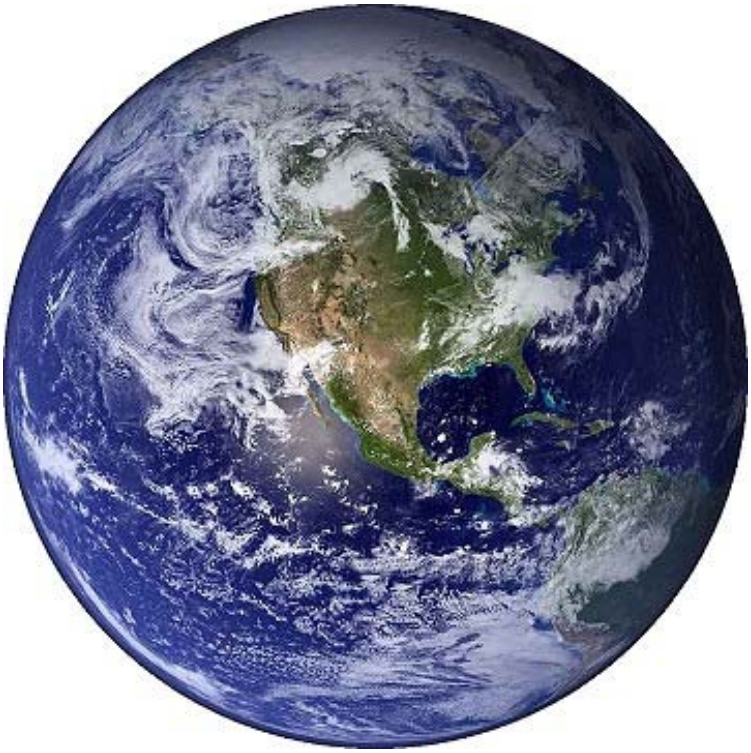
STATE OF CALIFORNIA

California Environmental Protection Agency

AIR RESOURCES BOARD

Mandatory Reporting of Greenhouse Gas Emissions: Instructional Guidance for Operators



Planning and Technical Support Division
Emission Inventory Branch

December 2008

Mandatory Reporting of Greenhouse Gas Emissions: Instructional Guidance for Operators

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Resources

Mandatory Reporting Webpage:
http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm

Text of Regulation:
http://www.arb.ca.gov/regact/2007/ghg2007/froghg.pdf

CHAPTER 1: INTRODUCTION TO THE GUIDANCE

The Greenhouse Gas (GHG) Mandatory Reporting Regulation (Regulation) was approved by the California Air Resources Board (ARB or Board) in December 2007 and requires facilities to report their annual GHG emissions in 2009 and every year thereafter.[1] This document is intended to provide instructional guidance on GHG reporting to facility operators. A separate guidance document is being drafted to address the needs of third-party verifiers.

Below, the purpose of the instructional guidance is explained, steps for successful reporting are explained, the mandatory GHG reporting regulation is summarized, organization of the regulation and this guidance are presented, the web-based reporting tool is described, and verification requirements are introduced.

1.1 Purpose of Instructional Guidance for Operators

ARB's mandatory GHG reporting regulation, which appears at sections 95100-95133 of title 17, California Code of Regulations, is a set of rules that establishes who must report GHG emissions to ARB and sets forth the requirements for measuring, calculating, reporting and verifying those emissions. ARB staff has prepared this document to describe the regulatory requirements in a user-friendly format. **Unlike the regulation itself, this guidance does not have the force of law.** It is not intended to and cannot establish new mandatory requirements beyond those that are already in the regulation, and it does not supplant, replace or amend any of the legal requirements of the regulation. Conversely, this guidance's omission or truncation of regulatory requirements does not relieve operators of their legal obligation to fully comply with all requirements of the regulation.

This guidance includes explanatory detail and examples where staff believed that additional information would be helpful to facilitate successful and accurate GHG reporting. Steps to successful GHG reporting are explained below and in following chapters. This reporting guidance is intended to work alongside consultation between ARB staff and operators to facilitate successful compliance with mandatory reporting requirements. ARB will also sponsor technical discussions and training workshops for reporting, including use of the on-line reporting tool. More information is posted at the Mandatory Greenhouse Gas Emissions Reporting webpage, http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm.

[1] The regulation was developed under the California Global Warming Solutions Act of 2006 (Statutes of 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)

The purpose of this chapter is to provide guidance on the requirements of the mandatory GHG reporting regulation. As described more specifically in section 1.1, this guidance does not add to, substitute for, or amend the regulatory requirements as written in these or other sections of the regulation [Subchapter 10, Article 2, sections 95100 to 95133, title 17, California Code of Regulations].

1.2 Steps to Successful GHG Reporting

Six steps to successful GHG reporting are outlined below, with reference to the relevant chapters in this guidance.

Steps		*Chapters*
Step 1:	Determine whether you need to report.	Chapter 2
Step 2:	Determine reporting and verification deadlines.	Chapter 3
Step 3:	Design a GHG inventory management program.	Chapter 4
Step 4:	Set up and document GHG calculation methods. Gain familiarity with ARB's on-line reporting tool.	Chapter 5, Applicable Sector-Specific Chapter(s) 7-12, and Chapter 13
Step 5:	Collect and record required data. Generate and submit your GHG emissions data report.	Applicable Sector-Specific Chapter(s) 7-12 and Chapter 13
Step 6:	Contract with a verifier and initiate verification. (Verification is optional in 2009 and required in 2010.)	Chapter 6

1.3 Summary of the Regulation

California's mandatory GHG reporting regulation is the first rule required by the Global Warming Solutions Act of 2006 (the Act), passed by the Legislature as Assembly Bill 32 (AB 32, Núñez, Chapter 488, Statutes of 2006) and signed by Governor Arnold Schwarzenegger in September 2006. The full scope of the Act creates a comprehensive, multi-year program to reduce GHG emissions in California, with the overall goal of restoring GHG emissions to 1990 levels by the year 2020.

Mandatory reporting is intended to provide information that assists development and implementation of strategies to reduce the emissions that cause climate change. Under the Act, the mandatory reporting regulation must:

- begin reporting with the most significant GHG emissions sources,
- use rigorous and consistent emission accounting methods, and
- provide for verification of reported emissions data.

Tables 1.3a and 1.3b provide a summary of the regulation. Additional information, including staff contact information, is available at ARB's Climate Change website, http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm.

Table 1.3a Summary of Mandatory Greenhouse Gas Reporting Regulation

Topic/Sector	ARB Regulation
Who Reports, What Level, How Often	♦ Annual reporting of emissions by calendar year, beginning with 2008 emissions reported in 2009. ♦ Facility-level reporting by company operating facility. ♦ Hospitals, schools, backup generators, portable equipment excluded. ♦ Applicable industrial sectors listed in Table 1.3b.
Reporting Scope and Source Categories	♦ Direct stationary combustion emissions. ♦ Specified process and fugitive emissions. ♦ Fuel usage by fuel type; biomass fuels separate. ♦ Indirect energy usage--electricity in kWh and thermal in Btu. ♦ Mobile emissions optional.
Gases Reported	♦ Reporting of Kyoto gases is required as specified by sector. ♦ Most facilities will have only CO_2, CH_4 and N_2O to report. ♦ SF_6 and HFCs are also included in the electricity sector.
Emissions Quantification	♦ Best available methods in 2009 emissions report (ramp-up year). ♦ Sector-specific methods rely on fuel testing (heating value, carbon content) for combustion, or use of continuous measurement systems. ♦ Default emission factors OK for general stationary combustion sources; all sources can use default CH_4 and N_2O factors. ♦ Site-specific factors can be developed for some sources, under air district supervision with ARB approval.
Verification	♦ Required annually for more complex sources, triennially for less complex. ♦ Will be provided by third-party consultants and air districts that meet accreditation criteria. ♦ Includes a conflict of interest policy. ♦ ARB will play an oversight role in verifications and quality of verifiers. ♦ Consistent with ISO 14064-3, ISO 14065, and EU practices.

