air pollution control district
SANTA BARBARA COUNTY

Agenda Item: H-2
Agenda Date: May 21, 2020
Agenda Placement: Regular
Estimated Time: 20 minutes
Continued Item: No

Board Agenda Item

TO: Air Pollution Control District Board

FROM: Aeron Arlin Genet, Air Pollution Control Officer

CONTACT: Timothy Mitro, Air Quality Engineer, Planning Division, (805) 961-8883

SUBJECT: Proposed Rule 364, Refinery Fenceline and Community Air Monitoring

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RECOMMENDATION:

That the Board:

1. Hold a public hearing to receive testimony on proposed Rule 364, Refinery Fenceline and Community Air Monitoring;

2. Adopt the resolution included as Attachment 1 that contains the following action items:

   a. Adopt the California Environmental Quality Act (CEQA) Findings pursuant to the CEQA guidelines;

   b. Adopt the General Rule Findings in support of the proposed rule amendments pursuant to Health and Safety Code section 40727 regarding necessity, authority, clarity, consistency, nonduplication, and reference; and

   c. Adopt proposed Rule 364.

BACKGROUND:

Petroleum refineries are among the largest stationary sources of air pollution in California. In recent years, community concerns over emissions from refineries and the potential for community exposure to air contaminants, both from routine facility operations and potential releases due to upset conditions or emergency situations, has increased. Assembly Bill

(AB) 1647, passed in 2017, contains requirements for fenceline air monitoring and community air monitoring for refineries operating in California by January 2020. Proposed Rule 364 was developed to address these requirements for refineries in Santa Barbara County. At present, Santa Maria Asphalt Refinery is the only refinery located in Santa Barbara County.

DISCUSSION:

A refinery fenceline system can provide the public and other agencies with real-time air quality data regarding various air pollutants and the potential health impacts near the refinery. Proposed Rule 364 requires monitoring of BTEX compounds (referring to benzene, toluene, ethylbenzene, and xylene), sulfur dioxide, and hydrogen sulfide at the facility fenceline. District staff recommends the use of open-path technologies to monitor the majority of these pollutants at the fenceline. Open-path technologies employ light beams to detect the pollutant concentration levels across an entire path, typically 200 to 500 meters long. Open-path systems are an accurate and cost-effective way to detect potential pollutant leaks at the refinery boundary, but other monitoring options could be used in accordance with the Refinery Fenceline Air Monitoring Guidelines, which are attached to the rule. Proposed Rule 364 requires that the pollutant data from the refinery's system be made available on a public website.

Proposed Rule 364 also addresses the need for the District to install and maintain a refinery-related community air monitoring system and make the pollutant data (BTEX, sulfur dioxide, and hydrogen sulfide) available to the public through the District's website. The community monitoring system can be co-located with the District's existing ambient air monitoring network to reduce the refinery's costs. However, the current monitoring site in central Santa Maria does not meet the federal EPA siting criteria. The District has been evaluating new locations to co-locate the equipment that could satisfy the monitoring objectives for the Santa Maria region as well as the community that is downwind of the refinery. The District hopes to have a final location for a co-located community monitor chosen by the summer of 2020.

FISCAL IMPACTS TO THE REGULATED COMMUNITY:

Proposed Rule 364 will affect the owner and operator of any petroleum refinery within the County as they will be responsible for the costs to implement the AB 1647 mandate. Staff evaluated various metrics (e.g., the cost of air monitoring equipment, equipment siting, data logging systems, and labor) to estimate the costs of both the fenceline monitoring system and the community air monitoring system. The costs are based on the analysis performed by the South Coast Air Quality Management District and adjusted downward based on District staff assessment. Based on the costs provided in the staff report, staff concludes that installing and maintaining the refinery fenceline equipment and reimbursing the District for the community air monitoring system will not significantly impact industry.

FISCAL IMPACTS TO THE DISTRICT BUDGET:

The proposed rule is not expected to result in any significant increased workload for District staff. District staff will have to review additional monitoring plans and reports and install and maintain new monitoring equipment for the community air monitoring system. These tasks can

take up to an additional 0.25 FTE (Full-Time Equivalent) workload for District staff. The District can manage the workload with existing staff, and no additional hires will be necessary.

PUBLIC REVIEW:

The District held a public workshop to present, discuss, and hear comments on the draft rule on December 16, 2019 at the District office in Santa Barbara. To inform the public about the workshop, District staff e-mailed a public notice to everyone who subscribed to the noticing subscription list. Staff also mailed a hardcopy notice to the Santa Maria Asphalt Refinery. The workshop was attended by representatives and consultants for the refinery. The written comments that were received from the refinery and the District's responses to those comments are included in the staff report.

The District brought the draft rule to the Community Advisory Council (CAC) on January 22 and February 26, 2020. Comments from the CAC and the District's responses to those comments are also included in the attached staff report. At the February meeting, the CAC unanimously recommended that the District Board adopt the proposed Rule 364. The proposed rule was then publicly noticed on April 19, 2020, and the public was invited to participate remotely at the May 21, 2020 Board Hearing where the rule will be considered for adoption. There have been no substantial changes to the proposed rule since the February 26 CAC meeting.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA):

The California Environmental Quality Act (CEQA) requires environmental review for proposed Rule 364, Refinery Fenceline and Community Air Monitoring. The District is the lead agency for this project. Proposed revisions to Rule 364 were examined and it was determined that the adoption of the rule will not result in the relaxation of air pollution control requirements in general, or in the relaxation of air pollution control standards that apply to any specific existing facilities or processes. Pursuant to §15061(b)(3) of the State CEQA Guidelines, the project is exempt from CEQA as it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment. As a result, the project is exempt from any additional CEQA review. CEQA findings to be adopted by the District Board, as well as a discussion of these findings, are provided in Attachment A to the Board resolution. A Notice of Exemption, as shown in Attachment B to the Board resolution, will be prepared in compliance with CEQA Guidelines section 15062.

ATTACHMENT:

1) District Board Resolution for adopting Rule 364, Refinery Fenceline and Community Air Monitoring, which includes the following:
    A. California Environmental Quality Act (CEQA) Findings
    B. CEQA Notice of Exemption
    C. General Rule Findings
    D. Rule 364 Staff Report
    E. Proposed Rule 364, including attached Refinery Fenceline Air Monitoring Guidelines

ATTACHMENT #1

Resolution in the Matter of Adopting
Rule 364, Refinery Fenceline and Community Air Monitoring

RESOLUTION OF THE BOARD OF DIRECTORS OF

THE SANTA BARBARA COUNTY

AIR POLLUTION CONTROL DISTRICT

IN THE MATTER OF ADOPTING RULE 364, REFINERY FENCELINE AND COMMUNITY AIR MONITORING	APCD RESOLUTION NO. _____

RECITALS

WHEREAS, the Air Pollution Control District Board of the County of Santa Barbara ("Board") is authorized to adopt, amend, or repeal rules and regulations pursuant to Health and Safety Code section 40725 et seq; and

WHEREAS, pursuant to Health and Safety Code section 40001, the Board is required to adopt and enforce rules and regulations to achieve and maintain the state and federal ambient air quality standards; and

WHEREAS, Assembly Bill 1647 (Muratsuchi, 2017), codified at California Health and Safety Code section 42705.6, requires that: (1) owners and operators of petroleum refineries develop, install, operate, and maintain a fence-line monitoring system; 2) air districts develop, install, operate, and maintain a refinery-related community air monitoring system; 3) air districts and owners and operators of petroleum refineries collect real-time data from the systems and provide the data to the public as quickly as possible in a publicly accessible format; and 4) owners and operators of petroleum refineries be responsible for the costs associated with implementing the systems; and

WHEREAS, proposed Rule 364, Refinery Fenceline and Community Air Monitoring, would require owners and operators of petroleum refineries in Santa Barbara County to meet all of the requirements of California Health and Safety Code section 42705.6.

NOW, THEREFORE, IT IS HEREBY RESOLVED, as follows:

1. This Board has held a hearing and accepted public comments in accordance with the requirements of Health and Safety Code section 40725 et seq.
2. The California Environmental Quality Act ("CEQA") findings, as set forth in Attachment A of this resolution, are hereby adopted as findings of this Board pursuant to CEQA, the State CEQA Guidelines, and the Environmental Review Guidelines for the Santa Barbara County Air Pollution Control District. A Notice of Exemption, as set forth in Attachment B of this resolution, will be prepared in compliance with CEQA Guidelines section 15062.
3. The General Rule findings, as set forth in Attachment C of this resolution, are hereby adopted as findings of this Board pursuant to Health and Safety Code section 40727.
4. The Staff Report, as set forth in Attachment D of this resolution, has been presented to this Board and reviewed and considered prior to approving this project.
5. The proposed Rule 364, Refinery Fenceline and Community Air Monitoring, as set forth in Attachment E of this resolution, is hereby adopted as a rule of the Santa Barbara County Air Pollution Control District pursuant to Health and Safety Code section 40725 et seq.

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PASSED, APPROVED AND ADOPTED by the Air Pollution Control District Board of the Santa Barbara County, State of California, this ___ day of _____, _____, by the following vote:

Ayes:

Noes:

Abstain:

Absent:

SANTA BARBARA COUNTY
AIR POLLUTION CONTROL DISTRICT

By _____
Chair

Date _____

ATTEST:

AERON ARLIN GENET
Clerk of the Board

By _____
Deputy

APPROVED AS TO FORM:

MICHAEL C. GHIZZONI
Santa Barbara County Counsel

By Rachel Van Mullen
District Counsel

Resolution in the Matter of Adopting
Rule 364, Refinery Fenceline and Community Air Monitoring

ATTACHMENT A.

CEQA Findings

CEQA FINDINGS

Pursuant to State CEQA Guidelines, Santa Barbara County Air Pollution Control District (District), as Lead Agency, reviewed the adoption of proposed Rule 364, Refinery Fenceline and Community Air Monitoring. The District found that there is no potential for significant environmental impacts from the adoption of the proposed rule.

The Board finds that:

- The adoption of proposed Rule 364 will not have significant adverse impacts on the environment.

- No relaxation in meeting ambient air quality standards will result. No cross-media impacts were identified.

- Pursuant to §15061(b)(3) of the CEQA Guidelines, the project is exempt from CEQA as it can be seen with certainty that there is no possibility that the activity may have a significant effect on the environment.

The District will prepare and file a Notice of Exemption for the project with the County Clerk of the Board in compliance with CEQA Guidelines section 15062.

Discussion of CEQA Guidelines Section 15061(b)(3) finding of no significant effect

District staff has evaluated the environmental impacts related to the adoption of proposed Rule 364 in the context of the California Environmental Quality Act (CEQA) Guidelines section 15061, *Review for Exemption*. Subsection (a) of this section states that, "*once a lead agency has determined that an activity is a project subject to CEQA, a lead agency shall determine whether the project is exempt from CEQA."* A CEQA exemption can be in the form of a statutory exemption, a categorical exemption, or it can be covered by the general rule, as expressed in section 15061(b)(3), that, "…*CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA."*

The project consists of adopting Rule 364, Refinery Fenceline and Community Air Monitoring. This rulemaking project consists of additional monitoring requirements for a petroleum refinery and the payment of fees to fund a refinery-related community air monitoring system. Additional monitoring will provide more information to the District and the public. Since this Rule is limited to monitoring existing air conditions and providing the public with information, there are no reasonably foreseeable environmental impacts.

District staff have concluded with certainty that there is no possibility the project will have a significant effect on the environment. As a result, the project is not subject to any additional CEQA review and the District will prepare and file a Notice of Exemption in compliance with CEQA Guidelines section 15062.

Resolution in the Matter of Adopting Rule 364, Refinery Fenceline and Community Air Monitoring

ATTACHMENT B.

CEQA Notice of Exemption

apcd air pollution control district
SANTA BARBARA COUNTY

NOTICE OF EXEMPTION

TO: Clerk of the Board
County of Santa Barbara
105 East Anapamu Street – Room 407
Santa Barbara, CA 93101

FROM: Santa Barbara County
Air Pollution Control District
260 North San Antonio Road, Suite A
Santa Barbara, CA 93110

Project I.D.: APCD Rule 364

Project Title: Proposed Adoption of Rule 364, Refinery Fenceline and Community Air Monitoring

Location: Santa Barbara County

Project Description: The project consists of adopting Rule 364, Refinery Fenceline and Community Air Monitoring. This rulemaking project consists of additional monitoring requirements for petroleum refineries and the requirement to fund a refinery-related community air monitoring system. The project is an action taken by the District to increase monitoring data collection and there will be no relaxation of standards.

Exempt Status: (Check One)

___ Ministerial (Section 21080 (b)(1); 15268)
___ Declared Emergency (Section 21080(b)(3); 15269(a))
___ Emergency Project (Section 21080(b)(4); 15269(b)(c))
___ Categorical Exemption
CEQA Section(s): _____
___ Statutory Exemption
Code Number(s): _____
_x_ General Exemption under CEQA Section 15061(b)(3)

Reasons Why Project is Exempt: The project is exempt because it can be seen with certainty that there is no possibility that the activity may have a significant effect on the environment. The existing environment remains the same and there is no relaxation in standards. This project will provide more air monitoring and data collection and make that data available to the public.

Contact Person: Timothy Mitro

Telephone: (805) 961-8883

_____
Molly Pearson
Planning Division

Date: _____

Clerk of the Board Date and Time Stamp

_____
Aeron Arlin Genet
Air Pollution Control Officer

Resolution in the Matter of Adopting Rule 364, Refinery Fenceline and Community Air Monitoring

ATTACHMENT C.

General Rule Findings

GENERAL RULE FINDINGS

Pursuant to California Health and Safety Code section 40727, the Board makes the following findings for the adoption of District Rule 364.

Necessity

The Board determines that it is necessary to adopt Rule 364 in order to comply with the legal mandate in Health and Safety Code section 42705.6.

Authority

The Board is authorized under state law to adopt, amend, or repeal rules and regulations pursuant to Health and Safety Code sections 40000, 40001, and 40725 through 40728, which assigns to local and regional authorities the primary responsibility for the control of air pollution from all sources other than exhaust emissions from motor vehicles. Additionally, pursuant to Health and Safety Code section 40702, the District Board is required to adopt rules and regulations and to do such acts as are necessary and proper to execute the powers and duties granted to it and imposed upon it by State law.

Clarity

The Board finds that proposed Rule 364 is sufficiently clear. The rule was publicly noticed and reviewed at a public workshop and by the Community Advisory Council. The rule is written or displayed so that its meaning can be easily understood by persons directly affected by it.

Consistency

The Board determines that proposed Rule 364 is consistent with, and not in conflict with or contradictory to, existing federal or state statutes, court decisions, or regulations.

Nonduplication

The Board finds that proposed Rule 364 does not impose the same restrictions as any existing state or federal regulation, and the proposed rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the District.

