Response to Comments for the Final Environmental Impact Report for the Bay Area Air Quality Management District

AB 617 Expedited BARCT Implementation Schedule Project

State Clearing House Number: 2018082003

Prepared for:

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December 2018

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Response to Comments
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1.0 INTRODUCTION

This Final Environmental Impact Report (FEIR) has been prepared in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) and the CEQA Guidelines (California Code of Regulations Section 15000 et seq.). According to CEQA Guidelines, Section 15132, the FEIR shall consist of:

- The Draft Environmental Impact Report (DEIR) or a revision of the Draft;
- Comments and recommendations received on the DEIR either verbatim or in summary;
- A list of persons, organizations, and public agencies comments on the DEIR;
- The responses of the Lead Agency to significant environmental points raised in the review and consultation process; and,
- Any other information added by the Lead Agency.

This Response to Comments, together with other portions of the DEIR as revised, constitutes the FEIR for the proposed AB 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule.

The DEIR contains a detailed project description, the environmental setting for each of the environmental resources topic areas where the Notice of Preparation and Initial Study (NOP/IS) determined there was a potential significant adverse impact, an analysis of the potentially significant environmental impacts including cumulative impacts, project alternatives, mitigation measures, and other areas of discussion as required by CEQA. The discussion of the project-related and cumulative environmental impacts included a detailed analysis of air quality, hazards and hazardous materials, and hydrology and water quality.

The DEIR was released on October 23, 2018 and circulated for a 45-day public review and comment period that ended on December 7, 2018. The DEIR is available at the Bay Area Air Quality Management District (BAAQMD), 375 Beale Street, Suite 600, San Francisco, California 94105. Copies can also be obtained by accessing the BAAQMD's website at http://www.baaqmd.gov/ab617barct. The BAAQMD received one comment letter on the Draft EIR during the public comment period. The comment letters and responses to the comments raised in those letters are provided in this document. The comments are bracketed and numbered. The related responses are identified with the corresponding number and are included following each comment letter.

1.1 FORMAT OF THIS DOCUMENT

The Final EIR for the Expedited BARCT Implementation Schedule consists of the Draft EIR and its technical appendices; the Responses to Comments included herein; and other written documentation prepared during the EIR process. The District would also consider adoption of a Statement of Findings of Fact and a Statement of Overriding Considerations as part of the approval process for the Project.

This Response to Comments document is organized as follows:

- Section 1 provides a brief introduction to this document.
- Section 2 identifies the Draft EIR commenters.
- Section 3 provides responses to substantive comments received on the Draft EIR. Responses are provided in the form of individual responses to comment letters received. Comment letters are followed immediately by the responses to each letter.
- Section 4 presents clarifications to the Draft EIR, identifying revisions to the text of the document.

1.2 CEQA REQUIREMENTS REGARDING COMMENTS AND RESPONSES

CEQA Guidelines Section 15204 (a) outlines parameters for submitting comments, and reminds persons and public agencies that the focus of review and comment of DEIRs should be "on the sufficiency of the document in identifying and analyzing possible impacts on the environment and ways in which significant effects of the project might be avoided or mitigated. Comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate the significant environmental effects. At the same time, reviewers should be aware that the adequacy of an EIR is determined in terms of what is reasonably feasible. CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commenters. When responding to comments, lead agencies need only respond to significant environmental issues and do not need to provide all information requested by reviewers, as long as a good-faith effort at full disclosure is made in the EIR."

CEQA Guidelines Section 15204 (c) further advises, "Reviewers should explain the basis for their comments, and should submit data or references offering facts, reasonable assumptions based on facts, or expert opinion supported by facts in support of the comments. Pursuant to Section 15064, an effect shall not be considered significant in the absence of substantial evidence." Section 15204 (d) also states, "Each responsible agency and trustee agency shall focus its comments on environmental information germane to that agency's statutory responsibility." Section 15204 (e) states, "This section shall not be used to restrict the ability of reviewers to comment on the general adequacy of a document or of the lead agency to reject comments not focused as recommended by this section."

2.0 COMMENTS RECEIVED ON THE DRAFT EIR

In accordance with the State CEQA Guidelines Section 15132, the following is a list of public agencies, organizations, individuals, and businesses that submitted comments on the Draft EIR received as of close of the public review period on December 7, 2018. Comments have been numbered and responses have been developed with corresponding numbers.

TABLE 2-1

Comment Letters with Responses Prepared

Comment Letter	Commenter	Date Received
1	Gordon Johnson, Shell Oil Products, U.S. Martinez Refinery	12/7/18

3.0 RESPONSES TO COMMENTS

This section includes responses to all substantive environmental issues raised in comments received on the Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule. Responses are provided for each of the comments received. This section is formatted so that the respective comment letters are followed immediately by the corresponding responses. Comment letters and specific comments are given letters and numbers, respectively, for reference purposes.

Comment Letter No. 1

Shell Oil Products US

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

BY CERTIFIED MAIL AND EMAIL

December 07, 2018

Mr. David Joe
Office of Rules and Strategic Policy
Bay Area Air Quality Management District (BAAQMD)
375 Beale Street, Suite 600
San Francisco, CA 94105

Subject: Shell Comments on Staff Report and DEIR for AB 617 Expedited BARCT Implementation Schedule

Dear Mr. Joe:

The Shell Martinez Refinery (Shell) is writing this letter to provide comments on the revised Staff Report on the Assembly Bill 617 (AB 617) Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule and Draft Environmental Impact Report (DEIR), dated October of 2018. 1-1

Staff Report
In a letter dated October 5, 2018, Shell provided BAAQMD comments on the prior Initial Staff Report issued in September of 2018. The comments in the October 5, 2018 letter are still applicable and are attached to this letter.

DEIR
Chapter 3.4 of the DEIR, "Hydrology and Water Quality," concludes that the installation and operation of a wet gas scrubber (WGS) to control sulfur oxide emissions would result in significant impacts on water demand. More specifically, the DEIR estimates the expected water demand may be up to 300 gallons per minute or 432,000 gallons per day for each WGS. The DEIR states that up to three WGS may be installed in the San Francisco Bay Area to comply with the proposed Expedited BARCT Implementation Schedule, which would result in total water demand of up to 1,296,000 gallons per day. Shell appreciates BAAQMD acknowledging the significant impact on water demand that would result from the installation and operation of a WGS. 1-2

However, the DEIR states, "it is not expected that wastewater would exceed a facility's current wastewater discharge limits, require changes to existing wastewater permit conditions, or require new wastewater permits" and that "water quality impacts during operation are concluded to be less than significant." These conclusions cannot be made without further analysis. For example, assuming that a new WGS system at Shell would generate up to 300 gallons per minute of new wastewater, Shell would need to upgrade the existing wastewater infrastructure to address potential sewer bottlenecks and overall capacity. In addition, Shell would need to update the National Pollutant Discharge Elimination

System (NPDES) permit to address the changes in the wastewater treatment system and potential increase in contaminants. BAAQMD should either perform a more complete analysis of water quality impacts to correctly characterize the impacts or, if information is not currently available to show otherwise, conclude that impacts on water quality may be potential significant.

Shell is looking forward to continuing to work with BAAQMD staff to further discuss these concerns and determine a path forward.

Please contact Rick Shih at 925-313-0586 if you would like to discuss these issues in more detail.

1-2 cont..

Very truly yours,

Gordon Johnson
Manager, Environmental
Shell Oil Products, US – Martinez Refinery

Attachment:

Shell Comment Letter Dated October 5, 2018

Shell Oil Products US

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

CERTIFIED MAIL AND EMAIL

October 05, 2018

Mr. David Joe
Office of Rules and Strategic Policy
Bay Area Air Quality Management District (BAAQMD)
375 Beale Street, Suite 600
San Francisco, CA 94105

Subject: Shell Comments on Initial Staff Report for AB 617 Expedited BARCT Implementation Schedule

Dear Mr. Joe,

The Shell Martinez Refinery (Shell) is writing this letter to provide comments on the Initial Staff Report on the Assembly Bill 617 (AB 617) Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule (dated September of 2018). The focus of Shell's comments is on the Rule Development Project Scope for fluidized catalytic cracking units (FCCU) and carbon monoxide (CO) Boilers attached to the Initial Staff Report (referred to as Project Scope in this letter). Shell previously provided BAAQMD Shell's initial comments to the draft Project Scope issued in May of 2018. Those initial comments that are still applicable are also reiterated below. 1-3

Additional Studies Required Prior to Rule Implementation

The Staff Report states that additional testing and time to gather more information may be needed for the BARCT Refinery FCCU and CO Boiler rule. In fact, BAAQMD has adjusted the proposed implementation schedule to better account for the additional time needed. Shell appreciates BAAQMD recognition of the importance of thorough information gathering necessary to obtain accurate data on potential emission reductions and data on cost of controls to calculate the cost effectiveness of a proposed BARCT rule. 1-4

More specifically, the Project Scope for FCCU and CO Boilers notes the need for additional testing and study to properly characterize condensable PM emissions from the CO Boilers. Due to the flow patterns in Shell's CO Boiler stacks, BAAQMD staff agree that current EPA test methodologies are not able to accurately measure condensable particulate in these stacks. Shell agrees further testing and study is needed to properly characterize condensable particulate emissions.

Attainment for SO_2 and Non-attainment for PM

AB617 requires BARCT implementation in non-attainment areas. Although the Bay Area is in attainment for sulfur dioxide (SO_2), BAAQMD staff focuses on SO_2 emission reductions in the Project Scope for FCCU and CO Boilers because SO_2 emissions can lead to the formation of condensable PM. Shell believes instead that the cost effectiveness for this BARCT rule should be based on the emission reductions of the non-attainment pollutant (PM) rather than on the attainment pollutant (SO_2). However, 1-5

until the condensable PM emissions can be accurately measured from the CO Boiler stacks, the condensable PM reductions as a result of SO_2 reductions cannot be accurately determined for use in the cost effectiveness calculations. Therefore, until additional information on condensable PM from SO_2 can be obtained, it will be difficult to develop a BARCT rule.

1-5 cont.

New/Reconstructed/Modified versus Existing (BACT versus BARCT)

The Project Scope sets a preliminary SO_2 BARCT level of 50 parts per million by volume (ppmv) on a seven-day rolling average and 25 ppmv on a 365-day rolling average based on Best Available Control Technology (BACT) guidelines and New Source Performance Standards (NSPS) Subpart Ja for newly constructed, reconstructed and modified units. BAAQMD staff believes this will require the use of wet gas scrubbers (WGS).

1-6

By definition, BARCT is retrofit technology for an existing unit, which is not the same as new units or those being reconstructed or modified. Therefore, the BACT and NSPS Subpart Ja standards should not be used as a basis for BARCT.

WGS Cost Effectiveness

The current cost effectiveness estimates presented in the Project Scope severely underestimate the actual costs.

Capital Cost: BAAQMD estimates the costs for retrofitting an existing FCCU/CO Boiler with a WGS to be $135 million. The basis for this estimate is not detailed in the report. Shell believes the actual capital costs would be significantly greater. As explained below, Shell believes the cost will be over $700 million.

BAAQMD's own engineering evaluation in 2008 identified capital costs of up to $200 million for a WGS to be installed in Delaware (2008 Application#17798 for Tesoro, Plant No. 14628). Using this $200 million cost and adjusting to account for inflation, the 2018 capital costs would be $234 million. Even the $234 million value is a significant underestimate of actual costs to install a WGS at Shell. Examples of why the costs are understated are described below:

- The $234 million value is based on costs in Delaware but the cost to install a WGS in the Bay Area would be significantly higher due to the high construction cost in the Bay Area.

1-7

- As the engineering evaluation referenced above states, the capital cost estimates did not include costs associated with upgrades that would be needed for existing equipment. For example, Shell would need to replace the existing CO Boilers with new CO boilers that work at the higher pressures of the WGS system. New boilers could also trigger the installation of selective catalytic reduction (SCR) units for NOx control. The permitting, design and construction of new boilers would add significant costs.

- Due to the existing lack of free space at the Catalytic Cracking Unit and CO Boilers, the likelihood of identifying an area to accommodate the WGS and new CO Boilers footprint is highly unlikely. Given the limited space near the existing CO Boilers and if a feasible location can be found for the WGS, a significant amount of piping and infrastructure would be required to route the exhaust from the CCU to the new CO Boilers to the proposed WGS. Again, Shell strongly believes it is unlikely an area would be identified to accommodate the footprint of new CO Boilers and a WG.

- It is Shell's understanding that a recently built WGS project at Valero cost over $700 million, if not higher over 10 years ago.

Table 1 summaries the costs presented above. Considering the above factors, Shell believes the actual capital cost to install a WGS at the refinery would be at least $700 million.

Table 1. Summary of Capital Costs

Basis	BAAQMD Sept 2018 Project Scope	BAAQMD 2008 Tesoro Permit Evaluation Adjusted for Inflation	Shell Estimate[1]
Capital Cost	$135 Million	$234 Million	>700 Million

[1]With Site Specific Considerations and Valero Actual Costs

1-7 cont.

Operating Cost: In addition, the operating costs are significantly greater than what is used in the Project Scope. Based on factors presented in the Initial Staff report, the annual maintenance and operating cost used in the Project Scope appears to be about $9 million per year. This is in contrast to the $26 million per year operating cost based on the Tesoro engineering evaluation (after adjusting the listed $22 million per year for inflation). Operating and maintenance costs for WGS need to account for the additional energy and water usage; the more frequent maintenance required to address corrosion in the WGS; and additional cost of disposing liquid and solid waste, which may be hazardous (e.g., cost of laboratory analysis, handling and transportation, treatment, and final disposal).

1-8

Cost Effectiveness: Using the conservatively low 2018 capital costs of $234 million and the same annualized factors used in the 2008 engineering evaluation, the annualized capital cost would be $47 million per year. Adding this 2018 annualized capital cost and the 2018 operating cost of $26 million per year, the total annualized cost would be $73 million per year. Based on a potential reduction of 567 tons per year estimated by BAAQMD, the resulting cost effectiveness would then be $130,000 per ton.

Using the Shell Martinez estimate of at least $700 million, the annualized factors used in the 2008 engineering evaluation, and the same $26 million per year operating cost, the cost effectiveness would be at least $300,000 per ton. The Project Scope's estimate of $47,000 per ton significantly underestimates the cost-effectiveness of the WGS. Table 2 summaries the cost effectiveness results presented above.

Considering BAAQMD's low capital and operating cost estimates, Shell requests BAAQMD provide more details on the basis for BAAQMD's cost estimates. For example, what was BAAQMD's basis for the $135 million capital cost estimate? Also, the Initial Staff Report lists the factors to estimate annual cost from the capital cost. However, the General and Administrative cost factor (identified as typically being 2 percent of the capital cost in BAAQMD's BACT Policy and Implementation Procedure) was not listed and does not appear to be have been considered.

1-9

Table 2. Summary of Cost Effectiveness

Basis	BAAQMD Project Scope September 2018	BAAQMD 2008 Tesoro Permit Evaluation Adjusted for Inflation	Shell Estimate[1]
Cost Effectiveness	$47,000 per ton	$130,000 per ton	>$300,000 per ton

[1]With Site Specific Considerations and Valero Actual Costs

WGS – GHG, Energy, Water and other Environmental Impact Considerations

By requiring the installation of WGS on a FCCU, GHG emissions will increase as a result of the higher energy demand to operate a WGS. Thus, while the use of a WGS may result in a decrease in CCU criteria pollutants, facility wide GHG emissions and energy use will increase. In addition, there will be other environmental impacts from the construction and operation of a WGS.

1-10

In particular, the increased water use for a WGS must be carefully evaluated and considered. Also, the liquid purged from the WGS will need to be appropriately treated before discharging or reusing the liquid. This will result in the generation of additional waste water and solid waste (potentially hazardous waste) as well as potentially new wastewater treatment equipment. Also, the use of a WGS would likely result in a colder, saturated plume that would not disperse as effectively as exhaust going through the current CO Boiler stacks, thereby countering some of the benefits of reduced emissions to local receptors. These impacts must be considered when determining the overall benefit of the rule.

1-10 cont.

Catalyst Additives

In addition, the Project Scope notes that further study is needed to assess the use of a catalyst additive to reduce SO_2 emissions. Shell is not aware of any data the demonstrates Data is not currently proposed BARCT levels can be achieved through the use of catalyst additives. Shell agrees further study and testing is needed to properly assess the cost and benefits of using catalyst additive to reduce SO_2 emissions.

1-11

Summary

In summary, Shell has the following comments:

- **Additional PM Studies:** To develop an effective rule, additional studies are needed to accurately characterize any potential PM emission reductions.
- **Attainment:** Since the area is in attainment of SO_2 and non-attainment of PM standards, the cost-effectiveness should be based on PM emission reductions (which again cannot be accurately determined without further study).
- **Retrofit vs New/Modified**: The proposed SO_2 limits are based on BACT guidelines and NSPS, both of which are for newly constructed, reconstructed, and modified units. However, BARCT applies to the retrofit of existing units not being reconstructed or modified and so the proposed limits are not appropriate.
- **WGS Cost Effectiveness**: The actual costs for retrofitting an existing FCCU/CO Boiler with a WGS are significantly greater than estimated by BAAQMD.
- **Other Environmental Impacts**: WGS would result in higher energy consumption, greater GHG emissions, increase water usage, and greater liquid and solid waste generation.
- **Catalyst Additives:** Additional studies would be needed to determine the potential emission reductions and cost effectiveness of catalyst additives.

1-12

Shell is looking forward to continuing to work with BAAQMD staff to further discuss these concerns and determine a path forward.

Please contact Rick Shih at 925-313-0586 if you would like to discuss these issues in more detail.

Very truly yours,

Gordon Johnson
Manager, Environmental
Shell Oil Products, US – Martinez Refinery

Comment Letter No. 1

Gordon Johnson
Shell Oil Products, U.S. – Martinez Refinery

Response No. 1-1

Comment 1-1 is an introductory comment indicating that the letter provides comments on the Expedited Best Available Retrofit Control Technology (BARCT) Draft Environmental Impact Report (DEIR) and Staff Report.

The comment indicates that the comments provided by Shell on October 5, 2018 for the Initial Staff Report are still applicable to the Staff Report. The comment does not address any issue related to the DEIR and no response is required.

Response No. 1-2

Response 1-2 summarizes the conclusions in the DEIR with respect to water demand impacts, which reported that water demand impacts were potentially significant.

The comment further indicates that generating up to 300 gallons per minute of new wastewater would require upgrades to Shell's existing wastewater infrastructure and revisions to Shell's NPDES permit, and suggests that the EIR include a more complete analysis of water quality impacts or conclude that water quality impacts are potentially significant. Shell's comment incorrectly implies that the volume of the wastewater stream from a wet gas scrubber (WGS) would equal the volume of the water feed to the scrubber. To the contrary, by the nature of the process, only a fraction of the water used by a WSG is discharged as wastewater. This is because a large portion of the water demand is lost in the abatement process and through steam. Water used in the WGS is emitted in the form of steam from a stack that is saturated with water, forming a steam plume. The steam plume is the result of using water to reduce the particulate emissions in the WGS. Therefore, the wastewater generation would not equal the entire 300 gpm of water demand. For example, one wet ESP and WGS were installed on the FCCU at the Phillips 66 Los Angeles Refinery, and the environmental analysis for the project indicated that the expected wastewater discharge from the combined operation would be about 70 gallons per minute (100,800 gallons per day) as opposed to the system water demand of 300 gpm.[1] The current permitted wastewater discharge flow from the Martinez Refinery is about 10 million gallons per day with an average flow of 5.9 million gallons per day.[2] Therefore, the installation of a WGS would result in an increase in wastewater of about one percent of the maximum wastewater treatment capacity at the Shell Refinery (1.7 percent of the average flow), thus representing a relatively small increase in wastewater discharge from the Refinery.

[1] SCAQMD, 2007. Final EIR for the ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Projects, SCH No. 2006111138. Available at: http://www.aqmd.gov/home/research/documents-reports/lead-agency-permit-projects/permit-project-documents---year-2007/feir-for-conocophillips-pm10-and-nox-reduction

[2] San Francisco Bay Regional Water Quality Control Board, Tentative Order No. R2-2017-00XX, NPDES No. CA0005789. Available at: https://pubapps.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2017/October/shelloil/Tentative_Order.pdf

The potential increase in wastewater generation may require that facilities modify their National Pollution Prevention Discharge Elimination System (NPDES) permit, which varies from facility to facility. However, all facilities that would be affected by the expedited BARCT requirements operate under the requirements of an NDPES permit. As discussed in the DEIR (see Page 3.4-9), the NPDES permit establishes discharge pollutant thresholds and operational conditions for industrial facilities (including refineries) and wastewater treatment plants. For point sources (including refineries), the Regional Water Quality Control Boards prepare specific effluent limitations for constituents of concern and require monitoring of those constituents. Constituents of concern for the Shell Refinery include biochemical oxygen demand (BOD), total suspended solids, chemical oxygen demand (COD), oil and grease, total sulfides, phenolic compounds, chromium and hexavalent chromium, ammonia nitrogen, copper, cyanide, nickel, selenium, dioxin, and pH. By operating under the NPDES requirements, along with the enforcement of the permit as well as other existing regulations, the impacts on water quality associated with the installation of a WGS are expected to be less than significant.

Response No. 1-3 to 1-12

As stated in Response No. 1-1, Comment 1-1 indicates that the comments provided by Shell on October 5, 2018 for the Initial Staff Report are still applicable to the Staff Report. Comments 1-3 through 1-12 pertain to the Staff Report, and the comments do not address the DEIR and no response is required.

4.0 CHANGES TO THE DRAFT EIR

This section includes changes made to the DEIR due to recommended clarifications and other revisions. None of the modifications alter any conclusions reached in the Draft EIR, nor provide new information of substantial importance relative to the draft document that would require recirculation of the Draft EIR pursuant to CEQA Guidelines §15088.5. Additions to the text of the Final EIR are denoted using underline. Text that has been eliminated is shown using ~~strike outs~~.

3.2.4.2 Potential Criteria Pollutant Impacts During Operation

Table 3.2-29 has been revised and incorporated into the Final EIR to reflect corrections in the number of truck trips and corrections to transcription errors from the Draft EIR Appendix B. The table listed the number of one-way truck trips while the trip length reflected a round trip distance, resulting in the peak daily estimated emissions to be doubled. This has been changed by correcting the number of truck trips to reflect round trips rather than one-way trips for the peak-daily emissions calculations. Revisions are also being made to correct clerical errors that were made when transcribing the ROG, CO, PM_{10}, and $PM_{2.5}$ emissions from the Draft EIR Appendix B to the summary tables. None of these modifications alter any conclusions reached in the Draft EIR, nor provide new information of substantial importance relative to the draft document that would require recirculation of the Draft EIR pursuant to CEQA Guidelines §15088.5.

TABLE 3.2-29

Delivery Truck Emissions

Material	Truck Trips	Estimated Trip Length (mi)	Criteria Pollutant					
			ROG ~~**CO**~~	**CO** ~~**ROG**~~	**NOx**	**SOx**	**PM_{10}**	**$PM_{2.5}$**
Operational Emissions Per Facility (lbs/day)								
Caustic/Catalyst for 3 WGS Units	3 ~~6~~	120	0.13 ~~0.24~~	0.83 ~~1.65~~	3.88 ~~7.77~~	0.01 ~~0.03~~	0.93 ~~0.18~~	0.24 ~~0.06~~
Caustic/Catalyst for LoTox Scrubber	1 ~~2~~	120	0.04 ~~0.08~~	0.28 ~~0.55~~	1.29 ~~2.59~~	<0.01 ~~0.01~~	0.31 ~~0.06~~	0.08 ~~0.02~~
Lime for Cement Kiln	1 ~~2~~	100	0.04 ~~0.07~~	0.23 ~~0.46~~	1.08 ~~2.16~~	<0.01 ~~0.01~~	0.26 ~~0.05~~	0.07 ~~0.01~~
Total Peak Daily Emissions			**0.20** ~~**0.39**~~	**1.34** ~~**2.66**~~	**6.25** ~~**12.52**~~	**0.02** ~~**0.05**~~	**1.50** ~~**0.29**~~	**0.38** ~~**0.09**~~
Operational Emissions Per Facility (Tons/year)								
Caustic/Catalyst for 3 WGS	312	120	0.01 ~~0.03~~	0.04 ~~0.03~~	0.20 ~~0.21~~	<0.01 ~~0.03~~	0.05 ~~0.06~~	0.01 ~~0.03~~
Caustic/Catalyst for LoTox Scrubber	104	120	<0.01	0.01	0.07	<0.01	0.02	<0.01

Lime for Cement Kiln	365	100	0.01	0.04	0.20	<0.01	0.05	0.01
Total Annual Transport Emissions			**0.02** ~~**0.05**~~	**0.10** ~~**0.08**~~	**0.47** ~~**0.48**~~	**<0.01** ~~**0.05**~~	**0.11** ~~**0.13**~~	**0.03** ~~**0.05**~~

Table 3.2-30 has been revised accordingly to reflect the revisions to the total emissions in Table 3.2-29. Additionally, a rounding error has been corrected under Annual Concurrent Operational Emissions for oxidizers, changing the total emissions from 19.5 tons/yr to 19.4 tons/yr. None of these modifications alter any conclusions reached in the Draft EIR, nor provide new information of substantial importance relative to the draft document that would require recirculation of the Draft EIR pursuant to CEQA Guidelines §15088.5.

TABLE 3.2-30

Worst-Case Operational Emissions Under the AB 617 Expedited BARCT Implementation Schedule

ACTIVITY	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10}**	**$PM_{2.5}$**
Daily Concurrent Operational Emissions (lb/day)						
15 Oxidizers	2.4	107	13.1	0.2	2.6	2.6
Delivery Trucks for Caustic, Ammonia, and Lime	0.2 ~~2.7~~	1.3 ~~0.4~~	6.3 ~~12.5~~	<0.1 ~~0.1~~	1.5 ~~0.3~~	0.4 ~~0.1~~
Total Concurrent Emissions	2.6 ~~5.1~~	107.9 ~~107.4~~	19.4 ~~25.6~~	0.2 ~~0.3~~	4.1 ~~2.9~~	3.0 ~~2.7~~
Reductions from Project Implementation[1]	411	--	--	6,932	--	--
Net Concurrent Emissions[2]	-408.4 ~~-405.9~~	107.9 ~~107.4~~	19.4 ~~25.6~~	-6931.3 ~~-6,931.8~~	4.1 ~~2.9~~	3.0 ~~2.7~~
Significance Thresholds	**54**	**None**	**54**	**None**	**82**	**54**
Significant?	**No**	**--**	**No**	**--**	**No**	**No**
Annual Concurrent Operational Emissions (tons/yr)						
15 Oxidizers	0.4	19.4 ~~19.5~~	2.4	<0.1	0.5	0.5
Delivery Trucks for Caustic, Ammonia, and Lime	≤0.1	0.1	0.5	≤0.1	0.1	≤0.1
Total Concurrent Emissions	0.5	19.5	2.9	0.1	0.6	0.5
Reductions from Project Implementation	75.0	--	--	1,265.0	--	--
Net Concurrent Emissions[2]	-74.5	19.5	2.9	-1,264.9	0.6	0.5
Significance Thresholds	**10**	**None**	**10**	**None**	**15**	**10**
Significant?	**No**	**--**	**No**	**--**	**No**	**No**

(1) See Table 3.2-10. Assumes 365 days of operations.
(2) Negative numbers indicate emission benefit.

Appendix B:

Appendix B has been revised to reflect the changes in Tables 3.2-29 and 3.2-30. The tables on page B-16 have been revised to better clarify the truck trip emission calculations. The summary table on page B-2 has been revised to reflect the changes in Tables 3.2-30. None of these modifications alter any conclusions reached in the Draft EIR, nor provide new information of substantial importance relative to the draft document that would require recirculation of the Draft EIR pursuant to CEQA Guidelines §15088.5.

Appendix B
Expedited BARCT Implementation Schedule
Operational Delivery Truck Emissions

Equipment	Vehicle	Trip Length	Total Trips	VMT	VOC (lb/mi)	CO (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	PM (lb/mi)	Fugitive PM	CO2e (lb/mile)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Caustic/Catalyst for 1 WGS	HHDT	120	104	12480	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	4.397	28.805	134.496	0.437	32.213	8.241	21.202
Caustic/Catalyst for 1 LoTox Scrubber	HHDT	120	104	12480	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	4.397	28.805	134.496	0.437	32.213	8.241	21.202
Lime for Cement Kiln	HHDT	100	365	36500	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	12.860	84.246	393.357	1.279	94.212	24.101	62.008
Annual Emissions (tons/yr)												**0.05**	**0.08**	**0.49**	**0.05**	**0.13**	**0.05**	**146.82**
Peak Daily (lb/day)												**0.39**	**2.66**	**12.52**	**0.05**	**0.29**	**0.09**	**0.58**

Notes:

(1) Peak day assumes 3 caustic delivery trucks for WGS, 1 caustic delivery truck for LoTOx, and 1 lime delivery truck.

(2) Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet.

(3) Fugitive PM emission calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (grms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light, 5.5 for medium trucks, and 24 for heavy trucks)

(4) Carbon Dioxide Equivalence (CO_2e) = $CO_2 + CH_4 * 21 + N2O*310$

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2019		
	Light	Medium	Heavy
CO2 (lb/mi)	0.8949	2.2430	3.7418
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.906	2.247	3.745

Daily Peak Emissions (lbs/day)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Caustic/Catalyst for 1 WGS	0.08	0.55	2.59	0.01	0.06	0.02	898.86
Caustic/Catalyst for 1 LoTox Scrubber	0.08	0.55	2.59	0.01	0.06	0.02	898.86
Lime for Cement Kiln	0.07	0.46	2.16	0.01	0.05	0.01	749.05

Annual Emissions (tons/yr)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Caustic/Catalyst for 1 WGS	0.00	0.01	0.07	0.00	0.02	0.00	0.01
Caustic/Catalyst for 1 LoTox Scrubber	0.00	0.01	0.07	0.00	0.02	0.00	0.01
Lime for Cement Kiln	0.01	0.04	0.20	0.00	0.05	0.01	0.03

Appendix B
Expedited BARCT Implementation Schedule
Operational Emissions Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Daily Concurrent Operational Emissions (lb/day)							
15 Oxidizers	2.4	107	13.1	0.2	2.6	2.6	18.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	1.2
Delivery Trucks for Caustic, Ammonia, and Lime	2.7	0.4	12.5	0.1	0.3	0.1	0.7
Total Concurrent Emissions	5.1	107.4	25.6	0.3	2.9	2.7	20.6
Reductions from Project Implementation[1]	411.0	--	--	6932	--	--	--
Net Concurrent Emissions[2]	-405.9	107.4	25.6	-6931.8	2.9	2.7	20.6
Significance Thresholds	54	None	54	None	82	54	None
Significant?	No	--	No	--	No	No	--
Annual Concurrent Operational Emissions (tons/yr)							
15 Oxidizers	0.4	19.5	2.4	0.1	0.5	0.5	6825.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	451.9
Delivery Trucks for Caustic, Ammonia, and Lime	0.1	0.1	0.5	0.1	0.1	0.1	111.2
Total Concurrent Emissions	0.5	19.5	2.9	0.1	0.6	0.5	7388.8
Reductions from Project Implementation	75.0	0.0	0.0	1265.0	0.0	0.0	0.0
Net Concurrent Emissions[2]	-74.5	19.5	2.9	-1264.9	0.6	0.5	7388.8
Significance Thresholds	10	None	10	None	15	10	10000
Significant?	No	--	No	--	No	No	No

Note:

(1) Assumes 365 days of operations.

(2) Negative numbers indicate emission benefit.

Appendix B
Expedited BARCT Implementation Schedule
Operational Delivery Truck Emissions

Equipment	Vehicle	Trip Length	Total Trips	VMT	VOC (lb/mi)	CO (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	PM (lb/mi)	Fugitive PM	CO2e (lb/mile)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Caustic/Catalyst for 3 WGS	HHDT	120	312	37440	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	13.191	86.415	403.487	1.311	96.639	24.722	63.605
Caustic/Catalyst for LoTox Scrubber	HHDT	120	104	12480	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	4.397	28.805	134.496	0.437	32.213	8.241	21.202
Lime for Cement Kiln	HHDT	100	365	36500	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	12.860	84.246	393.357	1.279	94.212	24.101	62.008
Annual Emissions (tons/yr)												**0.02**	**0.10**	**0.47**	**0.00**	**0.11**	**0.03**	**146.81**
Peak Daily (lb/day)												**0.20**	**1.34**	**6.25**	**0.02**	**1.50**	**0.38**	**0.99**

Notes:

(1) Peak day assumes 3 caustic, 1 ammonia, and 1 lime delivery truck.

(2) Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet.

(3) Fugitive PM emission calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light, 5.5 for medium trucks,

and 24 for heavy trucks)

(4) Carbon Dioxide Equivalence (CO_2e) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources. EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

	2019		
Chemical	Light	Medium	Heavy
CO2 (lb/ml)	0.8949	2.2430	3.7418
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.906	2.247	3.745

Single Trip Emissions (lbs/day)	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Caustic/Catalyst for 3 WGS	0.13	0.83	3.88	0.01	0.93	0.24	0.61
Caustic/Catalyst for LoTox Scrubber	0.04	0.28	1.29	0.00	0.31	0.08	0.20
Lime for Cement Kiln	0.04	0.23	1.08	0.00	0.26	0.07	0.17
Total Peak Daily Emissions	0.20	1.34	6.25	0.02	1.50	0.38	0.99

Total Annual Emissions (tons/yr)	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Caustic/Catalyst for 3 WGS	0.01	0.04	0.20	0.00	0.05	0.01	63.60
Caustic/Catalyst for LoTox Scrubber	0.00	0.01	0.07	0.00	0.02	0.00	21.20
Lime for Cement Kiln	0.01	0.04	0.20	0.00	0.05	0.01	62.01
Total Annual Emissions	0.02	0.10	0.47	0.00	0.11	0.03	146.81

Appendix B
Expedited BARCT Implementation Schedule
Operational Emissions Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Daily Concurrent Operational Emissions (lb/day)							
15 Oxidizers	2.4	106.6	13.1	0.2	2.6	2.6	18.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	1.2
Delivery Trucks for Caustic, Ammonia, and Lime	0.2	1.3	6.3	0.0	1.5	0.4	1.0
Total Concurrent Emissions	2.6	107.9	19.4	0.2	4.1	3.0	20.9
Reductions from Project Implementation[1]	411.0	--	--	6931.5	--	--	--
Net Concurrent Emissions[2]	-408.4	107.9	19.4	-6931.3	4.1	3.0	20.9
Significance Thresholds	54	None	54	None	82	54	None
Significant?	No	--	No	--	No	No	--
Annual Concurrent Operational Emissions (tons/yr)							
15 Oxidizers	0.4	19.4	2.4	0.0	0.5	0.5	6825.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	451.9
Delivery Trucks for Caustic, Ammonia, and Lime	0.0	0.1	0.5	0.0	0.1	0.0	146.8
Total Concurrent Emissions	0.5	19.5	2.9	0.0	0.6	0.5	7424.4
Reductions from Project Implementation	75.0	0.0	0.0	1265.0	0.0	0.0	0.0
Net Concurrent Emissions[2]	-74.5	19.5	2.9	-1265.0	0.6	0.5	7424.4
Significance Thresholds	10	None	10	None	15	10	10000
Significant?	No	--	No	--	No	No	No

Note:

(1) Assumes 365 days of operations.

(2) Negative numbers indicate emission benefit.

Notice of Public Hearing
and California Environmental Quality Act
Notice of Availability of a Draft Environmental Impact Report
for
AB 617 Expedited Best Available Retrofit Control Technology Implementation Schedule

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TO: **Interested Parties**

FROM: **Bay Area Air Quality Management District**
375 Beale St., Suite 600
San Francisco, CA 94105

Lead Agency: **Bay Area Air Quality Management District**
Contact: **David Joe, Principal Air Quality Engineer Phone: (415) 749-8623**

SUBJECT: NOTICE OF PUBLIC HEARING AND CEQA NOTICE OF AVAILABILITY OF A DRAFT ENVIRONMENTAL IMPACT REPORT

Notice is hereby given pursuant to California Public Resource Code, Sections 15206 and 15087 (c) that the Bay Area Air Quality Management District ("Air District") has prepared a Draft Environmental Impact Report (EIR) for the Assembly Bill 617 (AB 617) Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule in accordance with California Environmental Quality Act (CEQA) requirements. Notice is also given that the Board of Directors of the Bay Area Air Quality Management District will conduct a public hearing on December 19, 2018, at the Air District Headquarters' Board Room, 375 Beale Street, San Francisco, California, at 9:45 a.m., or as soon thereafter as the matter may be heard, to consider adoption of the AB 617 Expedited BARCT Implementation Schedule and certification of a final Environmental Impact Report.

Project Title: Assembly Bill 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule

State Clearinghouse Number: 2018082003

Project Location: The proposed Expedited BARCT Implementation Schedule applies within the Bay Area Air Quality Management District ("District"), which includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, and the southern portions of Solano and Sonoma counties.

Project Description: Assembly Bill 617, approved July 26, 2017, amends California Health and Safety Code section 40920.6 et seq. and requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of best available retrofit control technology (BARCT) on specified facilities by the earliest feasible date, but no later than December 31, 2023. Local air districts are required to adopt this schedule before January 1, 2019. This requirement applies to each industrial source subject to California Greenhouse Gas (GHG) Cap-and-Trade requirements. The overall purpose of BARCT implementation is to reduce criteria pollutant emissions from significant industrial sources that currently participate in the GHG Cap-and-Trade system.
The Expedited BARCT Implementation Schedule includes six potential rule development projects to address emissions from: 1) organic liquid storage tanks; 2) petroleum wastewater treating; 3) Portland cement manufacturing; 4) refinery fluid catalytic crackers and CO gas boilers; 5) refinery heavy liquid leaks; and 6) petroleum coke calcining.

Significant Impacts: The draft EIR for the Expedited BARCT Implementation Schedule concluded that air quality impacts associated with the construction of air pollution control equipment would be potentially significant after mitigation and cumulatively considerable. Water demand impacts from the operation of air pollution control equipment were found to be potentially significant after mitigation and cumulatively considerable. Mitigation measures are required for air quality impacts from construction activities and water demand impacts from operation of air pollution control equipment.

The proposed AB 617 Expedited BARCT Implementation Schedule staff report and draft EIR are available

at the Air District headquarters, on the website at http://www.baaqmd.gov/ab617barct, or by request. Requests for copies of the staff report or draft EIR should be directed to Karen Fremming (kfremming@baaqmd.gov) at (415) 749-8427.

Comments relating to the proposed schedule and environmental analysis should be addressed to David Joe, Bay Area Air Quality Management District, 375 Beale Street, Suite 600, San Francisco, CA 94105. Comments may also be sent by e-mail to djoe@baaqmd.gov. Comments on the proposed Expedited BARCT Implementation Schedule and draft EIR will be accepted from October 23, 2018 until December 7, 2018 at 5:00 p.m.

Jack P. Broadbent
Executive Officer
Bay Area Air Quality Management District

Draft Environmental Impact Report for the Bay Area Air Quality Management District

AB 617 Expedited BARCT Implementation Schedule Project

Prepared for:

Bay Area Air Quality Management District
375 Beale St., Suite 600
San Francisco, CA 94109
Contact: David Joe
(415) 749-8623

Prepared By:

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1000-A Ortega Way
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October 2018

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PREFACE
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CHAPTER 1

INTRODUCTION AND EXECUTIVE SUMMARY

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Bay Area Air Quality Management District (District), in accordance with Assembly Bill 617, (AB 617) is proposing to implement the Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule (project or proposed project). AB 617 requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of BARCT by the earliest feasible date but no later than 2023. This requirement applies to industrial sources subject to California's Greenhouse Gas (GHG) Cap-and-Trade requirements.

The purpose of the proposed project is to reduce criteria pollutant emissions from industrial sources that currently participate in the GHG Cap-and-Trade system. The Cap-and-Trade system is designed to address and limit GHG emissions, and allows sources to comply with Cap-and-Trade limits by either reducing emissions at the source or purchasing GHG emission allowances. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities that are already suffering a disproportionate burden from air pollution. The goal of AB 617 is to reduce communities' burden from air pollution and the Expedited BARCT Implementation Schedule is part of that process.

1.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the potential environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid identified significant adverse environmental impacts of these projects be identified. To fulfill the purpose and intent of CEQA, the Air District has prepared this Environmental Impact Report (EIR) under the requirements of CEQA Guidelines §15187 to address the potential environmental impacts associated with the Expedited BARCT Implementation Schedule. Prior to making a decision on the adoption of the proposed project, the Air District Governing Board must review and certify the EIR as providing adequate information on the potential adverse environmental impacts of implementing the proposed Expedited BARCT Implementation Schedule.

1.2.1 NOTICE OF PREPARATION/INITIAL STUDY

A Notice of Preparation for the Draft EIR for the Expedited BARCT Implementation Schedule was distributed to responsible agencies and interested parties for a 30-day review on August 7, 2018. A notice of the availability of this document was distributed to other agencies and organizations and was placed on the Air District's web site. A public scoping meeting was held at the District headquarters on August 24, 2018. Two public comment letters were submitted on the NOP to the Air District and are included in Appendix A of this EIR.

The NOP/IS identified impacts on the following environmental resources as being potentially significant, requiring further analysis in the EIR: air quality, hazards and hazardous materials, hydrology and water quality, and utilities and service systems. Impacts on the following environmental resources were considered to be less than significant in the NOP/IS: aesthetics, agriculture and forestry resources, biological resources, cultural resources, geology/soils, greenhouse gas emissions, land use/planning, mineral resources, noise, population/housing, public services, recreation, transportation/traffic, and tribal cultural resources (see Appendix A). Water demand impacts were considered to be potentially significant in both the hydrology and water quality section, and the utilities and service systems portion of the Initial Study. In the EIR, the discussion of water demand impacts was consolidated into the hydrology and water quality section.

1.2.2 TYPE OF EIR

In accordance with §15121(a) of the State CEQA Guidelines (California Administrative Code, Title 14, Division 6, Chapter 3), the purpose of an EIR is to serve as an informational document that: "will inform public agency decision-makers and the public generally of the significant environmental effect of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project." The EIR is an informational document for use by decision-makers, public agencies and the general public. The proposed project requires discretionary approval and, therefore, it is subject to the requirements of CEQA (Public Resources Code, §21000 et seq.).

The focus of this EIR is to address the environmental impacts of the implementation of the Expedited BARCT Implementation Schedule as identified in the NOP and Initial Study (included as Appendix A of this EIR). The degree of specificity required in an EIR corresponds to the degree of specificity involved in the underlying activity described in the EIR (CEQA Guidelines §15146). The Expedited BARCT Implementation Schedule would apply to industrial sources including petroleum refineries, facilities with storage tanks, cement kilns, and petroleum coke calciners.

1.2.3 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 EIR is intended to: (a) provide the Air District's Board of Directors and the public with information on the environmental effects of the proposed project; and, (b) be used as a tool by the Air District's 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 EIR 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 federal, state, or local permits required to adopt the Expedited BARCT Implementation Schedule. Local public agencies, such as cities, and counties could be expected to utilize this EIR if local approval is required for facility modifications due to the implementation of BARCT (e.g., new air pollution control equipment) at affected industrial sources, pursuant to CEQA Guidelines §15152. However, implementation of the proposed project is limited to implementation of air pollution control equipment and measures.

1.2.4 AREAS OF POTENTIAL CONTROVERSY

In accordance with CEQA Guidelines §15123(b)(2), the areas of controversy known to the lead agency including issues raised by agencies and the public shall be identified in the EIR. As noted above, two comment letters were received on the NOP/IS. Issues and concerns raised in the comment letters included: (1) potential impacts associated with the installation of geodesic domes on storage tanks; and (2) a recommendation that lead agencies consult with all California Native American tribes. The impacts on aesthetics associated with domes on storage tanks were addressed in the NOP/IS (see Appendix A). The NOP/IS concluded that BARCT measures would include the installation of equipment, including domes, that may be visible outside of the existing industrial facilities; however, these facilities are located in industrial areas which do not have scenic views or scenic resources. Storage tanks are generally located at refineries, bulk handling and storage facilities, or manufacturing facilities that are located in industrial areas. Because of the location, domes on storage tanks are not expected to have significant adverse aesthetic impacts to the surrounding communities. Regarding tribal resources, construction activities are limited to industrial facilities and all construction activities would take place at existing facilities that have been previously graded, such that proposed BARCT requirements are not expected to affect tribal resources. Nonetheless, individual projects will need to be examined on a project-specific basis, when the precise location and compliance methods are known, and additional consultation with tribes may be required.

1.3 EXECUTIVE SUMMARY: CHAPTER 2 – PROJECT DESCRIPTION

The Expedited BARCT Implementation Schedule strategy will consist of the implementation of several rule development projects in order to fulfill the requirements of AB 617. The Bay Area air basin is in attainment with both the National Ambient Air Quality Standards and California Ambient Air Quality Standards for carbon monoxide (CO), SO_2, NO_2, and lead. The air basin is designated as nonattainment for ozone (O_3) and particulate matter ($PM_{2.5}$ and PM_{10}) California ambient air standards, therefore the BARCT review was conducted focusing on the following pollutants:

- Nitrogen Oxides (NOx)
- Reactive Organic Gases (ROG)
- Particulate Matter less than 10 microns (PM_{10})

- Particulate Matter less than 2.5 microns ($PM_{2.5}$)
- Sulfur Dioxide (SO_2)

NOx and ROG are included because they are precursors for ozone formation. SO_2 may contribute to formation of condensable PM (i.e. formed in the emissions plume from the stack), so PM control strategies may include SO_2 limits.

A list of facilities, sources, and emissions were developed from the 2016 Reporting Year Emissions Inventory. The Bay Area has 80 facilities subject to Cap-and-Trade, which encompass 3,246 individual sources in 61 source categories. This list of facilities was reduced to 19 "industrial" facilities, which includes all covered entities that are eligible for free allowance allocations in accordance with the Cap-and-Trade requirements based on their engagement in an activity within a particular North American Industrial Code System (NAICS) Code listed in Table 8-1 of the Cap-and-Trade regulation (17 CCR § 95890(a)). These 19 industrial Cap-and-Trade facilities encompass 1,899 individual sources in 50 source categories. These sources were reviewed for the amount of emissions and existing controls that may already comply with BARCT. After screening for these sources with emissions greater than 10 pounds per day and sources that have not already achieved BARCT, the population of sources was reduced to the following:

- NOx: 21 source categories, 73 sources representing 30% of the emissions (1,764 tpy)
- ROG: 23 source categories, 259 sources representing 93% of the emissions (2,430 tpy)
- PM: 16 source categories, 124 sources representing 92% of the emissions (1,851 tpy)
- SO_2: 15 source categories, 102 sources representing 71% of the emissions (3,651 tpy)

The BAAQMD reviewed available information on current achievable emission limits and potential controls for each source category and pollutant. Six potential rule development projects have been identified for inclusion in the Expedited BARCT Implementation Schedule to address the following:

- Reduce ROG emissions from Organic Liquid Storage Tanks;
- Reduce ROG emissions associated with Refinery Wastewater Treatment Systems;
- Reduce PM and SO_2 emissions from Portland cement manufacturing;
- Reduce PM and SO_2 emissions from Refinery Fluid Catalytic Cracking Units and CO Gas Boilers;
- Reduce ROG emissions from Fugitive Heavy Liquid Leaks; and
- Reduce NOx emissions from Petroleum Coke Calcining Operations.

1.3.1 PROJECT OBJECTIVES

The objectives of the Expedited BARCT Implementation Schedule are to:

- Implement and/or install best available retrofit control technologies on industrial sources subject to CARB's Cap-and-Trade program, as defined by the AB 617 requirements;

- Reduce criteria pollutant emissions from significant industrial sources that participate in CARB's Cap-and-Trade program;

- Lessen the burden of air quality impacts on communities that suffer a disproportionate burden from air pollution; and

- Comply with the requirements AB 617.

1.3.2 SOURCES AFFECTED BY EXPEDITED BARCT IMPLEMENTATION

The overall purpose of the Expedited BARCT Implementation Schedule is to reduce criteria pollutant emissions from significant sources that currently participate in CARB's GHG Cap-And-Trade program. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities. The proposed project would apply to refineries, petroleum coke calcining facilities, and cement kilns.

1.3.3 BARCT EMISSION CONTROL TECHNOLOGIES

To comply with the BARCT requirements for affected facilities, operators could reduce operations or implement BARCT, which includes different types of air pollution control equipment or measures. The type of emission capture and control technology that may be used depends on the specific type of pollutant to be controlled. The air pollution control measures that are likely to be encountered as a result of the proposed BARCT requirements are categorized into the following groups:

- Installing domes on external floating roof tanks and capturing vented emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit;
- Covering lift stations, manholes, junction boxes, conveyances and other wastewater facilities at refineries and venting ROG emissions to a vapor combustor;
- Requiring additional lime injection on cement kilns to control SO_2 in order to reduce condensable PM emissions;
- Controlling PM emissions from FCCUs using SO_2 reducing catalyst additives, additional ESP capacity, or wet gas scrubbers;
- Reducing ROG emissions from fugitive components in heavy liquid service at refineries through increased LDAR programs;
- Reducing NOx emissions from coke calcining facilities through the use of SCR units and/or LoTOx system with a wet scrubber.

1.4 EXECUTIVE SUMMARY: CHAPTER 3 – ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Chapter 3 of the Draft EIR describes the existing environmental setting in the Bay Area, analyzes the potential environmental impacts of the Expedited BARCT Implementation Schedule and

recommends mitigation measures (when significant environmental impacts have been identified). Chapter 3 provides this analysis for each of the environmental areas identified in the Initial Study (see Appendix A), including: (1) Air Quality; (2) Hazards and Hazardous Materials; (3) Hydrology and Water Quality, and (4) Utilities and Service Systems. Included for each impact category is a discussion of the environmental setting, significance criteria, whether the proposed project will result in any significant impacts (either individually or cumulatively in conjunction with other projects), and feasible project-specific mitigation (if necessary and available). Note that water demand impact was found to be potentially significant under both Hydrology and Water Quality, and Utilities and Service Systems in the NOP/IS. In the EIR, the discussion of water demand impacts has been consolidated into the Hydrology and Water Quality resource section.

1.4.1 AIR QUALITY

1.4.1.1 Air Quality Setting

It is the responsibility of the Air District to ensure that state and federal ambient air quality standards (AAQS) 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 (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), 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. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. The Air District is in attainment of the State AAQS for CO, NO_2, and SO_2. However, the Air District does not comply with the State 24-hour PM_{10} standard, annual PM_{10} standard, and annual $PM_{2.5}$ standard. The Air District is unclassifiable/attainment for the federal CO, NO_2, SO_2, lead, and PM_{10} standards. A designation of unclassifiable/attainment means that the U.S. EPA has determined to have sufficient evidence to find the area either is attaining or is likely attaining the NAAQS.

The 2017 air quality data from Air District monitoring stations show that no monitoring stations measured an exceedance of any State or federal AAQS for CO and SO_2. There was one exceedance of the federal NO_2 AAQS at one monitoring station in 2017, although the area did not violate the NAAQS. All monitoring stations were in compliance with the federal PM_{10} standards. The State 24-hour PM_{10} standard was exceeded on six days in 2017, at the San Jose monitoring station.

The Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard and the federal 24-hour $PM_{2.5}$ standard. The state and federal 8-hour ozone standards were exceeded on 6 days in 2017 at one site or more in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) and the Santa Clara Valley. The federal 24-hour $PM_{2.5}$ standard was exceeded at one or more Bay Area station on 18 days in 2017, most frequently in the Napa, San Rafael, Vallejo, and San Pablo.

1.4.1.2 Air Quality Impacts

The Expedited BARCT implementation Schedule consists of six individual rule development projects that aim to control a variety of TACs and criteria pollutants in order to achieve the goals of AB 617. The Expedited BARCT Implementation Schedule is expected to result in a substantial reduction in criteria pollutant emissions, including approximately 75-125 tons per year of ROG emissions and 1,265 tons per year of SOx emissions. Additional criteria pollutant emission reductions are expected due to implementation of the Expedited BARCT Implementation Schedule and related control measures. However, the magnitude of the emissions reductions associated with some of the control measures is currently unknown.

Implementation of some of the control measures in the Expedited BARCT Implementation Schedule could involve retrofitting and replacing air pollution control equipment, which has the potential to create air quality impacts. Emissions from one pollutant may increase slightly in order to effectively reduce overall emissions.

Increases in criteria pollutant emissions could also occur as a consequence of efforts to improve air quality. Implementation of the Expedited BARCT Implementation Schedule would result in air emission increases associated with: (1) construction activities (e.g., to install air pollution control equipment); (2) air pollution control technologies that generates air emissions (e.g., oxidizers); and (3) transportation of materials (caustic, ammonia, and lime). As shown in Chapter 3.2, construction activities could generate ROG, NOx, PM_{10}, and $PM_{2.5}$ emissions that exceed the Air District's construction significance threshold. Therefore, construction air quality impacts are concluded to be significant, as well as cumulatively considerable. The impacts from operation of air pollution control equipment and methodologies to control criteria pollutant emissions under the Expedited BARCT Implementation Schedule are expected to be less than significant for all criteria pollutant emissions. Additionally, the project is expected to have quantifiable emissions benefits for both ROG and SOx emissions. For the remaining pollutants, the project is expected to provide emissions benefits, but because the benefits are not readily quantifiable, they have not been included in Chapter 3.2.

In general, it should be noted that while there are secondary TAC emissions increases associated with the operation of new air pollution control equipment (e.g., ammonia and caustic), a reduction in TAC emissions would also be expected. It is not possible to estimate those emission reductions at this point until the sources that will be controlled are more defined and the appropriate engineering analyses have been completed and so forth. Nonetheless, air pollution control equipment installed to control ROG emissions as a result of the proposed project (e.g., domes/vapor control on storage tanks) is expected to result in a reduction in TAC emissions from affected facilities.

1.4.2 HAZARDS AND HAZARDOUS MATERIALS

1.4.2.1 Hazards and Hazardous Materials Setting

The potential for hazards exist in the production, use, storage and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials

as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Currently, hazardous materials are transported throughout the district in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions and include: (1) toxic gas clouds due to releases of volatile chemicals; (2) fires or explosions; (3) thermal radiation from the heat generated by a fire; and (4) explosion and overpressure when vessels containing flammable explosive vapors and potential ignition sources are combined.

In 2017, there were a total of 1,634 incidents reported in the nine counties regulated by the Air District, with the most incidents (388) reported in Alameda County, followed by Contra Costa County (313). Hazardous materials incidents during transportation, residential areas, and at waterways were the most common locations, respectively, for hazardous materials incidents. About 19 percent of the hazardous materials incidents that occurred within California occurred within the nine counties that comprise the Bay Area, with spills in industrial areas the most common (38 percent), followed by waterways (28 percent).

1.4.2.2 Hazards and Hazardous Materials Impacts

The Expedited BARCT Implementation Schedule would require facilities and refineries to install new or modify their existing air pollution control equipment or implement control measures. Additional hazard and hazardous material impacts are expected to result from the operation of several of the possible control technologies that would most likely be used. Facility modifications associated with the proposed project are expected to include additional lime injection at cement plants, increased LDAR in heavy liquid service at refineries, thermal incinerators, vapor combustors, vapor recovery units, the installation of SCRs, wet gas scrubbers, electrostatic precipitators, and/or LoTOx^{TM} injection.

As discussed in Chapter 3.3.4, the increased use of hazardous materials including lime, caustic, and ammonia were determined to result in less than significant impacts for the increase in materials, as well as the related transportation hazards. The hazard impacts associated with the installation and operation of air pollution control equipment under the Expedited BARCT Implementation Schedule are expected to be less than significant.

1.4.3 HYDROLOGY AND WATER QUALITY

1.4.3.1 Hydrology and Water Quality Setting

The District is within the San Francisco Bay Hydrologic Region (Bay Region) which includes all of San Francisco County and portions of Marin, Sonoma, Napa, Solano, San Mateo, Santa Clara, Contra Costa, and Alameda counties. It occupies approximately 4,500 square miles; from

southern Santa Clara County to Tomales Bay in Marine County; and inland to near the confluence of the Sacramento and San Joaquin rivers at the eastern end of Suisun Bay. The eastern boundary follows the crest of the Coast Ranges, where the highest peaks are more than 4,000 feet above mean sea level.

The most prominent surface water body in the Bay Region is San Francisco Bay itself. Other surface water bodies include: Creeks and rivers; ocean bays and lagoons (such as Bolinas Bay and Lagoon, Half Moon Bay, and Tomales Bay); urban lakes (such as Lake Merced and Lake Merritt); human-made lakes and reservoirs (such as Lafayette Reservoir, Briones Reservoir, Calaveras Reservoir, Crystal Springs Reservoir, Kent Lake, Lake Chabot, Lake Hennessey, Nicasio Reservoir, San Andreas Lake, San Antonio Reservoir, San Pablo Reservoir, Upper San Leandro Reservoir, Anderson Reservoir, and Lake Del Valle).

Local water supplies account for about 31 percent of the total, and the remaining water supply is imported from the State Water Project (SWP) (13 percent), Central Valley Project (CVP) (15 percent), the Mokelumne watershed (19 percent), and the Tuolumne watersheds (19 percent). Some Bay Area water agencies are projecting future water supply shortfalls in dry years (including Alameda County Water District -2020, Santa Clara Valley Water District – 2040, and Sonoma County Water Agency – 2025), and some are already seeing such shortfalls (including East Bay Municipal Utility District, City of Napa Water Department, and Solano County Water Agency). Other agencies anticipate being able to handle a single dry year, largely because of reservoirs, or other storage capacity, including Contra Costa Water District, Marin Municipal Water District, San Francisco Public Utilities Commission, and Zone 7 Water Agency. The severity and timing of dry year shortfalls differ greatly among the agencies because of the wide variation of supply sources, types of use, and climates within the region. Shortages in precipitation in the Sierra Nevada can have a pronounced effect on water supply in the region than a drought in the Bay Area itself because of the reliance of the region on water from the Tuolumne and Modelumne watersheds.

Wastewater treatment in the Bay Area is provided by various agencies as well as individual city and town wastewater treatments. Some treatment plants serve individual cities while others serve multiple jurisdictions. More than 50 agencies provide wastewater treatment throughout the Bay Area. Each plant is typically sized to accommodate growth over a 15- to 20-year period. In addition, a number of industrial facilities also have wastewater treatment facilities, e.g., refineries.

1.4.3.2 Hydrology and Water Quality Impacts

It is expected that affected industrial facilities would install new or modify existing air pollution control equipment to comply with the Expedited BARCT Implementation Schedule. Most air pollution control equipment does not use water or generate wastewater. However, additional water demand and wastewater generation impacts are expected to result from the operation of wet gas scrubbers and/or wet ESPs, which may be used to control refinery FCCUs and coke calciners, and water to make the lime slurry to control emissions from the cement kiln.

Water demand impacts from installing up to three WGS systems on refinery FCCUs, additional lime injection on a cement kiln, and a LoTOX on a coke calciner may exceed applicable water demand significance thresholds and, therefore, water demand impacts are concluded to be significant, as well as cumulatively considerable. Mitigation measures were imposed that required the use of recycled water, if available, and a written declaration from the local water purveyor, if recycled water cannot be supplied to the applicable air pollution control equipment. In spite of implementing the identified mitigation measures, water demand impacts during operation of the proposed project remain significant, in part because there is currently no guarantee that reclaimed water will be available to all of the affected facilities and because of the prevalence of drought conditions in California. Therefore, impact of the proposed project will remain significant, as well as cumulatively considerable, after mitigation for water demand.

Water quality impacts from installing most types of air pollution control equipment that use water as part of the control process would not exceed applicable water quality significance thresholds and, therefore, are concluded to be less than significant.

1.5 EXECUTIVE SUMMARY: CHAPTER 4 – ALTERNATIVES

An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)). As discussed in Chapter 4 of this EIR, the proposed project could result in potentially significant impacts to: (1) air quality during construction; and (2) water demand associated with operation of additional air pollution control equipment. An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)).

Under Alternative 1, the No Project Alternative, no additional air pollution control equipment or measures (e.g., monitoring/repair of fugitive heavy liquid leaks) would be implemented. Alternative 1 would not comply with AB 617, which requires air districts to review the emissions control technology installed on pollution sources located at industrial facilities subject to the Cap-and-Trade program and implement BARCT at affected facilities. Alternative 1 would not comply with the AB 617 requirements and would not be considered feasible at this time. It should be noted that it would be unlikely that the District would remain out of compliance with AB 617 indefinitely and some action would likely be taken in the future to comply. Nonetheless,

for the purpose of comparison and public disclosure, it will be assumed that no action will be taken under the No Project Alternative.

Alternative 2 would delay the Expedited BARCT Implementation Schedule so that all rules would not be implemented until 2023, which is the deadline for implementing BARCT air pollution control measures required under AB 617. Therefore, the overlap of construction activities would be expected to be reduced; however, there will be a loss of operational emissions benefits (emissions reductions) for several years as compared to the proposed project.

Alternative 1 would eliminate the potentially significant ROG, NOx, PM_{10}, and $PM_{2.5}$ impacts associated with construction activities to less than significant, but would not achieve any of the proposed project objectives. Alternative 2 would reduce the potentially significant ROG, NOx, PM_{10}, and $PM_{2.5}$ impacts associated with construction activities, but not to less than significant levels, and the water demand impact would be the same as the proposed project; however, Alternative 2 would achieve all of the project objectives. Since Alternative 2 would reduce the potentially significant ROG, NOx, PM_{10}, and $PM_{2.5}$ impacts and achieve the project objectives, Alternative 2 would be considered the environmentally superior alternative.

The proposed project would be considered the preferred alternative as it would achieve all of the project objectives and emission reductions associated with the implementation of BARCT on the affected facilities and the emission reductions would be expected to occur two years earlier than under Alternative 2, providing an additional two years-worth of emissions benefits.

1.6 EXECUTIVE SUMMARY: CHAPTER 5

Chapter 5 provides the references used in the preparation of the EIR.

TABLE 1-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

Impact	Mitigation Measures	Residual Impacts
Air Quality		
The construction activities required as a result of the Expedited BARCT Implementation Schedule may result in ROG, NOx, PM_{10}, and $PM_{2.5}$ emissions that would exceed the significance thresholds resulting in potentially significant air quality impacts.	Minimize emissions from vehicles and trucks; limit truck idling; maintain construction equipment to manufacturer's recommendations; identify construction areas served by electricity; use cranes rated 200 hp or greater with Tier 4 engines or equivalent (if available); and use off-road equipment rated 50 to 200 hp with Tier 4 or equivalent engines (if available).	ROG, NOx, PM_{10}, and $PM_{2.5}$ emission impacts during construction activities are potentially significant under the Expedited BARCT Implementation Schedule following mitigation, but are short-term and would cease when construction activities are complete.
Operational activities that may be required as a result of the Expedited BARCT implementation Schedule are expected to result in emissions of ROG, CO, NOx, SOx, PM_{10}, and $PM_{2.5}$ that would result in less than significant impacts. In addition the project would result in substantial reductions in ROG (75-125 tons/yr) and SOx (1,265 tons/yr). Additional emission reductions are expected but the magnitude of the reductions is currently unknown.	None required.	Operational emissions of ROG, CO, NOx, SOx, PM_{10}, and $PM_{2.5}$ would result in less than significant impacts.
Potential TAC emissions increases associated with implementation of the Expedited BARCT implementation Schedule are expected to result in less than significant impacts. Additional TAC emission reductions are expected but the magnitude of the reductions is currently unknown.	None required.	Impacts from potential TAC emissions under the Expedited BARCT Implementation Schedule would be less than significant.

TABLE 1-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

Impact	Mitigation Measures	Residual Impacts
Hazards and Hazardous Materials		
Hazard impacts from air pollution control equipment, including fire or explosion impacts from the use of dry ESPs, are expected to be less than significant under the Expedited BARCT implementation Schedule.	None required.	Hazard impacts associated with the use of air pollution control equipment would remain less than significant.
Transportation and use of hazardous materials in WGSs, lime injection systems, and SCRs are expected to result in less than significant impacts under the Expedited BARCT Implementation Schedule	None required.	Impacts from transportation and use of hazardous materials would remain less than significant.
Hydrology and Water Quality		
The potential water demand associated with air pollution control equipment, particularly refinery wet gas scrubbers/ESPs, lime injection, and LoTOx, could result in a significant impact on water demand associated with the Expedited BARCT Implementation Schedule.	Mitigation measures include the requirement to use reclaimed or recycled water, if available.	Water demand impacts are expected to remain significant as the use of reclaimed or recycled water cannot be assured.
Wastewater generated from the installation of air pollution control equipment to comply with the Expedited BARCT Implementation Schedule is not expected to exceed any applicable water quality significance thresholds. Therefore, no wastewater impacts are expected.	None required.	Wastewater impacts are expected to remain less than significant.