Table 1.3b Summary of Industry Sector-Specific Requirements		
Cement Plants		♦ Clinker-based method from California Climate Action Registry (CCAR) for CO_2 process emissions with plant-specific factors. ♦ Combustion methods for CH_4 and N_2O use default emission factors. ♦ Fuel testing for CO_2 combustion factors, per CCAR.
Electricity Sector		♦ *Generating Units:* Report if ≥1 MW and ≥2,500 MT CO_2. ♦ Methods from CCAR power/utilities protocol include fuel testing or use of continuous monitoring systems; more frequent testing in some cases to address fuel variability. ♦ Process and fugitive emissions methods from CCAR, including HFCs. ♦ *Retail providers and power marketers* also provide purchase, sales, import, export information. ARB to calculate emissions. Provisions included to help determine whether reductions from future power purchase contract changes are real. ♦ Facilities and entities report SF_6 fugitive emissions from equipment and circuit breakers.
Cogeneration Facilities		♦ Same thresholds and methods as electricity generating units. ♦ Same process and fugitive emissions as in electricity sector. ♦ Distribution of emissions for electricity generation, thermal energy production, manufactured products based on CCAR Efficiency Method. ♦ Abbreviated requirement for specified smaller facilities.
Petroleum Refineries		♦ Combustion methods for CO_2 use fuel specific emission factors derived from daily fuel sampling to account for carbon variability. ♦ Combustion methods for CH_4 and N_2O use default emission factors. ♦ Reported process emissions (CO_2, CH_4 and N_2O) include catalytic cracking, hydrogen production, process vents and sulfur recovery. ♦ Reported fugitive emissions (CH_4 and N_2O) include wastewater treatment, oil/water separators, storage tanks. ♦ CCAR discussion paper aided methodology development.
Hydrogen Plants		♦ Process-related CO_2 emissions from hydrogen production. ♦ Combustion methods similar to refineries. ♦ Transferred CO_2 and hydrogen production.
General Stationary Combustion (GSC) Facilities		♦ Facilities not included in other sectors but emitting 25,000 metric tonnes or more of CO_2 per year from stationary combustion would report their CO_2, N_2O and CH_4 emissions. ♦ Most facilities apply default emission factors and fuel use data to estimate their emissions, per CCAR protocols. ♦ GSC facilities involved in oil and gas production would implement specific fuel test requirements.

1.4 Crosswalk between Sections of the Reporting Regulation and the Guidance Document

This *Instructional Guidance* for operators generally follows the organization of the reporting regulation. The mandatory reporting regulation is codified in subchapter 10, article 2, sections 95100 to 95133, title 17, California Code of Regulations.[2] Sections in article 2 are organized into an introduction (sections 95100-95101) and four subarticles:

1. **General requirements** for applicable facilities are provided in subarticle 1, sections 95102- 95109.
2. **Sector-specific requirements** for calculation methods and reporting are detailed in subarticle 2, sections 95110-95115.
3. **Common calculation methods** that apply to multiple types of facilities are described in subarticle 3, section 95125.
4. **Verification of data reports and requirements for verifiers** are explained in subarticle 4, sections 95130-95133.

Table 1.4 provides a crosswalk between this *Instructional Guidance* and the regulation. While this guidance is written to help operators meet their reporting obligations, it neither replaces nor amends the regulation. See section 1.1, above, for information about the relationship between the guidance and the regulation.

[2] Regulations to implement the California Global Warming Solutions Act of 2006 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.) are contained in Subchapter 10: Climate Change.

Table 1.4 Crosswalk between Instructional Guidance and the Mandatory GHG Reporting Regulation

Instructional Guidance Chapter	*Regulation Subarticles and Sections*
Chapter 1. Introduction to the Guidance	
Chapter 2. Industrial Sectors and Applicability 2.1 Who must report? 2.2 If I determine my facility has no reporting obligation, are there any other requirements that may apply to me? 2.3 Are some facility operators, and some equipment, exempt from the reporting requirement? 2.4 How do I determine my reporting obligations?	**Applicability,** Section 95101
Definitions are provided within the context of each chapter, as needed for clarity.	**Definitions,** Section 95102
Chapter 3. Reporting and Verification Schedules 3.1 When are emissions data reports and verification opinions due? 3.2 How do I determine whether I must follow an annual or triennial verification schedule?	**Reporting and Verification Schedules for Existing Facilities,** Sections 95103(b) and (c)
3.3 Do I need to continue reporting if my facility's emissions fall below the applicability threshold?	**Cessation of Reporting after Reduced Emissions,** Section 95103(e)
3.4 We have a new facility that will not be operational until sometime in 2009. How do the reporting and verification schedules apply?	**New Facilities,** Section 95103(d)

Instructional Guidance Chapter	*Regulation Subarticles and Sections*
Chapter 4. Greenhouse Gas Inventory 4.1 What must be included in my inventory of emissions sources? 4.2. What sources can I declare as *de minimis* and what are the reporting requirements for these sources? 4.3 What are the key considerations for identifying and selecting quantification methods, including emission factors? 4.4 What are the requirements for the first year transition period? 4.5 What are the key considerations for data collection and management? 4.6 What do I need to consider if my facility has an existing Continuous Monitoring System (CEMS) or is planning to install one? 4.7 In addition to regulatory requirements, are there best practices to guide establishing a GHG inventory program?	**General Greenhouse Gas Reporting Requirements,** Sections 95103-95104
4.8 Is there an opportunity to revise my Emissions Data Report if needed?	**Revisions,** Section 95104(d)
4.9 What are the document retention and record keeping requirements?	**Document Retention and Record Keeping Requirements,** Section 95105
4.10 Are both internal auditing and third-party verification required?	**Data Completeness,** Section 95104(c)

Instructional Guidance Chapter	*Regulation Subarticles and Sections*
Chapter 5. Emissions Data Reports 5.1 Is there a standard form or format for reporting to ARB? 5.2 Can members of the California Climate Action Registry submit their CCAR reports to satisfy ARB's mandatory reporting requirements? 5.3 What information about the facility or entity must be included in the report to ARB? 5.4 How do I report fuel consumption? 5.5 Which emissions sources and GHGs must be included? 5.6 Am I required to report mobile source emissions? 5.7 What additional supporting information must be included in my report? 5.8 May I include voluntary or optional information?	**General Greenhouse Gas Reporting Requirements,** Sections 95103-95104
5.9 I have concerns about maintaining the confidentiality of portions of my report. How is sensitive information protected?	**Confidentiality,** Section 95106
Chapter 6. Verification 6.1 What are the general requirements for emissions report verification? 6.2 What is ARB's role as my facility or company considers a verification body? 6.3 What's needed to assure a positive verification opinion? 6.4 What if my facility uses alternate methods for the 2009 emissions report, as the regulation permits? 6.5 Is there an appeals process if I don't agree with the verifier? 6.6 What are the consequences of not undergoing verification when required? What happens if the verification opinion is adverse? 6.7 Can ARB participate in the verification?	**Requirements for Verification of Emissions Data Reports, and Requirements Applicable to Emissions Data Verifiers,** Sections 95130-95133