Reference

The Board finds that it has the authority under state law to adopt Rule 364 pursuant to Health and Safety Code section 39002. Health and Safety Code section 39002 assigns to local and regional authorities the primary responsibility for the control of air pollution from all sources other than exhaust emissions from motor vehicles, and Health and Safety Code section 42705.6 places new requirements on petroleum refineries in California. Additionally, pursuant to Health and Safety Code section 40702, the Board is required to adopt rules and regulations and to do such acts as necessary and proper to execute the powers and duties granted to it and imposed upon it by State law.

Resolution in the Matter of Adopting Rule 364, Refinery Fenceline and Community Air Monitoring

ATTACHMENT D.

Staff Report

SANTA BARBARA COUNTY
AIR POLLUTION CONTROL DISTRICT

Proposed Staff Report for:

Rule 364
Refinery Fenceline and Community Air Monitoring

Date: April 17, 2020

Aeron Arlin Genet
Air Pollution Control Officer

Prepared By:
Tim Mitro
Air Quality Engineer

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Santa Maria, CA 93454

Our Mission

Our mission is to protect the people and the environment of Santa Barbara County from the effects of air pollution.

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1. EXECUTIVE SUMMARY

Petroleum refineries are among the largest stationary sources of air pollution in California. These sources process crude oil into various products such as gasoline, diesel fuel, asphalt oils, and other fuel oils. Crude oil consists of a complex mixture of hydrocarbon compounds with smaller amounts of impurities including sulfur, nitrogen, organic acids, metals, and various toxic compounds. The processing of crude oil at petroleum refineries results in emissions of criteria pollutants and toxic air contaminants. In recent years, community concern over emissions from refineries and the potential for community exposure to air contaminants, both from routine facility operations and potential releases due to upset conditions or emergency situations, has increased.

Proposed Rule 364 was developed to address the air monitoring requirements of California Assembly Bill (AB) 1647[1], which requires both a real-time fenceline air monitoring system and community air monitoring near petroleum refineries in California. Currently, the Santa Maria Asphalt Refinery is the only petroleum refinery located within Santa Barbara County. The fenceline system and community air monitoring systems would provide the public with additional air quality information about various air pollutants at the refinery and in the community.

Proposed Rule 364 requires the submittal and approval of a fenceline air monitoring plan that provides detailed information about the fenceline air monitoring system such as siting, data collection, maintenance procedures, temporary measures for equipment failures, quality assurance and auditing, and data reporting methods. Additionally, the proposed rule establishes requirements for a plan review process, notifications, and recordkeeping. The associated Rule 364 Refinery Fenceline Air Monitoring Guidelines inform the refinery operator of the elements necessary to complete a fenceline monitoring plan. These guidelines also serve as a written framework to be used by the Control Officer to evaluate and approve the fenceline monitoring plan.

The proposed rule addresses the need for the District to install and operate a refinery-related community air monitoring system. The community air monitoring station may be co-located with the District's existing monitoring equipment in Santa Maria to reduce the costs. However, based on the wind patterns in the region, the existing Santa Maria monitoring station is unlikely to adequately monitor the refinery pollutants. The District is evaluating alternative locations to move the existing monitoring equipment, and the new location could also function as a co-located community air monitoring station. Proposed Rule 364 includes cost recovery provisions to cover the costs to establish and operate a refinery-related community air monitoring system.

[1] AB 1647, Muratsuchi. Petroleum refineries: air monitoring systems; Approved October 8, 2017

2. BACKGROUND

2.1 Source Category Description

Petroleum refineries convert crude oil into a wide variety of refined products including gasoline, aviation fuel, diesel and other fuel oils, asphalt, lubricating oils, and feed stocks for the petrochemical industry. Crude oil is most often characterized by the oil's density (light to heavy) and sulfur content (sweet to sour). Crude oil consists of a mixture of hydrocarbon compounds with small amounts of impurities including sulfur, nitrogen, oxygen, and metals. Most of the petroleum refinery air emissions are associated with storage vessels, equipment leaks, loading racks, steam boilers, and process heaters. The primary pollutants emitted are reactive organic compounds arising from leakage and evaporation of the hydrocarbon materials processed and stored at the refinery. Significant amounts of sulfur oxides, hydrogen sulfide, and several species of toxic compounds are also emitted from refining operations.

2.2 Santa Maria Asphalt Refinery

The Santa Maria Asphalt Refinery was originally constructed in 1932 by the Five C Refining Company. The facility has been transferred to multiple owners throughout the decades, including Conoco, DuPont, Saba Petroleum, and Greka Energy. The current owner is California Asphalt Production, Inc.

Crude feedstock is transported into the facility by truck and pumped directly into one of four storage tanks. The feedstock is then sent to the flash and fractionator towers where it is eventually separated into naphtha, kerosene distillate, gas oil, and asphalt. The asphalt can be used for paving, mixed with gas oil, or combined with water and emulsifiers to produce emulsified asphalt. The processed materials can be stored in heated or non-heated storage tanks and transported out of the facility via loading racks or rail tank car. Heat and steam for the refinery is supplied by various process heaters and steam boilers. Most operations at the Santa Maria Asphalt Refinery result in residual tail gas vapors that are routed to and incinerated in the crude heaters or directed to a dry bed adsorbent system to control the hydrogen sulfide emissions.

2.3 Assembly Bill 1647

In recent years, community concern over emissions from refineries and the potential for community exposure to air contaminants, both from routine facility operations and potential releases due to upset conditions or emergency situations, has increased. Assembly Bill 1647 was drafted and approved by the Governor of California on October 8, 2017 to help resolve this issue. AB 1647 has four main requirements:

1) Petroleum refineries need to install, operate, and maintain a fenceline air monitoring system;
2) Air districts need to install, operate, and maintain a refinery-related community air monitoring system;
3) The real-time data from both of these systems needs to be made accessible to the public; and

4) The refineries are responsible for the costs to implement the requirements of the state mandate.

Consistent with AB 1647, Proposed Rule 364 establishes requirements for fenceline air monitoring systems and cost recovery provisions for a refinery-related community air monitoring system. The rule implements the requirements of California Health and Safety Code section 42705.6 and further protects public health by requiring petroleum refineries to collect real-time data of refinery air pollutant emissions at or near their property boundaries, and to provide data as quickly as possible to the public and to the District. These monitoring systems are also expected to help in the event of a refinery emergency. Knowing the various chemicals and their emissions levels will help emergency responders characterize the potential health effects that may occur.

2.4 Criteria Pollutants and Toxic Air Contaminants

Criteria Pollutants

Criteria pollutants are emissions for which Ambient Air Quality Standards (AAQS) have been established. The AAQS are concentration-based standards that are established to protect public health and welfare. Criteria pollutants and their precursor emissions typically refer to oxides of nitrogen (NOx), reactive organic compounds (ROCs), sulfur dioxide (SO_2), particulate matter (PM), and carbon monoxide (CO).

The refinery is subject to various air quality rules that have been adopted by the District over the years. These rules contain standards that ensure criteria pollutant emissions are effectively controlled. Such rules include District Rule 331, where the facility is required to implement a fugitive hydrocarbon inspection and maintenance program, commonly known as a Leak Detection and Repair (LDAR) program. This rule achieves approximately an 80-percent ROC reduction, as various valves and fittings can degrade over time and they are fixed during the quarterly inspections. Other rules include Rules 326 and 346 that require vapor recovery on the storage tanks and loading racks, and Rules 342 and 361 that require low-NOx burners on combustion units.

Toxic Air Contaminants

Toxic air contaminants (TACs) are emissions for which AAQS have not been established, but may result in human health risks. There are nearly 200 separate chemical compounds that have been identified as TACs by the state, which includes acetaldehyde, benzene, 1,3-butadiene, formaldehyde, and xylenes. TACs vary in their relative toxicity, and certain TACs cause health impacts at lower concentrations than other TACs. Health impacts from TACs are expressed in terms of cancer risk and noncancer (acute and chronic) hazard index.

2.5 Refinery-Related Pollutants of Concern

OEHHA has collaborated with the California Air Resources Board (CARB) and the California Environmental Protection Agency's Interagency Refinery Task Force to develop information on chemicals emitted from refineries and their health effects. The information is summarized in the report, "Analysis of Refinery Chemical Emissions and Health Effects," as it prioritizes the refinery chemicals according to their emissions levels and toxicity. The report helps support the

air districts in developing the necessary rules for implementing AB 1647. Summaries of the main refinery-related pollutants are listed below.

Reactive Organic Compounds (ROCs) & BTEX Compounds

ROCs are precursor pollutants for ozone and they are emitted by a large number of sources throughout the county. Refineries can be a large source of fugitive ROC emissions due to their piping components, tanks, loading racks, and other processing equipment.

BTEX compounds (referring to benzene, toluene, ethylbenzene, and xylenes) are a subset of ROCs that occur naturally in crude oil and are associated with emissions from petroleum refineries. BTEX compounds can be emitted by incomplete combustion, fugitive emissions from petroleum storage, and motor vehicle usage. Hence, elevated levels of BTEX compounds are expected in the vicinity of refineries and major roadways. This group of ROCs is important because it is typically the largest contributor to health risk at a refinery. Measuring BTEX is critical to quickly detecting and preventing excessive leaks.

Sulfur Dioxide (SO_2)

Sulfur oxides (SOx) are air pollutants that are involved in a number of chemical reactions in the atmosphere where they are transformed into acids and particulate sulfates. Heating and combusting fossil fuel releases the sulfur present in these materials and results in the formation of SOx. Since SO_2 is the most prevalent species of SOx, it is used as the monitoring pollutant indicator. SO_2 is a criteria pollutant that can have direct health impacts and can cause damage to the environment. The major sources of SO_2 at refineries are fuel fired in process heaters and boilers, Fluid Catalytic Cracking (FCC) units, Sulfur Recovery Units, and flares.

Hydrogen Sulfide (H_2S)

Hydrogen sulfide is a colorless, flammable, extremely hazardous gas with a "rotten egg" smell. It can result from the breakdown of organic matter in the absence of oxygen such as in swamps and sewers, occurs naturally in crude petroleum and natural gas, and is produced at oil refineries as a by-product of refining crude oil. Low-level concentrations can occur continuously at petroleum refineries and its measurement will help identify potential leaks at refineries and address community odor concerns.

2.6 Existing On-site Monitoring

All refineries have, to some degree, established internal monitoring systems to protect workers, emergency responders, and the surrounding public from unplanned releases. Refinery operators themselves are typically stationed at the process unit control panels and actively assessing operating conditions. The operators monitor multiple process parameters and provide alarms if preset limits are exceeded. Operators and technicians, through experience and adequate training, can detect problems early and initiate preventative action to stop them from increasing or proliferating.

Operators and technicians are typically equipped with personal air monitors that alarm when a measured concentration exceeds a preset limit. When these devices alarm, plant staff can evacuate the area and notify the operators to shut down the equipment. Personal H_2S sensors are

the most commonly used, while other sensors monitor for flammable gases, insufficient oxygen levels, and carbon monoxide. Since odor thresholds are typically lower than device detection limits, refinery personnel often can take action before a monitor alarm sounds. It is critical that all personal air monitors are properly maintained and calibrated to ensure accuracy and reliability.

The refinery fenceline and community air monitoring required by AB 1647 will provide an additional layer of information that can be used by the refinery operator, emergency response personnel, and the public to assess the potential for public exposure to pollutants from the facility.

2.7 Fenceline Air Monitoring Technology

A refinery fenceline air monitoring system requires a combination of equipment that measures and records air pollutant concentrations at or near the property boundary. Conventional air monitoring techniques rely on point source monitors that are limited to providing information about emission concentrations from a single point within a survey area. Given the lack of spatial and temporal data from point source monitors, using additional technologies can help create a more complete emission profile of the various emission sources at a refinery.

Open-path air monitoring technology is a well-established method to measure path-integrated pollutant concentrations in the atmosphere, making it ideal for long-term fenceline monitoring. Open-path technology is a type of Optical Remote Sensing (ORS) that measures air emissions along a path, typically 200 - 500 meters long. ORS instruments use a light signal to continuously detect and measure concentrations of multiple chemical compounds along the distance covered by the light signal in real-time. As a result, open-path technologies can provide greater temporal and spatial resolution as compared to conventional air monitoring techniques. Although the open-path ORS techniques have been used for over 20 years, they are constantly improving. Improvements often include changes to technologies that improve detection limits or the type of compounds detected. An in-depth review of the fenceline monitoring technologies can be found in the Rule 364 Refinery Fenceline Air Monitoring Guidelines.

3. PROPOSED RULE REQUIREMENTS – Rule 364

3.1 Overview of Proposed Requirements

Rule 364 is proposed to consist of four key components:

- Fenceline Monitoring Plan submittal by the Refinery;
- Fenceline Monitoring Plan review by the District;
- Implementation of the Fenceline Monitoring System; and
- Community Air Monitoring Station and Fees.

All of the requirements are described in further detail in their corresponding sections below.

3.2 Fenceline Monitoring Plan Submittal

A fenceline monitoring plan outlines all of the details and methods to install, operate, and maintain a fenceline monitoring system. The proposed rule requires the fenceline air monitoring plan to be submitted to the District no later than 3 months after the rule is adopted and provide the following detailed information: equipment to be used for fenceline monitoring; siting and equipment specifications; wind measurements; procedures for equipment maintenance and failures; and procedures for implementing quality assurance and quality control audits by an independent third party. The fenceline air monitoring plan shall be consistent with all of the criteria set forth in the Refinery Fenceline Air Monitoring Guidelines.

Of the various chemicals that are emitted from California refineries, 18 chemicals were found as the top candidates for air monitoring by OEHHA. Their report was based on the pollutant toxicity, average levels of emissions, and involvement in multiple refinery processes and incidences from refineries statewide. However, candidate chemicals will differ based on the processes at each specific refinery. Some top-candidate chemicals may only be released in limited amounts from individual refineries.

The Santa Maria Asphalt Refinery is a small asphalt refinery and does not have the same magnitude of emissions as the large refineries in the Bay Area and South Coast jurisdiction. The District evaluated the processes at the Santa Maria Asphalt Refinery and reduced the pollutant list to 6 main chemicals: Benzene, Toluene, Ethylbenzene, Xylene, Sulfur Dioxide, and Hydrogen Sulfide. Monitoring for these pollutants will help the refinery detect potential leaks at their facility. Furthermore, these pollutants serve as appropriate surrogates for the other potential pollutants that were identified by OEHHA. As shown in Table 1 below, Rule 364 will require all of the listed pollutants to be monitored. The release of these chemicals does not necessarily mean that local communities face substantial exposures or significant health risks. However, it does increase their likelihood of exposure, and additional air monitoring may inform decisions that could help reduce exposures.

Table 1: Pollutants for Fenceline Air Monitoring

Air Pollutants
Benzene
Toluene
Ethylbenzene
Xylene
Sulfur Dioxide
Hydrogen Sulfide

Based on the relative cost of open-path technologies as compared to conventional air monitoring techniques, District staff recommends the use of open-path air monitoring techniques for implementing a fenceline air monitoring system. Fugitive emissions can occur from gaseous or vapor leaks in pressurized process equipment (e.g., valves, pipe connections, mechanical seals, or related equipment) and from other accidental releases. Fugitive emissions can also emanate from storage tanks used to store crude oil, intermediates generated during the refining processes, and product streams. These emissions are best monitored using open-path systems given the numerous potential sources, their distribution over large areas, and the challenges with immediate detection and repair of the equipment.

