SANTA BARBARA COUNTY
AIR POLLUTION CONTROL DISTRICT

Draft Staff Report:
Assembly Bill 617 – Best Available Retrofit Control Technology (BARCT) Implementation Schedule

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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

Assembly Bill (AB) 617 requires each air district to adopt an expedited schedule for the implementation of Best Available Retrofit Control Technology (BARCT) at each industrial source subject to the California Greenhouse Gas (GHG) Cap-and-Trade requirements. This legislation affects six industrial sources within Santa Barbara County. District staff evaluated these sources and determined that the majority of their operations already meet BARCT standards, but some equipment units may still need retrofits.

District staff prepared an implementation schedule that contains three new rules and the modification of three existing rules in order to satisfy the AB 617 retrofit requirements. This schedule commits the District to a rule development process that ensures the timelines in AB 617 are achieved. Each rule will go through the District's established public process, including Public Workshops and Community Advisory Council vetting. If adopted, the rule amendments will help reduce emissions from some of the largest sources of air pollution within the County.

2. AB 617 BACKGROUND & MANDATES

2.1 AB 617 Background & Mandates

Assembly Bill (AB) 617, enacted in July 2017, has a multitude of requirements to address the disproportionate impacts of air pollution in environmental justice communities. One of the key components of AB 617 is to reduce air pollutant emissions from facilities that participate in the California Greenhouse Gas (GHG) Cap-and-Trade system.[1] Cap-and-Trade is designed to limit GHG emissions, and allows facilities to comply by either reducing GHG emissions at the source or by purchasing GHG emission allowances. Emissions of criteria pollutants and toxic air contaminants are often associated with GHG-emitting sources, and these pollutants may impact local communities that are already experiencing a disproportionate burden from air pollution.

AB 617 helps alleviate the pollution burden near these communities by requiring each air district to adopt an expedited schedule for the implementation of Best Available Retrofit Control Technology (BARCT) by January 1, 2019.[2] BARCT is "an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source."[3] To meet the BARCT emission limits, a facility may need to install new air pollution controls on their existing unit, or replace the unit in part or in whole.

The requirement for BARCT only applies to facilities described in AB 617 as an "industrial source." An "industrial source" is any facility subject to the Cap-and-Trade requirements that is located in an area designated nonattainment for an air pollutant. Since Santa Barbara County is nonattainment for the state PM_{10} standard (particulate matter with a diameter of 10 microns or less) and is nonattainment-transitional for the state ozone standard, these industrial sources must install BARCT by no later than December 31, 2023. However, there are a few caveats. First, retrofits are not required if the District determines that BARCT standards are already in place for

[1] https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm
[2] California Health and Safety Code section 40920.6.(c).1
[3] California Health and Safety Code section 40406 definition

the equipment category. Also, the schedule does not apply to facilities that have already implemented BARCT for an equipment category since 2007.

2.2 CARB Technology Clearinghouse - BARCT

AB 617 also required the California Air Resources Board (CARB) to create a statewide clearinghouse that identifies and consolidates the various BARCT determinations made within the state.[4] CARB developed a new web-based database that contains emission control data for District rules (i.e., BARCT) as well as District Best Available Control Technology (BACT) determinations and guidelines. To help design the Technology Clearinghouse, CARB created a workgroup consisting of various air districts in California, including Santa Barbara County APCD. The Technology Clearinghouse provides a valuable portal for air agencies and the public in comparing the BARCT rules and BACT determinations throughout the state, and it is available to the public at the following website: https://www.arb.ca.gov/techclearinghouse/.

[4] California Health and Safety Code section 40920.8

3. AB 617 Industrial Sources

There are six facilities in the District that have been identified as industrial sources subject to AB 617 BARCT requirements. A brief description of each facility is listed below.

3.1 ExxonMobil – Pacific Offshore Pipeline Company

The Pacific Offshore Pipeline Company ("POPCO") Gas Plant is a facility that is located in Las Flores Canyon, approximately 20 miles west of Santa Barbara. The POPCO facility was originally permitted in 1980, and it processes raw sour gas produced from Platforms Hondo, Harmony, and Heritage, which are located in federal waters off the California coast in the Santa Barbara Channel. The gas is transported through a subsea pipeline and treated at the onshore facility. The natural gas is dried, treated, compressed, and sold to the local utility company. In addition, the plant contains a Sulfur Removal Unit (SRU) process to convert the extracted sulfur compounds into elemental sulfur. The elemental sulfur is sold and trucked out of the facility as a by-product chemical. Propane and butane are also produced and trucked offsite.

The plant contains multiple processes that generate emissions, including two large steam boilers (each rated at 41 MMBtu/hr) that are used to supply process heat and incinerate tail gas produced from the SRU; two tri-ethylene glycol (TEG) reboilers burning natural gas; and, a thermal oxidation unit to safely handle and dispose of waste gases generated during facility start-ups, shutdowns, and process upsets.

3.2 ExxonMobil – Las Flores Canyon

The Las Flores Canyon Oil and Gas Plant is a facility that is located adjacent to the POPCO Gas Plant in Las Flores Canyon, approximately 20 miles west of Santa Barbara. The facility was originally permitted in 1987 to process crude oil and natural gas from Platforms Hondo, Harmony, and Heritage, which are located in federal waters off the California coast in the Santa Barbara Channel. The facility receives a produced crude oil/water/gas emulsion from the offshore platforms via a 20-inch emulsion pipeline.

The onshore facilities are broken down into four main plants: the Oil Treating Plant (OTP), the Transportation Terminal (TT), the Stripping Gas Treating Plant (SGTP), and the Cogeneration Power Plant (CPP). The Oil Treating Plant dehydrates, stabilizes, and sweetens the crude oil to meet product specifications. Oil is transferred to storage tanks at the Transportation Terminal, and is then transported via the Plains All American Pipeline for final processing at a downstream refinery.[5] The Stripping Gas Treating Plant processes the gas to produce a sweet fuel gas for use in the onshore facilities. Finally, the Cogeneration Power Plant (CPP) generates up to 49 megawatts (MW) of electric power for both the onshore facilities and the offshore platforms. In the CPP, heat from the gas turbine exhaust is recovered in a Heat Recovery Steam Generator (HRSG) to generate steam for the plant. The HRSG system is also supplementary fired to provide additional heat for the oil and gas processing operations.

