



MONTEREY BAY AIR RESOURCES DISTRICT

24580 Silver Cloud Court, Monterey, CA 93940

MEETING DATE:	November 5, 2020
TO:	Advisory Committee
FROM:	Amy Clymo, Engineering and Compliance Manager
SUBJECT:	Receive Report and Provide Comments on Evaluation of Best Available Retrofit Control Technology (BARCT) Rule for Internal Combustion Engines

RECOMMENDATION

Receive Report and Provide Comments on Evaluation of Best Available Retrofit Control Technology (BARCT) Rule for Internal Combustion Engines

DISCUSSION

In 2018, the Board adopted an Expedited BARCT Implementation Schedule to satisfy the requirements of Health and Safety Code Section 40920.6 (c). The purpose of the BARCT schedule was to establish a timeline for further consideration of new rules or revisions to existing rules to reduce emissions from permitted equipment at industrial sources. The BARCT schedule only applies to the following sources: Aera Energy LLC, Chevron U.S.A. Inc., Eagle Petroleum LLC, and L'hoist North America of Arizona, Inc. In February 2020, the first BARCT rule, Rule 441, was adopted to address Boilers, Process Heaters, and Steam Generators.

The current BARCT rule category under review is Internal Combustion (IC) Engines to reduce emissions of ozone precursor compounds oxides of nitrogen (NOx) and volatile organic compounds (VOC). The Monterey Bay Air Resources District reviewed the permitted engines at the four industrial sources subject to the BARCT schedule and found eight permitted IC Engines; seven engines are portable and one is stationary. The portable engines are subject to phase-out under state law by the year 2029. MBARD also reviewed emissions from these engines over the past three years and found an average of 0.53 tons NOx/year and 0.13 tons VOC/year. These emissions are insignificant when compared to the 2015 emission inventory of 39 tons NOx/day (14,235 tons/year) and 59 tons VOC/day (21,535 tons/year), as reported in the most recent Air Quality Management Plan. MBARD is proposing to not proceed with a new BARCT Rule for IC Engines for the following reasons:

1. The majority of the permitted IC engines at the subject industrial sources are portable engines subject to phase-out by state law.
2. A new rule would only apply to one stationary emergency engine which already meets the Best Available Control Technology (BACT) permitting requirement for NOx and did not trigger BACT for VOC when permitted.

3. The California Air Resources Board is proposing to re-designate MBARD to attainment for the state 8-hour ozone standard based on monitoring data for years when the engines operated. Emission reductions from these engines are not needed to attain or maintain the 8-hour ozone standard.

FINANCIAL IMPACT

The California Air Resources Board (CARB) provided grants to air districts to implement the community air protection program aspects of AB617 which included the BARCT schedule. MBARD was awarded two grants which will be utilized by Planning for community air protection activities and Engineering for rule development activities associated with the implementation of the expedited BARCT schedule.

There will be no financial impacts to the subject industrial sources because MBARD is proposing to not proceed with rule development for the IC engine category.

ATTACHMENT

Evaluation of Best Available Retrofit Control Technology (BARCT) Rule for Internal Combustion Engines



Evaluation of Best Available Retrofit Control Technology (BARCT) Rule for Internal Combustion Engines

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October 26, 2020

Background

Assembly Bill 617 (AB 617), which was approved on July 26, 2017, amended California Health and Safety Code Division 26, Part 3, Chapter 10, Section 40920.6., and required each air district that is a nonattainment area for one or more air pollutants to adopt, by January 1, 2019, an expedited schedule for implementation of best available retrofit control technology (BARCT) by the earliest feasible date, but no later than December 31, 2023. This requirement applies to each industrial source subject to California Greenhouse Gas (GHG) Cap-and-Trade requirements. At the time AB 617 was approved, the Monterey Bay Air Resources District (MBARD) was designated nonattainment for the state 8-hour ozone standard and state 24-hour particulate matter less than 10 microns (PM₁₀) standard and was therefore required to adopt an expedited BARCT schedule. However, based on monitoring data for the years 2017-2019, the California Air Resources Board (CARB) is proposing to re-designate MBARD to attainment for the 8-hour ozone standard.