In accordance with the Rule 364 Guidelines, the refinery owner or operator has the option to use other air monitoring techniques and/or emerging technologies. In these instances, the refinery operator must demonstrate that the proposed alternative air monitoring technology will meet the requirements of the rule and provide adequate sensitivity and temporal and spatial coverage for the compounds being monitored. Minimum detection limits (MDLs) are listed in the guidelines for both benzene and hydrogen sulfide, and these MDLs will serve as a baseline for the acceptable sensitivity of the monitoring equipment.

3.3 Fenceline Monitoring Plan Review

After the refinery submits their fenceline monitoring plan, the Control Officer shall notify the owner or operator in writing whether their plan is approved or whether modifications are necessary. Determination of approval status shall be based on the submittal of information that satisfies the criteria set forth in the Rule 364 Guidelines.

If modifications are necessary, the owner or operator shall resubmit the fenceline air monitoring plan within 30 calendar days after notification by the Control Officer. The resubmitted plan is required to include any information necessary to address deficiencies in the plan. The Control Officer will either approve the revised and resubmitted fenceline plan or modify the plan and approve it as modified. The rule also requires the refinery to submit an updated monitoring plan to the District under certain situations, such as:

1) 45 days before the date of implementation of any planned facility, equipment, process or administrative modification that could result in changes to an approved fenceline and air monitoring plan;
2) 10 days after the date of any unplanned facility, equipment, process or administrative modification that could result in changes to an approved fenceline monitoring plan; or

3) 60 days after the date of receiving new information that an approved fenceline air monitoring plan does not adequately measure any pollutant(s) identified in Rule 364.

Failure to comply with the provisions for submitting an updated fenceline air monitoring plan outlined above will result in revocation of an approved fenceline air monitoring plan. If an approved plan is revoked, the owner or operator of a petroleum refinery would be required to submit a new fenceline air monitoring plan to the Control Officer within 30 days after revocation of the approved plan. The owner or operator of the refinery may also appeal to the Hearing Board any District modifications or revocations of the fenceline air monitoring plan pursuant to Regulation V, Hearing Board.

3.4 Implementation of the Fenceline Air Monitoring System

Beginning no later than 365 days after a fenceline air monitoring plan is approved by the Control Officer, the owner or operator of a petroleum refinery shall complete installation and begin operation of the real-time fenceline air monitoring system. The fenceline monitoring plan also requires the refinery to document the methods for continuous dissemination of data collected to the public as expeditiously as possible. In accordance with the Rule 364 Guidelines, fenceline air monitoring data needs to be disseminated by website displays that are user-friendly and provide context to the air monitoring information that is collected.

3.5 Community Air Monitoring Station and Fees

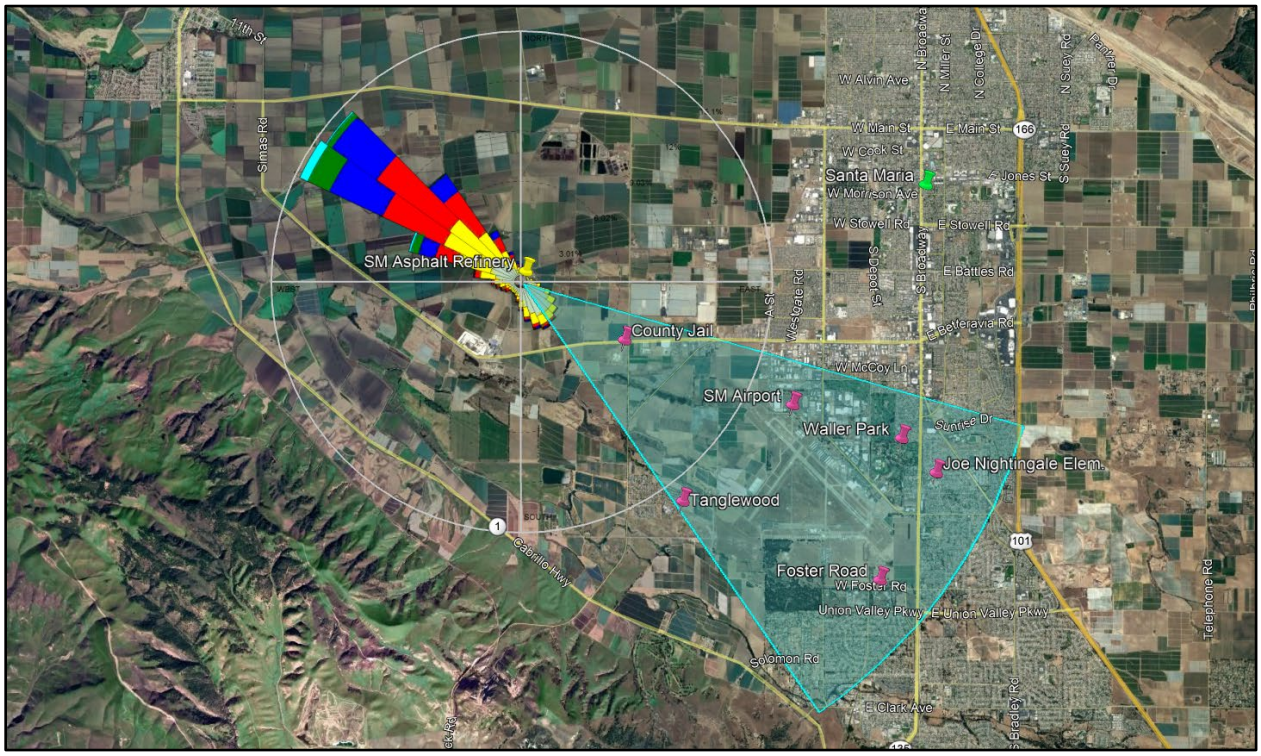
Per AB 1647, the District is required to install and operate a refinery-related community air monitoring system and make the pollutant data available to the public through the District's website. To help determine an appropriate location for the community air monitor, Figure 1, below, includes an overlay of a wind rose (with data from the Santa Maria Airport) at the refinery location to demonstrate the historical wind patterns for the region. The winds typically come from the northwest, so affected community members would be located to the southeast of the refinery, as shown in the light blue arc. Based on the wind data, potential locations for a community monitor include the Santa Maria Airport, Waller Park, or the county-owned buildings on Foster Road.

The California Air Resources Board currently operates the existing Santa Maria monitoring station that is located in central Santa Maria. The station monitors ozone, nitrogen dioxide, carbon monoxide, PM_{10}, and $PM_{2.5}$. The District plans to assume full responsibility to operate the monitoring station in the near future and would also be able to add additional monitoring equipment at that time. However, based on the wind patterns shown in Figure 1, the existing Santa Maria monitoring station is unlikely to adequately monitor the refinery pollutants. The District is evaluating alternative locations to move the existing monitoring equipment, and the new location could also function as a co-located community air monitoring station.

The co-located station needs to be able to satisfy the monitoring objectives of the Santa Maria region as well as the community that is downwind of the refinery. This means that the location needs to be representative of the larger urban area, is able to monitor potential impacts from the refinery, is suitable for a long-term lease, and has access to the necessary infrastructure. The

District hopes to have a final location for a co-located community monitor chosen by the summer of 2020.

Figure 1: Potential Community Monitoring Locations



Consistent with AB 1647, the initial and on-going costs for this co-located scenario would be shared between the District and the refinery in a reasonably equitable manner. In the event that the community air monitoring station is not co-located with a District-operated monitoring station and is an independent monitoring station, the refinery will be responsible for all costs to install and operate the independent monitoring station. See Table 2 below for a list of the estimated community air monitoring fees and their due dates. For a full listing of the estimated costs and how they were determined, please see Section 4.5, Impact to Industry. The community air monitoring system will be operated as long as the refinery is refining or storing oil products at the facility.

Table 2: Estimated Community Air Monitoring Station Costs

	Co-Located	Independent	Cost Difference
Initial Capital Costs	**$253,750** [1]	**$367,500**	**$113,750** [2]
Annual Operating and Maintenance Costs [3]	**$62,900**	**$109,700**	**$46,800**

1: Due 6 months after rule adoption.
2: Upon written notification by the District, due within 60 days.
3: Invoiced annually in January.

4. IMPACTS OF THE PROPOSED RULE

4.1 Emission Impacts

Rule 364 does not set any emission standards nor does it directly reduce emissions from the petroleum refinery. However, emission benefits may be realized due to the potential for early detection of leaks and quick action to control any fugitive emissions.

4.2 Cost-Effectiveness

California Health and Safety Code section 40703 requires the District, in the process of adopting or amending a rule, to consider and make public its findings related to the cost-effectiveness of a control measure. Cost-effectiveness, for rule-making purposes, is calculated by taking the estimated compliance costs of the rule and dividing it by the amount of air pollution reduced. Estimated compliance costs for a rule can include, but are not limited to, capital equipment costs, engineering design costs, installation costs, and on-going maintenance costs, such as additional labor, fuel, or electrical costs. However, as this rule is not achieving any quantifiable emission reductions, the cost-effectiveness cannot be calculated.

4.3 Incremental Cost-Effectiveness

California Health and Safety Code section 40920.6 requires the performance of an incremental cost-effectiveness analysis that identifies more than one control option that meets the emission reduction objective of the regulation. The incremental cost-effectiveness is the difference in cost between two successively more effective controls, divided by the additional emission reductions achieved. As this rule is not achieving any quantifiable emission reductions, the incremental cost-effectiveness cannot be calculated.

4.4 Socioeconomic Impacts

California Health and Safety Code section 40728.5 requires Districts with populations greater than 500,000 people to consider the socioeconomic impact of any new rule if air quality or emission limits are significantly affected. In 2019, the population of Santa Barbara County was approximately 455,000 persons based on data from the Santa Barbara County Association of Governments. Using the expected growth rates for the County, the current population estimate is still below the 500,000 person threshold. Therefore, the District is not required to perform a socioeconomic impact analysis for the proposed rule.

4.5 Impact to Industry

Proposed Rule 364 will affect the owner and operator of any petroleum refinery within the County as they will be responsible for the costs to implement the AB 1647 mandate. Staff evaluated various metrics (e.g., the cost of air monitoring equipment, equipment siting, data logging systems, and labor) to estimate the costs of both the fenceline monitoring system and the community air monitoring station, as shown in Tables 3 and 4. The costs are based on the analysis performed by the South Coast Air Quality Management District and adjusted downward based on District staff assessment.

Table 3: Refinery Fenceline Monitoring System Estimated Costs

Initial Capital Costs	**$670,500**
Fenceline Monitoring Plan	**$57,500**
Air Monitoring Plan Development	$50,000
Air Monitoring Plan Review	$7,500
Monitoring Equipment	**$205,000**
OP-UVDOAS System	$150,000
H_2S Analyzer	$25,000
Met Station	$20,000
Data Logger	$10,000
Site Preparation	**$150,000**
Data Dissemination and Notification	**$258,000**
Website - Design and Development	$140,000
Mobile App and Notification Development	$118,000

Annual Operating and Maintenance Costs	**$64,400**
Fenceline System Costs	**$23,400**
Data Dissemination Costs	**$41,000**

Table 4: Community Air Monitoring Station Estimated Costs

	Co-Located	**Independent**
Initial Capital Costs	**$253,750**	**$367,500**
Monitoring Equipment	**$170,000**	**$200,000**
Auto-Gas Chromatograph (GC)	$100,000	$100,000
SO_2 Analyzer	$25,000	$25,000
H_2S Analyzer	$25,000	$25,000
Dilution Gas Calibrator	$20,000	$20,000
Met Station	Already own	$20,000
Data Logger	Already own	$10,000
Site Preparation	**$75,000**	**$150,000**
Air Monitoring Station Container	$25,000	$50,000
Site Preparation	$20,000	$40,000
Building Pad / Cement Slab	$15,000	$30,000
Fencing	$7,500	$15,000
Power	$7,500	$15,000
Labor: AQ Specialist (60 or 120 hours)	**$8,750**	**$17,500**

Annual Operating and Maintenance Costs	**$66,900**	**$113,700**
Site Maintenance	**$10,300**	**$20,600**
Electricity	$3,600	$7,200
Utilities	$2,700	$5,400
Land/Site Lease	$4,000	$8,000
Monitoring Equipment Maintenance	**$20,100**	**$20,100**
Calibration Gases	$6,100	$6,100
Maintenance Parts	$10,000	$10,000
Third-party Audit	$4,000	$4,000
Labor: AQ Specialist (250 or 500 hours)	**$36,500**	**$73,000**

As discussed in Section 3.5, the community monitoring fees would be assessed differently under two separate scenarios, one where the community air monitoring system is co-located with the District's monitoring station and one where the station is operated independently. Costs for the co-located system would be shared in an equitable manner, based on the burdens imposed and benefits received by the refinery. These costs are limited to the amounts necessary for compliance with Health and Safety Code section 42705.6. Based on the cost estimates, staff concludes that installing and maintaining the refinery fenceline system and reimbursing the District for the community air monitoring system will not significantly impact industry.

4.6 Impact to the District

The proposed rule is not expected to result in a significant increased workload for District staff. District staff will have to review monitoring plans and reports. For the community air monitoring system, staff will order, install, operate and maintain new monitoring equipment as well as review, process and store data and make it available on our website. These tasks can take up to an additional 0.25 FTE (Full-Time Equivalent) workload for District staff. The fees built into the rule will cover the District's increased workload.

The $7,500 plan review fee listed in Section H.1.a of the rule covers the cost to conduct an initial review of the fenceline monitoring plan, generate comments, re-review the plan after receiving responses to comments, and final plan approval.[1] All other costs related to fenceline monitoring plan modifications after the initial plan is approved will be assessed on a cost-reimbursement basis pursuant to Rule 210, Fees. The District can manage the workload with existing staff and no additional hires will be necessary.

[1] Assumes 45 hours total staff time at the current labor rate for an Air Quality Engineer III of $165.30/hr.

5. ENVIRONMENTAL IMPACTS – CEQA

5.1 Environmental Impacts

California Public Resources Code section 21159 requires the District to perform an analysis of the reasonably foreseeable environmental impacts of the methods of compliance. The analysis shall take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites.

The analysis must include the following information on the proposed rule:

1) *An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.*

   The adoption of Rule 364 will require additional fenceline and community monitoring near a petroleum refinery. Additional monitoring will provide more information to the District and the public. Since this Rule is limited to monitoring existing air conditions and providing the public with information, there are no reasonably foreseeable environmental impacts.

2) *An analysis of the reasonably foreseeable mitigation measures.*

   Since no adverse environmental impacts are expected, no mitigation measures are proposed.