CHAPTER 2

PROJECT DESCRIPTION

Introduction
Project Location
Project Objectives
Background and Project Description

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2.0 PROJECT DESCRIPTION

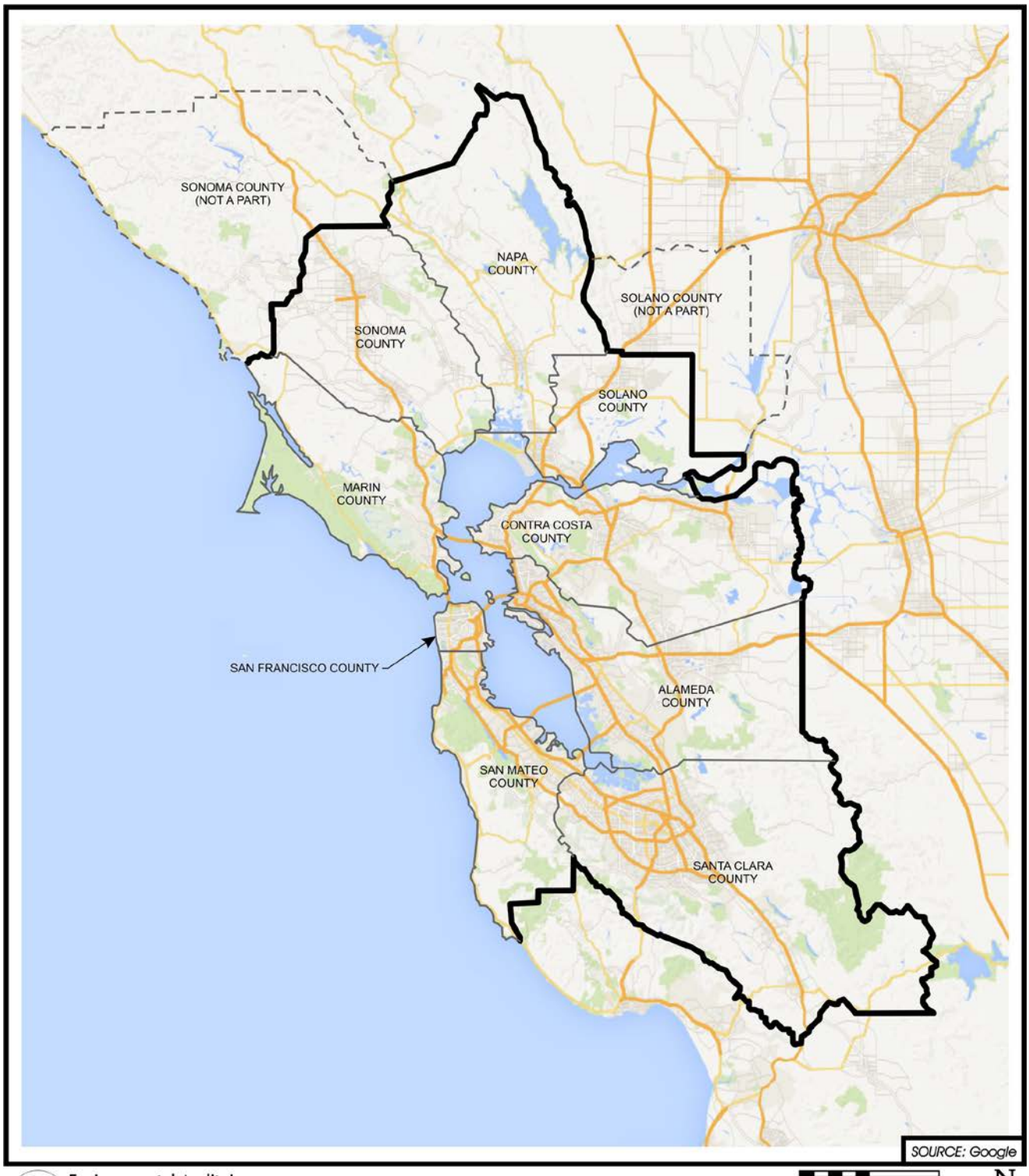
2.1 INTRODUCTION

The Bay Area Air Quality Management District (District), in accordance with Assembly Bill 617, (AB 617) is preparing the best available retrofit control technology (BARCT) implementation schedule project (project or proposed project). AB 617 requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of best available retrofit control technology (BARCT) by the earliest feasible date. This requirement applies to each industrial source subject to California Air Resources Board's (CARB's) Greenhouse Gas (GHG) Cap-and-Trade requirements.

The purpose of the proposed project is to reduce criteria pollutant emissions from industrial sources that participate in CARB's GHG Cap-and-Trade program. The Cap-and-Trade program is designed to address and limit GHG emissions, and allows sources to comply with Cap-and-Trade limits by either reducing emissions at the source or purchasing GHG emission allowances. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities that are already suffering a disproportionate burden from air pollution.

2.2 PROJECT LOCATION

The BAAQMD has jurisdiction of an area encompassing 5,600 square miles. The Air District includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties. The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys and bays (see Figure 2.2-1).



Project No. 3013

Figure 2.2-1

N:\3013\BAAQMD Map.cdr

2.3 PROJECT OBJECTIVES

The objectives of the Expedited BARCT Implementation Schedule are to:

- Implement and/or install best available retrofit control technologies;
- Reduce criteria pollutant emissions from significant industrial sources that participate in Cap and Trade; and
- Lessen the burden of air quality impacts on communities that suffer a disproportionate burden from air pollution.

2.4 BACKGROUND AND PROJECT DESCRIPTION

2.4.1 BACKGROUND

With the adoption of AB 617, the state acknowledges that many communities around the state continue to experience disproportionate impacts from air pollution. To address these impacts, AB 617 directs all air districts that are in nonattainment areas to apply BARCT to all industrial sources subject to Cap-and-Trade, and to identify communities with a "high cumulative exposure burden" to air pollution. Districts must then prioritize these communities for the development of community air monitoring projects and/or emission reduction programs. The State requires that monitoring campaigns and emission reduction programs be developed through a community-based process.

The purpose of the proposed project is to reduce criteria pollutant emissions from industrial sources that participate in the GHG Cap-and-Trade system. The Cap-and-Trade system is designed to address and limit GHG emissions, and allows sources to comply with Cap-and-Trade limits by either reducing emissions at the source or purchasing GHG emission allowances. The Cap-and-Trade program includes particular provisions for "industrial" facilities, which are covered entities or facilities that are eligible for free allowance allocation. Under the Cap-and-Trade program, these free allocations are provided to certain industrial sectors to minimize potential leakage of economic activity and GHG emissions. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities that are already suffering a disproportionate burden from air pollution.

The proposed project aims to implement rule development projects that will require the use of BARCT for specific equipment in industrial facilities that are subject to GHG Cap-and-Trade requirements in order to reduce criteria pollutant emissions. A summary of the AB617 requirements is outlined below.

- Air districts in nonattainment areas must implement BARCT on all industrial sources subject to the AB 32 Cap-and-Trade Program.

- The California Air Resources Board (CARB) must establish and maintain a clearinghouse of best available control technology (BACT), and BARCT.
- Air pollution violation maximum penalties were increased, and will adjust with inflation.
- CARB must prepare an air monitoring plan for all areas of the state by October 1, 2018.
- Based on air monitoring plan information, CARB must select communities with high cumulative exposure burden to both toxic and criterial air pollutants by July 1, 2019.
    - Each air district with a high cumulative burden community must deploy a community air monitoring system in that community within one year, and provide the air quality data to CARB for publication.
- By January 1, 2020, and each January 1 thereafter, CARB will select additional communities with high cumulative exposure burden.
    - Each air district with a high burden community must deploy a community air monitoring system in that community within one year, and provide the air quality data to CARB for publication.
- CARB must prepare a state-wide strategy to reduce emissions of toxic and criteria pollutants in communities affected by high cumulative exposure burden, by October 1, 2018, and update the strategy every five years. Criteria for the state-wide strategy include:
    - Disadvantaged communities and sensitive receptor locations are a priority.
    - A methodology for assessing and identifying contributing sources, and estimating their relative contribution to elevated exposure (source apportionment).
    - Assessment of whether an air district should update and implement the risk reduction audit and emissions reduction plan for any facility if the facility causes or significantly contributes to the high cumulative exposure burden.
    - Assessment of available measures for reducing emissions including BACT, BARCT, and best available control technology for toxics (TBACT).
- CARB will select locations for preparation of Community Emission Reduction Plans by October 1, 2018. CARB will select additional locations annually thereafter.
    - Within one year, the air district will adopt Community Emission Reduction Plans in consultation with CARB, individuals, community-based organizations, affected sources, and local governmental bodies.
    - The Community Emission Reduction Plans must be consistent with the state-wide strategy, and include emission reduction targets, specific reduction measures, a schedule for implementation of the measures, and an enforcement plan.
    - The Community Emission Reduction Plans must be submitted to CARB for review and approval.
    - The Community Emission Reduction Plans must achieve emission reductions in the community, based on monitoring or other data.

    - The air district must prepare an annual report summarizing the results and actions taken to further reduce emissions.
- CARB will provide grants to community-based organizations for technical assistance and to support community participation in identification of communities with high exposure burden, and development and implementation of the Community Emission Reduction Plans.

AB 617 represents a significant enhancement to the approach CARB and local air districts take in addressing local air quality issues. The Air District has implemented and established a number of programs that support the goals and intent of AB 617; these programs include the Community Air Risk Evaluation (CARE) Program, Health Risk Assessments for the AB 2588 Air Toxics "Hot Spots" Program, and Air District Rule 11-18: Reduction of Risk from Air Toxic Emissions at Existing Facilities. However, the requirements of AB 617 formalize the requirements and establish goals and timelines for implementation.

2.5 PROJECT DESCRIPTION

The Expedited BARCT Implementation Schedule will consist of the implementation of several rule development projects in order to fulfill the requirements of AB 617. The Bay Area air basin is in attainment with both the National Ambient Air Quality Standards and California Ambient Air Quality Standards for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead. The air basin is designated as nonattainment for ozone (O_3) and particulate matter ($PM_{2.5}$ and PM_{10}) under California ambient air standards, therefore, the BARCT review was conducted focusing on the following pollutants:

- Nitrogen Oxides (NOx)
- Reactive Organic Gases (ROG)
- Particulate Matter less than 10 microns (PM_{10})
- Particulate Matter less than 2.5 microns ($PM_{2.5}$)
- Sulfur Dioxide (SO_2)

NOx and ROG are included because they are precursors for ozone formation. SO_2 may contribute to the formation of condensable PM (i.e. formed in the emissions plume from the stack) at certain types of sources, so PM control strategies may include SO_2 limits.

A list of facilities, sources, and emissions were developed from the 2016 Reporting Year Emissions Inventory. The Bay Area has 80 facilities subject to Cap-and-Trade, which encompass 3,246 individual sources in 61 source categories. This list of facilities was reduced to 19 "industrial" facilities, which includes all covered entities that are eligible for free allowance allocations in accordance with the Cap-and-Trade requirements based on their engagement in an activity within a particular North American Industrial Code System (NAICS) Code listed in Table 8-1 of the Cap-and-Trade regulation (17 CCR § 95890(a)). These 19 industrial Cap-and-Trade facilities encompass 1,899 individual sources in 50 source categories. These sources were reviewed for the amount of emissions and existing controls that may already comply with BARCT. After screening

for these sources with emissions greater than 10 pounds per day and sources that have not already achieved BARCT, the population of sources was reduced to the following:

- NOx: 21 source categories, 73 sources representing 30% of the emissions (1,764 tpy)
- ROG: 23 source categories, 259 sources representing 93% of the emissions(2,430 tpy)
- PM: 16 source categories, 124 sources representing 92% of the emissions (1,851 tpy)
- SO_2: 15 source categories, 102 sources representing 71% of the emissions (3,651 tpy)

The Air District reviewed available information on current achievable emission limits and potential controls for each source category and pollutant. This information included guidelines and recent determinations of BACT, reasonably available control technology (RACT), and lowest achievable emission rate (LAER) from EPA, CARB, and other air districts. Six potential priority rule development projects have been identified for inclusion in the Expedited BARCT Implementation Schedule. Potential priority rule development projects are shown in Table 2-1.

TABLE 2-1 – BARCT Rule Development Projects

PROPOSED RULE DEVLOPMENT PROJECTS – EXPEDITED BARCT IMPLEMENTATION SCHEDULE		
Project Name	**Pollutant**	**Rule Development Project Summary**
Organic Liquid Storage Tanks	ROG TACs	Regulation 8, Rule 5: Storage of Organic Liquids may be amended to specifically address ROGs and TACs emissions from external floating roof tanks storing organic liquids. Emission reductions are expected from installing domes on external floating roof tanks and capturing emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit to a thermal incinerator.
Petroleum Wastewater Treating	ROG	The Air District has addressed ROG emissions from petroleum wastewater treatment facilities (Rule 8-8 Wastewater Collection and Separation Systems) in previous rule developments. This project will review each of the five Bay Area refineries for any opportunities for reduction of wastewater ROG's. BACT for refinery wastewater systems includes the use of entirely enclosed systems in addition to good control practices.
Portland Cement Manufacturing	PM SO_2	BARCT levels are still under development for condensable PM emissions from cement kilns; however, controls will likely involve the reduction of SO_2, ammonia, or other condensable components and precursors. Expedited BARCT implementation for SO_2 emissions reductions includes the judicious selection and use of raw materials, dry scrubbing, and dry sorbent (lime) injection.
Refinery Fluid Catalytic Crackers and CO Boilers	PM SO_2	PM and SO_2 emissions reductions are expected through optimization of ammonia injection, additional ESP capacity, optimization of newer catalyst additives, and/or wet gas scrubbing.
Refinery Heavy Liquid Leaks	ROG	Amendments to Regulation 8, Rule 18: Equipment Leaks (Rule 8-18) in December 2015 addressed equipment that service heavy liquids at these sources, but those amendments have not yet been fully implemented due to litigation regarding uncertainty of heavy liquid fugitive emissions. BAAQMD is coordinating with each of the five Bay Area refineries to conduct a Heavy Liquid Leak Study. The study is designed to determine appropriate emission factors for heavy liquid leaks. The results of the study are expected by Fall 2018. BARCT levels will likely be set after the study has concluded; implementation is expected to involve additional leak detection and repair (LDAR) provisions for components in heavy liquid service.
Petroleum Coke Calcining	NOx	Regulation 9, Rule 14: Petroleum Coke Calcining Operations (Rule 9-14), which currently only addresses SO_2 emissions, may be amended to address NOx emissions. Technologies available for NOx reduction in petroleum coke calcining operations is expected to include SCRs and LoTOx injection systems.

2.6 SOURCES THAT MAY BE SUBJECT TO BARCT

The overall purpose of the Expedited BARCT Implementation Schedule is to reduce criteria pollutant emissions from industrial sources that participate in CARB's GHG Cap-And-Trade program. Emission of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities. Expedited BARCT implementation would apply to a wide range of commercial and industrial facilities including petroleum refineries, chemical plants and manufacturing operations. Table 2-2 shows the most likely types of facilities anticipated to be subject to BARCT and the primary emissions that would be controlled.

TABLE 2-2

Summary of Facilities and Sources Where BARCT May Apply Under the Expedited BARCT Requirements

Facility	Sources	Pollutants Controlled
Refineries	Fugitive Emissions (tanks, valves, pumps, compressors) Fluidized Catalytic Cracking Units CO Boilers Wastewater Treatment Operations	ROG PM SO_2
Petroleum Coke Calcining	Coke Calciners	NOx
Cement Manufacturing	Cement Kiln	PM SO_2
Refineries, Chemical Plants, Bulk Storage and Transfer Operations, and General Manufacturing	Organic Liquid Storage Tanks	ROG

2.6.1 REFINERIES

Petroleum refineries convert crude oil into a wide variety of refined products, including gasoline, aviation fuel, diesel and other fuel oils, lubricating oils, and feed stocks for the petrochemical industry. Crude oil consists of a complex mixture of hydrocarbon compounds with smaller amounts of impurities including sulfur, nitrogen, oxygen and metals (e.g., iron, copper, nickel, and vanadium). Crude oil that originates from different geographical locations may vary with respect to its composition, thus, potentially generating different types and amounts of emissions. The types of equipment where BARCT may be applied under the expedited BARCT requirements are further described below.

Fugitive Emissions Sources: Petroleum refineries include a large number and wide variety of fugitive emissions sources. Fugitive emissions are emissions of gases or vapors from pressurized equipment due to leaks and other unintended or irregular releases of gases during the crude refining process and do not include pollutants vented to an exhaust stack before release to the atmosphere. Generally, any processes or transfer areas where leaks can occur are sources of fugitive emissions. Fugitive emissions sources include, but are not limited to the following: valves, connectors (i.e., flanged, screwed, welded or other joined fittings), pumps, compressors, pressure relief devices, and diaphragms in ROG service. Fugitive emissions are generally controlled through leak detection and repair (LDAR) programs. Similarly, tanks storing crude oil or petroleum products also produce fugitive emissions.

Fluid Catalytic Cracking Units (FCCUs) and CO Boilers: FCCUs are complex processing units that convert heavy components of crude oil into light, high-octane products that are required in the production of gasoline. Each FCCU consists of a reaction chamber, a catalyst regenerator, and a fractionator. The cracking process begins in the reaction chamber were fresh catalyst is mixed with pre-heated heavy oils. A

chemical reaction occurs that converts the heavy oil 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 lighter hydrocarbon components such as light gases, gasoline, light gas oil, and cycle oil. The catalyst becomes coated with carbonaceous material (coke) during its exposure to the hydrocarbon feedstock. FCCUs include a catalyst regenerator where coke is burned off the surface of the catalyst to restore its activity so it can be re-used. Catalyst regenerators may be designed to burn the coke completely to carbon dioxide (full burn) or to only partially burn the coke to a mixture of CO and CO_2 (partial burn). Because the flue gas from these partial burn regenerators has high levels of CO, the flue gas is vented to a CO boiler where the CO is further combusted to CO_2. FCCUs and associated CO boilers can generate substantial PM, NOx, and SO_2 emissions.

Petroleum Wastewater Treating: All refineries employ some form of wastewater treatment, so water effluents can safely be reused at the refinery or discharged. Wastewater treatment operations provide a means of treating water that has come into contact with petroleum hydrocarbons, and, as such, are a potential source of ROG emissions. The design of wastewater treatment plants is complicated by the diversity of refinery pollutants, including oil, phenols, sulfides, dissolved, solids, and toxic chemicals. Although the treatment processes employed by refineries vary greatly they generally include drain systems, neutralizers, oil/water separators, settling chambers, clarifiers, dissolved air flotation systems, coagulators, and activated sludge units.

Drain systems consist of individual process drains, where oily water from various sources is collected, and junction boxes, which receive the oily water from multiple drains. The first stage of a typical wastewater treatment process is the oil-water separator, which physically separates the free oil and solids from the water. Gravity allows any oil in the water to rise to the surface of the separator and any solid particles to sink to the bottom. A continually moving scraper system pushes oil to one end and the solids to the other. Both are removed and the recovered oil is sent back to the refinery for reprocessing. Small suspended oil particles are then typically removed in the dissolved air flotation unit. Wastewater is sent to the activated sludge units, where naturally-occurring microorganisms feed on the dissolved organics in the wastewater, and convert them to water, CO_2 and nitrogen gas, which can be safely released into the atmosphere. Finally, wastewater enters the clarifying tanks, where the microorganisms settle to the bottom while the treated wastewater flows away.

2.6.2 PETROLEUM COKE CALCINING

Petroleum coke, the heaviest portion of crude oil, cannot be recovered in the normal refining process. Instead, petroleum coke is processed in a delayed coker unit to generate a carbonaceous solid referred to as “green coke,” a commodity. To improve the 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 can be used as a fuel grade coke by the fuel, cement, steel, calciner and specialty chemicals industries.

The process of making calcined (removing impurities) 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. Hot gases from the calciner are sent to a pyroscrubber that removes particulates through a combination of settling and incineration and sulfur compounds are oxidized to SO_2. 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 and sold for industrial uses.

2.6.3 CEMENT MANUFACTURING

Cement is manufactured in a cement kiln using a pyroprocess or high temperature reactor that is constructed along a longitudinal axis with segmented rotating cylinders whose connected length is anywhere from 50 to 200 yards in length. The pyroprocess in the kiln consists of three phases during which clinker is produced from raw materials undergoing physical changes and chemical reactions. The first phase in the kiln, the drying and pre-heating zone, operates at a temperature between 1,000 ^{o}F and 1,600 ^{o}F and evaporates any remaining water in the raw mix of materials entering the kiln. The second phase, the calcining zone, operates at a temperature between 1,600 ^{o}F and 1,800 ^{o}F and converts the calcium carbonate from the limestone in the kiln feed into calcium oxide and releases CO_2. During the third phase, the burning zone operates on average at 2,200 ^{o}F to 2,700 ^{o}F (though the flame temperature can at times exceed 3,400 ^{o}F) during which several reactions and side reactions occur. As the materials move towards the discharge end, the temperature drops and eventually clinker nodules form and volatile constituents, such as sodium, potassium, chlorides, and sulfates, evaporate. The red-hot clinker exits the kiln, is cooled in the clinker cooler, passes through a crusher and is conveyed to storage.

As indicated above cement manufacturing occurs at high temperatures using several combustion fuels. Fuels that have been used for primary firing include coal, petroleum coke, heavy fuel oil, natural gas, landfill off-gas and oil refinery flare gas. High carbon fuels such as coal are preferred for kiln firing, because they yield a luminous flame. The clinker is brought to its peak temperature mainly by radiant heat transfer, and a bright (i.e. high emissivity) and hot flame is essential for this. Combustion emissions are exhausted through the kiln's stack.

Relative to cement manufacturing, fugitive dust is wind-driven particulate matter emissions from any disturbed surface work area that are generated by wind action alone.

The process of making cement begins with the acquisition of raw materials, predominantly limestone rock (calcium carbonate) and clay, which exist naturally in rocks and sediment on the earth's surface. These and other materials used to manufacture cement are typically mined at nearby quarries and comprise "raw mix." The raw mix is refined by a series of mechanical crushing and grinding operations to segregate and eventually reduce the size of each component to 0.75 inch or smaller before being conveyed to storage.

2.6.4 ORGANIC LIQUID STORAGE FACILITIES

Storage vessels containing organic liquids can be found in many industries, including: (1) petroleum producing and refining; (2) petrochemical and chemical manufacturing; (3) bulk storage and transfer operations; and (4) other industries consuming or producing organic liquids. Organic liquids in the petroleum industry generally are mixtures of hydrocarbons having dissimilar true vapor pressures (for example, gasoline and crude oil). Organic liquids in the chemical industry are composed of pure chemicals or mixtures of chemical with similar vapor pressures (for example, benzene or a mixture of isopropyl and butyl alcohols).

Six basic tank designs are used for organic liquid storage vessels: fixed roof (vertical and horizontal), external floating roof, domed external (or covered) floating roof, internal floating roof, variable vapor space, and pressure tanks (low and high). Tanks associated with refineries comprise over 95 percent of the AB 617 organic liquid storage tanks.

ROG emissions from organic liquids in storage occur because of evaporative loss of the liquid during its storage and as a result of changes in the liquid level. ROG emissions vary with tank design, as does the relative contribution of each type of tank. Emissions from fixed roof tanks are a result of evaporative losses during storage (breathing losses or standing storage losses) and evaporative losses during filling and emptying operations (referred to as working losses). External and internal floating roof tanks are ROG emission sources because of evaporative losses that occur during standing storage and withdrawal of liquid from the tank. Standing storage losses are a result of evaporative losses through rim seams, deck fittings, and/or deck seams. Pressure tank losses occur when connecting to or disconnecting from the tank.

2.7 BARCT EMISSION CONTROL TECHNOLOGIES

The expedited implementation of BARCT would apply to existing facilities in the Bay Area that are generally large sources of emissions and included in the CARB GHG Cap-and-Trade program as industrial facilities. The overall purpose of the Expedited BARCT Implementation Schedule is to reduce criteria pollutant emissions from industrial sources that participate in the GHG Cap-and-Trade program. Emissions of criteria pollutants and TACs are often associated with GHG emission sources.

To comply with the BARCT requirements for affected facilities, operators could reduce operations or install BARCT equipment, which are different types of air pollution control

equipment or measures. The type of emission capture and control technology that may be used depends on the specific type of pollutant to be controlled. The most common air pollution control measures that are likely to be encountered as a result of the proposed implementation of expedited BARCT are categorized into the following groups and are summarized in Table 2-3:

- Installing domes on external floating roof tanks and capturing vented emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit;
- Covering lift stations, manholes, junction boxes, conveyances and other wastewater facilities at refineries and venting ROG emissions to a vapor combustor;
- Requiring additional lime injection on cement kilns to control SO_2 in order to reduce condensable PM emissions;
- Control PM emissions from FCCUs using SO_2 reducing catalyst additives, additional ESP capacity, or wet gas scrubbers;
- Reducing ROG emissions from fugitive components in heavy liquid service at refineries through increased LDAR programs;
- Reducing NOx emissions from coke calcining facilities through the use of SCR units and/or LoTOx system with a wet scrubber.

TABLE 2-3

Expedited BARCT Measures and Target Substances

BARCT Measure	Pollutant
Additional Controls on Organic Liquid Storage Tanks	ROG
Enclosures and Vapor Combustors at Refinery Wastewater Treatment Plants	ROG
Additional Lime Injection at Cement Plants Systems	PM and SO_2
Wet Gas Scrubbers, ESPs, and SO_2 Reducing Catalysts at Refinery FCCUs and CO Boilers	PM and SO_2
Increase LDAR for Equipment in Heavy Liquid Service Refineries	ROG
SCR and LoTOx (wet scrubber) at Petroleum Coke Calciners	NOx

The following subsections briefly describe the most likely types of control technologies that would be used to comply with the expedited BARCT measures. Table 2-4 summarizes the estimated number of each type of air pollution control technology that may be used to meet emissions reductions under the expedited BARCT requirements for the purposes of this EIR.

TABLE 2-4

Expedited BARCT Expected Air Pollution Control Equipment

Type of Air Pollution Control	Number of Units Potentially Installed Under Expedited BARCT	Notes/Comments
Vapor Recovery Unit and/or Thermal Incinerator on Organic Liquid Storage Tanks	Up to 20 domes, and up to 10 VRU/Incinerators	
Vapor Combustor on Refinery Wastewater Treatment Plants	Up to 5	Assumes that a refinery would implement one system for their wastewater treatment plant, and potentially all 5 refineries would need some type of control
Additional Lime Injection at Cement Plants	1	
Wet Gas Scrubbers/ESPs	Up to 3	Assumes highest impact scenario would involve WGS/ESP installation on up to 3 FCCUs
Increased LDAR in Heavy Liquid Service at Refineries	5	Increased scope of LDAR will likely impact all 5 refineries
SCR or LoTOX (wet scrubber) at Petroleum Coke Calciners	1	

2.7.1 Additional Controls on Organic Liquid Storage Tanks

ROG emissions from organic liquids in storage occur because of evaporative loss of the liquid during its storage and as a result of changes in the liquid level. ROG emissions vary with tank design, as does the relative contribution of each type of emission source.

Potential ROG emission reductions would be achieved by installing domes on external floating roof tanks and capturing vented emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit (VRU) flowing back to the tank for recovery or to a thermal incinerator. Thermal oxidizers, or thermal incinerators, are combustion devices that control ROG and volatile TAC emissions by combusting them to CO_2 and water. Domed roofs on external floating roofs without VRUs would reduce ROG emissions by limiting wind effects.

2.7.2 Enclosures and Vapor Combustors at Refinery Wastewater Treatment Plants

The main component of atmospheric emissions from refinery wastewater treatment plants are fugitive ROG emissions and dissolved gases that evaporate from the surfaces of wastewater residing in open process drains, separators, and ponds. The control of wastewater treatment plant emissions involves covering systems where emission generation is greatest (such as oil/water separators and settling basins) and removing dissolved gases from water streams with sour water strippers before contact with the atmosphere. Covering wastewater operations potentially can achieve greater than 90 percent reduction of wastewater system emissions. In addition, all lift stations, manholes, junction boxes, conveyances and any other wastewater facilities should be covered and all emissions routed to a vapor combustor with a destruction removal efficiency (DRE) of 99 percent for control. Vapor combustors are combustion devices that control ROG emissions by combusting them to carbon dioxide and water.

2.7.3 Lime Injection at Cement Plants

The formation of SO_2 in cement kilns is a product of the chemical make-up of the raw materials and fuel, as well as the high operating temperatures and oxygen concentration in the kiln. In a lime injection system, hydrated lime powder is injected into the flue gas. SO_2 reacts with lime (calcium carbonate) and is captured in the baghouse as calcium sulfate. The hydrated lime usually absorbs up to 60% of the SO_2 in the gases if injected at the correct temperature. The one cement kiln in the District currently operates a lime injection system for the control of hydrochloride emissions. The use of additional lime injection is expected to reduce SO_2 emissions even further.

2.7.4 Wet Gas Scrubbers

In wet scrubbing processes, liquid or solid particles are removed from a gas stream by transferring them to a liquid. This addresses only wet scrubbers for control of particulate matter. The liquid most commonly used is water. A wet scrubber's particulate collection efficiency is directly related to the amount of energy expended in contacting the gas stream with the scrubber liquid. Most wet scrubbing systems operate with particulate collection efficiencies over 95 percent (U.S. EPA, 2017).

There are three energy usage levels for wet scrubbers. A low energy wet scrubber is capable of efficiently removing particles greater than about 5-10 micrometers in diameter. A medium energy scrubber is capable of removing micrometer-sized particles, but is not very efficient on sub-micrometer particles. A high-energy scrubber is able to remove sub-micrometer particles.

A spray tower scrubber is a low energy scrubber and is the simplest wet scrubber used for particulate control. It consists of an open vessel with one or more sets of spray nozzles to distribute the scrubbing liquid. Typically, the gas stream enters at the bottom and passes upward through the sprays. The particles are collected when they impact the droplets. This is referred to as counter-current operation. Spray towers can also be operated in a cross-current arrangement. In cross-current scrubbers, the gas flow is horizontal and the

liquid sprays flow downward. Cross-current spray towers are not usually as efficient as counter-current units.

The most common high energy wet scrubber is the venturi, although it can also be operated as a medium energy scrubber. In a fixed-throat venturi, the gas stream enters a converging section where it is accelerated toward the throat section. In the throat section, the high-velocity gas stream strikes liquid streams that are injected at right angles to the gas flow, shattering the liquid into small drops. The particles are collected when they impact the slower moving drops. Following the throat section, the gas stream passes through a diverging section that reduces the velocity.

All wet scrubber designs incorporate mist eliminators or entrainment separators to remove entrained droplets. The process of contacting the gas and liquid streams results in entrained droplets, which contain the contaminants or particulate matter. The most common mist eliminators are chevrons, mesh pads, and cyclones. Chevrons are simply zig-zag baffles that cause the gas stream to turn several times as it passes through the mist eliminator. The liquid droplets are collected on the blades of the chevron and drain back into the scrubber. Mesh pads are made from interlaced fibers that serve as the collection area. A cyclone is typically used for the small droplets generated in a venturi scrubber. The gas stream exiting the venturi enters the bottom of a vertical cylinder tangentially. The droplets are removed by centrifugal force as the gas stream spirals upward to the outlet.

2.7.5 Electrostatic Precipitator

An ESP is a control device designed to remove particulate matter (both PM_{10} and $PM_{2.5}$) from an exhaust gas stream. ESPs take advantage of the electrical principle that opposites attract. By imparting a high voltage charge to the particles, a high voltage direct current (DC) electrode negatively charges airborne particles in the exhaust stream, while simultaneously ionizing the carrier gas, producing an electrified field. The electric field in an ESP is the result of three contributing factors: the electrostatic component resulting from the application of a voltage in a dual electrode system, the component resulting from the space charge from the ions and free electrons, and the component resulting from the charged particulate. As the exhaust gas passes through this electrified field, the particles are charged. The strength or magnitude of the electric field is an indication of the effectiveness of an ESP. Typically, 20,000 to 70,000 volts are used. The particles, either negatively or positively charged, are attracted to the ESP collecting electrode of the opposite charge. When enough particulates have accumulated, the collectors are shaken to dislodge the dust, causing it to fall by gravity to hoppers below and then removed by a conveyor system for disposal or recycling. ESPs can handle large volumes of exhaust gases and because no filters are used, ESPs can handle hot gases from 350 ^{o}F to 1,300 ^{o}F.

2.7.6 SO_2 Reducing Catalysts

To help reduce condensable particulate matter formation from sulfur compounds, SOx reducing additives (catalysts) are used for reducing the production of SOx by-products in FCCUs. A SOx reducing catalyst is a metal oxide compound such as aluminum oxide (Al_2O_3), magnesium oxide (MgO), vanadium pentoxide (V_2O_5) 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 SO_2, CO, and CO_2 by-products are formed. A portion of SO_2 will react with excess oxygen and form SO_3, 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 (H_2S). The net effect of these reactions is that the quantity of SO_2 in the regenerator is typically reduced between 40 to 65 percent while the quantity of H_2S in the reactor is increased. Generally, the increase in H_2S is handled by sulfur recovery processes located elsewhere within a refinery.

2.7.7 Enhanced LDAR for Components in Heavy Liquid Service

Oil refineries, chemical plants, bulk plants, bulk terminals, and other facilities that store, transport and use organic liquids may occasionally have leaks wherever there is a connection between two pieces of equipment, and lose some organic material as fugitive ROG emissions. Valves, pumps, and compressors can also leak organic materials. The District Rule 8-18 requires such facilities to maintain LDAR programs. The rule originally required the monitoring of components in light hydrocarbon liquid service, but was expanded in 2015 to include equipment in heavy hydrocarbon liquid service. Those amendments have not been fully implemented due to litigation regarding uncertainty of heavy liquid fugitive emissions. The District is in the process of conducting studies to determine appropriate emission factors for heavy liquid leaks. Completion of the heavy liquid leak study has been problematic, because some heavy hydrocarbon liquids are condensing and coating the leak detection sensors. The study approach has been re-configured and the results are expected by Fall 2018. The results of the study will be used to determine appropriate revisions to Rule 8-18, e.g., types of monitoring instruments, frequency of monitoring, leak concentration limits, time allowed for repair of the leak, recordkeeping requirements, etc.

2.7.8 Selective Catalytic Reduction (SCR) at Petroleum Coke Calciners

SCR is post combustion control equipment for NOx control of combustion sources such as boilers and process heaters and is capable of reducing NOx emissions by as much as 95 percent or higher. A typical SCR system consists of an ammonia storage tank, ammonia vaporization and injection equipment, a booster fan for the flue gas exhaust, an SCR reactor with catalyst, and exhaust stack plus ancillary electronic instrumentation and operations control equipment. An SCR system reduces NOx by injecting a mixture of ammonia and air into the flue gas exhaust stream from the combustion equipment. This mixture flows into the SCR reactor where the catalyst, ammonia and oxygen in the flue gas exhaust reacts with NO and NO_2 to form nitrogen and water in the presence of the

catalyst. The amount of ammonia introduced into the SCR system is approximately a one-to-one molar ratio of ammonia to NOx for optimum control efficiency, though the ratio may vary based on equipment-specific NOx reduction requirements. SCR catalysts are available in two types of solid, block configurations or modules, plate or honeycomb type, and are comprised of a base material of titanium dioxide that is coated with either tungsten trioxide, molybdic anhydride, vanadium pentoxide, iron oxide, or zeolite catalysts. These catalysts are used for SCRs because of their high activity, insensitivity to sulfur in the exhaust, and useful life span of five years or more. Ultimately, the material composition of the catalyst is dependent upon the application and flue gas conditions such as gas composition, temperature, etc. (SCAQMD, 2015).

For conventional SCRs, the minimum temperature for NOx reduction is 500^{o}F and the maximum operating temperature for the catalyst is 800 ^{o}F. The presence of particulates, heavy metals, sulfur compounds, and silica in the flue gas exhaust can limit catalyst performance. Minimizing the quantity of injected ammonia and maintaining the ammonia temperature within a predetermined range helps to avoid these undesirable reactions while minimizing the production of unreacted ammonia which is commonly referred to as "ammonia slip." Depending on the type of combustion equipment utilizing SCR, the typical amount of ammonia slip can vary between less than five ppmv when the catalyst is fresh and 20 ppmv at the end of the catalyst life.

2.7.9 LoTOx (wet scrubber) at Petroleum Coke Calciners

The LoTOx^{TM} is a registered trademark of Linde LLC (previously BOC Gases) and was later licensed to BELCO of Dupont for refinery applications. LoTOx^{TM} stands for "Low Temperature Oxidation" process in which ozone (O_3) is used to oxidize insoluble NOx compounds into soluble NOx compounds which can then be removed by absorption in a caustic, lime, or limestone solution. The LoTOx^{TM} process is a low temperature application, optimally operating at about 325 ^{o}F.

A typical combustion process produces about 95 percent NO and five percent NO_2. Because both NO and NO_2 are relatively insoluble in an aqueous solution, a WGS alone is not efficient in removing these insoluble compounds from the flue gas stream. However, with a LoTOx^{TM} system and the introduction of O_3, NO and NO_2 can be easily oxidized into a highly soluble compound N_2O_5 and subsequently converted to nitric acid (HNO_3). Then, in a wet gas scrubber for example, the HNO_3 is rapidly absorbed in caustic (NaOH), limestone or lime solution. The LoTOx^{TM} process can be integrated with any type of wet scrubbers (e.g., venturi, packed beds), semi-dry scrubbers, or wet ESPs. In addition, because the rates of oxidizing reactions for NOx are fast compared to the very slow SO_2 oxidation reaction, no ammonium bisulfate ($(NH_4)HSO_4$) or sulfur trioxide (SO_3) is formed (Confuorto and Sexton, 2007).

CHAPTER 3

ENVIRONMENTAL SETTING, IMPACTS, MITIGATION MEASURES, AND CUMULATIVE IMPACTS

Introduction
Air Quality
Hazards and Hazardous Materials
Hydrology and Water Quality
Growth Inducing Impacts
Significant Environmental Effects Which Cannot be Avoided
Environmental Effects Not Found to be Significant

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3.0 ENVIROMENTAL SETTING, IMPACTS, MITIGATION MEASURES AND CUMULATIVE IMPACTS

3.1 INTRODUCTION

This chapter of the Draft EIR describes the existing environmental setting in the Bay Area, analyzes the potential environmental impacts of the Expedited BARCT Implementation Schedule, and recommends mitigation measures (when significant environmental impacts have been identified). The chapter provides this analysis for each of the environmental areas identified in the Initial Study prepared by the Air District for the Expedited BARCT Implementation Schedule (BAAQMD, 2018) (see Appendix A). The Initial Study concluded that the approval of the Expedited BARCT Implementation Schedule could potentially result in significant environmental impacts to Air Quality, Hazards and Hazardous Materials, Hydrology and Water Quality, and Utilities and Service Systems. Water demand impacts were considered to be potentially significant in both the Hydrology and Water Quality, and Utilities and Service Systems section. The potential impacts on water demand were considered to be significant in both the Hydrology and Water Quality and Utilities Sections of the Initial Study. The impacts on water demand have been consolidated into the Hydrology and Water Quality section.

The potential impacts identified in the Initial Study will be evaluated in this EIR. Included for each impact category is a discussion of the: (1) Environmental Setting; (2) Regulatory Setting; (3) Significance Criteria; (4) Environmental Impacts; (5) Mitigation Measures (if necessary and available); and (6) Cumulative Impacts. A description of each subsection follows.

3.1.1 ENVIRONMENTAL SETTING

CEQA Guidelines §15360 (Public Resources Code Section 21060.5) defines "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 §15125(a) requires that an EIR include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting is intended to be no longer than is necessary to gain an understanding of the significant effects of the proposed project and its alternatives.

This Chapter describes the existing environment in the Bay Area as it exists at the time the environmental analysis commenced (2018) to the extent that information is available. The analyses included in this chapter focus on those aspects of the environmental resource areas that could be adversely affected by the implementation of the proposed Expedited BARCT Schedule as determined in the NOP/IS (see Appendix A), and not those environmental resource areas determined to have no potential adverse impact from the proposed project.

The NOP/IS (see Appendix A) determined that impacts on Air Quality, Hazards and Hazardous Materials, and Hydrology and Water Quality (including water demand) associated with the proposed project were potentially significant and are evaluated in this EIR.

3.1.2 SIGNIFICANCE CRITERIA

This section identifies the criteria used to determine when physical changes to the environment created as a result of the proposed project approval would be considered significant. The levels of significance for each environmental resource were established by identifying significance criteria. These criteria are based upon those presented in the California Environmental Quality Act (CEQA) environmental checklist and the Air Districts CEQA Air Quality Guidelines (BAAQMD, 2017a).

The significance determination under each impact analysis is made by comparing the proposed project impacts with the conditions in the environmental setting and comparing the difference to the significance criteria.

3.1.3 ENVIRONMENTAL IMPACTS

The CEQA Guidelines also require the EIR 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 must be identified and described, with consideration given to both short- and long-term impacts. The potential impacts associated with each resource are either quantitatively analyzed where possible or qualitatively analyzed where data are insufficient to quantify impacts. The impacts are compared to the significance criteria to determine the level of significance.

The impact sections of this chapter focus on those impacts that are considered potentially significant per the requirements of CEQA. An impact is considered significant if it leads to a "substantial, or potentially substantial, adverse change in the environment." Impacts from the project fall within one of the following categories:

Beneficial: Impacts will have a positive effect on the resource.

No Impact: There would be no impact to the identified resource as a result of the project.

Less than Significant: Some impacts may result from the project; however, they are judged to be less than significant. Impacts are frequently considered less than significant when the changes are minor relative to the size of the available resource base or would not change an existing resource. A “less than significant impact” applies where the environmental impact does not exceed the significance threshold.

Potentially Significant but Mitigation Measures Can Reduce Impacts to Less Than Significant: Significant adverse impacts may occur; however, with proper mitigation, the impacts can be reduced to less than significant.

Potentially Significant or Significant Impacts: Adverse impacts may occur that would be significant even after mitigation measures have been applied to minimize their severity. A "potentially significant or significant impacts" applies where the environmental impact exceeds the significance threshold, or information was lacking to make a finding of insignificance.

It is important to note that CEQA may also apply to individual projects at the time any permits are submitted in the future in response to the regulation or regulations that may be approved by the Board and the potential for any control equipment or other design modifications to affected facilities to have secondary adverse environmental impacts will be evaluated at that time.

3.1.4 MITIGATION MEASURES

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). The analyses in this chapter describe the potential for significant adverse impacts and identify mitigation measures where appropriate. This section describes feasible mitigation measures that could minimize potentially significant or significant impacts that may result from project approval. CEQA Guidelines (§15370) defines mitigation to include:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating or restoring the impacted environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

In accordance with CEQA statutes (§21081.6), a mitigation and monitoring program would be required to be adopted to demonstrate and monitor compliance with any mitigation measures identified in this EIR. The program would identify specific mitigation measures to be undertaken, when the measure would be implemented, and the agency responsible for oversight, implementation and enforcement.

3.1.5 CUMULATIVE IMPACTS

CEQA Guidelines §15130(a) requires an EIR to discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. An EIR evaluating the environmental impact of air quality regulations essentially evaluates the cumulative impacts associated with a variety of regulatory activities. As such, this EIR evaluates the cumulative environmental impacts associated with implementation of other air quality regulations as outlined in the 2017 Clean Air Plan, the most recent air plan for the Bay Area (BAAQMD, 2017). The area evaluated for cumulative air impacts in this EIR is the area within the jurisdiction of the District, an area encompassing 5,600 square miles, which includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties.

CHAPTER 3.2

AIR QUALITY IMPACTS

Introduction
Environmental Setting
Regulatory Setting
Significance Criteria
Air Quality Impacts

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3.2 AIR QUALITY

This subchapter of the EIR evaluates the potential air quality impacts associated with implementation of the Expedited BARCT Implementation Schedule, which aims to reduce criteria pollutant emissions from industrial sources that currently participate in the GHG Cap-and-Trade system.

As discussed in the Initial Study, in accordance with AB 617, the purpose of the Expedited BARCT Implementation Schedule is to implement several rule development projects that utilize BARCT to reduce criteria pollutant emissions from sources participating in the GHG Cap-and-Trade system in the Bay Area. However, certain control measures have the potential to increase emissions of other pollutants, such as GHGs and criteria pollutants. Adverse impacts include increased emissions associated with construction activities and combustion sources from certain types of air pollution control equipment. The NOP/IS (see Appendix A) determined that air quality impacts of the proposed project are potentially significant. Project-specific and cumulative adverse air quality impacts associated with the proposed rule amendments have been evaluated in Chapter 3.2.6 of this EIR.

3.2.1 ENVIRONMENTAL SETTING

3.2.1.1 Criteria Pollutants

Ambient Air Quality Standards

It is the responsibility of the Air District to ensure that state and federal ambient air quality standards (AAQS) 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 (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb). These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride. The state and national NAAQS for each of these pollutants and their effects on health are summarized in Table 3.2-1.

TABLE 3.2-1

Federal and State Ambient Air Quality Standards

AIR POLLUTANT	STATE STANDARD CONCENTRATION/ AVERAGING TIME	FEDERAL PRIMARY STANDARD CONCENTRATION/ AVERAGING TIME	MOST RELEVANT EFFECTS
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	No Federal 1-hr standard 0.070 ppm, 8-hr avg. >	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (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; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(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; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.030 ppm, annual avg. 0.18 ppm, 1-hr avg. >	0.053 ppm, ann. avg.> 0.100 ppm, 1-hr avg.	(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; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	No Federal 24-hr Standard> 0.075 ppm, 1-hr avg.>	(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 (PM_{10})	20 µg/m^3, ann. arithmetic mean > 50 µg/m^3, 24-hr average>	No Federal annual Standard 150 µg/m^3, 24-hr avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter ($PM_{2.5}$)	12 µg/m^3, annual arithmetic mean> No State 24-hr Standard	12 µg/m^3, annual arithmetic mean> 35 µg/m^3, 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 µg/m^3, 24-hr avg. >=	No Federal Standard	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 µg/m^3, 30-day avg. >= No State Calendar Quarter Standard No State 3-Month Rolling Avg. Standard	No Federal 30-day avg. Standard 1.5 µg/m^3, calendar quarter> 0.15 µg/m^3 3-Month Rolling average	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70%, 8-hour average (10am – 6pm PST)	No Federal Standard	Visibility based standard, not a health based standard. Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent

U.S. EPA requires CARB and Air Districts to measure the ambient levels of air pollution to determine compliance with the NAAQS. To comply with this mandate, the Air District monitors levels of various criteria pollutants at 25 monitoring stations within the San Francisco Bay Area. A summary of the 2017 maximum concentration and number of days exceeding state and federal ambient air standards at the Air District monitoring stations are presented in Table 3.2-2.

TABLE 3.2-2
Bay Area Air Pollution Summary – 2017

MONITORING STATIONS	OZONE						CARBON MONOXIDE			NITROGEN DIOXIDE				SULFUR DIOXIDE				PM 10				PM 2.5				
	Max 1-Hr	Cal 1-Hr Days	Max 8-Hr	Nat 8-Hr Days	Cal 8-Hr Days	3-Yr Avg	Max 1-Hr	Max 8-Hr	Nat/ Cal Days	Max 1-Hr	Ann Avg	Nat 1-Hr Days	Cal 1-Hr Days	Max 1-Hr	Max 24-Hr	Nat 1-Hr Days	Cal 24-Hr Days	Ann Avg	Max 24-Hr	Nat 24-Hr Days	Cal 24-Hr Days	Max 24-Hr	Nat 24-Hr Days	3-Yr Avg	Ann Avg	3-Yr Avg
North Counties	(ppb)						(ppm)			(ppb)				(ppb)				($\mu g/m^3$)				($\mu g/m^3$)				
Napa	98	1	84	2	2	63	5.6	4.7	0	53	7	0	0	-	-	-	-	-	-	-	-	199.1	13	35	13.7	10.9
San Rafael	88	0	63	0	0	58	2.6	1.6	0	53	10	0	0	-	-	-	-	17.7	94	0	2	74.7	8	27	9.7	8.2
Sebastopol	87	0	71	1	1	53	2.1	1.6	0	35	5	0	0	-	-	-	-	-	-	-	-	81.8	4	21	8.1	6.5
Vallejo	105	1	88	2	2	61	3.1	2.1	0	49	8	0	0	5.9	2.17	0	0	-	-	-	-	101.9	9	30	11.6	9.5
Coast/Central Bay																										
Berkeley Aquatic Pk*	58	0	49	0	0	*	2.2	1.7	0	123	16	1	0	-	-	-	-	-	-	-	-	52.0	7	*	9.1	*
Laney College Fwy	-	-	-	-	-	-	1.9	1.3	0	68	17	0	0	-	-	-	-	-	-	-	-	70.8	8	27	11.6	10.1
Oakland	136	2	100	2	2	54	3.2	2.2	0	65	10	0	0	-	-	-	-	-	-	-	-	70.2	7	24	9.4	7.9
Oakland-West	87	0	68	0	0	48	6.0	2.1	0	52	13	0	0	16.9	2.2	0	0	-	-	-	-	56.0	7	28	12.8	10.6
Richmond	-	-	-	-	-	-	-	-	-	-	-	-		16.0	2.9	0	0	-	-	-	-	-	-	-	-	-
San Francisco	87	0	54	0	0	47	2.5	1.4	0	73	11	0	0	-	-	-	-	22.0	77	0	2	49.9	7	27	9.7	8.3
San Pablo	104	3	80	2	2	52	2.5	1.9	0	48	8	0	0	8.3	2.7	0	0	20.3	95	0	4	71.2	9	30	10.8	9.3
Eastern District																										
Bethel Island	90	0	71	1	2	68	1.6	1.0	0	34	5	0	0	5.3	3.5	0	0	16.3	52	0	1	-	-	-	-	-
Concord	82	0	70	0	0	66	1.7	1.3	0	41	7	0	0	13.2	2.6	0	0	13.3	41	0	0	89.4	6	26	12.0	8.9
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	-	23.5	5.6	0	0	-	-	-	-	-	-	-	-	-
Fairfield	80	0	62	0	0	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	109	5	86	6	6	75	-	-	-	45	9	0	0	-	-	-	-	-	-	-	-	41.5	2	25	8.5	8.2
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	-	15.9	3.1	0	0	-	-	-	-	-	-	-	-	-
San Ramon	92	0	75	2	2	68	-	-	-	31	5	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
South Central Bay																										
Hayward	139	2	110	3	4	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	115	2	86	2	2	56	2.8	1.4	0	67	11	0	0	-	-	-	-	-	-	-	-	60.8	6	23	9.1	7.7
Santa Clara Valley																										
Gilroy	96	1	84	1	1	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48.4	2	18	75.5	6.1
Los Gatos	93	0	75	3	3	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose	121	3	98	4	4	67	2.1	1.8	0	68	12	0	0	3.6	1.1	0	0	21.6	70	0	6	49.7	6	27	9.5	9.3
San Jose Freeway	-	-	-	-	-	-	2.6	1.8	0	77	17	0	0	-	-	-	-	-	-	-	-	48.4	8	28	10.8	9.5
San Martin	96	1	86	3	3	69	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
Total Days over Standard		**6**		**6**	**6**				**0**			**1**	**0**			**0**	**0**			**0**	**6**		**18**			

Source: BAAQMD, 2018.
*Near-road air monitoring at Berkeley Aquatic Park began on July 1,2016. Therefore, 3-year average statistics for ozone and $PM_{2.5}$ are not available.
(ppb) = parts per billion (ppm) = parts per million, ($\mu g/m^3$) = micrograms per cubic meter

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. The long-term trend of ambient concentrations of air pollutants and the number of days on which the region exceeds (AAQS) have generally declined, although some year-to-year variability primarily due to meteorology, causes some short-term increases in the number of exceedance days (see Table 3.2-3). The Air District is in attainment of the State AAQS for CO, NO_2, and SO_2. However, the Air District does not comply with the State 24-hour PM_{10} standard, annual PM_{10} standard, and annual $PM_{2.5}$ standard. The Air District is unclassifiable/attainment for the federal CO, NO_2, SO_2, Pb, and PM_{10} standards. A designation of unclassifiable/attainment means that the U.S. EPA has determined to have sufficient evidence to find the area either is attaining or is likely attaining the NAAQS.

The 2017 air quality data from the Air District monitoring stations are presented in Table 3.2-2. No monitoring stations measured an exceedance of any of State or federal AAQS for CO and SO_2. There was one exceedance of the federal NO_2 AAQS at one monitoring station in 2017, although the area did not violate the NAAQS. All monitoring stations were in compliance with the federal PM_{10} standards. The State 24-hour PM_{10} standard was exceeded on six days in 2017, at the San Jose monitoring station (see Table 3.2-2).

The Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard and the federal 24-hour $PM_{2.5}$ standard. The state and federal 8-hour ozone standards were exceeded on 6 days in 2017 at one site or more in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) and the Santa Clara Valley (see Table 3.2-2). The federal 24-hour $PM_{2.5}$ standard was exceeded at one or more Bay Area station on 18 days in 2017, most frequently in the Napa, San Rafael, Vallejo, and San Pablo.

TABLE 3.2-3

Bay Area Air Quality Summary
Days over Standards

YEAR	OZONE			CARBON MONOXIDE				NOx		SULFUR DIOXIDE		PM_{10}		$PM_{2.5}$
	8-Hr	1-Hr	8-Hr	1-Hr		8-Hr		1-Hr		1-Hr	24-Hr	24-Hr*		24-Hr
	Nat	Cal	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat
2008	19	9	20	0	0	0	0	0	0	2	0	0	5	12
2009	11	11	13	0	0	0	0	0	0	0	0	0	1	11
2010	11	8	11	0	0	0	0	0	0	0	0	0	2	6
2011	9	5	10	0	0	0	0	0	0	0	0	0	3	8
2012	8	3	8	0	0	0	0	1	0	0	0	0	2	3
2013	3	3	3	0	0	0	0	0	0	0	0	0	6	13
2014	9	3	10	0	0	0	0	0	0	0	0	0	2	3
2015	12	7	12	0	0	0	0	0	0	0	0	0	1	9
2016	15	6	15	0	0	0	0	0	0	0	0	0	0	0
2017	6	6	6	0	0	0	0	1	0	0	0	0	6	18

Source: BAAQMD, 2018

3.2.1.2 Criteria Pollutant Health Effects

3.2.1.2.1 Ozone

Ozone is not emitted directly from pollution sources. Instead ozone is formed in the atmosphere through complex chemical reactions between hydrocarbons, or reactive organic gases (ROG, also commonly referred to as reactive organic gases (ROG), and nitrogen oxides (NOx), in the presence of sunlight. ROG and NOx are referred to as ozone precursors.

Ozone, 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 mixing 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, ground level ozone is harmful, is a highly reactive oxidant, which accounts for its damaging effects on human health, plants and materials at the earth's surface.

Ozone is harmful to public health at high concentrations near ground level. Ozone can damage the tissues of the lungs and respiratory tract. High concentrations of ozone irritate the nose, throat, and respiratory system and constrict the airways. Ozone also can aggravate other respiratory conditions such as asthma, bronchitis, and emphysema, causing increased hospital admissions. Repeated exposure to high ozone levels can make people more susceptible to respiratory infection and lung inflammation and permanently damage lung tissue. Ozone can also have negative cardiovascular impacts, including chronic hardening of the arteries and acute triggering of heart attacks. Children are most at risk as they tend to be active and outdoors in the summer when ozone levels are highest. Seniors and people with respiratory illnesses are also especially sensitive to ozone’s effects. Even healthy adults can be affected by working or exercising outdoors during high ozone levels.

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells, and ambient ozone concentrations in the Bay Area are occasionally 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, reducing the respiratory system's ability to remove inhaled particles and fight infection while long-term exposure damages lung tissue. People with respiratory diseases, children, the elderly, and people who exercise heavily are more susceptible to the effects of ozone.

Plants are sensitive to ozone at concentrations well below the health-based standards and ozone is responsible for significant crop damage. Ozone is also responsible for damage to forests and other ecosystems.

3.2.1.2.2 Reactive Organic Gases (ROGs)

It should be noted that there are no state or national ambient air quality standards for ROGs because they are not classified as criteria pollutants. ROGs are regulated, however, because ROG emissions contribute to the formation of ozone. They are also transformed into organic aerosols in the atmosphere, contributing to higher PM_{10} and lower visibility levels.

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

ROG emissions result primarily from incomplete fuel combustion and the evaporation of paints, solvents and fuels. Mobile sources are the largest contributors to ROG emissions. Stationary sources include processes that use solvents (such as manufacturing, degreasing, and coating operations) and petroleum refining, and marketing. Area-wide ROG sources include consumer products, pesticides, aerosol and architectural coatings, asphalt paving and roofing, and other evaporative emissions.

3.2.1.2.3 Carbon Monoxide (CO)

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 used in 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 District 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 atmospheric portion of the day.

When CO is inhaled in sufficient concentration, it can displace oxygen and bind with the hemoglobin in the blood, reducing the capacity of the blood to carry oxygen. Individuals most at risk from the effects of CO include heart patients, fetuses (unborn babies), smokers, and people who exercise heavily. Normal healthy individuals are affected at higher concentrations, which may cause impairment of manual dexterity, vision, learning ability, and performance of work. The results of studies concerning the combined effects of CO and other pollutants in animals have shown a synergistic effect after exposure to CO and ozone.

3.2.1.2.4 Particulate Matter (PM_{10} & $PM_{2.5}$)

Particulate matter, or PM, consists of microscopically small solid particles or liquid droplets suspended in the air. PM can be emitted directly into the air or it can be formed from secondary reactions involving gaseous pollutants that combine in the atmosphere. Particulate pollution is primarily a problem in winter, accumulating when cold, stagnant weather comes into the Bay Area. PM is usually broken down further into two size distributions, PM_{10} and $PM_{2.5}$. 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 PM_{10} and $PM_{2.5}$.

A consistent correlation between elevated ambient particulate matter (PM_{10} and $PM_{2.5}$) 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 ($PM_{2.5}$) 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 PM_{10} and $PM_{2.5}$.

3.2.1.2.5 Nitrogen Dioxide (NO_2)

NO_2 is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N_2) and oxygen (O_2) 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 NO_2. NO_2 is responsible for the brownish tinge of polluted air. The two gases, NO and NO_2, are referred to collectively as nitrogen oxides or NOx.

In the presence of sunlight, NO_2 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 (HNO_3) which reacts further to form nitrates, which are a component of PM_{10}.

NO_2 is a respiratory irritant and reduces resistance to respiratory infection. Children and people with respiratory disease are most susceptible to its effects.

3.2.1.2.6 Sulfur Dioxide (SO_2)

SO_2 is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H_2SO_4), which contributes to acid precipitation, and sulfates, which are a component of PM_{10} and $PM_{2.5}$. Most of the SO_2 emitted into the atmosphere is produced by the burning of sulfur-containing fuels.

At sufficiently high concentrations, SO_2 affects breathing and the lungs' defenses, and can aggravate respiratory and cardiovascular diseases. Asthmatics and people with chronic lung disease or cardiovascular disease are most sensitive to its effects. SO_2 also causes plant damage, damage to materials, and acidification of lakes and streams.

3.2.1.3 Current Emissions Inventory

An emission inventory is a detailed estimate of air pollutant emissions from a range of sources in a given area, for a specified time period. Future projected emissions incorporate current levels of control on sources, growth in activity in the Air District and implementation of future programs that affect emissions of air pollutants.

3.2.1.3.1 Ozone

NOx and ROG emissions are decreasing state-wide and in the San Francisco Bay Area since 1975 and are projected to continue to decline. ROG emissions result primarily from incomplete fuel combustion and the evaporation of paints, solvents and fuels. Mobile sources are the largest contributors to ROG emissions. Stationary sources include processes that use solvents (such as manufacturing, degreasing, and coating operations) and petroleum refining and marketing. Area-wide ROG sources include consumer products, pesticides, aerosol and architectural coatings, asphalt paving and roofing, and other evaporative emissions. About 42 percent of anthropogenic ROG emissions in the Bay Area are from mobile source emissions, while 26 percent are from petroleum and solvent evaporation (see Table 3.2-4) (BAAQMD, 2017).

TABLE 3.2-4

Anthropogenic Air Emission Inventory 2015
(tons per day)

Source	ROG	NOx
On-Road Motor Vehicles	59.6	128.1
Other Mobile Sources	49.2	122.2
Petroleum & Solvent Evaporation	67.3	--
Industrial and Commercial	15.4	3.0
Combustion	13.0	44.7
Other Sources	54.4	1.2

Source: BAAQMD, 2017

Approximately 84 percent of NOx emissions in the Bay Area are produced by the combustion of fuels. Mobile sources of NOx include motor vehicles, aircraft, trains, ships, recreation boats, industrial and construction equipment, farm equipment, off-road recreational vehicles, and other equipment. NOx and ROG emissions have been reduced for both stationary and mobile sources due to more stringent regulations from CARB and the District, respectively (see Table 3.2-4) (BAAQMD, 2017).

3.2.1.3.2 Particulate Matter

Particulate matter (both PM_{10} and $PM_{2.5}$) is a diverse mixture of suspended particles and liquid droplets (aerosols). PM includes elements such as carbon and metals; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust, wood smoke, and soil. Unlike the other criteria pollutants which are individual chemical compounds, PM includes all particles that are suspended in the air. PM is both directly emitted (referred to as direct PM or primary PM) and also formed in the atmosphere through reactions among different pollutants (this is referred to as indirect or secondary PM).

PM is generally characterized on the basis of particle size. Ultra-fine PM includes particles less than 0.1 microns in diameter. Fine PM ($PM_{2.5}$) consists of particles 2.5 microns or less in diameter. PM_{10} consists of particles 10 microns or less in diameter. Total suspended particulates (TSP) includes suspended particles of any size.

Combustion of fossil fuels and biomass, primarily wood, from various sources are the primary contributors of directly-emitted Bay Area $PM_{2.5}$ (BAAQMD, 2017). Biomass combustion concentrations are about 3-4 times higher in winter than during the other seasons, and its contribution to peak $PM_{2.5}$ is greater. The increased winter biomass combustion sources reflect increased residential wood-burning during the winter season. The inventory of PM_{10} and $PM_{2.5}$ emission sources is provided in Table 3.2-5.

TABLE 3.2-5

Particulate Emissions Inventory by Source, Annual Average 2015 (tons per day)

Source	PM_{10}	$PM_{2.5}$
Residential Wood-Burning	12.0	11.8
Geological Dust	49.1	6.6
On-Road Motor Vehicles	12.0	5.6
Other Mobile Sources	5.5	5.6
Industrial Combustion	6.5	6.1
Industrial/Commercial Processes	7.6	4.7
Accidental Fires	4.4	3.8
Commercial Cooking	2.2	1.9
Animal Waste	9.8	0.9

Source: BAAQMD, 2017

3.2.1.4 Non-Criteria Pollutants Health Effects

Although the primary mandate of the Air District is attaining and maintaining the national and state Ambient Air Quality Standards for criteria pollutants within the Air District jurisdiction, the Air District also has a general responsibility to control, and where possible, reduce public exposure to airborne toxic compounds. TACs are a defined set of airborne pollutants that may pose a present or potential hazard to human health. TACs can be emitted directly and can also be formed in the atmosphere through reactions among different pollutants. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis or genetic damage; or short-term acute affects such as eye watering, respiratory irritation, running nose, throat pain, and headaches. TACs are separated into carcinogens and non-carcinogens based on the nature of the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. Non-carcinogenic substances differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is expected to occur. These levels are determined on a pollutant-by-pollutant basis. The air toxics program was established as a separate and complementary program designed to evaluate and reduce adverse health effects resulting from exposure to TACs.

The major elements of the District's air toxics program are outlined below.

- Preconstruction review of new and modified sources for potential health impacts, and the requirement for new/modified sources with TAC emissions that exceed a specified threshold to use BACT.

- The Air Toxics Hot Spots Program, designed to identify industrial and commercial facilities that may result in locally elevated ambient concentrations of TACs, to report significant emissions to the affected public, and to reduce unacceptable health risks.

- The District's Community Air Risk Evaluation (CARE) Program has been implemented to identify areas where air pollution contributes most to health impacts and where populations are most vulnerable to air pollution; to reduce the health impacts in these areas; and to engage the community and other agencies to develop additional actions to reduce local health impacts.

- Control measures designed to reduce emissions from source categories of TACs, including rules originating from the state Toxic Air Contaminant Act and the federal Clean Air Act.

- The TAC emissions inventory, a database that contains information concerning routine and predictable emissions of TACs from permitted stationary sources.

- Ambient monitoring of TAC concentrations at a number of sites throughout the Bay Area.

- The District's Regulation 11, Rule 18: Reduction from Air Toxic Emissions at Existing Facilities which was adopted November 15, 2017. This rule requires the District to conduct screening analyses for facilities that report TAC emissions within the District and calculate health prioritization scores based on the amount of TAC emissions, the toxicity of the TAC pollutants, and the proximity of the facilities to local communities. The District will conduct health risk assessments for facilities that have priority scores above a certain level. Based on the health risk assessment, facilities found to have a potential health risk above the risk action level would be required to reduce their risk below the action level, or install Best Available Retrofit Control Technology for Toxics on all significant sources of toxic emissions.

3.2.1.4.1 TAC Health Effects

TACs can cause or contribute to a wide range of health effects. Acute (short-term) health effects may include eye and throat irritation. Chronic (long-term) exposure to TACs may cause more severe effects such as neurological damage, hormone disruption, developmental defects, and cancer. CARB has identified roughly 200 TACs, including diesel particulate matter (diesel PM) and environmental tobacco smoke.

Unlike criteria pollutants which are subject to ambient air quality standards, TACs are primarily regulated at the individual emissions source level based on risk assessment. Human outdoor exposure risk associated with an individual air toxic species is calculated as its ground-level concentration multiplied by an established unit risk factor for that air toxic species. Total risk due to TACs is the sum of the individual risks associated with each air toxic species.

Occupational health studies have shown diesel PM to be a lung carcinogen as well as a respiratory irritant. Benzene, present in gasoline vapors and also a byproduct of combustion, has been classified as a human carcinogen and is associated with leukemia. 1,3-butadiene, produced from motor vehicle exhaust and other combustion sources, has also been associated with leukemia. Reducing 1,3-butadiene also has a co-benefit in reducing the air toxic acrolein.