In 2018, the Board adopted an Expedited BARCT Implementation Schedule to satisfy the requirements of Health and Safety Code Section 40920.6 (c). The purpose of the BARCT schedule was to establish a timeline for further consideration of new rules or revisions to existing rules to reduce emissions from permitted equipment at industrial sources. In February 2020, the first BARCT rule, Rule 441, was adopted to address Boilers, Steam Generators, and Process Heaters. The current category under review is Internal Combustion (IC) Engines. Based on the following discussion, staff is proposing to not proceed in developing a new BARCT Rule for IC Engines.

Within the jurisdiction of MBARD, there are four industrial sources subject to the BARCT schedule: Aera Energy LLC, Chevron U.S.A. Inc., Eagle Petroleum LLC, and L'hoist North America of Arizona, Inc. The current rule under review would address reducing the ozone precursor compounds, oxides of nitrogen (NO_x) and volatile organic compounds (VOC), from internal combustion (IC) engines at the four industrial sources subject to the BARCT schedule.

IC Engine BARCT Rule Review

As defined in 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. The overall purpose of the BARCT implementation is to reduce criteria pollutant emissions from large industrial sources. By taking into account these various conditions, staff believes that developing a new BARCT rule of IC engines is unnecessary.

There are eight engines at the four applicable industrial sources that could be subject to a new IC engine rule. Two of these engines are stationary emergency engines and six engines are portable engines. A stationary engine is designed to stay in one location or remains in one location while a portable engine is designed and capable of being carried or moved from one location to another.

The stationary emergency engines, when permitted, were subject to MBARD Rule 1010 to address diesel particulate matter and Rule 207 New Source Review which evaluates Best Available Control Technology (BACT). The existing Rule 1010 is focused on reducing diesel particulate matter and limits the number of hours an emergency engine can operate for testing and maintenance. This rule does not address NOx or VOC emissions. Rule 207 can require emission limits for NOx or VOC in order to meet BACT requirements. However, Rule 207 only applies at the time of permitting so if an engine has been permitted for many years, it would not be subject to potentially stricter current emission limits. Therefore, a new BARCT rule for stationary IC engines would address NOx and VOC emissions.

The portable engines are already subject to the state Airborne Toxic Control Measure (ATCM) for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower and Greater. This existing regulation is focused on reducing diesel particulate matter; however, the regulation requires the phase-out of older tier engines which also reduces NOx and VOC because higher tier engines have lower emission rates. Tier 2 engines rated at less than 750 hp will phase-out, at the latest, by January 1, 2023. Tier 3 engines rated at less than 750 hp will phase-out, at the latest, by January 1, 2029. Therefore, MBARD would not include portable engines in a new rule for IC engines because these engines are already subject to phase-out by state law.

Emissions

Using MBARD's 2017 – 2019 emission inventories, a summary of the emissions from the currently permitted IC engines are presented in Tables 1-3 below. As shown in the tables, the majority of the portable engines have not operated in the past three years. The two emergency IC engines in the tables would potentially be subject to a new rule.

Table 1. Calendar Year 2017 Emissions

Equipment Description	NO _x (tons/yr)	VOC (tons/yr)
Portable Abrasive Blasting With IC Engine	0	0
Emergency IC Engine #1 (Tier 3)	0.41	0.03
Emergency IC Engine #2 (Tier 0)	0.04	0.003
Portable IC Engine-Workover Rig #1	0	0
Portable IC Engine-Workover Rig #2	0	0
Portable IC Engine-Workover Rig #3	0	0
Portable IC Engine (Tier 3 or higher)	0	0
Portable IC Engine-Pump (Tier 3)	0.07	0.01
Total	0.52	0.04

Table 2. Calendar Year 2018 Emissions

Equipment Description	NO _x (tons/yr)	VOC (tons/yr)
Portable Abrasive Blasting With IC Engine	0	0
Emergency IC Engine #1 (Tier 3)	0.27	0.02
Emergency IC Engine #2 (Tier 0)	0.004	0.0003
Portable IC Engine-Workover Rig #1	0	0
Portable IC Engine-Workover Rig #2	0	0
Portable IC Engine-Workover Rig #3	0	0
Portable IC Engine (Tier 3 or higher)	0	0
Portable IC Engine-Pump (Tier 3)	0.04	0.003
Total	0.32	0.02

