Title 17. California Air Resources Board

NOTICE OF PUBLIC HEARING TO CONSIDER THE PROPOSED REGULATION FOR GREENHOUSE GAS EMISSION STANDARDS FOR CRUDE OIL AND NATURAL GAS FACILITIES

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider the proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities.

DATE: July 21, 2016

TIME: 9:00 A.M.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, California 95814

This item may be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., July 21, 2016, and may continue at 8:30 a.m., on July 22, 2016. Please consult the agenda for the hearing, which will be available at least 10 days before July 21, 2016, to determine the day on which this item will be considered.

WRITTEN COMMENT PERIOD AND SUBMITTAL OF COMMENTS

Interested members of the public may present comments orally or in writing at the hearing and may provide comments by postal mail or by electronic submittal before the hearing. The public comment period for this regulatory action will begin on June 3, 2016. Written comments not physically submitted at the hearing must be submitted on or after June 3, 2016 and received **no later than 5:00 pm on** July 18, 2016.

ARB requests that when possible, written and email statements be filed at least 10 days before the hearing to give ARB staff and Board members additional time to consider each comment. The Board also encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action. Comments submitted in advance of the hearing must be addressed to one of the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

Please note that under the California Public Records Act (Gov. Code, § 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

Additionally, the Board requests but does not require that persons who submit written comments to the Board reference the title of the proposal in their comments to facilitate review.

AUTHORITY AND REFERENCE

This regulatory action is proposed under the authority granted in California Health and Safety Code; sections 38510, 38562, 38580, 39600, 39601, 39603, 39607 and 41511, Health and Safety Code. This action is proposed to implement, interpret, and make clear specific sections 38551, 38560, 39600, 40701, 40702, 41511, 42300, 42301 and 42311, Health and Safety Code.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW (GOV. CODE, § 11346.5, subd. (a)(3))

Sections Affected: Proposed adoption to California Code of Regulations, title 17, Subarticle 13, Sections 95665, 95666, 95667, 95668, 95669, 95670, 95671, 95672, 95673, 95674, 95675, 95676 and Appendix A, Appendix B, and Appendix C.

Documents Incorporated by Reference (Cal. Code Regs., tit. 1, § 20, subd. (c)(3)):
The following documents are proposed for incorporation by reference into the regulation.

ASTM D-70-09	Standard Test Method for Density of Semi-Solid Bituminous Materials (Pycnometer Method). 2009.
ASTM D-287-92	Standard Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method). Reapproved 2000.
ASTM D-1945-03	Standard Test Method for Analysis of Natural Gas by Gas Chromatography. Reapproved 2010.
ASTM D-2597-10	Standard Test Method for Analysis of Demethanized Hydrocarbon Liquid Mixtures Containing Nitrogen and Carbon Dioxide by Gas Chromatography 2010.
ASTM D-3710-95	Standard Test Method for Boiling Range Distribution of Gasoline and Gasoline Fractions by Gas Chromatography. Reapproved 2009.
ASTM D-3588-98	Standard Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels. Reapproved 2003.
ASTM D-4007-08	Standard Test Method for Water and Sediment in Crude Oil by the Centrifuge Method (Laboratory Procedure). 2008.
ASTM D-4052-09	Standard Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter. 2009.
ASTM D-5002-16	Standard Test Method for Density and Relative Density of Crude Oils by Digital Density Analyzer. 2016.
EPA Method 21	Determination of Volatile Organic Compound Leaks. 2016.

EPA Method 8021B	Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors. 2014.
EPA Method 8260B	Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS). 1996.
EPA Method TO-14	Determination of Volatile Organic Compounds (VOCs) In Ambient Air Using Specially Prepared Canisters with Subsequent Analysis By Gas Chromatography. 1999.
EPA Method TO-15	Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters and Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS). 1999.
GPA 2174-93	Obtaining Liquid Hydrocarbon Samples For Analysis by Gas Chromatography. 2000.
GPA 2177-03	Analysis of Natural Gas Liquid Mixtures Containing Nitrogen and Carbon Dioxide by Gas Chromatography (2003).
GPA 2261-00	Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography 2000.
GPA 2286-95	Tentative Method of Extended Analysis for Natural Gas and Similar Gaseous Mixtures by Temperature Programmed Gas Chromatography. Reprinted 1999

GPA means Gas Processing Association.