Instructional Guidance Chapter	*Regulation Subarticles and Sections*
Sector Technical Chapters 7-12	**Sector-specific requirements** for calculation methods and reporting are detailed in Subarticle 2, Sections 95110-95115:
Chapter 7. Cement Plants	Section 95110
Chapter 8. Electricity Generating Facilities, Retail Providers, and Marketers	Section 95111
Chapter 9. Cogeneration	Section 95112
Chapter 10. Petroleum Refineries	Section 95113
Chapter 11. Hydrogen Plants	Section 95114
Chapter 12. General Stationary Combustion Facilities	Section 95115
Chapter 13. Common Calculation Methods	**Common calculation methods** that apply to multiple types of facilities are described in Subarticle 3, Section 95125.
Appendix A **Fuel Analytical Data Management** What are the fuel analytical data capture requirements? What are the fuel use measurement accuracy requirements? What documentation could a verifier seek to address the fuel measurement accuracy requirement? What are the options in the event of an equipment breakdown that affects fuel analytical data collection? Are there other fuel composition and analytical considerations? Are there requirements affecting the installation and operation of on-line instrumentation?	**General Greenhouse Gas Reporting Requirements,** Section 95103

Instructional Guidance Chapter	*Regulation Subarticles and Sections*
Appendix B GHG Source Testing to Support Mandatory Reporting When is GHG Source Testing Allowed? How Do I Get a Source Test Plan Approved by ARB? What Methods are Acceptable for Source Testing of CO_2 Concentrations? What Methods are Acceptable for Source Testing of CH_4 Concentrations? What Methods are Acceptable for Source Testing of N_2O Concentrations? What Methods are Acceptable for Determining Flow Rates and Other Parameters? Are Other Test Methods Acceptable? Can Test Methods Be Combined? What Must Be Included in a Source Test Plan? What Key Data are Collected or Computed for Source Testing? How Many Source Tests Are Required? What Constitutes a Source Test? Can Testing Be Performed Less Often Than Annually? For Biomass or Waste Derived Fuels, What Sampling Schedule is Acceptable? Do Emission Factors Need to be Reported? What is Meant by ARB or District Oversight? How are Emission Factors Calculated Using Measured Concentration and Flow Data? Converting Source Test Data to an Emission Factor Testing for Geothermal Electricity Generation Facilities What if a Source Test Plan is Rejected? Who Can Help With GHG Source Testing Questions?	**Reporting Emission Factors,** Section 95104(a)(9) **CO_2 from Biomass and Waste-Derived Fuels,** Section 95125 (h)(3). **Geothermal CO_2,** Section, 95111(i)(2) **CH_4 and N_2O Combustion Emissions**, Section 95125(b)(4) **Refinery Sulfur Recovery Process Emissions, Molecular Fraction of CO_2** Section, 95113(b)(5)(B)

1.2 Web-based Reporting Tool

To assist facility operators in reporting, ARB has developed a comprehensive web-based reporting tool to simplify and guide the reporting process. Facility operators will have the opportunity to set up accounts in the system where they can assign staff, consultants, and verifiers who will have varying levels of access to enter, modify, or view the facility data. There is additional discussion of the reporting tool in Chapter 5.

1.3 Verification

In addition to the prescriptive reporting requirements, the regulation requires independent third-party verification of GHG data, which may be unfamiliar to those who have not previously reported GHG emissions. As discussed in Chapter 6, submitted emissions reports and underlying data must be verified by independent third parties trained and accredited by ARB and hired by the operator. Verification helps to ensure completeness, accuracy, and consistency in the reported GHG data, and that the methods specified in the regulation have been correctly applied.

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CHAPTER 2: INDUSTRIAL SECTORS AND APPLICABILITY
(Guidance for Regulation Section 95101)

Determining which specified industrial sectors must report is provided in section 95101 (Applicability) of the reporting regulation. Reporting obligations are determined by industrial sector, operational control, and, in most cases, emissions thresholds.

2.1 Who must report?

Operators of the following facilities are required to report unless they are expressly exempted from reporting (see Section 2.3):

- cement plants;
- petroleum refineries ($\geq$25,000 Metric Tons CO_2 in a calendar year);
- hydrogen plants ($\geq$25,000 MT CO_2 in a calendar year);
- electricity generating facilities and cogeneration facilities ($\geq$ 1 MW and $\geq$2,500 MT CO_2 in a calendar year);
- Electricity retail providers and marketers;
- other industrial facilities referred to as "general stationary combustion facilities" ($\geq$25,000 MT CO_2 in a calendar year).

Once a facility is subject to mandatory reporting, its operator must continue to file emissions data reports until the facility's emissions drop below the prescribed level for three consecutive years. A one- or two-year drop below the reporting threshold does not end the reporting obligation (See Table 2.4b and Section 3.3).

Electricity retail providers and marketers, as defined in the regulation, are required to report even if they do not operate any of the facilities listed above.

Examples of other industrial facilities that may have reporting obligations as "general stationary combustion facilities" include, but are not limited to,

- natural gas transmission and oil production,
- industrial gas producers,
- food and beverage processing,
- paperboard manufacture,
- steel foundries,
- colleges and universities,
- mineral processes, and
- glass container manufacture.

The purpose of this chapter is to provide guidance on the requirements of section 95101 of the mandatory GHG reporting regulation. As described more specifically in Chapter 1 of this document, this guidance does not add to, substitute for, or amend the regulatory requirements as written in these or other sections of the regulation [Subchapter 10, Article 2, sections 95100 to 95133, title 17, California Code of Regulations].

2.2 If I determine that my facility is not subject GHG reporting, are there any other obligations that may apply to me?

You may be required to *demonstrate non-applicability.* Any entity operating a facility that does not report its GHG emissions to ARB may be requested to demonstrate that it does not meet one or more of the applicability criteria. Demonstration must be provided within 20 working days of a written request received from ARB's Executive Officer, as required in regulation section 95101(d).

2.3 Are some facility operators, and some equipment, exempt from the reporting requirement?

Reporting is not required for:

- Electricity generating facilities that are solely powered by nuclear, hydroelectric, wind, or solar energy;
- Portable equipment;
- Generating units designated as backup or emergency generators in a permit issued by an air pollution control district or air quality management district;
- Hospitals with a North American Industry Classification System (NAICS) code starting with 62;
- Primary and secondary schools with a NAICS code of 611110.

