at or adjacent to the affected facilities. Aside from the temporary effects due to a slight increase in truck traffic when facilities undergo construction activities, Alternative B is not expected to alter the existing long-term circulation patterns. Further, Alternative B is not expected to require a modification to circulation, thus, no long-term impacts on the traffic circulation system are expected to occur. Alternative B does not involve construction of any roadways, so there would be no increase in roadway design feature that could increase traffic hazards. Emergency access at each affected facility is not expected to be impacted by Alternative B. Further, each affected facility is expected to continue to maintain its existing emergency access gates.

Each affected facility will be expected to provide parking for the construction workers, as applicable, either on or within close proximity to each facility. No additional parking will be needed after completion of the construction phase because the work force at each facility is not expected to significantly increase as a result of Alternative B.

Lastly, construction and operation activities resulting from Alternative B are not expected to conflict with policies supporting alternative transportation since the proposed project does not involve or affect alternative transportation modes (e.g., bicycles or buses) because the construction and operation activities related to Alternative B will occur solely in existing industrial, commercial, and institutional areas. Based upon these considerations, significant transportation/traffic impacts are not expected from the implementation of Alternative B.

Alternative C – Intermediate SOx Reductions

Alternative C proposes the same SOx emission reduction targets as the proposed project for the following equipment/source categories: FCCUs, sulfuric acid manufacturing, coke calciner, glass melting furnace, and cement kilns. Like the proposed project, there are two SOx control approaches that can be applied to FCCUs under Alternative C. For this reason, Alternative C has been bifurcated into two options: Option 1 assumes that WGSs will be the control approach for FCCUs; and, Option 2 assumes that SOx reducing additives will be the control approach for FCCUs. The remaining source categories and their respective control approaches applicable to Alternative C will be the same for both Option 1 and Option 2. Less add-on control equipment would be expected to be installed (and less existing equipment modified) under Alternative C (i.e., eight WGSs plus two DGSs under Option 1 and four WGSs plus two DGSs under Option 2) in order to achieve the proposed SOx emission limits as compared to the proposed project (i.e., 11 WGSs plus two DGSs for Option 1 and seven WGSs plus to DGSs under Option 2).

The following analysis will demonstrate that the projected increases in trips associated with Alternative C will be less than significant because the amount of peak daily trips needed to install and operate the new SOx controls was well below the applicable trips significance criteria. While less equipment would be installed or modified with fewer trips under Alternative C, adverse traffic and transportation impacts are expected to occur but they will be less than the proposed project.

Construction activities resulting from implementing both options of Alternative C may generate a slight, albeit temporary, increase in traffic in the areas of each affected facility associated with construction workers, construction equipment, and the delivery of construction materials. However, neither option of Alternative C is expected to cause a significant increase in traffic relative to the existing traffic load and capacity of the street systems surrounding the affected facilities. Also, Alternative C is not expected to exceed, either individually or cumulatively, the current LOS of the areas surrounding the affected facilities during construction as explained in the following paragraph.

As previously noted in the section that discusses "Air Quality," the maximum construction workforce during any six-month construction period is expected to be approximately 175 workers per facility. For a worst-case analysis, four facilities may need a total of up to 700 workers were assumed to undergo overlapping construction activities. Even if it is assumed that all 700 construction workers drive alone (which represents an average vehicle ridership equal to 1.0) not all of the workers would be driving to the same facility. It is unlikely that these vehicle trips would substantially affect the LOS at any intersection because the trips will be somewhat dispersed over a large area and the workers would not all arrive at the same site at exactly the same time. Therefore, the work force at each affected facility is not expected to significantly increase as a result of Alternative C. Further, the conclusion of no significant transportation impacts based on the workforce is consistent with the transportation analyses in the Environmental Impact Reports prepared for six refineries in accordance with the CARB Phase III Reformulated Gasoline requirements. Specifically, the number of construction workers for each of the six projects ranged from approximately 200 to 700 daily construction worker trips and each of these projects was concluded to have no significant transportation impacts.