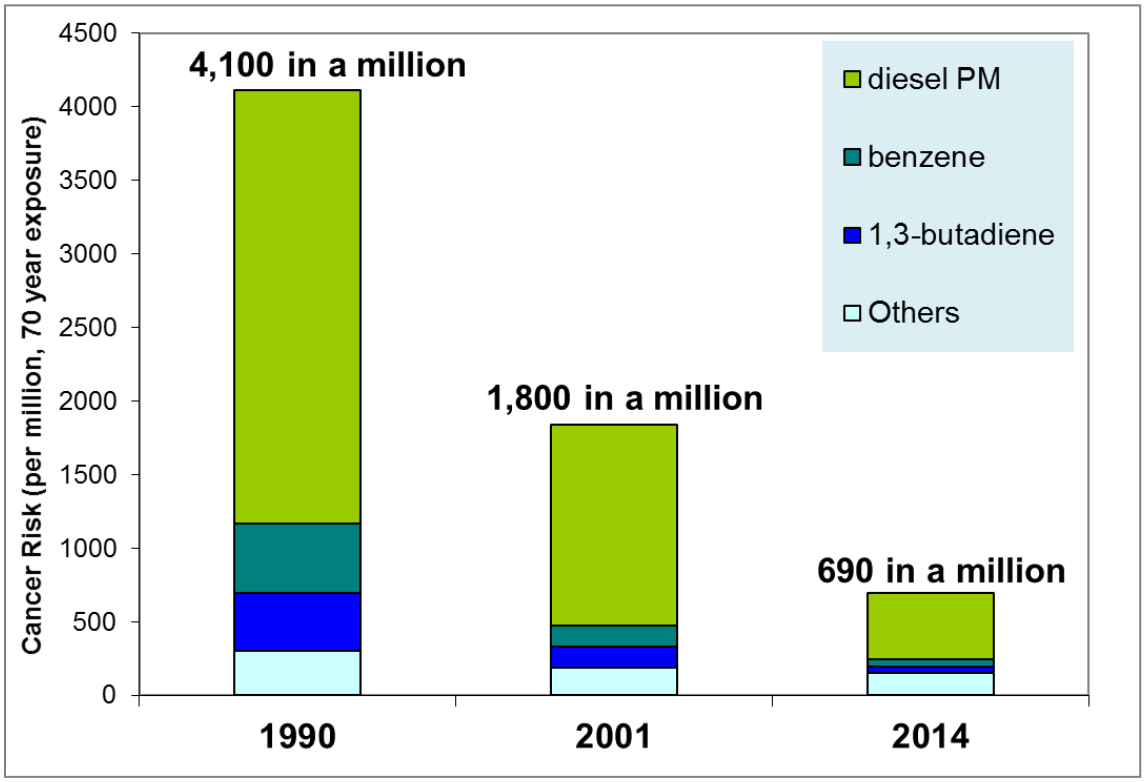
Acetaldehyde and formaldehyde are emitted from fuel combustion and other sources. They are also formed photo-chemically in the atmosphere from other compounds. Both compounds have been found to cause nasal cancers in animal studies and are also associated with skin and respiratory irritation. Human studies for carcinogenic effects of acetaldehyde are sparse but, in combination with animals studies, sufficient to support classification as a probable human carcinogen. Formaldehyde has been associated with nasal sinus cancer and nasopharyngeal cancer, and possibly with leukemia.

The primary health risk 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 many scientists currently believe that there are not "safe" levels of exposure to carcinogens without some risk to causing cancer. The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods. Based on ambient air quality monitoring, and using OEHHA cancer risk factors,[1] the estimated lifetime cancer risk for Bay Area residents, over a 70-year lifespan from all TACs combined, declined from 4,100 cases per million in 1990 to 690 cases per million people in 2014, as shown in Figure 3.2-1. This represents an 80 percent decrease between 1990 and 2014 (BAAQMD, 2016).

The cancer risk related to diesel PM, which accounts for most of the cancer risk from TACs, has declined substantially over the past 15-20 years as a result of ARB regulations and Air District programs to reduce emissions from diesel engines. However, diesel PM still accounts for roughly 60 percent of the total cancer risk related to TACs.

[1] See CARB's Risk Management Guidance for Stationary Sources of Air Toxics, Discussion Draft, May 27, 2015, https://www.arb.ca.gov/toxics/rma/rma_guidancedraft052715.pdf and the Office Environmental Health Hazard Assessment's toxicity values at http://oehha.ca.gov/media/CPFs042909.pdf. The cancer risk estimates shown in Figure 3.2-1 are higher than the estimates provided in documents such as the Bay Area 2010 Clean Air Plan and the April 2014 CARE report entitled *Improving Air Quality and Health in Bay Area Communities*. It should be emphasized that the higher risk estimates shown in Figure 3.2-1 are due solely to changes in the methodology used to estimate cancer risk, and not to any actual increase in TAC emissions or population exposure to TACs.

FIGURE 3.2-1 Cancer-Risk Weighted Toxics Trends



Source: BAAQMD, 2016

3.2.1.4.2 Air Toxics Emission Inventory

The Air District maintains a database that contains information concerning emissions of TACs from permitted stationary sources in the Bay Area. This inventory, and a similar inventory for mobile and area sources compiled by CARB, is used to plan strategies to reduce public exposure to TACs. The detailed emissions inventory is reported in the Air District Toxic Air Contaminant Control Program, 2010 Annual Report (BAAQMD, 2015). The 2010 emissions inventory continues to show decreasing emissions of many TACs in the Bay Area.

3.2.1.4.3 Ambient Monitoring Network

Table 3.2-6 contains a summary of average ambient concentrations of TACs measured at monitoring stations in the Bay Area by the District in 2017.

TABLE 3.2-6

Summary of 2017 Air District Ambient Air Toxics Monitoring Data

Compound	Max. Conc. (ppb) (1)	Min. Conc. (ppb) (2)	Mean Conc. (ppb) (3)
1,3-Butadiene	0.541	0.000	0.012
Acetaldehyde	5.680	0.480	1.982
Acetone	29.901	0.345	4.072
Acetonitrile	3.799	0.000	0.088
Acyrlonitrile	0.323	0.000	0.001
Benzene	3.123	0.000	0.221
Carbon Tetrachloride	0.130	0.024	0.098
Chloroform	0.115	0.000	0.023
Dichloromethane	1.791	0.000	0.159
Ethyl Alcohol	91.740	0.236	5.455
Ethylbenzene	1.136	0.000	0.138
Ethylene Dibromide	0.000	0.000	0.000
Ethylene Dichloride	0.000	0.000	0.000
Formaldehyde	7.290	0.480	2.707
Freon-113	0.205	0.051	0.070
Methyl Chloroform	1.226	0.000	0.006
Methyl Ethyl Ketone	5.743	0.000	0.259
Tetrachloroethylene	0.337	0.000	0.003
Toluene	3.925	0.000	0.503
Trichloroethylene	0.328	0.000	0.001
Trichlorofluoromethane	0.593	0.194	0.248
Vinyl Chloride	0.000	0.000	0.000
m/p-Xylene	2.929	0.000	0.236
o-Xylene	1.446	0.000	0.108

Source: BAAQMD, 2018a

NOTES: Table 3.2-6 summarizes the results of the Air District gaseous toxic air contaminant monitoring network for the year 2017. These data represent monitoring results at 21 separate sites at which samples were collected.

(1) "Maximum Conc." is the highest daily concentration measured at any of the 21 monitoring sites.

(2) "Minimum Conc." is the lowest daily concentration measured at any of the 21 monitoring sites.

(3) "Mean Conc." is the arithmetic average of the air samples collected in 2017 at the 21 monitoring sites.

(4) Acetaldehyde and formaldehyde concentrations reflect measurements from one monitoring site (San Jose-Jackson).

3.2.2 REGULATORY SETTING

3.2.2.1 Criteria Pollutants

Ambient air quality standards in California are the responsibility of, and have been established by, both the U.S. EPA and CARB. These standards have been set at concentrations, which provide margins of safety for the protection of public health and welfare. Federal and state air quality standards are presented in Table 3.2-1. The federal, state, and local air quality regulations are identified below in further detail.

3.2.2.1.1 Federal Regulations

The U.S. EPA is responsible for setting and enforcing the National Ambient Air Quality Standards for ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The U.S. EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The U.S. EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

The Clean Air Act (CAA) Amendments of 1990 give the U.S. EPA additional authority to require states to reduce emissions of ozone precursors and particulate matter in non-attainment areas. The amendments set attainment deadlines based on the severity of problems. At the state level, CARB has traditionally established state ambient air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emission inventories, collected air quality and meteorological data, and approved state implementation plans. At a local level, California's air districts, including the Air District, are responsible for overseeing stationary source emissions, approving permits, maintaining emission inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality-related sections of environmental documents required by CEQA.

Other federal regulations applicable to the Bay Area include Title III of the Clean Air Act, which regulates toxic air contaminants. Title V of the Act establishes a federal permit program for large stationary emission sources. The U.S. EPA also has authority over the Prevention of Significant Deterioration (PSD) program, as well as the New Source Performance Standards (NSPS), both of which regulate stationary sources under specified conditions.

3.2.2.1.2 California Regulations

CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act and federal Clean Air Act, and for regulating emissions from consumer products and motor vehicles. CARB has established California Ambient Air Quality Standards for all pollutants for which the federal government has established National Ambient Air Quality Standards and also has

standards for sulfates, visibility, hydrogen sulfide and vinyl chloride. Federal and state air quality standards are presented in Table 3.2-1 under Air Quality Environmental Setting. California standards are generally more stringent than the National Ambient Air Quality Standards. CARB has established emission standards for vehicles sold in California and for various types of combustion equipment. CARB also sets fuel specifications to reduce vehicular emissions.

CARB released the Proposed 2016 State Strategy for the State Implementation Strategy on May 17, 2016. The measures contained in the State SIP Strategy reflect a combination of state actions, petitions for federal action, and actions for deployment of cleaner technologies in all sectors. CARB's proposed state SIP Strategy includes control measures for on-road vehicles, locomotives, ocean going vessels, and off-road equipment that are aimed at helping all districts in California to comply with federal and state ambient air quality standards.

California gasoline specifications are governed by both state and federal agencies. During the past two decades, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. CARB adopted the Reformulated Gasoline Phase III regulations in 1999, which required, among other things, that California phase out the use of MTBE in gasoline. The CARB Reformulated Gasoline Phase III regulations have been amended several times (the most recent amendments were adopted in 2013) since the original adoption by CARB.

The California Clean Air Act (AB2595) mandates achievement of the maximum degree of emission reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date.

3.2.2.1.3 Air District Regulations

The California Legislature created the Air District in 1955. The Air District is responsible for regulating stationary sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties. The District is governed by a 24-member Board of Directors composed of publicly-elected officials apportioned according to the population of the represented counties. The Board has the authority to develop and enforce regulations for the control of air pollution within its jurisdiction. The District is responsible for implementing emissions standards and other requirements of federal and state laws. Numerous regulations have been developed by the District to control emissions sources within its jurisdiction. It is also responsible for developing air quality planning documents required by both federal and state laws.

Bay Area facilities are subject to various air quality regulations that have been adopted by the Air District, CARB and U.S. EPA. These rules contain standards that are expressed in a variety of forms to ensure that emissions are effectively controlled including:

- Requiring the use of specific emission control strategies or equipment (e.g., the use of floating roof tanks for ROG emissions);
- Requiring that emissions generated by a source be controlled by at least a specified percentage (e.g., 95 percent control of ROG emissions from pressure relief devices);
- Requiring that emissions from a source not exceed specific concentration levels (e.g., 100 parts per million (ppm) by volume of ROG for equipment leaks, unless those leaks are repaired within a specific timeframe; 250 ppm by volume SO_2 in exhaust gases from sulfur recovery units; 1,000 ppm by volume SO_2 in exhaust gases from catalytic cracking units);
- Requiring that emissions not exceed certain quantities for a given amount of material processed or fuel used at a source (e.g., 0.033 pounds NOx per million BTU of heat input, on a refinery-wide basis, for boilers, process heaters, and steam generators);
- Requiring that emissions be controlled sufficient to not result in off property air concentrations above specified levels (e.g., 0.03 ppm by volume of hydrogen sulfide (H_2S) in the ambient air);
- Requiring that emissions from a source not exceed specified opacity levels based on visible emissions observations (e.g., no more than 3 minutes in any hour in which emissions are as dark or darker than No. 1 on the Ringelmann chart); and
- Requiring that emissions be minimized by the use of all feasible prevention measures (e.g., flaring prohibited unless it is in accordance with an approved Flare Minimization Plan).
- Requiring that emissions of non-methane organic compounds and methane from the waste decomposition process at solid waste disposal sites be limited.
- Requiring emission limits on ozone precursor organic compounds from valves and flanges.
- Requiring the limitation of emissions of organic compounds from gasoline dispensing facilities.

3.2.2.2 Toxic Air Contaminants

3.2.2.2.1 Federal and State Regulations

TACs are regulated in the District through federal, state, and local programs. At the federal level, TACS are regulated primarily under the authority of the CAA. Prior to the amendment of the CAA in 1990, source-specific NESHAPs were promulgated under Section 112 of the CAA for certain sources of radionuclides and hazardous air pollutants (HAPs).

Title III of the 1990 CAA amendments required the U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by the U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for affected sources must require the maximum achievable control technology (MACT). MACT is defined as the maximum degree of emission reduction achievable considering cost and non-air quality

health and environmental impacts and energy requirements. All NESHAPs were promulgated by May 2015.

Many sources of TACs that have been identified under the CAA are also subject to the California TAC regulatory programs. CARB developed four regulatory programs for the control of TACs. Each of the programs is discussed 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 Assembly Bill 1807 (AB 1807) (California Health and Safety Code §39662), is a two-step program in which substances are identified as TACs, and airborne toxic control measures (ATCMs) are adopted to control emissions from specific sources. Since adoption of the program, CARB has identified 18 TACs, and CARB adopted a regulation designating all 189 federal HAPs as TACs.

Control of TACs Under the Air Toxics "Hot Spots" Act: The Air Toxics Hot Spot Information and Assessment Act of 1987 (AB 2588) (California Health and Safety Code §39656), as amended by Senate Bill (SB) 1731, 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 those emissions. AB2588 requires operators of certain stationary sources to inventory air toxic emissions from their operation and, if directed to do so by the local air district, prepare a health risk assessment to determine the potential health impacts of such emissions. If the health impacts are determined to be "significant" (greater than 10 per million exposures or non-cancer chronic or acute hazard index greater than 1.0), each facility must, upon approval of the health risk assessment, provide public notification to affect individuals.

Community Air Protection Program (AB 617): The Community Air Protection Program was established under AB 617 to reduce exposure in communities most impacted by air pollution. The Program includes community air monitoring and community emissions reduction programs, as well as funding to support early actions to address localized air pollution through targeted incentive funding to deploy cleaner technologies in these impacted communities. AB 617 also includes new requirements for accelerated retrofit of pollution controls on industrial sources, increased penalty fees, and greater transparency and availability of air quality and emissions data, which will help advance air pollution control efforts. CARB is required to select the communities for action in the first year of the program and develop the program requirements by October 2018. The 2018 communities in the Bay Area recommended by CARB staff for approval by the CARB Governing Board are Richmond and West Oakland.

3.2.2.2.2 District TAC Rules and Regulations

The Air District uses three approaches to reduce TAC emissions and to reduce the health impacts resulting from TAC emissions: 1) Specific rules and regulations; 2) Pre-construction review; and, 3) the Air Toxics Hot Spots Program. In addition, the Air

District implements U.S. EPA, CARB, and Air District rules that specifically target toxic air contaminant emissions from sources at petroleum refineries.

District Rules and Regulations: The Air District has a number of rules that reduce or control emissions from stationary sources. A number of regulations that control criteria pollutant emissions also control TAC emissions. For example, inspection and maintenance programs for fugitive emission sources (e.g., pumps, valves, and flanges) control ROG emissions, some of which may also be TAC emissions. Also, as discussed above, the District's Rule 11-18: Reduction from Air Toxic Emissions at Existing Facilities requires a review of TAC emissions, health risk assessments for facilities that have priority scores above a certain level, and risk reduction measures or installation of Best Available Retrofit Control Technology for Toxics on all significant sources of toxic emissions, if certain health risks are exceeded.

Preconstruction Review: The Air District's Regulation 2, Rule 5 is a preconstruction review requirement for new and modified sources of TACs implemented through the Air District's permitting process. This rule includes health impact thresholds, which require the use of the best available control technology for TAC emissions (TBACT) for new or modified equipment, and health risk limits cannot be exceeded for any proposed project.

Air Toxics Hot Spots Program: The Air Toxic Hot Spots program, or AB2588 Program, is a statewide program implemented by each individual air district pursuant to the Air Toxic Hot Spots Act of 1987 (Health and Safety Code Section 44300 et. seq.). The Air District uses standardized procedures to identify health impacts resulting from industrial and commercial facilities and encourage risk reductions at these facilities. Health impacts are expressed in terms of cancer risk and non-cancer hazard index. Under this program, the Air District uses a prioritization process to identify facilities that warrant further review. This prioritization process uses toxic emissions data, health effects values for TACs, and Air District approved calculation procedures to determine a cancer risk prioritization score and a non-cancer prioritization score for each site. The District updates the prioritization scores annually based on the most recent toxic emissions inventory data for the facility.

Facilities that have a cancer risk prioritization score greater than 10 or a non-cancer prioritization greater than 1 must undergo further review. If emission inventory refinements and other screening procedures indicate that prioritizations scores remain above the thresholds, the Air District will require that the facility perform a comprehensive site-wide HRA.

In 1990, the Air District Board of Directors adopted the current risk management thresholds pursuant to the Air Toxic "Hot Spots" Act of 1987. These risk management thresholds, which are summarized in Table 3.2-7 below, set health impact levels that require sites to take further action, such as conducting periodic public notifications about the site's health impacts and implementing mandatory risk reduction measures.

TABLE 3.2-7

Summary of Bay Area Air Toxics Hot Spots Program Risk Management Thresholds

Requirement	Site Wide Cancer Risk	Site Wide Non-Cancer Hazard Index
Public Notification	Greater than 10 in one million	Greater than 1
Mandatory Risk Reduction	Greater than 100 in one million	Greater than 10

Targeted Control of TACs Under the Community Air Risk Evaluation Program: In 2004, the Air District established the Community Air Risk Evaluation (CARE) program to identify locations with high emissions of toxic air contaminants (TAC) and high exposures of sensitive populations to TAC and to use this information to help establish policies to guide mitigation strategies that obtain the greatest health benefit from TAC emission reductions. For example, the Air District will use information derived from the CARE program to develop and implement targeted risk reduction programs, including grant and incentive programs, community outreach efforts, collaboration with other governmental agencies, model ordinances, new regulations for stationary sources and indirect sources, and advocacy for additional legislation.

The CARE program was initiated to evaluate and reduce health risks associated with exposures to outdoor TACs and other pollutants in the Bay Area. The program examines emissions from point sources, area sources, and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The main objectives of the program are to:

- Characterize and evaluate potential cancer and non-cancer health risks associated with exposure to TACs and other pollutants from both stationary and mobile sources throughout the Bay Area.
- Assess potential exposures to sensitive populations including children, senior citizens, and people with respiratory illnesses.
- Identify significant sources of emissions and prioritize use of resources to reduce exposure in the most highly impacts areas (i.e., priority communities).
- Develop and implement mitigation measures such as grants, guidelines or regulations, to achieve cleaner air for the public and the environment, focusing initially on priority communities.

The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses

will be used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations.

The District's Regulation 11, Rule 18: Reduction from Air Toxic Emissions at Existing Facilities: Rule 11-18, adopted November 15, 2017, requires the District to conduct screening analyses for facilities that report TAC emissions within the District and calculate health prioritization scores based on the amount of TAC emissions, the toxicity of the TAC pollutants, and the proximity of the facilities to local communities. The District will conduct health risk assessments for facilities that have priority scores above a certain level. Based on the health risk assessment, facilities found to have a potential health risk above the risk action level would be required to reduce their risk below the action level, or install Best Available Retrofit Control Technology for Toxics on all significant sources of toxic emissions.

A partial list of the air pollution rules and regulations that the Air District implements and enforces at Bay Area facilities follows:

- Air District Regulation 1: General Provisions and Definitions
- Air District Regulation 2, Rule 1: Permits, General Requirements
- Air District Regulation 2, Rule 2: New Source Review
- Air District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants
- Air District Regulation 2, Rule 6: Major Facility Review (Title V)
- Air District Regulation 6, Rule 1: Particulate Matter, General Requirements
- Air District Regulation 6, Rule 2: Miscellaneous Operations
- Air District Regulation 8, Rule 5: Storage of Organic Liquids
- Air District Regulation 8, Rule 6: Terminals and Bulk Plants
- Air District Regulation 8, Rule 7: Gasoline Dispensing Facilities
- Air District Regulation 8, Rule 8: Wastewater (Oil-Water) Separators
- Air District Regulation 8, Rule 9: Vacuum Producing Systems
- Air District Regulation 8, Rule 10: Process Vessel Depressurization
- Air District Regulation 8, Rule 18: Equipment Leaks
- Air District Regulation 8, Rule 22: Valves and Flanges at Chemical Plants
- Air District Regulation 8, Rule 28: Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants
- Air District Regulation 8, Rule 33: Gasoline Bulk Terminals and Gasoline Delivery Vehicles
- Air District Regulation 8, Rule 39: Gasoline Bulk Terminals and Gasoline Delivery Vehicles
- Air District Regulation 8, Rule 44: Marine Vessel Loading Terminals
- Air District Regulation 9, Rule 1: Sulfur Dioxide
- Air District Regulation 9, Rule 2: Hydrogen Sulfide
- Air District Regulation 9, Rule 7: Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters

- Air District Regulation 9, Rule 8: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines
- Air District Regulation 9, Rule 9: Nitrogen Oxides and Carbon Monoxide from Stationary Gas Turbines
- Air District Regulation 9, Rule 10: Nitrogen Oxides and Carbon Monoxide from Boilers, Steam Generators and Process Heaters in Petroleum Refineries
- Air District Regulation 9, Rule 11: Nitrogen Oxides And Carbon Monoxide from Utility Electric Power Generating Boilers
- Air District Regulation 11, Rule 1: Lead
- Air District Regulation 11, Rule 8: Hexavalent Chromium
- Air District Regulation 11, Rule 18: Risk Reduction from Air Toxic Emissions at Existing Facilities
- Air District Regulation 12, Rule 11: Flare Monitoring at Petroleum Refineries
- Air District Regulation 12, Rule 12: Flares at Petroleum Refineries
- 40 CFR Part 63, Subpart CC: Petroleum Refineries (NESHAP)
- 40 CFR Part 63, Subpart UUU: Petroleum Refineries: Catalytic Cracking, Catalytic Reforming, and Sulfur Plant Units (NESHAP)
- 40 CFR Part 61, Subpart FF: Benzene Waste Operations (NESHAP)
- 40 CFR Part 60, Subpart J: Standards of Performance for Petroleum Refineries (NSPS)
- State Airborne Toxic Control Measure for Stationary Compression Ignition (Diesel) Engines (ATCM)

3.2.3 SIGNIFICANCE CRITERIA

On June 2, 2010, the District's Board of Directors unanimously adopted thresholds of significance to assist in the review of projects under CEQA. These CEQA thresholds were designed to establish the level at which the District believed air pollution emissions would cause significant environmental impacts under CEQA. The CEQA thresholds were challenged in court. Following litigation in the trial court, the court of appeal, and the California Supreme Court, all of the Thresholds were upheld. However, in an opinion issued on December 17, 2015, the California Supreme Court held that CEQA does not generally require an analysis of the impacts of locating development in areas subject to environmental hazards unless the project would exacerbate existing environmental hazards.

In view of the Supreme Court’s opinion, local agencies may rely on the District’s CEQA thresholds designed to reflect the impact of locating development near areas of toxic air contamination where such an analysis is required by CEQA or where the agency has determined that such an analysis would assist in making a decision about the project. However, the CEQA thresholds are not mandatory and agencies should apply them only after determining that they reflect an appropriate measure of a project’s impacts.

The Air District published a new version of the Guidelines dated May 2017, which includes revisions made to address the Supreme Court’s opinion. The CEQA Guidelines for implementation of the Thresholds are for information purposes only to assist local

agencies. Recommendations in the Guidelines are advisory and should be followed by local governments at their own discretion. The Air District is currently working to revise any outdated information in the Guidelines as part of its update to the CEQA Guidelines and thresholds of significance. Since these are the most current air quality significance thresholds and address court decisions, they will be used in the CEQA analysis for the current project.

3.2.3.1 Construction Emissions

Regarding construction emissions, the Air District's 2017 Thresholds of Significance will be used in the current air quality analysis for construction emissions (see Table 3.2-8).

TABLE 3.2-8

Thresholds of Significance for Construction-Related Criteria Air Pollutants and Precursors

Pollutant/Precursor	Daily Average Emissions (lbs/day)
ROG	54
NOx	54
PM_{10}	82*
$PM_{2.5}$	54*
PM_{10}/ $PM_{2.5}$ Fugitive Dust	Best Management Practices

*Applies to construction exhaust emissions only.
Source: BAAQMD, 2017a

3.2.3.2 Operational Emissions

The most recently available CEQA Guidelines established emission thresholds for specific projects, general plans, and regional plans. An air quality rule does not fall neatly into any of these categories. Air quality rules are typically regional in nature, as opposed to general plans, community plans and regional plans. In addition, air quality rules are usually specific to particular source types and particular pollutants. The Air Quality Plan threshold of "no net increase in emissions" is appropriate for Air Quality Plans because they include a mix of several control measures with individual trade-offs. For example, one control measure may result in combustion of methane to reduce greenhouse gas emissions, while increasing criteria pollutant emissions by a small amount. Those increases from the methane measure would be offset by decreases from other measures focused on reducing criteria pollutants. In a particular rule development effort, there may not be opportunities to make these trade-offs.

The 2017 project-level stationary source CEQA thresholds are identified in Table 3.2-8. These represent the levels at which a project's individual emissions would result in a cumulatively considerable contribution to the Air District's existing air quality conditions for individual projects. These thresholds are based on the federal offset requirements for ozone precursors for which the Bay Area is designated as a non-attainment area, which is

an appropriate approach to prevent further deterioration of ambient air quality and thus has nexus and proportionality to prevent regionally cumulative significant impacts (e.g., worsened status of non-attainment). Despite being a non-attainment area for state PM_{10} and pending nonattainment for federal $PM_{2.5}$, the federal NSR significant emission rate annual limits of 15 and 10 tons per year, respectively, are the thresholds as the District has not established an offset requirement limit for $PM_{2.5}$ and the existing limit of 100 tons per year is much less stringent and would not be appropriate in light of the pending non-attainment designation for the federal 24-hour $PM_{2.5}$ standards. These operational thresholds represent the emission levels above which a project's individual emissions would result in a cumulatively considerable contribution to the Bay Area's existing air quality conditions. The Air District is planning to develop significance thresholds specifically for rules. Until that effort is complete and in order to provide a conservative air quality analysis, the project-specific thresholds recommended in the revised 2017 CEQA Guidelines (BAAQMD, 2017) will be used in the current air quality impacts analysis (see Table 3.2-9).

TABLE 3.2-9

Thresholds of Significance for Operation-Related Criteria Air Pollutants and Precursors

Pollutant/Precursor	Daily Average Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROG	54	10
NOx	54	10
PM_{10}	82	15
$PM_{2.5}$	54	10

*Source: BAAQMD, 2017a

3.2.4 ENVIRONMENTAL IMPACTS

As discussed previously, the NOP/IS (see Appendix A) found that the Expedited BARCT Implementation Schedule would require industrial facilities to install new or modify their existing air pollution control equipment. Under the Expedited BARCT Implementation Schedule, facilities that participate in the GHG Cap-and-Trade system in the Bay Area would be required to implement BARCT to reduce their criteria pollutant emissions. In the NOP/IS, air quality impacts were noted to be potentially significant and further analyzed and discussed in this section.

It is expected that the direct effects of the Expedited BARCT Implementation Schedule would be reductions in criteria pollutant and TAC emissions. However, construction equipment and activities to install air pollution control equipment has the potential to generate secondary air quality impacts, primarily from exhaust emissions. Further, air pollution control equipment that reduces one or more regulated pollutants has the potential to generate adverse secondary air quality impacts from other sources such as mobile

sources or from the air pollution control equipment. For example, some types of air pollution control equipment that use caustic as part of the control process have the potential to generate emissions of the caustic material that may be considered a TAC.

Potential secondary air quality impacts from construction activities and equipment that may be required under the Expedited BARCT Implementation Schedule are analyzed herein. The analysis identifies construction air quality impacts from air pollution control equipment that could be installed to comply with AB 617 requirements (e.g., SCRs, vapor recovery units, wet gas scrubber, etc.). Construction and operation air quality impacts are identified and provided in the following subsections.

There are a total of six rule development projects that are being evaluated under the Expedited BARCT Implementation Schedule. Of these six projects, only the Refinery Heavy Liquid Leaks project is expected to implement control measures that will have minor or no construction or operational air quality impacts.

The Refinery Heavy Liquid Leaks Project is expected to require increased LDAR in order to achieve BARCT requirements. The amendments for Regulation 8, Rule 18: Equipment Leaks have currently not been fully implemented due to litigation, making expected emissions reductions difficult to estimate. However, increase LDAR is not expected to have any air quality impacts as it would require additional monitoring of fugitive emissions and repair of equipment found to be leaking. No construction is required and LDAR does not use equipment that would contribute to air quality impacts during operation.

The overall emission benefits that are expected from the Expedited BARCT Implementation Schedule are presented in Table 3.2-10. For some of the potential rule development projects, emission reductions may be unknown at this time. For particular sources or pollutants, there may be uncertainties associated with emission estimates or the level of control and emission reductions achievable, and further study and evaluation would be required to develop more detailed estimates. For example, potential emission reductions of condensable PM are often difficult to quantify due to the complex nature of condensable PM formation. This formation can be highly dependent on site-specific source parameters, including flue gas properties and composition. Because control strategies typically involve the reduction of condensable components and precursors (such as ammonia and SO_2) instead of a direct limit on condensable PM, reductions of condensable PM emissions associated with these control measures may be difficult to estimate without specific engineering information.

TABLE 3.2-10

Expedited BARCT Implementation Schedule Emission Reductions Associated with Rule Development Projects

Rule Development Project Title	Estimated Emission Reductions Criteria Air Pollutants (tons/yr)				
	ROG	CO	NOx	SOx	PM
Organic Liquid Storage Tanks[1]	75 - 125	--	--	--	--
Petroleum Wastewater Treating	Unknown(2)	--	--	--	--
Portland Cement Manufacturing	--	--	--	698	Unknown
Refinery Fluid Catalytic Crackers and CO Boilers	--	--	--	567	Unknown
Refinery Heavy Liquid Leaks	Unknown	--	--	--	--
Petroleum Coke Calcining	--	--	Unknown	--	--

(1) The Organic Liquid Storage Tanks Project, Petroleum Wastewater Treating and Refinery Heavy Liquid Leak projects will also reduce TAC emissions. TAC emissions are not readily quantifiable and are thus not presented.

(2) For some of the potential rule development projects the estimates of emissions reductions are unknown at this time. This is due to uncertainties associated with emission estimates or the level of control and emission reductions that are achievable.

3.2.4.1 Potential Criteria Pollutant Impacts during Construction

The proposed project aims to reduce a wide variety of criteria pollutants. Different types of control technologies may need to be installed, as necessary, at affected facilities to achieve the goals of the Expedited BARCT Implementation Schedule. The potential secondary adverse air quality construction impacts from control equipment identified in Chapter 2 that may be installed to comply with the Expedited BARCT Implementation Schedule (see Table 2-4) have been analyzed in the following subsections.

The Expedited BARCT Implementation Schedule has the potential to affect industrial facilities in the Bay Area that are subject to Cap-and-Trade requirements, which include cement manufacturing facilities, refineries, and organic liquid storage facilities. Many of these facilities are expected to install various air pollution control equipment or use other means to achieve BARCT requirements.

Construction equipment associated with installing air pollution control technologies would result in ROG, NOx, SOx, CO, PM_{10}, and $PM_{2.5}$ emissions, although the amount generated by specific types of equipment can vary greatly. As shown in Table 3.2-11, different types of equipment can generate construction emissions in much different quantities depending on the type of equipment. For example, the estimated emissions of NOx range from of

0.17 pound per hour (lb/hr) of NOx for a forklift to 1.06 lbs/hr for a large drill rig. To provide a conservative construction air quality analysis and in the absence of information on the specific construction activities necessary to complete a construction project, a typical construction analysis assumes that, in the absence of specific information, all construction activities would occur for eight hours per day. This is considered a conservative assumption because workers may need to be briefed on daily activities, so construction may start later than their arrival times or the actual construction activities may not require eight hours to complete. However, for some construction projects, specific types of construction equipment and hours of operation have been developed using analyses prepared for other similar types of construction projects or using construction estimator guidelines used by construction contractors when bidding on jobs. As a result, under some construction scenarios hours of equipment operation may be more or less than eight hours.

TABLE 3.2-11

Emission Factors Associated with Typical Construction Equipment(1)

Equipment Type	VOC (lb/hr)	CO (lb/hr)	NOx (lb/hr)	SOx (lb/hr)	PM (lb/hr)
Aerial Lift	0.00	0.17	0.10	0.00	0.00
Backhoe	0.02	0.36	0.27	0.00	0.02
Compressor	0.02	0.21	0.13	0.00	0.01
Concrete Saw	0.03	0.25	0.18	0.00	0.02
Crane	0.05	0.40	0.72	0.00	0.03
Drill Rig Large	0.08	0.50	1.06	0.00	0.04
Excavator	0.02	0.51	0.31	0.00	0.01
Forklift	0.02	0.22	0.17	0.00	0.01
Front End Loader	0.05	0.44	0.60	0.00	0.03
Generator	0.02	0.22	0.13	0.00	0.01
Light Plants	0.02	0.29	0.13	0.00	0.01
Welding Machine	0.03	0.23	0.18	0.00	0.02

(1) Emission Factors from Off-Road 2011, Model Year 2019. CO emissions from SCAQMD, 2006: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls.

A range of construction scenarios for installing various types of control equipment was identified to determine whether or not construction air quality impacts would exceed any applicable air quality significance thresholds. To provide a conservative analysis of potential construction air quality impacts, it is assumed that construction of one or more of the control technologies evaluated in the following subsections could overlap. The following subsections identify construction scenarios that may occur for control technologies and are considered to be a representative range of construction activities and equipment used to install air pollution control equipment. Construction activities range from installing or retrofitting small-scale air pollution control equipment, which would require few pieces of construction equipment or hours of operation, to installing large-scale

air pollution control technologies, which require larger construction crews, more construction equipment, and longer hours of operation. As shown in the following subsections, construction activities could result in substantial construction air quality impacts.

3.2.4.1.1 Air Pollution Control Equipment with Minor Construction Activities

Both the Organic Liquid Storage Tanks Rule Development Project and Petroleum Wastewater Treating Rule Development Project aim to reduce ROG emissions at refineries. These emission reductions are expected to be met through the installation of domes for external floating roof tanks, vapor recovery units and/or thermal incinerators for the Organic Liquid Storage Tanks Rule and through the installation of vapor combustors for the Petroleum Wastewater Treating Rule. While some vapor recovery units require less combustion than thermal incinerators or vapor combustors, any control devices with vapor combustion are evaluated together as oxidizers. All vapor recovery devices are all expected to require minor construction activities in order to install the requisite equipment.

Oxidizers

A Negative Declaration was prepared for Rule 2-5 New Source Review for Toxic Air Contaminants (SS21) which estimated the construction emissions associated with installation of oxidizers. The construction equipment that would most likely be required for the installation of a refinery oxidizer, during a peak month is provided in Table 3.2-12. This EIR assumes that each refinery would implement one vapor combustor for their respective petroleum wastewater treatment plant, resulting in a total of 5 vapor combustors for the Petroleum Wastewater Treating Rule Development Project. For the Organic Liquid Storage Tank Rule Development Project, this EIR assumes that up to 10 oxidizers may be installed. This estimate is based on the number of external floating roof tanks identified that may be subject to these BARCT requirements, and assumes that each oxidizer may be applied to multiple tanks (up to 2 tanks per oxidizer). Therefore, it is conservatively estimated that up to 15 total oxidizers could be installed in order to meet BARCT requirements; however, it is unlikely that all 15 units would be installed concurrently. This EIR assumes that a maximum of five units would share overlapping construction emissions, as shown in Table 3.2-13.

TABLE 3.2-12

Estimated Construction Equipment for Installing One Oxidizer

Off- Road Equipment Type	Number	Daily Hours of Use
Backhoes	2	8
Cement and Mortar Mixers	1	8
Cranes	1	8
Dozers	1	8
Forklifts	1	8
Generator	1	8

Pavers	1	8
Rollers	1	8

(1) Reference: SCAQMD, 2016a

Table 3.2-13

Estimated Construction Emissions for Oxidizers

ACTIVITY	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Construction Emissions from Oxidizers on Refinery Units(1) (lbs/day)						
Construction Activities for 1 Oxidizer	0.03	0.35	0.45	0.00	0.15	0.07
Overlapping Construction Emissions for 5 Oxidizers	0.15	1.74	2.25	0.01	0.76	0.33
Total Construction Estimates for Oxidizers on Refinery Units (tons emitted during construction period – tons/yr)						
Construction Activities for 1 Oxidizer(2)	0.000	0.004	0.005	0.000	0.002	0.001
Overlapping Construction Emissions for 5 Oxidizers	0.002	0.018	0.024	0.000	0.008	0.003

(1) Reference: SCAQMD, 2016a
(2) Construction of oxidizers is expected to take 21 working days

Domes

The Organic Liquid Storage Tanks Rule Development Project is expected to require the addition of domes to existing external floating roof tanks. A typical external floating roof tank consists of an open- topped cylindrical steel shell equipped with a roof that floats on the surface of the stored liquid. The floating roof consists of a deck, fittings, and rim seal system. External floating decks are equipped with a rim seal system, which is attached to the deck perimeter and contacts the tank wall. The purpose of the floating roof and rim seal system is to reduce evaporative loss of the stored liquid. Some annular space remains between the seal system and the tank wall. The seal system slides against the tank wall as the roof is raised and lowered. The floating deck is also equipped with fittings that penetrate the deck and serve operational functions. The external floating roof design is such that evaporative losses from the stored liquid are limited to losses from the rim seal system and deck fittings (standing storage loss) and any exposed liquid on the tank walls (withdrawal loss).

Domed floating roof tanks have the heavier type of deck used in external floating roof tanks as well as a fixed roof at the top of the shell like internal floating roof tanks. Domed external floating roof tanks usually result from retrofitting an external floating roof tank with a fixed roof. As with the internal floating roof tanks, the function of the fixed roof is not to act as a vapor barrier, but to block the wind (thus, minimizing evaporative losses). The type of fixed roof most commonly used is a self-supporting aluminum dome roof, which is of bolted construction. The estimated construction equipment needed to install one dome on

an existing refinery floating roof tank is presented in Table 3.2-14 and detailed emission calculations are provided in Appendix B. The overall estimated emissions from installing floating roof tank domes are presented in Table 3.2-15. Based on the number of external floating roof tanks identified that may be subject to these BARCT requirements, it is estimated that up to 20 dome retrofits could be installed; however, it is unlikely that all 20 units would be installed concurrently. This EIR assumes that a maximum of five units would share overlapping construction emissions.

TABLE 3.2-14

Estimated Construction Equipment for Installing One Dome

Off- Road Equipment Type	Number	Daily Hours of Use
Aerial Lift	1	8
Air Compressor	1	8
Crane	1	8
Forklift	2	8
Generator Sets	4	8
Welder	4	8

Table 3-2-15

Estimated Construction Emissions for Domes

ACTIVITY	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Peak Daily Emissions (lb/day)						
Construction of One Dome	2.43	24.78	23.37	0.07	2.59	1.57
Construction of Five Concurrent Domes	12.17	123.89	116.87	0.35	12.97	7.85
Peak Emissions (tons)						
Construction of One Dome	0.02	0.23	0.17	0.00	0.01	0.01
Construction of Five Dome	0.11	1.16	0.84	0.00	0.06	0.06
Construction of 20 Domes	0.43	4.64	3.35	0.01	0.25	0.22

See Appendix B for detailed emission calculations.

The Portland Cement Manufacturing Rule is expected to require additional lime injection in order to reduce PM emissions and SO_2 emissions to BARCT levels. Lime injection already occurs at the cement plant in the Bay Area that would be subject to the BARCT requirements; however, modifications to the system or additional equipment to improve, upgrade, or increase capacity of the system may be required. These may include modifications to or additional installation of storage bins, mixing tanks, and injection equipment. Construction activities would be limited and are assumed to be similar in scope to that of an oxidizer due to the limited size and nature of the additional equipment. The

construction equipment that would most likely be required for this activity is provided in Table 3.2-16. Construction emissions are shown in Table 3.2-17.

TABLE 3.2-16

Estimated Construction Equipment for Modifying One Lime Injection System

Off- Road Equipment Type	Number	Daily Hours of Use
Backhoes	2	8
Cement and Mortar Mixers	1	8
Cranes	1	8
Dozers	1	8
Forklifts	1	8
Generator	1	8
Pavers	1	8
Rollers	1	8

(1) Construction activity assumed to be similar to that of 1 oxidizer

Table 3.2-17

Estimated Construction Emissions for Lime Injection System Modifications

ACTIVITY	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Construction Emissions from Lime Injection System Modifications (1) (lbs/day)						
Construction Activities for Modifications to 1 Lime Injection System	0.03	0.35	0.45	0.00	0.15	0.07
Total Construction Estimates for Lime Injection System Modifications (tons emitted during construction period – tons/yr)						
Construction Activities for Modifications to 1 Lime Injection System(2)	0.000	0.004	0.005	0.000	0.002	0.001

(1) Construction activity assumed to be similar to that of 1 oxidizer
(2) Construction expected to take 21 working days

3.2.4.1.2 Air Pollution Control Equipment for Large Construction Activities

One of the projects under the Expedited BARCT Implementation Schedule aims to reduce PM and SO_2 emissions from refinery fluid catalytic crackers and CO boilers. These emissions reductions may be met at three different facilities using WGS and/or ESPs. Two facilities are anticipated to require controls to reduce condensable particulate matter emissions, which may require installation of either one additional ESP system or a WGS system in each facility. Another facility is anticipated to require controls to reduce both condensable particulate matter and SO_2 emissions. For this EIR, all three facilities are conservatively expected to require installation of WGS. Due to the size of a refinery FCCU, these control devices are expected to require substantial construction.

SCR is typically considered to be BACT or BARCT to reduce NOx emissions from large industrial combustion sources; however, the affected facility may install a LoTOx™

system to further control NOx emissions. It is expected that the Petroleum Coke Calcining Rule Development Project may require the coke calciner to install one SCR or one LoTOx™ system in order to meet BARCT for NOx emissions from Bay Area coke calciners.

Wet Gas Scrubbers

WGSs have been used on large scale refinery equipment for the control of particulate matter and SO_2.

The following analysis of the construction impacts associated with installing a WGS is based on an EIR prepared for the installation of a WGS on an FCCU in southern California (SCAQMD, 2007). Because of its large size, it is expected that installing a WGS would occur over a 17-month period; one month to demolish any nearby existing equipment or structures and 16 months to construct the WGS, which would include: site preparation, assembly and installation of the unit and ancillary support equipment, and tying-in the new WGS to the affected equipment. As noted above, this EIR assumes that FCCUs at three facilities might be retrofitted with a WGS under the Schedule. These construction emission estimates from the SCAQMD EIR are appropriate for the construction air quality analysis for the proposed Schedule because they likewise are based on the construction of a WGS on one refinery FCCU. Regardless of the location of the construction activities, the amount or types of construction equipment and hours of operation would not be expected to differ substantially compared to the 2007 analysis. The analysis uses a conservative assumption that equipment would operate for 10 hours per day; this is consistent with the 2007 project which was on an aggressive installation schedule. The construction equipment that would most likely be required for the installation of a refinery WGS, for example, during a peak month is provided in Table 3.2-18.

TABLE 3.2-18

Estimated Peak Day Off-Road Construction Equipment for Installing One Refinery Wet Gas Scrubber

Off- Road Equipment Type	Number	Daily Hours of Use
Backhoe	1	10
Crane	3	10
Front End Loader	1	10
Man Lift	3	10
Forklift	2	10
Generator	1	10
Demolition Hammer	1	10
Welder	3	10

Reference: SCAQMD, 2007

Using worst-case assumptions derived for a WGS constructed at another refinery in California, it is assumed that constructing a WGS would require the use of one or more of

the following types of construction equipment: backhoes, cranes, man lifts, forklifts, front end loaders, generators, diesel welding machines, jack hammers, a medium-duty flatbed truck, a medium-duty dump truck, and a cement mixer. Other sources of construction emissions could include: equipment delivery, on-site travel (would include fugitive dust associated with travel on paved roads, and fugitive dust associated with construction activities), and construction worker commute trips (SCAQMD, 2007).

Based on the assumptions used for the construction of a WGS at another refinery in California, it is assumed that up to 50 construction workers would be required for demolition activities. Demolition activities are assumed to require the use of one or more of the following types of equipment: crane, front-end loader, forklift, demolition hammer, water truck, and medium-duty flatbed truck (SCAQMD, 2007). Other sources of demolition emissions could include haul truck trips to dispose of demolition debris, on-site travel (would include fugitive dust associated with travel on paved roads, fugitive dust associated with demolition activities), and construction worker commute trips.

Construction and demolition emission estimates for activities associated with installing one WGS are provided in Table 3.2-19. Typically, construction activities occur sequentially, that is, demolition must be completed before construction activities begin.

TABLE 3.2-19

Estimated Construction Emissions for a Refinery Wet Gas Scrubber

ACTIVITY	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Construction Emissions from one WGS on a Large Refinery Unit[(1)] (lbs/day)						
Demolition for 1 WGS at Refinery[(1)]	6	36	28	<1	3	2
Construction Activities for 1 Refinery WGS[(1)]	17	67	84	<1	39	23
Total Construction Estimates for one WGS on a Large Refinery Unit (tons emitted during construction period)						
Demolition for 1 WGS at Refinery[(2)]	0.06	0.36	0.28	<0.1	0.03	0.02
Construction Activities for 1 WGS at Refinery[(3)]	2.04	8.04	10.08	<0.1	4.68	2.76
Total Construction Emissions for 1 WGS[(3)]	2.10	8.40	10.36	<0.1	4.71	2.78

(1) Reference: SCAQMD 2007
(2) Demolition activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for one month (20 working days)
(3) Construction activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for a total of 16 months (20 working days per month), with 8 months at peak construction activities and 8 months at 50 percent of peak construction activities.

Electrostatic Precipitators

ESPs may be installed in order to comply with the Refinery FCCU and CO Boilers Rule Development Project. ESPs used for a refinery FCCU has been previously evaluated in the ExxonMobil SCAQMD Rule 1105.1 Compliance Project (SCAQMD, 2007a). Based

on the construction information used from that project, the construction equipment that would most likely be required for the installation of a refinery ESP during a peak month is provided in Table 3.2-20 (SCAQMD, 2007a). Table 3.2-21 summarizes the peak daily construction emissions associated with the installation of a Refinery FCCU ESP. Based on the construction information used for the ESP at the ExxonMobil refinery, construction of an ESP for a refinery FCCU is expected to take approximately 14 months and would occur over four phases: site preparation and foundation laying, equipment installation, QA/QC and equipment tie-in. Peak day emission calculations assume 20 workers per day and that all deliveries would occur in one day (SCAQMD 2007a).

The construction emissions in the ExxonMobil Rule 1105.1 EIR were based on two concurrent ESPs being installed at the same facility. In order to estimate the emissions associated with the construction of one ESP, the duration of the equipment installation phase was reduced by half and recalculated with updated emission factors (see Appendix B for detailed emission calculations).

TABLE 3.2-20

Estimated Peak Day Off-Road Construction Emissions from Installing Two Refinery ESPs

Off- Road Equipment Type	Number	Daily Hours of Use
Backhoe	1	20
Compressor	1	20
Concrete Pump Truck	1	10
Concrete Saw	1	10
Crane	1	20
Drill Rig Large	1	10
Cement Truck	10	1
Excavator	1	20
Forklift	1	20
Front End Loader	1	20
Generator	2	20
Light Plants	2	10

(1) Reference: SCAQMD 2007a

Table 3.2-21

Estimated Peak Daily Emissions from Installing ESP on a Refinery FCCU[(1)]

ACTIVITY	ROG	CO	NOx	SOx	PM_{10}
Construction Emissions from One ESP on a Refinery FCCU (lbs/day)					
Site Prep and Foundation	5.64	63.56	57.66	0.17	4.67
Equipment Installation	8.09	83.60	65.17	0.20	4.85
QA/QC	2.02	24.43	14.75	0.05	1.20
Tie-in	4.90	60.48	39.20	0.13	2.96
Peak Day Emissions	**8.09[(2)]**	**83.60**	**65.17**	**0.20**	**4.85**
Total Construction Estimates for ESP on a Refinery FCCU[(3)] (tons emitted during construction period)					
Construction Activities for One ESP	0.96	10.56	8.42	0.03	0.71

(1) See Appendix B for detailed emission calculations.
(2) Highest daily emissions from the above construction phases.
(3) Assumes 14 months of construction.

Selective Catalytic Reduction

The coke calcining facility subject to the BARCT requirements may install an SCR system to reduce NOx emissions under the proposed project. The following analysis of the construction air quality impacts associated with installing an SCR on a coke calciner is based on an environmental analysis of the effects of further limiting NOx emissions at southern California refineries (SCAQMD, 2015a). These construction emission estimates are appropriate for the construction air quality analysis for the Expedited BARCT Implementation Schedule because they are expected to be similar to emissions produced by the installation of an SCR used for a refinery coke calciner. Regardless of the location of the construction activities, the amount or types of construction equipment and hours of operation, these parameters would not be expected to change. Retrofitting a coke calciner with SCR is estimated to require a total of 260 days of construction, and use a crew of 140 construction workers during peak construction periods (SCAQMD, 2015a). The construction equipment that would most likely be required for installing an SCR on one coke calciner during a peak month is provided in Table 3.2-22.

The construction emission estimates for activities associated with installing one SCR on a coke calciner are provided in Table 3.2-23. Major demolition activities are not expected to be necessary to install an SCR because these units are constructed directly next to or on to the emissions sources' exhaust stacks. A maximum of one SCR is expected to be constructed as a result of the Petroleum Coke Calcining rule development project under the Expedited BARCT Schedule.

TABLE 3.2-22

Estimated Peak Day Off-Road Construction Emissions from Installing One SCR on One Coke Calciner

	Coke Calciner SCR Unit	
Off- Road Equipment Type	**Number**	**Daily Hours of Use**
Air Compressor	1	8
Backhoe	1	8
Concrete Pump	1	2
Concrete Saw	1	2
Crane	2	10
Forklift	1	6
Generator	2	8
Man Lift	2	2
Plate Compactor	1	2
Welder	2	8

Reference: SCAQMD, 2015

TABLE 3.2-23

Estimated Construction Emissions for an SCR Unit on a Coke Calciner

ACTIVITY	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Peak Construction Emissions for One SCR Unit (lbs/day)						
Construction Activities for 1 SCR (1)	1.86	12.02	14.94	0	4.12	3.79
Total Construction On-road Vehicle Trips (2)	5.22	8.58	8.60	0.71	0.47	0.22
Total Construction Emissions	7.08	20.60	23.54	0.71	4.59	4.01
Total Construction Emissions for One SCR Unit (tons emitted during construction period)						
Construction Activities for 1 SCR	0.69	3.18	3.75	0.07	0.85	0.76

Reference: SCAQMD 2015

(1) Construction activities are estimated to occur for a total of 12 months (20 working days per month), with 6 months at peak construction activities and 6 months at 50 percent of peak construction activities.

(2) Vehicle trip assumptions include average vehicle ridership of 1.0 and a trip length of 11 miles one way (CAPCOA, 2016).

LoTOX™ Systems

The coke calcining facility subject to the BARCT requirements may install a LoTOx™ system instead of an SCR to reduce NOx emissions under the proposed project. LoTOx™ stands for "Low Temperature Oxidation" process in which ozone (O_3) is used to oxidize insoluble NOx compounds into soluble NOx compounds which can then be removed by absorption in a caustic, lime, or limestone solution. The LoTOx™ process is a low

temperature application, optimally operating at about 325 ^{o}F. The LoTOx^{TM} process requires equipment that is similar to a wet gas scrubber, therefore it is assumed that construction activity associated with a LoTOx^{TM} system would be similar to construction activity associated with a refinery WGS. The expected construction equipment needed to construct a refinery LoTOX^{TM} system is presented in Table 3.2-24; estimated construction emissions are presented in Table 3.2-25.

TABLE 3.2-24

Estimated Peak Day Off-Road Construction Equipment for Installing One LoTOX^{TM} System

Off- Road Equipment Type	Number	Daily Hours of Use
Backhoe	1	10
Crane	3	10
Front End Loader	1	10
Man Lift	3	10
Forklift	2	10
Generator	1	10
Demolition Hammer	1	10
Welder	3	10

Reference: SCAQMD, 2007

TABLE 3.2-25

Estimated Construction Emissions for a LoTOX^{TM} Unit on a Refinery Coke Calciner

ACTIVITY[(1)]	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Peak Daily Emissions (lb/day)						
Demolition	6.00	36.00	28.00	<1	3.00	2.00
Construction	17.00	67.00	84.00	<1	39.00	23.00
Total Emissions (tons)						
Demolition[(2)]	0.06	0.36	0.28	<0.1	0.03	0.02
Construction[(3)]	2.04	8.04	10.08	<0.1	4.68	2.76
Total Construction Emissions	2.10	8.40	10.36	<0.1	4.71	2.78

(1) Construction activities are estimated to occur for a total of 12 months (20 working days per month), with 6 months at peak construction activities and 6 months at 50 percent of peak construction activities.

(2) Vehicle trip assumptions include average vehicle ridership of 1.0 and a trip length of 11 miles one way (CAPCOA, 2016).

3.2.4.1.3 Summary of Construction Emission Impacts

As discussed above, construction and installation of some types of air pollution control technologies would not be expected to result in significant adverse construction air quality impacts. For example, the installation of oxidizers under the Organic Liquid Storage Tanks and Refinery Wastewater Treatment Plants Rule Development Projects would result in few construction activities or related emissions. However, the construction of other equipment would require a more substantial amount of construction equipment and generate more construction emissions. Table 3.2-26 summarizes the potential construction emissions and the potential overlap of construction activities. While the actual construction activities that may occur under the Expedited BARCT Implementation Schedule may not overlap, it is reasonable to assume that there is a potential for overlap due to the process and time restraints placed by the individual rule development projects.

Based on the construction emissions in Tables 3.2-26, it is concluded that construction air quality impacts associated with ROG, NOx, PM_{10}, and $PM_{2.5}$ would be significant. Construction emissions, however, are temporary as construction emissions would cease following completion of construction activities. It is also worth noting that construction emissions may be less than the values shown in Table 3.2-26 depending on the equipment ultimately required to comply with BARCT. Mitigation measures for construction impacts are addressed in Section 3.2.5

TABLE 3.2-26

Worst-Case Construction Emissions Under the AB 617 BARCT Implementation Schedule

ACTIVITY	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Peak Daily Concurrent Construction Emissions (lbs/day)						
5 VRU, Incinerators, or Vapor Combustors	0.2	1.8	2.3	0.1	0.8	0.4
5 Domes	12.2	123.9	116.9	0.4	13.0	7.8
1 Lime Injection System	0.0	0.4	0.5	0.0	0.2	0.1
1 Large SCR	7.1	20.6	23.5	0.7	4.6	4.0
3 Refinery WGS	51	201	252	0.3	117	69
Total Concurrent Emissions (lbs/day)	**70.5**	**347.7**	**395.2**	**1.5**	**135.6**	**81.3**
Significance Thresholds	**54**	**None**	**54**	**None**	**82**	**54**
Significant?	**Yes**	**--**	**Yes**	**--**	**Yes**	**Yes**

3.2.4.2 Potential Criteria Pollutant Impacts During Operation

The net effect of implementing the Expedited BARCT Implementation Schedule is to reduce TAC and criteria pollutant emissions from industrial facilities that participate in the Cap-and-Trade Program. However, some control technologies have the potential to generate secondary or indirect air quality impacts as part of the control process. Table 3.2-

27 lists all the identified air pollution control technologies that may be used to comply with future regulatory requirements under the proposed project, as well as potential secondary or indirect operational air quality impacts associated with some types of air pollution control technologies. Those air pollution control technologies in Table 3.2-27 where no direct or indirect operational air quality impacts were identified are not discussed further. The remaining air pollution control technologies that have the potential to generate secondary or indirect operational air quality impacts will be evaluated further in the following subsections.

The following analyses of potential operational secondary air quality impacts from the proposed project include the following assumption; it is assumed that no additional employees would be needed to operate any new or modified air pollution control equipment, so the existing work force at each affected facility is expected to be sufficient. As such, no workers' commute trip emissions are anticipated for the operation of the new or modified air pollution control equipment.

TABLE 3.2-27

Potential Operational Air Quality Impacts from Installing Air Pollution Control Equipment

Potential Control Technology	Potential Air Quality Impacts	Analyzed Further?
Domes on Storage Tanks	None Identified	**No**
Thermal Incinerator	Minor increase in combustion emissions	**Yes**
Vapor Combustor	Minor increase in combustion emissions	**Yes**
Vapor Recovery Unit	Minor increase in combustion emissions	**Yes**
Additional Lime Injection at Cement Plants	Minor indirect mobile source emission increases	**Yes**
Wet Gas Scrubbers	Minor indirect mobile source emission increases	**Yes**
Electrostatic Precipitator (Wet and Dry)	None identified (STAPPA /ALAPCO, 2000)	**No**
Increased LDAR in Heavy Liquid Service at Refineries	None Identified	**No**
SO_2 Reducing Catalyst	None Identified	**No**
LoTOX™ at Petroleum Coke Calciners	Some ozone "slip", but reaction is rapid, impact is minor (CARB, 2005)	**No**
Selective Catalytic Reduction at Petroleum Coke Calciners	Ammonia slip emissions, minor indirect mobile source emission increases	**Yes**

3.2.4.2.1 Direct Emissions Sources

Oxidizers

Two of the rule development projects that fall under the Expedited BARCT Implementation Schedule are aimed at controlling ROG emissions from organic liquid storage tanks and petroleum wastewater treating, respectively. ROG emission reductions are expected to be met using various oxidizers, including vapor recovery units, vapor combustors, and thermal incinerators. The operation of these oxidizers will create secondary criteria pollutant emissions from combustion.

The potential air quality impacts included the emissions associated with the installation of oxidizers were previously calculated in the 2017 Clean Air Plan EIR (BAAQMD, 2017). The various control technologies aimed at controlling emissions via incineration are expected to have similar emissions. The operational emissions associated with the installation of 3.0 mm Btu/hr oxidizers are summarized in Table 3.2-28. While oxidizers may cause a small increase in criteria pollutant emissions, the Expedited BARCT Implementation Schedule will achieve an overall reduction in ROG and NOx. The emission control devices require air permits to operate. Emissions from vapor recovery devices are generally controlled by using efficient combustion practices and enforced with permit conditions.

TABLE 3.2-28

Potential Operational Air Quality Impacts from Oxidizers

Parameter	ROG	CO(1)	NOx (2)	SOx	PM_{10}	$PM_{2.5}$
Emission Factor(3)	7.00	0.30	0.04	0.60	7.50	7.50
Emission Factor Units	lb/mmscf	lb/mmbtu	lb/mmbtu	lb/mmscf	lb/mmscf	lb/mmscf
Heater Duty (mmbtu/hr)	3.00	3.00	3.00	3.00	3.00	3.00
Heating Value (btu/scf)	1,050	1,050	1,050	1,050	1,050	1,050
Operational time (hr/day)	8.0	8.0	8.0	8.0	8.0	8.0
Daily Emissions for 1 Oxidizer (lb/day)	**0.16**	**7.10**	**0.88**	**0.01**	**0.17**	**0.17**
Daily Emissions for 15 Oxidizers lbs/day	**2.40**	**106.56**	**13.13**	**0.21**	**2.57**	**2.57**
Annual Emissions for 1 Oxidizer (tons/yr)	**0.03**	**1.30**	**0.16**	**0.00**	**0.03**	**0.03**
Annual Emissions for 15 Oxidizers (tons/yr)	**0.44**	**19.45**	**2.40**	**0.04**	**0.47**	**0.47**

Source: Detailed calculations can be found in BAAQMD, 2017, Appendix A.

(1) Based on 400 ppm

(2) Based on 30 ppm

(3) Default emission factors for natural gas combustion for external combustion sources. SCAQMD Annual Emissions Reporting.

3.2.4.2.2 Delivery Truck Emissions

Truck trips transporting the catalyst, caustic, lime, or ammonia solutions would occur relatively infrequently. Further, a single truck's emissions while delivering caustic solutions from San Jose to Benicia[2], for example, would be minimal, a few pounds per day at most. As shown in Table 3.2-29, indirect mobile source emissions from transporting delivery trucks would be low. Peak day transportation emissions assume four caustic/catalyst trucks and one lime truck (see Appendix B for detailed emission calculations). Note that the delivery truck emissions may be less than the values shown in

[2] Review of caustic suppliers located a chemical supplier in San Jose. The haul truck trip from San Jose to the Valero Refining Company in Benicia would likely represent a conservative trip length assumption because trip lengths to all other affected facilities would be shorter.

Table 3.2-29, depending on the equipment ultimately required to comply with BARCT and the associated delivery of materials required. Truck trip emissions from transporting to and from industrial facilities under the Expedited BARCT Implementation Schedule would not generate significant adverse operational air quality impacts or contribute to significant adverse operational air quality impacts that may be caused by other control technologies.

TABLE 3.2-29

Delivery Truck Emissions

Material	Truck Trips	Estimated Trip Length (mi)	Criteria Pollutant					
			CO	ROG	NOx	SOx	PM_{10}	$PM_{2.5}$
Operational Emissions Per Facility (lbs/day)								
Caustic/Catalyst for 3 WGS Units	6	120	0.24	1.65	7.77	0.03	0.18	0.06
Caustic/Catalyst for LoTox Scrubber	2	120	0.08	0.55	2.59	0.01	0.06	0.02
Lime for Cement Kiln	2	100	0.07	0.46	2.16	0.01	0.05	0.01
Total Peak Daily Emissions			**0.39**	**2.66**	**12.52**	**0.05**	**0.29**	**0.09**
Operational Emissions Per Facility (Tons/year)								
Caustic/Catalyst for 3 WGS	312	120	0.03	0.03	0.21	0.03	0.06	0.03
Caustic/Catalyst for LoTox Scrubber	104	120	<0.01	0.01	0.07	<0.01	0.02	<0.01
Lime for Cement Kiln	365	100	0.01	0.04	0.20	<0.01	0.05	0.01
Total Annual Transport Emissions			**0.05**	**0.08**	**0.48**	**0.05**	**0.13**	**0.05**

Wet Gas Scrubbers

Although the main effect of installing air pollution control equipment is reducing emissions, some types of control equipment require delivery of materials that are a necessary part of the pollution control process. For example, WGS operations require a delivery of fresh catalyst and caustic solution on a daily basis. Therefore, indirect emissions occur from trucks delivering supplies (i.e., fresh catalyst and caustic solution to refill the storage tanks) on a regular basis is expected.

Depending on the size and configuration of the WGS, the sodium hydroxide (NaOH) caustic solution used in the WGS would likely need to be delivered one time per week or a little over 50 additional delivery truck trips per year per unit. For example, catalyst and caustic solutions are typically used in relatively small amounts per day. The use of NaOH (50 percent solution, by weight) caustic in a WGS unit could occur at facilities that already use and store NAOH caustic for other purposes, typically in one 10,000-gallon storage tank. Otherwise, the refinery operator would need to construct a new NaOH caustic storage tank and ancillary piping and other associated equipment.

Truck trips transporting the catalyst/caustic or ammonia solutions would occur relatively infrequently. Further, a single truck's emissions while delivering caustic solutions from San Jose to Benicia[3], for example, would be very low, a few pounds per day at most. As shown in Table 3.2-29, indirect mobile source emissions from transporting the catalyst/caustic would be low. Truck trip emissions from transporting caustic to affected refineries that install a WGS would not generate significant adverse operational air quality impacts or contribute to significant adverse operational air quality impacts that may be caused by other control technologies.

NOx Emission Reductions

The Petroleum Coke Calcining Rule Development Project is expected to include the installation of an SCR or a LoTOx™ system in order to best limit NOx emissions. SCRs have been used to control NOx emissions from stationary sources for many years by promoting chemical reactions in the presence of a catalyst. Installation of new SCR equipment or increasing the control efficiency of existing equipment would be expected to increase the amount of ammonia used for NOx control. SCRs would require the additional delivery of ammonia or urea to the facilities where they are installed. It is estimated that about 40 truck trips per year would be required for the delivery of ammonia/urea. This amount could vary depending on the size of the SCR and size of the ammonia or urea storage systems. However, the 40 trucks per year is expected to provide a conservative estimate of transportation requirements. The emissions associated with these truck deliveries are included in Table 3.2-29 and are expected to be minor. Delivery truck emissions associated with the installation of a LoTOx™ system are expected to be similar to those needed for a WGS as discussed above. The emissions associated with these deliveries are also presented in Table 3.2-29.

The Petroleum Coke Calcining Project could reduce NOx by using SCR, which may potentially result in increased ammonia emissions due to "ammonia slip" (release). As a result, ammonia slip emissions could increase, thus, contributing to $PM_{2.5}$ concentrations. Ammonia can be released in liquid form, thus, directly generating $PM_{2.5}$ emissions. Ammonia can also be released in gaseous form where it is a precursor to $PM_{2.5}$ emissions. Ammonia slip can increase as the catalyst ages and becomes less effective. Ammonia slip from SCR equipment is continuously monitored and controlled. The SCR technology has progressed such that ammonia slip can be limited to five parts per million (ppm) or less. SCR vendors have developed better injection systems that result in a more even distribution of NOx ahead of the catalyst so that the potential for ammonia slip has been reduced. Similarly, ammonia injection rates are more precisely controlled by model control logic units that are a combination of feed-back control and feed forward control using a proportional/integral controller that sets flow rates by predicting SCR outlet ammonia concentrations and calibrating them to a set reference value. Installation of an SCR would require an Authority to Construct from the Air District. A limit on ammonia slip is

[3] Review of caustic suppliers located a chemical supplier in San Jose. The haul truck trip from San Jose to the Valero Refining Company in Benicia would likely represent a conservative trip length assumption because trip lengths to all other affected facilities would be shorter.

normally included in air permits for stationary sources. Operators would be required to monitor ammonia slip by conducting an annual source test and maintain a continuous monitoring system to accurately indicate the ammonia-to-emitted-NOx mole ratio at the inlet of the SCR. These measures are expected to minimize potential air quality impacts associated with ammonia slip.

Additional Lime Injection at Cement Plants

The formation of SO_2 in cement kilns is a product of the chemical make-up of the raw materials and fuel, as well as the high operating temperatures and oxygen concentration in the kiln. The one cement kiln in the District currently operates a lime injection system for the control of SO_2 emissions. A hydrated lime powder is injected into the flue gas. SO_2 reacts with lime (calcium carbonate) and is captured in the baghouse as calcium sulfate. The hydrated lime usually absorbs up to 60% of the SO_2 in the gases if injected at the correct temperature.