3) *An analysis of the reasonably foreseeable alternative means of compliance with the rule or regulation.*

   No alternatives means of compliance are proposed because the rule implements the legislative mandate from AB 1647.

The above analysis under Public Resource Code section 21159 further demonstrates that there is no reasonable possibility that the adoption of proposed Rule 364 will have a significant effect on the environment due to unusual circumstances.

5.2 California Environmental Quality Act (CEQA) Requirements

The California Environmental Quality Act (CEQA) requires environmental review for certain actions. This rulemaking project consists of additional monitoring requirements for a petroleum refinery and the requirement to fund a refinery-related community air monitoring station. The project will provide more air monitoring and data collection and make that data available to the public. The refinery will continue to operate as it currently does with no change to existing conditions or emissions. The existing environment remains the same and there is no relaxation in standards.

Pursuant to §15061(b)(3) of the State CEQA Guidelines, the project is not subject to CEQA as it can be seen with certainty that there is no possibility that the activity may have a significant effect on the environment. A CEQA determination will be made when the proposed rule is brought to the District Board for adoption. Any subsequent changes to the project description during the public review period will undergo additional environmental review under CEQA.

6. PUBLIC REVIEW

Rule 364 Workshop

The District held a public workshop to present, discuss, and hear comments on the draft rule on December 16 at the District office in Santa Barbara. To inform the public about the workshop, District staff e-mailed a public notice to everyone who subscribed to the noticing subscription list. Staff also mailed a hardcopy notice to the Santa Maria Asphalt Refinery. The workshop was attended by representatives and consultants for the refinery.

The draft rule was made available on the District's website and a three-week comment period followed the workshop. Written comments received during the comment period were considered and incorporated into the proposed rule, as appropriate. The written public comments that were received during the rule proceeding are included as Attachment #1 to this report. The District's responses to the comments are included as Attachment #2 to this report.

Community Advisory Council

To facilitate the participation of the public and the regulated community in the development of the District's regulatory program, the District created the Community Advisory Council (CAC). The CAC is composed of representatives appointed by the District's Board of Directors. Its charter is, among other things, to review proposed changes to the District's Rules and Regulations and make recommendations to the Board of Directors on these changes.

The CAC convened and discussed the proposed District Rule 364 on January 22 at the Buellton Community Recreation Center. At the meeting, staff presented the key aspects of the rule and the staff report to the CAC members. The CAC deliberated on the various aspects of the rule, such as the proposed monitoring plan, the available monitoring technologies, the data reporting, and the community air monitoring station. A motion was made to continue the discussion item at the following meeting on February 26. After hearing additional information at the February meeting, the CAC unanimously recommended that the District Board adopt the proposed Rule 364.

District staff prepared a summary of CAC comments and responses from both meetings, and this summary is included as Attachment #3 to this report.

Public Hearing

In accordance with California Health and Safety Code section 40725, the proposed rule will be publicly noticed and made available at the District offices and on the District's website prior to the public hearing before the Board of Directors. The public will be invited to provide comments and testimony on the proposed rule prior to and at the hearing.

7. REFERENCES

1) South Coast Air Quality Management District – Rule 1180 (Refinery Fenceline and Community Air Monitoring Guidelines), Adopted December 1, 2017.
2) South Coast Air Quality Management District – *Staff Report for Proposed Rule 1180 (Refinery Fenceline and Community Air Monitoring)*, December 2017.
3) South Coast Air Quality Management District – Rule 1180 Refinery Fenceline Air Monitoring Plan Guidelines, December 2017.
4) Bay Area Air Quality Management District – Regulation 12, Rule 15 (Petroleum Refining Emissions Tracking), Amended December 18, 2018.
5) Bay Area Air Quality Management District – *Staff Report for Proposed Air District Regulation 12, Rule 15 (Petroleum Refining Emissions Tracking)*, April 2016.
6) Bay Area Air Quality Management District – Air Monitoring Guidelines for Petroleum Refineries, April 2016.
7) Bay Area Air Quality Management District – Regulation 12, Rule 15 (Petroleum Refining Emissions Tracking), Amended December 18, 2018.
8) San Joaquin Valley Unified Air Pollution Control District – Rule 4460 (Petroleum Refinery Fence-line Air Monitoring) and Rule 3200 (Petroleum Refinery Community Air Monitoring Fees), Adopted December 19, 2019.
9) California Air Resources Board – Refinery Emergency Air Monitoring Assessment Report, Objective 2: Evaluation of Air Monitoring Capabilities, Gaps, and Potential Enhancements, March 2019
10) Office of Environmental Health Hazard Assessment – Analysis of Refinery Chemical Emissions and Health Effects, March 2019

ATTACHMENT #1

Public Comments

CAP

CALIFORNIA ASPHALT PRODUCTION, INC.

January 7, 2020

Mr. Timothy Mitro
Air Quality Engineer
Santa Barbara County Air Pollution Control District
260 N San Antonio Rd, Ste A
Santa Barbara, CA 93110

SENT VIA EMAIL: MitroT@sbcapcd.org

Re: California Asphalt Production Inc.'s Comments on SBCAPCD's Refinery Fenceline & Community Air Monitoring Regulation

Dear Mr. Mitro:
California Asphalt Production Inc. ('Refinery') is pleased to provide this comment letter to the Santa Barbara County Air Pollution Control District (SBCAPCD) in regards to the Refinery Fenceline & Community Monitoring regulation (i.e. Draft Rule 364) that was presented at the SBCAPCD workshop on December 16, 2019. There are three specific areas that we would like to provide some feedback as it pertains to the Refinery, as follows:

1. Air Pollutants to be Addressed by Fenceline Air Monitoring Plans

Table 1 in the draft Rule 364 lists the criteria air pollutants, reactive organic compounds and other compounds that should be included in a facility's fenceline air monitoring plan. During the workshop, SBCAPCD recommended that the Refinery include these pollutants in their fenceline air monitoring program unless justification could be provided for excluding any of these recommended air pollutants. The Refinery has prepared an analysis to demonstrate that most of the air pollutants listed in Table 1 are not applicable to the Refinery's operations or are anticipated to be emitted in very minute quantities and therefore should be excluded from the Refinery's fenceline monitoring program (please refer to Attachment A to this letter). The Refinery is requesting that only *BTEX Compounds (Benzene, Toluene, Ethylbenzene, Xylene)* be included in their fenceline air monitoring plan. To further support our justification that the Refinery is a very small source of air pollutants, we have also prepared a comparison chart to highlight the huge disparity in air emissions between the larger refineries in the state of California and California Asphalt Production Inc. (please refer to Attachment B to this letter).

2. Implementation Schedule of the Fenceline Air Monitoring Program

During the December 16, 2019 SBCAPCD workshop, it was mentioned that the fenceline monitoring must be implemented and operational within 180 days of the fenceline monitoring plan approval. The Refinery (and its consultants) contacted Dr. Paul Roberts of Sonoma Technology, Inc. who has considerable experience in developing fenceline monitoring plans and subsequent implementation of the fenceline monitoring program. Based on his feedback, it would appear that a more reasonable timeline for implementation of the fenceline monitoring program would be one (1) year. Dr. Roberts cites several major impediments to swift implementation which are detailed in his email to the Refinery's consultant (please refer to Attachment C to this letter). Therefore, while the Refinery is committed to implementing the fenceline monitoring program as expeditiously as possible after the approval of the plan, the Refinery is requesting flexibility in the 180 days restriction.

3. Colocation with Community Air Monitoring Stations

During the December 16, 2019 SBCAPCD workshop, it was mentioned that the SBAPCD will be implementing community air monitoring stations as part of the Rule 364 implementation. The Refinery would like to propose that any community air monitoring station within the vicinity of the Refinery be collocated with the Refinery's fenceline monitoring station. This would provide additional robustness to the monitoring program and improve data integrity. Colocated monitoring stations would also be beneficial in the event that any one station has a malfunction, significant periods of data loss can be avoided.

Thank you for your time and consideration of these comments. If you have any questions or require additional information, please contact me at (805) 310-7681.

Sincerely,
GIT, Inc.

Stephen Ward
Environmental Engineer

Cc: Julio Corona (CAP)
Bart Leininger (ALG)

Enclosures

ATTACHMENT A

Pollutants To Be Monitored[1]	Refinery Emission Source[2]	Refinery Remarks
Sulfur Dioxide	Stationary combustion devices, Process Vents, Flares	Refinery has heaters and boilers combusting natural gas and refinery fuel gas. However, these emissions are not significant and the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.
Nitrogen Dioxide	Stationary combustion devices, Process Vents, Flares	Refinery has heaters and boilers combusting natural gas and refinery fuel gas. However, these emissions are not significant and the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.
Total ROCs	Equipment leaks, storage tanks, stationary combustion devices, Process Vents, Flares, Waste Water, Cooling Tower, Product Loading	Refinery has storage tanks and heaters and boilers combusting natural gas and refinery fuel gas. Refinery is in agreement that ROCs are emitted from the refinery. However, since the refinery is recommending that BTEX compounds (which are more specific to refinery operations) be monitored, the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.
Formaldehyde	Stationary combustion devices, Process Vents, Flares	Refinery has heaters and boilers combusting natural gas and refinery fuel gas. Formaldehyde is expected from natural gas combustion. However, these emissions are not significant and the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.
Acetaldehyde	Stationary combustion devices, Process Vents, Flares	Refinery has heaters and boilers combusting natural gas and refinery fuel gas. Acetaldehyde is expected from natural gas combustion. However, these emissions are not significant and the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.
Acrolein	Stationary combustion devices, Process Vents, Flares	Refinery has heaters and boilers combusting natural gas and

		refinery fuel gas. However, these emissions are not significant and the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.
1,3 Butadiene	Equipment leaks, storage tanks, stationary combustion devices, Process Vents, Flares, Waste Water, Cooling Tower, Product Loading	Refinery has heaters and boilers combusting natural gas and refinery fuel gas. 1,3 Butadiene is expected from natural gas combustion. However, these emissions are not significant and the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.
Styrene	Equipment leaks, storage tanks, stationary combustion devices, Process Vents, Flares, Waste Water, Cooling Tower, Product Loading	Refinery has heaters and boilers combusting natural gas and refinery fuel gas. Styrene is expected from natural gas combustion. However, these emissions are not significant and the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.
BTEX Compounds	Equipment leaks, storage tanks, stationary combustion devices, Process Vents, Flares, Waste Water, Cooling Tower, Product Loading	Refinery has heaters and boilers combusting natural gas and refinery fuel gas. BTEX compounds (benzene, toluene, ethylbenzene and xylenes) are expected from natural gas combustion. Refinery is in agreement that this pollutant should be included in the fenceline monitoring plan.
Hydrogen Sulfide	Sulfur recovery plant, asphalt plant, flares	The refinery does not have a sulfur recovery plant or flare but does have an asphalt plant. Therefore, it is not a significant source of hydrogen sulfide emissions and the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.
Carbonyl Sulfide	Sulfur recovery plant	The refinery does not have this unit and does not expect carbonyl sulfide emissions. Therefore, the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.

Ammonia	Catalytic cracking unit, fluid coking unit	The refinery does not have any of these units (i.e. SCRs) and does not expect ammonia emissions. Therefore, the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.
Black Carbon	Sulfur recovery plant	The refinery does not have this unit and does not expect black carbon emissions. Therefore, the refinery requests that this pollutant be *excluded* from its fenceline monitoring plan.
Hydrogen Cyanide	Stationary combustion devices, Process Vents, Flares	The main source of hydrogen cyanide emissions from a refinery is the catalytic cracking unit[3]. The refinery does not have this unit and therefore, requests that this pollutant be *excluded* from its fenceline monitoring plan.

Notes:

[1] Based on Table 1 – Air Pollution to be Addressed by Fenceline Air Monitoring Plans, Rule 364 Refinery Fenceline and Community Air Monitoring, Santa Barbara County APCD.

[2] Based on Table 1-1. Summary of Pollutants and Emission Sources Inclusion in a Petroleum Refinery's Emission Inventory, Emission Estimation Protocol for Petroleum Refineries, Version 2.1.1, May 2011, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, https://www3.epa.gov/ttnchie1/efpac/protocol/Emission_Estimation_Protocol_for_Petroleum_Refinerie_052011.pdf, accessed December 30, 2019.

[3] Based on Section 5.1.4 Methodology Rank 5B for Catalytic Cracking Units, Emission Estimation Protocol for Petroleum Refineries, Version 2.1.1, May 2011, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, https://www3.epa.gov/ttnchie1/efpac/protocol/Emission_Estimation_Protocol_for_Petroleum_Refinerie_052011.pdf, accessed December 30, 2019.

ATTACHMENT B: Emissions by Facility
California Refinery Sector

Year	Facility	City	VOC (tons)	NOx (tons)	SOx (tons)	BTEX (lbs)
2017	Chevron Products Company - Richmond	RICHMOND	1,343	737	374	22,110
2017	Shell Oil Products US - Martinez	MARTINEZ	1,177	916	1,155	24,760
2017	Tesoro Refining - Martinez	MARTINEZ	876	360	344	27,240
2017	PBF Torrance Refinery	TORRANCE	659	924	242	30,186
2017	Chevron Products Company - El Segundo	EL SEGUNDO	530	729	282	16,090
2017	Tesoro Refining - Carson	CARSON	493	661	339	36,241
2017	Valero Refining Company	BENICIA	323	1,013	95	21,185
2017	Phillips 66 Company - Wilmington	WILMINGTON	249	471	109	8,580
2017	Phillips 66 Company - Rodeo	RODEO	248	218	368	17,649
2017	**Greka Refining Company - Santa Maria**	**SANTA MARIA**	**18**	**2**	**0**	**527**

Sources: BTEX emission data for Greka Refining Company based on California Air Resources Boards Facility Search Engine, 2017 Criteria & Toxic Plus Risk Data, Accessed 1/7/2020, https://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php?dd=

All other refinery BTEX emissions data from EPA's Toxic Release Inventory (TRI) Program, Basic Data Files, Accessed 9/10/2019, https://www.epa.gov/toxics-release-inventory-tri-program/tri-basic-data-files-calendar-years-1987-2017

Criteria pollutant emissions data from the California Air Resources Boards Facility Search Engine, 2017 Criteria & Toxic Plus Risk Data, Accessed 1/7/2020, https://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php?dd=

Irra Core

From: Paul Roberts <Paul@sonomatech.com>
Sent: Thursday, December 19, 2019 7:47 PM
To: Bart Leininger
Cc: Clinton MacDonald
Subject: Re: Proposed Santa Barbara County Air Pollution Control District Fence-line Monitoring Rule
Attachments: image003.png

Follow Up Flag: Follow up
Flag Status: Flagged

Bart: Thanks for your questions.

Regarding the time to prepare a monitoring plan: 3 months should be sufficient time to prepare a monitoring plan for fenceline monitoring, once clear and complete requirements and guidance are provided by the SBCAPCD.