The operation-related traffic will be primarily for deliveries of NaOH, SOx reducing additives, limestone, TG-10 blend, Sulfinol, Merox catalyst, and elemental sulfur and for hauling away of solid waste to be recycled or disposed of in a Class III landfill. Table 5-57 contains a summary of the delivery and haul away distances and frequencies for each substance that is associated with Alternative C. Of the substances listed for deliveries, all but four are available from local suppliers within the District. For the local suppliers, a round-trip delivery distance of 50 miles was assumed. This distance is expected to be conservative as most suppliers are located closer to the affected facilities. However, suppliers for SOx Reducing Additives, Merox Catalyst, TG-10 and Sulfinol are all located out of state. Thus, deliveries of these materials are trucked into the District from out of state and the delivery mileage assumptions reflect the round-trip distance from the state line, either at the Arizona/California border (e.g., 400 miles) or the Nevada/California border (e.g., 500 miles). For solid waste disposal, facility operators will have three options: 1) disposal of solid waste in a landfill located within the District or recycling of solid waste at a cement plant located within the District (e.g., 162 round-trip miles); 2) recycling of solid waste at a cement plant located outside of the District but within California (e.g., 264 round-trip miles); and, 3) recycling of solid waste at a cement plant located outside of the District and outside of California (e.g., 400 round-trip miles). For a worst-case analysis of solid waste disposal trips, the maximum mileage of 400 round-trip miles was assumed.

Table 5-57
Alternative C: Delivery and Hauling Away Truck Types and Driving Distances

Substance	Travels as a:	Truck Type	Delivery Area	Peak Round-trip Mileage per Delivery	Delivery Status
Limestone	Aggregate	25-ton Heavy-duty Truck	Within SCAQMD	1	Increase
Merox Catalyst	Pre-mixed liquid	6,000 gallon tanker truck	Outside SCAQMD	500	Increase
NaOH (50% by weight)	Pre-mixed liquid	6,000 gallon tanker truck	Within SCAQMD	50	Increase
Solid Waste	Varies	25-ton Heavy-duty Truck	Within or Outside SCAQMD	1. 162 for in-District recycling or disposal; 2. 264 for out-of-District but in-state recycling; or, 3. 400 for out of state recycling (worst-case)	Increase
SOx Reducing Additives	Fine powder	25-ton Heavy-duty Truck	Outside SCAQMD	400	Increase
Sulfinol	Pre-mixed liquid	6,000 gallon tanker truck	Outside SCAQMD	500	Increase
Sulfur (Elemental)	Pre-mixed liquid	6,000 gallon tanker truck	Within SCAQMD	50	Increase
TG-10	Pre-mixed liquid	6,000 gallon tanker truck	Outside SCAQMD	400	Increase
MDEA	Pre-mixed liquid	6,000 gallon tanker truck	Within SCAQMD	50	No Change
DEA	Pre-mixed liquid	6,000 gallon tanker truck	Within SCAQMD	50	Decrease
MEA	Pre-mixed liquid	6,000 gallon tanker truck	Within SCAQMD	50	Decrease

A summary of the estimated truck trips of these substances per facility is provided in Tables 5-58 and 5-59 for Options 1 and 2 of Alternative C, respectively. The amount of peak daily truck trips associated with Alternative C is 27 for Option 1 and 24 for Option 2. Since neither option is expected to have an increase in heavy-duty transport truck traffic to and/or from any given facility by more than 350 truck round trips per day as shown in Tables 5-58 and 5-59, less than significant transportation impacts are expected from implementation either option of Alternative C. Further, taking into consideration the "worst-case" delivery and hauling transportation schedule, delivery and hauling trips associated with Alternative C are not expected to exceed, either individually or cumulatively, the current LOS of the areas surrounding the affected facilities during operations. Thus, the projected increase of traffic due to construction and operational activities is expected to be minimal and thus, the traffic impacts are expected to be less than significant for the proposed project.