The Portland Cement Manufacturing Rule Development Project is expected to require additional lime injection in order to meet BARCT requirements for PM and SO_2. The one facility that would require additional lime injection already has systems in place to administer lime and is not expected to require new equipment to administer additional lime that would generate substantial operational emissions. Additional lime injection will however require additional truck trips in order to deliver the lime to the facility. It is estimated that no more than one truck per day would be needed to meet the new lime demands on the facility. Thus, it is conservatively estimated that 365 truck trips per year would be required for the delivery of additional lime. The annual emissions associated with these truck deliveries are included in Table 3.2-29 and are expected to be minor.

3.2.4.2.3 Summary of Operational Emission Impacts

As shown in Table 3.2-30, the Expedited BARCT Implementation Schedule would not produce operational emissions that exceed either the Air District's daily or annual criteria pollutant significance thresholds. ROG, CO, NOx, PM_{10} and $PM_{2.5}$ emissions would be less than the applicable significance threshold and, therefore, the associated impacts are concluded to be less than significant.

It should be noted that in addition to the estimated emission increases associated with the operation of new air pollution control equipment under the Expedited BARCT Implementation Schedule, reduction in air emissions would also be expected (see Table 3.2-10). Some of those reductions would be large and are included in Table 3.2-10; however, it is not possible to estimate those emission reductions for all sources, the type of air pollution control device has been identified, appropriate engineering analyses have been completed and so forth. Nonetheless the potential emission increases are expected to be either wholly or partially offset with emission decreases.

TABLE 3.2-30

Worst-Case Operational Emissions Under the AB 617 Expedited BARCT Implementation Schedule

ACTIVITY	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Daily Concurrent Operational Emissions (lb/day)						
15 Oxidizers	2.4	107	13.1	0.2	2.6	2.6
Delivery Trucks for Caustic, Ammonia, and Lime	2.7	0.4	12.5	0.1	0.3	0.1
Total Concurrent Emissions	5.1	107.4	25.6	0.3	2.9	2.7
Reductions from Project Implementation(1)	411	--	--	6,932	--	--
Net Concurrent Emissions(2)	-405.9	107.4	25.6	-6,931.8	2.9	2.7
Significance Thresholds	**54**	**None**	**54**	**None**	**82**	**54**
Significant?	**No**	**--**	**No**	**--**	**No**	**No**
Annual Concurrent Operational Emissions (tons/yr)						
15 Oxidizers	0.4	19.5	2.4	<0.1	0.5	0.5
Delivery Trucks for Caustic, Ammonia, and Lime	0.1	0.1	0.5	0.1	0.1	0.1
Total Concurrent Emissions	0.5	19.5	2.9	0.1	0.6	0.5
Reductions from Project Implementation	75.0	--	--	1,265.0	--	--
Net Concurrent Emissions(2)	-74.5	19.5	2.9	-1,264.9	0.6	0.5
Significance Thresholds	**10**	**None**	**10**	**None**	**15**	**10**
Significant?	**No**	**--**	**No**	**--**	**No**	**No**

(1) See Table 3.2-10. Assumes 365 days of operations.
(2) Negative numbers indicate emission benefit.

3.2.4.3 Potential Toxic Air Contaminant Impacts

Table 3.2-31 shows air pollution control technologies that would be the most likely technologies installed at affected facilities under the Expedited BARCT Implementation Schedule that may have the potential to generate TAC emission impacts during operation. The subsections below evaluate those air pollution control technologies identified in Table 3.2-31 that have the potential to generate adverse TAC emission impacts. Air pollution control technologies where no direct increase or reduce operational TAC emission impacts were identified will not be discussed further.

TABLE 3.2-31

Potential TAC Impacts from Installing Air Pollution Control Equipment

Potential Control Technology	TAC Impacts
Oxidizers	Reduction in TAC emissions
Domes	Reduction in TAC emissions
Lime Injection	No increase in TAC emissions (calcium oxide)
SCR	Increase in TAC emissions (ammonia)
LoTOX™ System	Increase in TAC emissions (caustic)
WGS	Increase in TAC emissions (caustic)
ESP	Potential Increase in TAC emissions (ammonia)

3.2.4.3.1 Wet Gas and LoTOX™ Scrubbers

There are several types of caustic solutions that can be used in WGS or LoTOX™ operations, but NaOH (50 percent solution, by weight) is the one most commonly used. NaOH is a TAC that is a non-cancerous, but an acutely hazardous substance. NaOH emissions typically occur as a result of filling loss and the working loss of each NaOH tank, resulting in relatively low NaOH emissions. Because it is assumed that refinery operators would opt to use the same type of caustic that they are currently using for other purposes, there would likely be a small incremental increase in risk because of the increased throughput of caustic through the existing storage tanks. However, because NaOH is typically diluted and used in small quantities, the combined filling loss and working loss would be small. In addition, any NaOH storage tanks would likely be located in the interior areas of a refinery, so the distance to the nearest sensitive receptive would likely be far enough away that substantial dispersion of any NaOH emission would occur. Table 3.2-32 shows the level of NaOH working losses at a receptor located 25 meters from the unit.

TABLE 3.2-32

NaOH Working Losses

Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM_{10}) Filling Loss (lb/hr)	B: Hourly NaOH (as PM_{10}) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM_{10}) Losses (lb/hr)	NaOH Acute Level at 25 meters (lb/hr)
3.37	7.60E-04	2.28E-03	2.28E-03	2.28E-05

See Appendix B for calculation methodology.

As indicated in Table 3.2-32, the rate of NaOH working loss emissions would be relatively low for any scrubber unit. Since it is likely that only one tank would be used to store the NaOH solution at each affected facility, working loss concentrations would not overlap. As such, even with multiple NaOH storage tanks, it is not expected that working loss

emissions would exceed the acute and chronic hazard indices. For these reasons, it is unlikely that NaOH emissions would create significant adverse acute or chronic hazard impacts to any nearby sensitive receptors. Further, there is an alternative to using NaOH as the caustic solution, sodium carbonate (Na_2CO_3) which is commonly known as soda ash, a non-toxic, non-cancerous, and nonhazardous substance.

The analysis for caustic lime would be expected to be similar as NaOH, also a caustic material. Lime is currently used at the cement plant and additional lime could be used under the Expedited BARCT requirements. Lime is not a TAC regulated by OEHHA. Therefore, the additional use of lime would not generated additional TAC emissions for the cement kiln.

3.2.4.3.2 Selective Catalytic Reduction

Unreacted ammonia emissions generated from SCR units are referred to as ammonia slip. BARCT for ammonia slip is limited to five parts per million (ppm) and enforced by a specific permit condition. Modeling has been performed that shows the concentration of ammonia at a receptor located 25 meters from a stack would be much less than one percent of the concentration at the release from the exit of the stack (SCAQMD, 2015b)[4]. Thus, the peak concentration of ammonia at a receptor located 25 meters from a stack is calculated by assuming a dispersion of one percent. While ammonia does not have an OEHHA approved cancer potency value, it does have non-carcinogenic chronic (200 µg/m3) and acute (3,200 µg/m3) reference exposure levels (RELs). Table 3.2-33 summarizes the calculated non-carcinogenic chronic and acute hazard indices for ammonia and compared these values to the respective significance thresholds; both were shown to be less than significant. Therefore, non-cancer health risks would be less than the acute and chronic hazard indices and associated impacts would be less than significant. This would also be true if ammonia was used as a conditioner for an ESP.

TABLE 3.2-33

Ammonia Slip Calculation

Ammonia Slip Conc. at the Exit of the Stack, ppm(1)	Dispersion Factor(2)	Molecular Weight, g/mol	Peak Conc. at a Receptor 25 m from the Stack, ug/m3	Acute REL, ug/m3	Chronic REL, ug/m3	Acute Hazard Index(3)	Chronic Hazard Index(3)
5	0.01	17.03	35	3,200	200	0.01	0.17

(1) Assumes ammonia slip is limited to five ppm by permitting.
(2) Assumes that the concentration at a receptor 25 m from a stack would be much less than one percent of the concentration at the release from the exist of the stack (SCAQMD, 2015a). The dispersion factor is based on local meteorology.
(3) Hazard index = conc. at receptor 25 m from stack, ug/m3/REL, ug/m3

[4] It is expected that concentrations at 25 meters in the Bay Area would be comparable or less than in southern California because the different meteorological conditions in southern California compared to the Bay Area.

3.2.4.3.3 Summary of TAC Emission Impacts

In general, it should be noted that in addition to the estimated TAC emission increases associated with the operation of new air pollution control equipment, a reduction in TAC emissions would also be expected. The proposed Expedited BARCT Schedule would result in reductions in ROG associated with control on organic liquid storage tanks, petroleum wastewater treating, and fugitive emissions from heavy liquid leaks at refineries. A portion of the ROG emissions associated with ROG emissions may also be TAC emissions. OEHHA has compiled a comprehensive list of 188 chemicals that have been reported to be emitted from California refineries. The ten highest routine emissions from California refineries include ammonia, formaldehyde, methanol, sulfuric acid, hydrogen sulfide, toluene, xylenes, benzene, hexane, and hydrogen chloride. The refinery processes and equipment associated with the most chemical emissions were product loading, fluid catalytic cracking units, heaters, cokers, and vents. The chemicals released in the majority of the processes were phenol, naphthalene, benzene, and toluene (OEHHA, 2017).

OEHHA also calculated the toxicity-weighted score for refinery emissions using the emissions data (pounds emitted per year) and a toxicity weight derived from the U.S. EPA's Inhalation Toxicity Scores for individual chemicals. The chemicals emitted from refineries in California with the highest calculated toxicity-weighted emissions are: formaldehyde, nickel, arsenic, cadmium, benzene, polycyclic aromatic hydrocarbons, hexavalent chromium, benzo(a)pyrene, phenanthrene, beryllium, ammonia, 1,3-butadiene, naphthalene, hydrogen sulfide, acetaldehyde, manganese, and diethanolamine. Gases make up the majority of the routine refinery TAC emissions (OEHHA, 2017).

However, it is not possible to estimate the potential TAC emissions reductions at this point until the sources that will be controlled are known and the appropriate engineering analyses have been completed and so forth. Nonetheless, air pollution control equipment installed to control ROG emissions as a result of the proposed project is expected to result in a reduction in TAC emissions from affected facilities. Further, the identified TAC emission increases are less than the CEQA significance thresholds. Therefore, TAC emissions associated with the proposed project are expected to result in less than significant impacts.

3.2.4.4 Conclusion

Based on the evaluation of the rule development projects associated with the Expedited BARCT Implementation Schedule and the control equipment that would likely be installed as a result of those projects, construction activities could generate NOx, emissions that exceed the Air District's construction significance threshold. Therefore, construction air quality impacts are concluded to be significant. Impacts from the operation of air pollution control equipment and methodologies to control criteria pollutant emissions under the Expedited BARCT Implementation Schedule are expected to be less than significant for all criteria pollutant emissions. Further, TAC emissions associated with the proposed project are expected to result in less than significant impacts, with additional reductions in volatile organic TAC emissions.

Additionally, while ROG and SOx emissions show a quantifiable benefit in Table 3.2-30, it is important to remember that the Expedited BARCT Implementation Schedule also expects to achieve NOx, PM_{10}, $PM_{2.5}$, and TAC emissions reductions. While these emissions reductions are difficult to quantify, and thereby not included in Table 3.2-30, the reductions are expected to be substantial and in-line with the goals of AB 617.

3.2.5 MITIGATION MEASURES

3.2.5.1 Construction Mitigation Measures

The proposed project is expected to have significant adverse air quality impacts during the construction phase. Therefore, the following mitigation measures will be imposed on future projects comprised of installing air pollution control equipment to reduce emissions associated with construction activities:

On-Road Mobile Sources:

A-1 Implement measures to minimize emissions from vehicles including, but not limited to, consolidating truck deliveries, prohibiting truck idling in excess of five minutes as contract conditions with carriers and by posting signs onsite, specifying truck routing to minimize congestion emissions, specifying hours of delivery to avoid peak rush-hour traffic, allowing ingress/egress only at specified entry/exit points to avoid heavily congested traffic intersections and streets, and specifying allowable locations of onsite parking.

Off-Road Mobile Sources:

A-2 Prohibit construction equipment from idling longer than five minutes at the facility under consideration as contract conditions with construction companies and by posting signs onsite.

A-3 Maintain construction equipment tuned up and with two- to four-degree retard diesel engine timing or tuned to manufacturer's recommended specifications that optimize emissions without nullifying engine warranties.

A-4 The facility operator shall survey and document the locations of construction areas and identify all construction areas that are served by electricity. Electric welders shall be used in all construction areas that are demonstrated to be served by electricity. Onsite electricity rather than temporary power generators shall be used in all construction areas that are demonstrated to be served by electricity.

A-5 If cranes are required for construction, cranes rated 200 hp or greater equipped with Tier 4 or equivalent engines shall be used. Engines equivalent to Tier 4 may consist of Tier 3 engines retrofitted with diesel particulate filters and oxidation catalysts, selective catalytic reduction, or other equivalent NOx control equipment. Retrofitting cranes rated 200 hp or greater with PM and NOx control devices must

occur before the start of construction. If cranes rated 200 hp or greater equipped with Tier 4 engines are not available or cannot be retrofitted with PM and NOx control devices, the facility operator shall use cranes rated 200 hp or greater equipped with Tier 3 or equivalent engines. The facility operator shall provide documentation as information becomes available that cranes rated 200 hp or greater equipped with Tier 4 or equivalent engines are not available.

A-6 For off-road construction equipment rated 50 to 200 hp that will be operating for eight hours or more, the facility operator shall use equipment rated 50 to 200 hp equipped with Tier 4 or equivalent engines. Engines equivalent to Tier 4 may consist of Tier 3 engines retrofitted with diesel particulate filters and oxidation catalysts, selective catalytic reduction, or other equivalent NOx control equipment. Retrofitting equipment rated 50 to 200 hp with PM and NOx control devices must occur before the start of construction. If equipment rated 50 to 200 hp equipped with Tier 4 engines is not available or cannot be retrofitted with PM and NOx control devices, the facility operator shall use equipment rated 50 to 200 hp equipped with Tier 3 or equivalent engines. The facility operator shall provide documentation as information becomes available that equipment rated 50 to 200 hp equipped with Tier 4 or equivalent engines are not available.

3.2.5.1.1 Remaining Construction Impacts

In spite of implementing the construction air quality mitigation measures above, emissions from the construction of air pollution control equipment concurrently would be expected to continue to exceed the applicable construction air quality significance thresholds. The largest exceedance of the significance thresholds is caused by NOx emissions from construction activity. As shown in Table 3.2-34, switching from Tier 3 Blue Sky compliant equipment to Tier 4 could reduce NOx emissions by approximately 90 percent for certain equipment. In order to mitigate NOx emission related to construction activities below the significance threshold, the mitigation measures would need to achieve a reduction in NOx emissions of approximately 86 percent. Thus, the strict enforcement of the Tier 4 requirement for all construction equipment could reduce NOx emissions from construction activities to near or below the significance threshold for NOx emissions. However, the availability of Tier 4 equipment is not expected to be 100 percent because of limited inventory, which could be exacerbated by the size of the projects themselves. Further, equipment under 75 horsepower is not required to achieve NOx reductions from Tier 4 equipment. CARB's In-Use Off-Road Diesel Regulation does require fleets to include Tier 4 or retrofit engines; however, this regulation only requires that 10 percent of the fleet meet this Tier 4 standard. A higher percentage of Tier 4 construction equipment may be achievable, but would be subject to constraints of availability, demand, timing, and the need for any specialized equipment. Therefore, it is conservative to assume the mitigation measures that require the use of Tier 4 construction equipment would achieve at least approximately a 10 percent reduction in NOx emissions from construction related activities, but are not likely to achieve an 86 percent reduction in those emissions.

Table 3.2-34

Tier 4 Equipment Potential Mitigation Reductions

Horsepower	CO	HC	NOx	PM
Pre-Tier 4 Emission Factors (lb/hp-hr)				
50 - 99	3.7		3.5	0.18
100 - 174	3.7		3	0.13
175 - 300	2.6	1	3	0.09
Tier 4 Emission Factors (lb/hp-hr)				
50 - 74	3.7		3.5	0.022
75 - 175	3.7	0.14	0.3	0.015
175+	2.6	0.14	0.3	0.015
Approximate Reduction				
50 - 74	0%	NA	0%	88%
75 - 175	0%	NA	90%	88%
175+	0%	86%	90%	83%

Note:
Pre-Tier 4 assumes Blue Sky Series Engines and NMHC+NOx is all NOx.
Federal off-road diesel emission standards.

In spite of implementing the construction air quality mitigation measures above, it is concluded that the installation of two or more types of air pollution control equipment concurrently would continue to exceed the applicable construction air quality significance thresholds and, therefore, impacts from construction emissions would remain significant.

3.2.5.2 Operation Mitigation Measures

Air quality impacts during operation are expected to be less than significant; therefore, no mitigation measures are required.

3.2.6 CUMULATIVE IMPACTS

Pursuant to CEQA Guidelines §15130(a), "An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in Section 15065 (a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable. Further, CEQA Guidelines §15130 requires that an EIR reflect the severity of the cumulative impacts from a proposed project and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness. Cumulative impacts are defined by CEQA as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, §15355).

Cumulative impacts are further described as follows:

- The individual effects may be changes resulting from a single project or a number of separate projects. (State CEQA Guidelines §15355(a).

- The cumulative impacts from several projects are the changes in the environment which result from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CEQA Guidelines, §15355(b)).

- A "cumulative impact" consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR. (CEQA Guidelines, §15130(a)(1)).

3.2.6.1 Criteria Air Pollutants

3.2.6.1.1 Construction Air Quality Impacts

In the analysis of construction air quality impacts, it was concluded that air quality impacts from construction activities would be significant from implementing the proposed project because the potential overlap in construction activities for air pollution control equipment would likely exceed the applicable ROG, NOx, PM_{10}, and $PM_{2.5}$ significance thresholds for construction air quality impacts. Further, it was concluded that, even after implementing mitigation measures, construction air quality impacts would continue to exceed the applicable significance thresholds for construction. These thresholds represent the levels at which a project's individual emissions would result in a cumulatively considerable contribution to the Air District's existing air quality conditions for individual projects (BAAQMD, 2017a). Thus, the air quality impacts due to construction are considered to be cumulatively considerable for ROG, NOx, PM_{10}, and $PM_{2.5}$ emissions pursuant to CEQA Guidelines §15064 (h)(1) and therefore, generate significant adverse cumulative construction 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 and would be terminated once any future construction activities are completed.

3.2.6.1.2 Operational Air Quality Impacts

As noted above, the Expedited BARCT Implementation Schedule is not expected to generate significant adverse project-specific air quality impacts and is not expected to exceed the applicable significance thresholds. These thresholds represent the levels at which a project's individual emissions would result in a cumulatively considerable contribution to the Air District's existing air quality conditions for individual projects (BAAQMD, 2017a). As a result, air quality impacts from the proposed project are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1). As discussed above, in addition to the estimated emission increases associated with the operation of new air pollution control equipment under the Expedited BARCT Implementation Schedule, reductions in air emissions would also be expected, some of which are potentially large. However, it is not possible to estimate all of those emission reductions at this point until the type of air pollution control device has been identified, appropriate engineering analyses have been completed and so forth. Nonetheless the potential emission increases are expected to be either wholly or partially offset with emission decreases.

As described in the EIR for the Clean Air Plan (BAAQMD, 2017), air quality within the Bay Area has improved since 1955 when the Air District was created and is projected to continue to improve. This improvement is mainly due to lower-polluting on-road motor vehicles, more stringent regulation of industrial sources, and the implementation of emission reduction strategies by the Air District. This trend towards cleaner air has occurred in spite of continued population growth. The Air District is in attainment of the State and federal ambient air quality standards for CO, NOx, and SO_2.

However, the Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard. The State 8-hour standard was exceeded on 6 days in 2017 in the Air District, most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) and the Santa Clara Valley (see Table 3.2-2). The federal 8-hour standard was also exceeded on 6 days in 2017. The Air District is unclassified for the federal 24-hour PM_{10} standard and is non-attainment with the State 24-hour PM_{10} standard. Since the District is not in attainment for the federal and state ozone standard, the state 24-hour PM_{10} standard, and the federal 24-hour $PM_{2.5}$ standard, past projects and activities have contributed to the nonattainment air quality impacts that are cumulatively significant.

The 2017 Clean Air Plan contains numerous control measures that the District intends to impose to improve overall air quality in the District. Control measures in the 2017 Clean Air Plan included some of the rules in the Expedited BARCT Implementation Schedule as well as a number of other control measures to control emissions from stationary sources. The 2017 Clean Air Plan is expected to result in overall reductions in ROG, NOx, SOx, and PM emissions, providing an air quality benefit (BAAQMD, 2017). As reported in the Final EIR for the 2017 Clean Air Plan, large emission reductions are expected from implementation of the 2017 Plan including reductions in ROG emissions of 1,596 tons/year; NOx emissions of 2,929 tons/year, SOx emissions of 2,590 tons/year, and $PM_{2.5}$emissions of 503 tons/year (see Table 3.2-21 of the Final EIR, BAAQMD 2017). These emission reductions are expected to help the Bay Area come into compliance or attainment with the federal and state 8-hour ozone standard, the federal and state PM_{10} standards, the federal 24-hour $PM_{2.5}$ standards, and the state 24-hour $PM_{2.5}$ standard, providing both air quality and public health benefits. Emission reductions from the 2017 Plan are expected to far outweigh any potential secondary emission increases associated with implementation of the control measures in the 2017 Clean Air Plan, as well as emission increases from the Expedited BARCT Implementation schedule, providing a beneficial impact on air quality and public health.

3.2.6.2 Toxic Air Contaminants

It was concluded for the analysis of TAC air quality impacts, that TAC emissions from the use of ammonia and caustic, and lime (calcium carbonate) would be minor and less than significant. Because operational TAC emissions do not exceed the applicable cancer and non-cancer health risk significance thresholds, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative cancer and non-cancer health risk impacts. In addition, reductions in TAC emissions would be expected due to implementation of the proposed project, but those emission reductions and the related health risk benefits cannot be estimated at this time.

CHAPTER 3.3

HAZARDS AND HAZARDOUS MATERIALS

Introduction
Environmental Setting
Regulatory Setting
Significance Thresholds
Environmental Impacts
Mitigation Measures
Cumulative Impacts

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3.3 HAZARDS AND HAZARDOUS MATERIALS

This subchapter of the EIR evaluates the potential hazards and hazardous material impacts associated with the Expedited BARCT Implementation Schedule, which aims to reduce criteria pollutant emissions from industrial sources that currently participate in the GHG Cap-and-Trade system.

As discussed in the Initial Study, in accordance with AB 617, the purpose of the Expedited BARCT Implementation Schedule is to implement rule development projects that utilize BARCT to reduce criteria pollutant emissions from sources participating in the GHG Cap-and-Trade system throughout the Bay Area. The NOP/IS (see Appendix A) evaluated the potential hazard and hazardous materials impacts associated with implementation of the control equipment in the proposed project. The NOP/IS determined that some control measures have the potential to create direct or indirect hazard impacts. For example, control devices may increase the hazards or releases at industrial facilities due to failure of the control equipment, which would then create an increase in potential hazard impacts in the event of an accidental release of hazards materials into the environment. This subchapter evaluates the potential hazards and hazardous materials impacts that could result due to expedited BARCT implementation.

3.3.1 ENVIRONMENTAL SETTING

The potential for hazards exist in the production, use, storage and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Specifically, storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the district in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. 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 the following events:

- **Toxic gas clouds:** Toxic gas clouds are releases of volatile chemicals (e.g., anhydrous ammonia, chlorine, and hydrogen sulfide) that could form a cloud and migrate off-site, thus exposing individuals. "Worst-case" conditions tend to arise when very low wind speeds coincide with an accidental release, which can allow the chemicals to accumulate rather than disperse.

- **Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases):** The rupture of a storage tank or vessel containing a flammable gaseous material (like propane or gasoline), without

immediate ignition, can result in a vapor cloud explosion. The "worst-case" upset would be a release that produces a large aerosol cloud with flammable properties. If the flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.

- **Thermal Radiation:** Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.

- **Explosion/Overpressure:** Process vessels containing flammable explosive vapors and potential ignition sources are present at industrial facilities, e.g., refineries and chemical plants. Explosions may occur if the flammable/explosive vapors came into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

3.3.1.1 Hazardous Materials Incidents

The Department of Transportation, Office of Pipeline and Hazardous Materials Safety Administration (PHMSA) utilizes a post incident reporting system that collects data on incidents involving accidents. Information on accidental releases of hazardous materials are reported to PHMSA. PHMSA provides access to retrieve data from the Incident Reports Database, which also includes non-pipeline incidents, e.g., truck and rail events. Incident data and summary statistics, e.g., release date geographical location (state and county) and type of material released, are available online from the Hazmat Incident Database and are summarized in yearly incident summary reports (PHMSA, 2018).

The California Hazardous Materials Incident Reporting System (CHMIRS) is a post incident reporting system to collect data on incidents involving the accidental release of hazardous materials. Information on accidental releases of hazardous materials are reported to and maintained by the California Governor's Office of Emergency Services (Cal OES). While information on accidental releases is reported to Cal OES, Cal OES no longer conducts statistical evaluations of the releases.

Table 3.3-1 provides a summary of the reported hazardous materials incidents in the nine counties within the Bay Area. In 2017, there were a total of 1,634 incidents reported in the nine counties regulated by the BAAQMD (see Table 3.3-1), with the most incidents (388) reported in Alameda County, followed by Contra Costa County (313).

TABLE 3.3-1

Hazardous Materials Incidents 2017 by County

COUNTY	REPORTED INCIDENTS
Alameda	388
Contra Costa	313
Marin	97
Napa	54
San Francisco	112
San Mateo	140
Santa Clara	189
Solano*	132
Sonoma*	209
Total No. of Reported Incidents	**1,634**

Source: OES, 2018

* Not all of Solano or Sonoma Counties are within the jurisdiction of BAAQMD

The location of the spills varies (see Table 3.3-2). In the nine counties that comprise the Air District, hazardous materials incidents during transportation, residential areas, and at waterways were the most common locations, respectively, for hazardous materials incidents. About 19 percent of the hazardous materials incidents that occurred within California occurred within the nine counties that comprise the Bay Area, with spills in industrial areas being the most common (38 percent), followed by waterways (28 percent).

TABLE 3.3-2

Hazardous Materials Incidents 2017

Spill Site	BAAQMD	Statewide	Percent of State Total
Waterways	250	880	28%
Transportation	463	2,956	16%
Industrial	182	480	38%
Commercial	209	1,191	18%
Residential	279	1,415	20%
Utilities	58	290	20%
Military	4	58	7%
Other	189	1,487	13%
Total	1,634	8,757	19%

Source: OES, 2018

3.3.1.2 Potential Hazards Associated with Air Pollution Control Equipment

The District has evaluated the hazards associated with the implementation of rules in previous air plans (2017 Clean Air Plan) and proposed District rules. The analyses covered a range of potential air pollution control technologies and equipment. EIRs prepared for the previous rules and air plans have specifically evaluated hazard impacts from add-on pollution control equipment. Add on pollution control technologies include scrubbers, bag filters, SCRs, vapor recovery systems, and electrostatic precipitators. The use of add-on pollution control equipment may concentrate or utilize hazardous materials. A malfunction or accident when using add-on pollution control equipment could potentially expose people to hazardous materials, explosions, or fires. The transport, use, and storage of hazardous materials are evaluated herein.

3.3.2 REGULATORY SETTING

There are many federal and state rules and regulations for handling hazardous materials, which serve to minimize the potential impacts associated with hazards.

3.3.2.1 Federal Regulations

The U.S. EPA is the primary federal agency charged with protecting human health and with safeguarding the natural environment from pollution into air, water, and land. The U.S. EPA works to develop and enforce regulations that implement environmental laws enacted by Congress. The U.S. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and Indian tribes the responsibility for issuing permits and for monitoring and enforcing compliance. Since 1970, Congress has enacted numerous environmental laws that pertain to hazardous materials, for the U.S. EPA to implement as well as to other agencies at the federal, state and local level, as described in the following subsections.

3.3.2.1.1 Hazardous Materials and Waste Regulations

Resource Conservation and Recovery Act: The Resource Conservation and Recovery Act (RCRA) of 1976 authorizes the U.S. EPA to control the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA considers materials and waste to be hazardous based on four characteristics: ignitability, corrosivity, reactivity, and toxicity. Under RCRA regulations, hazardous wastes must be tracked from the time of generation to the point of disposal. In 1984, RCRA was amended with addition of the Hazardous and Solid Waste Amendments, which authorized increased enforcement by the U.S. EPA, stricter hazardous waste standards, and a comprehensive underground storage tank program. Likewise, the Hazardous and Solid Waste Amendments focused on waste reduction and corrective action for hazardous releases. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Amendments. Individual states may implement their own hazardous waste programs under RCRA, with approval by the U.S. EPA. California has been delegated authority to operate its own hazardous waste management program.

Comprehensive Environmental Response, Compensation and Liability Act: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which is often commonly referred to as Superfund, is a federal statute that was enacted in 1980 to address abandoned sites containing hazardous waste and/or contamination. CERCLA was amended in 1986 by the Superfund Amendments and Reauthorization Act, and by the Small Business Liability Relief and Brownfields Revitalization Act of 2002.

CERCLA contains prohibitions and requirements concerning closed and abandoned hazardous waste sites; establishes liability of persons responsible for releases of hazardous waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified. The trust fund is funded largely by a tax on the chemical and petroleum industries. CERCLA also provides federal jurisdiction to respond directly to releases or impending releases of hazardous substances that may endanger public health or the environment.

CERCLA also enabled the revision of the National Contingency Plan (NCP) which provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the National Priorities List, which identifies hazardous waste sites eligible for long-term remedial action financed under the federal Superfund program.

Prevention of Accidental Releases and Risk Management Programs: Requirements pertaining to the prevention of accidental releases are promulgated in §112 (r) of the CAA Amendments of 1990 [42 U.S.C. §7401 et. seq.]. The objective of these requirements was to prevent the accidental release and to minimize the consequences of any such release of a hazardous substances. Under these provisions, facilities that produce, process, handle or store hazardous substances have a duty to: 1) identify hazards which may result from releases using hazard assessment techniques; 2) design and maintain a safe facility and take steps necessary to prevent releases; and, 3) minimize the consequence of accidental releases that occur.

In accordance with the requirements in §112 (r), U.S. EPA adopted implementing guidelines in 40 CFR Part 68. Under this part, stationary sources with more than a threshold quantity of a regulated substance shall be evaluated to determine the potential for and impacts of accidental releases from any processes subject to the federal risk management requirements. Under certain conditions, the owner or operator of a stationary source may be required to develop and submit a Risk Management Plan (RMP). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program. At the local level, RMPs are implemented by the local fire departments.

3.3.2.1.2 Emergency Planning and Community Right-to-Know Act

The Emergency Planning and Community Right-to-Know Act (EPCRA) is a federal law adopted by Congress in 1986 that is designed to help communities plan for emergencies involving hazardous substances. EPCRA establishes requirements for federal, state and local governments, Indian tribes, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help

increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment. There are four major provisions of EPCRA:

1. Emergency Planning (§§301 – 303) requires local governments to prepare chemical emergency response plans, and to review plans at least annually. These sections also require state governments to oversee and coordinate local planning efforts. Facilities that maintain Extremely Hazardous Substances (EHS) onsite (see 40 CFR Part 355 for the list of EHS chemicals) in quantities greater than corresponding "Threshold Planning Quantities" must cooperate in the preparation of the emergency plan.

2. Emergency Release Notification (§304) requires facilities to immediately report accidental releases of EHS chemicals and hazardous substances in quantities greater than corresponding Reportable Quantities (RQs) as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to state and local officials. Information about accidental chemical releases must be made available to the public.

3. Hazardous Chemical Storage Reporting (§§311 – 312) requires facilities that manufacture, process, or store designated hazardous chemicals to make Safety Data Sheets (SDSs, formerly referred to as material safety data sheets or MSDSs) describing the properties and health effects of these chemicals available to state and local officials and local fire departments. These sections also require facilities to report to state and local officials and local fire departments, inventories of all onsite chemicals for which SDSs exist. Lastly, information about chemical inventories at facilities and SDSs must be available to the public.

4. Toxic Chemical Release Inventory (§313) requires facilities to annually complete and submit a Toxic Chemical Release Inventory Form for each Toxic Release Inventory (TRI) chemical that are manufactured or otherwise used above the applicable threshold quantities.

Implementation of EPCRA has been delegated to the State of California. The California Emergency Management Agency requires facilities to develop a Hazardous Materials Business Plan if they handle hazardous materials in quantities equal to or greater than 55 gallons, 500 pounds, or 200 cubic feet of gas or extremely hazardous substances above the threshold planning quantity. The Hazardous Materials Business Plan is provided to state and local emergency response agencies and includes inventories of hazardous materials, an emergency plan, and implements a training program for employees.

3.3.2.1.3 Hazardous Materials Transportation Act

The Hazardous Material Transportation Act (HMTA), adopted in 1975 (see 49 U.S.C. §§5101 – 5127), gave the Secretary of Transportation the regulatory and enforcement authority to provide adequate protection against the risks to life and property inherent in the transportation of

hazardous materials in commerce. The U.S. DOT (see 49 CFR Parts 171-180) oversees the movement of hazardous materials at the federal level. The HMTA requires that carriers report accidental releases of hazardous materials to U.S. DOT at the earliest practical moment. Other incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding $50,000. The hazardous material regulations also contain emergency response provisions which include incident reporting requirements. Reports of major incidents go to the National Response Center, which in turn is linked with CHEMTREC, a public service hotline established by the chemical manufacturing industry for emergency responders to obtain information and assistance for emergency incidents involving chemicals and hazardous materials.

Hazardous materials regulations are implemented by the Research and Special Programs Administration (RSPA) branch of the U.S. DOT. The regulations cover the definition and classification of hazardous materials, communication of hazards to workers and the public, packaging and labeling requirements, operational rules for shippers, and training. These regulations apply to interstate, intrastate, and foreign commerce by air, rail, ships, and motor vehicles, and also cover hazardous waste shipments. The Federal Aviation Administration Office of Hazardous Materials Safety is responsible for overseeing the safe handling of hazardous materials aboard aircraft. The Federal Railroad Administration oversees the transportation of hazardous materials by rail. The U.S. Coast Guard regulates the bulk transport of hazardous materials by sea. The Federal Highway Administration (FHWA) is responsible for highway routing of hazardous materials and issuing highway safety permits.

3.3.2.1.4 Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) was enacted by Congress in 1976 (see 15 U.S.C. §2601 et seq.) and gave the U.S. EPA the authority to protect the public from unreasonable risk of injury to health or the environment by regulating the manufacture, sale, and use of chemicals currently produced or imported into the United States. The TSCA, however, does not address wastes produced as byproducts of manufacturing. The types of chemicals regulated by the act fall into two categories: existing and new. New chemicals are defined as "any chemical substance which is not included in the chemical substance list compiled and published under [TSCA] section 8(b)." This list included all of chemical substances manufactured or imported into the U.S. prior to December 1979. Existing chemicals include any chemical currently listed under section 8 (b). The distinction between existing and new chemicals is necessary as the act regulates each category of chemicals in different ways. The U.S. EPA repeatedly screens both new and existing chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. The U.S. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

3.3.2.1.5 Hazardous Material Worker and Public Safety Requirements

Occupational Safety and Health Administration Regulations: The federal Occupational Safety and Health Administration (OSHA) is an agency of the United States Department of Labor that was created by Congress under the Occupational Safety and Health Act in 1970. OSHA is the agency responsible for assuring worker safety in the handling and use of chemicals

in the workplace. Under the authority of the Occupational Safety and Health Act of 1970, OSHA has adopted numerous regulations pertaining to worker safety (see 29 CFR Part 1910). 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 to protect workers who handle toxic, flammable, reactive, or explosive materials, including workplace conditions, employee protection requirements, first aid, and fire protection, as well as material handling and storage. For example, facilities which use, store, manufacture, handle, process, or move hazardous materials are required to conduct employee safety training, have available and know how to use safety equipment, prepare illness prevention programs, provide hazardous substance exposure warnings, prepare emergency response plans, and prepare a fire prevention plan.

Procedures and standards for safe handling, storage, operation, remediation, and emergency response activities involving hazardous materials and waste are promulgated in 29 CFR Part 1910, Subpart H. Some key subsections in 29 CFR Part 1910, Subpart H are §1910.106 - Flammable Liquids and §1910.120 - Hazardous Waste Operations and Emergency Response. In particular, the Hazardous Waste Operations and Emergency Response regulations contain requirements for worker training programs, medical surveillance for workers engaging in the handling of hazardous materials or wastes, and waste site emergency and remediation planning, for those who are engaged in specific clean-up, corrective action, hazardous material handling, and emergency response activities (see 29 CFR Part 1910 Subpart H, §1910.120 (a)(1)(i-v) and §1926.65 (a)(1)(i-v)).

Process Safety Management: As part of the numerous regulations pertaining to worker safety adopted by OSHA, specific requirements that pertain to Process Safety Management (PSM) of Highly Hazardous Chemicals were adopted in 29 CFR Part 1910 Subpart H, §1910.119 and 8 CCR §5189 to protect workers at facilities that have toxic, flammable, reactive or explosive materials. PSM program elements are aimed at preventing or minimizing the consequences of catastrophic releases of chemicals and include process hazard analyses, formal training programs for employees and contractors, investigation of equipment mechanical integrity, and an emergency response plan. Specifically, the PSM program requires facilities that use, store, manufacture, handle, process, or move hazardous materials to conduct employee safety training; have an inventory of safety equipment relevant to potential hazards; have knowledge on the use of the safety equipment; prepare an illness prevention program; provide hazardous substance exposure warnings; prepare an emergency response plan; and prepare a fire prevention plan.

Emergency Action Plan: An Emergency Action Plan (EAP) is a written document required by OSHA standards promulgated in 29 CFR Part 1910, Subpart E, §1910.38 (a) to facilitate and organize a safe employer and employee response during workplace emergencies. An EAP is required by all that are required to have fire extinguishers. At a minimum, an EAP must include the following: 1) a means of reporting fires and other emergencies; 2) evacuation procedures and emergency escape route assignments; 3) procedures to be followed by employees who remain to operate critical plant operations before they evacuate; 4) procedures to account for all employees after an emergency evacuation has been completed; 5) rescue and medical duties for those employees who are to perform them; and, 6) names or job titles of persons who can be contacted for further information or explanation of duties under the plan.

National Fire Regulations: The National Fire Codes (NFC), Title 45, published by the National Fire Protection Association (NFPA) 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.

In addition to the NFC, the NFPA adopted a hazard rating system which is promulgated in NFPA 704 - Standard System for the Identification of the Hazards of Materials for Emergency Response. 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." 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 3.3-3 summarizes what the codes mean for each hazards category.

In addition to the information in Table 3.3-3, a number of other physical or chemical properties may cause a substance to be a fire hazard. With respect to determining whether any substance is classified as a fire hazard, SDS lists the NFPA 704 flammability hazard ratings (e.g., NFPA 704).

Although substances can have the same NFPA 704 Flammability Ratings Code, other factors can make each substance's fire hazard very different from each other. For this reason, additional chemical characteristics, such as auto-ignition temperature, boiling point, evaporation rate, flash point, lower explosive limit (LEL), upper explosive limit (UEL), and vapor pressure, are also considered when determining whether a substance is fire hazard. The following is a brief description of each of these chemical characteristics.

> Auto-ignition Temperature: The auto-ignition temperature of a substance is the lowest temperature at which it will spontaneously ignite in a normal atmosphere without an external source of ignition, such as a flame or spark.
>
> Boiling Point: The boiling point of a substance is the temperature at which the vapor pressure of the liquid equals the environmental pressure surrounding the liquid. Boiling is a process in which molecules anywhere in the liquid escape, resulting in the formation of vapor bubbles within the liquid.

TABLE 3.3-3

NFPA 704 Hazards Rating Code

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.	Not applicable
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.	Not applicable

Evaporation Rate: Evaporation rate is the rate at which a material will vaporize (evaporate, change from liquid to a vapor) compared to the rate of vaporization of a specific known material. This quantity is a represented as a unit less ratio. For example, a substance with a high evaporation rate will readily form a vapor which can be inhaled or explode, and thus have a higher hazard risk. Evaporation rates generally have an inverse relationship to boiling points (i.e., the higher the boiling point, the lower the rate of evaporation).

Flash Point: Flash point is the lowest temperature at which a volatile liquid can vaporize to form an ignitable mixture in air. Measuring a liquid's flash point requires an ignition source. At the flash point, the vapor may cease to burn when the source of ignition is removed. There are different methods that can be used to determine the flashpoint of a

solvent but the most frequently used method is the Tagliabue Closed Cup standard (ASTM D56), also known as the TCC. The flashpoint is determined by a TCC laboratory device which is used to determine the flash point of mobile petroleum liquids with flash point temperatures below 175 degrees Fahrenheit (79.4 degrees Centigrade).

Flash point is a particularly important measure of the fire hazard of a substance. For example, the Consumer Products Safety Commission (CPSC) promulgated Labeling and Banning Requirements for Chemicals and Other Hazardous Substances in 15 U.S.C. §1261 and 16 CFR Part 1500. Per the CPSC, the flammability of a product is defined in 16 CFR Part 1500.3 (c)(6) and is based on flash point. For example, a liquid needs to be labeled as: 1) "Extremely Flammable" if the flash point is below 20 degrees Fahrenheit; 2) "Flammable" if the flash point is above 20 degrees Fahrenheit but less than 100 degrees Fahrenheit; or, 3) "Combustible" if the flash point is above 100 degrees Fahrenheit up to and including 150 degrees Fahrenheit.

Lower Explosive Limit (LEL): The lower explosive limit of a gas or a vapor is the limiting concentration (in air) that is needed for the gas to ignite and explode or the lowest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). If the concentration of a substance in air is below the LEL, there is not enough fuel to continue an explosion. In other words, concentrations lower than the LEL are "too lean" to burn. For example, methane gas has a LEL of 4.4 percent (at 138 degrees Centigrade) by volume, meaning 4.4 percent of the total volume of the air consists of methane. At 20 degrees Centigrade, the LEL for methane is 5.1 percent by volume. If the atmosphere has less that 5.1 percent methane, an explosion cannot occur even if a source of ignition is present. When the concentration of methane reaches 5.1 percent, an explosion can occur if there is an ignition source.

Upper Explosive Limit (UEL): The upper explosive limit of a gas or a vapor is the highest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). Concentrations of a substance in air above the UEL are "too rich" to burn.

Vapor Pressure: Vapor pressure is an indicator of a chemical's tendency to evaporate into gaseous form.

Health Hazards Guidance: In addition to fire impacts, health hazards can also be generated due to exposure of chemicals present in products, by-products and wastes. As a measure of a chemical's potential health hazards, the following values need to be considered: the Threshold Limit Values established by the American Conference of Governmental Industrial Hygiene, OSHA's Permissible Exposure Limits, the Immediately Dangerous to Life and Health levels recommended by the National Institute for Occupational Safety and Health (NIOSH), and health hazards developed by the National Safety Council. The following is a brief description of each of these values.

Threshold Limit Values (TLVs): The TLV of a chemical substance is a level to which it is believed a worker can be exposed day after day for a working lifetime without adverse health effects. The TLV is an estimate based on the known toxicity in humans or animals of a given chemical substance, and the reliability and accuracy of the latest sampling and analytical methods. The TLV for chemical substances is defined as a concentration in air, typically for inhalation or skin exposure. Its units are in parts per million (ppm) for gases and in milligrams per cubic meter (mg/m^3) for particulates. The TLV is a recommended guideline by the American Conference of Governmental Industrial Hygienists (ACGIH).

Permissible Exposure Limits (PEL): The PEL is a legal limit, usually expressed in ppm, established by OSHA to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air. A PEL is usually given as a time-weighted average (TWA), although some are short-term exposure limits (STEL) or ceiling limits. A TWA is the average exposure over a specified period of time, usually eight hours. This means that, for limited periods, a worker may be exposed to concentrations higher than the PEL, so long as the average concentration over eight hours remains lower. A short-term exposure limit is one that addresses the average exposure over a 15 to 30 minute period of maximum exposure during a single work shift. A ceiling limit is one that may not be exceeded for any period of time, and is applied to irritants and other materials that have immediate effects. The OSHA PELs are published in 29 CFR 1910.1000, Table Z1.

Immediately Dangerous to Life and Health (IDLH): IDLH is an acronym defined by NIOSH as exposure to airborne contaminants that is "likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment." IDLH values are often used to guide the selection of breathing apparatus that are made available to workers or firefighters in specific situations.

3.3.2.1.6 Oil and Pipeline Regulations and Oversight

Oil Pollution Act: The Oil Pollution Act was signed into law in 1990 to give the federal government authority to better respond to oil spills. The Oil Pollution Act improved the federal government's ability to prevent and respond to oil spills, including provision of money and resources. The Oil Pollution Act establishes polluter liability, gives states enforcement rights in navigable waters of the state, mandates the development of spill control and response plans for all vessels and facilities, increases fines and enforcement mechanisms, and establishes a federal trust fund for financing clean-up.

The Oil Pollution Act also establishes the National Oil Spill Liability Trust Fund to provide financing for cases in which the responsible party is either not readily identifiable, or refuses to pay the cleanup/damage costs. In addition, the Oil Pollution Act expands provisions of the National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan, requiring the federal government to direct all public and private oil spill response efforts. It also requires area committees, composed of federal, state, and local government officials, to develop detailed, location-specific area contingency plans. In addition,

the Oil Pollution Act directs owners and operators of vessels, and certain facilities that pose a serious threat to the environment, to prepare their own specific facility response plans. The Oil Pollution Act increases penalties for regulatory non-compliance by responsible parties; gives the federal government broad enforcement authority; and provides individual states the authority to establish their own laws governing oil spills, prevention measures, and response methods.

Oil Pollution Prevention Regulation: In 1973, the U.S. EPA issued the Oil Pollution Prevention regulation (see 40 CFR 112)**,** to address the oil spill prevention provisions contained in the Clean Water Act of 1972. The Spill Prevention, Control, and Countermeasure (SPCC) Rule is part of the Oil Pollution Prevention regulations (see 40 CFR Part 112, Subparts A - C). Specifically, the SPCC rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. SPCC Plans require applicable facilities to take steps to prevent oil spills including: 1) using suitable storage containers/tanks; 2) providing overfill prevention (e.g., high-level alarms); 3) providing secondary containment for bulk storage tanks; 4) providing secondary containment to catch oil spills during transfer activities; and, 5) periodically inspecting and testing pipes and containers.

U.S. Department of Transportation, Office of Pipeline Safety: The Office of Pipeline Safety, within the U.S. DOT, Pipeline and Hazards Material Safety Administration, has jurisdictional responsibility for developing regulations and standards to ensure the safe and secure movement of hazardous liquid and gas pipelines under its jurisdiction in the United States. The Office of Pipeline Safety has the following key responsibilities:

- Support the operation of, and coordinate with the United States Coast Guard on the National Response Center and serve as a liaison with the Department of Homeland Security and the Federal Emergency Management Agency on matters involving pipeline safety;

- Develop and maintain partnerships with other federal, state, and local agencies, public interest groups, tribal governments, and the regulated industry and other underground utilities to address threats to pipeline integrity, service, and reliability and to share responsibility for the safety of communities;

- Administer pipeline safety regulatory programs and develops regulatory policy involving pipeline safety;

- Oversee pipeline operator implementation of risk management and risk-based programs and administer a national pipeline inspection and enforcement program;

- Provide technical and resource assistance for state pipeline safety programs to ensure oversight of intrastate pipeline systems and educational programs at the local level; and,

- Support the development and conduct of pipeline safety training programs for federal and state regulatory and compliance staff and the pipeline industry.

49 CFR Parts 178 – 185 relates to the role of transportation, including pipelines, in the United States. 49 CFR Parts 186-199 establishes minimum pipeline safety standards. The Office of the State Fire Marshal works in partnership with the Federal Pipeline and Hazardous Materials Safety Administration to assure pipeline operators are meeting requirements for safe, reliable, and environmentally sound operation of their facilities for intrastate pipelines within California.

Chemical Facility Anti-Terrorism Standards: The Federal Department of Homeland Security established the chemical facility anti-terrorism standards in 2007 (see 6 CFR Part 27). These regulations established risk-based performance standards for the security of chemical facilities and require covered chemical facilities to prepare Security Vulnerability Assessments, which identify facility security vulnerabilities, and to develop and implement security plans.

3.3.2.2 State Regulations

California Hazardous Waste Control Law: The California Hazardous Waste Control Law is administered by the California Environmental Protection Agency (CalEPA) to regulate hazardous wastes within the State of California. While the California Hazardous Waste Control Law is generally more stringent than RCRA, both the state and federal laws apply in California. The California Department of Toxic Substances Control (DTSC) is the primary agency in charge of enforcing both the federal and state hazardous materials laws in California. The DTSC regulates hazardous waste, oversees the cleanup of existing contamination, and pursues methods to reduce hazardous waste produced in California. The DTSC regulates hazardous waste in California under the authority of RCRA, the California Hazardous Waste Control Law, and the California Health and Safety Code. Under the direction of the CalEPA, the DTSC maintains the Cortese List and Envirostor databases of hazardous materials and waste sites as specified under Government Code §65962.5.

The Hazardous Waste Control Law (22 CCR Chapter 11, Appendix X) also lists 791 chemicals and approximately 300 common materials which may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Occupational Safety and Health Administration: The California Occupational Safety and Health Administration (CalOSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. CalOSHA requires the employer to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. CalOSHA standards are generally more stringent than federal regulations.

Hazardous Materials Release Notification: Many state statutes require emergency notification of a hazardous chemical release, including:

- California Health and Safety Code §25270.7, §25270.8, and §25507;

- California Vehicle Code §23112.5;
- California Public Utilities Code §7673 (General Orders #22-B, 161);
- California Government Code §51018 and §8670.25.5(a);
- California Water Code §13271 and §13272; and,
- California Labor Code §6409.1(b)10.

California Accident Release Prevention (CalARP) Program: The California Accident Release Prevention Program (19 CCR Division 2, Chapter 4.5) requires the preparation of RMPs. CalARP requires stationary sources with more than a threshold quantity of a regulated substance to be evaluated to determine the potential for and impacts of accidental releases from any processes onsite (not transportion) subject to state risk management requirements. RMPs are documents prepared by the owner or operator of a stationary source containing detailed information including: (1) regulated substances held onsite at the stationary source; (2) offsite consequences of an accidental release of a regulated substance; (3) the accident history at the stationary source; (4) the emergency response program for the stationary source; (5) coordination with local emergency responders; (6) hazard review or process hazard analysis; (7) operating procedures at the stationary source; (8) training of the stationary source's personnel; (9) maintenance and mechanical integrity of the stationary source's physical plant; and (10) incident investigation. The CalARP program is implemented at the local government level by Certified Unified Program Agencies (CUPAs) also known as Administering Agencies (AAs). Typically, local fire departments are the administering agencies of the CalARP program because they frequently are the first responders in the event of a release. The CalARP regulations were last updated in October 2017 to include new Program 4 requirements.

Hazardous Materials Disclosure Program: The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) as promulgated by CalEPA in CCR, Title 27, Chapter 6.11 requires the administrative consolidation of six hazardous materials and waste programs (program elements) under one agency, a CUPA. The Unified Program administered by the State of California consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities for the state's environmental and emergency management programs, which include Hazardous Waste Generator and Onsite Hazardous Waste Treatment Programs (“Tiered Permitting”); Above ground SPCC Program; Hazardous Materials Release Response Plans and Inventories (business plans); the CalARP Program; the UST Program; and the Uniform Fire Code Plans and Inventory Requirements. The Unified Program is implemented at the local government level by CUPAs.

Hazardous Materials Management Act: The State of California (California Health and Safety Code Division 20, Chapter 6.95) requires any business that handles more than a specified amount of hazardous or extremely hazardous materials, termed a "reportable quantity," to submit a Hazardous Materials Business Plan to its Certified Unified Program Agency. Business plans must include an inventory of the types, quantities, and locations of hazardous materials at the facility. Businesses are required to update their business plans at least once every three years

and the chemical portion of their plans every year. Also, business plans must include emergency response plans and procedures to be used in the event of a significant or threatened significant release of a hazardous material. These plans need to identify the procedures to follow for immediate notification to all appropriate agencies and personnel of a release, identification of local emergency medical assistance appropriate for potential accident scenarios, contact information for all company emergency coordinators, a listing and location of emergency equipment at the business, an evacuation plan, and a training program for business personnel. The requirements for hazardous materials business plans are specified in the California Health and Safety Code and 19 CCR.

Hazardous Materials Transportation in California: California regulates the transportation of hazardous waste originating or passing through the State in Title 13, CCR. The California Highway Patrol (CHP) and Caltrans have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies. The CHP enforces 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 incident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP. Caltrans has emergency chemical spill identification teams at locations throughout the State.

California Fire Code: While NFC Standard 45 and NFPA 704 are regarded as nationally recognized standards, the California Fire Code (24 CCR) also 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.

3.3.2.3 Local Regulations

Most counties in California have prepared Hazardous Waste Management Plans (HWMPs) that outlines how hazardous waste generated in the county is managed. The HWMP identifies the types and amounts of wastes generated; establishes programs for managing these wastes; identifies an application review process for the siting of specified hazardous waste facilities; identifies mechanisms for reducing the amount of waste generated; and identifies goals, policies, and actions for achieving effective hazardous waste management

Contra Costa County has adopted an industrial safety ordinance that addresses the human factors that lead to accidents. The ordinance requires stationary sources to develop a written human factors program that considers human factors as part of process hazards analyses, incident investigations, training, operating procedures, among others.

3.3.3 SIGNIFICANCE CRITERIA

The impacts associated with hazards 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 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.

3.3.4 ENVIRONMENTAL IMPACTS

As discussed previously, the NOP/IS (see Appendix A) found that the Expedited BARCT Implementation Schedule would require facilities and refineries to install new or modify their existing air pollution control equipment. Under the Expedited BARCT Implementation Schedule, industrial facilities that participate in the GHG Cap-and-Trade system in the Bay Area would be required to implement BARCT to reduce their criteria pollutant emissions. Additional hazard and hazardous material impacts are expected to result from the operation of several of the possible control technologies that would most likely be used.

The Expedited BARCT Implementation Schedule is designed to reduce criteria pollutant emissions from industrial sources that currently participate in the GHG Cap-and-Trade system in the Bay Area. The proposed project is not expected to require substantial new development. Any new air pollution control equipment would be expected to occur within existing commercial or industrial facilities. Facility modifications associated with the proposed project are expected to include additional lime injection at cement plants, increased LDAR in heavy liquid service at refineries, thermal incinerators, vapor combustors, vapor recovery units, the installation of SCRs, wet gas scrubbers, electrostatic precipitators, and/or LoTOX^{TM} injection. The hazards associated with the use of these types of air pollution control equipment is summarized in Table 3.3-4 and the impacts of those with potential hazard impacts are discussed further in the subsections below.

3.3.4.1 Additional Lime Injection

3.3.4.1.1 Lime

Lime: Lime is a calcium-containing inorganic material in which oxides and hydroxides predominate. Powder hydrate lime ($Ca(OH_2)$) is transported via truck to the existing cement kiln and stored in bins. Lime is mixed with water to create a slurry for use in the cement kiln for emission control. Lime is not regulated as a toxic air contaminant by OEHHA. The hazard ratings of hydrated lime are: Health is rated 3 (highly hazardous) because it can cause severe irritation or burning when it comes into contact with eyes, skin, through ingestion, or if the powder becomes airborne and is inhaled. A release would not generate a gas cloud that could migrate offsite and affect a large number of people because lime is solid at standard temperature and pressures. Rather the health hazards would be limited to the workers at the facility (cement kiln) and emergency repose individuals that may come into contact with a spill during release or clean-up activities. The use of lime would occur at an existing cement kiln than already uses, stores, and transports lime for emission control purposes and the additional use of lime is not expected to result in any new hazard impacts.

TABLE 3.3-4

Potential Hazards Impacts from Installing Air Pollution Control Equipment

Potential Control Technology	Hazards Impact	Analyzed Further?
Domes on Storage Tanks	None Identified	**No**
Vapor Recovery Unit	None identified	**No**
Thermal Incinerator	None identified	**No**
Vapor Combustor	None identified	**No**
Additional Lime Injection	Potential hazards associated with increased use of lime	**Yes**
Wet Gas Scrubbers	Potential hazards associated with increased use of caustic	**Yes**
Electrostatic Precipitator (Wet and Dry)	Potential for explosion	**Yes**
Increased LDAR	None Identified	**No**
SO_2 Reducing Catalyst	None Identified	**No**
LoTOX™	Potential hazards associated with increased use of caustic or lime	**No**
Selective Catalytic Reduction	Potential hazards associated with increased use of ammonia	**Yes**

3.3.4.1 Wet Gas Scrubber

3.3.4.1.1 Caustic

For any operators at potentially affected refineries who choose to install a WGS, hazardous materials may be needed to operate the WGSs depending on the source category. Caustic is a key ingredient needed for the operation of a WGS; it is the most widely used substance for several pollutant 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 most commonly used for WGSs for FCCUs and coke calciners.

NAOH: NaOH, used as caustic in a WGS, is a toxic air contaminant; it is also a noncancerous but acutely hazardous substance. Located on the SDS for NaOH (50 percent by weight), the hazards ratings are as follows: health is rated 3 (highly hazardous) because of its corrosivity, flammability is rated 0 (none), and reactivity is rated 1 (slightly hazardous). NaOH is considered to be hazardous for health reasons when it comes into contact with the skin, eyes or is ingested. A release of NaOH at refineries would not generate a large gas cloud that would migrate offsite and affect a large number of people. Rather the health hazards would be limited to refinery

workers and emergency response individuals that may come into contact with the spill during release or clean-up activities. Use of NaOH caustic in a WGS would occur in at refineries that already use and store NaOH caustic for other purposes and additional use of NaOH is not expected to result in any new significant impacts.

Based on the above information, additional use of caustic in a WGS would not cause or contribute to exceedances of any applicable hazards and hazardous materials significance thresholds.

3.3.4.2 Electrostatic Precipitator

Electrostatic precipitators have several advantages compared with other air pollution control devices, in part, because they are very efficient collectors, even for small particles. Further, because the collection forces act only on the particles, ESPs can treat large volumes of gas with low pressure drops. They can collect dry materials, fumes, or mists. Electrostatic precipitators can also operate over a wide range of temperatures and generally have low operating costs. There are two broad types of ESPs, dry and wet.

3.3.4.2.1 Dry ESPs

Dry ESPs remove dust from the collection electrodes by vibrating the electrodes through the use of rappers. Wire-plate dry ESPs are by far the most common design of an ESP and are used in a number of industries, including petroleum refining. Dry ESPs remove dust from the collection electrodes by vibrating the electrodes through the use of rappers. Common types of rappers are gravity impact hammers and electric vibrators. For a given ESP, the rapping intensity and frequency must be adjusted to optimize performance. Sonic energy is also used to assist dust removal in some dry ESPs. The main components of dry ESPs are an outside shell to house the unit, high voltage discharge electrodes, grounded collection electrodes, a high voltage source, a rapping system, and hoppers.

Hazards associated with dry ESPs include fire and explosion hazards that can occur at the inlet to ESPs when highly charged dust particles are transported by a gas carrier that can contain the mixtures of both incombustible and combustible flue gases. The risk of ignition and even explosion is especially high in the presence of an explosive mixture of oxygen, hydrocarbons, carbon monoxide, etc. The ignition source is typically caused by the breakdown between the corona electrode and the collecting electrode, but in some cases electrostatic discharge (typically back corona) can also act as an ignition source.

Other problems that may contribute to fire or explosion hazards include the following: minimum clearance between electrodes may result in repeated “sparkover” causing local heating and vaporization of wires causing the wires to break; broken wires may swing freely and cause shorting between discharge and collector electrodes; excessive rapping may also break wires; poor electrical alignment may cause the wire frame to oscillate fatiguing wires and increasing sparking; if high levels of carbon are known to exist on the collecting surface or in the hoppers, opening the precipitator access doors may result in spontaneous combustion of the hot dust caused by the inrush of air.

Electrostatic Precipitators or ESPs have been used in industry for over 60 years. Although potential safety hazards exist for explosion or fire hazards associated with dry ESPs, standard industry practices and vendor safety recommendations, including frequent inspection and maintenance, air filter cleaning, use of hydrocarbon sensors, and electronic controls for process automation, are anticipated to reduce risks from operation of dry ESPs. Therefore, hazards and hazardous materials impacts from dry ESPs are concluded to be less than significant. Therefore, mitigation measures are not required.

3.3.4.2.2 Wet ESPs

The basic components of a wet ESP are the same as those of a dry ESP with the exception that a wet ESP requires a water spray system rather than a system of rappers. The gas stream is either saturated before entering the collection area or the collecting surface is continually wetted to prevent agglomerations from forming. Because the dust is removed from a wet ESP in the form of a slurry, hoppers are typically replaced with a drainage system. Wet ESPs have the following advantages over dry ESPs. Wet ESPs can adsorb gases, cause some pollutants to condense, are easily integrated with scrubbers, and eliminate re-entrainment of captured particles.

Particulates collected from wet ESPs are washed from the collection electrodes with water or another suitable liquid. Some wet ESP applications require that liquid is sprayed continuously into the gas stream; in other cases, the liquid may be sprayed intermittently. Since the liquid spray saturates the gas stream in a wet ESP, it also provides gas cooling and conditioning. Because particulates are removed from a wet ESP as a slurry, explosion hazards are unlikely (Dorman, 1974). Therefore, hazards and hazardous materials impacts from wet ESPs are concluded to be less than significant. Therefore, mitigation measures are not required.

3.3.4.3 Ammonia Use in SCRs

Expedited BARCT may require or encourage the use of SCR to reduce NOx emissions at Petroleum Coke Calcining facilities. Ammonia or urea is used to react with the NOx, in the presence of a catalyst, to form nitrogen gas and water. In some SCR installations, anhydrous ammonia is used. Although ammonia is currently used in SCRs throughout the Bay Area, safety hazards related to the transport, storage, and handling of ammonia exist. Ammonia has acute and chronic non-cancer health effects and also contributes to ambient PM_{10} emissions under some circumstances.

Onsite Release Scenario: The use of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric pressure and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and gas is only produced when a liquid pool from a spill evaporates. Under current OES regulations implementing the CalARP requirements, both anhydrous and aqueous ammonia are regulated under California Health and Safety Code Section 2770.1.

Installing SCRs for refinery coke calciners could lead to increased use and storage of ammonia. One coke calciner is operated by Phillips 66 in the District, located in an industrial area of the City of Rodeo. However, the use and storage of anhydrous ammonia would be expected to result in significant hazard impacts as there is the potential for anhydrous ammonia to migrate off-site and expose individuals to concentrations of ammonia that could lead to adverse health impacts. Anhydrous ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressure) and migrate from the point of release. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present. Depending on the location of the spill, a number of individuals could be exposed to concentrations of ammonia that would exceed the ERPG2 concentrations. Residential areas are located within about 2,000 feet of the Phillips 66 coke calciner

In the event of an aqueous ammonia release, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a release from onsite vessels or storage tanks, spills would be released into a containment area, which would limit the surface area of the spill and the subsequent toxic emissions. The containment area would limit the potential pool size, minimizing the amount of spilled material that would evaporate, form a vapor cloud, and impact residences or other sensitive receptors in the area of the spill. Significant hazard impacts associated with a release of aqueous ammonia would not be expected. Therefore, the use of aqueous ammonia is expected to be preferred over anhydrous ammonia.

Transportation Release Scenario: Use and transport of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric temperature and pressure, and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and pressure, and gas is only produced when a liquid pool from a spill evaporates. Deliveries of ammonia would be made to each facility by tanker truck via public roads. The maximum capacity of a tanker truck is 150 barrels. Regulations for the transport of hazardous materials by public highway are described in 49 Code of Federal Regulations (CFR) 173 and 177. Nineteen percent aqueous ammonia is considered a hazardous material under 49 CFR 172.

Although trucking of ammonia and other hazardous materials is regulated for safety by the U.S. Department of Transportation, there is a possibility that a tanker truck could be involved in an accident spilling its contents. 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, and driver training. 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.

The actual occurrence of an accidental release of a hazardous material cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the

least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and sensitive populations into account.

The hazards associated with the transport of regulated (CCR Title 19, Division 2, Chapter 4.5 or the CalARP requirements) hazardous materials, including ammonia, would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Factors such as amount transported, wind speed, ambient temperatures, route traveled, and distance to sensitive receptors are considered when determining the consequence of a hazardous material spill.

In the unlikely event that the tanker truck would rupture and release the entire 150 barrels of aqueous ammonia, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a road accident, the roads are usually graded and channeled to prevent water accumulation and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent toxic emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. Without this pooling effect on an impervious surface, the spilled ammonia would not evaporate into a toxic cloud and impact residences or other sensitive receptors in the area of the spill. An accidental aqueous ammonia spill occurring during transport is, therefore, not expected to have significant impacts.

In the unlikely event that a tanker truck would rupture and release the entire contents of anhydrous ammonia, the ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressure) and migrate from the point of release. There are federal, State and local agencies with jurisdiction over hazardous materials and waste that are responsible for ensuring that hazardous materials and waste handling activities are conducted in accordance with applicable laws and regulations. While compliance with these laws and regulations will minimize the chance of an accidental release of anhydrous ammonia, the potential will still exist that an unplanned release could occur. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present. Depending on the location of the spill, a number of individuals could be exposed to high concentrations of ammonia resulting in potentially significant impacts.

3.3.4.4 Releases During Transport

3.3.4.4.1 Lime

It is conservatively estimated that the cement kiln would double the amount of lime that it uses and import an additional 5,800 tons of hydrated lime per year. Each truck holds about 20 tons of lime for an estimated increase of 290 trucks per year, or an estimated one truck per day. Operators of trucks that transport hazardous materials by public highway are required to comply with requirements described in 49 CFR §§ 173 and 177 which establishes numerous requirements for the transport of hazardous materials, from the training and requirements of drivers, to the specifications and requirements of the trucks used to transport the material. Significant adverse hazards and hazardous materials impacts during use or transport of lime to a

facility or transport are expected to be less than significant because of they do not pose adverse health or physical hazard impacts and, in the event of an accidental release, the lime would be easily contained (because it is a solid at standard temperature and pressures) and cleaned up. Based on the above information, accidental releases of lime during transport would not cause or contribute to exceedances of any applicable hazards and hazardous materials significance thresholds.