Regarding the time to implement fenceline monitoring after the monitoring plan is approved: Based on the fenceline monitoring we have implemented at 5 refineries in both the BAAQMD and the SCAQMD, implementation took well longer than 6 months after plan approval. Major impediments to swift implementation included the significant design and planning effort needed to install and operate monitoring safely in the refinery environment, the major delays that occurred while waiting for permit approval for infrastructure construction, and the significant effort to install the infrastructure needed to properly operate fenceline monitors. One year, or even a little more was more typical for the implementation time from plan approval.

If you have additional questions, please contact me.

Paul

Paul T. Roberts, Ph.D.
President Emeritus
Chief Scientific Officer
Sonoma Technology, Inc.
1450 N. McDowell Blvd., Suite 200
Petaluma, CA 94954
(707) 665-9900
(707) 665-9800 fax
paul@sonomatech.com<mailto:paul@sonomatech.com>
www.sonomatech.com<http://www.sonomatech.com/>

From: Bart Leininger
Sent: Wednesday, December 18, 2019 11:37 AM
To: paul@sonomatech.com
Subject: Proposed Santa Barbara County Air Pollution Control District Fence-line Monitoring Rule

Paul: It was a pleasure speaking with you today. As I mentioned, the SBCAPCD is currently workshopping a fence-line monitoring rule and have included a proposed compliance timeline in the rule. The first is the preparation and submittal of a monitoring plan, which is due within 3 months of adoption. The second, is full implementation of monitoring. The draft rule proposes 6 months (180 days) from the date of plan approval to implement monitoring. I would appreciate any comments you may have on this timeline, given your experience with other refineries in the state.

Thank you.

Bart Leininger

[ALG Email Signature Block (2018)]
Bart Leininger, P.E. | Principal
T: 805.764.6012 | M: 805.432.9731| F: 805.764.6011
601 E. Daily Dr. Ste. 302 Camarillo CA 93010-5800 bleininger@algcorp.com<mailto:bleininger@algcorp.com> | www.algcorp.com<http://www.algcorp.com>

From: Bart Leininger
To: Timothy J. Mitro; Steve Ward
Subject: RE: CAP Comments to APCD Draft Rule 364
Date: Tuesday, January 7, 2020 4:10:30 PM
Attachments: image001.png

Hi Timothy: CAP was suggesting that the community monitor be collocated with the District's monitoring station. Sorry for any confusion.

Bart.

ASHWORTH LEININGER GROUP
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From: Timothy J. Mitro [mailto:MitroT@sbcapcd.org]
Sent: Tuesday, January 07, 2020 4:07 PM
To: Steve Ward <sgw@greka.com>
Cc: Bart Leininger <bleininger@algcorp.com>
Subject: RE: CAP Comments to APCD Draft Rule 364

Hi Steve,

Just for clarification on your third comment:
"The Refinery would like to propose that any community air monitoring station within the vicinity of the Refinery be collocated with the **Refinery's fenceline** monitoring station."

Was this comment supposed to be promoting the community air monitoring station being co-located with the **District's** monitoring station?
Having the community station co-located with the refinery's fenceline monitoring station seems a little redundant....two separate monitoring systems measuring the same pollutants at the same location.

Timothy Mitro
Air Quality Engineer II
Santa Barbara County APCD
(805) 961-8883
OurAir.org

Timothy J. Mitro

From: Stephen Ward <sgw@california-asphalt.com>
Sent: Thursday, February 20, 2020 2:29 PM
To: Timothy J. Mitro
Cc: jic@california-asphalt.com; 'Bart Leininger'
Subject: California Asphalt Production Additional Rule 364 Comment

Hi Tim,

As we discussed, I do have another comment **I would like for you to add to the public record by way of this email.** It is a single comment related to the timing of when payment is due for the District's community monitoring station (CMS). Rule 364 (H)(1)(b) as currently proposed, requires the subject payment within 3 months after rule adoption. In the interest of maximizing CAP's financial flexibility while remaining within the realm of what I believe to be reasonable AND the fact that District siting for the CMS is still undetermined, we are proposing that the District revise proposed Rule 364 by adjusting the timing for this payment from 3 months to 6 months (from rule adoption)..

That's it! Let me know if you have any questions.

Thank you for your consideration ☺

Steve

California Asphalt Production, Inc.
1660 Sinton Rd. Santa Maria CA 93458
Stephen Ward
Environmental Engineer
C: 805.310.7681

ATTACHMENT #2

Response to Public Comments

Attachment #2: Response to Public Comments

#	Summarized Comment	District Response
1	**1/7/2020:** The Refinery is requesting that only BTEX Compounds (Benzene, Toluene, Ethylbenzene, Xylene) be included in their fenceline air monitoring plan. The other pollutants listed in the draft rule are anticipated to be emitted in very minute quantities and therefore should be excluded.	Based on staff analysis, the proposed rule has been tailored to focus on the main pollutants and health-risk drivers, which includes sulfur dioxide (SO_2), hydrogen sulfides (H_2S), and the BTEX compounds. Hydrogen sulfide and SO_2 are important pollutants to monitor for as they can be emitted in high amounts when the refinery processes sour crude oil or combusts field gas. The remaining pollutants have been removed from the rule due to their low emission rates.
2	**1/7/2020:** The Refinery is requesting that the timeline for implementation of the fenceline monitoring program is extended from 180 days to one (1) year after rule adoption.	To account for any technical implementation issues or land-use or building permit requirements, District staff has extended the time to implement the fenceline air monitoring program from 180 days to 365 days after the date the monitoring plan is approved.
3	**1/7/2020:** The Refinery would like to propose that any community air monitoring station within the vicinity of the Refinery be collocated with the District's monitoring station.	The District agrees that a co-located station would provide additional robustness to the current monitoring program while reducing the costs for the refinery and District staff time to implement community air monitoring. The District is actively searching for a monitoring location that will satisfy the monitoring objectives of the Santa Maria region as well as the community that is downwind of the refinery.
4	**2/20/2020:** Please delay the timeline for the refinery's payment of the initial community monitoring fees from 3 months after rule adoption to 6 months after rule adoption.	The District feels that the request is reasonable based on the anticipated timelines for both the fenceline monitoring and community air monitoring installations. The change has been incorporated into the rule.

ATTACHMENT #3

Summary of CAC Comments & Responses

Attachment #3: Summary of CAC Comments & Responses

Following is a summary of items that were identified by the Community Advisory Council (CAC) members at the January 22 and February 26, 2020 meetings. The comments are divided into four categories: Fenceline Monitor Design & Installation, Open-path Technology Operation, Public Data from the Monitoring Systems, and General Comments. Revisions that were made to the Rule 364 documents as a result of the discussion are listed at the end of the document.

Fenceline Monitor Design & Installation

Comment #1: Is the District expecting the refinery to cover their entire fenceline perimeter with the monitors?

Response/revisions: No. The District is anticipating the facility will monitor only on the southern and eastern sides of the facility, as those sides are more likely to detect the pollutants that will affect the community, based on the wind patterns in the region.

Comment #2: At what height will the fenceline monitors be installed? I'm concerned about the public or wild animals that may interfere with the open-path systems.

Response/revisions: Open-path monitoring systems can be installed at a vertical height of 5 feet off the ground. In some instances, the monitoring systems can be installed at elevations of 15-20 feet off the ground so that the equipment doesn't interfere with facility operations (personnel, vehicles, etc.) or to accommodate other site-specific characteristics such as topography or building and road configurations. Fencing may also be used for security purposes to prevent the public and wild animals from interfering with the system.

Comment #3: At the 5-foot level, the fenceline monitoring equipment most likely won't detect the pollution from any of the process heater exhaust stacks. Is this correct?

Response/revisions: The fenceline monitoring equipment is intended to detect the highest emission concentrations at the refinery, which typically occur near ground level due to accidental or fugitive releases. The exhaust from the process heaters are directed upward, but some of the pollution will still register at ground level due to vertical mixing.

Comment #4: Are any additional County permits required to install the fenceline monitors? Also, will the Federal Aviation Administration (FAA) prevent the installation of any tall structures, such as the met station tower?

Response/revisions: Based on conversations with County staff, the changes at the refinery to accommodate the fenceline monitoring equipment will require planning and building permits to install the equipment shelter, electrical utilities, concrete pads, and meteorological tower. Based on discussions with Santa Maria Airport staff, a meteorological tower, which is typically 10 meters tall, will not trigger additional review by the FAA. Furthermore, other equipment at the refinery already exceeds 10 meters in height, and so the FAA is not anticipated to prevent or delay the installation.

Open-path Technology Operation

Comment #5: The emission detection levels for the open-path systems are very low. Is this proven technology? What happens if it is problematic to use this technology?

Response/revisions: The open-path technology is proven and well-established, and has been used since the 1990s at other California refineries. Since then, the technology has improved the detection limits and detection capabilities for additional compounds. The monitoring systems will be professionally installed and designed to work at each location.

The District recommends the use of the open-path system so that the refinery fenceline monitoring achieves sufficient spatial coverage. However, the refinery may still propose alternative technologies in its monitoring plan if the refinery demonstrates that the open-path system is not feasible for the specific location.

Comment #6: What are the potential weather-related issues and interferences with the open-path system (i.e dust, fog, rain, strong winds)?

Response/revisions: Weather-related environmental conditions can reduce the visibility in the area and prevent the light beams from being received by the open-path system. Based on the monitoring plans submitted for other California refineries (including coastal refineries), these weather-related events are expected to prevent the system from displaying emission readings for approximately 1% of the time each year. The refinery's QA/QC protocol and procedures will address these weather-related events as well as data flagging events such as outliers or stuck values. As stated in the Rule 364 Refinery Fenceline Air Monitoring Guidelines, the fenceline monitoring system plan shall specify a data recovery efficiency of 90% or greater after excluding the status flags. This 90% level is comparable to the minimum data recovery efficiency for other Continuous Emission Monitoring Systems (CEMS) that are installed in the District.

Comment #7: Does the 90% data recovery efficiency exclude the time that the system is down due to weather-related issues? The fog-related issues in the Bay Area may not be comparable to the weather in Santa Maria as there is direct onshore flow here, so the fog could be worse.

Response/revisions: No, the 90% data recovery efficiency does not exclude the time that the system is down due to weather-related issues. These issues should be taken into account by the designers of the system. For example, the monitoring path distance could be shortened to make sure the light beam remains strong enough to penetrate the fog.

Comment #8: What is the penalty for not achieving a 90% recovery rate?

Response/revisions: The District's compliance department would take enforcement action if the refinery does not meet the conditions of its monitoring plan. The monitoring plan will be incorporated into the refinery's permit by reference. Changes to the refinery's monitoring plan may be necessary to ensure that the 90% recovery rate is achieved for future years.

Comment #9: Are there going to be other chemical compounds that will invalidate or interfere with the readings of the open-path system, or create false-positive readings?

Response/revisions: Every compound has a unique light absorption "signature" that can be measured by the instrument at the same time. For example, the signature for benzene is different from the signatures of other compounds that contain a benzene ring. The system's analytical software is designed to identify select bands of light that enable the instrument to distinguish between these compounds with certainty. Thus, the instrument and its related software are able to identify the specific chemicals being measured and their relative concentrations with high accuracy and avoid any cross-interferences between different chemical compounds.

Comment #10: How will the open-path monitoring equipment be calibrated?

Response/revisions: The main method to calibrate the open-path equipment is to use gas calibration cells that contain known concentrations of benzene and sulfur dioxide. The calibration cells are inserted into the beam path on a monthly basis and the system is checked against the known concentrations of each gas. The specific calibration methods that the facility will be using should be identified in the refinery's fenceline monitoring plan.

Comment #11: Who determines that the refinery's fenceline monitoring system audits are performed by a qualified and independent contractor?

Response/revisions: As part of the District's review of the fenceline monitoring plan, the District will consider the contractor's qualifications. If the contractor has audited the fenceline monitoring systems at other refineries in California, and those audits have been accepted by other air districts, then we would accept the auditor in our district as well. Whereas, if the refinery proposes to use a brand new contractor, then the District would further review the contractor's qualifications.

Public Data from the Monitoring Systems

Comment #12: How is the public going to respond when they see the data from the fenceline system?

Response/revisions: The Rule 364 Refinery Fenceline Air Monitoring Guidelines require the refinery to have education materials about the different pollutants on the refinery's data website. The refinery also has to correlate the specific pollutant levels to the Reference Exposure Levels (RELs) of concern. RELs are designed to protect the most sensitive individuals in the population and they are assessed by the Office of Environmental Health Hazard Assessment (OEHHA). As stated in the guidelines, the refinery's data website should include a notification system that allows interested members of the public to be notified via email if the 1-hour REL threshold is exceeded for any of the pollutants. The extensive requirements for a publicly available website are intended to help educate the public, so that they can better understand the values that are generated by the fenceline monitoring equipment.

Comment #13: The District should review the refinery's data website to make sure that the public is being clearly informed about the data and its intended purpose.

Response/revisions: The District will review the refinery's data website to make sure that they're using the proper verbiage. This review period should be incorporated into the refinery's monitoring plan.

Comment #14: District rules currently allow the facility to emit 60 parts per billion (ppb) of hydrogen sulfide at the fenceline. There is no need to monitor hydrogen sulfide at such low levels when there are no health effects in the 1-2 ppb range.

Response/revisions: OEHHA has published an acute REL for hydrogen sulfide that equates to 30 ppb and a chronic REL that equates to 7 ppb. The monitoring equipment needs to be able to routinely detect hydrogen sulfide below these limits, so a point source monitor that can achieve a 1-2 ppb detection limit is recommended. Furthermore, there are odor and other negative effects associated with hydrogen sulfide at levels below the RELs.

Comment #15: An open-path tunable diode laser (TDL) may be a better option for hydrogen sulfide monitoring because a single point-source hydrogen sulfide monitor won't be able to provide sufficient coverage at the fenceline.

Response/revisions: Tunable diode lasers have a minimum detection limit in the 30-50 ppb range for hydrogen sulfide, which is above the acute and chronic REL thresholds. At this time, the District believes a single hydrogen sulfide point source monitor is better equipped to meet the statutory objectives of AB 1647 because it has lower detection limits.

Comment #16: Will the refinery fenceline system have to notify the interested members of the public even if the background pollutant levels are high?

Response/revisions: Yes, the fenceline system will have to notify the interested members of the public if the 1-hour REL thresholds are exceeded, even if a portion of the total pollution is due to background pollutant levels. The background pollutant levels by themselves are not expected to exceed the 1-hour REL thresholds.

Comment #17: Will the 1-hour REL threshold notifications be coordinated with other local response agencies?

Response/revisions: According to the Rule 364 Refinery Fenceline Air Monitoring Guidelines, the refinery operator must list in their monitoring plan the primary local agency that provides emergency preparedness and response services and work with them to coordinate any public alert thresholds or public alert systems. The District will also take an active role in monitoring the data feed and communicating with emergency response agencies, including the Santa Barbara County Fire Department and the Office of Emergency Management.

Comment #18: Can the District maintain one website that has both the refinery fenceline monitoring data and the community monitor data?