Table 5-58
Alternative C - Option 1: Potential Increases in Truck Trips per Facility

Facility ID	Option 1: Proposed Control Technology	Substances Delivered (D) or Hauled Away (H)	Peak Daily Truck Trips* (round trips/day)	Peak Daily Round Trip Driving Distance* (miles/day)	Annual Truck Trips* (round trips/year)	Annual Round Trip Driving Distance* (miles/day)
A	1 WGS for FCCU (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	8 + 12 **20**	400 + 4,800 **5,200**
A	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. DEA (D)	1 + -1 **0**	500 + -50 **450**	22 + - 22 **0**	11,000 + -1,100 **9,900**
		Subtotal: Facility A	**2**	**900**	**20**	**15,100**
B	1 WGS for FCCU (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	12 + 16 **28**	600 + 6,400 **7,000**
		Subtotal: Facility B	**2**	**450**	**28**	**7,000**
C	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. MEA (D) 3. Elemental Sulfur (H)	1 + -1 + 1 **1**	500 + - 50 + 50 **500**	47 + - 48 + 1 **0**	23,500 - 2,400 + 50 **21,150**
C	1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	None	**0**	**0**	**0**	**0**
		Subtotal: Facility C	**1**	**500**	**0**	**21,150**
D	1 FGT by Merox Treatment Upgrade (modified)	1. NaOH (D) 2. Merox catalyst (D) 3. Elemental Sulfur (H) 4. Solid Waste (H)	1 + 1+ 1 + 1 + **4**	50 + 500 + 50 + 400 **1,000**	5 + 1+ 1 + 5 + **12**	250 + 500 + 50 + 2,000 **2,800**
		Subtotal: Facility D	**4**	**1,000**	**12**	**2,800**
E	1 WGS for FCCU (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	5 + 7 **12**	250 + 2,800 **3,050**
E	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. DEA (D) 3. Elemental Sulfur (H)	1 + - 1 + 1 **1**	500 + - 50 + 50 **500**	65 + -63 + 3 **5**	32,500 + -3,150 150 **29,500**
		Subtotal: Facility E	**3**	**950**	**17**	**32,550**
F	1 WGS for FCCU (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	20 + 28 **48**	1,000 + 11,200 **12,200**
F	1 FGT by Amine Additive (modified)	1. TG-10 (D) 2. Elemental Sulfur (H)	1 + 1 **2**	400 + 50 **450**	1 + 1 **2**	400 + 50 **450**
		Subtotal: Facility F	**4**	**900**	**50**	**12,650**

Table 5-58 (concluded)
Alternative C - Option 1: Potential Increases in Truck Trips per Facility

Facility ID	Option 1: Proposed Control Technology	Substances Delivered (D) or Hauled Away (H)	Peak Daily Truck Trips* (round trips/day)	Peak Daily Round Trip Driving Distance* (miles/day)	Annual Truck Trips* (round trips/year)	Annual Round Trip Driving Distance* (miles/day)
G	1 FGT by Merox Treatment Upgrade (modified)	1. NaOH (D) 2. Merox catalyst (D) 3. Elemental Sulfur (H) 4. Solid Waste (H)	1 + 1+ 1 + 1 + **4**	50 + 500 + 50 + 400 **1,000**	28 + 1+ 2 + 30 + **61**	1,400 + 500 + 100 + 12,000 **14,000**
		Subtotal: Facility G	**4**	**1,000**	**61**	**14,000**
H	1 WGS for calciner (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	32 + 7 **39**	1,600 + 2,800 **4,400**
		Subtotal: Facility H	**2**	**450**	**39**	**4,400**
I	2 WGSs for glass melting furnaces (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 133 **183**	8 + 1 **9**	400 + 133 **533**
		Subtotal: Facility I	**2**	**183**	**9**	**533**
J	1 WGS for sulfuric acid unit (new)	NaOH (D)	**1**	**50**	**13**	**650**
		Subtotal: Facility J	**1**	**50**	**13**	**650**
K	2 DGSs for cement kilns (new)	1. Limestone (D) 2. Solid Waste (H)	1 + 1 **2**	1 + 142 **143**	27 + 37 **64**	27 + 2,558 **2,585**
		Subtotal: Facility K	**2**	**143**	**64**	**2,585**
		ALTERNATIVE C - OPTION 1: TOTAL	**27**	**6,526**	**313**	**113,418**

* A negative number means a reduction in usage or demand.