Key Definitions

"Facility" means any property, plant, building, structure, stationary source, stationary equipment or grouping of stationary equipment or stationary sources located on one or more contiguous or adjacent properties, in actual physical contact or separated solely by a public roadway or other public right-of way, and under common operational control, that emits or may emit any greenhouse gas. Operators of military installations may classify such installations as more than a single facility based on distinct and independent functional groupings within contiguous military properties.

"Operator" means the entity having operational control of a facility, or other entity, from which an emissions data report is required under this article. For purposes of reporting electricity transactions as required in section 95111, "operator" means a retail provider, marketer, or facility operator.

"Operational control" for a facility subject to this article means the authority to introduce and implement operating, environmental, health and safety policies. In any circumstance where this authority is shared among multiple entities, the entity holding the permit to operate from the local air pollution control district or air quality management district is considered to have operational control for purposes of this article.

Example: A hospital has a cogeneration system on-site with a nameplate generating capacity of at least 1MW and emissions associated with electricity generation of at least 2,500 metric tonnes CO_2. What is the reporting obligation?

Two cases are described that illustrate how operational control affects applicability.

Case A: The cogeneration system is under the operational control of the hospital. Because the hospital is exempt, there is no reporting obligation.

Case B: A separate entity owns and operates the cogeneration system at the hospital. Or, a separate entity shares operational control of the cogeneration system with the hospital, and holds the permit to operate granted by the local air district. In these circumstances, the cogeneration facility operator must submit an emissions data report to ARB.

2.4 How do I determine my reporting obligations?

The following procedure may provide operators a general estimate of emissions, in order to determine whether or not a given facility falls within the scope of the mandatory GHG reporting program. *Note that this procedure alone may not be sufficient to demonstrate that a facility has no reporting obligation.*

Step 1: *See Table 2.4a to determine which reporting sector primarily applies to your facility (primary sector) and whether you have other operations on-site that may trigger reporting requirements that apply to other sectors (secondary sector(s)).*

Table 2.4a Sector Associations

Primary Sector	Possible Secondary Sectors			
	Electricity Generating Facility	Cogeneration Facility	Asset-owning or Asset-controlling Supplier	Hydrogen Plant
Electricity Generating Facility		X	Optional	
Cogeneration Facility	X		Optional	
Cement Facility	X	X		
Petroleum Refinery	X	X		X
Hydrogen Plant	X	X		
General Stationary Combustion	X	X		
Retail Provider-Non-Multijurisdictional	X	X	Optional	
Retail Provider-Multijurisdictional	X	X	Optional	
Marketer			Optional	
Dept. of Water Resources	X	X		
Asset-owning or Asset-controlling Supplier	X	X		

Step 2: Determine whether your facility must report GHGs based on reporting thresholds for primary sector and secondary sector(s) under common operational control, if applicable. See Table 2.4b.

In evaluating which secondary sectors may require reporting, consider facility-wide emissions. The 25,000 metric tonnes CO_2 threshold is a facility-wide threshold applied for a report year (the calendar year for which emissions are being reported). For example, if a single owner operates three processing plants, and the processing plants are distinct, geographically separate facilities, each plant would be evaluated separately to determine whether the 25,000 metric tonnes threshold has been met or exceeded. If one of the plants meets the threshold and the other two do not, only the plant emitting at least 25,000 metric tonnes for the report year would be subject to the reporting requirements (assuming the remaining plants are not included in another applicable reporting sector).

In evaluating whether your facility emits more than 25,000 tons of CO_2 per year, you should begin by estimating stationary combustion emissions of CO_2, then consider applicable process emissions. A coal-burning power plant would consider the additional process emissions from acid gas scrubbers, for example. Do not include fugitive or mobile emissions when determining if you need to report. Also, do not include any indirect emissions associated with purchased electricity or thermal energy in your assessment.

Table 2.4b also indicates the thresholds at which reporting may cease if emissions decline in certain sectors, as discussed in section 3.3 of this document.

Table 2.4b Regulated Sectors and Reporting Thresholds

Regulated Sectors	*Location*	*Reporting Applicability Thresholds*	*Reporting Cessation Thresholds*
Cement plants	Operating in California	No threshold	Not applicable
Petroleum refineries	Operating in California	Emit ≥ 25,000 metric tonnes of CO_2 in any calendar year after 2007 from the combination of stationary combustion and process sources	< 20,000 metric tonnes of CO_2 for three consecutive report years until emissions ≥ 25,000 metric tonnes of CO_2
Hydrogen plants	Operating In California	Emit ≥ 25,000 metric tonnes of CO_2 in any calendar year after 2007 from the combination of stationary combustion sources and hydrogen production processes	< 20,000 metric tonnes of CO_2 for three consecutive report years until emissions ≥ 25,000 metric tonnes of CO_2

Regulated Sectors	*Location*	*Reporting Applicability Thresholds*	*Reporting Cessation Thresholds*
Electricity generating facilities	Located in California or operated by a retail provider	• Nameplate generating capacity ≥ 1 MW and • Emit ≥ 2500 metric tonnes of CO_2 in any calendar year after 2007 from electricity generating activities, including hybrid generating facilities	< 2000 metric tonnes of CO_2 for three consecutive report years until emissions ≥ 2500 metric tonnes of CO_2
Retail providers	Serve retail customers in California	No threshold	Not applicable
Marketers	Deliver electricity to California	No threshold	Not applicable
Cogeneration facilities	Located in California or operated by a retail provider	• Nameplate generating capacity ≥ 1 MW and • Emit ≥ 2,500 metric tonnes of CO_2 in any calendar year after 2007 from electricity generating activities • Includes emissions from stationary combustion associated with bottoming cycle systems	< 2000 metric tonnes of CO_2 for three consecutive report years until emissions ≥ 2500 metric tonnes of CO_2
Other facilities with stationary combustion sources	Located in California	• Emit ≥ 25,000 metric tonnes of CO_2 in any calendar year after 2007 from stationary combustion sources • Includes emissions from additional stationary combustion associated with secondary operations	< 20,000 metric tonnes of CO_2 for three consecutive report years until emissions ≥ 25,000 metric tonnes of CO_2

Step 3: Estimate metric tonnes of CO_2 emissions from stationary combustion, if applicable.

ARB staff suggests the following method to estimate CO_2 emissions based on fuel use. Table 2.4c shows the approximate amounts of fuel that, when fully combusted, would result in 25,000 and 2,500 metric tonnes of CO_2 for selected common fuel types. This table is based on the ARB-accepted emission factors which are set forth in the regulation and included in this Guidance. *Note that use of this table alone may not be sufficient to demonstrate that a facility has no reporting obligation.*

The 25,000 metric tonne threshold is the level at or above which most sectors are required to report. The 2,500 metric tonne threshold for electricity generating activities is the level at or above which electricity

generating facilities and cogeneration facilities ≥1MW are required to report.

If an operator is combusting multiple fuels types, or is using a fuel type not listed in this table, then the operator can multiply the amount of fuel consumed annually for each fuel type by the ARB-provided emission factor and sum the emissions to estimate annual CO_2 emissions from stationary combustion.