3.3 Pacific Coast Energy Company – Orcutt Hill

Pacific Coast Energy Company ("PCEC") – Orcutt Hill is an onshore oil and gas production and processing facility that is located approximately 2.5 miles south of the community of Orcutt. The

[5] Oil production has halted since the pipeline ruptured near Refugio Beach in May 2015.

facility was originally developed by the Union Oil Company in the 1920s, and it is comprised of 12 oil and gas leases, each with their own oil wells; some leases also have tank batteries and related processing equipment. The extracted crude oil and gas emulsion from the wells is separated in tank batteries using various equipment units such as heaters, tanks, separators. The crude oil is shipped offsite via pipeline. Produced gas is gathered from the various leases and is piped to the Orcutt Hill Compressor Plant. At the compressor plant, the gas is dehydrated and scrubbed to remove hydrogen sulfide (H_2S), condensate, and water. This gas is then burned in various combustion equipment located at the stationary source (e.g., boilers, engines and steam generators). Many of the oil wells at the source are powered by internal combustion engines.

PCEC uses gas-fired steam generators to enhance oil recovery at the various wells. This process involves cyclic steaming of wells at the various leases by producing high-pressure steam that is injected into the oil wells. Only a few wells are steamed at a time, typically lasting for three to five days. Steam is allowed to soak in the wells for one to two days before the wells are returned to production. This process continues until all wells have been steamed, after which the process is repeated.

3.4 ERG Operating Company – Cat Canyon West

ERG Operating Company ("ERG") – Cat Canyon West is an onshore oil and gas production and processing stationary source that is located approximately ten miles southeast of the City of Santa Maria. The facility was originally developed over 100 years ago, and it is comprised of 14 oil and gas leases, each with their own oil wells; some leases also have tank batteries and related processing equipment. The extracted crude oil and gas emulsion from the wells is separated in tank batteries using various equipment units such as heaters, tanks, separators. The crude oil is transported offsite by tanker trucks. Produced gas is scrubbed to remove H_2S, condensate, and water. This gas is then burned in various combustion equipment located at the stationary source (e.g., boilers, engines and steam generators).

At newer well sites, gas-fired steam generators create steam to enhance oil recovery. This process involves cyclic steaming of wells at the various leases by producing high-pressure steam that is injected into the oil wells. Only a few wells are steamed at a time, typically lasting for three to five days. Steam is allowed to soak in the wells for one to two days before the wells are returned to production. This process continues until all wells have been steamed, after which the process is repeated. The remaining wells are produced without steam injection.

3.5 Imerys Minerals California

Imerys Filtration Minerals, Inc. ("Imerys") is a diatomaceous earth mining and processing facility that is located approximately one mile south of the City of Lompoc. Mining has occurred at this site for over 100 years, with Imerys being the current owner and operator of the mine since 2012.[6]

Diatomaceous earth is a sedimentary deposit composed of fossilized diatoms that contained silicaceous skeletons. Imerys mines and mills diatomite into powders of various grades for use by industries, such as for filtration aids or fillers. Most of the ore is surface mined from lands

[6] Celite Corporation purchased the mine facility from Manville Sales Corporation in 1991 and changed its name to Imerys Minerals California in 2012.

adjacent to the plant, and then is initially crushed and screened using mobile equipment and stored in stockpiles. The crushed and screened crude is transported to the powder mills as needed using covered conveyors. Particulate Matter (PM) is created during the mining, crushing, screening, and conveying of the mineral product.

The powder mill production processes consists of varying combinations of additional crushing, milling, drying, calcining, conveying, classifying and packing. The natural diatomaceous earth is transformed into calcinated powders via exposure to high temperatures in the natural gas-fired rotary kilns. Many grades of ore contain naturally occurring sulfur. When this sulfur bearing ore is processed, significant amounts of sulfur dioxide are created. The final diatomaceous earth product is classified into a variety of grades before being bagged for shipment, by truck or by rail, to distributors and customers.

3.6 Windset Farms

Windset Farms is an industrial-sized greenhouse facility that is located on the western edge in the City of Santa Maria. The facility was initially built in 2010 and has since expanded, now consisting of six large greenhouses surrounding a centralized packhouse building. With the latest expansion, the greenhouses at Windset Farms cover over 7 million square feet. The greenhouses are based on a Dutch design of a semi-closed unit specifically engineered for use in the Santa Barbara County climate. The greenhouses utilize state-of-the-art control systems to manage irrigation and internal environmental growing conditions for their vegetable crops.

For greenhouses, internal temperature, humidity, and carbon dioxide (CO_2) content are critical elements for growing. The greenhouses are heated and dehumidified using six boilers, with each boiler serving its associated greenhouse. Each boiler has a rated heat input of 42.7 MMBtu/hr and the boiler exhaust is directed into the greenhouse as part of the CO_2-dosing process required for plant growth. The boilers also heat water that is stored in large insulated tanks that regulate greenhouse temperature and humidity as needed. Because these boilers are directly used in the growing of crops, they are classified as an agricultural source and are exempt from obtaining a District Permit to Operate pursuant to section D.3 of District Rule 202. Nevertheless, Windset Farms is an “industrial source” pursuant to the California Air Resources Board’s Cap-and-Trade Program; therefore, the AB 617 BARCT requirements apply to the facility.

4. Emission Source Categories, Applicable Rules, and BARCT Evaluation

To determine whether our existing rules and permit conditions reflect current BARCT emission standards, staff evaluated each emission category at the six AB 617 industrial sources. Staff reviewed available information on the current achievable emission limits and potential controls for each source category and pollutant. This information included guidelines and recent determinations of both BACT and BARCT made by other air districts, most of which are found at the CARB Technology Clearinghouse.[7]

Staff also estimated the potential emission reductions and cost-effectiveness of the control measures using preliminary data. The preliminary data will be refined further during the rule development process. The background information and preliminary BARCT determinations for each source category at the AB 617 industrial sources are shown below. Section 4.1 contains the source categories that do not meet current BARCT emission standards; a proposed schedule for implementing BARCT standards at the AB 617 industrial sources is included in Section 5 of this report. Section 4.2 contains the source categories that do meet current BARCT emission standards; rule revisions are not required for these source categories.