Background and Effect of the Proposed Regulatory Action:
In 2006, the Legislature passed and Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006 (Stats. 2006, chapter 488). In Assembly Bill (AB 32), the Legislature declared that global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The Legislature further declared that global warming will have detrimental effects on some of California's largest industries, including agriculture and tourism, and will increase the strain on electricity supplies. The Legislature recognized that action taken by California to reduce emissions of greenhouse gases (GHG) will have far-reaching effects by encouraging other states, the federal government, and other countries to act. AB 32 creates a comprehensive, multi-year program to reduce GHG emissions in California, with the overall goal of restoring emissions to 1990 levels by the year 2020. AB 32 requires ARB to take actions that include:

- Establishing a statewide GHG emissions cap for 2020, based on 1990 emissions;
- Adopting a scoping plan by January 1, 2009, indicating how emission reductions will be achieved from significant GHG sources via regulations, market mechanisms, and other actions;

Both the original 2008 Scoping Plan and the subsequent First Update to the Scoping Plan identified the regulation of oil and gas operations covered in the proposed regulation as a potential GHG mitigation measure. Accordingly, this proposed regulation covers greenhouse gas emissions, predominately methane, from production, gathering and boosting stations, and processing as well as natural gas storage and transmission compressor stations (collectively "oil and gas"). This proposed regulation is one of a suite of measures to reduce methane emissions. Methane emissions, if not controlled, will put continued pressure on the statewide GHG limit, as well as complicate any efforts to achieve deeper emissions reductions in the future. Steps therefore must be taken to control these emissions in order to fulfill AB 32's mandates.

Oil and gas operations are also subject to the federal Clean Air Act, including its permitting requirements. They are subject to United States Environmental Protection Agency (U.S. EPA) performance standards for oil and gas operations. These regulations, Title 40 Code of Federal Regulations (CFR) Part 60, Subpart OOOO ("Quad O"), limit emissions of volatile organic compounds from new equipment installed at crude oil and natural gas operations. These regulations achieve co-benefits of methane reductions. Corresponding air toxics standards for certain pieces of oil and gas equipment are also codified in 40 CFR Part 63. In August 2015, U.S. EPA also proposed standards under section 111 of the Clean Air Act for methane emissions that would cover new equipment in oil and gas fields, finalizing these standards in May 2016. As part of this effort, U.S. EPA also has proposed additional requirements for new and modified sources in the oil and gas sector and suggested Control Technology Guidance for existing sources in non-attainment areas. On March 10, 2016, President Obama announced steps to reduce emissions from all existing oil and gas facilities but that process is in the information gathering stage. Controls proposed in this regulation would aid in (and may suffice entirely for) compliance with any federal standards developed.

The Bureau of Land Management (BLM) has also recently proposed new regulations to reduce the waste of natural gas from venting, flaring, and leaks during oil and gas operations on federal and tribal lands (43 CFR 3162 and 3179).

California has authority to set its own standards to reduce emissions further to meet federal and state ambient air quality standards and climate change requirements and goals, and to require additional and separate reporting. The proposed regulation addresses existing facilities and equipment where Quad O, and the U.S. EPA's federal methane standards, only applies to new or modified sources as of August 2011 (or September 2015 for some sources); the BLM regulations also do not reach many California sources. The proposed regulation is generally more restrictive, as well as reaching additional sources, and is necessary to achieve additional benefits for human health, public welfare, and the environment. The proposed regulations are consistent with U.S. EPA's rules mentioned above and would apply to sources not covered in those rules. ARB's proposed regulation does not apply to tribal lands; however, it does apply to federal lands, in which case ARB may develop an MOU with BLM to coordinate enforcement.

In addition to direct federal regulations, many air districts with significant oil production have rules designed to reduce particulate matter less than 2.5 microns in diameter

($PM_{2.5}$) as well as oxides of nitrogen (NO_x) and volatile organic compound (VOC) emissions specifically from the oil and gas sector in order to meet federal ambient air quality requirements and generally to improve local air quality. The district rules do not cover methane specific sources and the proposed regulation addresses emissions from equipment and processes not already controlled by those existing district rules.

ARB staff carefully reviewed existing and proposed regulations as this proposed regulation was developed. The proposal is designed to be as strong as, or stronger than, existing rules in other jurisdictions and in certain California air districts, and to extend strong elements of those rules. The proposal is also designed to integrate well with regulatory efforts for other aspects of the sector, as well as to provide a complementary basis for compliance with potential proposed federal rules.

Objectives and Benefits of the Proposed Regulatory Action:

The proposed regulation covers greenhouse gas emissions, predominately methane, from production, gathering and boosting stations, and processing as well as natural gas storage and transmission compressor stations (collectively "oil and gas"). It addresses both vented (intentional) and fugitive (unintentional) releases of greenhouse gases by processes at facilities in the following sectors:

- Onshore and offshore crude oil or natural gas production,
- Crude oil, condensate and produced water separation and storage;
- Natural gas gathering and boosting stations;
- Natural gas processing plants;
- Natural gas transmission compressor stations; and
- Natural gas underground storage.

The proposed regulation establishes emission standards for active and idle equipment and components at these facilities. Depending on the equipment or component, control mechanisms include vapor recovery, leak detection and repair (LDAR), and equipment replacement. Additionally, the proposed regulation includes monitoring at underground natural gas storage facilities for the early detection of large leaks or well failures. Storage facility monitoring provisions were added to the proposed regulation in response to the catastrophic release that occurred at the Aliso Canyon natural gas storage facility in late 2015-early 2016.