Table 5-59
Alternative C - Option 2: Potential Increases in Truck Trips per Facility

Facility ID	Option 2: Proposed Control Technology	Substances Delivered (D) or Hauled Away (H)	Peak Daily Truck Trips* (round trips/day)	Peak Daily Round Trip Driving Distance* (miles/day)	Annual Truck Trips* (round trips/year)	Annual Round Trip Driving Distance* (miles/day)
A	1 SOx Reducing Additive Hopper for FCCU (modified)	SOx Reducing Additives (D)	**1**	**400**	**4**	**1,600**
A	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. DEA (D)	1 +F -1 **0**	500 + -50 **450**	22 + - 22 **0**	11,000 + -1,100 **9,900**
		Subtotal: Facility A	**1**	**850**	**4**	**11,500**
B	1 SOx Reducing Additive Hopper for FCCU (modified)	SOx Reducing Additives (D)	**1**	**400**	**4**	**1,600**
		Subtotal: Facility B	**1**	**400**	**4**	**1,600**
C	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. MEA (D) 3. Elemental Sulfur (H)	1 + -1 + 1 **1**	500 + - 50 + 50 **500**	47 + - 48 + 1 **0**	23,500 - 2,400 + 50 **21,150**
C	1 Upgrade to Existing Cansolv Unit/Sulfuric Acid (modified)	None	**0**	**0**	**0**	**0**
		Subtotal: Facility C	**1**	**500**	**0**	**21,150**
D	1 SOx Reducing Additive Hopper for FCCU (new)	SOx Reducing Additives (D)	**1**	**400**	**4**	**1,600**
D	1 FGT by Merox Treatment Upgrade (modified)	1. NaOH (D) 2. Merox catalyst (D) 3. Elemental Sulfur (H) 4. Solid Waste (H)	1 + 1+ 1 + 1 + **4**	50 + 500 + 50 + 400 **1,000**	5 + 1+ 1 + 5 + **12**	250 + 500 + 50 + 2,000 **2,800**
		Subtotal: Facility D	**5**	**1,400**	**16**	**4,400**
E	1 SOx Reducing Additive Hopper for FCCU (modified)	SOx Reducing Additives (D)	**1**	**400**	**4**	**1,600**
E	1 FGT by Sulfinol Conversion (modified)	1. Sulfinol (D) 2. DEA (D) 3. Elemental Sulfur (H)	1 + - 1 + 1 **1**	500 + - 50 + 50 **500**	65 + -63 + 3 **5**	32,500 + -3,150 150 **29,500**
		Subtotal: Facility E	**2**	**900**	**9**	**31,100**

Table 5-59 (concluded)
Alternative C - Option 2: Potential Increases in Truck Trips per Facility