4.1 Source Categories that Require BARCT Rule Revisions

4.1.1 Boilers and Process Heaters (Between 2 – 5 MMBtu/hr)

Rule 361 was initially adopted in January 2008 and it applies to medium-sized boilers, water heaters, steam generators, and process heaters with a rated heat input capacity between 2 to 5 MMBtu/hr. The current nitrogen oxides (NOx) emission limit in the rule is 30 ppm[8] NOx at 3% oxygen (O_2), and this limit does not represent today's BARCT standard for the source category.

Rule 361 was identified in the District's 2016 Ozone Plan as a rule that could be amended to attain further NOx emission reductions. In the 2016 Ozone Plan, District staff recommended amending the rule so that new units would have to meet either a 9 or 12 ppm NOx limit, depending on the boiler's configuration. Based on the CARB Technology Clearinghouse, these NOx limits represent the current BARCT standard for this source category. Staff proposes to incorporate the AB 617 requirements into the rule development process for Rule 361. More information regarding the proposed AB 617 requirements for this rule can be found in Section 5.1 of this report.

4.1.2 Boilers and Process Heaters (5 MMBtu/hr and greater)

Rule 342 was initially adopted in March 1992 and it applies to large boilers, water heaters, steam generators, and process heaters with a rated heat input capacity of 5 MMBtu/hr and greater. The current NOx emission limit in the rule, 30 ppm NOx at 3% O_2, does not represent today's BARCT standard for this source category.

Rule 342 was identified in the District's 2016 Ozone Plan as a rule that could be amended to attain further NOx emission reductions. In the 2016 Ozone Plan, District staff recommended

[7] https://www.arb.ca.gov/techclearinghouse/

[8] Parts per million by volume, expressed on a dry gas basis

amending the rule so that new units would have to meet either a 9 or 15 ppm NOx limit, depending on the boiler's maximum rated heat input. Based on the CARB Technology Clearinghouse, these new NOx limits may reflect BARCT, but further investigation is necessary to evaluate whether lower limits, such as 7 to 9 ppm NOx, reflect current BARCT emission standards. Staff proposes to incorporate the AB 617 requirements into the rule development process for Rule 342. More information regarding the proposed AB 617 requirements for this rule can be found in Section 5.2 of this report.

4.1.3 Reciprocating Internal Combustion Engines (RICE)

Reciprocating internal combustion engines generate power through an explosive combustion of an air/fuel mixture in an enclosed chamber. RICE are used for various functions such as generating electricity, operating water pumps, pumping oil from wells, and compressing gas. There are two primary types of engines: compression-ignition (CI) and spark-ignition (SI) engines. Compression ignition engines are typically fired on diesel fuel. There are emission and operational limitations for these engines due to the state's Airborne Toxic Control Measures (ATCMs). Spark-ignited internal combustion engines burn fuels such as natural gas, propane, or landfill gases.

District Rule 333, *Control of Emissions from Reciprocating Internal Combustion Engines,* was initially adopted in 1991. In 2008, the rule was amended to incorporate some of the recommended changes from CARB's 2001 Determination of Reasonably Available Control Technology (RACT) and Best Available Retrofit Control Technology (BARCT) for Stationary Spark-Ignited Internal Combustion Engines. Based on the District's attainment status, the District was only required to adopt the RACT standard for these engines, and so the current rule does not reflect the BARCT emission standard.

The District reviewed the engines that are permitted at the AB 617 industrial sources. All of the engines with a maximum rated brake horsepower of 50 or higher are either emergency or low-use engines (engines that are operated less than 200 hours per calendar year) or they have been derated to less than 50 brake horsepower using orifice plates. Retrofitting emergency and low-use engines would not be cost-effective as they are not operated enough to justify the additional costs. However, it may be feasible and cost-effective to bring the derated units into the rule by removing the Rule 333 exemption for just these six AB 617 industrial sources, as they could be equipped with non-selective catalytic control systems that achieve upwards of 95 percent NOx control efficiency. Staff proposes to amend District Rule 333 to address derated units for just these six AB 617 industrial sources. More information regarding the proposed AB 617 requirements for this source category can be found in Section 5.3 of this report.

4.1.4 Particulate Matter – Process Emissions and Fugitive Emissions

Particulate matter (PM) can be directly created from various types of manufacturing processes. For mineral processing operations, PM is created during the mining, crushing, screening, and conveying of the mineral product. Air pollution control devices such as baghouses, cyclones, and wet scrubbers can be used for controlling the PM emissions. These emission control systems can achieve a 99 percent or higher control efficiency when they are designed, operated, and maintained properly.

Of the six AB 617 industrial sources in the District, Imerys is the only facility that involves the processing of solid mineral materials. Line #7, Imerys' main production line, uses a Venturi Scrubber/Packed Bed Tower system that controls PM emissions with an efficiency of 99.8 percent or higher. This control efficiency is verified through the source test and monitoring requirements contained in the facility's permit. The production line at the Imerys Powder Mill, as well as the various specialty plants at the facility, have baghouses serving the diatomaceous earth production process. The baghouses are used to capture the particulate matter exhausted from the cyclones, and they are also used to control emissions in the loading areas.

Not all emission sources at the facility can be controlled by the air pollution control equipment. Fugitive dust (those emissions that cannot reasonably be captured by an emission control device) is generated during activities such as the initial extraction of the material from the ground, loading and unloading (into storage piles and then from the piles to conveyors), driving on unpaved roads, and wind erosion. The facility employs various best management practices to control the fugitive dust emissions. This includes using a water spray/fog dust suppression system to help prevent the creation of fugitive dust from the storage piles and other sources.

Based on the District's analysis of this facility, the conditions in its Title V permit, and staff's review of the CARB Technology Clearinghouse, the majority of the operations at Imerys meet the current BARCT standard for this source category. However, some of the older baghouses at the facility may not achieve the highest level of control when compared to new baghouses being designed today. Staff proposes to create a new rule that specifically addresses particulate matter control devices to ensure that the older baghouses meet the current BARCT standard. More information regarding the proposed AB 617 requirements for this source category can be found in Section 5.4 of this report.