Some methane reductions are already achieved as co-benefits of local air district regulations governing emissions of volatile organic compounds (VOC); methane is not considered to be a VOC but can be captured along with VOCs. Although methane emissions do not affect regional scale ozone production that occurs over hours to days like VOCs do, regional methane emissions are fairly well mixed in the atmosphere and contribute to global methane levels, which in turn contribute to global background levels of ozone. The goal of the proposed regulation is to obtain the maximum GHG emission reductions from the sector in a technically feasible and cost-effective manner, building upon the existing regulations already being implemented by the air districts. The source categories covered under the proposed regulation currently emit approximately two and a

half million metric tonnes (MMT) of CO_2e. The proposed regulation will reduce those emissions by over fifty percent. The proposal is also expected to reduce both VOC and toxic air contaminant (TAC) emissions and provide an essentially neutral NO_x impact statewide.

The specific provisions of the proposed regulation are:

1. Collection and use (or destruction) of methane and associated gases from uncontrolled oil and water separators and storage tanks with emissions above a set methane standard;
2. Collection and use (or destruction) of methane and associated gases from all uncontrolled well stimulation circulation tanks;
3. Leak Detection and Repair (LDAR) requirements for active and idle components, such as valves, flanges, and connectors, currently not covered by local air district rules;
4. Methane emission standards for large reciprocating compressors in addition to LDAR for the other large compressor components and smaller compressors;
5. Collection and use (or destruction) of methane and associated gases from specified centrifugal compressors, or replacement of higher emitting "wet seals" with lower emitting "dry seals;"
6. Use of "no bleed" pneumatic pumps and "no bleed" continuous bleed pneumatic devices with limited exemptions and restrictions on intermittent bleed pneumatic devices;
7. Enhanced monitoring for underground natural gas storage facilities including leak detection and ambient air monitoring; and
8. Reporting requirements for liquids unloading and well casing vents.

The proposal represents an ARB effort starting in 2008 to reduce emissions from the oil and gas sector. ARB staff coordinated a comprehensive industry wide survey of equipment, conducted research and analysis to better understand emissions and reduction opportunities, and visited several oil and gas facilities. ARB staff worked with major stakeholders such as oil and gas producers, storage operators, public utilities, environmental and public health advocates and local air districts to solicit input via meetings and public workshops on the proposal. Staff developed the proposal based on research, analysis, and feedback from stakeholders.

Comparable Federal Regulations:

U.S. EPA's New Source Performance Standards (NSPS) for Crude Oil and Natural Gas Production, Transmission, and Distribution (40 CFR Part 60 Subpart OOOO) applies to onshore oil and gas facilities newly constructed, reconstructed, or modified after August 23, 2011, and as of September 18, 2015 for some sources. The types of facilities covered are natural gas well sites, oil well sites, production gathering and boosting stations, natural gas processing plants, and natural gas compressor stations (transmission and storage). U.S. EPA's recently finalized methane standards add to these rules in 40 CFR Part 60 Subparts OOOO and OOOOa. ARB's proposed regulation is generally more stringent, as is discussed above, and will apply to more facilities in

California compared to U.S. EPA's NSPS because the NSPS are limited to new and modified sources and ARB's regulation will apply to all new and existing facilities as well as offshore oil and natural gas production facilities.

An Evaluation of Inconsistency or Incompatibility with Existing State Regulations (Gov. Code, § 11346.5, subd. (a)(3)(D)):

During the process of developing the proposed regulatory action, ARB conducted a search for any similar regulation on this topic and concluded the regulation is neither inconsistent nor incompatible with existing state regulations.

Many air districts with significant oil production have rules designed to reduce criteria pollutant emissions from the oil and gas sector in order to meet federal ambient air quality requirements. ARB staff carefully reviewed existing air district rules applicable to similar sources at oil and natural gas facilities. The district rules control emission of volatile organic compounds from tanks, separators, compressors, and specify requirements for leak detection and repair (LDAR). The district rules do not cover methane specific sources and the proposed regulation addresses emissions from equipment and processes not already controlled by those existing district rules. ARB has used the district rules as a starting point, particularly for leak detection and repair, where districts have been implementing programs for decades. ARB staff carefully reviewed existing and proposed regulations as this proposed regulation was developed. The proposal is designed to be as strong as, or stronger than, existing rules in other jurisdictions and in certain California air districts, and to extend strong elements of those rules. The proposal is also designed to integrate well with regulatory efforts for other aspects of the sector, as well as to provide a complementary basis for compliance with potential proposed federal rules.

DISCLOSURE REGARDING THE PROPOSED REGULATION

Fiscal Impact/Local Mandate Determination Regarding the Proposed Action (Gov. Code, § 11346.5, subds. (a)(5)&(6)):

The determinations of the Board's Executive Officer concerning the costs or savings incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulatory action are presented below.

Fiscal Impact on Local Agencies or School Districts

A local air district may decide – but is not obligated -- to be the primary agency responsible for enforcing the provisions of the proposed Regulation. This includes issuing permits for new control equipment, registration and inspection of equipment, and enforcing the LDAR portion of the regulation. The individual district cost estimates range from amounts some districts feel could be absorbed by them without additional funding, to over $300,000 per year in recurring costs and almost $1,000,000 in one-time costs, primarily for permitting. Even if the districts do decide to implement and enforce this regulation, there is an annual cost for ARB to manage the reporting requirements in the regulation. The costs to districts are estimated to be approximately $1,300,000 in initial costs, and approximately $660,000 in ongoing costs.