Table 3. Calendar Year 2019 Emissions

Equipment Description	NO _x (tons/yr)	VOC (tons/yr)
Portable Abrasive Blasting With IC Engine	0	0
Emergency IC Engine #1 (Tier 3)	0.36	0.03
Emergency IC Engine #2 (Tier 0)	0	0
Portable IC Engine-Workover Rig #1	0	0
Portable IC Engine-Workover Rig #2	0	0
Portable IC Engine-Workover Rig #3	0	0
Portable IC Engine (Tier 3 or higher)	0	0
Portable IC Engine-Pump (Tier 3)	0.39	0.31
Total	0.75	0.34

Other Air District Rules

Staff also compiled and reviewed other air district rules with emission limits established for IC engines. These BARCT emission limits are shown below in Table 4.

Table 4. Example BARCT Emission Limits

Air District and Rule Number	Category	NOx Emission Limits	VOC Emission Limits
San Joaquin Valley Air Pollution Control District Rule 4702	Spark-Ignited Internal Combustion Engine rated at >50 bhp, Rich Burn	11 ppmv – 50 ppmv, depending on gas type	250 ppmv
	Spark-Ignited Internal Combustion Engine rated at >50 bhp, Lean Burn	11 ppmv – 75 ppmv, depending on gas type	750 ppmv
	Compression-ignited, uncertified engine, installed on or before June 1, 2006	-Depends upon horsepower and use, Tier 3 – Tier 4 -Greater than 500 bhp and greater than or equal to 1000 annual operating hours NOx = 80 ppmv and VOC = 750 ppmv	
	Compression-ignited, EPA Certified Tier 1 or Tier 2 Engine	Tier 4	
Ventura County Air Pollution Control District Rule 74.9	Rich burn, general	25 ppmv	250 ppmv
	Lean burn, general	45 ppmv	750 ppmv
	Diesel	80 ppmv	750 ppmv
	Rich burn, waste gas	50 ppmv	250 ppmv
	Lean burn, waste gas	125 ppmv	750 ppmv
Santa Barbara Air Pollution Control District Rule 333	Lean Burn Engine > 50 Hp	200 ppmv	750 ppmv
	Lean Burn Engine > 100 Hp	125 ppmv	750 ppmv
	Rich Burn Engine	300 ppmv	250 ppmv
	Compression-Ignition	700 ppmv	750 ppmv

Upon reviewing the different BARCT rules and emission limits from other air districts, an important thing to note is that the BARCT emission limits established apply to only stationary engines. This is consistent with MBARD’s conclusion above that a potential new rule would only apply to stationary engines.

Cost-Effectiveness

As required by Health and Safety Code Section 40920.6(a), staff considered the cost-effectiveness of retrofitting or replacing the emergency IC engines to control NO_x and VOC emissions. Under current regulations, a minimum of a Tier 3 certified engine is required for

diesel emergency engines. Emergency IC Engine #1 is Tier 3, already meets the BACT requirement for NO_x, and did not trigger BACT for VOC. In addition, MBARD received an application in August 2020 to modify Emergency IC Engine #2 to a portable prime engine and the engine will be evaluated for BACT per Rule 207. Therefore, the existing IC engines will meet BACT for NO_x so a new rule is not necessary to retrofit or replace existing engines to achieve additional emission reductions.

Conclusion

The rule development activity under review per the Expedited BARCT Schedule is for NO_x and VOC emission reductions from IC Engines. MBARD is not moving forward with an IC Engine rule following reasons:

1. The majority of the permitted IC engines at the subject industrial sources are portable engines subject to phase-out by state law.
2. A new rule would only apply to one stationary emergency engine which already meets the BACT permitting requirement for NO_x and did not trigger BACT for VOC when permitted.
3. The California Air Resources Board is proposing to re-designate MBARD to attainment for the state 8-hour ozone standard based on monitoring data for years when the engines operated. Emission reductions from these engines are not needed to attain or maintain the 8-hour ozone standard.