4.1.5 Turbines, Duct Burners, and Heat Recovery Steam Generators

A gas-fired turbine is an internal combustion engine that consists of a compressor, a combustor and a power turbine. The compressor provides pressurized air to the combustor where the fuel is burned. Hot exhaust gases enter the power turbine where the gases expand across turbine blades, driving one or more shafts to power a compressor and an electric generator or other device. Stationary gas-fired turbines are generally used to generate electricity. Currently, the District does not have a rule that covers gas turbines. Other air districts, such as San Joaquin Valley Air Pollution Control District and South Coast Air Quality Management District, have implemented such a rule.

Based on our review of the CARB Technology Clearinghouse, the current BARCT standard for this source category is 5 ppm NOx at 15% O_2. Of the AB 617 industrial sources in the District, ExxonMobil – Las Flores Canyon is the only facility that uses turbines. The 39 megawatt gas turbine typically operates at an emission level between 2 and 4 ppm NOx at 15% O_2, as demonstrated through source tests and Continuous Emissions Monitoring data. However, the permit limit for the unit corresponds to approximately 8 ppm NOx at 15% O_2. To make the current BARCT standard for this source category enforceable, a turbine rule would be required. More information regarding the proposed AB 617 requirements for this source category can be found in Section 5.5 of this report.

4.1.6 Miscellaneous Nitrogen Oxides (NOx) Combustion Sources

This unit category covers emissions from dryers, dehydrators, ovens, furnaces, and kilns. In these types of processes, the flame or hot air directly heats the product or process fluid. The District does not have a rule that covers these types of emission units. Based on our review of the CARB Technology Clearinghouse, other districts, such as Ventura County Air Pollution Control District and South Coast Air Quality Management District, have implemented such a rule.

Of the AB 617 industrial sources in the District, Imerys is the only facility that employs such processes. Imerys uses multiple burners and dryer systems in their product lines, with the maximum heat input of the burners ranging from 1 MMBtu/hr to over 50 MMBtu/hr. Some of the units already use low-NOx burners, and a few units have conventional burners with no emission controls. Due to the high operating capacity of these burners, it may be feasible and cost-effective to create a new rule that can achieve emission reductions for this source category. More information regarding the proposed AB 617 requirements for this source category can be found in Section 5.6 of this report.

4.2 Source Categories that Do Not Require BARCT Rule Revisions

4.2.1 Boilers and Process Heaters (0.075 – 2 MMBtu/hr)

Rule 360 is a point-of-sale rule that regulates NOx from small boilers, water heaters, steam generators, and process heaters with a rated heat input capacity within the range of 0.075 to 2 MMBtu/hr. The rule was last amended in March 2018 to lower the NOx emission limit for new and modified natural gas fired units down to 20 ppm NOx at 3% O_2 content.

Based on the CARB Technology Clearinghouse, Rule 360 represents the most stringent standard that is feasible today, and the NOx limits in Rule 360 represent the BARCT standard for this source category. No other air district has adopted a rule with an emission limit of less than 20 ppm for this size of emission unit. Further BARCT evaluation and rulemaking for this source category is not required.

4.2.2 Oil & Gas Flares and Thermal Oxidizers

The incineration of waste gases in a flare or thermal oxidizer is a combustion process to destroy waste gases (reactive organic compounds and/or sulfur compounds) using a high-temperature flame. In the oil and gas production industry, flares and thermal oxidizers are also used to combust both waste gases and/or production gas that cannot be routed to a utility pipeline. Flares and thermal oxidizers are designed for both continuous service and intermittent service (e.g., emergency upset conditions). District Rule 359, *Flares and Thermal Oxidizers*, was initially adopted in 1994. The rule requires flare operators to minimize flare gas volumes, sets NOx and ROC emission limits for the flares, and limits the sulfur content of fuel that is combusted in the flares or thermal oxidizers.

Based on the CARB Technology Clearinghouse, Rule 359 represents the current BARCT standard for this source category because it is equivalent to the rules that have been implemented in other air districts. Further BARCT evaluation and rulemaking for this source category is not required.

4.2.3 Oil & Gas Storage Tanks and Loading Racks

Emissions from organic liquid storage tanks occur due to the evaporative, breathing and flashing losses associated with the production, processing, storage, and transference of the organic liquid. The emissions vary with tank design, as there are design features and controls that can prevent excessive evaporative losses. Depending on the type of facility, storage tanks are regulated under District Rule 325, *Crude Oil Production and Separation*, or Rule 326, *Storage of Reactive Organic Compound Liquids*. These rules were initially adopted in the early 1970s and were updated in the early 1990s to lower the thresholds in which the emission controls were required. There have only been a few minor updates to the rules since then.

Another source of emissions closely related to storage tanks is the oil tanker truck loading and unloading of organic liquids at a loading rack. The primary sources of emissions from the loading process are the reactive organic gases escaping from the truck or tank during the loading process. Loading racks are regulated under Rule 346, *Loading of Organic Liquid Cargo Vessels*. This rule was initially adopted in 1992, and it requires facilities operating above a specified throughput level to install a vapor recovery system on their loading racks. The District's 1992 Board Letter for the initial adoption of Rule 346 identified the measure as a BARCT measure.

Based on the CARB Technology Clearinghouse, the current rules for this source category represent the current BARCT standard because they have similar control requirements and achieve similar emission reductions when compared to the control requirements that have been adopted in other air districts. Further BARCT evaluation and rulemaking for this source category is not required.

4.2.4 Oil & Gas Sumps, Pits, and Well Cellars

Crude oil contains a substantial amount of water and solids, and these non-oil materials must be separated out before the oil can be sold. Sumps and pits, which are basically large detention basins, can be used to accomplish some of this separation by allowing materials time to settle out. Rule 344 was developed in 1994 to prevent sumps from being used, or to require the sumps to be replaced with storage tanks or other alternatives that achieve at least 80 percent control efficiency for Reactive Organic Compounds (ROCs).

Rule 344 also addresses well cellars, which are lined or unlined containments where one or more wellheads are installed. Well cellars average 6 feet in diameter and are about 6 feet deep. It was common to find cellars with standing crude oil at the bottom, and so Rule 344 required the proper maintenance of components at the wellhead in order to avoid excessive evaporative losses.