Table 2.4c Quantities of Fuel Combusted Resulting in 25,000 or 2,500 MT of CO_2 Emissions[1]

Fuel Type	*Fuel Units*	*Kg CO_2/Unit*	*Amount of fuel to produce 25,000 MT CO_2*	*Amount of fuel to produce 2,500 MT CO_2*
Natural Gas (unspecified)	scf	0.05	459,140,464	45,914,046
	MMBtu	53.02	471,520	47,152
LPG (energy use)	Gal	5.79	4,317,757	431,776
Distillate Fuel (#1,2 &4)	Gal	10.14	2,466,011	246,601
Motor Gasoline	Gal	8.80	2,841,174	284,117
Landfill Gas	MMBtu	52.03	480,503	48,050
	scf	0.025*	916,301,950	91,630,195
Coal (Unspecified Other Industrial)	Short Ton	2,082.89	12,003	1,200
Jet Fuel	Gal	9.56	2,614,682	261,468
Kerosene	Gal	9.75	2,562,972	256,297
Petroleum Coke	MMBtu	102.04	244,996	24,500
	Short Ton	2530.70	9,879	988
Crude Oil	Gal	10.29	2,430,348	243,035

* Note: The emission factor shown includes only the CO_2 emissions from the combustion of landfill gas. It does not include the CO_2 pass-through emissions.

Step 4. Estimate metric tonnes of CO_2 emissions from sector-specific processes, if applicable.

[1] Table 3, Appendix A of the Mandatory Reporting Regulation.

If your CO_2 emissions from stationary combustion are not already above the reporting threshold, check your sector-specific requirements to determine whether additional process emissions must be included. See the applicable sector-specific guidance in Chapters 7 through 12.

For example, if your facility is a petroleum refinery and/or hydrogen production facility that emits ≥25,000 MT CO_2 annually from stationary combustion *and process sources*, you are required to file an annual GHG emissions report with ARB.

Step 5. Add the CO_2 emissions from the required sources.

Consider all stationary sources, including those in any secondary reporting sectors at the facility. If you do not have operational control of sources in a secondary sector, just add the CO_2 emissions for the sources in your primary sector. If your facility does have operational control over sources in one or more secondary sectors (e.g., you are a general stationary combustion facility operator with a cogeneration system[2]), add in the CO_2 emissions from those sources, too.

Step 6. Finally, compare the total to applicable reporting thresholds.

If total stationary source emissions equal or exceed the 25,000 MT CO_2 threshold, or emissions from electricity generating activities at a generating or cogeneration facility (≥1 MW) equal or exceed the 2,500 MT CO_2 threshold, reporting is required.

[2] Consider also that a cogeneration facility is subject to the much lower threshold for cogeneration facility reporting. So although the general stationary combustion facility in this example may not meet the 25,000 MT threshold, a cogeneration facility reporting requirement would apply if the facility has a nameplate generating capacity ≥1MW and CO_2 emissions from electricity generating activities are ≥2,500 MT.

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CHAPTER 3: REPORTING AND VERIFICATION SCHEDULES

(Guidance for Regulation Section 95103)

Regulation Section 95103 includes the schedules for mandatory reporting and verification by sector are included in Regulation Section 95103. This chapter discusses those provisions, providing guidance on determining:

- When you must submit your emissions data report to ARB (section 95103(b));
- When the verification opinion is due, and whether your facility is required to undergo annual verification or has the option to choose triennial verification (section 95103(c));
- How to report emissions for new facilities (section 95103(d));
- Cessation of reporting after reduced emissions are maintained (section 95103(e)).

Key Definitions

"*Verification*" means the process used to ensure that an operator's emissions data report is free of material misstatement and complies with ARB's procedures and methods for calculating and reporting GHG emissions.

"*Verification cycle*" means one year of full verification and the next consecutive two years of less intensive verification for operators subject to annual verification. For operators subject to triennial verification, a verification cycle means one year of full verification, and if elected, the next consecutive two years of less intensive verification. A verification cycle cannot exceed three calendar years.

3.1 When are emissions data reports and verification opinions due?

Reporting is required every year beginning in 2009 for the previous years emissions. Emission reports are due April 1 or June 1. Verification is optional for all sources in 2009, and required for all sources in 2010. Verification opinions, filed by the body conducting the third-party verification, are due October 1 (when the report was submitted by April 1) or December 1 (when the report was submitted June 1).

The purpose of this chapter is to provide guidance on the requirements of section 95103 of the mandatory GHG reporting regulation. As described more specifically in Chapter 1 of this document, this guidance does not add to, substitute for, or amend the regulatory requirements as written in these or other sections of the regulation [Subchapter 10, Article 2, sections 95100 to 95133, title 17, California Code of Regulations].

Table 3.1 summarizes the reporting and verification due dates by type of facility for existing facilities.

Table 3.1 California GHG Mandatory Reporting and Verification Due Dates

Reporting Due: **April 1,** starting in 2009 **Verification Due:** **October 1,** starting in 2010 Annually or triennially as required	**Reporting Due:** **June 1,** starting in 2009 **Verification Due:** **December 1,** starting in 2010 Annually or triennially as required
for: • **General Stationary Combustion Facilities** excluding oil and gas facilities • **Electricity Generating and Cogeneration Facilities** not operated by retail providers or reporters subject to other sector requirements	for: • **Petroleum Refineries** • **Hydrogen Plants** • **Cement Plants** • **Electricity Retail Providers** • **Electricity Marketers** • **General Stationary Combustion Facilities** in the oil and gas sector • **Electricity Generating and Cogeneration Facilities** operated by retail providers and other reporters

3.2 How do I determine whether I must follow an annual or triennial verification schedule?

The frequency of required third-party verification services – annual or triennial -- is specified in regulation section 95103(c). Annual verification means that, in addition to undergoing a full verification with a site visit once every three years, less intensive verifier data checks based on the current sampling plan are required in the interim years. Under triennial verification the interim data checks are not required, but more comprehensive full verification services are required every three years. Sources subject to triennial verification may opt for annual verification, which is considered best practice.

In cases where facilities combine more than one reporting sector, the more stringent verification schedule applies. For example, a cement plant or general stationary combustion facility that has operational control over a natural gas cogeneration plant with capacity to generate 10 MW or more of electrical power is required to have annual verification of its emissions data reports, because annual verification is required for cogeneration facilities of this size.

All facilities subject to reporting are required to have their 2010 emissions data reports (2009 data) verified in 2010. Table 3.2 provides a comprehensive guide to verification frequency requirements.

3.3 Do I need to continue reporting if my facility's emissions fall below the applicability threshold?

Regulation section 95103(e) allows general stationary combustion facilities, refineries and hydrogen plants to cease reporting after their CO_2 emissions fall below 20,000 MT for three successive years. It also allows for a cessation of reporting by an electricity generating or cogeneration facility should its CO_2 emissions fall below 2,000 MT for three successive years. Note that these requirements apply independently. Thus, a general stationary combustion facility may still be required to report emissions below 20,000 MT if it has a cogeneration facility still emitting above the threshold for cogeneration. If your facility emissions fall below both reporting thresholds, you may continue to report to ARB on a voluntary basis.

3.4 We have a new facility that will not be operational until sometime in 2009. How do the reporting and verification schedules apply?

New facilities (facilities that begin operations after January 1, 2008) must submit an initial emissions data report for the first full calendar year of operation, in the following calendar year. This schedule does not apply to changes in ownership, management, or operations at existing facilities. Such changes do not affect the reporting schedule for existing facilities described above. The requirement for new facilities is specified in regulation section 95103(d).