3.3.4.4.2 Oxidation Catalyst

A typical oxidation catalyst system is not expected to require more than several hundred pounds of catalyst modules per year. As a result, delivery of catalyst modules can be accomplished in one truck trip. Based on their chemical and physical properties (solid material), oxidation catalysts are not expected to pose significant adverse health or physical hazard impacts during use. Similarly, significant adverse hazards and hazardous materials impacts during use or transport of new catalysts to a facility or transport of spent catalysts for recycling are expected to be less than significant because of they do not pose adverse health or physical hazard impacts and, in the event of an accidental release, the modules would be easily contained and cleaned up.

3.3.4.4.3 Wet Gas Scrubber

Installation of a WGS would require deliveries of fresh caustic. If an accidental release of caustic during transport occurs, potentially significant adverse hazards or hazardous materials impacts may be generated.

NaOH: Deliveries of NaOH (50 percent by weight) are typically made by tanker truck via public roads. The maximum capacity of one NaOH tanker truck is approximately 6,000 gallons. The projected consumption rates of NaOH are assumed to range from approximately 160 tons per year (T/Y) (0.44 tons per day (T/D)) to 1,228 T/Y (3.37 T/D) based on an analysis of WGS for refineries in southern California (SCAQMD, 2008). Based on worst-case assumptions, an affected refinery would need up to an additional 32 truck trips of NaOH caustic per year[1]. Although some of the affected refineries currently receive NaOH caustic, it is likely that they receive shipments periodically throughout the year rather than on a daily basis. Therefore, it is unlikely that an affected refinery would require one delivery per day in addition to any existing deliveries of NaOH caustic, instead it is likely that NaOH deliveries would occur on more days per year. Operators of trucks that transport hazardous materials by public highway are required to comply with requirements described in 49 CFR §§ 173 and 177. Hazardous materials impacts during the transport of NaOH caustic are considered to be less than significant.

Based on the above information, accidental releases of caustic during transport would not cause or contribute to exceedances of any applicable hazards and hazardous materials significance thresholds.

[1] Annual NaOH deliveries are calculated based on one delivery truck holding 6,000 gallons per truck load. For example, 1,228 T/Y NaOH x 2,000 lbs/ ton = 2,465.000 lbs/yr x 1 gal NaOH @ 50%/12.77 lbs = 192,000 gal/year x 1 truck/6,000 gallons = 32 trucks/year

3.3.5 MITIGATION MEASURES

Hazards and hazardous materials impacts are expected to be less than significant; therefore, no mitigation measures are required.

3.3.6 CUMULATIVE IMPACTS

As concluded in the above hazards and hazardous materials analysis, installation of air pollution control equipment, if required in the future, is not expected to cause or contribute to significant adverse hazard or hazardous materials impacts. Therefore, overall hazards and hazardous materials impacts, including accidental releases of hazardous materials during transport, were concluded to be less than significant. Because hazards and hazardous materials impacts do not exceed the applicable hazards and hazardous materials significance thresholds, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative hazards and hazardous materials impacts.

CHAPTER 3.4

HYDROLOGY AND WATER QUALITY

Introduction
Environmental Setting
Regulatory Setting
Significance Criteria
Hydrology and Water Quality Impacts
Mitigation Measures
Cumulative Impacts

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3.4 HYDROLOGY AND WATER QUALITY

This subchapter of the EIR evaluates the potential hazards and hazardous material impacts associated with the Expedited BARCT Implementation Schedule, which aims to reduce criteria pollutant emissions from industrial sources that currently participate in the GHG Cap-and-Trade system.

As discussed in the Initial Study, in accordance with AB 617, the purpose of the Expedited BARCT Implementation Schedule is to implement several rule development projects that utilize BARCT to reduce criteria pollutant emissions from industrial sources participating in the GHG Cap-and-Trade system throughout the Bay Area. The NOP/IS concluded that certain control equipment, particularly wet gas scrubbers, could result in a substantial increase in water use or wastewater discharge.

The NOP/IS determined that the potential flooding, flood hazards and increased stormwater runoff impacts were less than significant as modifications would occur at existing facilities that have been graded and developed. Therefore, project-specific and cumulative adverse water demand and water quality impacts associated with the Expedited BARCT Implementation Schedule have been evaluated in Chapter 3.4 of this EIR. It should be noted that the NOP/IS concluded that the potential utilities and service system impacts were potentially significant due to an increase in water demand. The EIR consolidated the potential water demand impacts on both hydrology and water quality and utilities and service systems in this Subchapter 3.4

3.4.1 ENVIRONMENTAL SETTING

3.4.1.1 Regional Hydrology

The state of California is divided into ten hydrologic regions corresponding to the state‘s major water drainage basins. The hydrologic regions define a river basin drainage area and are used as planning boundaries, which allows consistent tracking of water runoff, and the accounting of surface water and groundwater supplies. The Air District is within the San Francisco Bay Hydrologic Region (Bay Region) which includes all of San Francisco County and portions of Marin, Sonoma, Napa, Solano, San Mateo, Santa Clara, Contra Costa, and Alameda counties. It occupies approximately 4,500 square miles; from southern Santa Clara County to Tomales Bay in Marin County; and inland to near the confluence of the Sacramento and San Joaquin rivers at the eastern end of Suisun Bay. The eastern boundary follows the crest of the Coast Ranges, where the highest peaks are more than 4,000 feet above mean sea level (CDWR, 2013).

The San Francisco Bay estuary system is one of the largest in the country and drains approximately 40 percent of the state’s surface water from the Sierra Nevada and the Central Valley. The two major drainages, the Sacramento and San Joaquin Rivers, receive more than 90 percent of runoff during the winter and spring months from rainstorms and snow melt. Water from these drainages flows into what is known as the Delta region, then into the sub-bays, Suisun Bay and San Pablo Bay, and finally into the Central Bay and out the Golden Gate. Nearly half of the surface water in California starts as rain or snow that falls within the watershed and flows downstream toward the Bay. Much of the water flowing toward the Bay is diverted for agricultural, residential, and

industrial purposes as well as delivery to distant cities of southern California as part of state and federal water projects (ABAG, 2017).

The two major drainages, the Sacramento and San Joaquin Rivers receive more than 90 percent of runoff during the winter and spring months from rainstorms and snow melt. Other surface waters flow either directly to the Bay or Pacific Ocean. The drainage basin that contributes surface water flows directly to the Bay covers a total area of 3,464 square miles. The largest watersheds include Alameda Creek (695 square miles), the Napa River (417 square miles), and Coyote Creek (353 square miles) watersheds. The San Francisco Bay estuary includes deep-water channels, tidelands, and marshlands that provide a variety of habitats for plants and animals. The salinity of the water varies widely as the landward flows of saline water and the seaward flows of fresh water converge near the Benicia Bridge. The salinity levels in the Central Bay can vary from near oceanic levels to one quarter as much, depending on the volume of freshwater runoff (ABAG 2017).

3.4.1.2 Surface Water Hydrology

Surface waters in the Bay Area include freshwater rivers and streams, coastal waters, and estuarine waters. Many of the original drainages toward the San Francisco Bay have been channelized and put underground through urbanization of the areas. Estuarine waters include the San Francisco Bay Delta from the Golden Gate Bridge to the Sacramento and San Joaquin Rivers, and the lower reaches of various streams that flow directly into the Bay, such as the Napa and Petaluma Rivers in the North Bay, and the Coyote and San Francisquito Creeks in the South Bay. Major water bodies, including creeks and rivers, in the Bay Area are summarized in Table 3.4-1.

The most prominent surface water body in the Bay Region is San Francisco Bay itself. Other surface water bodies include: creeks and rivers; ocean bays and lagoons (such as Bolinas Bay and Lagoon, Half Moon Bay, and Tomales Bay); urban lakes (such as Lake Merced and Lake Merritt); and human-made lakes and reservoirs (such as Lafayette Reservoir, Briones Reservoir, Calaveras Reservoir, Crystal Springs Reservoir, Kent Lake, Lake Chabot, Lake Hennessey, Nicasio Reservoir, San Andreas Lake, San Antonio Reservoir, San Pablo Reservoir, Upper San Leandro Reservoir, Anderson Reservoir, and Lake Del Valle).

TABLE 3.4-1

Watersheds of the San Francisco Bay Hydrologic Region

LOCATION	WATERSHED
North Bay	Corte Madera Creek Watershed
	Novato Creek Watershed
	Petaluma River Watershed
	Sonoma Creek Watershed
	Napa River Watershed
	Marin and North Bay Coastal Drainages(1)
Suisun Bay	GreenValley/Suisun Creeks watersheds
	Walnut Creek Watershed
	San Pablo/Wildcat Creeks Watersheds
	Suisun Bay Drainages(2)
East Bay	San Leandro Creek Watershed
	San Lorenzo Creek Watershed
	Alameda Creek Watershed
	East Bay Drainages(3)
South Bay	Coyote Creek Watershed
	Guadalupe River Watershed
	West Santa Clara Valley Drainages(4)
Peninsula	San Francisquito Creek Watershed
	San Mateo Creek Watershed
	San Mateo and Peninsula Coastal Drainages(5)

Source: ABAG, 2017

(1) Including Lagunitas Creek, Arroyo Corte Madera Creek, Miller Creek, etc.
(2) Including Sulphur Springs Creek, Laurel Creek, Mt. Diablo Creek, etc.
(3) Including Rodeo Creek, Cordonices Creek, Claremont Creek, Peralta Creek, Lake Merritt, etc.
(4) Including Stevens Creek, Permanente Creek, Saratoga Creek, etc.
(5) Including Cordilleras Creek, Colma Creek, Pilarcitos Creek, Pescadero Creek, San Gregorio Creek, etc.

3.4.1.3 Groundwater

A groundwater basin is an area underlain by permeable materials capable of storing a significant amount of water. Groundwater basins are closely linked to local surface waters. As water flows from the hills toward the Bay, it percolates through permeable soils into the groundwater basins. The nine-county Bay Area contains a total of 28 groundwater basins. The ten primary groundwater basins are the Petaluma Valley, Napa-Sonoma Valley, Suisun-Fairfield Valley, San Joaquin Valley, Clayton Valley, Diablo Valley, San Ramon Valley, Livermore Valley, Sunol Valley, and Santa Clara Valley basins. Groundwater in the Bay Area is used for numerous purposes, including municipal and industrial water supply; however, groundwater use accounts for only about five percent of the total water usage (ABAG, 2017).

3.4.1.4 Water Quality

The quality of regional surface water resources in the Bay Area varies considerably and is locally affected by point-source and nonpoint-source discharges throughout individual watersheds.

Regulated point sources, such as wastewater treatment effluent and industrial waste water discharges, usually involve a single point discharge into receiving waters. Point-source pollutants can also enter water bodies from urban runoff that includes oil and gasoline by-products from parking lots, streets, and freeways that are collected in drainage systems and discharged directly to surface waters. Most urban runoff flows untreated into creeks, lakes, and San Francisco Bay. This nonpoint-source runoff often carries pollutants that contribute heavy metals (and other pollutants) to local waters. Other pollutant sources include upstream historic and current mining discharges and legacy pollutants that were historically emitted by industry or other human activities, but are currently banned or significantly restricted from current usage. Examples include mercury, lead, polychlorinated biphenyls, and dichlorodiphenyltrichloroethane (ABAG, 2017).

Nonpoint-source pollutants are transported into surface waters through rainfall, air, and other pathways. The nonpoint-source pollutants originate from many diffuse sources and are the leading cause of water quality degradation in the region's waterways. Regionally, stormwater runoff is estimated to contribute more heavy metals to San Francisco Bay than direct municipal and industrial dischargers, as well as significant amounts of motor oil, paints, chemicals, debris, grease, and detergents. Runoff in storm drains may also include pesticides and herbicides from landscaping products and bacteria from animal waste (ABAG, 2017).

In addition to the degradation of water quality in many of the region's surface waters, many of the region's creeks are channelized, culverted, or otherwise altered, which has had adverse effects on aquatic and riparian habitats, sediment transfer, and hydrology. Water quality in the more rural areas of the region has also been affected by grazing and agriculture, confined animal facilities, onsite sewage systems, and land conversions. Coastal watersheds have been impaired because of sedimentation and habitat degradation (ABAG, 2017).

The San Francisco Bay Regional Water Quality Control Board (RWQCB), the main agency charged with protecting and enhancing surface water and groundwater quality in the Bay Area, has classified the San Francisco Bay and man of its tributaries as impaired for various water quality constituents, as required by the Clean Water Act (CWA). The San Francisco RWQCB implements the Total Maximum Daily Load (TMDL) Program for impaired water bodies, which involves determining a safe level of loading for each problem pollutant, determining the pollutant sources, allocating loads to all of the sources, and implementing the load allocations. The list of impaired water bodies includes more than 270 listings in 88 water bodies. RWQCB staff are currently developing TMDL projects or studies to address more than 160 of these listing. SFBRWQCB is taking a watershed management approach to runoff source issues, including TMDL implementation, by engaging all affected stakeholders in designing and implementing goals on a watershed basis to protect water quality. Completed and current TMDL projects in the Bay Area are listed in Table 3.4-2.

TABLE 3.4-2

TMDL Projects in the Bay Area

WATER BODY	POLLUTANT
Guadalupe River Watershed	Mercury
Lagunitas Creek	Sediment
Napa River	Sediment and Pathogens
North San Francisco Bay	Selenium
San Francisco Bay Beaches	Bacteria
San Francisco Bay	Mercury and PCBs
San Vicente Creek and Fitzgerald Marine Reserve	
San Pedro Creek and Pacifica State Beach	Bacteria
Sonoma Creek	Pathogens and Sediment
Tomales Bay	Mercury and Pathogens
Urban Creeks	Pesticide Toxicity
Walker Creek	Mercury
Butano and Pescadero Creeks	Sediment
Permanente Creek	Selenium
San Francisquito Creek	Sediment
Stevens Creek	Toxicity
Suisun Marsh	Low Dissolved Oxygen, Organic Enrichment, Mercury, Nutrients, and Salinity

Source: ABAG, 2017

3.4.1.5 Water Supply and Demand

Water supply for each county is provided by its respective water supply department or agency. The following water agencies serve the majority of the water demands in the Bay Area Region:

- Alameda County Water District (ACWD)
- Contra Costa Water District (CCWD)
- East Bay Municipal Utility District (EBMUD)
- Marin Municipal Water District (MMWD)
- City of Napa Water Department
- San Francisco Public Utilities Commission (SFPUC)
- Santa Clara Valley Water District (SCVWD)
- Solano County Water Agency (Solano CWA)
- Sonoma County Water Agency (Sonoma CW)
- Zone 7 Water Agency (Zone 7)

The Bay Area relies on imported water, local surface water, and groundwater for water supply. Local supplies account for about 31 percent of the total, and the remaining supply is imported from the State Water Project (SWP) (13 percent), Central Valley Project (CVP) (15 percent), the Mokelumne watershed (19 percent), and the Tuolumne watersheds (19 percent). Table 3.4-3 shows the projected water supplies and demands from recent urban water management plans (UWMP) for normal years in the future (2020) and over the next twenty years. All of the water districts will be able to provide adequate water supplies to meet projected demand in a year of normal precipitation, although doing so requires some districts to acquire additional supplies (ABAG, 2017).

TABLE 3.4-3

Projected Normal Year Water Supply and Demand
(acre-feet per year)

Water Agency	2020 Water Supply	2020 Demand	Future Water Supply (2040)	Future Water Demand (2040)
Alameda County WD	78,000	63,400	78,000	70,300
Contra Costa WC	329,200	264,000	362,800	303,900
East Bay Municipal Utility District	243,000	243,000	258,000	258,000
Marin Municipal WD	151,000	42,000	153,000	42,000
City of Napa	52,000	14,000	52,000	15,000
San Francisco PUC	87,000	87,000	101,000	101,000
Santa Clara Valley WD	390,000	376,000	442,000	435,000
Solano County WA(1)	255,000	255,000	255,000	255,000
Sonoma County WA	66,000	66,000	76,000	76,000
Zone 7 WA	79,000	72,000	100,000	93,000

Source: ABAG, 2017

(1) Future supply and demand are for the year 2030.

Some Bay Area water agencies are projecting future water supply shortfalls in dry years (including Alameda County Water District -2020, Santa Clara Valley Water District – 2040, and Sonoma County Water Agency – 2025), and some are already seeing such shortfalls (including East Bay Municipal Utility District, City of Napa Water Department, and Solano County Water Agency). Other agencies anticipate being able to handle a single dry year, largely because of reservoirs, or other storage capacity, including Contra Costa Water District, Marin Municipal Water District, San Francisco Public Utilities Commission, and Zone 7 Water Agency. The severity and timing of dry year shortfalls differ greatly among the agencies because of the wide variation of supply sources, types of use, and climates within the region. Shortages in precipitation in the Sierra Nevada can have a pronounced effect on water supply in the region than a drought in the Bay Area itself because of the reliance of the region on water from the Tuolumne and Modelumne watersheds (ABAG, 2017).

3.4.1.6 Drinking Water Quality

Drinking water in the Bay Region ranges from high-quality Mokelumne and Tuolumne River water to variable-quality Delta water, which constitutes about one-third of the domestic water supply. Purveyors that depend on the Delta for all or part of their domestic water supply can meet drinking water standards, but still need to be concerned about microbial contamination, salinity, and organic carbon.

In 2013, the SWRCB completed a statewide report titled, "Communities that Rely on a Contaminated Groundwater Source for Drinking Water." The report identified contaminated wells statewide that exceed a primary drinking water standard prior to any treatment or blending. In the Bay Region, 28 contaminated wells were identified that are used by 18 water systems. Most of the affected drinking water systems are small and often need financial assistance to construct a water treatment plant or another facility to meet drinking water standards. The most prevalent contaminants in the region are arsenic, nitrate, and aluminum (CDWR, 2013).

3.4.1.7 Recycled Water

In the 1990s, a number of local agencies joined with the CDWR and the United States Bureau of Water Reclamation to study the feasibility of using high-quality recycled water to augment water supplies and help the Bay-Delta ecosystem. This cooperative effort, known as the Bay Area Regional Water Recycling Program (BARWRP), produced a Master Plan for regional water recycling in 1999 for the five South Bay counties. Since then, local water agencies have built a number of projects consistent with BARWRP, and recycled water has come to be widely used in the Bay Area for a number of applications, including landscape irrigation, agricultural needs, commercial and industrial purposes, and as a supply to the area's wetlands. In 2010, the Bay Area recycled approximately 60,000 acre-feet of water per year, almost 10 percent of the wastewater effluent generated, and supply is expected to more than double over the next 20 years (ABAG, 2017). The largest use of recycled water is for landscape irrigation, including golf courses, wetlands, industrial uses, and agricultural irrigation.

3.4.1.8 Desalination

The Alameda County Water District opened the Newark Desalination Facility in 2003, and has a capacity of 12.5 million gallons per day. The five largest water agencies in the Bay Area (SCCWD, EBMUC, SFPUC, SCVWD, and Zone 7) are currently studying the feasibility of constructing a 10 to 20 million gallon per day desalination facility in eastern Contra Costa County (ABAG, 2017).

3.4.1.9 Wastewater Treatment

Wastewater is generated by residential, commercial and industrial sources throughout the Bay Area. The Clean Water Act requires treatment of wastewater for the protection of human health and receiving water bodies and preservation of the health of aquatic and riparian species. Wastewater treatment facilities consist of staged processes with the specific treatment systems authorized through NPDES permits. Primary treatment generally consists of initial screening and clarifying. Primary clarifiers are large pools where solids in wastewater are allowed to settle out. The clarified water is pumped into secondary clarifiers and the screenings and solids are collected, processed through large digesters to break down organic contents, dried and pressed, and either

disposed of in landfills or used for beneficial agricultural applications. Secondary clarifiers repeat the process of the primary clarifiers further, refining the effluent.

Other means of secondary treatment include flocculation (adding chemicals to precipitate solids removal) and aeration (adding oxygen to accelerate breakdown of dissolved constituents). Tertiary treatment involves the removal of nutrients and nearly all suspended organic matter from wastewater, and may consist of filtration, disinfection, and reverse osmosis technologies. Chemicals are added to the wastewater during the primary and secondary treatment processes to accelerate the removal of solids and to reduce odors. Chlorine is often added to eliminate pathogens during final treatment, and sulfur dioxide is often added to remove the residual chlorine. Methane produced by the treatment processes can be used as fuel for the plant's engines and electricity needs. Recycled water must receive a minimum of tertiary treatment in compliance with DHS regulations. Water used to recharge potable groundwater supplies generally receives reverse osmosis and microfiltration prior to reuse (Water Education Foundation, 2013).

Wastewater treatment in the Bay Area is provided by various agencies as well as individual city and town wastewater treatments. Treated wastewater is generally discharged into a water body, evaporation pond or percolation basin, or used recycled for agriculture, irrigation or landscaping. The U.S. EPA's NPDES permit program affects how a municipality handles its sanitary wastewater. Tertiary treatment is now commonly required for discharges to bodies of water, particularly where there is potential for human contact. Properly managed wastewater treatment systems play an important role in protecting community health and local water quality

3.4.2 REGULATORY SETTING

There are a variety of overlapping federal, state and local regulations that regulate water resources and water quality. A number of federal regulations (e.g., the Clean Water Act) are primarily implemented by state agencies with oversight from the U.S. EPA. This section summarizes the more pertinent federal, state and local regulations on water resources.

3.4.2.1 Federal Regulations

3.4.2.1.1 Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into "waters of the United States." The Act specifies a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. Some of these tools include:

- Section 303(d) – Total Maximum Daily Loads (TMDLs);
- Section 401 – Water Quality Certification;
- Section 402 – National Pollutant Discharge Elimination System (NPDES) Program; and
- Section 404 – Discharge of Dredge or Fill Material.

Section 303(d) – Total Maximum Daily Loads (TMDLs): The CWA §303(d) requires the SWRCB to prepare a list of impaired water bodies in the state and determine total maximum daily loads (TMDLs) for pollutants or other stressors impacting water quality of these impaired water bodies. A TMDL is a quantitative assessment of water quality conditions, contributing sources, and the load reductions or control actions needed to restore and protect bodies of water in order to meet their beneficial uses. All sources of the pollutants that caused each body of water to be included on the list, including point sources and non-point sources, must be identified. The California §303 (d) list was completed in March 1999. On July 25, 2003, U.S. EPA gave final approval to California's 2002 revision of §303 (d) List of Water Quality Limited Segments. A priority schedule has been developed to determine TMDLs for impaired waterways. TMDL projects are in various stages throughout the District for most of the identified impaired water bodies. The Regional Water Quality Control Boards are responsible for ensuring that total discharges do not exceed TMDLs for individual water bodies as well as for entire watersheds.

Section 401 – Water Quality Certification: The RWQCBs coordinate the State Water Quality Certification program, or CWA §401. Under CWA §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 CWA §404 which obligates the U.S. Army Corps of Engineers to issue permits for the movement of dredge and fill material into and from “waters of the United States”.

Section 402 – National Pollutant Discharge Elimination System (NPDES) Program: Section 402 regulates point-source discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program. In California, the SWRCB oversees the NPDES program, which is administered by the RWQCBs. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. The NPDES program covers municipalities, industrial activities, and construction activities. The NPDES program includes an industrial stormwater permitting component that covers ten categories of industrial activity that require authorization under an NPDES industrial stormwater permit for stormwater discharges. 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.

Construction activities, also administered by the State Water Board, are discussed below under state regulations. Section 402(p) of the federal Clean Water Act, as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from municipal separate storm sewer systems (MS4s), stormwater discharges associated with industrial activity (including construction activities), and designated stormwater discharges, which are considered significant contributors of pollutants to waters of the United States. On November 16, 1990, U.S. EPA published regulations (40 CFR Part 122), which prescribe permit application requirements for MS4s pursuant to CWA 402(p). On May 17, 1996, U.S. EPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems,

which provided guidance on permit application requirements for regulated MS4s. MS4 permits include requirements for post-construction control of stormwater runoff in what is known as Provision C.3. The goal of Provision C.3 is for the Permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques.

3.4.2.1.2 Safe Water Drinking Act (SDWA)

Passed in 1974 and amended in 1986 and 1996, the SDWA gives the U.S. EPA the authority to set drinking water standards. Drinking water standards apply to public water systems, which provide water for human consumption through at least 15 service connections, or regularly serve at least 25 individuals. There are two categories of drinking water standards, the National Primary Drinking Water Regulations (NPDWR) and the National Secondary Drinking Water Regulations (NSDWR). The NPDWR are legally enforceable standards that apply to public water systems. NPDWR standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in water.

3.4.2.1.3 Section 10 of the Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act, administered by United States Army Corp of Engineers (U.S. ACE), requires permits for all structures (such as riprap) and activities (such as dredging) in navigable waters of the U.S.

3.4.2.1.4 Executive Order 11990 – Protection of Wetlands

Executive Order 11990 is an overall wetlands policy for all agencies managing federal lands, sponsoring federal projects, or providing federal funds to state or local projects. Executive Order 11990 requires that when a construction project involves wetlands, a finding must be made by the federal agency that there is no practicable alternative to such construction, and that the proposed action includes all practicable measures to minimize impacts to wetlands resulting from such use.

3.4.2.2 State Regulations

3.4.2.2.1 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act established the SWRCB and divided the state into nine regions, each overseen by a RWQCB. The nine regional boards have the primary responsibility for the coordination and control of water quality within their respective jurisdictional boundaries. Under the Porter-Cologne Water Quality Control Act, water quality objectives are limits or levels of water quality constituents or characteristics established for the purpose of protecting beneficial uses. The Act requires the RWQCBs to establish water quality objectives while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Designated beneficial uses, together with the corresponding water

quality objectives, also constitute water quality standards under the federal Clean Water Act. Therefore, the water quality objectives form the regulatory references for meeting state and federal requirements for water quality control.

Each RWQCB is required to prepare and update a Basin Plan for their jurisdictional area. Pursuant to the CWA NPDES program, the RWQCB also issues permits for point source discharges that must meet the water quality objectives and must protect the beneficial uses defined in the Basin Plan.

3.4.2.2.2 Construction General Permit

The California Construction Stormwater Permit (Construction General Permit), adopted by the State Water Resources Control Board, regulates construction activities that include clearing, grading, and excavation resulting in soil disturbance of at least one acre of total land area. Individual storm water NPDES permits are required for specific industrial activities and for construction sites greater than five acres. Statewide general storm water NPDES permits have been developed to expedite discharge applications. They include the statewide industrial permit and the statewide 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. The Stormwater Rule automatically designates, as small construction activity under the NPDES stormwater permitting program, all operators of construction site activities that result in a land disturbance of equal to or greater than one and less than five acres. Site activities that disturb less than one acre are also regulated as small construction activity if they are part of a larger common plan of development or sale with a planned disturbance of equal to or greater than one acre and less than five acres, or if they are designated by the NPDES permitting authority. The NPDES permitting authority or U.S. EPA Region may designate construction activities disturbing less than one acre based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States.

The Construction General Permit authorizes the discharge of stormwater to surface waters from construction activities. The Construction General Permit requires that all developers of land where construction activities will occur over more than one acre to develop and implement a Stormwater Pollution Prevention Plan (SWPPP), which specifies Best Management Practices (BMPs) that will reduce pollution in stormwater discharges to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standards; and, perform inspections and maintenance of all BMPs. Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, control sediment, control pollutants from construction materials, and address post construction runoff quantity (volume) and quality (treatment). The SWPPP must also include a discussion of the program to inspect and maintain all BMPs.

3.4.2.2.3 Drinking Water Standards

The California Safe Drinking Water Act, enacted in 1976, is codified in Title 22 of the CCR. The California Safe Drinking Water Act provides for the operation of public water systems and imposes various duties and responsibilities for the regulation and control of drinking water in the State of California including enforcing provisions of the federal Safe Drinking Water Act. The California Safe Drinking Water Program was originally implemented by the California Department of Public Health until July 1, 2014 when the program was transferred to the SWRCB via an act of legislation, SB 861. This transfer of authority means that the SWRCB has regulatory and enforcement authority over drinking water standards and water systems under Health and Safety Code §116271.

Potable water supply is managed through the following agencies and water districts: the California Department of Water Resources (CDWR), the California Department of Health Services (DHS), the SWRCB, the U.S. EPA, and the U.S. Bureau of Reclamation. Water right applications are processed through the SWRCB for properties claiming riparian rights. The CDWR manages the State Water Project (SWP) and compiles planning information on water supply and water demand within the state. Primary drinking water standards are promulgated in the CWA §304 and these standards require states to ensure that potable water retailed to the public meets these standards. Standards for a total of 88 individual constituents, referred to as Maximum Contaminant Levels (MCLs), have been established under the Safe Drinking Water Act as amended in 1986 and 1996. The U.S. EPA may add additional constituents in the future. The MCL is the concentration that is not anticipated to produce adverse health effects after a lifetime of exposure. State primary and secondary drinking water standards are codified in CCR Title 22 §§64431 - 64501. Secondary drinking water standards incorporate non-health risk factors including taste, odor, and appearance. The 1991 Water Recycling Act established water recycling as a priority in California. The Water Recycling Act encourages municipal wastewater treatment districts to implement recycling programs to reduce local water demands. The DHS enforces drinking water standards in California.

3.4.2.2.4 Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act was enacted in September 2014. The Act provides for the management and use of groundwater in a manner that can be maintained during a 50-year planning and implementation horizon without causing undesirable results. The Act establishes a structure for locally managing California's groundwater and includes the following key elements: (1) provides for the establishment of a Groundwater Sustainability Agency; (2) requires all groundwater basins found to be of "high" or "medium" priority to prepare Groundwater Sustainability Plans (Sonoma, Napa, Solano, Contra Costa, Alameda and Control Costa Counties include basins designed as high or medium priority); (3) provides for the proposed revisions, by local agencies, to the boundaries of a basin; (4) provides authority to adopt regulations to evaluate Groundwater Sustainability Plans and review them for compliance every five years; (5) requires that Best Management Practices and technical measures be developed to implement Groundwater Sustainability Plans; and (6) provides the regulatory authority for the SWRCB to implement interim groundwater monitoring programs under certain circumstances.

3.4.2.2.5 Wastewater Treatment Regulations

The federal government enacted the CWA to regulate point source water pollutants, particularly municipal sewage and industrial discharges, to waters of the United States through the NPDES permitting program. In addition to establishing a framework for regulating water quality, the CWA authorized a multibillion dollar Clean Water Grant Program, which together with the California Clean Water Bond funding, assisted communities in constructing municipal wastewater treatment facilities. These financing measures made higher levels of wastewater treatment possible for both large and small communities throughout California, significantly improving the quality of receiving waters statewide. Wastewater treatment and water pollution control laws in California are codified in the CWC and CCR, Titles 22 and 23. In addition to federal and state restrictions on wastewater discharges, most incorporated cities in California have adopted local ordinances for wastewater treatment facilities. Local ordinances generally require treatment system designs to be reviewed and approved by the local agency prior to construction. Larger urban areas with elaborate infrastructure in place would generally prefer new developments to hook into the existing system rather than construct new wastewater treatment facilities. Other communities promote individual septic systems to avoid construction of potentially growth accommodating treatment facilities. The RWQCBs generally delegate management responsibilities of septic systems to local jurisdictions. Regulation of wastewater treatment includes the disposal and reuse of biosolids.

3.4.2.2.6 California Department of Fish and Wildlife

The California Department of Fish and Wildlife is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code (Section 1602) requires an entity to notify the Department of any proposed activity that may substantially modify a river, stream, or lake. The notification requirement applies to any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken within the flood plain of a body of water.

3.4.2.3 Local Regulations

3.4.2.3.1 McAteer-Petris Act/San Francisco Bay Conservation and Development Commission

The McAteer-Petris Act is a provision under California law that preserves San Francisco Bay from indiscriminate filling. The Act established the San Francisco Bay Conservation and Development Commission (BCDC) as the agency charged with preparing a plan for the long-term use of the Bay and regulating development in and around the Bay while the plan was being prepared. The San Francisco Bay Plan, completed in January 1969, includes policies on 18 issues critical to the wise use of the bay, ranging from ports and public access to design considerations and weather. The McAteer-Petris Act authorizes BCDC to incorporate the policies of the Bay Plan into state law. The Bay Plan has two features: policies to guide future uses of the bay and shoreline, and maps that apply these policies to the bay and shoreline. BCDC conducts the regulatory process in accordance with the Bay Plan policies and maps, which guide the protection and development of the bay and its tributary waterways, marshes, managed wetlands, salt ponds, and shoreline.

3.4.2.3.2 General Plan Elements

The conservation, open space and safety elements are the most relevant of the general plan elements to hydrology and water quality. The conservation element typically addresses watershed protection, land or water reclamation, prevention or control of the pollution of streams and other coastal waters, regulation of land uses along stream channels and in other areas required to implement the conservation plan (e.g., buffer areas), to control or correct soil erosion, and for flood control. The open space element applies to the preservation of natural resources, including fish and wildlife habitat, rivers, streams, bays and estuaries, and open space.

3.4.2.3.3 Other Local Regulations

In addition to federal and state regulations, cities, counties and water districts may also provide regulatory advisement regarding water resources. Many jurisdictions incorporate policies related to water resources in their municipal codes, development standards, storm water pollution prevention requirements, and other regulations.

3.4.3 SIGNIFICANCE CRITERIA

The proposed project impacts on hydrology and water quality would be considered significant if the following occurs:

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 263,000 gallons per day of potable water.

Water Quality:

- The project will cause degradation or depletion of ground water 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 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.

3.4.4 ENVIRONMENTAL IMPACTS

Under the Expedited BARCT Implementation Schedule, industrial sources that participate in the GHG Cap-and-Trade system in the Bay Area would be required to expedited BARCT to reduce criteria pollutant emissions. As discussed in the NOP/IS (see Appendix A), additional water

demand and wastewater generation impacts are expected to result from the operation of several of the possible control technologies that would most likely be used (see Table 3.4-3).

3.4.4.1 Potential Water Demand Impacts

It is expected that affected industrial facilities would install new or modify existing air pollution control equipment to comply with the Expedited BARCT Implementation Schedule. Most air pollution control equipment does not use water or generate wastewater (see Table 3.4-4). However, additional water demand and wastewater generation impacts are expected to result from the operation of wet gas scrubbers (or LoTOX), which may be used to control refinery FCCUs and coke calciners, and water usage to make the lime slurry to control emissions from the cement kiln (see Table 3.4-4).

Demolition and construction activities to install air pollution control equipment have the potential to generate potential water demand and water quality impacts. For example, water is used during construction to reduce fugitive dust from any site preparation or grading activities. Potential water demand and water quality impacts during potential future construction activities will be evaluated in the subsections below.

Table 3.4-4 shows air pollution control equipment that are expected to be required under the Expedited BARCT Implementation Schedule. As shown in Table 3.4-4, not all control technologies use water as part of the emission control process and, therefore, would not be expected to contribute to water demand or water quality impacts. These control technologies, which includes domes on storage tanks, increased LDAR, and SO_2 Reducing Catalysts, will not be considered further in this analysis. Analyses of water demand and water quality impacts from control equipment that do use water as part of the control process are provided in the following subsections.

3.4.4.1.1 Dust Suppression Associated with Construction Activities

Installation of some types of relatively small air pollution control equipment, e.g., thermal incinerators, vapor recovery units and vapor combustors, are not expected to require site preparation activities because the equipment is generally not very large and could often be constructed onto existing foundations. In the event that some site preparation is necessary for these types of control technologies, plots would be small in area, thus, requiring little water for fugitive dust control. Therefore, little or no water for dust suppression purposes is expected to be needed for construction of thermal incinerators, vapor combustors, or vapor recovery units.

TABLE 3.4-4

Potential Control Technologies and Potential Water Use and Wastewater Generation during Equipment Operations

Potential Control Technology	Uses Water?	Exceeds threshold?	Generates Wastewater?	Exceeds Threshold?
Domes on Storage Tanks	No	No	No	No
Vapor Recovery Unit	No	No	No	No
Thermal Incinerator	No	No	No	No
Vapor Combustor	No	No	No	No
Additional Lime Injection	Yes	No	No	No
Wet Gas Scrubbers	Yes	Yes	Yes	No
Electrostatic Precipitator (Dry)	No	No	No	No
Electrostatic Precipitator (Wet)	Yes	No	Yes	No
Increased LDAR	No	No	No	No
SO_2 Reducing Catalyst	No	No	No	No
LoTOX™	Yes	Yes	Yes	No
Selective Catalytic Reduction	No	No	No	No

For larger air pollution control equipment, e.g., ESPs, WGSs (including LoTOx) and SCRs, site preparation activities requiring water for dust control would likely be necessary. For example, it is assumed that one water truck per affected refinery may be needed for dust suppression activities during the initial site preparation/earth moving to install large air pollution control equipment. One water truck used for dust control can hold approximately 6,000 gallons and it can be refilled over the course of the day if more than 6,000 gallons is needed. A WGS is one of the largest types of potential air pollution control equipment that could be installed as part of the Expedited BARCT Implementation Schedule. A typical WGS system could require an area of approximately 6,000 square feet. By applying one gallon of water per square foot of disturbed area, at a minimum of two times per day to minimize fugitive dust, the total amount of water expected to be used for dust suppression is approximately 12,000 gallons per day for each affected facility. Installation of the controls required under the Schedule might include large construction projects that involve site preparation activities requiring water for dust control, such as construction of LoTOx or SCR at the coke calciner; ESPs or WGS units at two refinery FCCUs for reducing particulate matter emissions; and a WGS at a third refinery FCCU for reducing particulate matter and SO_2 emissions. Table 3.4-5 summarizes the potential water demand associated with the potential overlap of site preparation/earth moving activities. While the actual construction and site preparation/earth moving activities that may occur under the Expedited BARCT Implementation Schedule may not overlap, it is reasonable to assume that there is a potential for overlap due to the process and time

restraints placed by the individual rule development projects. As shown, even in the unlikely event that site preparation/earth moving activities for four construction projects were to coincide and each use water simultaneously, an estimated 48,000 gallons per day of water would be expected to be used for dust suppression activities, which would be less than the significance threshold for water demand. This analysis assumes that all water used for dust suppression activities is potable water. It is likely that the affected facilities have access to reclaimed water supplies, which could be used instead of potable water for dust suppression activities. Finally, once construction is complete, water demand for fugitive dust control activities would cease.

TABLE 3.4-5

Estimated Water Use During Construction of Control Equipment

Air Pollution Control Equipment	Estimated Size of Grading (sq ft)	Estimated Water Needed for Dust Suppression (gal/day)
Individual Refinery WGS, LoTOx, SCR, or ESP (1 Unit)	6,000	12,000
Potential Overlapping Site Preparation/Earth Moving Activities		
Refinery WGS or ESP (3 Units)	18,000	36,000
Coke calciner SCR (1 Unit)	6,000	12,000
Total	**-**	**48,000**
Significance Threshold	**-**	**263,000**
Significant?	**-**	**No**

3.4.4.1.2 Operation

Additional Lime Injection

Hydrated lime is mixed with water to create a slurry for use in the cement kiln for emission control. It is assumed that the cement kiln will use a 25 percent hydrated lime solution, the same concentration that is currently used at the facility; however, increased lime injection will be used to remove SO_2 emissions. The use of approximately 5,800 tons per year of lime, would result in the increased use of 4,752,000 gallons per year or approximately 13,000 gallons per day. The water use for the existing lime injection system is from the plant's reclaimed water system. It is expected that some or all of the increase in water use for the increase in lime injection would come from the reclaimed water system as well; however, for this EIR, it is conservatively assumed that the increase in water use is potable water.

Wet Electrostatic Precipitator

Installation of ESPs may occur under the Expedited BARCT Implementation Schedule. ESPs could be used to control PM emissions from FCCUs. Dry ESPs require no water, while wet ESP use water spray/mist to entrain the particulates and remove them from the gas stream.

The SCAQMD required additional control of particulates from FCCUs at refineries in southern California. All refineries installed new dry ESPs or upgraded existing dry ESPs, and one refinery

installed a WGS and wet ESP to comply with SCAQMD Rule 1105.1. Wet ESPs are used in situations for which dry ESPs are not suited, such as when the material to be collected is wet, sticky, flammable, explosive, or has high resistivity (U.S. EPA, 2018). The use of dry ESPs would not require water usage. The use of wet ESPs would require additional water, which is used as part of the emission control process. Instead of potable water, it is likely that each affected refinery operator would utilize strip sour water or similar existing treated waste process water from elsewhere within each refinery. Because existing sources of wastewater, e.g., strip sour water or similar existing treated wastewater, could be used to operate a wet ESP, demand from installing new add-on control equipment would be minimal. In addition, wastewater from the wet ESP can be treated and recycled back to the wet ESP, further minimizing water demand impacts. Thus, the impacts of installing ESPs on future water demand at an affected facility are not expected to exceed any applicable water demand significance thresholds because dry ESPs are more likely to be utilized.

Wet Gas Scrubber – Operation

One wet ESP and WGS were installed on the FCCU at the Phillips 66 Los Angeles Refinery to control sulfur oxide emissions, as well as PM_{10} and $PM_{2.5}$ emissions. The environmental analysis for this project indicated that the expected water demand associated with the WGS was about 300 gallons per minute (432,000 gallons per day) (SCAQMD, 2007). WGS systems of this size are primarily designed for large emission sources (e.g., refineries and other large manufacturing facilities). The water demand from LoTOx, which operates similar to a wet scrubber, is expected to be similar to a WGS. The water demand from one new WGS of this size would exceed the CEQA significance threshold for water demand of 263,000 gallons per day. District staff has estimated that up to three WGS systems, one LoTOx system, and additional lime injection may be implemented to comply with the Expedited BARCT Implementation Schedule. If all three WGS are required, along with one LoTOx unit and additional lime injection, the total water usage is estimated to be up to 1,741,000 gal/day, as summarized in Table 3.4-6. Therefore, operational impacts to water demand are considered to be significant.

TABLE 3.4-6

Estimated Operational Water Use of Expedited BARCT Implementation Schedule

Equipment	Estimated Operational Water Use (gal/day)
Refinery WGS (3 Units)	1,296,000
Coke Calciner LoTOX	432,000
Cement Kiln Lime Injection	13,000(1)
Maximum Daily Water Usage	**1,741,000**
Significance Threshold	**263,000**
Significant?	**Yes**

(1) A portion of this water is expected to be reclaimed water.

Conclusion

Based upon the above considerations, water demand impacts from installing three WGS on refinery FCCUs, a LoTOX on a coke calciner, and additional lime injection at a cement kiln may exceed applicable water demand significance thresholds and, therefore, water demand impacts are concluded to be significant.

3.4.4.2 Potential Water Quality Impacts

Increased demand for water from the various control technologies generally will be proportional to any increases in wastewater generation from affected facilities; however, there are a number of factors that affect wastewater generation. As with quantifying water demand, there is insufficient information available to calculate the volumes of wastewater from control equipment for the following reasons. First, not all of the additional water demand generated by installing air pollution control equipment would ultimately be discharged as wastewater. In some control systems, a portion of the increased water demand would be emitted as steam or would evaporate during the control process. To determine this evaporation rate, it is necessary to know the operating temperature and humidity in the vicinity of the equipment, which are currently unknown. In addition, wastewater discharge requirements under a facility's Industrial Wastewater Discharge Permit (IWDP) and current wastewater discharge rates need to be known. To the extent possible and based on available information, water quality impacts from air pollution control technologies that use water as part of the control process are evaluated in the following subsections.

3.4.4.2.1 Construction Activities

Water used for dust suppression activities typically wets the top one to two inches of soil, evaporates and then forms a soil crust. As a result, this water does not flow into storm drains, sewers or other water collection systems and, therefore, water runoff from dust suppression activities would not be expected to occur and water quality impacts from dust suppression activities are concluded to be less than significant.

3.4.4.2.2 Operation

Since additional water would be needed as part of certain types of air pollution control equipment, the proposed project could increase the wastewater generated by each affected facility. The cement kiln uses lime injection in the form of lime slurry, where powder hydrated lime is mixed with water to create a 25 percent hydrated lime solution. The slurry is sprayed together with the conditioning water into the kiln's exhaust flue gas. The water in the hydrated lime slurry is then evaporated by the hot gases. Therefore, the water used to make the slurry is not expected to result in any additional wastewater discharges because the water is evaporated in the kilns.

Wastewater from WGS, ESP, and LoTOx systems is collected and flows into a sump where it is typically treated. The wastewater is treated in the facility's wastewater treatment plant and then discharged or recycled to minimize the water demand and wastewater generated from the equipment.

Depending on the facility's wastewater treatment system, the effluent may be further treated and discharged to the sanitary sewer system. WGS, ESP, and LoTOx systems would be used on

FCCUs or coke calciners, which currently have wastewater discharges and wastewater treatment systems. Depending on the type of WGS or LoTOx, some water may be lost as steam. For these reasons, it is not expected that wastewater would exceed a facility's current wastewater discharge limits, require changes to existing wastewater permit conditions, or require new wastewater permits. Refineries are large users of water, have large wastewater discharges, and have large wastewater treatment facilities. Changes to existing permit conditions would not likely be required and no violations of existing IWDPs, NPDES permits, or other wastewater permit limits are expected. Wastewater discharges from an industrial facility would be required to be discharged in compliance with applicable wastewater discharge permits. Therefore, water quality impacts from the operation of WGS, ESP, and LoTOx systems are not expected to exceed any applicable water quality significance thresholds, so water quality impacts during operation are concluded to be less than significant.

Once recycled, wastewater generated by the WGS, ESP, and LoTOx systems can also be returned to the equipment for reuse, which would reduce the total amount of water required for air pollution control, as well as the amount of wastewater discharged into the sewer system.

3.4.4.3 Conclusion

Based upon the above considerations, water quality impacts from installing most types of air pollution control equipment that use water as part of the control process would not exceed applicable water quality significance thresholds and, therefore, are concluded to be less than significant.

3.4.5 MITIGATION MEASURES

3.4.5.1 Water Demand

Because it was concluded that if wet gas scrubbers, additional lime injection, and LoTOx systems are installed as a response to the Expedited BARCT Implementation Schedule, potential future water demand impacts from the proposed systems during operation would be significant, mitigation measures for water demand are required. Therefore, for any affected facility that installs an air pollution control technology that increases demand for water, the following water demand mitigation measures will apply.

HWQ-1 When air pollution control equipment is installed and water is required for its operation, the facility is required to use recirculated, reclaimed, or recycled water, if available, to satisfy the water demand for the air pollution control equipment.

HWQ-2 In the event that reclaimed or recycled water cannot be delivered to the affected facility, the facility is required to submit a written declaration with the application for a Permit to Construct for the air pollution control equipment, to be signed by an official of the water purveyor indicating the reason(s) why reclaimed or recycled water cannot be supplied to the project.

3.4.5.2 Remaining Impacts

In spite of implementing the mitigation measures identified above, water demand impacts during operation of the proposed project remain significant, in part because there is currently no guarantee that reclaimed water will be available to all of the affected facilities and because of the prevalence of drought conditions in California. The use of recirculated, reclaimed, or recycled water may be able to reduce water demand from these control systems, however, the availability and feasibility of procuring and using these water sources in the future is not currently known, and would be dependent on the individual equipment design and site-specific considerations of water availability. Therefore, impacts associated with the proposed project will remain significant after mitigation for water demand.

With regard to water quality, it was concluded that impacts would be less than significant, so no mitigation measures are required.

3.4.6 CUMULATIVE IMPACTS

In the above analyses of construction water demand and water quality it was concluded that impacts would be less than significant. Similarly, it was concluded that water quality impacts from the proposed project during operation would be less than significant. Therefore, because construction water quality and water demand impacts and operational water quality impacts were concluded to be less than significant, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative impacts for these environmental topic areas.

In the above analysis of water demand impacts from the proposed project during operation it was concluded that installing WGS, additional lime injection, and LoTOx systems has the potential to generate significant adverse operational water demand impacts. Therefore, operational water demand impacts during operation of the proposed project are considered to be cumulatively considerable for the Expedited BARCT Implementation Schedule (CEQA Guidelines §15064 (h)(1)).

CHAPTER 3.5

OTHER CEQA SECTIONS

Growth Inducing Impacts
Significant Environmental Effects Which Cannot Be Avoided And Significant Irreversible Environmental Changes
Potential Environmental Impacts Found Not to be Significant

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3.5 OTHER CEQA SECTIONS

3.5.1 GROWTH INDUCING IMPACTS

3.5.1.1 Introduction

CEQA defines growth-inducing impacts as those impacts of a proposed project that "could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects, which would remove obstacles to population growth" (CEQA Guidelines §15126.2(d)).

To address this issue, potential growth-inducing effects are examined through the following considerations:

- Facilitation of economic effects that could result in other activities that could significantly affect the environment;
- Expansion requirements for one or more public services to maintain desired levels of service as a result of the proposed project;
- Removal of obstacles to growth, e.g., through the construction or extension of major infrastructure facilities that do not presently exist in the project area or through changes in existing regulations pertaining to land development;
- Adding development or encroachment into open space; and/or
- Setting a precedent that could encourage and facilitate other activities that could significantly affect the environment.

3.5.1.2 Economic and Population Growth, and Related Public Services

The Expedited BARCT Implementation Schedule would not directly foster economic or population growth or the construction of new housing in the Bay area. The Expedited BARCT Implementation Schedule may require construction of air pollution control equipment or operational measures/modifications within the confines of the existing industrial facilities but would not be expected to involve new development outside of existing facilities. Therefore, it would not stimulate significant population growth, remove obstacles to population growth, or necessitate the construction of new community facilities that would lead to additional growth.

A project would directly induce growth if it would directly foster economic or population growth or the construction of new housing in the surrounding environment (e.g., if it would remove an obstacle to growth by expanding existing infrastructure). The proposed rule amendments would not remove barriers to population growth, as it involves no changes to General Plan, zoning ordinance, or related land use policy. The proposed rule amendments do not include the development of new housing or population-generating uses or infrastructure that would directly

encourage such uses. Therefore, the Expedited BARCT Implementation Schedule would not directly or indirectly trigger new residential development in the District.

Further, the Expedited BARCT Implementation Schedule would not result in an increase in local population, housing, or associated public services (e.g. fire, police, schools, recreation, and library facilities) since the proposed project would not result in an increase in permanent workers or residents. Additional workers would be limited to temporary construction workers. Likewise, the proposed project would not create new demand for secondary services, including regional or specialty retail, restaurant or food delivery, recreation, or entertainment uses. As such, the proposed project would not foster economic or population growth in the surrounding area in a manner that would be growth-inducing.

3.5.1.3 Removal of Obstacles to Growth

The Expedited BARCT Implementation Schedule would not employ activities or uses that would result in growth inducement, such as the development of new infrastructure (i.e., new roadway access or utilities, such as wastewater treatment facilities) that would directly or indirectly cause the growth of new populations, communities, or currently undeveloped areas. Likewise, the Expedited BARCT Implementation Schedule would not result in an expansion of existing public service facilities (e.g., police, fire, libraries, and schools) or the development of public service facilities that do not already exist.

3.5.1.4 Development of Encroachment Into Open Space

Development can be considered growth-inducing when it is not contiguous to existing urban development and introduces development into open space areas. The Expedited BARCT Implementation Schedule may require additional air pollution control equipment and measures within the confines of existing facilities and existing industrial areas. New development outside of the boundaries of industrial facilities is not expected to occur. Therefore, the proposed rule amendments would not result in development within or encroachment into an open space area.

3.5.1.5 Precedent Setting Action

The Expedited BARCT Implementation Schedule would lead to further control of criteria pollutant emissions. The type of control equipment that would be implemented as part of the proposed project (e.g., SCRs, ESPs, thermal oxidizers, WGS, etc.) has been used and proven to be effective at other industrial facilities. Requiring technologies and measures that have been demonstrated to be effective to control air emissions from the affected industrial facilities would not result in precedent-setting actions that might cause significant environmental impacts.

3.5.1.6 Conclusion

The Expedited BARCT Implementation Schedule would not be considered growth-inducing, because they would not result in an increase in production of resources or cause a progression of growth that could significantly affect the environment either individually or cumulatively.

3.5.2 SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED AND SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Section 15126.2(b) of the CEQA Guidelines requires that an EIR describe significant environmental impacts that cannot be avoided, including those effects that can be mitigated but not reduced to a less than significant level. As evaluated in the preceding portions of Chapter 3 of this EIR, the proposed rule amendments would result in potentially significant unavoidable impacts as identified in Table 3.5-1.

TABLE 3.5-1

IMPACTS IDENTIFIED AS POTENTIALLY SIGNIFICANT IN THIS EIR FOR IMPLEMENTATION OF THE EXPEDITED BARCT IMPLEMENTATION SCHEDULE

POTENTIALLY SIGNIFICANT IMPACTS
ROG, NOx, PM_{10}, and $PM_{2.5}$ Emission Impacts During Construction
Water Demand Impacts

3.5.3 POTENTIAL ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

The environmental effects of the Expedited BARCT Implementation Schedule that may have potentially significant adverse effects on the environment are identified, evaluated, and discussed in detail in the preceding portions of Chapter 3 of this EIR and in the Initial Study (see Appendix A) per the requirements of the CEQA Guidelines (§§15126(a) and 15126.2). The potentially significant adverse environmental impacts as determined by the Initial Study (see Appendix A) are: air quality, hazards and hazardous materials, hydrology and water quality, and utilities and service systems. The water demand impacts were determined to be significant under hydrology/water quality and utilities/services. To avoid repetition, the water demand impacts have been consolidated under the hydrology and water quality impacts section in Chapter 3.4 of this EIR. The analysis provided in the Initial Study has concluded that impacts on the following environmental topics would be less than significant: aesthetics; agriculture and forestry resources; biological resources; cultural resources; geology and soils; greenhouse gas emissions, land use and planning; mineral resources; noise; population and housing; public services; recreation; transportation and traffic; tribal cultural resources; and utilities and service systems. The reasons for finding impacts to the environmental resources to be less than significant are explained in the following subsections, which are summarized from the NOP/IS (see Appendix A) unless otherwise noted.

3.5.3.1 Aesthetics

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to existing industrial structures. Some BARCT measures are not expected to be visible outside of the existing facility. This would include covering portions of petroleum wastewater treatment

facilities, lime injection at cement plants, use of SO_2 reducing catalysts, and increased LDAR.

Other BARCT measures would include the installation of equipment that may be visible outside of the existing industrial facilities, however, these facilities are located in industrial areas which do not have scenic views or scenic resources. For example, domes on storage tanks increase the height of the storage tanks making them more visible to the areas surrounding the storage tanks. However, storage tanks are generally located at refineries, bulk handling and storage facilities, or manufacturing facilities and are located within industrial areas. Thus, they are not expected to have significant adverse aesthetic impacts to the surrounding community. Additionally, new air pollution control equipment is not expected to block any scenic vista, degrade the visual character or quality of the area, or result in significant adverse aesthetic impacts.

The industrial facilities affected by the Expedited BARCT Implementation Schedule may need to install or modify air pollution control equipment to reduce criteria pollutant emissions from their facilities. These facilities are existing industrial facilities that currently operate or can operate 24 hours a day and have existing lighting for nighttime operations. For example, refineries operate continuously 24 hours per day, 7 days per week and are already lighted for nighttime operations. The same is true for most other types of manufacturing operations. Therefore, the Expedited BARCT Implementation Schedule is not expected to require any additional lighting to be installed as a result of new air pollution control equipment or control measures. New light sources, if any, would be located in industrial areas and are not expected to be noticeable in residential areas. Most local land use agencies have ordinances that limit the intensity of lighting and its effects on adjacent property owners. Therefore, the Expedited BARCT Implementation Schedule is not expected to have significant adverse aesthetic impacts to the surrounding community.

3.5.3.2 Agriculture and Forestry Resources

Physical modifications at facilities due to the proposed project are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to existing industrial structures. This equipment would be compatible with the existing industrial character of the area and would not be located in agricultural or forestland areas. Thus, no impacts to agriculture and forestry resources are expected.

The proposed project would not conflict with existing agriculture related zoning designations or Williamson Act contracts. Existing agriculture and forest resources within the boundaries of the Air District are not expected to be affected by the construction of additional air pollution control equipment or modification to existing emission sources. Therefore, there is no potential for conversion of farmland to non-agricultural use or conflicts related to agricultural uses or land under a Williamson Act contract, or impacts to forestland resources.

3.5.3.3 Biological Resources

Physical modifications at facilities due to the Expedited BARCT Implementation Schedule are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to

existing industrial structures. These facilities have been built and graded and no major grading would be expected to occur due to the installment of additional air pollution control equipment. Construction activities would occur within industrial areas, where native biological resources have been removed or are non-existent. Thus, the proposed project is not expected to result in any impacts to biological resources.

The proposed project is not expected to affect land use plans, local policies or ordinances, or regulations protecting biological resources such as a tree preservation policy or ordinances for the reasons already given. Land use and other planning considerations are determined by local governments and land use or planning requirements are not expected to be altered by the proposed project. Similarly, the Expedited BARCT Implementation Schedule is not expected to affect any habitat conservation or natural community conservation plans, biological resources or operations, and would not create divisions in any existing communities, as construction activities would be limited to existing facilities in industrial areas that have already been developed and graded.

3.5.3.4 Cultural Resources

Generally, resources (buildings, structures, equipment) that are less than 50 years old are excluded from listing in the National Register of Historic Places unless they can be shown to be exceptionally important. The Expedited BARCT Implementation Schedule would result in control measures and new air pollution control equipment to be constructed within the confines of the existing industrial facilities and adjacent to existing industrial structures. Affected facilities may have equipment or structures older than 50 years, however, this type of equipment does not meet the criteria identified in CEQA Guidelines §15064.5(a)(3). Further, construction activities associated with the proposed project are expected to be limited to industrial areas that have already been developed. Thus, the Expedited BARCT Implementation Schedule would not adversely affect historical or archaeological resources as defined in CEQA Guidelines §15064.5, destroy unique paleontological resources or unique geologic features, or disturb human remains interred outside formal cemeteries. Therefore, no impacts to cultural resources are anticipated to occur as a result of the proposed project as no major construction activities are required.

3.5.3.5 Geology and Soils

Physical modifications at facilities due to the Expedited BARCT Implementation Schedule are expected to be limited to industrial facilities. New development potentially resulting in earthquake hazards are expected to be limited to the construction of air pollution control equipment or measures at industrial facilities. New construction (including modifications to existing structures) requires compliance with the California Building Code. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage. The California Building Code bases seismic design on minimum lateral seismic forces (“ground shaking”). The California Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the California Building Code seismic design require

determination of the seismic zone and site coefficient, which represent the foundation conditions at the site. Compliance with the California Building Code would minimize the impacts associated with existing geological hazards.

Construction associated with the proposed project is expected to be limited to air pollution control equipment at industrial facilities. All construction would take place at already existing facilities that have been previously graded. Thus, the proposed project is not expected to result in substantial soil erosion or the loss of topsoil as construction activities are expected to be limited to existing operating facilities that have been graded and development, so that no major grading would be required.

3.5.3.6 Greenhouse Gas Emissions

While the primary purpose of the Expedited BARCT Implementation Schedule is to reduce emissions of ROG, NOx, SO_2, and PM, some types of control equipment have the potential to create secondary adverse air quality impacts and create GHG emissions, through construction activities or through the additional of air pollution control equipment. The Expedited BARCT Implementation Schedule may result in the installation of new equipment at facilities that need to comply with the new requirements.

Limited construction activities may be required under the Expedited BARCT Implementation Schedule to enclose open fugitive components, install new catalyst, install lime injection systems, and so forth. Construction emissions associated with this type of construction would be minor and would involve the transport of the new equipment which is expected to require one to two truck trips. Installation of the equipment would be expected to be limited to one to two workers and would not require any major construction equipment and no site preparation activities are expected to be required. Therefore, retrofitting this type of existing equipment would result in minor construction emissions.

Construction activities would also be required for the construction of new air pollution control equipment at existing facilities, including vapor combustors, wet gas scrubbers, selective catalytic reduction, ESPs, vapor recovery systems, and LoTOX systems. The equipment associated with the Expedited BARCT Implementation Schedule would be required at existing facilities with large emission sources, e.g., refinery FCCUs. Construction activities for these types of new air pollution control equipment would be temporary. Each of these sources that might be subject to the Expedited BARCT Implementation are subject to the Cap-and-Trade Program and its greenhouse gas emissions are required to comply with the requirements of the Cap-and-Trade Programs. As a result, the greenhouse gas emission impacts resulting from the Expedited BARCT Implementation Schedule will be less than significant, since these emissions are part of a state plan aimed at reducing GHG emissions.

The facilities affected by the Expedited BARCT Implementation Schedule could require the installation of additional air pollution control equipment or the implementation of new measures to control criteria pollutants. These measures could generate additional GHG emissions. However, the facilities subject to the Expedited BARCT Implementation Schedule must comply with the Cap and Trade Program, a requirement that the Expedited BARCT Implementation

Schedule will not change. The Expedited BARCT Implementation Schedule will therefore have a less than significant impact on GHG emissions.

3.5.3.7 Land Use and Planning

Physical modifications at facilities due to the Expedited BARCT Implementation Schedule are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities that have already been graded and developed. Thus, the proposed project is not expected to have impacts to non-industrial land uses and would not result in impacts that would physically divide an established community.

The General Plans and land use plans for areas with industrial land uses, generally allow for and encourage the continued use of industrial areas within their respective communities. Some of the General Plans encourage the modernization of existing industrial areas, including refineries (Benicia, 2015 and Santa Clara, 2011). The construction of equipment within the confines of existing facilities is not expected to conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the affected industrial facilities. The jurisdictions with land use approval recognize and support the continued use of industrial facilities. The construction required as part of the proposed project would not interfere with those land use policies or objectives.

The proposed project has no components which would affect land use plans, policies, or regulations. Regulating emissions from existing facilities will not require local governments to alter land use and other planning considerations. Habitat conservation or natural community conservation plans, agricultural resources or operations, would not be affected by the proposed project, and divisions of existing communities would not occur. Therefore, current or planned land uses within the District will not be significantly affected as a result of the proposed project.

3.5.3.8 Mineral Resources

Construction activities would occur within the confines of existing industrial facilities that have already been graded and developed. Construction of air pollution control equipment and modifications to existing industrial facilities as a result of the proposed project is not expected to affect mineral resources. Construction and operation of new equipment associated with proposed project is not expected to require mineral resources that are of value to the region or result in the loss of a locally important mineral resource site. Thus, no significant adverse impacts to mineral resources are expected.

3.5.3.9 Noise

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities and adjacent to existing industrial

structures. 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 facility premises. Construction required for the installation of air pollution control equipment or facility modifications is not expected to significantly alter the existing noise of an industrial facility. Construction activities associated with the proposed project would generate temporary noise associated with construction equipment and construction-related traffic. Construction would likely require truck trips to deliver equipment, construction workers, and construction equipment (e.g., forklift, welders, backhoes, cranes, and generators). All construction activities would be temporary, would occur during daylight hours, and would occur within the confines of existing industrial facilities so that no significant increase in noise during construction activities is expected.

Air pollution control equipment is not generally a major noise source. The equipment would be located within heavy industrial areas and compatible with such uses. Further, all noise producing equipment must comply with local noise ordnances and applicable OSHA and Cal/OSHA noise requirements. Therefore, industrial operations affected by the Expedited BARCT Implementation Schedule are not expected to have a significant adverse effect on local noise levels or noise ordinances.

The proposed project is not expected to generate or expose people to excessive groundborne vibration or groundborne noise. The use of large construction equipment that would generate substantial noise or vibration (e.g., backhoes, graders, jackhammers, etc.) would be limited because the sites are already graded and developed. Further, construction activities are temporary and would occur during the daylight hours, in compliance with local noise standards and ordinances. Therefore, the proposed project is not expected to generate excessive groundborne vibration or noise.

Affected facilities would still be expected to comply, and not interfere, with any applicable airport land use plans. None of the Expedited BARCT Implementation Schedule requirements would locate residents or commercial buildings or other sensitive noise sources closer to airport operations. There are no components of the Expedited BARCT Implementation Schedule that would substantially increase ambient noise levels within or adjacent to airports. Therefore, these topics will not be further evaluated in the EIR.

3.5.3.10 Population and Housing

The population in the Bay Area is currently about 7.6 million people and is expected to grow to about 9.6 million people by 2040 (ABAG, 2017). The proposed project is not anticipated to generate any significant effects, either directly or indirectly, on the Bay Area's population or population distribution. The proposed project will require construction activities to modify existing operations and/or install air pollution control equipment at existing industrial facilities. It is expected that the existing labor pool would accommodate the labor requirements for the construction of the new and modified industrial equipment. In addition, it is not expected that the affected facilities would need to hire additional personnel to operate new air pollution control equipment. In the event that 1-2 new employees are hired, the existing local labor pool in the District (over seven million people) can accommodate any increase in demand for workers that

might occur as a result of adopting the Expedited BARCT Implementation Schedule. The proposed project is not expected to result in the creation of any industry/business 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 Bay Area.

3.5.3.11 Public Services

There is no potential for adverse public service impacts as a result of adopting the Expedited BARCT Implementation Schedule as it would not result in the need for new or physically altered government facilities to maintain acceptable service ratios, response times, or other performance objectives. Additionally, most of the affected refineries have on site security and fire protection personnel, so no increase in police or fire protection services is expected. Implementing the proposed rule would not cause a future population increase, thus it is not expected to affect land use plans, future development, or the demand for public facilities such as schools and parks.

3.5.3.12 Recreation

As discussed under "Land Use and Planning" and "Population and Housing," there are no provisions of the proposed project that would affect land use plans, policies, ordinances, or regulations as land use and other planning considerations are determined by local governments. No land use or planning requirements, including those relating to recreational facilities, will be altered by the proposed rule amendments. The proposed project does not have the potential to directly or indirectly induce population growth or redistribution. As a result, the proposed project would not increase the use of, or demand for, existing neighborhood or regional parks or other recreational facilities nor require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

3.5.3.13 Transportation and Traffic

Physical modifications at facilities due the Expedited BARCT Implementation Schedule are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities and adjacent to existing industrial structures.