Response/revisions: District staff believes that a separate data collection and reporting system will be the most efficient and cost-effective approach. Each data website will maintain a weblink to the other website to promote their existence to the public. Consolidating the data from both systems could be done, but the additional District costs would be passed on to the refinery. Standard templates for data collection, reporting, and noticing have already been developed by contractors for other California refineries. It would be more effective to use these existing tools, rather than integrate the data collection and reporting into the District's system. Furthermore, including the refinery's fenceline data on the District's website could confuse the public into thinking that the District operates the fenceline monitors.

Comment #19: For the community monitor, I'm concerned about the background levels of air pollution from the airport and that the monitor could detect high pollution levels from sources other than the refinery.

Response/revisions: The District is currently identifying potential locations for a community air monitor. The District will utilize a site selection checklist that is based on EPA siting guidelines and that will help evaluate and rank the sites that are being considered. This site evaluation process will help determine the location of the community monitor.

One of the main purposes of the community monitor is to show what the community is actively breathing. At times, there may be a direct correlation between the pollution levels detected at the refinery fenceline system and the pollution levels at the community monitor. In other instances, the wind direction may indicate that the community monitor is impacted by sources other than the refinery.

General Comments

Comment #20: How does the federal benzene monitoring program compare to this rule?

Response/revisions: The federal benzene monitoring program applies to the approximately 140 major refineries across the United States. One of the main requirements of the federal program is that the refineries need to take corrective action, such as fixing the source of an emission leak, if they exceed a monitored level of 3 ppb benzene at the fenceline. The federal program does not require any real-time data to be made available to the public.

Comment #21: Did the District consider approaching the refinery directly rather than going through the rule process to implement the state mandate?

Response/revisions: Yes, we did consider it, but a rule is more defensible and it gives the public an opportunity to become involved and comment on the proposed requirements. This approach is consistent with the District's approach to implement other state mandates. For example, in most cases the rule development process for implementing the Best Available Retrofit Control Technology (BARCT) requirements of Assembly Bill 617 only apply to one or two sources.

Comment #22: Did the draft rule initially require additional pollutants to be monitored?

Response/revisions: The draft rule that was presented at the December 16, 2019 workshop included 17 different pollutants, which was similar to the pollutant list that was proposed by the South Coast Air Quality Management District for their equivalent rule. The larger refineries in other air districts have additional processes and a larger processing capacity, so they are more likely to record detectable levels of the 17 pollutants. After reviewing the recent rule proposal by the San Joaquin Valley APCD (which also has smaller refineries) and the comments received from the Santa Maria Asphalt Refinery, District staff considered which pollutants were the most critical ones to be monitored based on the pollution that is expected to be emitted from this particular type and size of petroleum refinery. The list was then narrowed to the 6 priority pollutants that are included in the proposed rule. The 11 removed pollutants may still be emitted in trace amounts, but they are unlikely to record levels higher than the monitoring equipment's minimum detection limits (MDLs).

Comment #23: Is the refinery satisfied with the responses to their comments? They asked for a full year to install and operate the fenceline system, but the rule only allows for 9 months.

Response/revisions: The refinery representatives that provided public comment at the January 22, 2020 CAC meeting expressed that they are still concerned with 9 months being too short. After further review, the District has increased the implementation timing from 9 months to 1 year.

Comment #24: What happens if there are significant delays during the installation process that are outside of the refinery's control? For example, the land use permit can be appealed and then the refinery is unable to install the equipment within the 1 year timeline.

Response/revisions: If unexpected circumstances arise that are beyond the refinery's control, the refinery could pursue a variance through the District Hearing Board pursuant to Regulation V.

Comment #25: Can the District reduce the fenceline monitoring requirements in 4-5 years if the refinery shows that they haven't found considerable amounts of the pollutants?

Response/revisions: The refinery is required to continue monitoring the refinery-related pollutants unless the state legislature amends the requirements in California Health and Safety Code. Also, the fenceline system is intended to identify potential process upsets or fugitive releases from the refinery as it is currently permitted. So even if there are no major leaks in a 5-year period, there still may be a future leak where the continuous monitoring at the fenceline would be beneficial to the community.

Comment #26: Is there a possibility that any pollutants are emitted while the facility is shutdown? You may want to use alternative language besides "when the refinery is operational" to describe when the community monitoring equipment can be removed.

Response/revisions: The District will operate the community air monitor while the refinery is refining or storing oil products. Whereas if the refinery is permanently decommissioned and no longer in existence, the community monitoring equipment may be decommissioned.

Comment #27: This rule is open-ended. If the open-path system doesn't work, it's at the APCD discretion to determine how many point source monitors are necessary to achieve adequate spatial coverage on the refinery fenceline. Multiple point source monitors at the fenceline can increase the costs related to the rule.

Response/revisions: The District has a history of working with the regulated businesses to find equitable solutions while still meeting the objectives of local, state, and federal mandates. If the refinery provides information indicating that an open-path system isn't feasible, we will consider alternatives that continue to meet the objectives of Assembly Bill 1647. Fenceline monitoring systems are highly technical and their implementation requires consideration of site-specific and equipment-specific information. Having an overly prescriptive rule may limit the refinery from using new technologies as they are developed in the future.

Corrections/Revisions made to Rule 364 materials

In response to the comments, corrections and revisions were made to the proposed rule, staff report, and monitoring guidelines.

- Rule 364 Refinery Fenceline Air Monitoring Guidelines: Added a refinery fenceline equipment data recovery efficiency of 90% or higher, which is based on the goals for systems in other Air Districts and similar District programs. *[See Comment #6]*

- Rule 364 Refinery Fenceline Air Monitoring Guidelines: Clarified that the refinery's data website should contain a weblink to the District's air monitoring website. *[See Comment #18]*

- Proposed Rule 364: Updated the implementation timing for the installation and operation of the refinery fenceline monitoring system from 270 days to 365 days. *[See Comment #23]*

- Proposed Rule 364: Clarified in the rule definition that a community air monitoring system is required as long as the refinery is refining or storing oil products. *[See Comment #26]*

Resolution in the Matter of Adopting Rule 364, Refinery Fenceline and Community Air Monitoring

ATTACHMENT E.

Proposed Rule 364

RULE 364. REFINERY FENCELINE AND COMMUNITY AIR MONITORING
(Adopted xx/xx/xxxx)

A. Applicability

This rule shall apply to petroleum refineries.

B. Exemptions

None.

C. Definitions

See Rule 102, Definitions, for definitions not limited to this rule. For the purposes of this rule, the following definitions shall apply:

"Community Air Monitoring System" means a combination of equipment that measures and records air pollutant concentrations in communities near a petroleum refinery that is currently refining or storing oil products.

"Fenceline Air Monitoring System" means a combination of equipment that measures and records air pollutant concentrations at or near the property boundary of a petroleum refinery.

"Petroleum Refinery" means a facility that is permitted to process petroleum, as defined in the Standard Industrial Classification Manual as Industry No. 2911.

"Real-time" means the actual or near actual time during which pollutant levels occur at or near the property boundary of a petroleum refinery or in a nearby community.

"Refinery Fenceline Air Monitoring Guidelines" means a written framework to be used by the Control Officer to evaluate a refinery fenceline air monitoring plan, as shown in Attachment A.

D. Requirements – Fenceline Monitoring Plan

1. No later than *[3 months after rule adoption]*, the owner or operator of a petroleum refinery shall submit to the Control Officer a written fenceline air monitoring plan for establishing and operating a real-time fenceline air monitoring system.

2. All fenceline air monitoring plans shall be consistent with the attached Rule 364 Refinery Fenceline Air Monitoring Guidelines. At a minimum, the fenceline air monitoring plan shall provide the following detailed information:

    a. Equipment to be used to continuously monitor, record, and report air pollutant levels for the pollutants specified in Table 1 – Pollutants For Fenceline Air Monitoring in real-time, at or near the property boundary of the petroleum refinery;

    b. Equipment to be used to continuously record wind speed and wind direction data in at least one on-site location at the petroleum refinery;

    c. Siting and equipment specifications;

    d. A timeline and procedures for implementing the fenceline air monitoring plan, including information pertaining to the installation, operation, maintenance, and quality assurance, for the fenceline air monitoring system;

e. Procedures for air monitoring equipment maintenance and failures. The procedures for equipment maintenance and failures shall include a plan that describes the maintenance activities necessary to maintain proper performance of the fenceline air monitoring equipment and a plan that deals with equipment failures. At a minimum, the maintenance and failure plan shall describe the following:

1. Routine maintenance requirements for equipment;
2. A planned schedule for routine maintenance performed on equipment;
3. Length of time that equipment will not be operating during routine maintenance activities;
4. Notification procedures to inform the Control Officer of any failures to accurately provide monitoring data for 24 hours or longer; and
5. Temporary air monitoring measures that will be implemented in the event of an equipment failure or during routine maintenance activities, and that will be used until the fenceline air monitoring system is restored to normal operating conditions;

f. Procedures for implementing quality assurance by a qualified independent party, including quality control and audits of the fenceline air monitoring systems;

g. Methods for dissemination of data collected by the equipment specified in Sections D.2.a and D.2.b to the public, local response agencies, and the District as expeditiously as possible.

3. The fenceline air monitoring plan shall address real-time air monitoring for the air pollutants specified in Table 1 on a continuous basis.

TABLE 1 - POLLUTANTS FOR FENCELINE AIR MONITORING

Air Pollutants
Benzene
Toluene
Ethylbenzene
Xylene
Sulfur Dioxide
Hydrogen Sulfide

E. Requirements – Fenceline Monitoring Plan Review and Updates

1. The Control Officer shall notify the owner or operator in writing whether the fenceline air monitoring plan is approved or whether modifications are necessary. Determination of approval status for the fenceline air monitoring plan shall be based on, at a minimum, submittal of information that satisfies the criteria in Section D.

a. If modifications are necessary, the owner or operator shall resubmit the fenceline air monitoring plan within 30 days after the notification by the Control Officer. The resubmitted plan shall include any information necessary to address deficiencies identified by the District.

b. The Control Officer may either approve the revised and resubmitted fenceline air monitoring plan or modify the plan and approve it as modified.

2. The owner or operator of a petroleum refinery shall revise and submit an updated fenceline air monitoring plan to the Control Officer as follows:

a. Forty-five (45) days before the date of implementation of any planned facility, equipment, process or administrative modification that could result in changes to an approved fenceline air monitoring plan.

b. Ten (10) days after the date of any unplanned facility, equipment, process or administrative modification that could result in changes to an approved fenceline air monitoring plan.

c. Sixty (60) days after the date of receiving information that an approved fenceline air monitoring plan does not adequately measure one or more pollutants identified in Table 1. This includes equipment failures that result in a failure to accurately provide continuous, real-time air monitoring information for more than 30 days.

3. Failure to comply with the requirements of Section E.2 shall result in revocation of an approved fenceline air monitoring plan. Thirty (30) days after revocation of an approved fenceline air monitoring plan, the owner or operator shall submit a new fenceline air monitoring plan to the Control Officer that meets the requirements of this rule.

F. Requirements – Fenceline Air Monitoring System

Beginning no later than 365 days after the fenceline air monitoring plan is approved by the Control Officer, the owner or operator of a petroleum refinery shall complete installation and begin operation of a real-time fenceline air monitoring system in accordance with the approved fenceline air monitoring plan.

G. Requirements – Recordkeeping

The owner or operator shall maintain records of all information required under this rule for at least five years and shall make the information available to District staff upon request. Records for at least the two most recent years shall be kept onsite.

H. Requirements – Refinery Fenceline and Community Air Monitoring Fees

1. Pursuant to California Health and Safety Code §42705.6, an owner or operator of a petroleum refinery shall pay the following fees associated with the refinery fenceline and community air monitoring system.

a. An owner or operator of a petroleum refinery shall make a payment to the District in the amount of $7,500 for the review of a refinery fenceline monitoring plan. The review fee shall be submitted with the initial monitoring plan pursuant to Section D.1 and with any new monitoring plans pursuant to Section E.3 of this rule. All costs incurred by the District for the review and revision of a District-approved monitoring plan, pursuant to Section E.2, shall be reimbursable costs pursuant to Section I.C of Rule 210, Fees.

b. No later than *[6 months after rule adoption]*, the owner or operator of a petroleum refinery shall make a payment to the District in the amount to cover the shared cost of the initial installation of the co-located community air monitoring system. Consistent with California Health and Safety Code §42705.6, these costs shall be shared in a reasonably equitable manner.

c. In the event that the community air monitoring system is not co-located with a District-operated monitoring station and is an independent monitoring station, the owner or operator of a petroleum refinery shall make an additional payment to the District in the amount to cover any additional costs for the initial installation of the community air monitoring system. This fee shall be due and payable no later than sixty (60) days after written notification by the District.

d. Beginning in calendar year 2021, the owner or operator of a petroleum refinery shall make a payment to the District in the amount to cover the cost of the annual operation and maintenance of the community air monitoring system. Consistent with California Health and Safety Code §42705.6, if the community air monitoring system is co-located with a District-operated monitoring station, these costs will be shared in a reasonably equitable manner. Invoices for the annual operation and maintenance fee will be issued during the month of January. If the fees required by this section are not paid in full within sixty (60) days of the invoice date, a ten percent (10%) penalty shall be imposed for every thirty (30) days, or portion thereof, that the payment is overdue.

2. Any fee prescribed in this rule shall be adjusted annually by the Control Officer based on the change in the California Consumer Price Index (CPI) for the preceding year, as determined pursuant to Section 2212 of the Revenue and Taxation Code.

3. The refinery fenceline and community air monitoring fees required in this section are in addition to permit and other fees otherwise authorized to be collected from such facilities. Any subsequent owner(s) or operator(s) of a petroleum refinery shall be responsible for all unpaid fees listed in this rule. The Control Officer may initiate action to revoke the permit for any unpaid fees listed in this rule.

4. No later than January 1, 2026 and every five years thereafter, the Control Officer shall conduct a refinery fenceline and community air monitoring assessment to evaluate adequate coverage and/or need for equipment upgrades. The Control Officer shall also reassess the fees required by this section to ensure that the fees are consistent with the requirements of California Health and Safety Code §42705.6.

air pollution control district
SANTA BARBARA COUNTY

Rule 364, Attachment A:
Refinery Fenceline
Air Monitoring Guidelines

April 2020 – Proposed

Aeron Arlin Genet, Air Pollution Control Officer

805.961.8800 | 260 N. San Antonio Rd., Ste. A | Santa Barbara, CA 93110 | ourair.org | @OurAirSBC

TABLE OF CONTENTS

1. Executive Summary

The Santa Barbara County Air Pollution Control District (District) is proposing to adopt District Rule 364 – Refinery Fenceline and Community Air Monitoring. The purpose of District Rule 364 is to require a real-time fenceline air monitoring system at the only petroleum refinery in the District and to fund a refinery-related community air monitoring system that provides air quality information to the public and local response agencies about levels of various air pollutants in the community.