Based on the CARB Technology Clearinghouse, the current rule for this source category represents the current BARCT standard because it has similar control requirements and achieves similar emission reductions when compared to the control requirements that have been adopted in other air districts. Further BARCT evaluation and rulemaking for this source category is not required.

4.2.5 Oil & Gas Fugitive ROC Emissions

Facilities operating in the oil & gas sector use a variety of piping components to transfer produced oil and gases to refineries and other end-users. These components (such as valves, fittings, pumps, and compressors) may leak reactive organic compounds throughout their service life. To reduce these emissions, the components are regulated under District Rule 331, *Fugitive Emissions Inspection and Maintenance*. This rule was initially adopted in the early 1970s and was updated in the early 1990s to lower the thresholds in which the emission controls were required and to clarify other elements of the rule.

Rule 331 requires owners and operators of oil and gas production, processing, and refining facilities to inspect and maintain facility components to prevent fugitive emission leaks. The rule requires most components to be inspected every three months using a hand-held analyzer that detects hydrocarbons. If leaks are found, a component is required to be tightened or otherwise repaired within a specified time frame.

Based on the CARB Technology Clearinghouse, the current rule for this source category represents the current BARCT standard because it has similar control requirements and achieves similar emission reductions when compared to the control requirements that have been adopted in other air districts. Further BARCT evaluation and rulemaking for this source category is not required.

4.2.6 Sulfur Oxides (SOx) Emission Sources

District Rule 311 was originally adopted in 1971 and it contains the general sulfur content limits for gaseous and liquid fuels combusted in Santa Barbara County. However, all six of the AB 617 industrial sources in the District use processes or control equipment that go beyond the requirements in Rule 311.

The oil and gas production facilities all generate SOx emissions from the processing and combustion of produced natural gas. This is because the produced gas often includes a small percentage of sulfur compounds, including hydrogen sulfide. To control these SOx emissions, ExxonMobil's Las Flores Canyon facility uses a Sulfur Recovery Unit consisting of a Clause Unit and a Tail Gas Cleanup Unit to remove 99.9 percent of sulfur in the inlet gas. Whereas the POPCO facility uses a Sulfur Recovery Unit consisting of a Clause Unit, a Beavon Unit and a Stretford Process Unit to remove 99.9 percent of sulfur in the inlet gas. The controls utilized at these facilities represented Best Available Control Technology (BACT) at the time they were installed.

The PCEC Orcutt Hill and ERG Cat Canyon West facilities use sulfur treatment systems to reduce the sulfur content of the produced natural gas combusted at the facilities. PCEC Orcutt Hill uses SulfaTreat systems and blends their produced gas with utility purchased natural gas to maintain fuel sulfur levels below 23 ppm. ERG Cat Canyon West uses SulfaTreat and SulfaScrub systems to maintain fuel sulfur levels below 40 ppm.

The Imerys facility also generates SOx emissions from the processing of diatomaceous earth materials that contain elemental sulfur and other sulfur compounds. The raw materials are heated during processing, which oxidizes the sulfur compounds to form SOx. The main Imerys processing line, Line #7, uses a Venturi Scrubber/Packed Bed Tower system to control SOx

emissions by at least 99.75 percent. The smaller scale Celpure production line uses two Packed Tower Scrubbers to control SOx emissions by at least 99 percent. Both of these SOx control systems represented BACT at the time they were installed.

Finally, Windset Farms generates SOx emissions from the combustion of natural gas in their large boilers. They combust only utility purchased natural gas, which is tightly regulated by the California Public Utilities Commission (PUC) to ensure low sulfur content. Additional sulfur controls on PUC natural gas would not be feasible or cost-effective.

Based on our review of the CARB Technology Clearinghouse, the emission controls and fuel sulfur requirements in place at the six AB 617 industrial sources represent the current BARCT standard for this source category. Further BARCT evaluation and rulemaking for this source category is not required.

5. AB 617 PROPOSED IMPLEMENTATION SCHEDULE

Table 1 shows the estimated schedule for the six rule development projects that were identified in Section 4. To prioritize the rules on this schedule, staff took the following into account:

1) The local public health and clean air benefits to the community,
2) The cost-effectiveness of each control option, and
3) The air quality and attainment benefits of each control option.[9]

Staff recognizes that some rule development projects may take more time during the technical assessment phase, as information gathering from manufacturers and permitted sources can extend a project timeline. The schedule for the two 2016 Ozone Plan control measures involving Rules 361 and 342 originally included an adoption date of 2018. However, consideration of AB 617 BARCT requirements and the additional analysis of the Ozone Plan control measures to include BARCT requirements has delayed that process. Staff anticipates that the six rule development proceedings can be completed by the end of 2021. These rules would be fully implemented by December 31, 2023, as required by AB 617.

Table 1: Proposed AB 617 Implementation Schedule

Rule #	Rule Name	2016 Ozone Plan Schedule[10]	AB 617 Implementation Schedule
361	Boilers, Steam Generators and Process Heaters (Between 2-5 MMBtu/hr)	2018	2019
342	Boilers, Steam Generators and Process Heaters (5 MMBtu/hr and greater)	2018	2019
333	Control of Emissions from Reciprocating Internal Combustion Engines	N/A	2020
363	Particulate Matter (PM) Control Devices	N/A	2020
358	Stationary Gas Turbines	N/A	2021
362	Nitrogen Oxides (NOx) from Miscellaneous Combustion Sources	N/A	2021

More information regarding each of the rules and the anticipated AB 617 requirements can be found in the sections below. A listing of the AB 617 Affected Equipment Units can be found in Attachment C.

[9] California Health and Safety Code section 40920.6(d)
[10] Revised in August 2017 to incorporate the nonattainment-transitional ozone designation and analysis.

5.1 Rule 361 – Boilers, Steam Generators and Process Heaters (Between 2-5 MMBtu/hr)

Under the project description from the 2016 Ozone Plan, Rule 361 would be revised to include a NOx emission standard of 9-12 ppm for new or modified natural gas-fired units on or after January 1, 2020. Based on CARB's Technology Clearinghouse, the proposed emission limits of 9-12 ppm NOx in Rule 361 also represent the current BARCT standard for this source category.