Facility ID	Option 2: Proposed Control Technology	Substances Delivered (D) or Hauled Away (H)	Peak Daily Truck Trips* (round trips/day)	Peak Daily Round Trip Driving Distance* (miles/day)	Annual Truck Trips* (round trips/year)	Annual Round Trip Driving Distance* (miles/day)
F	1 SOx Reducing Additive Hopper for FCCU (modified)	SOx Reducing Additives (D)	**1**	**400**	**4**	**1,600**
F	1 FGT by Amine Additive (modified)	1. TG-10 (D) 2. Elemental Sulfur (H)	1 + 1 **2**	400 + 50 **450**	1 + 1 **2**	400 + 50 **450**
		Subtotal: Facility F	**3**	**850**	**6**	**2,050**
G	1 FGT by Merox Treatment Upgrade (modified)	1. NaOH (D) 2. Merox catalyst (D) 3. Elemental Sulfur (H) 4. Solid Waste (H)	1 + 1+ 1 + 1 + **4**	50 + 500 + 50 + 400 **1,000**	28 + 1+ 2 + 30 + **61**	1,400 + 500 + 100 + 12,000 **14,000**
		Subtotal: Facility G	**4**	**1,000**	**61**	**14,000**
H	1 WGS for calciner (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 400 **450**	32 + 7 **39**	1,600 + 2,800 **4,400**
		Subtotal: Facility H	**2**	**450**	**39**	**4,400**
I	2 WGSs for glass melting furnaces (new)	1. NaOH (D) 2. Solid Waste (H)	1 + 1 **2**	50 + 133 **183**	8 + 1 **9**	400 + 133 **533**
		Subtotal: Facility I	**2**	**183**	**9**	**533**
J	1 WGS for sulfuric acid unit (new)	NaOH (D)	**1**	**50**	**13**	**650**
		Subtotal: Facility J	**1**	**50**	**13**	**650**
K	2 DGSs for cement kilns (new)	1. Limestone (D) 2. Solid Waste (H)	1 + 1 **2**	1 + 142 **143**	27 + 37 **64**	27 + 2,558 **2,585**
		Subtotal: Facility K	**2**	**143**	**64**	**2,585**
		ALTERNATIVE C - OPTION 2: TOTAL	**24**	**6,726**	**225**	**93,968**

* A negative number means a reduction in usage or demand.

Though some of the facilities that will be affected by Alternative C are located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, actions that would be taken to comply with Alternative C, such as installing new air pollution control equipment, are not expected to significantly influence or alter air traffic patterns. Further, the size and type of air pollution control devices that would be installed would not be expected to affect navigable air space because they would not be substantially taller than other equipment at affected facilities. Thus, Alternative C would not result in a change in air traffic patterns, an increase in traffic levels or a change in location that results in substantial safety risks.

The siting of each existing affected facility is consistent with surrounding land uses and traffic/circulation in the surrounding areas of the affected facilities. Thus, Alternative C is not expected to substantially increase traffic hazards or create incompatible uses at or adjacent to the affected facilities. Aside from the temporary effects due to a slight increase in truck traffic when facilities undergo construction activities, Alternative C is not expected to alter the existing long-term circulation patterns. Alternative C is not expected to require a modification to circulation, thus, no long-term impacts on the traffic circulation system are expected to occur. Alternative C does not involve construction of any roadways, so there would be no increase in roadway design feature that could increase traffic hazards. Emergency access at each affected facility is not expected to be impacted by Alternative C. Further, each affected facility is expected to continue to maintain its existing emergency access gates.

Each affected facility will be expected to provide parking for the construction workers, as applicable, either on or within close proximity to each facility. No additional parking will be needed after completion of the construction phase because the work force at each facility is not expected to significantly increase as a result of Alternative C.

Lastly, construction and operation activities resulting from Alternative C are not expected to conflict with policies supporting alternative transportation since the proposed project does not involve or affect alternative transportation modes (e.g., bicycles or buses) because the construction and operation activities related to Alternative C will occur solely in existing industrial, commercial, and institutional areas. Based upon these considerations, significant transportation/traffic impacts are not expected from the implementation of Alternative C.

CONCLUSION

Table 5-60 summarizes all of the potential adverse environmental impacts from the proposed project and the alternatives.

Alternative A may not be a feasible alternative because it does not achieve any of the SOx emission reductions identified in the AQMP, which are necessary to demonstrate attainment with state and federal air quality standards. Even though Alternative A does not achieve the objectives of the proposed project and provides no benefit to air quality and public health, Alternative A would not be expected to generate any adverse environmental impacts. Thus, Alternative A is the environmentally superior alternative. However, if the "no project" alternative is determined to be the environmentally superior alternative, then the CEQA document shall identify an environmentally superior alternative among the other alternatives (CEQA Guidelines §15126.6 (e)(2)).