A fundamental requirement of Rule 364 is that a fenceline air monitoring plan must provide detailed information about the installation, operation, and maintenance of a fenceline air monitoring system. A fenceline air monitoring system is defined as a combination of equipment that measures and records air pollutant concentrations at or near the property boundary of a petroleum refinery. An effective fenceline air monitoring system should be capable of measuring routine emissions from the refinery and detecting leaks, as well as unplanned releases from refinery equipment and other sources of refinery-related emissions. The fenceline air monitoring system would inform refinery operators and the public about air pollution impacts to the nearby community.

Developing an air monitoring plan requires three important steps:

1) Identification of emissions sources and affected communities,
2) Deriving a fenceline air monitoring system that can provide real-time information about certain air pollutant levels, and
3) Effectively communicating this information using data management technology and displays.

An approvable fenceline air monitoring plan shall meet the following key objectives:

- Provide information about various air pollutant levels that are measured in real-time in durations short enough to adequately address significant emissions changes from refinery operations;
- Gather accurate air quality and meteorological data to identify both the time(s) and location(s) of various air pollutant levels near refinery operations and provide a comparison of these levels to other pollutant levels monitored in the area;
- Track long-term air pollutant levels, variations, and trends over time at or near the property boundaries of the petroleum refinery;
- Provide context to the data so that local communities can distinguish air quality in their location from other locations in the area and understand the potential health impacts associated with local air quality near petroleum refinery operations;
- Provide a notification system for communities near refineries when emissions exceed thresholds (e.g., RELs - Reference Exposure Levels); and
- Provide quarterly reports summarizing the measurements, data completeness, and quality assurance.

Rule 364 sets-forth requirements for air monitoring plans. The air monitoring plan shall include detailed information for the following:

- An evaluation of routine emission sources at the refinery (e.g., utilizing remote sensing or other measurement techniques or modeling studies, such as those used for health risk assessments);
- An analysis of the distribution of operations and processes within the refinery to determine potential emission sources;
- An assessment of air pollutant distribution in surrounding communities (e.g., mobile surveys, gradient measurements, and/or modeling studies used for health risk assessments);
- A summary of fenceline air monitoring instruments and ancillary equipment that are proposed to continuously measure, monitor, record, and report air pollutant levels in real-time near the petroleum refinery facility perimeter (i.e., fenceline);
- A summary of instrument specifications, detectable pollutants, and minimum and maximum detection limits for all air monitoring instruments;
- Proposed monitoring equipment siting and selected pathways (when applicable) for fenceline instruments, including the justification for selecting specific locations based on the assessments mentioned above;
- Operation and maintenance requirements for the proposed monitoring systems;
- An implementation schedule consistent with the requirements of Rule 364;
- Procedures for implementing quality assurance and quality control of data;
- A web-based system for disseminating information collected by the fenceline air monitoring system;
- Details of the proposed public notification system; and
- Demonstration of independent oversight.

This information will assist the Control Officer in determining the approval status of an air monitoring plan during the plan review process required by Rule 364.

2. Fenceline Air Monitoring Systems

A fenceline air monitoring system shall take into account the geospatial layout of the refinery site, potential release sources, local meteorology, atmospheric dispersion characteristics of the compounds of concern, the relative risk to likely receptors based on these criteria, and other considerations outlined in Table 1 below.

Table 1: Fenceline Air Monitoring Plan Checklist

Fenceline Air Monitoring Coverage (or Spatial Coverage)	
☑	Identify the facility's proximity to sensitive receptors affected by the refinery operation and provide the information below:
	Distance from facility to closest sensitive receptors
	Location of downwind and upwind communities
	Eminent sources of non-refinery emissions surrounding the facility
	Dispersion modeling *
☑	Describe historical facility emission patterns and pollutant hotspots based on the following:
	On-site location of operations and processes, and their level of emissions
	Facility plot plans and topography
	Dispersion modeling *
☑	Select sampling locations along the perimeter of the facility based on the information above. Also, provide the following:
	Locations where equipment will be sited (e.g., GIS coordinates) and measurement pathways
	Elevations of equipment and pathways
	A description of how the monitoring system will cover all nearby downwind communities
Fenceline Air Monitoring Equipment Description	
☑	Select fenceline air monitoring equipment that is capable of continuously measuring air pollutants in real-time and provide the following:
	Specifications for the fenceline instruments (e.g., detection limits, time resolution, etc.)
	Explanation of the operation and maintenance requirements for selected equipment
	Substantiate any request to use alternative technologies
☑	Monitor for the pollutants listed in Table 1 of Rule 364 and include the following:
	Specify pollutant detection limits for all instruments and paths measured
Quality Assurance	
☑	Develop a Quality Assurance Project Plan (QAPP) that describes the following:
	Quality assurance procedures for data generated by the fenceline air monitoring system (e.g. procedures for assessment, verification and validation)
	Standard operating procedures (SOP) for all measurement equipment
	Routine equipment and data audits

Table 1 (continued)

Data Presentation to the Public	
☑	Design a data display website that includes the following:
	Educational material that describes the objectives and capabilities of the fenceline air monitoring system
	A description of all pollutants measured and measurement techniques
	A description of background levels for all pollutants measured and provide context to levels measured at the fenceline
	Procedures to upload the data and ensure quality control
	Definitions of QC flags
	Hyperlinks to relevant sources of information
	A means for the public to provide comments and feedback; Procedures to respond to the feedback
	Archived data with data quality flags that explain changes due to QA/QC and provide chain of custody information
	Quarterly data summary reports, including relationship to health thresholds, data completeness, instrument issues, and quality control efforts
Notification System	
☑	Design a notification system for the public to voluntarily participate in, that includes the following:
	Notifications for activities that could affect the fenceline air monitoring system (e.g., planned maintenance activities or equipment failures)
	Notifications for the availability of periodic reports that inform the community about air quality
	Triggers for threshold exceedances (e.g. Acute Reference Exposure Levels (RELs))
	Communication methods for notifications, such as, website, mobile applications, automated emails/text messages and social media

* Dispersion modeling shall be conducted using U.S. EPA's Preferred and Recommended Air Quality Dispersion Model.

Details about these key considerations are explained below.

A. Multi-Pollutant Monitoring

Multi-pollutant monitoring is a means to broaden the understanding of air quality conditions and pollutant interactions, furthering capabilities to evaluate air quality models, develop emissions control strategies, and support research and health studies. Petroleum refineries and activities associated with them emit a wide range of air pollutants, including criteria pollutants (SOx and NOx), reactive organic compounds (ROCs), and toxic air contaminants (benzene, toluene, formaldehyde, and hydrogen sulfide).

Chemical compounds associated with health risk and those measured at other ambient air monitoring locations should be identified in the air monitoring plan. Identification of the health risk drivers can be informed by the health risk assessment studies performed at the refinery, as

well as other information regarding potential health risk near the refinery. Additional chemicals may be of interest to monitor as a part of the fenceline air monitoring system and may be included in the reporting for additional public information.

The California Environmental Protection Agency's (CalEPA) Office of Environmental Health Hazard Assessment (OEHHA) is collaborating with the California Air Resources Board (CARB) and the Interagency Refinery Task Force to identify and develop information on chemicals emitted from refineries and their health effects in order to assist air agencies in developing plans for air monitoring at refineries in California. In March 2019, OEHHA published a report[1] that presents a comprehensive list of chemicals emitted from California refineries, including emissions that occur routinely in daily operations as well as accidental and other non-routine emissions. The list prioritizes the chemicals according to their emissions levels and toxicity, providing a list of chemicals that would be top candidates for air monitoring near refineries according to the volume of the chemicals emitted and their toxicity. The presence of a chemical on this comprehensive list does not necessarily mean it is released from all refineries at all times or in significant quantities.

Based on the OEHHA report, the potential compounds emitted from refineries that pose the highest health risk in nearby communities were identified along with the appropriate monitoring technologies selected to measure them. The chemical compounds of interest for Rule 364 are the BTEX compounds (Benzene, Toluene, Ethylbenzene, Xylenes), Sulfur Dioxide (SO_2), and Hydrogen Sulfide (H_2S). Two of these pollutants, benzene and hydrogen sulfide, can cause acute health effects at low concentrations. To make sure that these pollutants are adequately detected, the fenceline monitoring equipment shall have a minimum detection limit (MDL)[2] equal to or less than 1 part per billion (ppb) of benzene and 2 ppb of hydrogen sulfide.

B. Selection of Fenceline Air Monitoring Technologies

A fenceline air monitoring system is a combination of equipment that measures and records air pollutant concentrations at or near the property boundary of the facility. The air monitoring plan must provide specifications for the instruments selected for a fenceline air monitoring system, such as the detection limits of the equipment for each chemical and time-resolution capabilities. Also, the air monitoring plan must demonstrate that the instruments can measure all the pollutants identified in Rule 364. Multiple technologies may need to be employed to ensure adequate compound identification.

i. Open-path Technology

Fugitive emissions are emissions of gases or vapors from leaks and other unintended or accidental releases of emissions. Leaks from pressurized process equipment generally occur

[1] Analysis of Refinery Chemical Emissions and Health Effects – Report. March 20, 2019 (www.oehha.ca.gov/air/analysis-refinery-chemical-emissions-and-health-effects)

[2] Minimum Detection Limit (MDL) is defined as the minimum concentration or amount of an analyte that can be determined with a specified degree of confidence to be different from zero.

through valves, pipe connections, mechanical seals, or related equipment, usually originating from the process area. Fugitive emissions also occur from storage tanks that are used to store crude oil prior to refining, intermediates between refining processes, and refined product streams. Due to the large number of potential leak sources that are scattered over a wide area at refineries and difficulties in detecting and repairing these leaks, these fugitive emissions are best monitored over a large area or path using open-path technology.

Open-path technology is a well-established method to measure path-integrated gas concentrations in the open atmosphere. Open-path technology is a type of Optical Remote Sensing (ORS) where the instruments use a light signal to continuously detect and measure concentrations of chemical compounds along the distance covered by the light signal in real-time. The equipment can be set up in a bi-static configuration, where the light source and detector are located on opposite ends of the path, or in a mono-static configuration, where the light source and detector are co-located. In mono-static configurations, a retroreflector is used to reflect the light back across the path. Both set-ups provide path-averaged concentrations of multiple pollutants. As a result, open-path technologies can provide greater temporal and spatial resolution compared to conventional air monitoring techniques, making it ideal for long-term fenceline monitoring at refineries. For example, narrow pollutant plumes can be detected by an open-path system that might otherwise be missed by point monitors.

U.S. EPA has published a comprehensive assessment of various open-path ORS technologies, outlining the advantages and limitations of each measurement method.[3] Optical methods such as Ultraviolet Differential Optical Absorption Spectroscopy (UVDOAS) and Fourier Transform Infrared (FTIR) monitors are advanced techniques that can measure BTEX compounds and sulfur dioxide. However, the UVDOAS instruments are able to detect BTEX compounds at lower concentrations compared to FTIR instruments, so UVDOAS is the preferred monitoring method. Although the open-path ORS techniques have been used for over 20 years, they are constantly improving by having lower detection limits and being able to detect additional compounds.

Based on the advantages that open-path technologies provide over conventional air monitoring techniques, District staff recommends the use of open-path technology for implementing a fenceline air monitoring system required by Rule 364. The selected open-path instruments should be able to record and store the measured spectral absorption and associated average concentrations of measured pollutants for retrospective investigations. Where open-path monitors are being operated, all factors that could affect air pollutant measurements, such as the maximum path length and potential interferences, must be discussed in the air monitoring plan.

[3] www.epa.gov/sites/production/files/2018-08/documents/gd-52v.2.pdf

ii. Point Monitors

Conventional fenceline air monitoring techniques rely on point monitors that only provide concentration information from a single point in the survey area, greatly increasing the chances of missing surface emission hotspots or emission plumes. Therefore, even after collecting data from multiple points in the survey area, the point sampling approach may lack the spatial or temporal data necessary to obtain a complete picture of the emissions from large permitted sources.

Automated gas chromatographs (Auto-GCs) are typically considered the best point monitor option to measure specific ROC pollutant concentrations semi-continuously at a monitoring site. This technology has been developed by a number of manufacturers, and U.S. EPA has evaluated several commercially available auto-GCs in order to determine their suitability for use in air monitoring networks. The U.S. EPA published the results in the Photochemical Air Monitoring Station (PAMS) Gas Chromatography Evaluation Study Report.[4] However, a substantial number of auto-GC units (or other point monitors) may need to be deployed to achieve sufficient spatial coverage along the property boundary or fenceline of a petroleum refinery.

iii. Emerging Technologies

In comparing the costs of an ORS-based measurement approach with traditional point monitoring approaches for long-term fenceline measurements, an ORS-based approach is likely to be more cost-effective at this time. However, a refinery owner or operator may demonstrate that other air monitoring techniques and/or technologies (e.g., emerging technologies) could be used in place of open-path technology depending on the pollutants that are monitored. For example, future sensor technology could allow cost-effective, real-time monitoring at numerous fixed locations along the perimeter of the petroleum refinery. In the event of an equipment failure or during extended maintenance activities, low-cost sensors can also serve as a temporary measurement technique until the main fenceline air monitoring system is restored to normal operating conditions.

Gaseous sensors are expected to improve in the future and fenceline air monitoring plans could be augmented to employ them. Therefore, the District may consider approving emerging technologies for future compliance with Rule 364. The petroleum refinery would submit a revised fenceline air monitoring plan if the changes to the fenceline air monitoring system are supported based on new information. This includes demonstrating that the proposed alternative air monitoring technology will meet the requirements of Rule 364 and provide adequate sensitivity and temporal and spatial coverage for the compounds identified in the rule.

[4] RTI (2014). Gas Chromatograph (GC) Evaluation Study: Laboratory Evaluation Phase Report. Prepared for U.S. EPA PAMS Program. www3.epa.gov/ttnamti1/files/ambient/pams/labevalreport.pdf

C. Fenceline Sampling Locations, Coverage, and Time Resolution

Air monitoring plans must specify the following information related to the locations selected for the fenceline air monitoring equipment:

- Areas along the perimeter that are likely to detect compounds associated with petroleum refinery operations;
- Proximity of the proposed fenceline monitoring equipment to residences and other sensitive receptors, such as schools, hospitals, and community parks;
- Where equipment will be sited (e.g., GIS coordinates);
- Elevations at which equipment will be placed; and
- Length of each path that will be monitored with fenceline instruments.

The air monitoring plan must provide a discussion that explains the rationale for choosing the equipment siting specifications. The refinery operator must also address key considerations, such as the distance necessary to accurately measure emissions and critical transport areas around the perimeter of the refinery. To ensure that the monitoring system will attain a high level of accuracy, the following key factors should be discussed:

i. Local Meteorological Conditions

Meteorological conditions can significantly affect the concentration of air pollutants in a region. Therefore, it is important that the refinery considers the typical meteorological conditions (e.g., wind patterns, temperature, rainfall, cloud cover, etc.) of a site. Evaluating historical meteorological data will help in determining whether certain candidate equipment locations are likely to experience higher measured pollutant concentrations from an emissions source.