Table 3.2 California GHG Mandatory Reporting and Verification Schedule

REPORTING SCHEDULE	VERIFICATION SCHEDULE	
April 1, every calendar year starting in 2009	**October 1, every calendar year starting in 2010**	
• **General Stationary Combustion Facilities (GSCs)**, excluding oil and gas facilities with a NAICS code of 211111	**TRIENNIAL VERIFICATION**	• *Exception:* **GSCs with Electric Generating or Cogeneration Facilities with nameplate generating capacity ≥10 MW and burning fossil fuels (>3% of total fuel) must verify annually**
• **Electric Generating Facilities,** and • **Cogeneration Facilities** When not under the operational control of a retail provider, cement plant operator, refinery operator, hydrogen plant operator, or oil and gas facility with a NAICS code of 211111	**ANNUAL VERIFICATION**	• **Combust fossil fuels (> 3%), and** • **Nameplate generating capacity ≥10 MW**
	TRIENNIAL VERIFICATION	• **Nameplate generating capacity <10 MW, or** • **Geothermal generating facilities, or** • **Combusting pure biomass or biogas (at least 97%)**
June 1, every calendar year starting in 2009	**December 1, every calendar year starting in 2010**	
• **Retail Providers** • **Marketers** • **Petroleum Refineries** • **Hydrogen Plants** • **GSC, in the oil and gas sector with NAICS of 211111**	**ANNUAL VERIFICATION**	• **When these operators have electricity generation or cogeneration facilities under their control, the electricity and cogen operations are also verified annually**
• **Electric Generating Facilities,** and • **Cogeneration Facilities** When under the operational control of another facility subject to GHG reporting	**ANNUAL VERIFICATION**	• **When under the operational control of a retail provider, refinery operator, hydrogen plant operator, or oil and gas facility with a NAICS code of 211111**
	TRIENNIAL VERIFICATION	• **When under the operational control of a cement plant, with nameplate generating capacity <10 MW or combusting pure biomass or biogas (at least 97%)**
• **Cement Plants**	**TRIENNIAL VERIFICATION**	• *Exceptions:* **Changes in materials or operations that require a change in air district permit require verification of report for following calendar year.** • **Annual verification if the facility is in operational control of on-site electric generating or cogeneration facilities with nameplate generating capacity ≥10 MW and burning fossil fuels (>3% of total fuel)**

CHAPTER 4: GREENHOUSE GAS INVENTORY
(Guidance for Regulation Sections 95103-95105)

The Regulation requires operators to establish, document, implement, and maintain data acquisition and handling activities for the calculation and reporting of greenhouse gas emissions and electricity transactions. Such activities must include measuring, monitoring, analyzing, recording, processing and calculating the specified parameters.

The operator is required to maintain a greenhouse gas inventory program, as specified in sections 95104(b)-(c), that ensures emissions calculations and electricity transactions information are:

- Transparent,
- Accurate, and
- Independently verifiable.

This chapter provides guidance to operators on developing an effective GHG inventory program that meets regulatory requirements. While the mandatory reporting regulation establishes minimum requirements that must be met for compliance, discretionary management decisions will help to achieve and maintain compliance.

An effective inventory program leads the reporter and verifier through the data collection and reporting process. A transparent inventory program allows verifiers and regulators to independently reconstruct and evaluate the facility inventory process, examine calculation methods and emission factors, and access supporting and reported data. A complete inventory program documents calculation methods, data collection procedures, and emission factors.

4.1 What must be included in my inventory of emissions sources?

First, identify all sources that must be reported to create your facility's emissions source inventory. Each sector's specific requirements are discussed in Chapters 7 through 12 of this guidance document. Generally, consumption data are categorized by fuels and feedstocks; direct GHG emissions data from combustion, process, and fugitive sources are reported by fuel type where appropriate; and indirect emissions are reported as purchases of electricity and thermal energy. While the regulation provides a required method to calculate on-road vehicle emissions, reporting this source is optional.

The purpose of this chapter is to provide guidance on the requirements of sections 95103 to 95105 of the mandatory GHG reporting regulation. As described more specifically in Chapter 1 of this document, this guidance does not add to, substitute for, or amend the regulatory requirements as written in these or other sections of the regulation [Subchapter 10, Article 2, sections 95100 to 95133, title 17, California Code of Regulations].

In addition to reviewing the guidance, consult the mandatory reporting regulation to identify requirements by emissions source:

- Cement – section 95110
- Electric generators, retail providers, marketers – section 95111
- Cogeneration facilities – section 95112
- Petroleum refiners – section 95113
- Hydrogen plants – section 95114
- General stationary combustion facilities – section 95115

You should determine each discrete source of emissions that is identified for reporting in the regulation. Reporters should provide a value that is measured, calculated, or estimated for each discrete source of emissions identified.

4.2. What sources can I declare as *de minimis* and what are the reporting requirements for these sources?

You may designate as *de minimis* one or more GHG sources that collectively produce no more than 3 percent of your facility's total CO_2 equivalent emissions. The sources you designate as *de minimis* (in total) may not exceed 20,000 metric tonnes CO_2 equivalent emissions. Emissions from these sources must be reported; however, you may use alternative methods to estimate these emissions. You should document these alternative methods, as these emissions are subject to verification that they are indeed *de minimis*. Requirements are specified in section 95103(a)(6).

De Minimis **Emissions Sources**	
May choose to report one or more sources as *de minimis* provided that they *collectively* produce	→ ≤3 percent of the facility's total CO_2e AND ≤20,000 metric tonnes CO_2e
Must determine CO_2 equivalence according to the 100-year global warming potentials specified	→ Regulation Appendix A, Table 2, provides 100-year global warming potentials
May choose alternative methods to estimate emissions	→ Alternative methods are subject to concurrence of the verification team[1]
Must separately identify and report emissions from designated *de minimis* sources	

4.3 What are the key considerations for identifying and selecting quantification methods, including emission factors?

As an operator you identify the emissions data reporting requirements that apply to your facility. Consulting the regulation as described above, the operator identifies which emissions calculation methods apply to your facility operations. Consider existing data collection and testing protocols and what additional data collection may be needed. Select emissions calculation methods and associated testing requirements.

[1] The verification team will decide whether the use of such methods provides reasonable assurance that the emissions do not exceed the applicable limits.

While striving to assure appropriate rigor in all methods so that high quality data are reported, ARB staff did provide some options to choose from in the estimation of emissions. Where continuous emissions monitoring systems are in place, for example, they can generally be used to measure CO_2 emissions as an alternative to fuel-based calculations. Source tests may be performed for CO_2 at some facilities, and for N_2O and CH_4 at all facilities, to move beyond default emission factors. Such options are limited and specified within the regulation. Guidance on source testing is provided in Appendix B. Additional consideration will be given to consistent application of methods within and across sectors in the event a market trading system is developed.

4.4 What are the requirements for the first year transition period?

The regulation provides for a one-year transition period. Under section 95103(a)(1), operators submitting an emissions data report in 2009 must develop their 2008 emissions estimates through use of best available emissions data and methods. For 2009, the methods specified in the regulation are considered best available when sound data has been collected that allows use of those methods. Use of the methods prescribed in the regulation also allows operators to gain familiarity with the full requirements that will apply in subsequent years.