AB 617 requires implementation of the BARCT emission standards at the AB 617 industrial sources by no later than December 31, 2023. When reviewing the applicable units in this source category, staff found that some of the applicable units still have conventional burners, and those units are scheduled to meet a 30 ppm NOx limit by January 1, 2020, as required under the 2008 version of Rule 361. The District acknowledges that it would not be cost-effective to replace or modify those units in 2020 and replace them again in 2023. As such, the District evaluated the facilities and concluded that it would be feasible to require the existing boilers at the AB 617 industrial sources to replace their conventional burners with the ultra-low NOx burners by January 1, 2020 since the new equipment is cost-effective and readily available. This would affect boilers at the following two facilities:

- ERG Operating Company – Cat Canyon West, and
- Imerys Minerals California.

This requirement would be incorporated into the proposed amendments for Rule 361. By expediting the implementation of BARCT, the AB 617 mandate of achieving emission reductions at the largest industrial sources in the County would be satisfied for this source category.

5.2 Rule 342 – Boilers, Steam Generators and Process Heaters (5 MMBtu/hr and greater)

Under the project description from the 2016 Ozone Plan, Rule 342 would be revised to include a NOx emission standard of 9-15 ppm for new or modified natural gas-fired units. Based on CARB's Technology Clearinghouse, the proposed emission limits of 9-15 ppm NOx may represent the current BARCT standard for Santa Barbara County. Further investigation needs to be conducted during the rule development process to see if lower NOx limits, such as 7-9 ppm, are feasible.

AB 617 requires implementation of the BARCT emission standards at the AB 617 industrial sources by no later than December 31, 2023. When reviewing the applicable units in this source category, staff found that all of the units that are currently permitted at *Pacific Coast Energy Company (PCEC) – Orcutt Hill* and *ERG – Cat Canyon West* are already permitted at levels between 7-9 ppm NOx. As such, it is expected that the only AB 617 facilities that would be affected by the requirements are:

- ExxonMobil – Pacific Offshore Pipeline Company (POPCO),
- Imerys Minerals California, and
- Windset Farms.

District staff evaluated the historic operations and fuel usage patterns of the various boilers at these facilities. Currently, there is a back-up boiler at Imerys that is rarely used, and there are

off-line boilers at the POPCO facility that have shown very little usage since the Plains All American Pipeline ruptured in 2015. Based on this information, staff determined that a low-use exemption from the BARCT standards would be required in order to develop a cost-effective strategy for this source category. If these units are replaced or modified, or if their operations ramp up to above the low-use threshold, they would be required to meet the ultra-low NOx standard. Draft rule language that includes the low-use exemption proposed above will be developed and vetted as part of the rule development process.

Based on initial cost estimates provided by manufacturers, it would be cost-effective to retrofit the remaining main boiler at Imerys and the six boilers at Windset Farms with ultra-low NOx burners by December 31, 2023. This requirement would be incorporated into the proposed amendments for Rule 342.

5.3 Rule 333 – Control of Emissions from Reciprocating Internal Combustion Engines

Rule 333, *Control of Emissions from Reciprocating Internal Combustion Engines*, has been revised as part of the District's previous ozone attainment planning process. The District adopted and achieved NOx emission reductions from the 1991 rule adoption and the 2008 rule amendments as it focused on reducing emissions from the various engines located at oil & gas production fields.

Since this rule has been in place, many operators have chosen to electrify or derate their engines to less than 50 horsepower to avoid emission controls. To derate an engine, the operator must install an orifice plate that is made of 10-gauge mild steel stock and place it between the carburetor and the intake manifold. Depending on the make and model of the engine, the orifice plate will have a specifically-sized hole that limits the amount of fuel to be combusted, preventing the engine from exceeding an output of 50 horsepower.

However, there is no technical reason that emissions from the derated engines cannot be reduced through the use of emission controls. For this rule amendment, staff proposes to remove the derating exemption[11] for AB 617 industrial sources. The only existing facility this change would affect is PCEC – Orcutt Hill. The majority of the engines at PCEC were originally manufactured in the 1970s and 1980s, and were derated soon after the 1991 adoption of Rule 333.

Based on CARB's Technology Clearinghouse, the current BARCT emission standard for rich burn, non-cyclically loaded engines is 25 ppm NOx at 15% O_2. The 43 derated engines at PCEC do not have any emission controls, but could be retrofitted with non-selective catalytic control systems and air/fuel ratio controllers to achieve the current BARCT standard. It is expected that some engines would use these emission controls, whereas other engines may be replaced with electric motors.

5.4 Rule 363 – Particulate Matter (PM) Control Devices

Rule 363, *Particulate Matter (PM) Control Devices*, is a new rule that is proposed for the AB 617 implementation schedule. The District is nonattainment for the state PM_{10} standard and AB 617 requires implementation of the current BARCT standard for all nonattainment pollutants. Based on our review of the CARB Technology Clearinghouse, the new rule would be

[11] Rule 333.B.1.c

based on South Coast Air Quality Management District Rule 1155, which was initially adopted in December 2009. The rule would only apply to AB 617 industrial sources, and as such, the only existing facility it would affect is Imerys.

As mentioned in Section 4.1.4, Imerys has multiple baghouses at their facility, some of which have been in operation for 30 years or more. These baghouses require regular maintenance, such as bag cleaning and bag replacement, to ensure that the units properly control particulate matter emissions. The new rule would include best management practices for all baghouses at the facility to make sure that PM emissions are effectively controlled and the current BARCT standard is met. New PM emission limits (in units of grains per dry standard cubic foot) would be established for the larger baghouses and requirements would be added for units to be equipped with a bag leak detector system (BLDS) to continuously monitor baghouse performance, including bag failure.

5.5 Rule 358 – Stationary Gas Turbines

Rule 358, *Stationary Gas Turbines*, is a new rule that is proposed for the AB 617 BARCT implementation schedule. A new rule is required in order to make the current BARCT standard for this source category enforceable. The rule would only apply to AB 617 industrial sources, and as such, the only existing facility it would affect is ExxonMobil - Las Flores Canyon.