Wind can be the most critical meteorological element for the transport of refinery emissions to the surrounding communities. Often, peak concentrations occur during stable, low wind speed conditions when pollutants can build up and meander in any direction. Frequency distributions of winds and associated graphic analyses (i.e., wind roses) can be analyzed to evaluate predominant wind patterns, as well as diurnal and seasonal variability. Also, if a facility is in an area that is prone to fog, the facility operator should ensure the equipment for the fenceline air monitoring system is not easily impeded by the fog. Heaters and fans may be required to keep the instrument optics and reflector mirrors free of moisture to maximize data recovery.

ii. Pollutant Hotspots and Topography

It is essential for the refinery operator to identify potential pollutant hotspots within the facility to ensure fenceline monitoring of these emissions and to provide effective information to the neighboring communities. Therefore, in developing the air monitoring plan, the refinery operator should survey the facility with special attention to areas where emissions are most likely, such as tank storage, oil processing, wastewater treatment, and loading areas. Information gathered from the survey should be used to establish the facility's overall emissions profile.

The survey should also consider the elevation of potential pollutant hotspots. Concentrations of pollutants can be greater in valleys than for areas of higher ground. This is because pollutants can become trapped in low lying areas under certain weather conditions. Therefore, the topography of the petroleum refinery can affect the distribution and dispersion of pollutants from refinery operations. The petroleum refinery operator should design the fenceline air monitoring system to ensure fenceline air monitoring equipment is sited such that it captures the most critical transport and dispersion areas along the perimeter of the facility.

iii. Spatial Coverage of Monitors

The fenceline monitoring system should be designed to ensure adequate coverage of the area along the facility perimeter, to the extent feasible. Considerations such as the proximity of refinery emissions sources to sensitive receptors and type of pollutants to be measured could require additional open-path monitors for a facility. Also, information available from dispersion modeling, gradient sampling, and mobile measurements should be taken into consideration when assessing adequate coverage.

Sampling locations should have an open, unobstructed path. Ideally, each air monitoring path should be at least 1 meter vertically and horizontally from any supporting structure and away from dusty or dirty areas. The air monitoring plan must also identify potential disruptions of airflow and the effect of obstacles or traffic on the measured concentrations. Potential interferences caused by meteorological or process issues associated with the selected location must be addressed. Furthermore, the air monitoring plan should describe how the proposed fenceline air monitoring system will effectively provide relevant information for all nearby downwind communities given the expected meteorological conditions.

iv. Continuous and Real-Time Measurement of Air Pollutants

Continuous air monitoring at or near the property boundaries of a petroleum refinery can significantly improve rapid detection and communication of potential hazardous releases to refinery operators, responders, and the public. Additionally, it provides long-term data to determine trends in emissions (e.g., diurnal, seasonal variations). Therefore, the fenceline monitoring shall be operated continuously with a required time resolution of five-minute averaging when feasible and with a three-minute averaging period for hydrogen sulfide. High time resolution monitoring reduces the chance of pollutant hot spots being undetected over the measured area and can provide real-time emission information to refinery personnel and the nearby communities. If achieving the desired time-resolution is not feasible, refinery operators shall provide rationale in the air monitoring plan for any proposed time resolutions that differ from these guidelines (e.g., based on the equipment employed, the number of paths covered by each open-path system, or other operational limitations).

3. Meteorological Measurements

Exposure to air contaminants within an urban area can vary greatly due to the proximity to emission sources, the magnitude and specific type of emissions, structures and terrain influences, and meteorological conditions. Variability in wind speed and direction pose significant challenges for the analysis of the data from air quality monitoring programs and exposure assessments. Hence, an understanding and assessment of the general meteorological patterns in and around each facility is a critical component in not only the design of the measurement systems, but also interpreting the measurement results, including the transport and dispersion of air pollutants from the refinery to the community. Therefore, Rule 364 requires fenceline monitoring locations to continuously record wind speed and wind direction data. The District also recommends collecting ambient temperature and sigma theta values for wind.

In order to provide high quality data, the air monitoring plan must provide information on siting considerations and equipment to be employed for real-time meteorological data collection at high resolution (at minimum, matching the time resolution of the air quality monitors). Wind sensor quality, siting, and quality assurance shall meet the specifications and guidelines that are typically required by air quality regulatory measurements and modeling purposes (for reference, see the U.S. EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV: Meteorological Measurements).[5]

4. Quality Assurance / Quality Control (QA/QC)

The measurements from the fenceline air monitoring system shall reflect a commitment to quality data that is outlined in the air monitoring plan. The air monitoring plan shall address quality assurance, including training of personnel, routine maintenance and calibration checks, technical audits, data verification and validation, and data quality assessment.

The plan must also document the instrument manuals, Standard Operating Procedures (SOP), and a Quality Assurance Project Plan (QAPP). The QAPP provides a blueprint for conducting and documenting a program that produces quality results and outlines the specific goals of the monitoring network and instrumentation. The QAPP also summarizes how the data will be reviewed and managed by the refineries. The QAPP must outline a QA/QC plan that follows U.S. EPA guidelines[6] and should provide clear definitions and procedures for QA/QC that are necessary to indicate why some data may be missing, suspect, or invalid. The critical functions to be addressed in the QAPP are summarized below:

- **Project background and management:** The QAPP should provide background information and define the problems to be addressed and the general goals of the

[5] www3.epa.gov/ttn/amtic/files/ambient/met/Volume_IV_Meteorological_Measurements.pdf
[6] U.S. EPA (2002). Guidance for Quality Assurance Project Plans. EPA/240/R-02/009. www.epa.gov/sites/production/files/2015-06/documents/g5-final.pdf

fenceline monitoring. The QAPP should describe project organization, quality objectives and acceptance criteria for measurement data, and plans for documentation, recordkeeping, and data dissemination.

- **Technical Approach:** The QAPP should demonstrate that the appropriate approaches and methodologies are employed for performing measurements, data handling, and quality control and address the design and implementation of the measurement systems.
- **Assessment/Oversight:** The QAPP should offer appropriate QA/QC steps for ensuring the effectiveness of the monitoring plan covering experimental design, representativeness of the data, instrument operation and data acquisition, calibration check procedures, data quality indicators, independent systems and performance audits, and peer-review.
- **Data Validation and Usability:** The QAPP should describe what steps will be taken to ensure that the individual data elements conform to the criteria specified in the monitoring plans.

All monitoring data must be collected, managed, and archived in a standard electronic format after necessary data processing and validation. Processing the data involves collecting the data, assuring its quality, storing the data in a standardized format, and interpreting the data for communication to the public. The most critical steps in this process include:

- Automatically retrieving data from the fenceline monitors containing the measured levels of each air pollutant along with meteorological parameters;
- Validating data file completeness and integrity;
- Transferring file contents to a database;
- Flagging data that do not meet pre-defined quality control limits;
- Copying quality assured data and indices into a database for use by the data display and dissemination program;
- Generating and recording logs to monitor system operation; and
- Notifications when measured concentrations are above pre-defined concentrations limits.

To ensure that the collected data meets the highest quality possible, each piece of monitoring equipment must be operated in strict accordance with an in-depth operating protocol. Standard Operating Procedures (SOPs) must be prepared for each specific measurement method to achieve the appropriate level of detail and standardization and to consequently ensure that the monitoring equipment provides high quality data. The SOPs should be informed by general operating instructions that are typically provided by the manufacturer of the equipment, by operational experience and audits, and by general operational guidelines and performance specifications that are available for U.S. EPA and State approved methods. The SOPs should address specific topics such as calibration procedures and quality control procedures (indicating standards and acceptance criteria), as well as data reduction (indicating validation procedures and reporting).

Rule 364 requires the measurements from the fenceline monitoring system to be available to the public on a real-time basis with QA/QC measures implemented to provide confidence in the data collected. Publicly available quarterly reports should reflect a higher level of data validation, including a manual review of the data by qualified personnel. The real-time and near-real-time disseminated measurement data should not be considered final, but it is important that the preliminary real-time measurement data distributed to the public be of an acceptable quality. Also, it is important that instrument failures are detected quickly to prevent grossly invalid data from being presented to the public. This can be accomplished by utilizing built-in status flags on the instrument operational parameters and by providing real-time data screening for outliers, impossible values, stuck values, negative values, rates of change, excessive short-term noise, etc. After accounting for all of the status flags, the system shall achieve a 90% or higher data recovery efficiency.

5. Data Display and Dissemination

The primary goal of Rule 364 is to collect real-time emissions data and share that data with the community, local responders, and industry so that it can be used to evaluate and adaptively manage the impacts of refinery emissions on the community. Therefore, it is essential that the collected data is made available and displayed online in a relevant and understandable manner to the public in real-time or near real-time. The air monitoring plan must include information and examples of how the quality-controlled data will be displayed and the steps taken to provide context to the real-time measurements to the public. Also, the air monitoring plan shall address means for providing automated, reliable, and understandable information, including the intent and limitations of the data collected and an explanation of how background concentrations and/or contributions from other sources may affect measured concentrations.

In order to make the data provided in this outreach as accessible as possible, the project website should use data visualization tools to graphically depict information using maps and time series plots of measured pollutants and wind data. The website should not simply provide graphical information about current conditions. It needs to allow the public to access historical data directly and in a user-friendly manner. The archived data should include data quality control flags, explain changes, and provide information to identify data that should be removed or was removed after QA/QC.

All preliminary data from the fenceline monitoring system must be submitted to the District as quickly as practicable and in an approved format. The refinery operators must also publish quarterly reports written at a public-friendly level on the data dissemination website. The quarterly data reports shall include rigorous review of calibration data, data processing calculations (such as conversion calculations of instrument signal to pollutant concentration), data consistency, field data sheets and logbooks, instrument performance checks, and equipment maintenance and calibration forms. All changes to the reported real-time data must be explained in quarterly reports. The major goals of the outreach program include:

- Developing multiple communication venues to ensure widespread access to environmental information and to appeal to the various communication preferences (e.g., text messages, email, website, etc.) among the end users;
- Promoting access to and awareness of the measurements and use of the real-time air pollution data through an active outreach and education program;
- Developing contextual material to assist interpretation and understanding of the real-time data and its limitations;
- Designing an effective public outreach program (e.g., informational meetings, workshops, etc.) that informs the public about the health impacts associated with emission levels detected by the fenceline air monitoring system and informs decisions related to reducing community exposure; and
- Identifying designated personnel to address District and public questions about monitoring equipment and readings.

In order to provide context to this complex data set for the public, the designed website should contain information regarding the species measured and the measurement techniques, discussion of levels of concern for each measured species, typical background levels, potential non-refinery sources that could contribute to measured concentrations, and definitions of data QC flags. This should be written at a public-friendly level with clarity and thoroughness and with links provided to additional sources of information. In addition, the air monitoring plan and the data website should include details of how the public can report experiences and provide comments and feedback for improvement of the website, the other data dissemination tools, and the monitoring activities in general. The website should also contain a weblink to the District's air monitoring website to promote the existence of the District's community air monitor.

6. Notification System

A. Reference Exposure Level (REL) Notifications

A Reference Exposure Level (REL) is an airborne concentration level of a chemical in which no adverse health effects are anticipated for a specified exposure duration. They are designed to protect the most sensitive individuals in the population by the inclusion of margins of safety. Therefore, an air concentration that exceeds the REL does not automatically indicate an adverse health impact. However, levels of exposure above the REL levels may have an increasing but undefined probability of resulting in an adverse health impact, particularly in sensitive individuals (e.g., children, the elderly, pregnant women, and those with acute or chronic illnesses).

The website should offer an opt-in notification system that is integrated with the data collected by the air monitoring network. The notification system should automatically generate and issue notifications to subscribers when any of the pollutant levels exceed the corresponding RELs or other lower thresholds pursuant to the approved air monitoring plan. Resources that should

inform the thresholds include the National Ambient Air Quality Standards (NAAQS), California Ambient Air Quality Standards (CAAQS), and the acute and chronic RELs as assessed by the Office of Environmental Hazard Assessment (OEHHA).[7]

OEHHA has developed acute RELs for assessing potential non-cancer health impacts for short-term, one-hour peak exposures to air pollutants and chronic RELs for assessing non-cancer impacts from long-term exposure. If the one-hour average concentration of any of the measured pollutants exceed its corresponding acute REL, notifications should be sent out to the subscribers. Whereas long-term exposures are typically assessed by their annual emissions. Therefore, chronic RELs and cancer risk must be compared to annual average concentrations of measured toxic pollutants and be reported in the periodic reports once one year of data is available.

B. Notification Methods & Emergency Response

The notification system should be designed to provide information to the public via email, text message or other communication venues with the ability to be notified regarding: (1) data availability and release of periodic reports; (2) exceedances of REL thresholds; and (3) monitoring system status. The timely notifications will inform the public when certain pollutants exceed those concentration thresholds or may pose a potential health concern, allowing the public to consider further actions to protect their health. The notifications would also provide information to refinery operators to rapidly identify and mitigate any undetected and/or accidental emissions. This can have a significant impact on the reduction of refinery fugitive emissions.

The air monitoring plan should also identify alternative methods of accessing periodic reports for those members of the community who may not have internet access (e.g., automated phone systems for dial-in information, public displays, hard copies of periodic reports in libraries or community centers, etc.). Based on the needs of the community, providing information in other languages should be strongly considered. Some examples of methods for communicating the data to the public include the following:

- Website data displays;
- Mobile application;
- Automated email/fax/text notification system;
- Social media feeds;
- Public data displays in community locations;
- Automated call-in phone system;
- Television and radio reports; and
- Published quarterly data summary reports.

[7] www.oehha.ca.gov/air/allrels.html

As provided by state law, emergency response agencies, such as local fire agencies, have the primary responsibility for scene management during an accidental release of emissions or other emergency incidents. The refinery operator must identify the primary local agency that provides emergency preparedness and response services. The refinery must also coordinate with the first responders to integrate with and augment the existing public alert systems. Communication mechanisms are necessary to provide the public with access to public safety information during refinery upsets and accidental releases of pollutants and not to conflict or duplicate the first response alert systems in case of an accidental release of emissions.

The California Air Resources Board (CARB) Monitoring and Laboratory Division and the California Air Pollution Control Officers Association (CAPCOA) have completed the first two volumes of the Refinery Emergency Air Monitoring Assessment Report. The Objective 1: Delineation of Existing Capabilities report, released in May 2015, provides a comprehensive inventory of emergency air monitoring assets and capabilities located in and around California's major oil refineries. The Objective 2: Evaluation of Air Monitoring Capabilities, Gaps, and Potential Enhancements became available in March 2019. Also in March 2019, OEHHA released a related report: Analysis of Refinery Chemical Emissions and Health Effects. These are available from the CARB Refinery Air Monitoring website.[8]

[8] www.arb.ca.gov/fuels/carefinery/crseam/crseam.htm