This provision recognizes that some facilities and entities did not have in place the monitoring, measurement, and record-keeping systems needed to satisfy regulation specifications. These systems should be in place in time to facilitate reporting in 2010 (on 2009 emission levels) that meets these specifications.

Third-party verification is optional in 2009, and required for all reporters beginning in 2010. See Chapter 6 on verification for considerations about whether to seek verification of your 2009 emissions data report if you must use alternative data or quantification methods.

Before proposing to use alternative methods for 2009 emissions data reports, reporters should attempt first to follow the specific methods identified in the regulation. The regulation methods are considered best available when data collection makes it possible for a reporter to follow them. A method other than that prescribed in the regulation may be used where the operator does not have the data available to support use of the prescribed method. Reporters may consult with ARB if there is some question as to whether the data and methods being used are best available.

ARB staff anticipates that estimates for some sources will be approximate where data are unavailable. Staff also recognizes that data reported in 2009 may not reflect the accuracy requirements for measured data that are specified in the regulation.

4.5 What are the key considerations for data collection and management?

The following steps are suggested to help guide implementation:

1. Identify data collection and retention requirements and calculation procedures.

2. Identify existing data sources and any additional data needs. Data sources may include monthly fuel bills, laboratory information management systems, and data acquisition systems.
3. Choose appropriate instrumentation. Original equipment manufacturer (OEM) instrumentation specifications must meet the ±5% accuracy requirement for the conditions encountered (temperature, pressure, maximum and minimum flow rates, etc.).[2]
4. Install instruments at your facility and establish data collection procedures and analytical methodologies where applicable. Instrumentation must be installed according to OEM specification to ensure stated level of accuracy.
5. Establish instrument maintenance and calibration procedures and schedule. Instrumentation must be operated, maintained and calibrated according to (OEM) specification to ensure stated level of accuracy.

4.6 What do I need to consider if my facility has an existing Continuous Monitoring System (CEMS) or is planning to install one?

Continuous emissions monitoring systems (CEMS) are employed at many stationary sources, including power plants, to monitor emissions of air pollutants in response to local, state and/or federal regulations. Many CEMS continuously monitor and record O_2 or CO_2 concentrations from an exhaust stack at a facility. These existing CEMS may be used by most operators to determine CO_2 emissions. The majority of CEMS are regulated in accordance with 40 CFR Part 60 and/or Part 75, including requirements for installing, certifying, operating, and maintaining CEMS. See guidance provided in Chapter 13, on common methods, for further discussion of the requirements pertaining to using existing or new CEMS for CO_2 emissions reporting.

Where a choice is provided in the ARB mandatory reporting regulation between using a fuel-based calculation or using a CEMS to calculate CO_2 emissions, you will make the choice of reporting method and continue to use that method for all future emissions data reports, as required in section 95103(a)(11). If you elect to install a new CEMS system (including CO_2 CEMS components) you may report combustion emissions on the basis of the fuel-based calculations for the 2008, 2009, and 2010 report years. The new CO_2 CEMS must be operational for purposes of emissions reporting by January 1, 2011.

The new CEMS must measure CO_2 concentrations and flue gas flow and be installed and operated according to the requirements of 40 CFR Part 75, not Part 60. (This requirement does not mean that the emissions must be reported to the U.S. EPA.)

You may elect to add devices for the purposes of measuring CO_2 concentrations or flue gas flow to an existing CEMS. Installation timelines and reporting requirements for new devices are under the same requirements as a new CEMS installation as described above.

[2] Note that use of methods specified by the reporting regulation, for example CEMS in section 95125(g), is accepted as meeting the accuracy requirement.

Electric generating facilities that combust biomass solid fuels or municipal solid waste must use CO_2 CEMS data to determine CO_2 emissions if the facility already measures CO_2 concentrations and flue gas flow. If not, the operator is provided alternate methodologies to calculate CO_2 emissions.

4.7 In addition to regulatory requirements, are there best practices to guide establishing a GHG inventory program?

The regulation requires that all facility operators maintain a GHG inventory program. Depending on the size and complexity of a facility, the inventory program may range from hand entered spreadsheets to more automated data tracking procedures. The facility should have in place an appropriately robust and well maintained data-collection system to ensure accuracy and completeness of data. The facility operator can take additional steps to ensure their inventory program is sufficient to support a credible emissions data report.

There should be well documented procedures for the use, maintenance, and calibration of any measurement equipment. The facility operator could also implement routine checks on the data tracking systems to ensure data accuracy and completeness. For example, for values entered by hand into a spreadsheet, a simple graph can identify any outliers that may have resulted from a data entry error. Periodic checks could eliminate any last minute discoveries of shortcomings in the underlying data needed to develop an emissions data report. If during the course of verification any weaknesses are found in the GHG inventory program, they should be addressed to mitigate their effects on future GHG emissions data reports.

In addition, operators are encouraged to consult voluntary international specifications and guidance developed by the International Organization for Standardization for the design, development, and management of GHG inventories.[3] Decisions on data collection procedures and whether to report certain categories of emissions that are optional under the mandatory reporting regulation can be informed by guidance provided by established voluntary programs, such as those implemented by the California Climate Action Registry,[4] The Climate Registry,[5] the US EPA Climate Leaders Program,[6] or your industry. Voluntary GHG reporting programs and industry-specific guidance often refer to the WRI/WBCSD *Corporate Accounting and Reporting Standard*, which includes established principles to guide reporters in developing their GHG inventories. See the box below.

[3] ISO 14064-1:2006. *Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.*
[4] http://www.climateregistry.org/
[5] http://www.theclimateregistry.org/
[6] www.epa.gov/climateleaders

GHG Accounting and Reporting Principles[7]

- **Relevance**: Ensure that your GHG inventory appropriately reflects your GHG emissions and serves the decision-making needs of users—both internal and external to your organization.
- **Completeness**: Account for and report all GHG emission sources and activities within the defined inventory boundary.
- **Consistency**: Use consistent methodologies to allow for meaningful comparisons of emissions over time. Clearly document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
- **Transparency**: Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
- **Accuracy**: Ensure that the quantification of GHG emissions is neither systematically overstating nor understating your true emissions, and that uncertainties are reduced as much as practicable. Achieve sufficient accuracy enabling users of your data to be able to make decisions with reasonable assurance of the integrity of the reported information.

4.8 Is there an opportunity to revise my Emissions Data Report, if needed?

Revisions are allowed under certain conditions, as specified in section 95104(d). The operator must maintain documentation to support any revisions made to a previously submitted emissions data report. Documentation for all emissions data report revisions shall be retained by the operator for five years, as specified in section 95105.

Revisions are allowed under the following circumstances:

(1) If during the course of receiving verification services and prior to completion of a verification opinion an operator chooses to make a correction or improvement to the report;

(2) If an operator wishes to correct or improve an emissions data report not subject to verification, provided those changes are documented and approved by ARB;

(3) If, within five years of submittal, an operator wishes to correct or improve an emissions data report that has received a positive verification opinion, in which case the revision must also be made subject to verification.

[7] World Resource Institute / World Business Council for Sustainable Development (WRI/WBCSD) *GHG Protocol: Corporate Accounting and Reporting Standard* (Revised Edition).