Construction would likely require truck trips to deliver equipment, construction workers, and construction equipment (e.g., forklift, welders, backhoes, cranes, and generators). All construction activities and related traffic would be temporary, would occur during daylight hours, would occur within the confines of existing industrial facilities, and would cease following the completion of construction. As discussed in "Population and Housing" above, the labor force in the Bay Area is sufficient to handle the temporary increase in construction-related jobs. No increase in permanent workers is expected due to the installation of additional air pollution control equipment or facility modifications. The installation of some air pollution control equipment, e.g., SCRs and wet gas scrubbers, could result in an increase of about 1-2 trucks per week to deliver ammonia, catalyst or caustic materials to the facilities for the operation of the equipment. The increase in one truck per day would be a negligible increase in traffic in the Bay Area.

The proposed project is not expected to affect the performance of mass transit or non-motorized travel to street, highways and freeways, pedestrian or bicycle paths, as no increase in permanent workers is expected. No conflicts with any congestion management programs, to include level of service and travel demand measures, or other standards established by county congestion management agencies for designated roads or highways are expected. No changes are expected to parking capacity at or in the vicinity of affected facilities as the proposed project only pertain to equipment located within existing industrial facilities. Therefore, no significant adverse impacts resulting in changes to traffic patterns or levels of service at local intersections are expected.

The Expedited BARCT Implementation Schedule is not expected to: (1) involve the delivery of materials via air so no increase in air traffic is expected or change air traffic patterns; (2) create traffic hazards or create incompatible uses; (3) impact emergency access at industrial facilities affected by the proposed project, as no modifications that effect traffic or access are expected to be required; (4) increase vehicle trips or to alter the existing long-term circulation patterns, thus creating traffic hazards; (5) affect the performance of mass transit or non-motorized travel to street, highways and freeways, pedestrian or bicycle paths as construction is expected to be limited to existing industrial facilities; (6) result in an increase in permanent workers; or (7) conflict with any congestion management programs or other plans, increase travel demand, impact public transit, or impact bicycle or pedestrian safety. Therefore, no impacts resulting in changes to traffic patterns or adopted traffic plans or programs are expected.

3.5.3.14 Tribal Cultural Resources

The proposed Expedited BARCT Implementation Schedule may require the construction of air pollution control equipment and facility modifications to industrial facilities. Affected facilities may have equipment or structures older than 50 years, however, this type of equipment does not meet the criteria identified in CEQA Guidelines §15064.5(a)(3), are not listed or eligible for listing in the California Register of Historic Resources or a local register of historical resources (Public Resources Code Section 5020.1(k), and are not considered to have cultural value to a California Native American tribe.

Construction associated with the proposed project is expected to be limited to the construction at industrial facilities. All construction would take place at existing facilities that have been previously graded. Because construction will be limited to facilities that have been graded, the Expedited BARCT Implementation Schedule is not expected to require physical changes to a site, feature, place, cultural landscape, sacred place or object with cultural value to a California Native American Tribe. The Expedited BARCT Implementation Schedule is not expected to result in a physical change to a resource determined to be eligible for inclusion or listed in the California Register of Historical Resources or included in a local register of historical resources.

As part of releasing the NOP/IS for public review and comment, the document was circulated to the State Clearinghouse that provides notice of the proposed project to all California Native American Tribes that requested to be on the Native American Heritage Commission's (NAHC) notification list per Public Resources Code § 21080.3.1(b)(1). The NAHC notification list provides a 30-day period during which a Native American Tribes may respond to the notice, in writing,

requesting consultation on the Expedited BARCT Implementation Schedule. No tribes have requested consultation.

Since construction activities will be limited to existing industrial facilities, the Expedited BARCT Implementation Schedule is not expected to affect historical or tribal resources as defined in Public Resources Section 5020.1(k), or 5024.1. Therefore, no impacts to tribal resources are anticipated to occur as a result of the proposed project.

3.5.3.15 Utilities and Service Systems

The potential water use and wastewater impacts associated with the Expedited BARCT Implementation Schedule were discussed under Hydrology and Water Quality.

Air pollution control equipment and facility modifications to implement the Expedited BARCT Implementation Schedule would occur within the confines of existing industrial facilities where stormwater is already controlled. The proposed project is not expected to require additional paving that would generate additional stormwater runoff. Therefore, the proposed project would not be expected to alter the existing drainage systems or require the construction of new storm water drainage facilities. Nor would the proposed project create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Therefore, no significant adverse impacts on storm drainage facilities are expected.

Construction of air pollution control equipment as a result of the Expedited BARCT Implementation Schedule is not expected to significantly increase solid or hazards wastes generated by the affected existing facilities. Some air pollution control equipment uses catalysts that need to be replaced when it is depleted. The catalyst is usually recycled because of the metal content of the catalyst and would not be expected to generate additional hazardous or solid waste that requires disposal. Waste streams from affected facilities would be treated/disposed/recycled in the same manner as they currently are handled. Therefore, no significant impacts to hazardous or solid waste disposal facilities are expected due to the proposed project. Facilities are expected to continue to comply with all applicable federal, state, and local statutes and regulations related to solid and hazardous wastes.

While potential electricity and natural gas impacts were not discussed in the NOP/IS, this EIR provides a discussion of potential electricity and natural gas impacts. The California Energy Commission tracks both electricity and natural gas consumption for the state of California. A summary of the annual consumption of both electricity and natural gas is provided below in Table 3.5-2.

Table 3.5-2

Bay Area Natural Gas and Electricity Consumption, 2016(1)

County	Electricity (million kWH)	Natural Gas Use (million therms)
Alameda	10815	361
Contra Costa	9644	1136
Marin	1343	66
Napa	1058	36
San Francisco	5759	227
San Mateo	4340	200
Santa Clara	16777	421
Solano	3207	254
Sonoma	2965	106
Total	**55907**	**2807**

(1) CEC, 2018

A number of the rule development projects under the Expedited BARCT Implementation Schedule would require electricity as part of installing or modifying existing air pollution control equipment. Electricity could be utilized to operate certain construction equipment in lieu of diesel, such as welders and temporary lights, if electricity is available. Any additional electricity that may be needed as part of construction activities associated with the proposed project would typically be supplied by the local electrical utility; however, the majority of construction equipment is diesel-powered and does not require electricity. Thus, electricity use during construction activities would be minor.

Implementation of the Expedited BARCT Implementation Schedule would result in the installation of air pollution control equipment that would increase electricity use during operation. Table 3.5-3 provides estimates of electricity demand associated with the operation of the air pollution control equipment that would be expected as a result of the Expedited BARCT Implementation Schedule. Note that because ESPs have a higher electricity demand than WGS, ESP electricity demand was considered for this analysis to provide a conservative estimate.

Overall the electricity demand created by the proposed project is expected to be able to be met by local suppliers or the facility themselves as a number of refineries operate their own cogeneration units. The electricity would be used to further control emissions of criteria pollutants and assist the District in complying with ambient air quality standards; therefore, the electricity would not be used in a wasteful or inefficient manner. Thus, it is concluded the Expedited BARCT Implementation Schedule will not have a significant impact on electricity or use electricity in a wasteful manner.

Table 3.5-3

Annual Electricity Use of Air Pollution Control Equipment Associated with the Expedited BARCT Implementation Schedule

Control Equipment	Number of Units	Potential Increased Electricity Demand (MWhr/day)	Potential Increased Electricity Demand (Million kWH/yr)
WGS[(1)]	1	261	95.3
LoTox Scrubber[(2)]	1	261	95.3
SCR[(2)]	1	222	81.0
ESP[(3)]	2	803	293.1
Total		**1547**	**564.7**

(1) SCAQMD, 2007
(2) SCAQMD, 2015
(3) SCAQMD, 2007a

Of the air pollution control equipment that would be installed as a result of the Expedited BARCT Implementation Schedule, only vapor combustors, thermal incinerators, and vapor recovery units, collectively referred to as oxidizers, are expected to require the use of natural gas. The natural gas usage for one oxidizer is expected to be approximately 75 mmscf/yr. With a heating value of 1,050 mmbtu/scf and a total of 15 oxidizers expected to be installed as a result of the Expedited BARCT Implementation Schedule, the total natural gas usage is expected to be approximately 118 million therms/yr.

Overall, the natural gas use associated with the proposed project is expected to be met by local suppliers or the facility themselves as refineries general refinery fuel gas, which can be used in place of natural gas. The natural gas would be used to further control emissions of criteria pollutants and assist the District in complying with ambient air quality standards; therefore, the natural gas would not be used in a wasteful or inefficient manner. Thus, it is concluded the Expedited BARCT Implementation Schedule will not have a significant impact on natural gas or use natural gas in a wasteful manner.

CHAPTER 4

ALTERNATIVES ANALYSIS

Discussion of Alternatives
Description of Alternatives
Environmental Impacts of Project Alternatives
Conclusion
Comparison of Alternatives

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4.0 ALTERNATIVES ANALYSIS

4.1 DISCUSSION OF ALTERNATIVES

An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)). As discussed in Chapter 3 of this EIR the proposed project could result in significant impacts to air quality (ROG, NOx, PM_{10}, and $PM_{2.5}$) during construction activities and water demand associated with the operation of potential air pollution control equipment (WGS, LoTOX, and lime injection) associated with the Expedited BARCT Implementation Schedule. Therefore, alternatives analysis should focus on alternatives that avoid or minimize these potentially significant impacts. The project objectives are as follows:

1. Implement and/or install best available retrofit control technologies on industrial sources subject to CARB's Cap-and-Trade program, as defined by the AB 617 requirements;

2. Reduce criteria pollutant emissions from significant industrial sources that participate in CARB's Cap-and-Trade program;

3. Lessen the burden of air quality impacts on communities that suffer a disproportionate burden from air pollution; and

4. Comply with the requirements of AB 617.

Chapter 4 provides a discussion of alternatives to the proposed project as required by CEQA. According to the CEQA guidelines, alternatives should include feasible measures to attain the basic objectives of the proposed project and provide means for evaluating the comparative merits of each alternative. In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative (CEQA Guidelines, §15126.6(a)). The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation.

In accordance with CEQA Guidelines §15126.6(c), a CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and briefly explain the reason underlying the lead agency's determination. Section 15126.6(c) also states that among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (1) failure to meet most of the basic project objectives; (2) infeasibility; or (3) inability to avoid significant environmental impacts.

Alternatives that consider other rule development projects were rejected as infeasible because they would not be compliant or achieve the goals of AB 617. AB 617 requires air districts to review the emissions control technology installed on pollution sources located at industrial facilities subject to the Cap-and-Trade program. The schedule must give priority to any sources that have not had emissions limits modified for the greatest period of time. The schedule does not apply to sources that have implemented BARCT since 2007. No other rule development projects were identified that would comply with these requirements.

4.2 DESCRIPTION OF THE PROJECT ALTERNATIVES

The possible alternatives to the Expedited BARCT Implementation Schedule are limited by the nature of the project. Other than the No Project Alternative, the other alternative is limited to adjusting the timeline of the implementation schedule. This is because of the conditions imposed by AB 617, which define the scope and timeline of the project. Therefore, the alternatives will be limited to delaying the Expedited BARCT Implementation Schedule to its maximum extent while still complying with AB 617 (except for the No Project Alternative).

4.2.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

CEQA Guidelines §151216.6 (e) requires evaluation of a "No Project Alternative." Under the No Project Alternative, the Expedited BARCT Implementation Schedule would not be implemented. There would be no rule development activity for new rules or rule amendments to:

- Reduce ROG emissions from Organic Liquid Storage Tanks;
- Reduce ROG emissions associated with refinery wastewater treatment systems;
- Reduce PM and SO_2 emissions from Portland cement manufacturing;
- Reduce PM and SO_2 emissions from Refinery Fluid Catalytic Cracking Units and CO gas boilers;
- Reduce ROG emissions from fugitive heavy liquid leaks; and
- Reduce NOx emissions from petroleum coke calcining operations.

Under Alternative 1, no additional air pollution control equipment or measures (e.g., monitoring/repair of fugitive heavy liquid leaks) would be implemented. Alternative 1 would not comply with AB 617, which requires air districts to address industrial Cap-and-Trade facilities that do not have BARCT in place and adopt an Expedited BARCT Implementation Schedule. Therefore, Alternative 1 would not comply with the AB 617 requirements. Per CEQA Guidelines §15364, "feasible" "means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." Alternative 1 would not comply with the AB 617 requirements and would not be considered feasible at this time.

It should be noted that it would be unlikely that the District would remain out of compliance with AB 617 indefinitely and some action would likely be taken in the future to comply. Nonetheless, for the purpose of comparison and public disclosure, it will be assumed that no action will be taken under the No Project Alternative.

4.2.2 ALTERNATIVE 2 – BARCT DELAYED IMPLEMENTATION

AB 617 requires each air district that is in nonattainment for one or more air pollutants to adopt an expedited schedule for implementation of BARCT by the earliest feasible date, but no later than December 31, 2023. The Expedited BARCT Implementation Schedule is shown in Table 4.2-1 and shows that the applicable rules would be amended or adopted by third quarter of 2021. Alternative 2 would delay the Expedited BARCT Implementation Schedule so that all rules would not be implemented until 2023, which is the deadline for implementing monitoring and air pollution controls measures required under AB 617 (see Table 4.2-2). Therefore, the overlap of construction activities would be expected to be reduced; however, there will be a loss of operational emissions benefits (emissions reductions) for several years as compared to the proposed project.

TABLE 4.2-1

Proposed Project - Expedited BARCT Implementation Schedule

Rule Development Project	Pollutants Addressed	Anticipated Development Schedule	2018				2019				2020				2021			
Organic Liquid Storage Tanks	ROG	Q4 2018 – Q1 2020				■	■	■	■	■	■							
Petroleum Wastewater Treating	ROG	Q1 2019 – Q3 2020					■	■	■	■	■	■	■					
Portland Cement Manufacturing	PM, SO_2	Q2 2019 – Q2 2021						■	■	■	■	■	■	■	■	■		
Refinery Fluid Catalytic Crackers and CO Boilers	PM, SO_2	Q1 2019 – Q4 2020					■	■	■	■	■	■	■	■				
Refinery Heavy Liquids Leaks	ROG	Q1 2019 – Q4 2019					■	■	■	■								
Petroleum Coke Calcining	NOx	Q3 2020 – Q3 2021											■	■	■	■	■	

TABLE 4.2-2

Alternative 2 – Delayed BARCT Implementation Schedule

Rule Development Project	Pollutants Addressed	Anticipated Development Schedule	2018		2019		2020		2021		2022		2023	
Organic Liquid Storage Tanks	ROG	Q3 2019 – Q4 2020				■	■	■						
Petroleum Wastewater Treating	ROG	Q3 2020 – Q2 2022						■	■	■	■			
Portland Cement Manufacturing	PM, SO_2	Q1 2020 – Q2 2022					■	■	■	■	■			
Refinery Fluid Catalytic Crackers and CO Boilers	PM, SO_2	Q3 2020 – Q4 2022						■	■	■	■	■		
Refinery Heavy Liquids Leaks	ROG	Q3 2019 – Q2 2020				■	■							
Petroleum Coke Calcining	NOx	Q1 2023 – Q4 2023											■	■

4.3 ENVIRONMENTAL IMPACTS OF PROJECT ALTERNATIVES

4.3.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

4.3.1.1 Air Quality

Under Alternative 1, the Expedited BARCT Implementation Schedule would not be implemented. Therefore, no construction emissions are expected under the No Project Alternative. As shown in Table 3.2-26, the worst-case construction schedule for the proposed project would be expected to result in ROG, NOx, PM_{10}, and $PM_{2.5}$ emissions that would exceed significance thresholds. Therefore, the Expedited BARCT Implementation Schedule would result in significant air quality impacts during construction activities, which would also be cumulatively considerable. The significant construction air quality impacts would be eliminated under Alternative 1.

The operational air quality impacts associated with the proposed project were determined to be less than significant. Impacts from the potential increase in operational emissions, including emissions from truck traffic, were determined to be less than significant. Nonetheless, they would be eliminated under Alternative 1.

The overall emission benefits that are expected from the proposed project are presented in Table 4.3-1. For some of the potential rule development projects, emission reductions may be unknown at this time but would nonetheless be expected to occur. Under Alternative 1, the beneficial impacts associated with ROG emission reductions (75 to 125 tons per year) and SOx emissions reductions (1,265 tons per year) would also not occur.

Impacts from the potential increase in TAC emissions associated with the proposed project were also determined to be less than significant. Further, the proposed project is expected to result in a beneficial reduction in TAC emissions, as well, as criteria pollutants. However, it is not possible to estimate the potential TAC emissions reductions at this point until appropriate engineering analyses have been completed and so forth. Nonetheless, air pollution control measures to control ROG emissions (e.g., domes on tanks and additional ROG monitoring on fugitive components in heavy liquid service) as a result of the proposed project is expected to result in a reduction in TAC emissions from affected facilities. The potential TAC emissions reductions under the proposed project would be eliminated under Alternative 1.

TABLE 4.3-1

Expedited BARCT Implementation Schedule Emission Reductions Associated with Rule Development Projects

Rule Development Project Title	Estimated Emission Reductions Criteria Air Pollutants (tons/yr)				
	ROG	CO	NOx	SOx	PM
Organic Liquid Storage Tanks[1]	75 - 125	--	--	--	--
Petroleum Wastewater Treating	Unknown(2)	--	--	--	--
Portland Cement Manufacturing	--	--	--	698	Unknown
Refinery Fluid Catalytic Crackers and CO Boilers	--	--	--	567	Unknown
Refinery Heavy Liquid Leaks	Unknown	--	--	--	--
Petroleum Coke Calcining	--	--	Unknown	--	--

(1) The Organic Liquid Storage Tanks Project, Petroleum Wastewater Treating and Refinery Heavy Liquid Leak projects will also reduce TAC emissions. TAC emissions are not readily quantifiable and are thus not presented.

(2) For some of the potential rule development projects the estimates of emissions reductions are unknown at this time. This is due to uncertainties associated with emission estimates or the level of control and emission reductions that are achievable.

4.3.1.2 Hazards and Hazardous Materials

The hazard impacts associated with the installation of air pollution control equipment under the Expedited BARCT Implementation Schedule are expected to be less than significant. Under Alternative 1, none of the potential rules or rule amendments associated with the Expedited BARCT Implementation would occur at this time and the impacts from related hazards, including transport of materials, use of hazardous materials, and hazards associated with air pollution control equipment would remain less than significant.

4.3.1.2 Hydrology and Water Quality

Water demand impacts from operating WGS systems at refinery FCCUs, additional lime injection at a cement kiln, and a LoTOx at a coke calciner may exceed applicable water demand significance thresholds and, therefore, water demand impacts associated with the proposed project were concluded to be significant after mitigation and cumulatively considerable. Under Alternative 1, no additional air pollution control equipment would be installed at this time; therefore, no significant or cumulatively considerable impacts associated with water demand would be expected.

Under the proposed project, water quality impacts from installing most types of air pollution control equipment that use water as part of the control process would not exceed applicable water quality significance thresholds and, therefore, were concluded to be less than significant. Under Alternative 1 no additional air pollution control equipment would be installed at this time; therefore, no increase in wastewater would occur and the impacts on wastewater generation and water quality would remain less than significant.

4.3.2 ALTERNATIVE 2 – DELAYED BARCT IMPLEMENTATION

4.3.2.1 Air Quality

Under Alternative 2, the Expedited BARCT Implementation Schedule would be delayed until 2023. Under Alternative 2, all of the proposed BARCT rule development projects would be implemented, but would be implemented at a slower pace. As shown in Table 3.2-26, the worst-case construction schedule for the proposed project would be expected to result in ROG, NOx, PM_{10}, and $PM_{2.5}$ emissions that would exceed the significance thresholds. Therefore, the Expedited BARCT Implementation Schedule would result in significant air quality impacts during construction activities, which would also be cumulatively considerable. The significant construction air quality impacts would be reduced under Alternative 2. As shown in Table 4.3-2, Alternative 2 would be expected to reduce the overlap in construction emissions. However, the emissions, while less than the proposed project, would still be expected to exceed the significance threshold and impacts from construction emissions would remain significant.

TABLE 4.3-2

Estimated Construction Emissions Under Alternative 2

ACTIVITY	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Peak Daily Concurrent Construction Emissions (lbs/day)						
2 VRU, Incinerators, or Vapor Combustors	0.1	0.7	0.9	<0.1	0.3	0.2
2 Domes	4.9	49.6	46.8	0.2	5.2	3.1
3 Refinery WGS	51	201	252	0.3	117	69
Total Concurrent Emissions (lbs/day)	**56.0**	**251.3**	**299.7**	**0.6**	**122.5**	**72.3**
Significance Thresholds	**54**	**None**	**54**	**None**	**82**	**54**
Significant?	**Yes**	**--**	**Yes**	**--**	**Yes**	**Yes**
Proposed Project Emission Estimates	**70.5**	**347.7**	**395.2**	**1.5**	**135.6**	**81.3**

The operational air quality impacts associated with the proposed project were determined to be less than significant. Impacts from the potential increase in operational emissions, including the emissions from truck traffic, were determined to be less than significant.

The operational emissions under Alternative 2 would remain the same as the proposed project and associated impacts would also be less than significant.

The overall emission benefits that are expected from the proposed project are presented in Table 4.3-1. For some of the potential rule development projects, emission reductions may be unknown at this time but would nonetheless be expected to occur. Under Alternative 2, the beneficial impacts associated with ROG emission reductions (75 to 125 tons per year) and SOx emissions reductions (1,265 tons per year) still be expected to occur. However, those benefits could be delayed for several years. Therefore, Alternative 2 could result in emission reductions forgone (not achieved) during the two year delay period of an estimated 150 – 250 tons of ROG and up to 2,530 tons of SOx.

Impacts from the potential increase in TAC emissions associated with the proposed project were also determined to be less than significant. The proposed project is expected to result in a beneficial reduction in TAC emissions, as well, as criteria pollutants. However, it is not possible to estimate the potential TAC emissions reductions at this point until appropriate engineering analyses have been completed and so forth. Nonetheless, air pollution control equipment installed to control ROG emissions (e.g., domes on tanks and additional ROG monitoring on fugitive components in heavy liquid service) as a result of the proposed project is expected to result in a reduction in TAC emissions from affected facilities. The potential TAC emissions reductions under the proposed project are expected to be the same as the proposed project, although those reductions may be delayed for a period of approximately two years.

4.3.2.2 Hazards and Hazardous Materials

The hazard impacts associated with the installation of air pollution control equipment under the Expedited BARCT Implementation Schedule are expected to be less than significant. All of the air pollution control equipment that would installed under the proposed project would also be installed under Alternative 2. Therefore, hazard impacts under Alternative 2 would be the same as the proposed project and less than significant.

4.3.2.2 Hydrology and Water Quality

Water demand impacts from operating WGS systems at refinery FCCUs, additional lime injection at a cement kiln, and a LoTOx at a coke calciner may exceed applicable water demand significance thresholds and, therefore, water demand impacts associated with the proposed project were concluded to be significant after mitigation and cumulatively considerable. All of the air pollution control equipment that would be installed under the proposed project would also be installed under Alternative 2. Therefore, water demand impacts under Alternative 2 would remain significant.

Under the proposed project, water quality impacts from installing most types of air pollution control equipment that use water as part of the control process would not exceed applicable water quality significance thresholds and, therefore, were concluded to be less than significant. All of the air pollution control equipment that would be installed

under the proposed project would also be installed under Alternative 2. Therefore, water quality impacts under Alternative 2 would be the same as the proposed project and less than significant.

4.4 CONCLUSION

Alternative 1 - No Project Alternative would theoretically reduce the potentially significant ROG, NOx, PM_{10}, and $PM_{2.5}$ construction air quality impacts and water demand impacts associated with the Expedited BARCT Implementation Schedule. However, Alternative 1 is not feasible due to legal factors, as it would violate the requirements of AB 617. Further, Alternative 1 would not achieve any of the project objectives 1 through 4 (see page 4-1).

Under Alternative 2, the BARCT Implementation Schedule would be extended with all of the proposed rule development projects implemented by 2023, instead of 2021. The impacts under Alternative 2 would essentially be the same as the proposed project, as all of the proposed rule projects included in the proposed project would also be implemented under Alternative 2. The potentially significant ROG, NOx, PM_{10}, and $PM_{2.5}$ construction air quality impacts would be reduced, but they would not be reduced to less than significant.

Under Alternative 2, the beneficial impacts associated with ROG emission reductions (75 to 125 tons per year) and SOx emissions reductions (1,265 tons per year) would still be expected to occur. However, those emission reduction benefits could be delayed for several years. Therefore, Alternative 2 could result in emission reductions forgone (not achieved) during the two year delay period of an estimated 150 – 250 tons of ROG and up to 2,530 tons of SOx.

Finally, potentially significant water demand impacts would remain as the same as the proposed project, because all of the air pollution control equipment under the proposed project, would still be implemented under Alternative 2, including the WGS and LoTOx equipment. Water demand impacts under Alternative 2 would remain significant and cumulatively considerable.

4.5 COMPARISON OF ALTERNATIVES

Pursuant to CEQA Guidelines §15126.6(d), an EIR should include sufficient information about each alternative to allow meaningful comparison with the proposed project. Section 15126.6(d) also recommends the use of a matrix to summarize the comparison. Table 4.5-1 provides this matrix comparison displaying the major characteristics and significant environmental effects of each alternative. Table 4.5-1 lists the alternatives considered in this EIR and how they compare to the proposed project. Table 4.5-1 presents a matrix that lists the significant adverse impacts as well as the cumulative impacts associated with the proposed project and the project alternatives for all environmental topics analyzed. The table also ranks each section as to whether the

proposed project or a project alternative would result in greater or lesser impacts relative to one another.

TABLE 4.5-1

COMPARISON OF ALTERNATIVES

ENVIRONMENTAL TOPIC	Proposed Project	Alternative 1 No Project Alternative	Alternative 2 Delayed BARCT Implementation Schedule
Air Quality			
Construction Emission Impacts	PS	NS (-)	PS (-)
Operational Criteria Pollutant Impacts	NS	NS (-)	NS (=)
Toxic Air Contaminant Impacts	NS	NS (-)	NS (=)
Cumulative Air Quality Impacts	PS	NS (-)	PS (-)
Hazards and Hazardous Materials			
Operational Hazard Impacts	NS	NS (-)	NS (=)
Transportation Hazard Impacts	NS	NS (-)	NS (=)
Cumulative Hazards Impacts	NS	NS (-)	NS (=)
Hydrology and Water Quality			
Construction Water Demand Impacts	NS	NS (-)	NS (=)
Operational Water Demand Impacts	PS	NS (-)	PS (=)
Wastewater/Water Quality Impacts	NS	NS (-)	NS (=)
Cumulative Hydrology/Water Quality Impacts	PS	NS (-)	PS (=)

Notes:
PS = Potentially significant
MNS = Mitigated to less than significant
NS = Less than significant
(-) = Potential impacts are less than the proposed project.
(+) = Potential impacts are greater than the proposed project.
(=) = Potential impacts are approximately the same as the proposed project.

As shown in Table 4.5-1, Alternative 1 would eliminate the potentially significant ROG, NOx, PM_{10}, and $PM_{2.5}$ impacts associated with construction activities but would not achieve any of the proposed project objectives. Alternative 1 could be considered the environmentally superior alternative. Alternative 2 would reduce the potentially significant ROG, NOx, PM_{10}, and $PM_{2.5}$ impacts associated with construction activities, but not to less than significant levels, and the water demand impact would be the same as the proposed project; however, Alternative 2 would achieve all of the project objectives. Since Alternative 2 would reduce the potentially significant ROG, NOx, PM_{10}, and $PM_{2.5}$ impacts and achieve the project objectives, Alternative 2 would be considered the environmentally superior alternative.

The proposed project would be considered the preferred alternative as it would achieve all of the project objectives and emission reductions associated with the implementation of BARCT on the affected facilities would be expected to occur two years earlier than under Alternative 2.

The proposed project has been demonstrated to be the most effective approach that achieves all of the project objectives relative to environmental impacts generated. Mitigation measures have been developed to minimize the potential increase in construction emissions and water demand, while providing the greatest public health benefit by reducing criteria pollutant emissions from stationary sources to the greatest feasible extent. Further, emission reductions associated with the implementation of BARCT on the affected facilities would be expected to occur two years earlier than under Alternative 2. Therefore, the proposed project is the preferred alternative.

CHAPTER 5

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References
Organizations and Persons Consulted
List of Environmental Impact Report Preparers

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5.2 ORGANIZATIONS AND PERSONS CONSULTED

The CEQA statues and Guidelines require that organizations and persons consulted be provided in the EIR. The following organizations and persons have provided input into this document.

Victor Douglas
Todd Gonsalves
Guy Gimlen
David Joe

5.3 LIST OF ENVIRONMENTAL IMPACT REPORT PREPARERS

Bay Area Air Quality Management District
San Francisco, California

Environmental Audit, Inc.
Placentia, California

APPENDIX A

NOTICE OF PREPARATION AND INITIAL STUDY

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California Environmental Quality Act

Notice of Preparation of Draft Environmental Impact Report and Scoping Meeting for AB 617 Expedited Best Available Retrofit Control Technology Implementation Schedule

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TO: **Interested Parties**

FROM: **Bay Area Air Quality Management District**
375 Beale St., Suite 600
San Francisco, CA 94105

Lead Agency: **Bay Area Air Quality Management District**
Contact: **Victor Douglas, Manager** **Phone: (415) 749-4752**

SUBJECT: NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT AND SCOPING MEETING

Notice is hereby given pursuant to California Public Resources Code §21091, 21092, 21092.2, and 21092.3 and CEQA Guidelines Section 15085 and 15087 that the Bay Area Air Quality Management District ("Air District"), as lead agency, will prepare a Draft Environmental Impact Report (EIR) in connection with the project described below.

Project Title: AB 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule

Project Location: The project would apply within the Bay Area Air Quality Management District ("Air District"), which includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, and the southern portions of Solano and Sonoma counties.

Project Description: The AB 617 Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule is intended to satisfy the requirements of Assembly Bill 617 (AB 617), which requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of best available retrofit control technology at industrial sources subject to California Greenhouse Gas (GHG) Cap-and-Trade requirements. The overall purpose of BARCT implementation is to reduce criteria pollutant emissions from these industrial sources. The project identifies six potential rule development projects to reduce air pollution from a variety of industrial stationary sources located throughout the San Francisco Bay Area Air Basin. The potential rule development projects include rules for organic liquid storage tanks, petroleum wastewater treating, Portland cement manufacturing, refinery fluid catalytic crackers and CO boilers, refinery heavy liquid leaks, and petroleum coke calcining.

Scoping Meetings: Notice is also given pursuant to California Public Resource Code, Sections 15206 and 15082 (c) that the Air District will conduct a California Environmental Quality Act (CEQA) scoping meeting at the Air District Headquarters' Yerba Buena Room, 375 Beale Street, San Francisco, California, on August 24, 2018 at 2 p.m., to discuss and accept oral comments on the scope and content described in a Notice of Preparation and an Initial Study (NOP/IS) prepared in anticipation of a draft Environmental Impact Report (DEIR) for the project.

Reviewing the Notice of Preparation/Initial Study (NOP/IS): The NOP/IS documents are available at the District headquarters, on the Air District's website at www.baaqmd.gov/ab617barct, or by request. Requests for copies of the NOP/IS should be directed to David Joe (djoe@baaqmd.gov) at (415) 749-8623.

Comment Procedure: Comments relating to the environmental analysis in the NOP/IS should be addressed to David Joe, Bay Area Air Quality Management District, 375 Beale Street, Suite 600, San Francisco, CA 94105. Comments may also be sent by e-mail to djoe@baaqmd.gov. Comments on the NOP/IS will be accepted until September 7, 2018 at 5:00 p.m.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Initial Study for

AB617 Expedited BARCT Implementation Schedule

Prepared by:

Bay Area Air Quality Management District
375 Beale St., Suite 600
San Francisco, CA 94109

Contact: Guy Gimlen
(415) 749-4734

August 2018

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1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

The Bay Area Air Quality Management District (District or Air District), in accordance with Assembly Bill 617, (AB 617) is preparing the best available retrofit control technology (BARCT) implementation schedule project (project or proposed project). AB 617 requires each air district that is a nonattainment area for one or more air pollutants to adopt an expedited schedule for implementation of best available retrofit control technology (BARCT) by the earliest feasible date. This requirement applies to each industrial source subject to California Greenhouse Gas (GHG) Cap-and-Trade requirements.

The purpose of the proposed project is to reduce criteria pollutant emissions from industrial sources that participate in the GHG Cap-and-Trade system. The Cap-and-Trade system is designed to address and limit GHG emissions, and allows sources to comply with Cap-and-Trade limits by either reducing emissions at the source or purchasing GHG emission allowances. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities that are already suffering a disproportionate burden from air pollution.

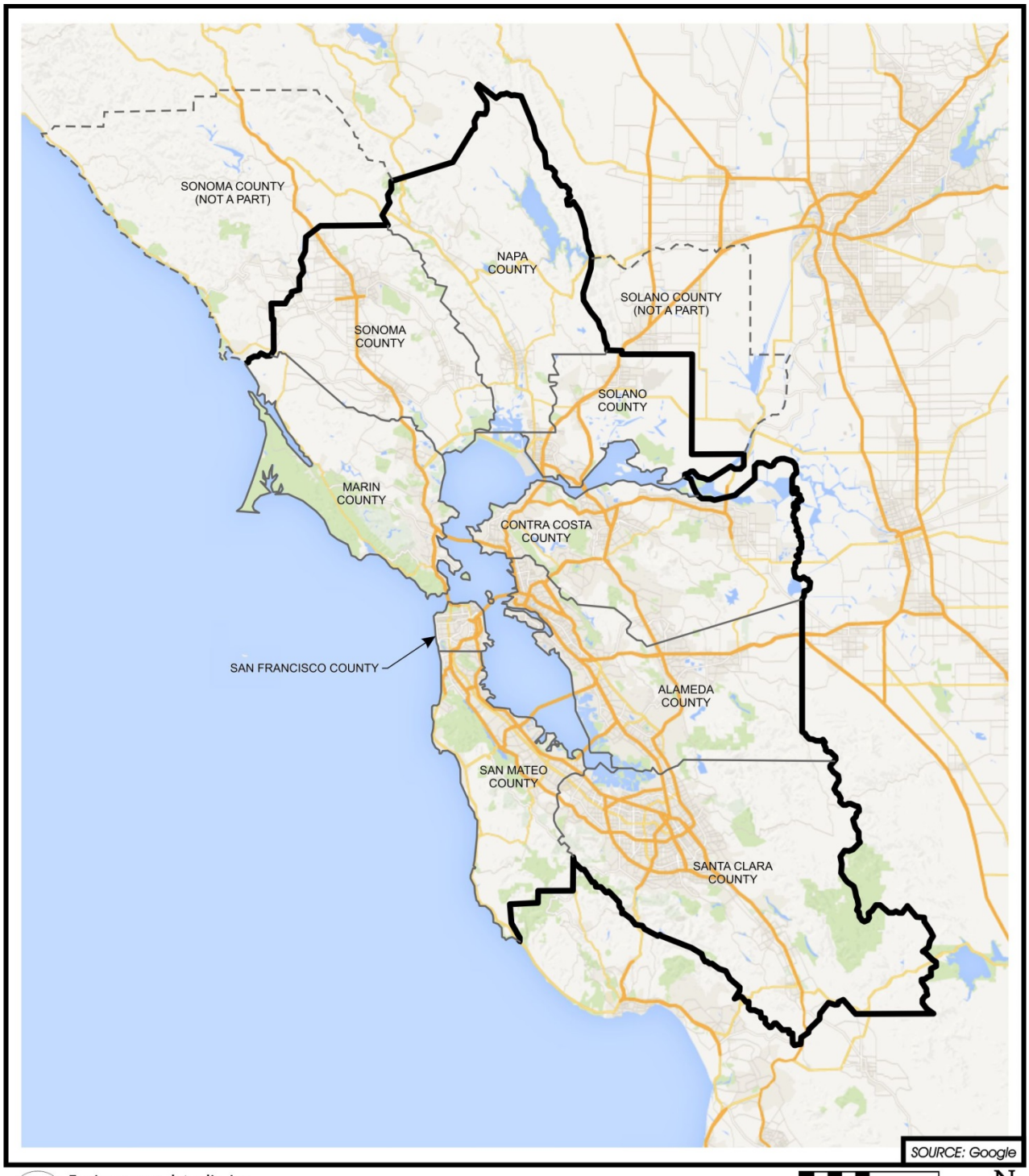
1.2 AGENCY AUTHORITY

CEQA, Public Resources Code §21000 et seq., requires that the environmental impacts of proposed projects be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. To fulfill the purpose and intent of CEQA, the Air District is the lead agency for this project and has prepared the Notice of Preparation/Initial Study for the proposed expedited BARCT implementation schedule.

The Lead Agency is the "public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment" (Public Resources Code Section 21067). It was determined that the Air District has the primary responsibility for supervising or approving the entire project as a whole and is the most appropriate public agency to act as lead agency (CEQA Guidelines Section 15051(b)).

1.3 PROJECT LOCATION

The Air District has jurisdiction of an area encompassing 5,600 square miles. The Air District includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties. The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys and bays (see Figure 1-1).



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Project No. 2997 Figure 1-1

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1.4 PROJECT BACKGROUND

With the adoption of AB 617, the state acknowledges that many communities around the state continue to experience disproportionate impacts from air pollution. To address these impacts, AB 617 directs all air districts to apply BARCT to all industrial sources subject to Cap-and-Trade, and to identify communities with a "high cumulative exposure burden" to air pollution. Districts must then prioritize these communities for the development of community air monitoring projects and/or emission reduction programs. The State requires that monitoring campaigns and emission reduction programs be developed through a community-based process.

AB 617 represents a significant enhancement to the approach CARB and local air districts take in addressing local air quality issues. The Air District has already implemented and established a number of programs that support the goals and intent of AB 617; these programs include the Community Air Risk Evaluation (CARE) Program, Health Risk Assessments for the AB 2588 Air Toxics "Hot Spots" Program, and Air District Rule 11-18: Reduction of Risk from Air Toxic Emissions at Existing Facilities. However, the requirements of AB 617 formalize new programs and establish challenging goals and timelines for implementation.

The purpose of the proposed project is to reduce criteria pollutant emissions from industrial sources that participate in the GHG Cap-and-Trade system. The Cap-and-Trade system is designed to address and limit GHG emissions, and allows sources to comply with Cap-and-Trade limits by either reducing emissions at the source or purchasing GHG emission allowances. The Cap-and-Trade program includes particular provisions for "industrial" facilities, which are covered entities or facilities that are eligible for free allowance allocation. Under the Cap-and-Trade program, these free allocations are provided to certain industrial sectors to minimize potential leakage of economic activity and GHG emissions. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities that are already suffering a disproportionate burden from air pollution. The proposed project aims to implement rule development projects that will require the use of BARCT for specific equipment in industrial facilities that are subject to GHG Cap-and-Trade requirements in order to reduce criteria pollutant emissions.

1.5 PROJECT DESCRIPTION

The expedited BARCT Implementation Schedule strategy will consist of the implementation of several rule development projects in order to fulfill the requirements of AB 617. The Bay Area air basin is in attainment with both the National Ambient Air Quality Standards and California Ambient Air Quality Standards for carbon monoxide (CO), SO_2, NO_2, and Lead. The air basin is designated as nonattainment for ozone (O_3) and particulate matter ($PM_{2.5}$ and PM_{10}) California ambient air standards, therefore the BARCT review was conducted focusing on the following pollutants:

- Nitrogen Oxides (NOx)
- Reactive Organic Gases (ROG)
- Particulate Matter less than 10 microns (PM_{10})
- Particulate Matter less than 2.5 microns ($PM_{2.5}$)
- Sulfur Dioxide (SO_2)

NOx and ROG are included because they are precursors for ozone formation. SO_2 may contribute to the formation of condensable PM (i.e. formed in the emissions plume from the stack) at certain types of sources, so PM control strategies may include SO_2 limits.

A list of facilities, sources, and emissions were developed from the 2016 Reporting Year Emissions Inventory. The Bay Area has 80 facilities subject to Cap-and-Trade, which encompass 3,246 individual sources in 61 source categories. This list of facilities was reduced to 19 "industrial" facilities, which includes all covered entities that are eligible for free allowance allocations in accordance with the Cap-and-Trade requirements based on their engagement in an activity within a particular North American Industrial Code System (NAICS) Code listed in Table 8-1 of the Cap-and-Trade regulation (17 CCR § 95890(a)). These 19 industrial Cap-and-Trade facilities encompass 1,899 individual sources in 50 source categories. These sources were reviewed, and screening was conducted to remove sources where potential emission reductions would likely be small and not cost-effective (e.g., less than 10 pounds per day) and sources that already comply with BARCT. After screening for these sources with emissions greater than 10 pounds per day and sources that do not already achieve BARCT, the population of sources was reduced to the following (percentage values represent the percentage of total emissions from initial population of industrial Cap-and-Trade sources in the Bay Area):

- NOx: 21 source categories, 73 sources representing 30% of the emissions (1,764 tpy)
- ROG: 23 source categories, 259 sources representing 93% of the emissions (4,430 tpy)
- PM: 16 source categories, 124 sources representing 92% of the emissions (2,358 tpy)
- SO_2: 15 source categories, 102 sources representing 71% of the emissions (3,651 tpy)

The Air District reviewed available information on current achievable emission limits and potential controls for each source category and pollutant. This information included guidelines and recent determinations of BACT, reasonably available control technology (RACT), and lowest achievable emission rate (LAER) from EPA and CARB. Six potential priority rule development projects have been identified as candidates for the expedited BARCT Implementation Schedule Project. Potential priority rule development projects are shown in Table 1-1.

1.6 SOURCES THAT MAY BE SUBJECT TO THE EXPEDITED BARCT SCHEDULE

The overall purpose of the expedited BARCT implementation schedule is to reduce criteria pollutant emissions from industrial sources that participate in CARB's GHG Cap-And-Trade program. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG emissions, and these criteria pollutants and toxic air contaminants may impact local communities. The expedited BARCT implementation schedule would apply to a wide range of commercial, industrial, and municipal facilities including petroleum refineries, chemical plants, wastewater treatment facilities, and manufacturing operations. Table 1-2 shows the most likely types of facilities anticipated to be subject to the expedited BARCT implementation schedule and the primary emissions that would be controlled.

TABLE 1-1 – Expedited BARCT Schedule Priority Rule Development Projects

PROPOSED RULE DEVLOPMENT PROJECTS – BARCT IMPLEMENTATION PLAN		
Project Name	**Pollutant**	**Rule Development Project Summary**
Organic Liquid Storage Tanks	ROG	Regulation 8, Rule 5: Storage of Organic Liquids would be amended to specifically address ROGs and associated TACs emissions from external floating roof tanks storing organic liquids. Emission reductions are expected from installing domes on external floating roof tanks and capturing emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit to a thermal incinerator.
Petroleum Wastewater Treating	ROG	The Air District has addressed ROG emissions from petroleum wastewater treatment facilities (Rule 8-8 Wastewater Collection and Separation Systems) in previous rule developments. This project will review each of the five Bay Area refineries for any opportunities for reduction of wastewater ROG emissions. BACT for refinery wastewater systems includes the use of entirely enclosed systems in addition to good control practices.
Portland Cement Manufacturing	PM SO_2	BARCT levels are still under development for PM emissions in cement kilns; however, controls will likely involve the reduction of SO_2, ammonia, or other condensable components and precursors. BARCT for SO_2 emissions reductions includes the judicious selection and use of raw materials, dry scrubbing, and dry sorbent (lime) injection.
Refinery Fluid Catalytic Crackers and CO Boilers	PM SO_2	PM and SO_2 emissions reductions are expected through optimization of ammonia injection, additional ESP capacity, optimization of newer catalyst additives, and/or wet gas scrubbing.
Refinery Heavy Liquid Leaks	ROG	Amendments to Regulation 8, Rule 18: Equipment Leaks (Rule 8-18) in December 2015 addressed equipment that service heavy liquids at these sources, but those amendments have not yet been fully implemented due to litigation regarding uncertainty of heavy liquid fugitive emissions. The District is coordinating with each of the five Bay Area refineries to conduct Heavy Liquid Leak Studies. These studies are designed to determine appropriate emission factors for heavy liquid leaks. The results of these studies are expected by Fall 2018. BARCT levels will likely be set after these studies have concluded; implementation is expected to involve additional leak detection and repair (LDAR) provisions for components in heavy liquid service.
Petroleum Coke Calcining	NOx	Regulation 9, Rule 14: Petroleum Coke Calcining Operations (Rule 9-14), which currently only addresses SO_2 emissions, may be amended to include NOx emission limits. Technologies available for NOx reduction in petroleum coke calcining operations is expected to include SCRs and LoTOx injection systems.

TABLE 1-2

Summary of Facilities and Sources Where BARCT Priority Rule Projects May Apply Under the Expedited BARCT Schedule Requirements

Facility	Sources	Pollutants Controlled
Refineries	Fugitive Emissions (tanks, valves, pumps, compressors) Fluidized Catalytic Cracking Units CO Boilers Wastewater Treatment Operations	ROG PM SO_2
Petroleum Coke Calcining	Coke Calciners	NOx
Cement Manufacturing	Cement Kiln	PM SO_2
Refineries, Chemical Plants, Bulk Storage and Transfer Operations, and General Manufacturing	Organic Liquid Storage Tanks	ROG

1.6.1 REFINERIES

Petroleum refineries convert crude oil into a wide variety of refined products, including gasoline, aviation fuel, diesel and other fuel oils, lubricating oils, and feed stocks for the petrochemical industry. Crude oil consists of a complex mixture of hydrocarbon compounds with smaller amounts of impurities including sulfur, nitrogen, oxygen and metals (e.g., iron, copper, nickel, and vanadium). Crude oil that originates from different geographical locations may vary with respect to its composition, thus, potentially generating different types and amounts of emissions. The types of equipment where BARCT may be applied under the expedited BARCT requirements are further described below.

Fugitive Emissions Sources: Petroleum refineries include a large number and wide variety of fugitive emissions sources. Fugitive emissions are emissions of gases or vapors from pressurized equipment due to leaks and other unintended or irregular releases of gases during the crude refining process and do not include pollutants vented to an exhaust stack before release to the atmosphere. Generally, any processes or transfer areas where leaks can occur are sources of fugitive emissions. Fugitive emissions sources include, but are not limited to the following: valves, connectors (i.e., flanged, screwed, welded or other joined fittings), pumps, compressors, pressure relief devices, and diaphragms in ROG service. Fugitive emissions are generally controlled through leak detection and repair (LDAR) programs. Similarly, tanks storing crude oil or petroleum products also produce fugitive emissions.

Fluid Catalytic Cracking Units (FCCUs) and CO Boilers: FCCUs are complex processing units that convert heavy components of crude oil into light, high-octane products that are required in the production of gasoline. Each FCCU consists of a reaction chamber, a catalyst regenerator, and a fractionator. The cracking process begins in the reaction chamber were fresh catalyst is mixed with pre-heated heavy oils. A chemical reaction occurs that converts the heavy oil 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 lighter hydrocarbon components such as light gases, gasoline, light gas oil, and cycle oil. The catalyst becomes coated with carbonaceous material (coke)

during its exposure to the hydrocarbon feedstock. FCCUs include a catalyst regenerator where coke is burned off the surface of the catalyst to restore its activity so it can be re-used. Catalyst regenerators may be designed to burn the coke completely to carbon dioxide (full burn) or to only partially burn the coke to a mixture of CO and CO_2 (partial burn). Because the flue gas from these partial burn regenerators has high levels of CO, the flue gas is vented to a CO boiler where the CO is further combusted to CO_2. FCCUs and associated CO boilers can generate substantial PM, NOx, and SO_2 emissions.

Petroleum Wastewater Treating: All refineries employ some form of wastewater treatment so that water effluents can safely be reused at the refinery or discharged. Wastewater treatment operations provide a means of treating water that has come into contact with petroleum hydrocarbons, and, as such, are a potential source of ROG emissions. The design of wastewater treatment plants is complicated by the diversity of refinery pollutants, including oil, phenols, sulfides, dissolved solids, and toxic chemicals. Although the treatment processes employed by refineries vary greatly they generally include drain systems, neutralizers, oil/water separators, settling chambers, clarifiers, dissolved air flotation systems, coagulators, and activated sludge units.

Drain systems consist of individual process drains, where oily water from various sources is collected, and junction boxes, which receive the oily water from multiple drains. The first stage of a typical wastewater treatment process is the oil-water separator, which physically separates the free oil and solids from the water. Gravity allows any oil in the water to rise to the surface of the separator and any solid particles to sink to the bottom. A continually moving scraper system pushes oil to one end and the solids to the other. Both are removed and the recovered oil is sent back to the refinery for reprocessing. Small suspended oil particles are then typically removed in the dissolved air flotation unit. Wastewater is sent to the activated sludge units, where naturally-occurring microorganisms feed on the dissolved organics in the wastewater, and convert them to water, CO_2 and nitrogen gas, which can be safely released into the atmosphere. Finally, wastewater enters the clarifying tanks, where the microorganisms settle to the bottom while the treated wastewater flows away.

1.6.2 PETROLEUM COKE CALCINING

Petroleum coke, the heaviest portion of crude oil, cannot be recovered in the normal refining process. Instead, petroleum coke is processed in a delayed coker unit to generate a carbonaceous solid referred to as “green coke,” a commodity. To improve the 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 can be used as a fuel grade coke by the fuel, cement, steel, calciner and specialty chemicals industries.

The process of making calcined (removing impurities) 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 (^oF). 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. Hot gases from the calciner are sent to a pyroscrubber that

removes particulates through a combination of settling and incineration and sulfur compounds are oxidized to SO_2. 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 and sold for industrial uses.

1.6.3 CEMENT MANUFACTURING

Cement is manufactured in a cement kiln using a pyroprocess or high temperature reactor that is constructed along a longitudinal axis with segmented rotating cylinders whose connected length is anywhere from 50 to 200 yards in length. The pyroprocess in the kiln consists of three phases during which clinker is produced from raw materials undergoing physical changes and chemical reactions. The first phase in the kiln, the drying and pre-heating zone, operates at a temperature between 1,000 ^oF and 1,600 ^oF and evaporates any remaining water in the raw mix of materials entering the kiln. The second phase, the calcining zone, operates at a temperature between 1,600 ^oF and 1,800 ^oF and converts the calcium carbonate from the limestone in the kiln feed into calcium oxide and releases CO_2. During the third phase, the burning zone operates on average at 2,200 ^oF to 2,700 ^oF (though the flame temperature can at times exceed 3,400 ^oF) during which several reactions and side reactions occur. As the materials move towards the discharge end, the temperature drops and eventually clinker nodules form and volatile constituents, such as sodium, potassium, chlorides, and sulfates, evaporate. The red-hot clinker exits the kiln, is cooled in the clinker cooler, passes through a crusher and is conveyed to storage.

As indicated above, cement manufacturing occurs at high temperatures and uses several combustion fuels. Fuels that have been used for primary firing include coal, petroleum coke, heavy fuel oil, natural gas, landfill off-gas and oil refinery flare gas. High carbon fuels such as coal are preferred for kiln firing, because they yield a luminous flame. The clinker is brought to its peak temperature mainly by radiant heat transfer, and a bright (i.e. high emissivity) and hot flame is essential for this. Combustion emissions are exhausted through the kiln's stack.

At cement manufacturing facilities, fugitive dust may consist of wind-driven particulate matter emissions from any disturbed surface work area that are generated by wind action alone. The process of making cement begins with the acquisition of raw materials, predominantly limestone rock (calcium carbonate) and clay, which exist naturally in rocks and sediment on the earth's surface. These and other materials used to manufacture cement are typically mined at nearby quarries and comprise "raw mix." The raw mix is refined by a series of mechanical crushing and grinding operations to segregate and eventually reduce the size of each component to 0.75 inch or smaller before being conveyed to storage.

1.6.4 ORGANIC LIQUID STORAGE FACILITIES

Storage vessels containing organic liquids can be found in many industries, including: (1) petroleum producing and refining; (2) petrochemical and chemical manufacturing; (3) bulk storage and transfer operations; and (4) other industries consuming or producing organic liquids. Organic liquids in the petroleum industry generally are mixtures of hydrocarbons having dissimilar true vapor pressures (for example, gasoline and crude oil). Organic liquids in the chemical industry are composed of pure chemicals or mixtures of chemical with similar vapor pressures (for example, benzene or a mixture of isopropyl and butyl alcohols). Tanks associated with refineries comprise over 95 percent of the organic liquid storage tanks identified in the BARCT evaluation process.

Six basic tank designs are used for organic liquid storage vessels: fixed roof (vertical and horizontal), external floating roof, domed external (or covered) floating roof, internal floating roof, variable vapor space, and pressure tanks (low and high). ROG emissions from organic liquids in storage occur because of evaporative loss of the liquid during its storage and changes in the liquid level. ROG emissions vary with tank design, as does the relative contribution of each type of evaporative loss. Emissions from fixed roof tanks are a result of evaporative losses during storage (breathing losses or standing storage losses) and evaporative losses during filling and emptying operations (referred to as working losses). External and internal floating roof tanks are ROG emission sources because of evaporative losses that occur during standing storage and withdrawal of liquid from the tank. Standing storage losses are a result of evaporative losses through rim seams, deck fittings, and/or deck seams. Pressure tank losses occur when connecting to or disconnecting from the tank.

1.7 BARCT EMISSION CONTROL TECHNOLOGIES

The expedited implementation of BARCT would apply to existing facilities in the Bay Area that are generally large sources of emissions and included in the CARB GHG Cap-and-Trade program as industrial facilities. The overall purpose of the BARCT implementation schedule project is to reduce criteria pollutant emissions from industrial sources that participate in the GHG Cap-and-Trade program. Emissions of criteria pollutants and TACs are often associated with GHG emission sources.

To comply with the BARCT requirements, operators at affected facilities may need to implement different types of air pollution control equipment or measures. The type of emission capture and control technology that may be used depends on the specific source and type of pollutant to be controlled. The most common air pollution control measures that are likely to be implemented as a result of the proposed expedited BARCT schedule are categorized into the following groups and are summarized in Table 1-3:

- Installing domes on external floating roof tanks and capturing vented emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit;
- Covering lift stations, manholes, junction boxes, conveyances and other wastewater facilities at refineries and venting ROG emissions to a vapor combustor;
- Requiring additional lime injection on cement kilns to reduce SO_2 emissions;
- Controlling PM emissions from FCCUs using SO_2 reducing catalyst additives, additional ESP capacity, or wet gas scrubbers;
- Reducing ROG emissions from fugitive components in heavy liquid service at refineries through increased LDAR programs;
- Reducing NOx emissions from coke calcining facilities through the use of SCR units and/or LoTOx system with a wet gas scrubber.

TABLE 1-3

Control Strategies and Target Pollutants

Control Strategy	Pollutant
Additional Controls on Organic Liquid Storage Tanks	ROG
Enclosures and Vapor Combustors at Refinery Wastewater Treatment Plants	ROG
Additional Lime Injection at Cement Plants	PM and SO_2
Wet Gas Scrubbers, Additional ESP Capacity, and SO_2 Reducing Catalysts at Refinery FCCUs and CO Boilers	PM and SO_2
Increase LDAR for Equipment in Heavy Liquid Service Refineries	ROG
SCR and LoTOx (wet scrubber) at Petroleum Coke Calciners	NOx

The following subsections briefly describe the most likely types of control technologies that would be used to comply with the BARCT rules included in the expedited BARCT implementation schedule.

1.7.1 ADDITIONAL CONTROLS ON ORGANIC LIQUID STORAGE TANKS

ROG emissions from organic liquids in storage occur because of evaporative loss of the liquid during its storage and as a result of changes in the liquid level. ROG emissions vary with tank design, as does the relative contribution of each type of evaporative loss.

Potential ROG emission reductions would be achieved by installing domes on external floating roof tanks and capturing vented emissions from internal floating roof tanks or coned roof tanks and removing ROG emissions through a vapor recovery unit (VRU) flowing back to the tank for recovery or VRU to a thermal incinerator. Thermal oxidizers, or thermal incinerators, are combustion devices that control volatile TAC emissions by combusting them to CO_2 and water. Domed roofs on external floating roofs without VRUs would reduce ROG emissions by limiting wind effects.

1.7.2 ENCLOSURES AND VAPOR COMBUSTORS AT REFINERY WASTEWATER TREATMENT PLANTS

The main component of atmospheric emissions from refinery wastewater treatment plants are fugitive ROG emissions and dissolved gases that evaporate from the surfaces of wastewater residing in open process drains, separators, and ponds. The control of wastewater treatment plant emissions involves covering systems where emission generation is greatest (such as oil/water separators and settling basins) and removing dissolved gases from water streams with sour water strippers before contact with the atmosphere. Covering wastewater operations potentially can achieve greater than 90 percent reduction of wastewater system emissions. In addition, all lift stations, manholes, junction boxes, conveyances and any other wastewater facilities should be covered and all emissions routed to a vapor combustor with a destruction removal efficiency (DRE) of 99 percent for control. Vapor combustors are combustion devices that control ROG emissions by combusting them to carbon dioxide and water.

1.7.3 LIME INJECTION AT CEMENT PLANTS

The formation of SO_2 in cement kilns is a product of the chemical composition of the raw materials and fuel, as well as the high operating temperatures and oxygen concentration in the kiln. In a lime injection system, a hydrated lime powder is injected into the flue gas to capture acidic gases. The cement kiln within the District's jurisdiction currently operates a lime injection system for the control of hydrogen chloride (HCl) emissions, but the use of additional lime or additional lime injection capacity would likely be needed to further control SO_2 emissions. SO_2 reacts with lime (calcium carbonate) and is captured in the baghouse as calcium sulfate. The hydrated lime usually absorbs up to 60% of the SO_2 in the gases if injected at the correct temperature.

1.7.4 WET GAS SCRUBBERS

In wet scrubbing processes, liquid or solid particles are removed from a gas stream by transferring them to a liquid. This addresses only wet scrubbers for control of particulate matter. The liquid most commonly used is water. A wet scrubber's particulate collection efficiency is directly related to the amount of energy

expended in contacting the gas stream with the scrubber liquid. Most wet scrubbing systems operate with particulate collection efficiencies over 95 percent (U.S. EPA, 2017).

There are three energy usage levels for wet scrubbers. A low energy wet scrubber is capable of efficiently removing particles greater than about 5-10 micrometers in diameter. A medium energy scrubber is capable of removing micrometer-sized particles, but is not very efficient on sub-micrometer particles. A high-energy scrubber is able to remove sub-micrometer particles.

A spray tower scrubber is a low energy scrubber and is the simplest wet scrubber used for particulate control. It consists of an open vessel with one or more sets of spray nozzles to distribute the scrubbing liquid. Typically, the gas stream enters at the bottom and passes upward through the sprays. The particles are collected when they impact the droplets. This is referred to as counter-current operation. Spray towers can also be operated in a cross-current arrangement. In cross-current scrubbers, the gas flow is horizontal and the liquid sprays flow downward. Cross-current spray towers are not usually as efficient as counter-current units.

The most common high energy wet scrubber is the venturi, although it can also be operated as a medium energy scrubber. In a fixed-throat venturi, the gas stream enters a converging section where it is accelerated toward the throat section. In the throat section, the high-velocity gas stream strikes liquid streams that are injected at right angles to the gas flow, shattering the liquid into small drops. The particles are collected when they impact the slower moving drops. Following the throat section, the gas stream passes through a diverging section that reduces the velocity.

All wet scrubber designs incorporate mist eliminators or entrainment separators to remove entrained droplets. The process of contacting the gas and liquid streams results in entrained droplets, which contain the contaminants or particulate matter. The most common mist eliminators are chevrons, mesh pads, and cyclones. Chevrons are simply zig-zag baffles that cause the gas stream to turn several times as it passes through the mist eliminator. The liquid droplets are collected on the blades of the chevron and drain back into the scrubber. Mesh pads are made from interlaced fibers that serve as the collection area. A cyclone is typically used for the small droplets generated in a venturi scrubber. The gas stream exiting the venturi enters the bottom of a vertical cylinder tangentially. The droplets are removed by centrifugal force as the gas stream spirals upward to the outlet.

1.7.5 ELECTROSTATIC PRECIPITATOR

An ESP is a control device designed to remove particulate matter (both PM_{10} and $PM_{2.5}$) from an exhaust gas stream. ESPs take advantage of the electrical principle that opposites attract. By imparting a high voltage charge to the particles, a high voltage direct current (DC) electrode negatively charges airborne particles in the exhaust stream, while simultaneously ionizing the carrier gas, producing an electrified field. The electric field in an ESP is the result of three contributing factors: the electrostatic component resulting from the application of a voltage in a dual electrode system, the component resulting from the space charge from the ions and free electrons, and the component resulting from the charged particulate. As the exhaust gas passes through this electrified field, the particles are charged. The strength or magnitude of the electric field is an indication of the effectiveness of an ESP. Typically, 20,000 to 70,000 volts are used. The particles, either negatively or positively charged, are attracted to the ESP collecting electrode of the opposite charge. When enough particulates have accumulated, the collectors are shaken

to dislodge the dust, causing it to fall by gravity to hoppers below and then removed by a conveyor system for disposal or recycling. ESPs can handle large volumes of exhaust gases and because no filters are used, ESPs can handle hot gases from 350 ^{o}F to 1,300 ^{o}F.

1.7.6 SO_2 REDUCING CATALYSTS

To help reduce formation of condensable particulate matter from sulfurous components, SOx-reducing additives (catalysts) are used for reducing the production of SOx by-products in FCCUs. A SOx reducing catalyst is a metal oxide compound such as aluminum oxide (Al_2O_3), magnesium oxide (MgO), vanadium pentoxide (V_2O_5) 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 SO_2, CO, and CO_2 by-products are formed. A portion of SO_2 will react with excess oxygen and form SO_3, 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 (H_2S). The net effect of these reactions is that the quantity of SO_2 in the regenerator is typically reduced between 40 to 65 percent while the quantity of H_2S in the reactor is increased. Generally, the increase in H_2S is handled by sulfur recovery processes located elsewhere within a refinery.

1.7.7 ENHANCED LDAR FOR COMPONENTS IN HEAVY LIQUID SERVICE

Oil refineries, chemical plants, bulk plants, bulk terminals, and other facilities that store, transport and use organic liquids may occasionally have leaks wherever there is a connection between two pieces of equipment, and lose some organic material as fugitive ROG emissions. Valves, pumps, and compressors can also leak organic materials. The District Rule 8-18 requires such facilities to maintain LDAR programs. The rule originally required the monitoring of components in light hydrocarbon liquid service, but was expanded in 2015 to include equipment in heavy hydrocarbon liquid service. Those amendments have not been fully implemented due to litigation regarding uncertainty of heavy liquid fugitive emissions. The District is in the process of conducting studies to determine appropriate emission factors for heavy liquid leaks. Completion of the heavy liquid leak study has been problematic, because some heavy hydrocarbon liquids are condensing and coating the leak detection sensors. The study approach is being re-configured and the results are expected by Fall 2018. The results of the study will be used to determine appropriate revisions to Rule 8-18, e.g., types of monitoring instruments, frequency of monitoring, leak concentration limits, time allowed for repair of the leak, recordkeeping requirements, etc.

1.7.8 SELECTIVE CATALYTIC REDUCTION (SCR) AT PETROLEUM COKE CALCINERS

SCR is post combustion control equipment for NOx control of combustion sources such as boilers and process heaters and is capable of reducing NOx emissions by as much as 95 percent or higher. A typical SCR system consists of an ammonia storage tank, ammonia vaporization and injection equipment, a booster fan for the flue gas exhaust, an SCR reactor with catalyst, and exhaust stack plus ancillary electronic instrumentation and operations control equipment. An SCR system reduces NOx by injecting a mixture of ammonia and air into the flue gas exhaust stream from the combustion equipment. This mixture flows into the SCR reactor where the catalyst, ammonia and oxygen in the flue gas exhaust reacts with NO and NO_2 to form nitrogen and water in the presence of the catalyst. The amount of ammonia introduced into the SCR system is approximately a one-to-one molar ratio of ammonia to NOx for optimum control efficiency, though the ratio may vary based on equipment-specific NOx reduction requirements. SCR catalysts are available in two types of solid, block configurations or modules, plate or honeycomb type, and are comprised of a base material of titanium dioxide that is coated with either tungsten trioxide, molybdic anhydride, vanadium pentoxide, iron oxide, or zeolite catalysts. These catalysts are used for SCRs because of their high activity, insensitivity to sulfur in the exhaust, and useful life span of five years or more. Ultimately, the material composition of the catalyst is dependent upon the application and flue gas conditions such as gas composition, temperature, etc. (SCAQMD, 2015).

For conventional SCRs, the minimum temperature for NOx reduction is 500^{o}F and the maximum operating temperature for the catalyst is 800 ^{o}F. The presence of particulates, heavy metals, sulfur compounds, and silica in the flue gas exhaust can limit catalyst performance. Minimizing the quantity of injected ammonia and maintaining the ammonia temperature within a predetermined range helps to avoid these undesirable reactions while minimizing the production of unreacted ammonia which is commonly referred to as “ammonia slip.” Depending on the type of combustion equipment utilizing SCR, the typical amount of ammonia slip can vary between less than five ppmv when the catalyst is fresh and 20 ppmv at the end of the catalyst life.

1.7.9 LOTOX (WET SCRUBBER) AT PETROLEUM COKE CALCINERS

The LoTOx^{TM} is a registered trademark of Linde LLC (previously BOC Gases) and was later licensed to BELCO of Dupont for refinery applications. LoTOx^{TM} stands for "Low Temperature Oxidation" process in which ozone (O_3) is used to oxidize insoluble NOx compounds into soluble NOx compounds which can then be removed by absorption in a caustic, lime, or limestone solution. The LoTOx^{TM} process is a low temperature application, optimally operating at about 325 ^{o}F.