Alternative B, with a potential SOx emissions reduction of 1.50 tons per day, only partially achieves the SOx emission reductions identified in the AQMP, which are necessary to demonstrate attainment with state and federal air quality standards. When compared to the proposed project, Alternative B provides fewer benefits to air quality and public health. However, because Alternative B is limited to fewer source categories, fewer WGSs would be installed. Of the adverse environmental impacts that would be generated under Alternative B, the impacts would be less than the proposed project and less than significant, except for air quality construction emissions which are identical to the proposed project and are concluded to be significant. Lastly, Alternative B does not employ as much use of NaOH, a toxic. Thus,

Table 5-60
Detailed Summary of Adverse Environmental Impacts

Environmental Topic	Environmental Impact	Proposed Project - Option 1	Proposed Project - Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C - Option 1: Intermediate SOx Reductions	Alternative C – Option 2: Intermediate SOx Reductions
Aesthetics	Number of new steam plumes from WGSs	11 (NS)	7 (NS)	0 (NS)	4 (NS)	8 (NS)	4 (NS)
Aesthetics	Number of new, tall stacks for WGSs	11 (NS)	7 (NS)	0 (NS)	4 (NS)	8 (NS)	4 (NS)
Air Quality	Peak Daily Construction Emissions (lb/day)	VOC = 89 (S) CO = 461 (NS) NOx = 464 (S) SOx = 1 (NS) PM10 = 159 (S) PM2.5 = 53 (NS)	Same as Proposed Project: Option 1	0 (NS)	Same as Proposed Project - Option 1	Same as Proposed Project - Option 1	Same as Proposed Project - Option 1
Air Quality	Peak Daily Operational Emissions (lb/day)	Increase: VOC = 1 (NS) CO = 5 (NS) NOx = 15 (NS) PM10 = 1 (NS) PM2.5 = 1 (NS) Decrease: SOx = 6.21 tons/day (NS)	Increase: VOC = 1 (NS) CO = 4 (NS) NOx = 13 (NS) PM10 = 1 (NS) PM2.5 = 1 (NS) Decrease: SOx = 6.21 tons/day (NS)	0 (NS)	Increase: NOx = 1 (NS) Decrease: SOx = 1.50 tons/day (NS)	Increase: VOC = 1 (NS) CO = 4 (NS) NOx = 13 (NS) PM10 = 1 (NS) PM2.5 = 1 (NS) Decrease: SOx = 5.48 tons/day (NS)	Increase: VOC = 1 (NS) CO = 4 (NS) NOx = 11 (NS) PM10 = 1 (NS) Decrease: SOx = 5.48 tons/day (NS)
Air Quality	GHG Emissions (MT/yr) [1]	39,020 without mitigation (S); 38,771 with mitigation (S)	19,662 without mitigation (S); 19,580 with mitigation (S)	0 (NS)	6,567 without mitigation (NS); 6,522 with mitigation (NS)	34,159 without mitigation (S); 33,911 with mitigation (S)	14,805 without mitigation (S); 14,723 with mitigation (S)
Air Quality	NaOH Demand (tons/day)	13.24 (NS)	8.79 (NS)	0 (NS)	5.45 (NS)	13.24 (NS)	8.79 (NS)