Although local agencies (air districts) may choose to implement this regulation, and certain aspects of it may be incorporated in permits as a matter of preexisting law, resulting in some fiscal impacts, the regulation imposes no reimbursable mandates. Air districts face no new legal requirements specific to them under this regulation. As to implementation tasks they may take on or any other costs that may result by operation of statute, air districts have legal authority under Health and Safety Code sections 40510 and 42311 to recover related costs by imposing fees. The proposed regulation also specifies that local air districts that choose to enforce the regulation may retain any penalty monies that result. ARB also may make arrangements to further support air districts as a voluntary matter. Thus, because the regulation applies generally to all entities operating affected sources, not the air districts, and so does not impose unique new requirements on local agencies, this is not a reimbursable mandate. (*County of Los Angeles v. State of California*, 42 Cal. 3d 46 (1987).

The proposed regulation's enforcement and implementation provisions recognize that California's local air districts already play an important role in regulating the oil and gas sector, and are intended to build on their efforts. The provisions make clear that ARB can directly enforce the proposed regulation, but also offer paths for local air districts to integrate its requirements into their existing programs to support efficient and effective enforcement. ARB's proposed regulation can be implemented and enforced by both ARB and the districts. ARB staff assumes most local air districts will choose to take the lead in implementing and enforcing the regulation, with ARB playing a backstop role, and it is our preference for the local air districts to do so. However, ARB will take a lead role in districts that choose not to. The local air districts are more familiar with operators, conduct inspections nearby or at the same sites, and in many instances have been regulating such sources for decades. This is why the regulation allows local districts to enter into MOUs with ARB in order to define implementation and enforcement responsibilities, as well as for information sharing. The regulation also allows for districts to incorporate this regulation into their local rules. To ensure uniform enforcement, however, districts may not waive or reduce the stringency of the state rules, which remain state law, enforceable as necessary by ARB. There are no other non-discretionary cost or savings imposed upon local agencies.

There are no cost or savings to any school district.

Fiscal Impact on State Agencies or Federal Funding to the State

ARB staff estimates that the regulation will require 6 PYs to implement depending on the mix of district and ARB implementation. In addition to PYs, ARB will need to purchase equipment including three IR cameras at $85,000 each, and three toxic vapor analyzers at $10,000 each. The costs are higher with ARB enforcement than with district enforcement due to the need to travel, train new staff, and set-up programs including a registration program. The total cost to ARB is estimated to be $285,000 in initial costs ((3 X $85,000) + (3 X $10,000)), and about $870,000 in ongoing costs (6 X $145,000). These costs are anticipated to be imposed during the 2017/2018 fiscal year.

There are no cost/savings to any other state agency, and there are no cost/savings in federal funding to the state.

Housing Costs (Gov. Code, § 11346.5, subd. (a)(12)):
The Executive Officer has also made the initial determination that the proposed regulatory action will not have a significant effect on housing costs.

Significant Statewide Adverse Economic Impact Directly Affecting Business, Including Ability to Compete (Gov. Code, §§ 11346.3, subd. (a), 11346.5, subd. (a)(7), 11346.5, subd. (a)(8)):

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

MAJOR REGULATION: Statement of the Results of the Standardized Regulatory Impact Analysis (SRIA) (Gov. Code, § 11346.3, subd. (c)):

In February 2015, ARB submitted a Standardized Regulatory Impact Assessment (SRIA) to the Department of Finance (DOF). ARB subsequently resubmitted a SRIA with additional information in April 2015. The information below refers to the April 2015 SRIA. On May 28, 2015, ARB received a letter from the DOF acknowledging this major regulation, and commenting on the information presented in the SRIA. The economic impacts have very small impacts on the macroeconomic indicators.

The following paragraphs summarize the findings of the SRIA as submitted in April of 2015. There have been significant changes in the proposed regulation since the submittal of the SRIA, including a change in the implementation date from January 1, 2017 to January 1, 2018. For this reason, the dates in the summary of the SRIA findings are a year earlier than what is currently anticipated. Despite these changes,, the overall impacts are still expected to be very small, After the summary, there is a discussion of the changes since the SRIA.

Creation or elimination of jobs within the State
The proposed regulatory action will have very small impact on employment growth each year. The SRIA shows the initial increase in employment growth estimated as 500 more jobs. This result is primarily due to the increased demand for capital and components in 2017 for secondary industries, and increases in other employment due to the induced and indirect effects of the regulation. The positive employment outweighs any potential reductions in employment growth for the primary industries from the additional production costs. Because the secondary industries do not face higher demand, but the primary industries still face higher costs, the initial employment increase is reduced in 2018, and continues to decrease through 2022. However, due to the level of employment in California and for the industries affected, these results are interpreted as negligible to both the economy and the affected industries.