A typical combustion process produces about 95 percent NO and five percent NO_2. Because both NO and NO_2 are relatively insoluble in an aqueous solution, a WGS alone is not efficient in removing these insoluble compounds from the flue gas stream. However, with a LoTOx^{TM} system and the introduction of O_3, NO and NO_2 can be easily oxidized into a highly soluble compound N_2O_5 and subsequently converted to nitric acid (HNO_3). Then, in a wet gas scrubber for example, the HNO_3 is rapidly absorbed in caustic (NaOH), limestone or lime solution. The LoTOx^{TM} process can be integrated with any type of wet scrubbers (e.g., venturi, packed beds), semi-dry scrubbers, or wet ESPs. In addition, because the rates of oxidizing reactions for NOx are fast compared to the very slow SO_2 oxidation reaction, no ammonium bisulfate ($(NH_4)HSO_4$) or sulfur trioxide (SO_3) is formed (Confuorto and Sexton, 2007).

CHAPTER 2

ENVIRONMENTAL CHECKLIST

Introduction

General Information

Environmental Factors Potentially Affected

Determination

Evaluation of Environmental Impacts

Environmental Checklist and Discussion

ENVIRONMENTAL CHECKLIST

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

GENERAL INFORMATION

Project Title:	AB 617 Expedited BARCT Implementation Schedule
Lead Agency Name and Address:	Bay Area Air Quality Management District 375 Beale Street, Suite 600 San Francisco, California 94105
Contact Person:	Guy Gimlen
Contact Phone Number:	415-749-4734
Project Location:	BARCT would apply to industrial sources subject to California GHG Cap-and-Trade requirements within the jurisdiction of the Bay Area Air Quality Management District, which encompasses all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties.
Project Sponsor's Name and Address:	Bay Area Air Quality Management District 375 Beale Street, Suite 600 San Francisco, California 94105
General Plan Designation:	The general plan designation varies as this rule would affect industrial facilities throughout the Bay Area. The majority of affected facilities are located within industrial or commercial designations.
Zoning:	See “General Plan Designation” above.
Description of Project:	See “Background” in Chapter 1.
Surrounding Land Uses and Setting:	See “Affected Area” in Chapter 1.
Other Public Agencies Whose Approval Is Required:	None

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed project. Impact areas in which the proposed project may have a significant impact are marked with a "✓". An explanation supporting the determination of significant impacts can be found in the Detailed Checklist and Discussion section below.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☑ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology / Soils
☐ Greenhouse Gas Emissions	☑ Hazards & Hazardous Materials	☑ Hydrology / Water Quality
☐ Land Use / Planning	☐ Mineral Resources	☐ Noise
☐ Population / Housing	☐ Public Services	☐ Recreation
☐ Transportation / Traffic	☐ Tribal Cultural Resources	☑ Utilities / Service Systems
☑ Mandatory Findings of Significance		

DETERMINATION

On the basis of this initial evaluation:

☐ I find the proposed project COULD NOT have a significant effect on the environment, and that a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be significant effects in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☑ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature: Date:

Printed Name: Date:

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis.

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant with Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, Program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.

   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a

previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This checklist is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and

   b) the mitigation measure identified, if any, to reduce the impact to less than significance.

ENVIRONMENTAL CHECKLIST AND DISCUSSION

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
I.	**AESTHETICS.** Would the project:				
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☑	☐
b)	Substantially damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	☐	☐	☑	☐
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☑	☐
d)	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	☐	☑

Setting

The Bay Area Air Quality Management District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano County and southern Sonoma County. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. Important views of natural features include the San Francisco Bay and ocean, San Francisco Bay, Mount Tamalpais, Mount Diablo, and other peaks and inland valleys of the Coast Range. Cityscape views offered by buildings and distinctive Bay Area bridges, especially the Golden Gate and Bay Bridges and the San Francisco skyline, are also important built visual resources to the region (ABAG, 2017). Views along travel corridors, including roads and rail lines, are in abundance in the Bay Area and include views of the San Francisco Bay, city scape, mountains and hills, redwood groves, and broader views of the ocean and lowlands, such as along ridgelines. Because of the variety of visual resources, scenic highways or corridors are located throughout the Bay Area and includes 15 routes that have been designated as scenic highways and 29 routes eligible for designation as scenic highways (ABAG, 2017).

BARCT would apply to a limited number of industrial sources with physical modifications limited to facilities in industrial or commercial areas. Scenic highways or corridors are generally not located in the vicinity of industrial facilities.

Regulatory Background

Visual resources are generally protected by the City and/or County General Plans through land use and zoning requirements.

Significance Criteria

Project-related impacts on aesthetics and visual resources will be considered significant if any of the following conditions are met:

- The proposed project would have a substantial adverse effect on a scenic vista.
- The proposed project would substantially damage scenic resources, including but not limited to trees, rock outcropping, and historical buildings within a state scenic highway.
- The proposed project would substantially degrade the existing visual character or quality of the site and its surrounds.
- The proposed project would add a visual element of urban character to an existing rural or open space area or add a modern element to a historic area.
- The proposed project would create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

Discussion of Impacts

I. a, b, and c). The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to existing industrial structures. Some BARCT measures are not expected to be visible outside of the existing facility. This would include covering portions of petroleum wastewater treatment facilities, lime injection at cement plants, use of SO_2 reducing catalysts, and increased LDAR.

Other BARCT measures would include the installation of equipment that may be visible outside of the existing industrial facilities, however, these facilities are located in industrial areas which do not have scenic views or scenic resources. For example, domes on storage tanks increase the height of the storage tanks making them more visible to the areas surrounding the storage tanks. However, storage tanks are generally located at refineries, bulk handling and storage facilities, or manufacturing facilities and are located within industrial areas. Thus, they are not expected to have significant adverse aesthetic impacts to the surrounding community. Additionally, new air pollution control equipment is not expected to block any scenic vista, degrade the visual character or quality of the area, or result in significant adverse aesthetic impacts.

I. d). The industrial facilities affected by the expedited BARCT requirements may need to install or modify air pollution control equipment to reduce criteria pollutant emissions from their facilities. These facilities are existing industrial facilities that currently operate or can operate 24 hours a day and have existing lighting for nighttime operations. For example, refineries operate continuously 24 hours per day, 7 days per week and are already lighted for nighttime operations. The same is true for most other types of manufacturing operations (e.g., cement plants). Therefore, implementation of the BARCT requirements is not expected to require any additional lighting to be installed as a result of the installation of new air pollution control equipment. New light sources, if any, would be located in industrial areas and are not expected to be noticeable in residential areas. Most local land use agencies have ordinances that limit the intensity of lighting and its effects on adjacent property owners. Therefore, the expedited BARCT requirements are not expected to have significant adverse aesthetic impacts to the surrounding community.

Conclusions

Based upon the above considerations, significant adverse impacts to aesthetics or light and glare are not expected to occur due to implementation of the AB 617 expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
II.	**AGRICULTURE and FORESTRY RESOURCES.** Would the project:				
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☑
b)	Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	☐	☐	☐	☑
c)	Conflict with existing zoning for, or cause rezoning of, forest land as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☑
d)	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☑
e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. Some of these agricultural lands are under Williamson Act contracts. Agricultural land under Williamson Act contract includes both prime and nonprime lands. Prime agricultural land includes land with certain specific soil characteristics, land that has returned a predetermined annual gross value for three of the past five years, livestock-supporting land with specific carrying capacities, or land planted with fruit or nut trees, vines, bushes or crops that have a non-bearing period of less than five years (Government Code §51200-51207). Nonprime lands include pasture and grazing lands and other non-irrigated agricultural lands with lesser soil quality.

The Bay Area has a significant amount of land in agricultural uses. In 2010, approximately over half of the region's approximately 4.5 million acres were classified as agricultural lands, as defined by the California Department of Conservation Farmland Mapping and Monitoring Program. Of these, 2.3 million acres of agricultural land, over 70 percent (about 1.7 million acres) are used for grazing. Products grown in the Bay Area include field crops, fruit and nut crops, seed crops, vegetable crops, and nursery products. Field crops, which include corn, wheat, and oats, as well as pasture lands, represent approximately 62 percent of the Bay Area agricultural land (ABAG, 2017). In 2014, about 1.25 million acres of land were under Williamson Act contract in the Bay Area. Of this, about 203,200 acres were prime farmland and one million acres were nonprime. Lands under Williamson Act contract are primarily used for pasture and grazing and not for cultivation of crops. Approximately 70 percent of prime farmlands under contract are in Santa Clara, Solano, and Sonoma counties (ABAG, 2017).

Expedited BARCT requirements would affect a limited number of facilities with physical modifications limited to facilities in industrial areas that are zoned for industrial use and agricultural or forest lands are not located within these areas or facilities.

Regulatory Background

Agricultural and forest resources are generally protected by the City and/or County General Plans, Community Plans through land use and zoning requirements, as well as any applicable specific plans, ordinances, local coastal plans, and redevelopment plans.

Significance Criteria

Project-related impacts on agriculture and forest resources will be considered significant if any of the following conditions are met:

- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed project conflicts with existing zoning for, or causes rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined in Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code § 51104 (g)).
- The proposed project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

Discussion of Impacts

II a-e. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources,

wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to existing industrial structures. This equipment would be compatible with the existing industrial character and land use of the area and would not be located in agricultural or forestland areas. Thus, no impacts to agriculture and forestry resources are expected.

The proposed project would not conflict with existing agriculture related zoning designations or Williamson Act contracts. Existing agricultural and forest resources within the boundaries of the Air District are not expected to be affected by the construction of additional air pollution control equipment or modification to existing emission sources. Therefore, there is no potential for conversion of farmland to non-agricultural use or conflicts related to agricultural uses or land under a Williamson Act contract, or impacts to forestland resources.

Conclusion

Based upon the above considerations, significant adverse impacts to agricultural or forestry resources are not expected to occur due to implementation of the AB 617 expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
III.	**AIR QUALITY.** Would the project:				
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
b)	Violate any air quality standard or contribute to an existing or projected air quality violation?	☑	☐	☐	☐
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☑	☐	☐	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	☑	☐	☐	☐
e)	Create objectionable odors affecting a substantial number of people?	☐	☐	☑	☐

Setting

It is the responsibility of the Air District 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 (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and lead.

The San Francisco Bay Area is characterized by a large, shallow basin surrounded by mountain ranges tapering into sheltered inland valleys. The basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of mountains, valleys and bays. Combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast.

Air quality conditions in the San Francisco Bay Area have improved greatly since the Air District was created in 1955, and regional concentrations of criteria pollutants are now in compliance with or near compliance with most ambient air quality standards. The Bay Area is in attainment with both the National Ambient Air Quality Standards and the California Ambient Air Quality Standards for CO, SO_2, NO_2, and lead. The air basin is designated as nonattainment for ozone and particulate matter (PM_{10} and $PM_{2.5}$) under the California ambient air quality standards.

Regulatory Background

Criteria Pollutants

At the federal level, the Clean Air Act (CAA) Amendments of 1990 give the U.S. EPA additional authority to require states to reduce emissions of ozone precursors and particulate matter in non-attainment areas. The amendments set attainment deadlines based on the severity of problems. At the state level, CARB has traditionally established state ambient air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emission inventories, collected air quality and meteorological data, and approved state implementation plans. At a local level, California's air districts, including the Bay Area Air Quality Management District, are responsible for overseeing stationary source emissions, approving permits, maintaining emission inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality-related sections of environmental documents required by CEQA.

The Air District is governed by a 24-member Board of Directors composed of publicly-elected officials apportioned according to the population of the represented counties. The Board has the authority to develop and enforce regulations for the control of air pollution within its jurisdiction. The Air District is responsible for implementing emissions standards and other requirements of federal and state laws. It is also responsible for developing air quality planning documents required by both federal and state laws.

Toxic Air Contaminants

TACs are regulated in the District through federal, state, and local programs. At the federal level, TACs are regulated primarily under the authority of the CAA. Prior to the amendment of the CAA in 1990, source-specific NESHAPs were promulgated under Section 112 of the CAA for certain sources of radionuclides and Hazardous Air Pollutants (HAPs).

Title III of the 1990 CAA amendments requires U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for major sources must require the maximum achievable control technology (MACT). MACT is defined as the maximum degree of emission reduction achievable considering cost and non-air quality health and environmental impacts and energy requirements. All NESHAPs were to be promulgated by the year 2000. Specific incremental progress in establishing standards were to be made by the years 1992 (at least 40 source categories), 1994 (25 percent of the listed categories), 1997 (50 percent of remaining listed categories), and 2000 (remaining balance). The 1992 requirement was met; however, many of the four-year standards were not promulgated as scheduled. Promulgation of those standards has been rescheduled based on court ordered deadlines, or the aim to satisfy all Section 112 requirements in a timely manner.

Many of the sources of TACs that have been identified under the CAA are also subject to the California TAC regulatory programs. CARB developed regulatory programs for the control of TACs, including: (1) California's TAC identification and control program, adopted in 1983 as Assembly Bill 1807 (AB 1807) (California Health and Safety Code §39662), a two-step program in which substances are identified as TACs, and airborne toxic control measures (ATCMs) are adopted to control emissions from specific sources; and (2) The Air Toxics Hot Spot Information and Assessment Act of 1987 (AB 2588) (California

Health and Safety Code §39656) established 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 those emissions.

In 2004, the Air District initiated the Community Air Risk Evaluation (CARE) program to identify areas with relatively high concentrations of air pollution–including toxic air contaminants (TACs) and fine particulate matter–and populations most vulnerable to air pollution's health impacts. Maps of communities most impacted by air pollution, generated through the CARE program, have been integrated into many District programs. For example, the Air District uses information derived from the CARE program to develop and implement targeted risk reduction programs, including grant and incentive programs, community outreach efforts, collaboration with other governmental agencies, model ordinances, new regulations for stationary sources and indirect sources, and advocacy for additional legislation.

Significance Criteria

On June 2, 2010, the District's Board of Directors unanimously adopted thresholds of significance to assist in the review of projects under CEQA. These CEQA thresholds were designed to establish the level at which the District believed air pollution emissions would cause significant environmental impacts under CEQA. The CEQA thresholds were challenged in court. Following litigation in the trial court, the court of appeal, and the California Supreme Court, all of the Thresholds were upheld. However, in an opinion issued on December 17, 2015, the California Supreme Court held that CEQA does not generally require an analysis of the impacts of locating development in areas subject to environmental hazards unless the project would exacerbate existing environmental hazards.

In view of the Supreme Court's opinion, local agencies may rely on the District's CEQA thresholds designed to reflect the impact of locating development near areas of toxic air contamination where such an analysis is required by CEQA or where the agency has determined that such an analysis would assist in making a decision about the project. However, the CEQA thresholds are not mandatory and agencies should apply them only after determining that they reflect an appropriate measure of a project's impacts.

The Air District published a new version of the Guidelines dated May 2017, which includes revisions made to address the Supreme Court's opinion. The CEQA Guidelines for implementation of the Thresholds are for information purposes only to assist local agencies. Recommendations in the Guidelines are advisory and should be followed by local governments at their own discretion. The Air District is currently working to revise any outdated information in the Guidelines as part of its update to the CEQA Guidelines and thresholds of significance. Since these are the most current air quality significance thresholds and address court decisions, they will be used in the CEQA analysis for the current project.

Construction Emissions

Regarding construction emissions, the Air District's 2017 Thresholds of Significance will be used in the current air quality analysis for construction emissions (see Table 2-1).

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TABLE 2-1

Thresholds of Significance for Construction-Related Criteria Air Pollutants and Precursors

Pollutant/Precursor	Daily Average Emissions (lbs/day)
ROG	54
NOx	54
PM_{10}	82*
$PM_{2.5}$	54*
PM_{10}/ $PM_{2.5}$ Fugitive Dust	Best Management Practices

*Applies to construction exhaust emissions only.
Source: BAAQMD, 2017

Operational Emissions

The most recently available CEQA Guidelines established emission thresholds for specific projects, general plans, and regional plans. An air quality rule does not fall neatly into any of these categories. Air quality rules are typically regional in nature, as opposed to general plans, community plans and regional plans. In addition, air quality rules are usually specific to particular source types and particular pollutants. The Air Quality Plan threshold of "no net increase in emissions" is appropriate for Air Quality Plans because they include a mix of control measures with individual trade-offs. For example, one control measure may result in combustion of methane to reduce greenhouse gas emissions, while increasing criteria pollutant emissions by a small amount. Those increases from the methane measure would be offset by decreases from other measures focused on reducing criteria pollutants. In a particular rule development effort, there may not be opportunities to make these trade-offs.

The 2017 project-level stationary source CEQA thresholds are identified in Table 2-2. These represent the levels at which an individual project's emissions would result in a cumulatively considerable contribution to the Air District's existing air quality conditions. The Air District does not currently have significance thresholds specifically for rules. In order to provide a conservative air quality analysis, the project-specific thresholds recommended in the revised 2017 CEQA Guidelines (BAAQMD, 2017) will be used in the current air quality impacts analysis (see Table 2-2).

TABLE 2-2

Thresholds of Significance for Operation-Related Criteria Air Pollutants and Precursors

Pollutant/Precursor	Daily Average Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROG	54	10
NOx	54	10
PM_{10}	82	15
$PM_{2.5}$	54	10

*Source: BAAQMD, 2017

Discussion of Impacts

III a. The proposed expedited BARCT requirements are not expected to conflict with or obstruct implementation of the applicable air quality plan. The applicable air quality plan is the Air District's recently-adopted 2017 Clean Air Plan, *Spare the Air, Cool the Climate*. The Plan outlines a strategy for achieving the Bay Area's clean air goals by reducing emissions of ozone precursors, particulate matter, and other pollutants in the region. The proposed expedited BARCT schedule will not conflict with or obstruct implementation of the 2017 Clean Air Plan, rather it will help achieve the Plan's goals by helping to reduce criteria pollutant emissions, including emissions of ozone precursors (ROG and NOx) and particulate matter or precursors to particulates (NOx and SO_2), thus improving public health and air quality in the region.

III b, c and d. While the primary purpose of implementing expedited BARCT requirements is to reduce emissions of ROG, NOx, SO_2, and PM, some types of control equipment have the potential to create secondary adverse air quality impacts, through construction activities or through the addition of air pollution control equipment (e.g., SCRs). The proposed expedited BARCT schedule may result in the installation of new equipment at facilities that need to comply with the new requirements.

Limited construction activities may be required for some BARCT measures to enclose open fugitive components, install new catalyst, increase lime injection and so forth. Construction emissions associated with this type of construction would be minor and would involve the transport of the new equipment which is expected to require one to two truck trips per project. Installation of the equipment would be expected to be limited to two to ten workers and would not require any major construction equipment and no site preparation activities would be expected to be required. Therefore, retrofitting this type of existing equipment would result in minor construction emissions.

Construction activities would also be required for the construction of new air pollution control equipment at existing facilities, including vapor combustors, wet gas scrubbers, ESPs, vapor recovery systems, and SCRs. Some of the BARCT equipment would be required at existing facilities with large emission sources, e.g., refinery FCCUs. Construction activities for these types of new air pollution control equipment could be substantial because the control equipment would be needed on large sources and would need to be appropriately sized. Construction activities associated with air pollution control

equipment at large sources could be substantial and generate significant, although temporary construction emissions.

Although the primary effect of installing air pollution control equipment is to reduce emissions of a particular pollutant, e.g., NOx, some types of control equipment have the potential to create secondary adverse air quality impacts. For example, control strategies aimed at reducing NOx from stationary sources may use ammonia for control (e.g., selective catalytic reduction). Ammonia use could result in increased ammonia emissions and, since ammonia is a precursor to particulate formation, increased particulate formation in the atmosphere. Because of the potential for secondary emissions from air pollution control equipment, there is also a potential that sensitive receptors could be exposed to increased pollutant concentrations, which may be significant. As a result, these potential air quality impacts of the expedited BARCT measures will be evaluated in the Draft EIR.

III e. The implementation of expedited BARCT is expected to result in emission decreases associated with control of criteria pollutant emissions, including SOx emissions. Some sulfur compounds have odors. However, a number of methods to reduce SOx emissions involve removing additional sulfur compounds, reducing the potential for odors in downstream equipment.

Odors associated with ammonia use in new SCR systems are expected to be minimal. Ammonia can have a strong odor; however, new SCRs are not expected to generate substantial ammonia emissions. Ammonia is generally stored in an enclosed pressurized tank, which prevents fugitive ammonia emissions. Ammonia emissions from the stack (also referred to as ammonia slip) are expected to be limited to 10 ppm and implemented through permit conditions. Since exhaust emissions are buoyant as a result of being heated, ammonia in the exhaust will disperse and ultimate ground level concentrations would be expected to be substantially lower than five ppm. Five ppm is below the odor threshold for ammonia of 20 ppm (OSHA, 2005). Potential odor impacts associated with the expedited BARCT requirements are not expected to be significant. The Air District will continue to enforce odor nuisance complaints through BAAQMD Regulation 7, Odorous Substances.

Conclusion

Implementation of expedited BARCT requirements would reduce ROG, SO_2, PM and NOx emissions from industrial facilities that operate stationary large emission sources throughout the Bay Area. However, construction and operation of new air pollution control systems have the potential to increase emissions of other criteria pollutants and generate localized impacts. Therefore, potential adverse secondary air quality impacts which could result from implementing expedited BARCT requirements will be evaluated in the Draft EIR. No significant impacts were identified on air quality plans or the generation of odors and these topics will not be addressed further in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IV.	**BIOLOGICAL RESOURCES.** Would the project:				
a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
c)	Have a substantial adverse effect on federally protected wetlands as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☑
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☑
e)	Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑
f)	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. A wide variety of biological resources are located within the Bay Area.

The Bay Area supports numerous distinct natural communities composed of a diversity of vegetative types that provide habitat for a wide variety of plant and wildlife species. Broad habitat categories in the region include grasslands, coastal scrubs and chaparral, woodlands and forests, riparian systems and freshwater aquatic habitat, and wetlands. Extensive aquatic resources are provided by the San Francisco Bay Delta estuary, as well as numerous other rivers and streams. Urban and otherwise highly disturbed habitats, such as agricultural fields, also provide natural functions and values as wildlife habitat (ABAG, 2017).

Expedited BARCT requirements would affect a limited number of facilities with physical modifications limited to facilities in industrial areas that are zoned for industrial use. Biological resources are not usually located in industrial areas.

Regulatory Background

Biological resources are generally protected by the City and/or County General Plans through land use and zoning requirements which minimize or prohibit development in biologically sensitive areas. Biological resources are also protected by the California Department of Fish and Wildlife, and the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service and National Marine Fisheries Service oversee the federal Endangered Species Act. Development permits may be required from one or both of these agencies if development would impact rare or endangered species. The California Department of Fish and Wildlife administers the California Endangered Species Act which prohibits impacting endangered and threatened species. The U.S. Army Corps of Engineers and the U.S. EPA regulate the discharge of dredge or fill material into waters of the United States, including wetlands.

Significance Criteria

The proposed project impacts on biological resources will be considered significant if:

- The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
- The project interferes substantially with the movement of any resident or migratory wildlife species.
- The project adversely affects aquatic communities through construction or operation of the project.

Discussion of Impacts

IV a, b, c and d). The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and

petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Air pollution control equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to existing industrial structures. These facilities have been built and graded and no major grading would be expected to occur due to the installation of additional air pollution control equipment. Construction activities would occur within industrial areas, where native biological resources have been removed or are non-existent. Thus, the proposed project is not expected to result in any impacts to biological resources.

IV e and f). The proposed project is not expected to affect land use plans, local policies or ordinances, or regulations protecting biological resources such as a tree preservation policy or ordinances for the reasons already given. Land use and other planning considerations are determined by local governments and land use or planning requirements are not expected to be altered by the proposed project. Similarly, the proposed BARCT requirements are not expected to affect any habitat conservation or natural community conservation plans, biological resources or operations, and would not create divisions in any existing communities, as construction activities would be limited to existing facilities in industrial areas that have already been developed and graded.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to biological resources are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
V.	**CULTURAL RESOURCES.** Would the project:				
a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☑
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☑
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☑
d)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. Cultural resources are defined as buildings, sites, structures, or objects which might have historical architectural, archaeological, cultural, or scientific importance. Cultural resources also include paleontological sites, which can consist of mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains that are more than 5,000 years old and occur mainly in Pleistocene or older sedimentary rock units.

The Carquinez Strait represents the entry point for the Sacramento and San Joaquin Rivers into the San Francisco Bay. This locality lies within the San Francisco Bay and the west end of the Central Valley archaeological regions, both of which contain a rich array of prehistoric and historical cultural resources. The areas surrounding the Carquinez Strait and Suisun Bay have been occupied for millennia given their abundant combination of littoral and oak woodland resources.

Important vertebrate and invertebrate fossils and unique geologic units have been documented throughout California. The fossil yielding potential of a particular area is highly dependent on the geologic age and origin of the underlying rocks. Pleistocene or older (older than 11,000 years) continental sedimentary deposits are considered to have a high paleontological potential while Holocene-age deposits (less than 10,000 years old) are generally considered to have a low paleontological potential because they are

geologically immature and are unlikely to contain fossilized remains of organisms. Metamorphic and igneous rocks have a low paleontological potential, either because they formed beneath the surface of the earth (such as granite), or because they have been altered under heat and high pressures.

Historic resources are standing structures of historic or aesthetic significance. Architectural sites dating from the Spanish Period (1529-1822) through the late 1960s are generally considered for protection if they are determined to be historically or architecturally significant. These may include missions, historic ranch lands, and structures from the Gold Rush and the region's early industrial era. More recent architectural sites may also be considered for protection if they could gain historic significance in the future (ABAG, 2017).

Of the 8,199 sites recorded in the Bay Area, there are 1,006 cultural resources listed on the California Register of Historic Resources (CRHR), meaning that they are significant at the local, State or federal level; of those, 744 are also listed on the National Register of Historic Places (NRHP). From this list, 249 resources are listed as California Historic Landmarks. The greatest concentration of historic resources listed on both the NRHP and the CRHR in the Bay Area occurs in San Francisco, with 181 resources. Alameda County has the second highest number with 147 resources (ABAG, 2017).

Expedited BARCT requirements would affect a limited number of facilities, with physical modifications limited to facilities in industrial areas that are zoned for industrial use which have been graded and developed.

Regulatory Background

The State CEQA Guidelines define a significant cultural resource as a "resource listed or eligible for listing on the California Register of Historical Resources" (Public Resources Code Section 5024.1). A project would have a significant impact if it would cause a substantial adverse change in the significance of a historical resource (State CEQA Guidelines Section 15064.5(b)). A substantial adverse change in the significance of a historical resource would result from an action that would demolish or adversely alter the physical characteristics of the historical resource that convey its historical significance and that qualify the resource for inclusion in the California Register of Historical Resources or a local register or survey that meets the requirements of Public Resources Code §§50020.1(k) and 5024.1(g).

Significance Criteria

The proposed project impacts to cultural resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
- Unique paleontological resources are present that could be disturbed by construction of the proposed project.
- The project would disturb human remains.

Discussion of Impacts

V a, b, c and d). CEQA Guidelines state that generally, a resource shall be considered 'historically significant' if the resource meets the criteria for listing in the California Register of Historical Resources including the following:

A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

B. Is associated with the lives of persons important in our past;

C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values;

D. Has yielded or may be likely to yield information important in prehistory or history (CEQA Guidelines §15064.5).

Generally, resources (buildings, structures, equipment) that are less than 50 years old are excluded from listing in the National Register of Historic Places unless they can be shown to be exceptionally important. The expedited BARCT requirements would result in control measures and new air pollution control equipment to be constructed within the confines of the existing industrial facilities and adjacent to existing industrial structures. Affected facilities may have equipment or structures older than 50 years, however, this type of equipment does not meet the criteria identified in CEQA Guidelines §15064.5(a)(3). Further, construction activities associated with the proposed project are expected to be limited to industrial areas that have already been developed. Thus, the proposed BARCT requirements would not adversely affect historical or archaeological resources as defined in CEQA Guidelines §15064.5, destroy unique paleontological resources or unique geologic features, or disturb human remains interred outside formal cemeteries. Therefore, no impacts to cultural resources are anticipated to occur as a result of the proposed project as no major construction activities are required.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to cultural resources are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☑	☐
ii) Strong seismic ground shaking?	☐	☐	☑	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☑	☐
iv) Landslides?	☐	☐	☑	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☑
c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☑
d) Be located on expansive soil, as defined in Table 18-1-B of the California Building Code (1994) (formerly referred to as the Uniform Building Code), creating substantial risks to life or property?	☐	☐	☐	☑
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	☐	☐	☐	☑

Setting

California has 11 natural geologic regions, known as geomorphic provinces, which are defined by the presence of similar physical characteristics, such as relief, landforms, and geology. Most of the Bay Area is located within the natural region of California known as the Coast Ranges geomorphic province, with the eastern portions of Contra Costa and Alameda Counties extending into the neighboring Great Valley geomorphic province, located east of the Coast Ranges. The Coast Range, extends about 400 miles from Oregon south into Southern California, and is characterized by a series of northwest trending ridges and valleys that roughly parallel the San Andreas fault zone. The San Francisco Bay is a broad, shallow regional structural depression created from an east-west expansion between the San Andreas and the Hayward fault systems.

Much of the Coast Range province is composed of marine sedimentary and volcanic rocks located east of the San Andreas Fault. The regional west of the San Andreas Fault is underlain by a mass of basement rock that is composed of mainly marine sandstone and various metamorphic rocks. Marginal lands surrounding San Francisco Bay consist generally of alluvial plains of low relief that slope gently towards the bay from bordering uplands and foothills (ABAG, 2017). Unconsolidated alluvial deposits, artificial fill, and estuarine deposits, (including Bay Mud) underlie the low-lying region along the margins of the Carquinez Straight and Suisun Bay. The organic, soft, clay-rich sediments along the San Francisco and San Pablo Bays are referred to locally as Bay Mud and can present a variety of engineering challenges due to inherent low strength, compressibility and saturated conditions. Landslides in the region occur in weak, easily weathered bedrock on relatively steep slopes.

The San Francisco Bay Area is a seismically active region, which is situated on a tectonic plate boundary marked by the San Andreas Fault System. Under the Alquist-Priolo Earthquake Fault Zoning Act, Earthquake Fault Zones were established by the California Division of Mines and Geology along “active” faults, or faults along which surface rupture occurred in Holocene time (the last 11,000 years). The San Andreas and the Hayward faults are the two faults considered to have the highest probabilities of causing a significant seismic event in the Bay Area. These two faults are classified as strike-slip faults that have experienced movement within the last 150 years. Other principal faults capable of producing significant ground shaking in the Bay Area are included in Table 2-3, and include the Rodgers Creek-Healdsburg, Concord-Green Valley, Marsh Creek-Greenville, San Gregorio-Hosgri, West Napa and Calaveras faults (ABAG, 2017). A major seismic event on any of these active faults could cause significant ground shaking and surface fault rupture. Other smaller faults in the region classified as potentially active include the Southampton and Franklin faults.

Ground movement intensity during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geological material. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill. Earthquake ground shaking may have secondary effects on certain foundation materials, including liquefaction, seismically induced settlement, and lateral spreading.

TABLE 2-3

Active Faults in the Bay Area

Fault	Recency of Movement	Maximum Moment Magnitude Earthquake
San Andreas	1989	7.9
Hayward	1868	7.1
Rodgers Creek-Healdsburg	1969	7.0
Concord-Green Valley	1955	6.9
Marsh Creek-Greenville	1980	6.9
San Gregorio-Hosgri	Late Quaternary	7.3
West Napa	2000	6.5
Maacama	Holocene	7.1
Calaveras	1990	6.8
Mount Diablo Thrust	Quaternary	6.7

(Source: ABAG, 2017)

Regulatory Background

Construction is regulated by the local City or County building codes that provide requirements for construction, grading, excavations, use of fill, and foundation work including type of materials, design, procedures, etc. which are intended to limit the probability of occurrence and the severity of consequences from geological hazards. Necessary permits, plan checks, and inspections are generally required.

The City or County General Plan includes the Seismic Safety Element. The Element serves primarily to identify seismic hazards and their location in order that they may be taken into account in the planning of future development. The California Building Code is the principle mechanism for protection against and relief from the danger of earthquakes and related events.

In addition, the Seismic Hazard Zone Mapping Act (Public Resources Code §§2690 – 2699.6) was passed by the California legislature in 1990 following the Loma Prieta earthquake. The Act required that the California Division of Mines and Geology (DMG) develop maps that identify the areas of the state that require site specific investigation for earthquake-triggered landslides and/or potential liquefaction prior to permitting most urban developments. The act directs cities, counties, and state agencies to use the maps in their land use planning and permitting processes.

Local governments are responsible for implementing the requirements of the Seismic Hazards Mapping Act. The maps and guidelines are tools for local governments to use in establishing their land use management policies and in developing ordinances and reviewing procedures that will reduce losses from ground failure during future earthquakes.

Significance Criteria

The proposed project impacts on the geological environment will be considered significant if:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.
- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.
- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

Discussion of Impacts

VI a, c, and d). The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. New development potentially resulting in earthquake hazards is expected to be limited to the construction of air pollution control equipment or measures at industrial facilities. New construction (including modifications to existing structures) requires compliance with the California Building Code. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage. The California Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The California Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the California Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site. Compliance with the California Building Code would minimize the impacts associated with existing geological hazards.

VI b). Construction associated with the proposed project is expected to be limited to air pollution control equipment at industrial facilities. All construction would take place at already existing facilities that have been previously graded. Thus, the proposed project is not expected to result in substantial soil erosion or the loss of topsoil as construction activities are expected to be limited to existing operating facilities that have been graded and developed, so that no major grading would be required.

VI e). Septic tanks or other similar alternative wastewater disposal systems are typically associated with small residential projects in remote areas. The expedited BARCT requirements would affect industrial

facilities that have existing wastewater treatment systems or which are connected to appropriate wastewater facilities and do not rely on septic tanks or similar alternative wastewater disposal systems. Based on these considerations, septic tanks or other alternative wastewater disposal systems are not expected to be impacted by the proposed project.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to geology and soils are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VII.	**GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE.** Would the project:				
a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☑	☐
b)	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☑	☐

Setting

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global climate change is caused primarily by an increase in levels of greenhouse gases (GHGs) in the atmosphere. The major greenhouse gases are the so-called "Kyoto Six" gases – carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs) – as well as black carbon.[1] These greenhouse gases absorb longwave radiant energy (heat) reflected by the earth, which warms the atmosphere in a phenomenon known as the "greenhouse effect." The potential effects of global climate change include rising surface temperatures, loss in snow pack, sea level rise, ocean acidification, more extreme heat days per year, and more drought years.

Increases in the combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.) since the beginning of the industrial revolution have resulted in a significant increase in atmospheric levels of greenhouse gases. CO_2 levels have increased from long-term historical levels of around 280 ppm before the mid-18th century to over 400 ppm today. This increase in greenhouse gases has already caused noticeable changes in the climate. The average global temperature has risen by approximately 1.4°F (0.8°C) over the past one hundred years, and 16 of the 17 hottest years in recorded history have occurred since 2001, according to the National Oceanic and Atmospheric Administration.

Total global greenhouse gas emissions contributing to climate change are in the tens of billions of metric tons of CO_2e (carbon dioxide equivalent) per year. The State of California alone produces about two percent of the entire world's GHG emissions with major emitting sources including fossil fuel consumption from transportation (37 percent), electricity production (20 percent), industry (24 percent), agricultural and forestry (8 percent), residential activities (6 percent), and commercial activities (5 percent) (ABAG, 2017). The Bay Area's contribution to the global total is approximately 85 million tons

[1] Technically, black carbon is not a gas but is made up of solid particulates or aerosols. It is included in the discussion of greenhouse gas emissions because, like true greenhouse gases, it is an important contributor to global climate change.

per year. Transportation sources generate approximately 40 percent of the total GHG emissions in the Bay Area, with the remaining 60 percent coming from stationary and area sources (BAAQMD, 2017).

Regulatory Background

California has committed to reducing its greenhouse gas emissions to 1990 levels by 2020, to 40 percent below 1990 levels by 2030, and to 80 percent below 1990 levels by 2050. This commitment was enacted in AB 32, the Global Warming Solutions Act of 2006, which adopted the 2020 target; in 2016's SB 32 (Pavley), which adopted the 2030 target; and in Executive Order S-3-05, which adopted the 2050 target. The Air District has adopted the same 80 percent reduction target for 2050 for the Bay Area's greenhouse gas emissions, in Board of Directors Resolution 2013-11.

To achieve these emission reduction goals, the California legislature directed the California Air Resources Board (CARB) to develop a Scoping Plan setting forth regulatory measures that CARB will implement, along with other measures, to reduce the state's greenhouse gas emissions. One of the principal regulatory measures is CARB's Cap and Trade program, which requires industrial greenhouse gas sources to obtain "allowances" equal to their greenhouse gas emissions. The amount of available allowances is subject to a "cap" on total emissions statewide, which CARB will reduce each year. Regulated facilities will either have to reduce their emissions or purchase allowances on the open market, which will give them a financial incentive to reduce emissions and will ensure that total annual emissions from the industrial sector will not exceed the declining statewide cap.

California has also adopted the "Renewable Portfolio Standard" for electric power generation, which requires that at least 33 percent of the state's electric power must come from renewable sources by 2020, and at least 50 percent must come from renewables by 2030. To complement these efforts on electricity generation, the state has also committed to increasing the energy efficiency of existing buildings by 50 percent by 2050 in order to reduce energy demand.

California has adopted regulatory measures aimed at reducing greenhouse gas emissions from mobile sources. These measures include standards for motor vehicle emissions and the state's Low Carbon Fuel Standard, which set limits on the carbon intensity of transportation fuels. California has also adopted SB 375, the Sustainable Communities and Climate Protection Act of 2008, which requires regional transportation and land use planning agencies to develop coordinated plans, called "Sustainable Communities Strategies," to reduce greenhouse gas emissions from the transportation sector by promoting denser development and alternatives to driving. The current Sustainable Communities Strategy for the Bay Area is *Plan Bay Area 2040*, which was adopted by the Metropolitan Transportation Commission and the Association of Bay Area Governments in July of 2017.

The Air District has committed to reducing the Bay Area's regional greenhouse gas emissions to 80 percent below 1990 levels by 2050, as noted above. The Air District has also committed to a broad suite of specific measures to address greenhouse gases in the 2017 Clean Air Plan, *Spare the Air, Cool the Climate*. That document lays out the Air District's vision for what the Bay Area may look like in a post-carbon year 2050 and describes policies and actions that the region needs to take in the near- to mid-term to achieves these goals.

Significance Criteria

CEQA Guidelines section 15064.4, promulgated in 2010, sets out the procedures for determining the significance of a project's greenhouse gas emissions. In making that determination, subdivision (b)(3) of that section allows a lead agency to consider "[t]he extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions."

In 2011, California Air Resources Board promulgated the regulations establishing the Cap and Trade Program (Cal. Code Regs., tit. 17, §§ 95801–96022) to reduce greenhouse gas emissions under the California Global Warming Solutions Act of 2006. The Cap and Trade Program seeks to reduce emissions of greenhouse gases from the subject sources by applying an aggregate greenhouse gas allowance budget on covered entities and providing a trading mechanism for greenhouse gas emission allowances or offsets. (Cal. Code Regs., tit. 17, § 95801.) Cap and Trade constitutes a "plan for the reduction . . . of greenhouse gas emissions" within the meaning of Guidelines section 15064.4, subdivision (b)(3), and that section therefore authorizes agencies to determine a project's greenhouse gas emissions will have a less than significant effect on the environment based on the project's compliance with the Cap and Trade Program. (Association of Irritated Residents v. Kern County Bd. of Supervisors (2017) 17 Cal. App. 5th 708, 743.)

Discussion of Impacts

VII. a). While the primary purpose of implementing expedited BARCT requirements is to reduce emissions of ROG, NOx, SO_2, and PM, some types of control equipment have the potential to create secondary adverse air quality impacts and generate GHG emissions, through construction activities or through the addition of air pollution control equipment. The proposed BARCT requirements may result in the installation of new equipment at facilities that need to comply with the new requirements.

Limited construction activities may be required for some BARCT measures to enclose open fugitive components, install new catalyst, increase lime injection, and so forth. Construction emissions associated with this type of construction would be minor and would involve the transport of the new equipment which is expected to require one to two truck trips per project. Installation of the equipment would be expected to be limited to two to ten workers and would not require any major construction equipment and no site preparation activities are expected to be required. Therefore, retrofitting this type of existing equipment would result in minor construction emissions.

Construction activities would also be required for the construction of new air pollution control equipment at existing facilities, including vapor combustors, wet gas scrubbers, ESPs, vapor recovery systems, and SCRs. Some of the BARCT equipment would be required at existing facilities with large emission sources, e.g., refinery FCCUs. Construction activities for these types of new air pollution control equipment would be temporary. Each of the sources that might be subject to the BARCT requirements set out in the expedited schedule is subject to the Cap and Trade Program and its greenhouse gas emissions are required to comply with the requirements of the Cap and Trade Program. As a result, the greenhouse gas emissions resulting from the implementation of the expedited BARCT schedule will be less than significant.

VII. b). The facilities affected by the expedited BARCT requirements could require the installation of additional air pollution control equipment or the implementation of new measures to control criteria pollutants. These measures could generate additional GHG emissions. However, the facilities subject to expedited BARCT must comply with the Cap and Trade Program, an obligation the implementation of the expedited BARCT schedule will not change. The GHG emissions resulting from the implementation of the BARCT schedule will therefore have a less-than-significant impact.

Conclusion

Based upon the above considerations, significant adverse impacts related to greenhouse gas emissions and climate change are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII.	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:				
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☑	☐	☐	☐
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☑	☐	☐	☐
c)	Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☑	☐	☐	☐
d)	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☑
e)	For a project 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, and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
g)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☑
h)	Significantly increased fire hazard in areas with flammable materials?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and potions of western Solano and southern Sonoma Counties. Because the area of coverage is vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses.

Facilities and operations within the District handle and process substantial quantities of flammable materials and acutely toxic substances. Accidents involving these substances can result in worker or public exposure to fire, heat, blast from an explosion, or airborne exposure to hazardous substances. The potential hazards associated with handling such materials are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facilities where they exist. 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 the following events.

- **Toxic gas clouds:** Toxic gas clouds are releases of volatile chemicals (e.g., anhydrous ammonia, chlorine, and hydrogen sulfide) that could form a cloud and migrate off-site, thus exposing the public. "Worst-case" conditions tend to arise when very low wind speeds coincide with an accidental release, which can allow the chemicals to accumulate rather than disperse.

- **Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases):** The rupture of a storage tank or vessel containing a flammable gaseous material (like propane), without immediate ignition, can result in a vapor cloud explosion. The "worst-case" upset would be a release that produces a large aerosol cloud with flammable properties. If the flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.

- **Thermal Radiation:** Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.

- **Explosion/Overpressure:** Process vessels containing flammable explosive vapors and potential ignition sources are present at many types of industrial facilities. Explosions may occur if the flammable/explosive vapors come into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

For all affected facilities, risks to the public are reduced if there is a buffer zone between industrial processes and residences or other sensitive land uses, or the prevailing wind blows away from residential areas and other sensitive land uses. The risks posed by operations at each facility are unique and determined by a variety of factors. The facilities affected by the proposed new rules are located in industrial areas.

Regulatory Background

There are many federal and state rules and regulations that facilities handling hazardous materials must comply with which serve to minimize the potential impacts associated with hazards at these facilities.

Under the Occupational Safety and Health Administration (OSHA) regulations [29 Code of Federal Regulations (CFR) Part 1910], facilities which use, store, manufacture, handle, process, or move highly hazardous materials must prepare a fire prevention plan. In addition, 29 CFR Part 1910.119, Process Safety Management (PSM) of Highly Hazardous Chemicals, and Title 8 of the California Code of Regulations, General Industry Safety Order §5189, specify required prevention program elements to protect workers at facilities that handle toxic, flammable, reactive, or explosive materials.

Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 7401 et. Seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop Risk Management Programs (RMPs) to prevent accidental releases of these substances, U.S. EPA regulations are set forth in 40 CFR Part 68. In California, the California Accidental Release Prevention (CalARP) Program regulation (CCR Title 19, Division 2, Chapter 4.5) was issued by the Governor's Office of Emergency Services (OES). RMPs are documents prepared by the owner or operator of a stationary source containing detailed information including: (1) regulated substances held onsite at the stationary source; (2) offsite consequences of an accidental release of a regulated substance; (3) the accident history at the stationary source; (4) the emergency response program for the stationary source; (5) coordination with local emergency responders; (6) hazard review or process hazard analysis; (7) operating procedures at the stationary source; (8) training of the stationary source's personnel; (9) maintenance and mechanical integrity of the stationary source's physical plant; and (10) incident investigation. California proposed modifications to the CalARP Program along with the state's PSM program in response to an accident at the Chevron Richmond Refinery. The proposed regulations were released for public comment on July 15, 2016 and the public comment period closed on September 15, 2016. After the close of the comment period a modified version of the proposed regulations was released in February 2017 and the public comment period for comments on the modifications closed on March 30, 2017. The final document was then filed with the Secretary of State in July 2017 and has gone into effect as of October 1, 2017.

Affected facilities that store materials are required to have a Spill Prevention Control and Countermeasures (SPCC) Plan per the requirements of 40 Code of Federal Regulations, Section 112. The SPCC is designed to prevent spills from on-site facilities and includes requirements for secondary containment, provides emergency response procedures, establishes training requirements, and so forth.

The Hazardous Materials Transportation (HMT) Act is the federal legislation that regulates transportation of hazardous materials. The primary regulatory authorities are the U.S. Department of Transportation, the Federal Highway Administration, and the Federal Railroad Administration. The HMT Act requires that carriers report accidental releases of hazardous materials to the Department of Transportation at the earliest practical moment (49 CFR Subchapter C). The California Department of Transportation (Caltrans) sets standards for trucks in California. The regulations are enforced by the California Highway Patrol.

California Assembly Bill 2185 requires local agencies to regulate the storage and handling of hazardous materials and requires development of a business plan to mitigate the release of hazardous materials. Businesses that handle any of the specified hazardous materials must submit to government agencies (i.e., fire departments), an inventory of the hazardous materials, an emergency response plan, and an employee training program. The information in the business plan can then be used in the event of an emergency to determine the appropriate response action, the need for public notification, and the need for evacuation.

Significance Criteria

The proposed project impacts associated with hazards 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 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.

Discussion of Impacts

VIII a, b, and c. The expedited BARCT implementation schedule would require certain industrial facilities, including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners, to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. SCRs could potentially be installed to control NOx emissions. Installation of new SCR equipment would be expected to increase the amount of ammonia used for NOx control. SCRs would require the additional delivery of ammonia or urea to the facilities where they are installed. Ammonia is a hazardous material that can be released in liquid or gaseous form. Additional catalysts could be required for SCR units and sulfur reducing catalyst additives may be required for SO_2 control. Alkaline may be required for alkaline and lime injection systems. The potential increase in the storage, transport and use of ammonia, catalysts, catalyst additives, and alkaline materials could result in significant hazard impacts which will be further evaluated in the Draft EIR.

Hazards associated with ESPs include fire and explosion hazards that can occur at the inlet to ESPs when highly charged dust particles are transported by a gas carrier that can contain the mixtures of both incombustible and combustible flue gases. The risk of ignition and even explosion is especially high in the presence of an explosive mixture of oxygen, hydrocarbons, carbon monoxide, etc. The ignition source is typically caused by the breakdown between the corona electrode and the collecting electrode, but in some cases electrostatic discharge (typically back corona) can also act as an ignition source, which may contribute to a fire or explosion.

Health and Safety Code §25506 specifically requires all businesses handling hazardous materials to submit a business emergency response plan to assist local administering agencies in an emergency release or threatened release of a hazardous material. Business emergency response plans generally require the following:

- Types of hazardous materials used and their locations;
- Training programs for employees including safe handling of hazardous materials and emergency response procedures and resources;
- Procedures for emergency response notification;
- Proper use of emergency equipment;
- Procedures to mitigate a release or threatened release of hazardous materials and measures to minimize potential harm or damage to individuals, property, or the environment; and
- Evacuation plans and procedures.

Hazardous materials at existing facilities would continue to be used in compliance with established by the California Occupational Safety and Health Administration (Cal-OSHA) regulations and procedures, including providing adequate ventilation, using recommended personal protective equipment and clothing, posting appropriate signs and warnings, and providing adequate worker health and safety training. The exposure of employees is regulated by Cal-OSHA in Title 8 of the CCR. Specifically, 8 CCR 5155 establishes permissible exposure levels (PELs) and short-term exposure levels (STELs) for various chemicals. These requirements apply to all employees. The PELs and STELs establish levels below which no adverse health effects are expected. These requirements protect the health and safety of the workers, as well as the nearby population including sensitive receptors.

In general, all local jurisdictions and all facilities using a minimum amount of hazardous materials are required to formulate detailed contingency plans to eliminate, or at least minimize, the possibility and effect of fires, explosion, or spills. In conjunction with the California Office of Emergency Services, local jurisdictions have enacted ordinances that set standards for area and business emergency response plans. These requirements include immediate notification, mitigation of an actual or threatened release of a hazardous material, and evacuation of the emergency area.

The above regulations provide comprehensive measures to reduce hazards of explosive or otherwise hazardous materials. Compliance with these and other federal, state and local regulations and proper operation and maintenance of equipment should ensure the potential for explosions or accidental releases of hazardous materials is not significant.

Despite the measures listed above, a malfunction or accident when using add-on pollution control equipment could potentially expose people to hazardous materials, explosions, or fires. The transport, use, and storage of additional hazardous materials may result in a release in the event of an accident. As a result, hazard impacts related to hazards to the public, schools, or the environment will be further evaluated in the Draft EIR.

VIII d. Government Code §65962.5 requires creation of lists of facilities that may be subject to Resource Conservation and Recovery Act (RCRA) permits or site cleanup activities. Most of the refineries affected by the expedited BARCT requirements are included on the hazardous materials sites list pursuant to Government Code §65962.5. It would be expected that other industrial facilities affected by the BARCT requirements would also be on the list. The facilities affected by the proposed BARCT requirements would be required to continue to manage any and all hazardous materials in accordance with federal, state, and local regulations. Implementing BARCT requirements are not expected to interfere with site cleanup activities or create additional site contamination. As a result, the proposed project is not expected to affect any facilities included on a list of hazardous material sites and, therefore, would not create a significant hazard to the public or environment.

VIII e-f. The proposed project is not expected to result in a safety hazard for people residing or working within two miles of a public airport or air strip. No impacts on airports or airport land use plans are anticipated from the proposed expedited BARCT requirements. Modifications to industrial facilities to install BARCT would be confined to the existing industrial area and would not be expected to interfere with airport activities. The hazards associated with the potential use of additional hazardous materials will be evaluated in the Draft EIR as discussed above.

VIII g-h. No increase in hazards associated with wildfires is anticipated from implementation of expedited BARCT. Affected facilities already exist and operate within the confines of existing industrial facilities. Native vegetation has been removed from the operating portions of the affected facilities to minimize fire hazards. The proposed project would not increase the existing risk of fire hazards in areas with flammable brush, grass, or trees, nor would it increase fire risk by increasing the use of flammable materials. It is expected that facilities adjacent to wildland areas take appropriate and required actions to protect their property from wildland fires. The proposed project requirements are not expected to expose people or structures to wild fires. Therefore, no significant increase in fire hazards is expected due to the proposed expedited BARCT requirements.

Conclusion

Implementation of the expedited BARCT requirements would reduce criteria pollutant emissions from industrial facilities throughout the Bay Area. However, construction and operation of new air pollution control equipment have the potential to result in an increase in the storage, transport and use of hazardous materials in the Bay Area and will be evaluated in the Draft EIR. No significant impacts were identified for sites included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5, projects located within or adjacent to airports or airport land use plans, emergency response plans, wildland fires, and hazards associated with flammable materials and these topics will not be addressed further in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY.					
Would the project:					
a)	Violate any water quality standards or waste discharge requirements?	☑	☐	☐	☐
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	☑	☐	☐	☐
c)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☑
d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?	☐	☐	☐	☑
e)	Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☑	☐
f)	Otherwise substantially degrade water quality?	☑	☐	☐	☐
g)	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☑
h)	Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☑

i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☑
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles). Reservoirs and drainage streams are located throughout the area within the Air District's jurisdiction, and discharge into the Bays. Marshlands incised with numerous winding tidal channels containing brackish water are located throughout the Bay Area.

The San Francisco Bay estuary system is one of the largest in the country and drains approximately 40 percent of California. Water from the Sacramento and San Joaquin Rivers of the Central Valley flow into what is known as the Delta region, then into the sub-bays, Suisun Bay and San Pablo Bay, and finally into the Central Bay and out the Golden Gate strait. The Delta is a large triangle of interconnected sloughs and agricultural "islands" that forms a key link in California's water delivery system. Some of the fresh water flows through the Delta and into Bay, but much is diverted from the Bay for agricultural, residential, and industrial purposes, as well as delivery to distant cities of southern California as part of state and federal water projects (ABAG, 2017).

The two major drainages, the Sacramento and San Joaquin Rivers receive more than 90 percent of runoff during the winter and spring months from rainstorms and snow melt. San Francisco Bay encompasses approximately 1,600 square miles and is surrounded by the nine Bay Area counties of which seven border the Bay. Other surface waters flow either directly to the Bay or Pacific Ocean. The drainage basin that contributes surface water flows directly to the Bay covers a total area of 3,464 square miles. The largest watersheds include Alameda Creek (695 square miles), the Napa River (417 square miles), and Coyote Creek (353 square miles) watersheds. The San Francisco Bay estuary includes deep-water channels, tidelands, and marshlands that provide a variety of habitats for plants and animals. The salinity of the water varies widely as the landward flows of saline water and the seaward flows of fresh water converge near the Benicia Bridge. The salinity levels in the Central Bay can vary from near oceanic levels to one quarter as much, depending on the volume of freshwater runoff (ABAG 2017).

Surface waters in the Bay Area include freshwater rivers and streams, coastal waters, and estuarine waters. Estuarine waters include the San Francisco Bay Delta from the Golden Gate Bridge to the Sacramento and San Joaquin Rivers, and the lower reaches of various streams that flow directly into the Bay, such as the Napa and Petaluma Rivers in the North Bay and the Coyote and San Francisquito Creeks in the South Bay (ABAG, 2017).

The Bay Area region is divided into a total of 28 groundwater basins. The ten primary groundwater basins in the Bay Area are the Petaluma Valley, Napa-Sonoma Valley, Suisun-Fairfield Valley, San Joaquin Valley, Clayton Valley, Diablo Valley, San Ramon Valley, Livermore Valley, Sunol Valley, and Santa Clara Valley basins. Groundwater in the region is used for numerous purposes, including municipal and

industrial water supply. However, groundwater use accounts for only about five percent of the total water usage (ABAG, 2017).

Together, surface water and ground water supply approximately 31 percent of Bay Area water. Surface water from local rivers and streams (including the Delta) is an important source for all Bay Area Water agencies, but particularly in the North Bay counties, where access to imported water is more limited because of infrastructure limitations. The greatest proportion of Bay Area water is imported from Sierra Nevada and Delta sources, comprising approximately 66 percent of supply. The primary Sierra Nevada sources are the Mokelumne River and Tuolumne River watersheds. Several Bay Area water agencies receive Delta water through the State and Central Valley Water Projects, which comprise a vast network of canals and aqueducts for the delivery of water throughout the Bay Area and the Central Valley (ABAG, 2017).

Recycled water in the Bay Area has come to be widely used for a number of applications, including landscape irrigation, agricultural uses, commercial and industrial purposes, and as a supply to the area's wetlands. The Alameda County Water District operates the Newark Desalination Facility which supplies approximately 12.5 million gallons per day to the distribution system (ABAG, 2017).

Wastewater treatment in the Bay Area is provided by various agencies as well as individual city and towns wastewater treatment systems. Some treatment plants serve individual cities while others serve multiple jurisdictions. More than 50 agencies provide wastewater treatment throughout the Bay Area. Most industrial facilities have wastewater and storm water treatment facilities and discharge treated wastewater under the requirements of National Pollutant Discharge Elimination System (NPDES) permits.

Regulatory Background

The Federal Clean Water Act of 1972 primarily establishes regulations for pollutant discharges into surface waters in order to protect and maintain the quality and integrity of the nation's waters. This Act requires industries that discharge wastewater to municipal sewer systems to meet pretreatment standards. The regulations authorize the U.S. EPA to set the pretreatment standards. The regulations also allow the local treatment plants to set more stringent wastewater discharge requirements, if necessary, to meet local conditions.

The 1987 amendments to the Clean Water Act enabled the U.S. EPA to regulate, under the NPDES program, discharges from industries and large municipal sewer systems. The U.S. EPA set initial permit application requirements in 1990. The State of California, through the State Water Resources Control Board, has authority to issue NPDES permits, which meet U.S. EPA requirements, to specified industries.

The Porter-Cologne Water Quality Act is California's primary water quality control law. It implements the state's responsibilities under the Federal Clean Water Act but also establishes state wastewater discharge requirements. The Regional Water Quality Control Boards administer the state requirements as specified under the Porter-Cologne Water Quality Act, which include storm water discharge permits. The water quality in the Bay Area is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board.

In response to the Federal Act, the State Water Resources Control Board prepared two statewide plans in 1991 and 1995 that address storm water runoff: the California Inland Surface Waters Plan and the California Enclosed Bays and Estuaries Plan, which have been updated in 2005 as the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. San Francisco Bay, and its constituent parts, including Carquinez Strait and Suisun Bay, fall under this category.

The San Francisco Bay Basin Plan identifies the: (1) beneficial water uses that need to be protected; (2) the water quality objectives needed to protect the designated beneficial water uses; and (3) strategies and time schedules for achieving the water quality objectives. The beneficial uses of the Carquinez Strait that must be protected which include water contact and non-contact recreation, navigation, ocean commercial and sport fishing, wildlife habitat, estuarine habitat, fish spawning and migration, industrial process and service supply, and preservation of rare and endangered species. The Carquinez Strait and Suisun Bay are included on the California list as impaired water bodies due to the presence of chlordane, copper, DDT, diazinon, dieldrin, dioxin and furan compounds, mercury, nickel, PCBs, and selenium.

Significance Criteria

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 263,000 gallons per day of potable water.

Water Quality:

- The project will cause degradation or depletion of ground water 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.

Discussion of Impacts

IX a, b, and f. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities that have already been graded and developed. While water may be used for dust suppression, substantial earthmoving would not be required. Therefore, significant water use would not be associated with construction activities.

The operation of some types of air pollution control equipment does not require the use of water or generate wastewater discharge, for example SCRs do not require the use of water and are not expected to result in any increase in wastewater. However, the use of wet gas scrubbers and wet ESPs do require additional water use. The proposed project would be considered significant if it exceeded the CEQA threshold of 263,000 gallons or more of potable water per day. Wet gas scrubbers on a refinery FCCU can require substantial water use in excess of 263,000 gallons per day and would result in additional wastewater discharge. Therefore, the potential impacts of water use and wastewater discharge will be evaluated in the Draft EIR.

VIII c, d, and e. Compliance with expedited BARCT requirements is expected to be limited to the installation of air pollution control equipment and modifications to industrial facilities. All activities associated with the proposed project are expected to occur within the confines of existing industrial facilities. The proposed project does not have the potential to substantially increase the area subject to runoff since the construction activities are expected to be limited in size and would be located within the confines of existing industrial facilities that have already been graded. In addition, storm water drainage within the facilities is currently controlled and construction activities are not expected to alter the storm water drainage within these facilities. Therefore, the BARCT measures are not expected to substantially alter the existing drainage or drainage patterns, result in erosion or siltation, alter the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite. Additionally, the proposed project is not expected to create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of contaminated runoff. Therefore, no significant adverse impacts to storm water runoff are expected as a result of the proposed project.

VIII g, h, i, and j. The proposed project does not include the construction of new or relocation of existing housing or other types of facilities and, as such, would not require the placement of housing or other structures within a 100-year flood hazard area. (See also XIII "Population and Housing"). The facilities affected by BARCT are industrial facilities. Any new construction associated with the proposed project is expected to occur within the confines of existing industrial facilities. As a result, the proposed project would not be expected to create or substantially increase risks from flooding; expose people or structures to significant risk of loss, injury or death involving flooding; or increase existing risks, if any, of inundation by seiche, tsunami, or mudflow.

Conclusion

Implementation of the expedited BARCT requirements would reduce criteria pollutant emissions from industrial facilities throughout the Bay Area. However, construction and operation of new air pollution control equipment has the potential to result in an increase in water use and wastewater

discharge associated with new air pollution control equipment and will be evaluated in the Draft EIR. No significant impacts were identified for storm water runoff and drainage, flood hazards, or the risks of inundation by seiche, tsunami or mudflow and these topics will not be addressed further in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
X.	**LAND USE AND PLANNING.** Would the project:				
a)	Physically divide an established community?	☐	☐	☐	☑
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to a general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑
c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. The land uses surrounding the Bay margins tend to be more intensely developed, particularly from San Francisco south along the Peninsula to Santa Clara County, and Contra Costa County south through Alameda County to Santa Clara County. These areas also include extensive networks of open space. The counties north of the Bay (Marin, Sonoma, and Napa) are more sparsely developed with a combination of suburban development, smaller cities and towns, and agriculture defining the landscape. Other areas of the Bay Area, such as the East Bay and Solano County, tend to be more suburban in character, with heavy industry related to oil refineries dotting the landscape as well as agriculture (ABAG, 2017).

Approximately 18 percent of the region's 4.8 million acres are considered to be urban or built-up land according to the California Farmland Mapping and Monitoring Program. The remaining undeveloped area includes open space and agricultural lands as well as water bodies and parks. Approximately 29 percent of the region is identified as protected open space. The Bay Area includes 101 cities, with San Jose, San Francisco, and Oakland representing the largest urbanized centers (ABAG, 2017).

Regulatory Background

Land uses are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

Significance Criteria

The proposed project impacts will be considered significant on land use and planning if the project conflicts with the land use and zoning designations established by local jurisdictions, or any applicable habitat conservation or natural community conservation plan.

Discussion of Impacts

X a-c. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities that have already been graded and developed. Thus, the proposed project is not expected to have impacts to non-industrial land uses and would not result in impacts that would physically divide an established community.

The General Plans and land use plans for areas with industrial land uses, generally allow for and encourage the continued use of industrial areas within their respective communities. Some of the General Plans encourage the modernization of existing industrial areas, including refineries (Benicia, 2015 and Santa Clara, 2011). The construction of equipment within the confines of existing facilities is not expected to conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the facilities that would be required to implement BARCT. The jurisdictions with land use approval recognize and support the continued use of industrial facilities. The construction required to comply with BARCT requirements that would be imposed by the proposed project would not interfere with those land use policies or objectives.

The proposed project has no components which would affect land use plans, policies, or regulations. Regulating emissions from existing facilities, will not require local governments to alter land use and other planning considerations. Habitat conservation or natural community conservation plans, agricultural resources or operations would not be affected by the proposed project, and divisions of existing communities would not occur. Therefore, current or planned land uses within the District will not be significantly affected as a result of the proposed project.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to land use and planning are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XI.	**MINERAL RESOURCES.** Would the project:				
a)	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☑
b)	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Regulatory Background

Mineral resources are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

Significance Criteria

The proposed project impacts on mineral resources will be considered significant if:

- The project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- The proposed project results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Discussion of Impacts

XI a-b. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities would occur within the confines of existing industrial facilities that have already been graded and developed. Construction of air pollution control equipment and modifications to existing industrial facilities as a result of the proposed project is not expected to affect mineral resources. Construction and operation of new equipment associated with proposed project is not expected to require mineral resources that are of value to the region or result in the loss of a locally important mineral resource site. Thus, no significant adverse impacts to mineral resources are expected.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to mineral resources are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XII.	**NOISE.** Would the project result in:				
a)	Exposure of persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☑	☐
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑	☐
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑	☐
e)	For a project 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 would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
f)	For a project within the vicinity of a private airstrip would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

Setting

The ambient noise environment in the urban areas of the Bay Area is defined by a wide variety of noise sources, with the predominant noise source being traffic. Traffic noise exposure is primarily a function of the volume of vehicles per day, the speed of those vehicles, the type of ground surface, the number of those vehicles represented by medium and heavy trucks, the distribution of those vehicles during daytime and nighttime hours, and the proximity of noise-sensitive receivers to the roadways. Existing average traffic noise exposure ranges from 52.1 decibels (dBA) (next to collector and small roads) to as high as 75.9 dBA (next to freeways). Bus transit also contributes to roadway noise levels. In San Francisco, a large portion of the transit bus fleet is electrified and, consequently, the contribution of bus transit to localized roadway noise levels is decreased (ABAG, 2013).

The Bay Area is also presently affected by noise from freight and passenger rail operations. While these operations generate significant noise levels in the immediate vicinity of the railways, train operations are intermittent and area railways are widely dispersed. Commuter rail such as San Francisco Muni Metro and Santa Clara Valley Transportation Authority (VTA) operate with more frequency than standard gauge rail operations but lower speeds resulting in lower noise levels. Bay Area Rapid Transit (BART) operations, on the other hand, can attain higher speeds and have the potential for greater noise levels along extended stretches. Noise levels from rail operations in the Bay Area can range from 70 dBA to 82 dBA, Community Noise Equivalent Level (CNEL). Train operations may be a source of ground vibration near the tracks. (ABAG, 2017).

The Bay Area is home to many airports—including public use, private use, and military facilities. Major airports include San Francisco International, Oakland International and Norman Y. Mineta San José International. In addition to the numerous daily aircraft operations originating and terminating at these facilities, aircraft not utilizing these airports frequently fly over the Bay Area. All of these operations contribute to the overall ambient noise environment. In general, like rail noise, the proximity of the receiver to the airport and aircraft flight path determines the noise exposure. Other contributing factors include the type of aircraft operated, altitude of the aircraft, and atmospheric conditions. Atmospheric conditions may contribute to the direction of aircraft operations (flow) and affect aircraft noise propagation (ABAG, 2017).

Based on the adopted Airport Land Use Compatibility Plan (ALUCP) for San Francisco International Airport, the 65 dBA CNEL contour extends approximately 6 miles northwest of the airport. Based on the ALUCP for Oakland International Airport, the 65 dBA CNEL contour extends approximately 5 miles south of the airport. Based on the ALUCP for Mineta San Jose International Airport, the 65 dBA CNEL contour extends approximately 2.5 miles northwest from the airport. Many other smaller airports and airstrips exist within the Bay Area where widely varying noise levels contribute to the existing noise environment (ABAG, 2017).