Gas-fired turbines can be designed in many different configurations. The ExxonMobil Las Flores Canyon facility Cogeneration Power Plant has a 39 MW gas turbine that generally operates in a combined cycle configuration, where the waste heat from the turbine's flue gas is utilized by a 10 MW steam turbine, making the unit capable of producing 49 MW of total electrical power. A 345 MMBtu/hr Heat Recovery Steam Generator (HRSG) is used to supplement the waste heat from the gas turbine to provide steam for various other processes related to the oil and gas processing at the plant.

As a BACT requirement during its initial permitting in 1987, Exxon was required to control NOx emissions from the unit using steam injection and selective catalytic reduction (SCR), where ammonia is injected into the commingled gas turbine and HRSG exhaust stream. This technology is capable of reaching sub-5 ppm NOx levels; operational adjustments may be necessary to ensure that the emission limits are met during normal operations.[12]

5.6 Rule 362 – Nitrogen Oxides (NOx) from Miscellaneous Combustion Sources

Rule 362, *Nitrogen Oxides (NOx) from Miscellaneous Combustion Sources*, is a new rule that is proposed for the AB 617 BARCT implementation schedule. The rule would be based on a combination of Ventura County Air Pollution Control District Rule 74.34, which was adopted in December 2016, and South Coast Air Quality Management District Rule 1147, which was initially adopted in December 2008. The rule would only apply to AB 617 industrial sources, and as such, the only existing facility it would affect is Imerys.

One of Imerys' kilns is rated at 50 MMBtu/hr and is equipped with a conventional burner that does not use low-NOx combustion technology. Based on the CARB Technology Clearinghouse, the current BARCT standard for this source category is to employ low-NOx burners that can

[12] Excluding startup and shutdown emissions, which are still minimized to the extent practicable.

achieve 60 ppm NOx at 3% oxygen for units that have a process temperature of 1,200 degrees Fahrenheit and greater. Since the Imerys kiln has not demonstrated through source testing that it consistently meets the current BARCT standard, a rule development proceeding is required to ensure that the unit meets the BARCT standard by December 31, 2023 and that adequate compliance verification processes are included. The Imerys facility also has six smaller kilns and dryers. As part of the rule development process, staff will evaluate whether additional NOx emission reductions from these smaller units are feasible.

6. ENVIRONMENTAL IMPACTS – CEQA

The California Environmental Quality Act (CEQA) requires environmental review for certain actions. This implementation schedule guides the District to incorporate new provisions into the District's rulebook to satisfy the BARCT requirements from AB 617. The creation of the implementation schedule is, by itself, an administrative change that will not affect emissions in Santa Barbara County. The project is purely an action taken by the District to satisfy the legal requirements of AB 617. It does not involve any physical changes to the environment and there will be no relaxation of standards. Each new provision in the District's rulebook will be thoroughly vetted and reviewed under CEQA during each rule's specific rule development process, when all of the project's parameters have been identified.

A CEQA determination will be made when the implementation schedule is brought to the District Board for adoption. Any changes to the project description that are made during the public review period will undergo additional environmental review under CEQA.

7. PUBLIC REVIEW

Community Advisory Council & Workshop

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 will meet and discuss the AB 617 BARCT Implementation Schedule on November 7, 2018 in Buellton. The event will also serve as a public workshop. The District will invite representatives from the AB 617 industrial sources to share information and directly comment on the proposed schedule. Also, individuals who have subscribed to the District's rule update notices will be invited to the joint workshop/CAC meeting.

Public Hearing

The proposed AB 617 BARCT Implementation Schedule is scheduled to be heard at the December 20, 2018 Board Meeting. The implementation schedule will be publicly noticed and made available at the District offices and on the District's website prior to the public hearing, where the Board will consider adopting the schedule. The public will be invited to the hearing and can provide comments on the proposed schedule prior to or at the hearing.

8. REFERENCES

1) California Air Resources Board – *Determination of Reasonably Available Control Technology and Best Available Retrofit Control Technology for the Control of Oxides of Nitrogen from Stationary Gas Turbines*, Approved May 18, 1992.
2) California Air Resources Board – *Determination of Reasonably Available Control Technology and Best Available Retrofit Control Technology for Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters*, Approved July 18, 1991.
3) California Air Resources Board – *Determination of Reasonably Available Control Technology and Best Available Retrofit Control Technology for Stationary Spark-Ignited Internal Combustion Engines*, Approved December 2001.
4) California Air Resources Board – *Technical Support Document for Suggested Control Measure for the Control of Organic Compound Emissions from Sumps Used in Oil Production Operations*, Approved July 1988.

9. ATTACHMENTS TO THE STAFF REPORT

9.1 Attachment A. FAQs and Clarification
9.2 Attachment B. Air District Rule Crosswalk
9.3 Attachment C. AB 617 Affected Equipment Units

ATTACHMENTS TO THE STAFF REPORT

ATTACHMENT A

FAQs and Clarification

Attachment A: FAQs and Clarification

The following text provides rule clarifications in the format of frequently asked questions:

1. **Question:** What is Best Available Retrofit Control Technology (BARCT)?

   Response: Per California Health and Safety Code section 40406, BARCT is an "emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source." Air districts that are designated as *serious*, *severe*, or *extreme* nonattainment for any air pollutant are already required to adopt BARCT.[13] Based on the evaluation by the South Coast Air Quality Management District, this statutory definition of BARCT does not preclude entirely replacing existing equipment with new cleaner equipment.

2. **Question:** Can BARCT change over time? How do past BARCT determinations apply?

   Response: Yes, BARCT can change over time. Past BARCT determinations may still be relevant if made recently and/or technology hasn't changed, but new BARCT determinations were made for this evaluation.

3. **Question:** What is the difference between BACT (Best Available Control Technology) and BARCT?

   Response: BACT represents the most stringent emission limit or control technique that is achieved in practice or is technically feasible and cost-effective. BACT is evaluated on the permit application prior to equipment installation or modification, in accordance with District Rule 802, *New Source Review*. Incorporating emission controls into a project is more practical during the design phase of a project. In most cases, BACT will be more stringent than BARCT.

4. **Question:** What is an "expedited schedule" for BARCT implementation?