Creation of new business or the elimination of existing businesses within the State
All impacts to the affected industries are small and negligible. For the secondary industries, there may be a slight expansion in the first year as they expand their businesses to meet the additional capital demand. For the primary industries, there are

slight increases in costs, which are slightly offset by the additional natural gas captured. These costs are small for most businesses and can be amortized; because the net cost is minor, there should not be any elimination of existing businesses.

Competitive advantages or disadvantages for businesses currently doing business within the State

The costs to primary businesses are small and are offset slightly by the additional natural gas that can be captured and counted as savings. The SRIA indicates that the additional price for natural gas faced by consumers would be less than a 0.005% increase in 2018 (the highest price impact year), which is unlikely to result in an increase in primary industry activity outside California, resulting in negligible impacts to the competitiveness of affected businesses.

Increase or decrease of investment in the State.

The proposed regulatory action would produce very small impacts on private business investment from 2017 through 2022. The change in these investments can be described as increases in spending by the primary and secondary industries on capital equipment (among other investments). As the compliance requirements are amortized by the primary industries, the production costs of the secondary industries lead to a reduction in output for that and thus reductions in their investment in capital equipment. ARB interprets these results as not discernable given the size of California's $2 trillion economy.

Incentives for innovation in products, materials, or processes.

The proposed regulatory action is intended to reduce leaking natural gas in an effort to decrease emissions from these sources. There are incentives for primary businesses to find cost-effective and innovative ways to detect and reduce emissions. With the increased demand for the devices and services relating to vapor recovery and leak detection, the competition for business may provide the necessary incentives to innovate the current products to achieve additional emissions reductions at a lower cost.

Benefits of the regulations

The proposed regulatory action will not directly affect individual consumers; however, as a result of the anticipated decrease in GHG emissions, toxics, and VOCs, the proposal will provide health benefits. Emissions reductions of these pollutants have been correlated with a reduction in the risk of premature deaths, hospital visits, emergency room visits for asthma, and a variety of other health impacts, especially in sensitive receptors including children, elderly, and people with chronic heart or lung disease.

Discussion of Changes since SRIA Proposal

The standards, methods of calculating emissions, savings, and costs of the proposed regulation have changed since the submittal of the SRIA. The figures in the Form 399 are updated costs that reflect the latest data and methodology associated with the modified proposed regulation. Costs are based on the best estimate at the time of preparation. There have been significant changes in the proposed regulation since the submittal of the SRIA as outlined below. However, the overall impacts are still expected to be very small.

In addition to changes made to the standards of the proposed regulation, ARB has made other modifications that impact the estimation of economic impacts. The proposed regulation is now using the 20-year AR4 value (72) of Global Warming Potential (GWP) for methane instead of the 100 year AR4 value (25) to identify the emission reductions in carbon dioxide equivalent (CO_2e).[1] Also, the value assigned to natural gas savings has been modified from $4.10 per million standard cubic feet (mscf) to $3.44 per mscf. This value was changed to reflect the most recently available data and is the average wholesale price that is specific to California over the last 12 months of available data, from November 2014 to October 2015.[2] The compliance dates for the proposed regulation have also changed from starting January 1, 2017, to starting January 1, 2018.

In addition, some of the methodologies for estimating the costs and emission have changed. This is due to the availability of better data, stakeholder comments, as well as the continued development of the proposed regulation. Although these changes have been made after the submittal of the SRIA, staff believes the conclusions of the SRIA continue to be accurate, since the overall annual cost, emission, reductions, and impacted industries are similar. These changes are summarized in Table 1 and 2, and described in detail below. The emissions and reductions estimated in the SRIA use a GWP of 25 while the updated proposed regulation uses a GWP of 72.

Table 1
Comparison of Emissions and Reductions from SRIA to Current Version of Regulation

	SRIA Proposed Regulation		**Current Proposed Regulation**	
Provision	Emissions (MT CO2e)	Reductions (MT CO2e)	Emissions (MT CO2e)	Reductions (MT CO2e)
VRU for Tanks	265,000	252,000	566,000	538,000
Reciprocating Compressors	476,000	143,000	504,000	68,000
LDAR	2,900	1,200	983,000	590,000
Pneumatic Devices	167,000	124,000	319,000	319,000
Well Stimulations	25,700	24,400	5,200	4,900
Centrifugal Compressors	20,000	10,700	3,700	3,500
Liquids Unloading	400	350		
Monitoring Plan	Not Included in SRIA Version			

[1] Intergovernmental Panel on Climate Change (IPCC). 2007. Direct Global Warming Potentials. Chapter 2,10.2. https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html
[2] U.S. Energy Information Administration (EIA). 2016. U.S. Natural Gas Citygate Price in California, available at: http://www.eia.gov/dnav/ng/hist/n3050ca3m.htm.

Remaining Emissions (includes equipment controlled under existing district programs)	41,000		76,000	
Total	**998,000**	**556,000**	**2,457,000**	**1,523,000**
All Other Oil and Gas Venting and Fugitive Sources	341,000		971,000	
Grand Total	**1,339,000**		**3,428,000**	

Numbers may not add due to rounding.