S = Significant; NS = Not Significant
[1] 1 MT = 1 metric ton = 2,205 pounds

Table 5-60 (concluded)
Detailed Summary of Adverse Environmental Impacts

Environmental Topic	Environmental Impact	Proposed Project - Option 1	Proposed Project - Option 2	Alternative A: No Project	Alternative B: AQMP	Alternative C - Option 1: Intermediate SOx Reductions	Alternative C – Option 2: Intermediate SOx Reductions
Energy	Natural Gas Demand (mmBTU/day)	-4.1 (NS)[2]	-4.1 (NS)[2]	0 (NS)	0	-34.25 (NS)[2]	-34.25 (NS)[2]
Energy	Electricity Demand (MWh/day)	204 (NS)	101 (NS)	0 (NS)	33 (NS)	182 (NS)	79 (NS)
Energy	Gasoline Demand (gal/day)	1,354 (NS)	1,354 (NS)	0 (NS)	1,354 (NS)	1,354 (NS)	1,354 (NS)
Energy	Diesel Demand (gal/day)	3,763 (NS)	3,397 (NS)	0 (NS)	1,465 (NS)	3,493 ~~3,063~~ (NS)	3,127 ~~2,690~~ (NS)
Hydrology & Water Quality	Total Water Demand (gal/day)	883,368 (NS)	642,272 (NS)	0 (NS)	125,285 (NS)	529,121 (NS)	288,025 (NS)
Hydrology & Water Quality	Potable Water Demand (gal/day)	201,587 (S)	108,436 (NS)	0 (NS)	125,285 (NS)	201,587 (S)	108,436 (NS)
Hydrology & Water Quality	Wastewater Generation (gal/day)	270,532 (NS)	158,203 (NS)	0 (NS)	40,669 (NS)	199,573 (NS)	87,244 (NS)
Traffic & Transportation	Customer Visits per day due to Construction	700 (NS)	700 (NS)	0 (NS)	700 (NS)	700 (NS)	700 (NS)
Traffic & Transportation	Heavy-duty truck traffic due to Construction	76 (NS)	76 (NS)	0 (NS)	76 (NS)	76 (NS)	76 (NS)
Traffic & Transportation	Customer Visits per day due to Operation	0 (NS)	0 (NS)	0 (NS)	0 (NS)	0 (NS)	0 (NS)
Traffic & Transportation	Heavy-duty truck traffic due to Operation	33 (NS)	30 (NS)	0 (NS)	5 (NS)	27 (NS)	24 (NS)

S = Significant; NS = Not Significant

[2] A negative number means a reduction in usage or demand.

aside from the "no project" alternative, Alternative B is concluded to be the least toxic alternative. For these aforementioned reasons, Alternative B is concluded to be the environmentally superior alternative.

Alternative C, with a potential SOx emissions reduction of 5.48 tons per day, achieves slightly less potential SOx emission reductions than the proposed project. When compared to the proposed project, the GHG emissions projected for both options of Alternative C are significant, but less than the proposed project. Because Alternative C employs the same amount of NaOH for Option 1 and Option 2, respectively as the proposed project, it has equivalent toxic impacts when compared to the proposed project. Further, even though Alternative C would require less WGSs to be installed and would require less total water overall, both Option 1 and Option 2 of Alternative C are estimated to have equivalent demands of potable water when compared to Option 1 and Option 2 of the proposed project. Thus, Alternative C has equivalent potable water demand impacts as the proposed project. With regard to water quality, both Option 1 and Option 2 of Alternative C would generate less wastewater than Option 1 and Option 2 of the proposed project, respectively. Overall, Alternative C has less environmental impacts than the proposed project but it does not achieve the additional SOx reductions and health benefits expected from the proposed project.

All things considered, since the Basin is in non-attainment for PM2.5, for which SOx is a major precursor and since the 17 million residents of the South Coast Air Basin are experiencing the worst PM2.5 exposure in the nation, the proposed project achieves the largest amount of overall SOx reductions by relying on currently available SOx control technologies. It should be noted that SCAQMD staff has calculated that one ton of SOx reductions is equal to 15 tons of NOx reductions in progressing towards attainment of the PM2.5 standard. Although the proposed project also has the largest amount of adverse environmental impacts overall when compared to the alternatives, it achieves the maximum level of SOx reductions and corresponding health benefits. Each of the alternatives was crafted to show the various possibilities or permutations of how operators of SOx RECLAIM facilities could achieve actual SOx reductions, but ultimately, there is no way to predict what each facility operator will do. Thus, considering the PM2.5 exposure levels of the residents in the South Coast Air Basin and the need for expeditious improvement in PM2.5 air quality, the proposed project is preferred over Alternatives A, B, and C because it provides the most flexibility in the methods for reducing SOx emissions while maximizing the amount of potential SOx reductions and health benefits if the methods are implemented.