A wide variety of industrial and other non-transportation noise sources are located within the Bay Area. These include manufacturing plants, landfills, treatment plants (e.g., water), power generation facilities, food packaging plants, lumber mills, and aggregate mining facilities, just to name a few. Noise generated by these sources varies widely, but in many cases may be a significant, if not dominant, contributor to the noise environment in a specific community (ABAG, 2017).

Regulatory Background

Noise levels related to construction and operation activities are addressed in local General Plan policies and local noise ordinance standards. The General Plans and noise ordinances generally establish allowable noise limits within different land uses including residential areas, other sensitive use areas (e.g., schools, churches, hospitals, and libraries), commercial areas, and industrial areas.

Significance Criteria

The proposed project impacts on noise will be considered significant if:

- Construction noise levels exceed the local noise ordinances or, if the noise ordinance is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary.
- The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

Discussion of Impacts

XII a, c, and d. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources, wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities and adjacent to existing industrial structures. 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 facility premises. Construction required for the installation of air pollution control equipment or facility modifications is not expected to significantly alter the existing noise of an industrial facility. Construction activities associated with the proposed project would generate temporary noise associated with construction equipment and construction-related traffic. Construction would likely require truck trips to deliver equipment, construction workers, and construction equipment (e.g., forklift, welders, backhoes, cranes, and generators). All construction activities would be temporary, would occur during daylight hours or within hours established under the local noise ordinance, and would occur within the confines of existing industrial facilities so that no significant increase in noise during construction activities is expected.

Air pollution control equipment is not generally a major noise source. The equipment would be located within heavy industrial areas and compatible with such uses. Further, all noise producing equipment must comply with local noise ordnances and applicable OSHA and Cal/OSHA noise requirements. Therefore, industrial operations affected by the expedited BARCT requirements are not expected to have a significant adverse effect on local noise levels or noise ordinances.

XII b. The proposed project is not expected to generate or expose people to excessive groundborne vibration or groundborne noise. The use of large construction equipment that would generate substantial noise or vibration (e.g., backhoes, graders, jackhammers, etc.) would be limited because the sites are already graded and developed. Further, construction activities are temporary and would occur during the daylight hours, in compliance with local noise standards and ordinances. Therefore, the proposed project is not expected to generate excessive groundborne vibration or noise.

XII e-f. Affected facilities would still be expected to comply, and not interfere, with any applicable airport land use plans. It is assumed that operations in these areas near airports are subject to and in

compliance with existing community noise ordinances and applicable OSHA or Cal/OSHA workplace noise reduction requirements. In addition to noise generated by current operations, noise sources in each area may include nearby freeways, truck traffic to adjacent businesses, and operational noise from adjacent businesses. None of the proposed BARCT measures would locate residents or commercial buildings or other sensitive noise sources closer to airport operations. There are no components of the proposed BARCT measures that would substantially increase ambient noise levels within or adjacent to airports. Therefore, these topics will not be further evaluated in the EIR.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts on noise are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area either directly (e.g., by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
c) Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. The expedited BARCT requirements would apply to facilities which are located within industrial areas of the Bay Area.

Population in the Bay Area in 2015 was about 7.6 million people, which is approximately 20 percent of California's population. The population of the Bay Area is expected to grow to about 9.6 million people by 2040. Approximately 4 million people in the Bay Area were employed in 2015, and that number is expected to grow to 4.7 million jobs by 2040. There were approximately 2.8 million households in the Bay Area in 2015, and the number of households is expected to increase to 3.4 million by 2040 (ABAG, 2017).

Regulatory Background

Population and housing growth and resources are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

Significance Criteria

The proposed project impacts on population and housing will be considered significant if:

- The demand for temporary or permanent housing exceeds the existing supply.

- The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

Discussion of Impacts

XIII a). According to ABAG, population in the Bay Area is currently about 7.6 million people and is expected to grow to about 9.6 million people by 2040 (ABAG, 2017). The proposed project is not anticipated to generate any significant effects, either directly or indirectly, on the Bay Area's population or population distribution. The proposed project will require construction activities to modify existing operations and/or install air pollution control equipment at existing industrial facilities. It is expected that the existing labor pool would accommodate the labor requirements for the construction of the new and modified industrial equipment. In addition, it is not expected that the affected facilities would need to hire additional personnel to operate new air pollution control equipment. In the event that 1-2 new employees are hired, the existing local labor pool in the District (over seven million people) can accommodate any increase in demand for workers that might occur as a result of adopting the expedited BARCT requirements. As such, adopting the expedited BARCT requirements is not expected to induce substantial population growth.

XIII b and c). As discussed previously, the proposed expedited BARCT requirements are designed to reduce criteria pollutant emissions from stationary sources in the Bay Area. Construction associated with the proposed project is expected to be limited to constructing new air pollution control equipment or facility modifications at industrial facilities. All construction would take place at existing industrial facilities. The implementation of the expedited BARCT requirements is not expected to result in the creation of any industry/business 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 Bay Area. Based upon these considerations, significant population and housing impacts are not expected from the implementation of the proposed project.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to population and housing are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES. Would the project:				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
Fire protection?	☐	☐	☐	☑
Police protection?	☐	☐	☐	☑
Schools?	☐	☐	☐	☑
Parks?	☐	☐	☐	☑
Other public facilities?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties.

Public services are provided by a wide variety of local agencies. Fire protection services are managed at the local level, typically by municipalities, counties, fire protection districts, or volunteer fire companies. California Government Code §38611 states that any city organized under general law must establish a fire department unless it is included within the boundaries of an established fire protection district. State and federal lands are generally served by State and federal fire agencies, e.g., CALFIRE and National Park Service. In some cases, businesses and native Tribes manage their own fire departments. Each fire protection agency is responsible for serving its own prescribed area, but mutual aid agreements are in wide use across the region such that agencies can rely on assistance from neighboring agencies in the case of overwhelming demand (ABAG, 2017).

Police services are provided on the State, county, and local levels. Police services provide law enforcement in crime prevention, traffic and congestion control, safety management, emergency response, and homeland security. The California Highway Patrol (CHP) is responsible for police protection along the interstate highway systems and provides services for traffic management, emergency response, and protection of the highway system. Each county in the Bay Area has its own sheriff's department responsible for police protection in unincorporated areas of each county. Each incorporated city and town has a police department responsible for police protection within its own jurisdiction. Unincorporated areas and individual cities and towns also may contract with county sheriff departments for police services instead of providing their own (ABAG, 2017).

Although the California public school system is under the policy direction of the Legislature, the California Department of Education relies on local control for the management of school districts. School district governing boards and district administrators allocate resources among the schools of the district and set education priorities for their schools. Each jurisdiction in the Bay Area provides residents with local public education facilities and services, including elementary, middle, secondary, and post-secondary schools, as well as special and adult education. As of 2015-2016 school year, there were 2,018 public and charter schools in the Bay Area with 1,019,853 enrolled students and 51,702 teachers (ABAG, 2017).

Public facilities within the Air District are managed by different county, city, and special-use districts.

Regulatory Background

City and/or County General Plans usually contain goals and policies to assure adequate public services are maintained within the local jurisdiction.

Significance Criteria

The proposed project impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

Discussion of Impacts

XIV a. As noted in the "Population and Housing" discussion above, the proposed project is not expected to induce population growth because the existing local labor pool (e.g., workforce) is sufficient to accommodate the expected construction work force. No increase in permanent workers is expected to be required to operate the equipment associated with the expedited BARCT requirements. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

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. The facilities affected by the proposed project are existing facilities for which public services are already required and no increase in the need for such services is expected. Furthermore, a number of industrial facilities have existing security and fire-fighting capabilities, e.g., refineries, and are able to respond to fire and security issues independent of public police and fire services. There will be no increase in population as a result of the adoption of the expedited BARCT schedule and, therefore, no need for physically altered government facilities.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts on public services are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. RECREATION.				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and potions of western Solano and southern Sonoma Counties. Because the area of coverage is vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. The Bay Area contains approximately 1.3 million acres of parks and open space areas, with Santa Clara County having the most (about 19%) followed by Sonoma County (17%), and Marin County (16%). Approximately 265,000 acres of new parkland were added to the regional's open space inventory between 2002 and 2013, representing a 26 percent increase. Additionally, approximately 200,000 acres of privately owned land are held in permanent reserve as of 2013. While access by the general public to these reserve areas is restricted, they are important for the preservation of wildlife habitats and the protection of the environment and rural characteristics of various parts of the region (ABAG, 2017).

Parks and open space are generally categorized according to their size and amenities. Smaller parks such as pocket parks, neighborhood parks, community parks, urban forests, and community gardens serve local communities, typically are located in urbanized areas, and often include a wide range of improvements from playing fields and picnic areas to playgrounds and fitness trails. These parks are most often managed by local park districts or municipalities, which typically set minimum standards for park acreage based on their population. Larger open space areas such as regional parks, greenbelts, trails and pathways, natural and wildlife preserves, state parks and federal parks serve a broader geographic range, typically are located outside of major urbanized areas, and generally include fewer improvements. Management of these parks is divided among a range of organizations and agencies including regional park districts, State and federal government, private individuals, and non-profit land trusts.

Regulatory Background

Recreational areas are generally protected and regulated by the City and/or County General Plans at the local level through land use and zoning requirements. Some parks and recreation areas are designated and protected by state and federal regulations.

Significance Criteria

The proposed project impacts on recreation will be considered significant if:

- The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The project adversely affects existing recreational opportunities.

Discussion of Impacts

XV a-b. As discussed under "Land Use" above, there are no provisions in the expedited BARCT requirements 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 will be altered by the proposed BARCT requirements. Construction associated with the proposed project is expected to be limited to air pollution control equipment and modifications to existing industrial facilities and would employ temporary construction workers. All construction would take place at existing facilities that have been previously graded. Further, no increase in permanent workers is expected at the facilities where BARCT would be installed. Thus, there would be no increase in population that would result in more frequent use of recreational facilities.

The proposed project would not increase or redistribute population and, therefore, would not increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or the expansion of existing recreational facilities. Therefore, adoption of the expedited BARCT requirements is not expected to have any significant adverse impacts on recreation.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to recreational facilities are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC. Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☑
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☑
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑
d) Substantially increase hazards because of a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☐	☑
e) Result in inadequate emergency access?	☐	☐	☐	☑
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. Transportation systems located within the Bay Area include railroads, airports, waterways, and highways.

The transportation infrastructure for vehicles and trucks in the Bay Area ranges from single lane roadways to multilane interstate highways. The Bay Area currently contains over 1,300 directional miles of limited-access highways, which include both interstates and state highways. These facilities provide access to major employment centers and to destinations outside of the Bay Area. In addition, the Bay Area has over 33,000 directional miles of arterials and local streets, providing localized access to individual communities. Together, these roadway facilities accommodate nearly 158 million vehicle miles each weekday. The road network also serves over 600,000 vehicles that travel into or out of the region from adjacent areas. Over half of these interregional travelers use two regional gateways: Interstate 80 connecting Solano County and Yolo County, and Interstate 580 and Interstate 205 connecting Alameda County and San Joaquin County (ABAG, 2017).

The region is served by numerous interstate and U.S. freeways. On the west side of San Francisco Bay, Interstate 280 and U.S. 101 run north-south. U.S. 101 continues north of San Francisco into Marin County. Interstates 880 and 660 run north-south on the east side of the Bay. Interstate 80 starts in San Francisco, crosses the Bay Bridge, and runs northeast toward Sacramento. Interstate 80 is a six-lane north-south freeway which connects Contra Costa County to Solano County via the Carquinez Bridge. State Routes 29 and 84, both highways that allow at-grade crossings in certain parts of the region, become freeways that run east-west, and cross the Bay. Interstate 580 starts in San Rafael, crosses the Richmond-San Rafael Bridge, joins with Interstate 80, runs through Oakland, and then runs eastward toward Livermore. From the Benicia-Martinez Bridge, Interstate 680 extends north to Interstate 80 in Cordelia. Interstate 780 is a four lane, east-west freeway extending from the Benicia-Martinez Bridge west to I-80 in Vallejo.

There are over 11,500 transit route miles of service including heavy rail (BART), light rail (Muni Metro and Santa Clara Valley Transportation Authority or VTA Light Rail), commuter rail (Caltrain and Alameda Commuter Express or ACE), diesel and electric buses, cable cars, and ferries. This public transit system accommodates a total of almost 1.7 million passengers a day, with about 53 percent of daily passengers on Muni Metro, about 26 percent of daily passengers on BART, 11 percent on AC Transit, and nine percent on VTA. Amtrak provides long-distance passenger rail services to the Bay Area via the Capitol Corridor, San Joaquin, Coast Starlight, and California Zephyr lines (ABAG, 2017).

In addition to public transit systems and operators, private transit options have been increasing including privately operated commuter shuttles (e.g., Apple and Google), publicly accessible private shuttles (e.g., Emery Go-Round and Chariot), and transportation network companies (e.g., Uber and Lyft) (ABAG, 2017).

The Bay Area also has an extensive local system of bicycle routes and pedestrian paths and sidewalks. At a regional level, the share of workers driving alone was about 65 percent in 2015. The portion of commuters that carpool was about 10 percent in 2015, while an additional 12 percent utilize public transit.

About two percent of commuters walked to work in 2015. In addition, other modes of travel (bicycle, motorcycle, etc.), account for five percent of commuters in 2015 (ABAG, 2017).

The Bay Area is served by five seaports, which provide the opportunity for intermodal transfers to truck and railcars. The Port of Oakland is the third largest U.S. seaport on the West Coast (after the Ports of Long Beach and Los Angeles). Other seaports include the Port of San Francisco, the Port of Richmond, the Port of Benicia, and the Port of Redwood City. These seaports are supported by freight railroad services operated by Union Pacific and Burlington Northern Santa Fe.

The Bay Area is also served by three international airports: San Francisco International Airport, Oakland International Airport, and Norman Y. Mineta San Jose International Airport. Each of these airports provides mobility for people and freight nationally and internationally. The region is also served by one smaller airport with limited commercial service, Charles M. Schulz Sonoma County Airport, as well as numerous small general aviation airports.

Regulatory Background

Transportation planning is usually conducted at the state and county level. Planning for interstate highways is generally done by the California Department of Transportation.

Most local counties maintain a transportation agency that has the duties of transportation planning and administration of improvement projects within the county and implements the Transportation Improvement and Growth Management Program, and the congestion management plans (CMPs). The CMP identifies a system of state highways and regionally significant principal arterials and specifies level of service standards for those roadways.

Significance Criteria

The proposed project impacts on transportation and traffic will be considered significant if:

- A major roadway is closed to all through traffic, and no alternate route is available.
- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.
- 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.

Discussion of Impacts

XVI a and b. The expedited BARCT implementation schedule would require certain industrial facilities including refineries, manufacturing, bulk storage and transfer operations, cement plants, and petroleum coke calciners to reduce criteria pollutant emissions. These facilities may need to install additional air pollution control equipment, including domes on storage tanks, enclosures on fugitive emission sources,

wet gas scrubbers, wet ESPs, SCRs, and LoTOx equipment.

Physical modifications at facilities due to installation of BARCT are expected to be limited to industrial facilities. Construction activities for new air pollution control equipment could be substantial for large facilities, e.g., FCCUs at refineries. However, construction activities would occur within the confines of existing industrial facilities and adjacent to existing industrial structures.

Construction activities associated with the proposed project would generate temporary noise associated with construction equipment and construction-related traffic. Construction would likely require truck trips to deliver equipment, construction workers, and construction equipment (e.g., forklift, welders, backhoes, cranes, and generators). All construction activities and related traffic would be temporary, would occur during daylight hours, would occur within the confines of existing industrial facilities, and would cease following the completion of construction. As discussed in "Population and Housing" above, the labor force in the Bay Area is sufficient to handle the temporary increase in construction-related jobs. No increase in permanent workers is expected due to the installation of additional air pollution control equipment or facility modifications. The installation of some air pollution control equipment, e.g., SCRs and wet gas scrubbers, could result in an increase of about 1-2 trucks per week to deliver ammonia, catalyst or alkaline materials to the facilities for the operation of the equipment. The increase in one truck per day would be a negligible increase in traffic in the Bay Area.

The proposed project is not expected to affect the performance of mass transit or non-motorized travel to street, highways and freeways, pedestrian or bicycle paths, as no increase in permanent workers is expected. No conflicts with any congestion management programs, to include level of service and travel demand measures, or other standards established by county congestion management agencies for designated roads or highways are expected. No changes are expected to parking capacity at or in the vicinity of affected facilities as the proposed project only pertains to equipment located within existing industrial facilities. Therefore, no significant adverse impacts resulting in changes to traffic patterns or levels of service at local intersections are expected.

XVI c. The expedited BARCT requirements are not expected to involve the delivery of materials via air so no increase in air traffic is expected. Construction associated with the proposed project is expected to be limited to air pollution control equipment and modifications at existing industrial facilities. All construction would take place at existing industrial facilities. Therefore, the proposed project would not result in a change in air traffic patterns or result in a change in location that results in substantial safety risks.

XVI d - e. The proposed expedited BARCT requirements would not increase traffic hazards or create incompatible uses. The proposed project does not involve construction of any roadways or other transportation design features, so no changes to current roadway designs that would increase traffic hazards are expected. Emergency access at industrial facilities affected by the expedited BARCT requirements is not expected to be impacted by the proposed project, as no modifications that effect traffic or access are expected to be required. The expedited BARCT requirements are not expected to increase vehicle trips or to alter the existing long-term circulation patterns, thus creating traffic hazards or impacting emergency access.

XVI f) The proposed expedited BARCT requirements are not expected to affect the performance of mass transit or non-motorized travel to street, highways and freeways, pedestrian or bicycle paths as construction associated with the proposed project is expected to be limited to existing industrial facilities. Implementation of expedited BARCT requirements could result in a temporary increase in traffic at these industrial facilities during the construction period and one or two delivery trucks per week. No increase in permanent workers is expected following the construction period. Therefore, the proposed project would not conflict with any congestion management programs or other plans, increase travel demand, impact public transit, or impact bicycle or pedestrian safety. No changes are expected to parking capacity at or in the vicinity of affected facilities as the BARCT requirements are not expected to require additional permanent employees. Therefore, no impacts resulting in changes to traffic patterns or adopted traffic plans or programs are expected.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to traffic and transportation are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVII. TRIBAL CULTURAL RESOURCES. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resourced Code section 5020.1(k), or	☐	☐	☐	☑
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe.?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. Tribal cultural resources include site features, places, cultural landscapes and sacred places or objects which are of cultural value to a Tribe. The Carquinez Strait represents the entry point for the Sacramento and San Joaquin Rivers into the San Francisco Bay. Dense concentrations of Native American archaeological sites occur along the historic margins of San Francisco and San Pablo Bays. In addition, archaeological sites have also been identified in the following environmental settings in all Bay Area counties: near water sources, such as vernal pools and springs; along ridgetops and on midslope terraces; and at the base of hills and on alluvial flats. Native American archaeological sites have also been identified in the inland valleys of all Bay Area counties. Remains associated with a Native American archaeological site may include chert or obsidian flakes, projective points, mortars and pestles, and dark friable soil contain shell and bone dietary debris, heat-affected rock, or human burials (ABAG, 2017).

Native American populations, identified by their language, that lived within the Bay Area, included Costanoan, Eastern Miwok, Patwin, Coast Miwok, Pomo, and Wappo. Native villages and campsites were inhabited on a temporary basis and are found in several ecological niches due to the seasonal nature of their subsistence base. Remains of these early populations indicate that main villages, seldom more than 1,000 residents, were usually established along water courses and drainages. By the late 1760s, about 300,000 Native Americans lived in California (ABAG, 2013).

Regulatory Background

The State CEQA Guidelines were amended in July 2015 to include evaluation of impacts on tribal cultural resources. Tribal cultural resources include sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe (Public Resources Code 21074).

Significance Criteria

The proposed project impacts to tribal resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of Tribal cultural significance to a community or ethnic or social group or a California Native American Tribe.
- Unique objects with cultural value to a California Native American Tribe are present that could be disturbed by construction of the proposed project.

Discussion of Impacts

XVII a). As discussed in Section V, Cultural Resources, resources (buildings, structures, equipment) that are less than 50 years old are excluded from listing in the National Register of Historic Places unless they can be shown to be exceptionally important. The proposed expedited BARCT requirements may require the construction of air pollution control equipment and facility modifications to industrial facilities, adjacent to existing industrial structures. Affected facilities may have equipment or structures older than 50 years, however, this type of equipment does not meet the criteria identified in CEQA Guidelines §15064.5(a)(3), are not listed or eligible for listing in the California Register of Historic Resources or a local register of historical resources (Public Resources Code Section 5020.1(k), and are not considered to have cultural value to a California Native American Tribe.

Further, construction associated with the proposed project is expected to be limited to the construction at industrial facilities. All construction would take place at existing facilities that have been previously graded. Because construction will be limited to facilities that have been graded, the proposed expedited BARCT requirements are not expected to require physical changes to a site, feature, place, cultural landscape, sacred place or object with cultural value to a California Native American Tribe. The proposed BARCT requirements are not expected to result in a physical change to a resource determined to be eligible for inclusion or listed in the California Register of Historical Resources or included in a local register of historical resources.

As part of releasing this CEQA document for public review and comment, the document is circulated to the State Clearinghouse that provides notice of the proposed project to all California Native American Tribes that requested to be on the Native American Heritage Commission's (NAHC) notification list per Public Resources Code § 21080.3.1(b)(1). The NAHC notification list provides a 30-day period during which Native American Tribes may respond to the notice, in writing, requesting consultation on the proposed expedited BARCT requirements.

Since construction activities will be limited to existing industrial facilities that have been previously graded and developed, the proposed expedited BARCT requirements are not expected to affect historical or tribal resources as defined in Public Resources Section 5020.1(k), or 5024.1. Therefore, no impacts to tribal resources are anticipated to occur as a result of the proposed project.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to tribal cultural resources are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVIII. UTILITIES/SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☑	☐	☐	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☑	☐	☐	☐
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements needed?	☑	☐	☐	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☑	☐	☐	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☑	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☑

Setting

Given the large area covered by the Air District, public utilities are provided by a wide variety of local agencies. The San Francisco Bay Hydrologic Region covers approximately 4,550 square miles and encompasses numerous individual watersheds that drain into the San Francisco Bay and directly into the Pacific Ocean. Water is supplied to affected facilities by water purveyors in the Bay Area, which include the Alameda County Water District, Contra Costa Water District, East Bay Municipal District, Marin Municipal Water District, Napa Water Department, San Francisco Public Utilities Commission, Santa

Clara Valley Water District, Solano County Water Agency, Sonoma County Water Agency, and the Zone 7 Water Agency.

Solid waste includes the garbage, refuse and other discarded solid materials generated by residential, commercial, and industrial activities. Solid waste is handled through a variety of municipalities, through recycling activities and at disposal sites. The Bay Area is currently served by 16 privately operated landfills and one operated by the Sonoma County Public Works Department. The 16 landfills have a total remaining capacity of 261,889,000 cubic yards, or a total daily throughput of 41,804 tons per day (ABAG, 2017).

There are no hazardous waste disposal sites within the jurisdiction of the Air District. Hazardous waste generated at facilities, which is not recycled off-site, is required to be disposed of at a licensed hazardous waste disposal facility. Two such facilities are the Chemical Waste Management Inc. (CWMI) Kettleman Hills facility in King's County, and the Safety-Kleen facility in Buttonwillow (Kern County). Hazardous waste can also be transported to permitted facilities outside of California.

Regulatory Background

City and/or County General Plans usually contain goals and policies to assure adequate utilities and service systems are maintained within the local jurisdiction.

Significance Criteria

The proposed project impacts on utilities/service systems will be considered significant if:

- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- An increase in demand for utilities impacts the current capacities of the electric utilities.
- 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.
- The project increases demand for water by more than 263,000 gallons per day.
- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

Discussion of Impacts

XVIII a, b, d and e). The potential water use and wastewater impacts associated with implementation of the proposed expedited BARCT requirements were discussed under Hydrology and Water Quality (see Section IX a.). Certain types of air pollution control devices (e.g., wet gas scrubbers) could result in substantial water use and wastewater discharge. Therefore, these topics will be evaluated further in the Draft EIR.

XVIII c). Air pollution control equipment and facility modifications to implement the expedited BARCT requirements would occur within the confines of existing industrial facilities where stormwater is already controlled. The proposed project is not expected to require additional paving that would generate

additional stormwater runoff. Therefore, the proposed project would not be expected to alter the existing drainage systems or require the construction of new storm water drainage facilities. Nor would the proposed project create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Therefore, no significant adverse impacts on storm drainage facilities are expected.

XVIII f and g). Construction of air pollution control equipment as a result of the expedited BARCT requirements is not expected to significantly increase solid or hazardous wastes generated by the affected existing facilities. Some air pollution control equipment uses catalysts that need to be replaced when they are depleted. The catalyst is usually recycled because of the metal content of the catalyst and would not be expected to generate additional hazardous or solid waste that requires disposal. Waste streams from affected facilities would be treated/disposed/recycled in the same manner as they currently are handled. Therefore, no significant impacts to solid or hazardous waste disposal facilities are expected due to the proposed project. Facilities are expected to continue to comply with all applicable federal, state, and local statutes and regulations related to solid and hazardous wastes.

Conclusion

Based upon the above considerations, the potentially significant impacts associated with water use and wastewater treatment will be evaluated in the Draft EIR, as discussed in Section IX – Hydrology and Water Quality above. The potential project-specific impacts to other utilities and service systems are not expected to occur due to implementation of the expedited BARCT requirements and, therefore, will not be further evaluated in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX.	**MANDATORY FINDINGS OF SIGNIFICANCE.**				
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☑
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☑	☐	☐	☐
c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☑	☐	☐	☐

Discussion of Impacts

XIX a. The proposed expedited BARCT requirements are designed to reduce criteria pollutant emissions from industrial facilities in the Bay Area. Modifications may be required to industrial facilities to install air pollution control equipment. As discussed in Section IV, Biological Resources; Section V, Cultural Resources; and Section XVIII no significant adverse impacts are expected to biological, cultural, or tribal resources. The facilities affected by the expedited BARCT requirements are existing industrial facilities that have been graded and developed, where native biological resources have been removed or are non-existent. Similarly, impacts to cultural or tribal resources would not be expected to occur.

Therefore, the proposed expedited BARCT requirements do not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory, as discussed in the previous sections of the CEQA checklist. As discussed in Section IV, Biological Resources; Section V, Cultural Resources; and Section

XVII, Tribal Cultural Resources, no significant adverse impacts are expected to biological, cultural, or tribal cultural resources.

XIX b-c. The proposed expedited BARCT requirements are expected to result in a reduction in criteria pollutant emissions and implement portions of the AB 617 requirements, helping to achieve the goals of reducing ozone and PM in the Bay Area, thus improving public health and air quality in the region. As discussed in Section III, Air Quality, emissions during construction activities and operation could potentially exceed applicable significance thresholds, which represent levels at which a project's individual emissions would result in a cumulatively considerable contribution to the Air District's existing air quality conditions. (However, please see the discussion in Chapter 2, Section III, "Air Quality", above, regarding the applicability of the Air District's project-level CEQA thresholds to rule development projects.) The hazard associated with the additional use of ammonia and other potentially hazardous materials may also result in impacts, as well as potential water demand and wastewater treatment impacts. These potential impacts will be evaluated in the Draft EIR.

As discussed in the previous checklist discussions, the proposed expedited BARCT requirements are not expected to exceed any of the applicable significance thresholds, which also serve as the cumulative significance thresholds, for the environmental resources of aesthetics, agricultural and forestry resources, biological resources, cultural resources, geology and soils, greenhouse gases, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and tribal cultural resources. Therefore, the proposed project impacts on these environmental resources are not considered to be significant or cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and will not be evaluated in the Draft EIR.

Chapter 3

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APPENDIX A
AB 617 EXPEDITED BARCT IMPLEMENTATION SCHEDULE
COMMENT LETTERS RECEIVED ON THE NOP/IS

The following are comments received on the NOP/IS for the AB 617 Expedited BARCT Implementation Schedule Project. The NOP/IS was circulated for a 30-day public review and comment period starting August 7, 2018 and ending September 7, 2018. In addition, the BAAQMD conducted a CEQA scoping meeting at the Air District Headquarters' Yerba Room on August 24, 2018 to take public comment on the proposed project.

The BAAQMD received two comment letters on the NOP/IS during the public review period and did not receive public comments at the public scoping meeting. The two comment letters that were received during the public comment period are provided below.

David Joe

From: Osterberg, Todd Eugene <TOsterberg@chevron.com>
Sent: Thursday, August 23, 2018 3:09 PM
To: David Joe
Cc: Yang, Steven
Subject: Chevron Richmond BARCT comment 8-5

Good afternoon David,

I have a comment regarding AB617 BARCT implementation in relation to storage tanks (Reg. 8-5):
Impacts to the appearance of the community skyline and other aesthetics imposed by the installation of BARCT, for example tank geodesic doming, should be considered in the rule making process.

Thank you.

Todd E Osterberg
CHMM
Environmental Specialist-Air
Chevron Richmond Refinery

Chevron Products Company
Global Downstream
Tel 510 242 2813
Cell 925 951 7109

STATE OF CALIFORNIA Edmund G. Brown Jr., Governor
NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone (916) 373-3710

August 8, 2018

Victor Douglas
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Also sent via e-mail: vdouglas@baaqmd.gov

RE: SCH# 2018082003, Expedited Best Available Retrofit Control Technology (BARCT) Implementation Schedule Project; Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties, California

Dear Mr. Douglas:

The Native American Heritage Commission has received the Notice of Preparation (NOP) for Draft Environmental Impact Report for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, § 15064.5 (b) (CEQA Guidelines Section 15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared. (Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd. (a)(1) (CEQA Guidelines § 15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a **separate category of cultural resources**, "tribal cultural resources" (Pub. Resources Code § 21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment (Pub. Resources Code § 21084.2). Please reference California Natural Resources Agency (2016) "Final Text for tribal cultural resources update to Appendix G: Environmental Checklist Form," http://resources.ca.gov/ceqa/docs/ab52/Clean-final-AB-52-App-G-text-Submitted.pdf. Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code § 21084.3 (a)). **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. § 800 et seq.) may also apply.

The NAHC recommends **lead agencies consult with all California Native American tribes** that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments. **Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws**.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a **lead agency** shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
   - **a.** A brief description of the project.
   - **b.** The lead agency contact information.
   - **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code § 21080.3.1 (d)).
   - **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code § 21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A **lead agency** shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code § 21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or environmental impact report. (Pub. Resources Code § 21080.3.1(b)).
   - **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18). (Pub. Resources Code § 21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
   - **a.** Alternatives to the project**.**
   - **b.** Recommended mitigation measures**.**
   - **c.** Significant effects**.** (Pub. Resources Code § 21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
   - **a.** Type of environmental review necessary.
   - **b.** Significance of the tribal cultural resources.
   - **c.** Significance of the project's impacts on tribal cultural resources.
   - **d.** If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code § 21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code § 21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
   - **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
   - **b.** Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code § 21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
    a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
    b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code § 21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code § 21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code section 21084.3 (b). (Pub. Resources Code § 21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
        i. Planning and construction to avoid the resources and protect the cultural and natural context.
        ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
        i. Protecting the cultural character and integrity of the resource.
        ii. Protecting the traditional use of the resource.
        iii. Protecting the confidentiality of the resource.
    c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    d. Protecting the resource. (Pub. Resource Code § 21084.3 (b)).
    e. Please note that a federally recognized California Native American tribe or a nonfederally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code § 815.3 (c)).
    f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code § 5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An environmental impact report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code section 21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code § 21082.3 (d)).

    This process should be documented in the Cultural Resources section of your environmental document.

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires **local governments** to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code § 65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code § 65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code section 65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code sections 5097.9 and 5097.993 that are within the city's or county's jurisdiction. (Gov. Code § 65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have been already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.

b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
- **a.** A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
- **b.** A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
- **a.** Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
- **b.** Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
- **c.** Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

Please contact me if you need any additional information at gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton

Gayle Totton, M.A., Ph.D.
Associate Governmental Program Analyst
(916) 373-3714

cc: State Clearinghouse

APPENDIX B

EMISSION CALCULATONS

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Appendix B
Expedited BARCT Implementation Schedule
Construction Emissions Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5
Peak Daily Concurrent Construction Emissions (lb/day)						
5 VRU, Incinerators, or Vapor Combustors	0.2	1.8	2.3	0.1	0.8	0.4
5 Domes	12.2	123.9	116.9	0.4	13.0	7.8
1 Lime Injector	<0.1	0.4	0.5	<0.01	0.2	0.1
1 Large SCR	7.1	20.6	23.5	0.7	4.6	4.0
3 Refinery WGS or LoTox Scrubber	51	201	252	0.3	117	69
Total Concurrent Emissions (lbs/day)	70.5	347.7	395.2	1.5	135.6	81.3
Significance Thresholds	54	None	54	None	82	54
Significant?	Yes	--	Yes	--	Yes	Yes

Appendix B
Expedited BARCT Implementation Schedule
Operational Emissions Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Daily Concurrent Operational Emissions (lb/day)							
15 Oxidizers	2.4	107	13.1	0.2	2.6	2.6	18.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	1.2
Delivery Trucks for Caustic, Ammonia, and Lime	2.7	0.4	12.5	0.1	0.3	0.1	0.7
Total Concurrent Emissions	5.1	107.4	25.6	0.3	2.9	2.7	20.6
Reductions from Project Implementation[(1)]	411.0	--	--	6932	--	--	--
Net Concurrent Emissions[(2)]	-405.9	107.4	25.6	-6931.8	2.9	2.7	20.6
Significance Thresholds	54	None	54	None	82	54	None
Significant?	No	--	No	--	No	No	--
Annual Concurrent Operational Emissions (tons/yr)							
15 Oxidizers	0.4	19.5	2.4	0.1	0.5	0.5	6825.7
Electricity for WGS, LoTox, SCR, and ESP	--	--	--	--	--	--	451.9
Delivery Trucks for Caustic, Ammonia, and Lime	0.1	0.1	0.5	0.1	0.1	0.1	111.2
Total Concurrent Emissions	0.5	19.5	2.9	0.1	0.6	0.5	7388.8
Reductions from Project Implementation	75.0	0.0	0.0	1265.0	0.0	0.0	0.0
Net Concurrent Emissions[(2)]	-74.5	19.5	2.9	-1264.9	0.6	0.5	7388.8
Significance Thresholds	10	None	10	None	15	10	10000
Significant?	No	--	No	--	No	No	No

Note:

(1) Assumes 365 days of operations.

(2) Negative numbers indicate emission benefit.

Appendix B
Expedited BARCT Implementation Schedule
Typical Construction Equipment

Equipment Type	ROG (lb/hr)	CO (lb/hr)	NOx (lb/hr)	SOx (lb/hr)	PM10 (lb/hr)	CO2e (lb/hr)
Aerial Lift	0.00	0.17	0.10	0.00	0.00	0.01
Backhoe	0.02	0.36	0.27	0.00	0.02	0.02
Compressor	0.02	0.21	0.13	0.00	0.01	0.01
Concrete Saw	0.03	0.25	0.18	0.00	0.02	0.01
Crane	0.05	0.40	0.72	0.00	0.03	0.04
Drill Rig Large	0.08	0.50	1.06	0.00	0.04	0.07
Excavator	0.02	0.51	0.31	0.00	0.01	0.03
Forklift	0.02	0.22	0.17	0.00	0.01	0.01
Front End Loader	0.05	0.44	0.60	0.00	0.03	0.04
Generator	0.02	0.22	0.13	0.00	0.01	0.01
Light Plants	0.02	0.29	0.13	0.00	0.01	0.01
Welding Machine	0.03	0.23	0.18	0.00	0.02	0.01

Off-Road 2011 for 2019 fleet. CO emissions from SCAQMD, 2006

Equipment Type	ROG (lb/day)	CO (lb/day)	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	CO2e (lb/day)
Aerial Lift	0.037995	1.372031	0.783044	0.003538	0.015551	0.085244
Backhoe	0.182131	2.904058	2.191215	0.006362	0.130734	0.153284
Compressor	0.182209	1.662714	1.016855	0.002355	0.079061	0.05674
Concrete Saw	0.265078	1.975434	1.448896	0.003111	0.121785	0.074946
Crane	0.420426	3.185271	5.794775	0.011741	0.266954	0.282861
Drill Rig Large	0.639636	4.007488	8.517353	0.022198	0.335185	0.534803
Excavator	0.19881	4.111668	2.482458	0.010666	0.103511	0.256955
Forklift	0.133628	1.732806	1.389462	0.003185	0.099319	0.076729
Front End Loader	0.378682	3.548417	4.802831	0.01285	0.21504	0.309592
Generator	0.182209	1.764821	1.016855	0.002355	0.079061	0.05674
Light Plants	0.182209	2.312164	1.016855	0.002355	0.079061	0.05674
Welding Machine	0.265078	1.817133	1.448896	0.003111	0.121785	0.074946

Assumes 8 hour days.

Appendix B
Expedited BARCT Implementation Schedule
Dome Off-road Construction Emissions

							Emission Factors (lb/hr)						Emissions (lb)						
Phase	**Equipment**	**HP**	**Amount**	**Days**	**Hr/Day**	**Total Hours**	**VOC**	**CO**	**NOx**	**SOx**	**PM10**	**CO2e**	**VOC**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO2e (MT)**
Equipment Installation	Air Compressor	Comp	1	20	8	160	0.02	0.21	0.13	0.00	0.01	0.01	3.64	33.25	20.34	0.05	1.58	1.57	1.13
Equipment Installation	Crane	Comp	1	20	4	80	0.05	0.40	0.72	0.00	0.03	0.04	4.20	31.85	57.95	0.12	2.67	2.64	2.83
Equipment Installation	Forklift	Comp	1	20	8	160	0.02	0.22	0.17	0.00	0.01	0.01	2.67	34.66	27.79	0.06	1.99	1.97	1.53
Equipment Installation	Generator Sets	50	2	20	8	320	0.02	0.28	0.13	0.00	0.01	0.01	7.29	89.97	40.67	0.09	3.16	3.13	2.27
Equipment Installation	Aerial Lift	Comp	4	20	8	640	0.00	0.17	0.10	0.00	0.00	0.01	3.04	109.76	62.64	0.28	1.24	1.23	6.82
Equipment Installation	Welder	50	4	20	8	640	0.03	0.23	0.18	0.00	0.02	0.01	21.21	145.37	115.91	0.25	9.74	9.65	6.00
Emissions for One Dome Construction (tons)													**0.02**	**0.22**	**0.16**	**0.00**	**0.01**	**0.01**	**20.58**
Peak Daily Emissions (lb/day)													**2.10**	**22.24**	**16.27**	**0.04**	**1.02**	**1.01**	**1.03**

Notes:

(1) Off-Road 2011 for 2019 fleet. CO emissions from SCAQMD, 2006 : http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls

(2) Carbon Dioxide Equivalents (CO2e) are based on fuel use and default emission factors for diesel. Metric tons.

Appendix B
Expedited BARCT Implementation Schedule
Dome On-road Construction Emissions

Phase	Vehicle	Trip Length	Total Trips	VMT	VOC (lb/mi)	CO (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	PM (lb/mi)	Fugitive PM	CO2e (lb/mile)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (tonnes)
Equipment Installation	Commuters	24.8	400	9920	0.000	0.002	0.000	0.000	0.000	0.000	0.906	0.426	17.070	2.743	0.070	3.251	1.431	4.078
Equipment Installation	Delivery	40	10	400	0.000	0.002	0.007	0.000	0.000	0.000	2.247	0.169	0.758	2.662	0.010	0.379	0.224	0.408
Equipment Installation	HHDT	40	10	400	0.000	0.002	0.011	0.000	0.000	0.002	3.745	0.141	0.923	4.311	0.014	1.032	0.264	0.680
Emissions for One Dome Construction (Total Emissions)												**0.000**	**0.009**	**0.005**	**0.000**	**0.002**	**0.001**	**5.165**
Emissions for One Dome Construction (Peak Daily)												**0.331**	**2.535**	**7.110**	**0.028**	**1.574**	**0.560**	**1.291**

Notes:

(1) Peak day assumes 20 workers per day and all deliverise occur in one day. Project emissiosn based on 20 commuters per day for 20 days.

(2) Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet.

(3) Fugitive PM emission calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks,

and 24 for heavy trucks)

(4) Carbon Dioxide Equivalence (CO_E) = $CO_2 + CH_4 * 21 + N2O*310$

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

	2019		
Chemical	**Light**	**Medium**	**Heavy**
CO2 (lb/mi)	0.8949	2.2430	3.7418
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.906	2.247	3.745

Appendix B
Expedited BARCT Implementation Schedule
Dome Construction Emission Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Peak Daily Emissions (lb/day)							
Construction of One Dome	2.43	24.78	23.37	0.07	2.59	1.57	2.32
Construction of Five Concurrent Domes	12.17	123.89	116.87	0.35	12.97	7.85	11.60
Total Emissions (tons)							
Construction of One Dome	0.02	0.23	0.17	0.00	0.01	0.01	25.75
Construction of Five Dome	0.11	1.16	0.84	0.00	0.06	0.06	128.74
Construction of 20 Domes	0.43	4.64	3.35	0.01	0.25	0.22	514.96

Appendix B
Expedited BARCT Implementation Schedule
ESP Off-road Construction Emissions

Phase	Equipment	Offroad Category	HP	Amount	Days	Hr/Day	Total Hours	Emission Factors (lb/hr)						Emissions (lb)						
								VOC	CO	NOx	SOx	PM10	CO2e	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Site Prep and Foundation	Aerial Lift	Aerial Lift	Comp	0	120	0	0	0.00	0.17	0.10	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Prep and Foundation	Backhoe	Tractors/Loaders/Backhoes	Comp	1	120	20	2400	0.02	0.36	0.27	0.00	0.02	0.02	54.64	871.22	657.36	1.91	39.22	38.83	45.99
Site Prep and Foundation	Compressor	Other Industrial Equipment	50	1	120	20	2400	0.02	0.21	0.13	0.00	0.01	0.01	54.66	498.81	305.06	0.71	23.72	23.48	17.02
Site Prep and Foundation	Concrete Saw	Other Construction Equipment	50	1	120	10	1200	0.03	0.25	0.18	0.00	0.02	0.01	39.76	296.32	217.33	0.47	18.27	18.09	11.24
Site Prep and Foundation	Crane	Crane	Comp	1	120	4	480	0.05	0.40	0.72	0.00	0.03	0.04	25.23	191.12	347.69	0.70	16.02	15.86	16.97
Site Prep and Foundation	Drill Rig Large	Drill Rig (Mobile)	Comp	1	120	10	1200	0.08	0.50	1.06	0.00	0.04	0.07	95.95	601.12	1277.60	3.33	50.28	49.78	80.22
Site Prep and Foundation	Excavator	Excavator	Comp	1	120	20	2400	0.02	0.51	0.31	0.00	0.01	0.03	59.64	1233.50	744.74	3.20	31.05	30.74	77.09
Site Prep and Foundation	Forklift	Forklft	Comp	1	120	20	2400	0.02	0.22	0.17	0.00	0.01	0.01	40.09	519.84	416.84	0.96	29.80	29.50	23.02
Site Prep and Foundation	Front End Loader	Rubber Tired Loaders	Comp	1	120	20	2400	0.05	0.44	0.60	0.00	0.03	0.04	113.60	1064.52	1440.85	3.86	64.51	63.87	92.88
Site Prep and Foundation	Generator	Other Industrial Equipment	50	2	120	20	4800	0.02	0.22	0.13	0.00	0.01	0.01	109.33	1058.89	610.11	1.41	47.44	46.96	34.04
Site Prep and Foundation	Light Plants	Other Industrial Equipment	50	2	120	10	2400	0.02	0.29	0.13	0.00	0.01	0.01	54.66	693.65	305.06	0.71	23.72	23.48	17.02
Site Prep and Foundation	Welding Machine	Other Construction Equipment	50	0	120	0	0	0.03	0.23	0.18	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment Installation	Aerial Lift	Aerial Lift	Comp	0	140	0	0	0.00	0.17	0.10	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment Installation	Backhoe	Tractors/Loaders/Backhoes	Comp	0	140	0	0	0.02	0.36	0.27	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment Installation	Compressor	Other Industrial Equipment	50	0	140	0	0	0.02	0.21	0.13	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment Installation	Concrete Saw	Other Construction Equipment	50	3	140	4	1680	0.03	0.25	0.18	0.00	0.02	0.01	55.67	414.84	304.27	0.65	25.57	25.32	15.74
Equipment Installation	Crane	Crane	Comp	0	140	0	0	0.05	0.40	0.72	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment Installation	Drill Rig Large	Drill Rig (Mobile)	Comp	0	140	0	0	0.08	0.50	1.06	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment Installation	Excavator	Excavator	Comp	2	140	20	5600	0.02	0.51	0.31	0.00	0.01	0.03	139.17	2878.17	1737.72	7.47	72.46	71.73	179.87
Equipment Installation	Forklift	Forklft	Comp	0	140	0	0	0.02	0.22	0.17	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment Installation	Front End Loader	Rubber Tired Loaders	Comp	2	140	20	5600	0.05	0.44	0.60	0.00	0.03	0.04	265.08	2483.89	3361.98	9.00	150.53	149.02	216.71
Equipment Installation	Generator	Other Industrial Equipment	50	4	140	10	5600	0.02	0.22	0.13	0.00	0.01	0.01	127.55	1235.37	711.80	1.65	55.34	54.79	39.72
Equipment Installation	Light Plants	Other Industrial Equipment	50	1	140	20	2800	0.02	0.29	0.13	0.00	0.01	0.01	63.77	809.26	355.90	0.82	27.67	27.39	19.86
Equipment Installation	Welding Machine	Other Construction Equipment	50	5	140	20	14000	0.03	0.23	0.18	0.00	0.02	0.01	463.89	3179.98	2535.57	5.44	213.12	210.99	131.16
QA/QC	Aerial Lift	Aerial Lift	Comp	0	20	0	0	0.00	0.17	0.10	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
QA/QC	Backhoe	Tractors/Loaders/Backhoes	Comp	0	20	0	0	0.02	0.36	0.27	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
QA/QC	Compressor	Other Industrial Equipment	50	0	20	0	0	0.02	0.21	0.13	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
QA/QC	Concrete Saw	Other Construction Equipment	50	1	20	4	80	0.03	0.25	0.18	0.00	0.02	0.01	2.65	19.75	14.49	0.03	1.22	1.21	0.75
QA/QC	Crane	Crane	Comp	0	20	0	0	0.05	0.40	0.72	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
QA/QC	Drill Rig Large	Drill Rig (Mobile)	Comp	0	20	0	0	0.08	0.50	1.06	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
QA/QC	Excavator	Excavator	Comp	2	20	10	400	0.02	0.51	0.31	0.00	0.01	0.03	9.94	205.58	124.12	0.53	5.18	5.12	12.85
QA/QC	Forklift	Forklft	Comp	0	20	0	0	0.02	0.22	0.17	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
QA/QC	Front End Loader	Rubber Tired Loaders	Comp	0	20	0	0	0.05	0.44	0.60	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
QA/QC	Generator	Other Industrial Equipment	50	2	20	10	400	0.02	0.22	0.13	0.00	0.01	0.01	9.11	88.24	50.84	0.12	3.95	3.91	2.84
QA/QC	Light Plants	Other Industrial Equipment	50	1	20	10	200	0.02	0.29	0.13	0.00	0.01	0.01	4.56	57.80	25.42	0.06	1.98	1.96	1.42
QA/QC	Welding Machine	Other Construction Equipment	50	1	20	20	400	0.03	0.23	0.18	0.00	0.02	0.01	13.25	90.86	72.44	0.16	6.09	6.03	3.75
Tie-in	Aerial Lift	Aerial Lift	Comp	0	10	0	0	0.00	0.17	0.10	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tie-in	Backhoe	Tractors/Loaders/Backhoes	Comp	1	10	24	240	0.02	0.36	0.27	0.00	0.02	0.02	5.46	87.12	65.74	0.19	3.92	3.88	4.60
Tie-in	Compressor	Other Industrial Equipment	50	0	10	0	0	0.02	0.21	0.13	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tie-in	Concrete Saw	Other Construction Equipment	50	3	10	4	120	0.03	0.25	0.18	0.00	0.02	0.01	3.98	29.63	21.73	0.05	1.83	1.81	1.12
Tie-in	Crane	Crane	Comp	0	10	0	0	0.05	0.40	0.72	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tie-in	Drill Rig Large	Drill Rig (Mobile)	Comp	0	10	0	0	0.08	0.50	1.06	0.00	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tie-in	Excavator	Excavator	Comp	2	10	24	480	0.02	0.51	0.31	0.00	0.01	0.03	11.93	246.70	148.95	0.64	6.21	6.15	15.42
Tie-in	Forklift	Forklft	Comp	0	10	0	0	0.02	0.22	0.17	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tie-in	Front End Loader	Rubber Tired Loaders	Comp	0	10	0	0	0.05	0.44	0.60	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tie-in	Generator	Other Industrial Equipment	50	4	10	12	480	0.02	0.22	0.13	0.00	0.01	0.01	10.93	105.89	61.01	0.14	4.74	4.70	3.40
Tie-in	Light Plants	Other Industrial Equipment	50	0	10	0	0	0.02	0.29	0.13	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tie-in	Welding Machine	Other Construction Equipment	50	2	10	24	480	0.03	0.23	0.18	0.00	0.02	0.01	15.90	109.03	86.93	0.19	7.31	7.23	4.50
Total Emissions for Construction of Two ESPs (tons)														**0.9**	**9.5**	**8.0**	**0.0**	**0.5**	**0.5**	**1069.2**
Site Prep and Foundation (Peak Daily Emissions lb/day)														**5.4**	**58.6**	**52.7**	**0.1**	**2.9**	**2.8**	**3.5**
Equipment Installation (Peak Daily Emissions lb/day)														**8.0**	**78.6**	**64.3**	**0.2**	**3.9**	**3.9**	**4.3**
QA/QC (Peak Daily Emissions lb/day)														**2.0**	**23.1**	**14.4**	**0.0**	**0.9**	**0.9**	**1.1**
Tie-in (Peak Daily Emissions lb/day)														**4.8**	**57.8**	**38.4**	**0.1**	**2.4**	**2.4**	**2.9**

Notes:

(1) Off-Road 2011 for 2019 fleet. CO emissions from SCAQMD, 2006 : http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls

(2) Carbon Dioxide Equivalents (CO2e) are based on fuel use and default emission factors for diesel. Metric tons.

(3) Equipment list and schedule from FEIR for Exxon Mobil Rule 1105.1 Compliance Project (SCAQMD 2007). Equipment installation phase duration scaled by half for one ESP instead of two.

Appendix B

Appendix B
Expedited BARCT Implementation Schedule
ESP Construction Emission Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e
Peak Daily Emissions (lb/day)							
Site Prep and Foundation	5.64	63.56	57.66	0.17	4.67	3.44	5.10
Equipment Installation	8.09	83.60	65.17	0.20	4.85	4.27	5.49
QA/QC	2.02	24.43	14.75	0.05	1.20	1.03	1.41
Tie-in	4.90	60.48	39.20	0.13	2.96	2.62	3.56
Total Emissions (tons)							
Construction Activities for One ESP(1)	0.96	10.56	8.42	0.03	0.71	0.56	1075.77

(1) Assumes 14 months of construction.

Appendix B
Expedited BARCT Implementation Schedule
ESP On-road Construction Emissions

Phase	Vehicle	Trip Length	Total Trips	VMT	VOC (lb/mi)	CO (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	PM (lb/mi)	Fugitive PM	CO2e (lb/mile)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (tonnes)
Site Prep and Foundation	Commuters	24.8	11400	282720	0.000	0.002	0.000	0.000	0.000	0.000	0.895	12.14	486.48	78.18	2.00	92.64	40.78	114.76
Site Prep and Foundation	Delivery	40	5	200	0.000	0.002	0.007	0.000	0.000	0.000	2.243	0.08	0.38	1.33	0.01	0.19	0.11	0.20
Site Prep and Foundation	HHDT	40	1200	48000	0.000	0.002	0.011	0.000	0.000	0.002	3.742	16.91	110.79	517.29	1.68	123.90	31.69	81.47
Equipment Installation	Commuters	24.8	32900	815920	0.000	0.002	0.000	0.000	0.000	0.000	0.895	35.03	1403.97	225.62	5.78	267.36	117.68	331.20
Equipment Installation	Delivery	40	15	600	0.000	0.002	0.007	0.000	0.000	0.000	2.243	0.25	1.14	3.99	0.02	0.57	0.34	0.61
Equipment Installation	HHDT	40	5	200	0.000	0.002	0.011	0.000	0.000	0.002	3.742	0.07	0.46	2.16	0.01	0.52	0.13	0.34
QA/QC	Commuters	24.8	600	14880	0.000	0.002	0.000	0.000	0.000	0.000	0.895	0.64	25.60	4.11	0.11	4.88	2.15	6.04
QA/QC	Delivery	40	5	200	0.000	0.002	0.007	0.000	0.000	0.000	2.243	0.08	0.38	1.33	0.01	0.19	0.11	0.20
QA/QC	HHDT	40	5	200	0.000	0.002	0.011	0.000	0.000	0.002	3.742	0.07	0.46	2.16	0.01	0.52	0.13	0.34
Tie-in	Commuters	24.8	600	14880	0.000	0.002	0.000	0.000	0.000	0.000	0.895	0.64	25.60	4.11	0.11	4.88	2.15	6.04
Tie-in	Delivery	40	5	200	0.000	0.002	0.007	0.000	0.000	0.000	2.243	0.08	0.38	1.33	0.01	0.19	0.11	0.20
Tie-in	HHDT	40	5	200	0.000	0.002	0.011	0.000	0.000	0.002	3.742	0.07	0.46	2.16	0.01	0.52	0.13	0.34
Total Emissions (tons)												**0.03**	**1.03**	**0.42**	**0.00**	**0.25**	**0.10**	**6.58**
Site Prep and Foundation (Peak Daily Emissions lb/day)												**0.24**	**4.98**	**4.97**	**0.03**	**1.81**	**0.60**	**1.64**
Equipment Installation (Peak Daily Emissions lb/day)												**0.13**	**5.02**	**0.83**	**0.02**	**0.96**	**0.42**	**1.19**
QA/QC (Peak Daily Emissions lb/day)												**0.04**	**1.32**	**0.38**	**0.01**	**0.28**	**0.12**	**0.33**
Tie-in (Peak Daily Emissions lb/day)												**0.08**	**2.64**	**0.76**	**0.01**	**0.56**	**0.24**	**0.66**

Notes:

(1) Peak day assumes 20 workers per day and all deliverise occur in one day. Project emissiosn based on 20 commuters per day for 20 days.

(2) Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet.

(3) Fugitive PM emission calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks,

and 24 for heavy trucks)

(4) Carbon Dioxide Equivalence (CO_E) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

	2019		
Chemical	**Light**	**Medium**	**Heavy**
CO2 (lb/mi)	0.8949	2.2430	3.7418
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.906	2.247	3.745

(5) Equipment list and schedule from FEIR for Exxon Mobil Rule 1105.1 Compliance Project (SCAQMD 2007). Equipment installation phase duration scaled by half for one ESP instead of two.

Appendix B
Expedited BARCT Implementation Schedule
Oxidizer Construction Emission Summary

ACTIVITY[1]	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Peak Daily Emissions (lb/day)							
Construction Activities for 1 Oxidizer	0.03	0.35	0.45	<0.01	0.15	0.07	0.57
Overlapping Construction Emissions for 5 Oxidizers	0.15	1.75	2.25	<0.01	0.75	0.35	2.87
Total Emissions (tons)							
Construction Activities for 1 Oxidizer[2]	<0.001	0.004	0.005	<0.001	0.002	0.001	12.07
Construction Emissions for 15 Oxidizers	0.005	0.055	0.071	<0.01	0.024	0.011	180.98

Notes:

(1) Emissions from Final Program EA for Proposed Amended Regulation XX - (RECLAIM) (SCAQMD 2015)

(2) Assumes 21 days of contruction.

Appendix B
Expedited BARCT Implementation Schedule
Lime Injector Construction Emission Summary

ACTIVITY[1]	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Peak Daily Emissions (lb/day)							
Construction Activities for Lime Injector	0.03	0.35	0.45	<0.01	0.15	0.07	0.57
Total Emissions (tons)							
Construction Activities for Lime Injector[2]	<0.001	0.004	0.005	<0.001	0.002	0.001	12.07

Notes:

(1) Emissions from Final Program EA for Proposed Amended Regulation XX - (RECLAIM) (SCAQMD 2015). Assumes similar emissions to oxidizer construction.

(2) Assumes 21 days of contruction.

Appendix B
Expedited BARCT Implementation Schedule
WGS Construction Emission Summary

ACTIVITY[1]	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e
Peak Daily Emissions (lb/day)							
Demolition	6.00	36.00	28.00	<1	3.00	2.00	--
Construction	17.00	67.00	84.00	<1	39.00	23.00	--
Total Emissions (tons)							
Demolition[2]	0.06	0.36	0.28	<0.1	0.03	0.02	--
Construction[3]	2.04	8.04	10.08	<0.1	4.68	2.76	--
Total Construction Emissions	2.10	8.40	10.36	<0.1	4.71	2.78	468.00

Notes:

(1) Emissions from FEIR for ConocoPhillips Los Angeles Refinery PM10 and Nox Reduction Projects (SCAQMD 2007)

(2) Demolition activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for one month (20 working days)

(3) Construction activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for a total of 16 months (20 working days per month), with 8 months at peak construction activities and 8 months at 50 percent of peak construction activities.

Appendix B
Expedited BARCT Implementation Schedule
LoTox Scrubber Construction Emission Summary

ACTIVITY[1]	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e
Peak Daily Emissions (lb/day)							
Demolition	6.00	36.00	28.00	<1	3.00	2.00	--
Construction	17.00	67.00	84.00	<1	39.00	23.00	--
Total Emissions (tons)							
Demolition[2]	0.06	0.36	0.28	<0.1	0.03	0.02	--
Construction[3]	2.04	8.04	10.08	<0.1	4.68	2.76	--
Total Construction Emissions	2.10	8.40	10.36	<0.1	4.71	2.78	468.00

Notes:

(1) Emissions from FEIR for ConocoPhillips Los Angeles Refinery PM10 and Nox Reduction Projects (SCAQMD 2007)

(2) Demolition activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for one month (20 working days)

(3) Construction activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for a total of 16 months (20 working days per month), with 8 months at peak construction activities and 8 months at 50 percent of peak construction activities.

Appendix B
Expedited BARCT Implementation Schedule
SCR Constrution Emissions Summary

ACTIVITY[1]	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e
Peak Daily Emissions (lb/day)							
Off-road Construction Emissions	1.86	12.02	14.94	0.00	4.12	3.79	--
On-road Vehicle Trip Emissions	5.22	8.58	8.6	0.71	0.47	0.22	--
Total Construction Emissions	7.08	20.6	23.54	0.71	4.59	4.01	--
Annual Emissions (tons/yr)							
Construction for One SCR [2]	0.69	3.18	3.75	0.07	0.85	0.76	574

Notes:

(1) Emissions from Final Program EA for Proposed Amended Regulation XX - (RECLAIM) (SCAQMD 2015)

(2) Assumes 12 months of contruction.

Appendix B
Expedited BARCT Implementation Schedule
Operation Emissions from Thermal Oxidizer

Parameter [1]	**VOC**	**CO**[2]	**NOx**[3]	**SOx**	**PM10**	**PM2.5**	**CO_2**	**N_2O**	**CH_4**	**CO2e**
Emission Factor[4]	7.00	0.30	0.04	0.60	7.50	7.50	120000.00	0.64	2.30	120246.70
Emission Factor Units	lb/mmscf	lb/mmbtu	lb/mmbtu	lb/mmscf	lb/mmscf	lb/mmscf	lb/mmscf	lb/mmscf	lb/mmscf	lb/mmscf
Heater Duty mmbtu/hr	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Heating Value (btu/scf)	1050.00	1050.00	1050.00	1050.00	1050.00	1050.00	1050.00	1050.00	1050.00	1050.00
Fuel Use (mmscf/yr)	25	25	25	25	25	25	25	25	25	25
Operational Time (hr/day)	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Daily Emissions (lb)	**0.16**	**7.10**	**0.88**	**0.01**	**0.17**	**0.17**	**2742.86**	**0.01**	**0.05**	**2748.50**
Daily Total for 15 Oxidizers (lb)	**2.40**	**106.56**	**13.13**	**0.21**	**2.57**	**2.57**	**41142.86**	**0.22**	**0.79**	**41227.44**
Annual Emissions (tons or MT for GHG Emissions)	**0.03**	**1.30**	**0.16**	**0.00**	**0.03**	**0.03**	**454.12**	**0.00**	**0.01**	**455.05**
Annual Emissions for 15 Oxidizers (tons or MT for GHG Emissions)	**0.44**	**19.45**	**2.40**	**0.04**	**0.47**	**0.47**	**6811.73**	**0.04**	**0.13**	**6825.74**

Note:

(1) Detailed calculations can be found in BAAQMD, 2016, Appendix A.

(2) Based on 400 ppm

(3) Based on 30 ppm

(4) Default emission factors for natural gas combustion for external combustion sources. SCAQMD Annual Emissions Reporting and AP-42 for GHG emissions.

Appendix B
Expedited BARCT Implementation Schedule
Operational Delivery Truck Emissions

Equipment	Vehicle	Trip Length	Total Trips	VMT	VOC (lb/mi)	CO (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	PM (lb/mi)	Fugitive PM	CO2e (lb/mile)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Caustic/Catalyst for 1 WGS	HHDT	120	104	12480	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	4.397	28.805	134.496	0.437	32.213	8.241	21.202
Caustic/Catalyst for 1 LoTox Scrubber	HHDT	120	104	12480	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	4.397	28.805	134.496	0.437	32.213	8.241	21.202
Lime for Cement Kiln	HHDT	100	365	36500	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	3.745	12.860	84.246	393.357	1.279	94.212	24.101	62.008
Annual Emissions (tons/yr)												**0.05**	**0.08**	**0.48**	**0.05**	**0.13**	**0.05**	**146.82**
Peak Daily (lb/day)												**0.39**	**2.66**	**12.52**	**0.05**	**0.29**	**0.09**	**0.58**

Notes:

(1) Peak day assumes 3 caustic delivery trucks for WGS, 1 caustic delivery truck for LoTOx, and 1 lime delivery truck.

(2) Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet.

(3) Fugitive PM emission calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks,

and 24 for heavy trucks)

(4) Carbon Dioxide Equivalence (CO_E) = $CO_2 + CH_4 * 21 + N2O*310$

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

	2019		
Chemical	Light	Medium	Heavy
CO2 (lb/mi)	0.8949	2.2430	3.7418
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.906	2.247	3.745

Daily Peak Emissions (lbs/day)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Caustic/Catalyst for 1 WGS	0.08	0.55	2.59	0.01	0.06	0.02	898.86
Caustic/Catalyst for 1 LoTox Scrubber	0.08	0.55	2.59	0.01	0.06	0.02	898.86
Lime for Cement Kiln	0.07	0.46	2.16	0.01	0.05	0.01	749.05

Annual Emissions (tons/yr)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (MT)
Caustic/Catalyst for 1 WGS	0.00	0.01	0.07	0.00	0.02	0.00	0.01
Caustic/Catalyst for 1 LoTox Scrubber	0.00	0.01	0.07	0.00	0.02	0.00	0.01
Lime for Cement Kiln	0.01	0.04	0.20	0.00	0.05	0.01	0.03

Appendix B
Expedited BARCT Implementation Schedule
GHG Emissions from Electricity

Control Equipment	Number of Units	Potential Increased Electricity Demand (MWhr/yr)	Emission Factor (lb/MWhr) (1)	Emissions (CO2e MT/yr)
WGS(2)	1	261	644	76.24
LoTox Scrubber(2)	1	261	644	76.24
SCR(3)	1	222	644	64.82
ESP(4)	2	803	644	234.57
			Total Emissions	451.87

(1) CAPCOA, 2016. Based on PG&E emission factors from CalEEMod.

(2) FEIR for ConocoPhillips Los Angeles Refinery PM10 and Nox Reduction Projects (SCAQMD 2007)

(3) Final Program EA for Proposed Amended Regulation XX - (RECLAIM) (SCAQMD 2015)

(4) FEIR for Exxon Mobil Rule 1105.1 Compliance Project (SCAQMD 2007)

Appendix B
Expedited BARCT Implementation Schedule
Scrubber TAC Emissions

Pollutant	Daily Usage (tons/day)	Annual Usage (tons/day)	Usage Rate (gal/day)	Density (lb/gal)	Daily Usage (lb/day)
NaOH (50% solution)	3.37	1228.30	22.00	12.747	280.43

NaOH Demand Filling Loss (lb/day)	Q = Fill Rate = NaOH Demand (MMgal/day)	S = Saturation Factor	P = Vapor Pressure of material Loaded (psia)	M = NaOH vapor molecular weight (lb/lbmole)	T= temperature of liquid loaded (oR)	Daily PM10 Filling Loss (lb/day)	Eworking = Hourly PM10 Working Loss (lb/hr)	Total Hourly PM10 Loss (lb/hr)	Total Hourly PM10 Loss (lb/hr) at 25m
3.37	0.53	1.45	0.042	24.8	544.67	1.82E-02	7.60E-04	2.28E-03	2.28E-05

NaOH @ 50% solution density = 12.747 lb/gal

Mv for NaOH solution = 24.8 lb/lbmol

Vapor Pressure for NaOH = 2.18 mmHg at 29.4oC or 85oF = 0.042 psia

Loading Temperature = 85^{o}F to 100^{o}F (544.67^{o}R to 559.67^{o}R)

Breathing Loss = 3 * Filling Loss

Filling Loss

$E_{loading}$ lb/day = (12.46) ((S)(P)(M)(Q))/T where:

S = saturation factor (dimensionless; obtained from Table 5.2-1 in AP-42)

= 1.45 (Splash loading: dedicated normal service)

P = vapor pressure of the material loaded at temperature T (psia)

M = vapor molecular weight (lb/lb-mole)

Q = volume of material loaded (1,000 gal/day)

T = temperature of liquid loaded (^{o}R).