Table 2
Comparison of Cost-Effectiveness from SRIA Proposed Regulation to Current Version of Proposed Regulation

	100-year AR4 GWP	**20-year AR4 GWP**
Emissions (MTCO2e)	1	2.5
Reductions (MTCO2e)	0.56	1.5
Cost-Effectiveness ($/MT CO2e)	40	17
Cost-Effectiveness with Gas Savings ($/MT CO2e)	32	15
GWP value	25	72
Amount of Gas Saved	1,100,000	894,000
Value of Gas Saved	$4.11	$3.44
Total Value of Savings	5 million	3 million

Changes from the SRIA by Category

Reciprocating Compressors

Under the proposed regulation at the time the SRIA was submitted, all reciprocating compressors would need to replace a rod packing after three years of use. In the current version of the proposed regulation, compressors at production facilities are no longer subject to a rod packing leak standard, but instead are required to meet an LDAR standard in order to integrate with local air district programs and provide a simpler form of testing for the majority of compressors located in California. Many of the compressors at production facilities are smaller, may be portable, and handle a different composition of gas than compressors at processing, storage or transmission facilities, making the LDAR standard the preferred requirement for production facilities. Also, most of the available data concerning leak rates and rod packing cost and performance are from larger compressors that are typically not found at production facilities. The provision to exclude production type compressors eliminated the regulation of over 600 of almost 1000 compressors from this segment, reducing the cost and emissions reductions anticipated in the current version of the proposed regulation.

In addition, industry provided data on the leak rate by compressor for a large subset of the compressors. This new data was used in place of the emission factors previously used, which were less representative of the smaller compressors. The reduction in number of compressors, change from a time based standard (rod packing leak) to a performance based standard (LDAR), and use of measurement data instead of emission factors, reduced the estimated emissions reduction of the proposed regulation from 143,000 MT CO2e to approximately 68,000 MT CO2e. Based on the decrease in compressors potentially impacted by the standard for rod packing leaks, the estimated cost of compliance has decreased from about $600,000 per year to about $260,000 per year.

Centrifugal Compressors

Under the proposed regulation at the time the SRIA was submitted, twenty five centrifugal compressors with wet seals were anticipated to need a vapor recovery system or to be converted to a dry seal. In an effort to verify this data, that was gathered in a 2009 ARB survey, staff contacted the facilities that would be impacted by this provision in the proposed regulation. ARB found that only one centrifugal compressor requires conversion to a dry seal or install a vapor recovery system, as the rest had previously been converted or replaced. In addition, measurement data taken directly from this single compressor was used in place of the emission factors used to generate the emissions and reductions for the SRIA. Due to the updated number of impacted units, the emissions dropped from about 20,000 MT CO2e to about 3,700 MT CO2e and the reduction estimates dropped from about 11,000 MT CO2e to about 3,500 MT CO2e. The associated cost of compliance decreased from about $375,000 per year to about $6,000 per year.

LDAR

In the SRIA version of the proposed regulation, the emissions estimates did not include a small percentage of super emitter components, which are responsible for the majority of emissions. In addition, in the current version of the proposed regulation the LDAR program has been changed from an annual inspection to a quarterly inspection requirement. These changes were made to address stakeholder comments and ensure emissions were estimated with the best available data. As a result, the estimated emissions reduction has changed from about 1,200 MT CO2e to about 590,000 MT CO2e, and the estimated cost has changed from about $2 million per year to about $10 million per year.

Pneumatic Devices

In the SRIA version of the proposed regulation, all continuous bleed pneumatic devices were required to change to a low bleed pneumatic device. This has been changed to require a no bleed pneumatic device in the current proposed regulation to maximize emission reductions with no increased cost. Also, after a review of the data, it was determined that the count of continuous bleed devices was overestimated by about 170. The anticipated emissions reduction from this segment have changed from about 124,000 MT CO2e to about 320,000 MT CO2e, and the estimated cost has changed from about $1.3 million per year to about $1.2 million per year.

Tank and Separator Systems

The provisions for tank and separator systems have changed from requiring a vapor recovery system for all uncontrolled systems to a requirement for uncontrolled systems anticipated to have over 10 MT per year of CH4 emissions to have a vapor recovery system and comply with a NOx emission standard. Due to this change, the estimated number of systems impacted by the proposed regulation has changed from over 600 to about 300. It is now assumed that a low NOx incinerator will be used to comply with the NOx emission standard in place of a flare. The emissions are now also calculated with the throughput to the separators instead of calculated using sparsely reported emissions from the 2009 ARB Survey. As a result, the estimated emissions reductions have changed from about 252,000 MT CO2e to about 538,000 MT CO2e. The estimated cost has changed from about $16 million per year to about $4.7 million per year.