   Response: An expedited schedule documents the feasible rules that may potentially be adopted within the next few years because the current requirements (whether in a District rule or in the affected unit's District permit) do not reflect the current BARCT standard. The feasibility of each rule will be further evaluated during the rule development process.

[13] California Health and Safety Code section 40919-40920.5

5. **Question:** Can a potential BARCT rule be excluded from the schedule if the reductions from the rule are not necessary to meet the requirements of the attainment plan?

   Response: No. In order to achieve emission reductions at the largest sources in the state and to benefit community health, AB 617 requires that all facilities subject to the Cap and Trade program meet the current BARCT standard for their source category by December 31, 2023.

6. **Question:** Can a potential BARCT rule be excluded from the schedule if the rule is not cost-effective or feasible?

   Response: Yes. In evaluating the BARCT rules, it may not be cost-effective or feasible to impose the BARCT emission limit on the industrial source. In these scenarios, no rule changes have to be made and the AB 617 requirements are still satisfied.

7. **Question:** What is the significance of the December 31, 2023 implementation date?

   Response: Pursuant to AB 617, the controls must be installed and operating at the facilities no later than December 31, 2023. The specific timeline and compliance requirements for the affected units will be documented in the amended rules.

ATTACHMENTS TO THE STAFF REPORT

ATTACHMENT B

Air District Rule Crosswalk

Attachment B: Air District Rule Crosswalk

District staff reviewed the rules applicable to the six AB 617 industrial sources and compared them to the corresponding rules at various other air districts. A crosswalk for each emission source category is provided below.

DISTRICT / EMISSION SOURCE	SANTA BARBARA COUNTY APCD	VENTURA COUNTY APCD	SOUTH COAST AQMD	SAN JOAQUIN VALLEY APCD	SAC-METRO AQMD	BAY AREA AQMD
Boilers (0.075 - 2 MMBtu/hr)	Rule 360	Rule 74.11.1, 74.15.1	Rule 1146.2	Rule 4308	Rule 411 & 414	Rule 9-6
Boilers (2 - 5 MMBtu/hr)	Rule 361	Rule 74.15.1	Rule 1146.1	Rule 4307	Rule 411	Rule 9-7
Boilers (5+ MMBtu/hr)	Rule 342	Rule 74.15	Rule 1146	Rule 4320	Rule 411	Rule 9-7
Reciprocating Internal Combustion Engines	Rule 333	Rule 74.9	Rule 1110.2	Rule 4702	Rule 412	Rule 9-8
Turbines	N/A	Rule 74.23	Rule 1134	Rule 4703	Rule 413	Rule 9-9
Miscellaneous NOx Sources	N/A	Rule 74.34	Rule 1147	Rule 4309	Rule 419	N/A
Particulate Matter – Process/Fugitive Emissions	Rule 302, 304-307	Rule 52-53, 55-55.2	Rule 401, 403-405, 1155, 1157, 1186, 1186.1	Rule 4101, 4201-4202, Regulation VIII	Rule 401, 403-405	Rule 6-1
Oil & Gas Flares and Thermal Oxidizers	Rule 359	Rule 54	Proposed Rule 1118.1	Rule 4311	N/A	Rule 12-11, 12-12
Oil & Gas Storage Tanks and Loading Racks	Rule 325-326, 346	Rule 71-1 to 71-3	Rule 462-463, 1178	Rule 4623-4624	Rule 446	Rule 8-5
Oil & Gas Sumps, Pits, and Well Cellars	Rule 344	Rule 71-4	Rule 1148.1, 1176	Rule 4402, 4625	N/A	Rule 8-37
Oil & Gas Fugitive ROC Emissions	Rule 331	Rule 74-10	Rule 466-467, 1173	Rule 4409	N/A	Rule 8-18, 8-37
Sulfur Compounds	Rule 309-311	Rule 54, 64	Rule 407, 431.1, 431.2, 468-469	Rule 4301, 4406 & source-specific rules	Rule 406, 420	Rule 9-1, 9-2

ATTACHMENTS TO THE STAFF REPORT

ATTACHMENT C

AB 617 Affected Equipment Units

Attachment C: AB 617 Affected Equipment Units

District staff reviewed the permitted equipment and processes at the six AB 617 industrial sources, and evaluated whether each emitting unit complied with the current BARCT standard for its source category. The units that may not meet the BARCT standard are identified in the table below.

Facility Name	ARB GHG ID	District Stationary Source ID	Device Name	Rated Heat Input Capacity (MMBtu/hr)	Rule Applicability	Current NOx limit	Footnote Reference
ExxonMobil – POPCO	104459	1482	Boiler A & Boiler B	41 (each)	Rule 342	30 ppm @ 3% O_2	---
ExxonMobil – Las Flores Canyon	104460	1482	Gas Turbine & HRSG	465 & 345	New Rule 358	7.4 ppm @ 15% O_2	---
PCEC – Orcutt Hill	101674	2667	43 derated engines	19.67 (combined total)	Rule 333	500 ppm @ 15% O_2	1
ERG – Cat Canyon West	104458	2560	Process Heater #1 & #2	4.8 (each)	Rule 361	80 ppm @ 3% O_2	2
			Heater Treater	4.9	Rule 361	80 ppm @ 3% O_2	2
Imerys	101318	1735	Main Boiler	23	Rule 342	30 ppm @ 3% O_2	---
			Standby Boiler	15.5	Rule 342	80 ppm @ 3% O_2	2
			Package Boiler	3.78	Rule 361	80 ppm @ 3% O_2	2
			Line #7 Kiln	50	New Rule 362	73 ppm @ 3% O_2	---
			Pellet Plant Kiln & Dryer	8.9 (combined total)	New Rule 362	80 ppm @ 3% O_2	2
			Celpure Plant Kiln & Dryers	9.0 (combined total)	New Rule 362	80 ppm @ 3% O_2	2
			Multiple Baghouses	N/A	New Rule 363	N/A	---
Windset Farms	104359	11108	Boilers #1 - 6	42.7 (each)	Rule 342	30 ppm @ 3% O_2	3

[1] Default Internal Combustion Emission Factor
[2] Default External Combustion Emission Factor
[3] Current NOx limit for Boilers #5-6 is assumed to be the same as Boilers #1-4.