Well Stimulations

The current proposed regulation uses emission factors from WSPA to estimate emissions from well stimulations.[3] These emission factors became available after the submittal of the SRIA when the best available data projected much greater emissions. As a result of this change, the estimated emissions reduction from this segment of the proposed regulation has dropped from about 24,400 MT CO2e to about 5,000 MT CO2e. The estimated cost has changed from about $200,000 per year to about $460,000 per year due to newly available cost data and the inclusion of additional compliance equipment in the current proposed regulation.

Monitoring Plan

The proposed regulation now includes a monitoring plan, which requires operators of natural gas storage facilities to monitor gas wells on a daily basis, and install a system for ambient air monitoring. This was not included in the proposed regulation analyzed in the SRIA. The cost of this provision is estimated to be about $8.7 million per year.

Response to DOF Comments

ARB summarized the comments received on May 28, 2015 from DOF. The original SRIA can be found in Appendix E of the ISOR.

Comment #1
It would be helpful to include the magnitude of unit and total costs of devices, and the geographical distribution of the affected facilities.

Most of the affected facilities are in the San Joaquin Air Pollution Control District (APCD). According to ARB's 2009 survey, over 60 percent of the affected LDAR components are located in the San Joaquin APCD. Other districts with a significant amount of affected facilities include Santa Barbara APCD, South Coast APCD, Feather River APCD, and Glenn County APCD. The magnitude of unit and total costs of devices is described in detail in the cost analysis section of Appendix B of the ISOR.

[3] Western States Petroleum Association. Recirculation Tank Emissions Testing, Source Test Report. October 2015.

Comment #2
Since the majority of retrofit costs are expected to occur in 2018, the highest direct cost and economic impact should occur in 2018, not in 2017.

The standards were set to be effective January 1, 2018 and it was anticipated that the capital costs would occur prior to that, in 2017. Since the effective date of the standards requiring the purchase of capital equipment has been changed to 2019, the majority of retrofit and other capital equipment is estimated to take place in 2018.

Comment #3
Include the direct cost of each alternative in the SRIA, rather than just the overall impacts.

At the time of the SRIA, the first alternative included a requirement that existing continuous-bleed pneumatic devices to be replaced with no-bleed devices. It also required an LDAR inspection program with quarterly inspections. These alternatives were eventually incorporated into the existing proposed regulation. The direct costs for this alternative were estimated to be about $28 million per year with an emissions reduction of about 500,000 MT CO2e. The second alternative eliminated the LDAR provision, the centrifugal compressor provision, and added a leak standard for rod packing replacement. This alternative was estimated to cost about $20 million per year with an emissions reduction of about 450,000 MT CO2e. Since the SRIA, better data has become available and through development of the regulation, several of the provisions have changed, and incorporated parts of each alternative. Due to these changes, a direct comparison of the costs and emissions is difficult to make.

Comment #4
Discuss how an individual facility's characteristics, such as emission rates and existing control devices, may affect the calculation of direct costs, and thus economic impacts of the Proposed Regulations.

Generally, the emission rates and number of affected devices are proportional to the estimated cost of compliance. Some facilities, which may not be subject to an existing LDAR program, may exhibit greater emissions than those that are under an existing LDAR program for VOC. These facilities may have a greater amount of emissions, or super leaking components. This would increase the cost minimally, but would be more cost effective.

Some facilities may also have an existing flare connected to a separator and tank system. In these cases, the flare would need to be removed to install a low NOx incinerator. This would be an additional cost for these facilities. The impact is expected to be minimal. Facilities with a tank and separator system with emissions under 10 tons per year of CH4 emissions would not be required to install vapor recovery and would have less overall cost than facilities with greater than 10 tons per year of CH4 emissions.

Business Report (Gov. Code, §§ 11346.5, subd. (a)(11); 11346.3, subd. (d)):
In accordance with Government Code sections 11346.5, subdivisions (a)(11) and 11346.3, subdivision (d), the Executive Officer finds the reporting requirements of the proposed regulatory action which apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

Cost Impacts on Representative Private Persons or Businesses (Gov. Code, § 11346.5, subd. (a)(9)):
In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative private persons or businesses.

The Executive Officer has initially assessed that the proposed regulatory action will affect the businesses that operate natural gas and crude oil production, processing, storage and transmission facilities. The costs for businesses and individuals that operate these facilities are estimated to be about $23 million per year which results in a cost-effectiveness of about $16 per MT CO_2e reduced when considered a twenty year time horizon.

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide economic impact directly affecting representative private persons.

Effect on Small Business (Cal. Code Regs., tit. 1, § 4, subds. (a) and (b)):
The Executive Officer has also determined under California Code of Regulations, title 1, section 4, that the proposed regulatory action would not affect small businesses because businesses in crude oil and natural gas production are exempt from the small business definition in Government Code section 14835 - 14843.

The ARB's Executive Officer has determined, pursuant to Government Code section 11346.5(a)(3)(B), that the proposed regulation will not affect small businesses. According to Government Code section 14835-14843, the primary industries are ineligible to be classified as a small business. However, businesses that would have otherwise been classified as a small business are expected to incur annual costs that are less than $8,000 per year, compared to costs of about $100,000 per year for all businesses.

A detailed assessment of the economic impacts of the proposed regulation can be found in the ISOR.

Alternatives Statement (Gov. Code, § 11346.5, subd. (a)(13)):
Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board (which includes during preliminary workshop activities), would be more effective in carrying out the purpose for which the action is proposed, would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law. The analysis of such alternatives can be found in Chapter III of the ISOR. We also examined alternatives

for the purposes of the SRIA and those can be found in the SRIA and are addressed in Chapter X of the ISOR. Environmental alternatives may be found the Draft Environmental Analysis.

ENVIRONMENTAL ANALYSIS

ARB, as the lead agency for the proposed regulation, has prepared a draft environmental analysis (Draft EA) in accordance with the requirements of its regulatory program certified by the Secretary of Natural Resources. (California Code of Regulations, title 17, sections 60006-60008; California Code of Regulations, title 14, section 15251, subdivision (d).) The resource areas from the California Environmental Quality Act Guidelines Environmental Checklist were used as a framework for a programmatic environmental analysis of the direct and reasonably foreseeable indirect environmental impacts resulting from implementation of the recommended actions in the proposed regulation.

The Draft EA, included as Appendix C to the ISOR, is entitled Draft Environmental Analysis prepared for the proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities. Written comments on the Draft EA will be accepted during a 45-day public review period. Written comments must be submitted on or after **June 3, 2016** and received **no later than 5:00 pm on July 18, 2016**.

The Draft EA provides an analysis of both the beneficial and adverse impacts and feasible mitigation measures for the reasonably foreseeable compliance responses associated with the recommended actions. Collectively, across all categories, the Draft EA concluded implementation of these actions could result in the following short-term and long-term beneficial and adverse impacts: beneficial long-term impacts to greenhouse gases; less-than-significant impacts to aesthetics, agriculture and forest resources, air quality, biological resources, energy demand, geology and soils, greenhouse gases, hazards and hazardous materials, hydrology and water quality, land use planning, mineral resources, noise, population and housing, public services, recreational services, transportation/traffic, and utilities and service systems; and potentially significant and unavoidable adverse impacts to biological resources, cultural resources, geology and soils, and hydrology and water quality.

The potentially significant and unavoidable adverse impacts are primarily related to short-term, construction-related activities, which explains why some resource areas are identified above as having both less-than-significant impacts and potentially significant impacts. For example, the Draft EA identifies some resource areas with potentially significant short-term impacts but less-than-significant long-term impacts. Please refer to the Draft EA for further details.

SPECIAL ACCOMMODATION REQUEST

Consistent with California Government Code Section 7296.2, special accommodation or language needs may be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Consecuente con la sección 7296.2 del Código de Gobierno de California, una acomodación especial o necesidades lingüísticas pueden ser suministradas para cualquiera de los siguientes:

- Un intérprete que esté disponible en la audiencia
- Documentos disponibles en un formato alterno u otro idioma
- Una acomodación razonable relacionados con una incapacidad

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envié un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California

AGENCY CONTACT PERSONS

Inquiries concerning the substance of the proposed regulatory action may be directed to the agency representative Mr. Joe Fischer, Air Resources Engineer, Oil and Gas Section (916) 445-0071 or (designated back-up contact) Ms. Joelle Howe, Air Pollution Specialist, Oil and Gas Section, at (916) 322-6349.

AVAILABILITY OF DOCUMENTS

ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled: Staff Report: Initial Statement of Reasons for the Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities.

Copies of the ISOR, which includes the Draft EA, and the full text of the proposed regulatory language, may be accessed on ARB's website listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990, on May 31, 2016.

Further, the agency representative to whom nonsubstantive inquiries concerning the proposed administrative action may be directed is Trini Balcazar, Regulations Coordinator, (916) 445-9564. The Board staff has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Government Code, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340).

Following the public hearing, the Board may vote on a resolution directing the Executive Officer to: make any proposed modified regulatory language that is sufficiently related to the originally proposed text that the public was adequately placed on notice and that the regulatory language as modified could result from the proposed regulatory action, and any additional supporting documents and information, available to the public for a period of at least 15 days; consider written comments submitted during this period; and make any further modifications as may be appropriate in light of the comments received available for further public comment. The Board may also direct the Executive Officer to: evaluate all comments received during the public comment periods, including comments regarding the Draft Environmental Analysis, and prepare written responses to those comments; and present to the Board, at a subsequently scheduled public hearing, the final proposed regulatory language, staff's written responses to comments on the Draft Environmental Analysis, along with the Final Environmental Analysis for action.

FINAL STATEMENT OF REASONS AVAILABLITY

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on ARB's website listed below.

INTERNET ACCESS

This notice, the ISOR, the Draft EA, and all subsequent regulatory documents, including the FSOR, when completed, are available on ARB's website for this rulemaking at http://www.arb.ca.gov/regact/2016/oilandgas2016/oilandgas2016.htm

CALIFORNIA AIR RESOURCES BOARD

_____

Richard W. Corey
Executive Officer

Date: May 17, 2016

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.arb.ca.gov