4.9 What are the document retention and record keeping requirements?

Document retention and record keeping requirements are specified in section 95105. The data management system needs to ensure that verifiers and ARB can reproduce all emissions calculations, when needed. All documents and data regarding your GHG accounting must be retained for a period of five years. This includes but is not limited to fuel use data, emission factors, instrument manuals, and maintenance and calibration records.

Operators are asked to structure and maintain data collection and record retention procedures in an orderly manner, so that you can easily address data and records requests from both your verifier and ARB staff. Your data collection methods, sampling protocol, analytical methodology, and GHG calculation methods should be documented in a clear and transparent manner, which will allow verifiers and regulators to examine all steps of the process used to generate your annual facility GHG emissions report.

Regulation section 95105 also requires that you maintain a log, beginning January 1, 2009, documenting all procedural changes that you make in your GHG accounting methods and instrumentation. It is important to be able to determine whether changes in a facility's GHG emissions from year to year are real or due to changes in reporting quantification methods.

In addition to information submitted as part of the emissions data report, each operator must retain, at a minimum, the following information for at least five years after the submission of the report:

1. The list of all sources included in the emission estimates;
2. The fuel use data used to calculate emissions for each source, categorized by process and fuel or material type;
3. Documentation of the process for collecting fuel use data for the facility and its sources;
4. Any GHG emissions calculations and methods used;
5. All emission factors used for emission estimates, including documentation for any factors not provided by ARB;
6. Any facility or other input data used for emission estimates;
7. Documentation of biomass fractions for specific fuels;
8. Record of electric power purchase and sale transactions, including imports and exports of power into and from California;
9. The fuel use data, emissions, or other data submitted to the ARB under this article including the emissions data report;
10. Names and documentation of key facility personnel involved in emissions calculating and reporting;
11. Any other information that is required for the verification of the emissions data report.
12. A log to be prepared for each reporting year, beginning January 1, 2009, documenting all procedural changes made in GHG accounting methods and changes to instrumentation critical to GHG emissions determination.

For measurement based methodologies, each operator must also retain the following information for at least five years after the submission of the emissions data report:

1. The list of all emission sources monitored;
2. Collected monitoring data;
3. The data used to assess the accuracy of emissions from each emissions source, categorized by process;
4. Quality assurance and quality control information including information regarding any measurement gaps;
5. The data used for the corroborating calculations;
6. A detailed technical description of the continuous measurement system, including documentation of any findings and approvals by federal, State or local agencies;
7. Raw and aggregated data from the continuous measurement system; including documentation of changes over time and the log book on tests, down-times, calibrations, servicing and maintenance;
8. Documentation of any changes in continuous measurement systems.

4.10 Are both internal auditing and third-party verification required?

Regulation section 95104(c) requires the operator to implement systems of internal audit, quality assurance, and quality control for the reporting program and the data reported. The operator must make every reasonable effort to complete emissions data reports that contain no material misstatement and are in conformance with the emission calculation methodologies and factors specified by the regulation. Integration with the facility's existing compliance management system or environmental management system will help assure a positive verification opinion can be achieved, and that the facility's resources are used most effectively. Verification is addressed further in Chapter 6 of this document.

CHAPTER 5: EMISSIONS DATA REPORTS
(Guidance for Regulation Sections 95103-95104)

This chapter discusses the common elements of emissions data reports are specified in regulation sections 95103 and 95104.

5.1 Is there a standard format for reporting to ARB?

To assist facility operators in reporting, ARB has developed a comprehensive web-based reporting tool to simplify and guide the reporting process. Facility operators have the opportunity to set up accounts in the system where they can assign staff, consultants, and verifiers who will have varying levels of access to enter, modify, or view the facility data. ARB staff will provide facility operators temporary user identification numbers and passwords to set up their accounts and begin entering their emissions data to the reporting system. It is the reporter's responsibility to assure that ARB has correct contact information so that notification of the GHG entity/facility identification number(s) and temporary passwords are sent to the appropriate personnel.

The reporting tool will also facilitate consistent reporting of data in the units of measurement required in the regulation. The regulation specifies the units of measurement for reporting in the sector-specific requirements (sections 95110-95115), covered in Chapters 7 to 12 of this document. Regulation Appendix A, Table 1, provides conversion factors.

5.2 Can members of the California Climate Action Registry submit their CCAR reports to satisfy ARB's mandatory reporting requirements?

Some California Climate Action Registry (CCAR) members have asked whether their reports to CCAR will satisfy ARB reporting requirements. ARB staff worked with CCAR staff and stakeholders during the regulatory process to consider existing CCAR methods. While ARB quantification methods are often similar to those in the CCAR reporting protocols, some modifications and additions were necessary to meet the requirements of AB 32. Operators are required to submit emissions data reports that meet the full requirements of ARB's mandatory reporting regulation.

With these provisions in mind, the 2008 emissions data reported in 2009 to CCAR for discrete emissions sources would be acceptable to ARB if it is "best available." The report must be supplemented with additional estimates for specific source emissions or transactions data specified in the regulation, if not covered in the CCAR report.

The purpose of this chapter is to provide guidance on the requirements of sections 95103 and 95104 of the mandatory GHG reporting regulation. As described more specifically in Chapter 1 of this document, this guidance does not add to, substitute for, or amend the regulatory requirements as written in these or other sections of the regulation [Subchapter 10, Article 2, sections 95100 to 95133, title 17, California Code of Regulations].

See Chapter 4 for further discussion of how the concept of "best available data" is applied to 2008 emissions data reported in 2009.

5.3 What information about the facility or entity must be included in the Emissions Data Report to ARB?

Required information is summarized below. Initially in the GHG reporting process, you will be required to provide information concerning the facility location, NAICS code, and responsible facility personnel. The operator also signs a statement confirming that the emissions data report is truthful, accurate, and complete. See section 95104 for details concerning this information requirement.

Emissions Data Report—Reporter Information
1. Report Year
2. Facility Information
• Facility name
• Facility identification number
• NAICS code
• Primary Regulated Sector
• Secondary Regulated Sector(s), if applicable
• Physical address
• Mailing address
• Description of facility geographic location
3. Operator Information
• Operator name (*person primarily responsible for preparing and submitting the emissions report*)
• Operator job title[1]
• Email address
• Telephone number
4. Parent Company Information[2]
• Parent company (or companies) of the operator
• List all facilities and offices in California owned or operated by the parent company or companies, directly or through a subsidiary, that emit direct GHG emissions from combustion that is not for the purpose of facility space heating, including facilities and offices not subject to the requirements of this article.[3]

[1] May elect to provide this information.
[2] Parent company information is not subject to verification requirements.
[3] This information may be submitted separately by the parent company for all facilities under the ownership or operational control of the parent company or its subsidiaries.

• Contact information for the facilities and offices including o physical addresses, o e-mail addresses if available o telephone numbers[4]
5. Operator Statement of Truth, Accuracy, and Completeness
Operator signature and date stating: *This report has been prepared in accordance with Subchapter 10[5], Article 1, sections 95100 to 95133, Title 17, California Code of Regulations. The statements and information contained in this emissions data report are true, accurate, and complete.*

5.4 How do I report fuel consumption?

Fuel use is reported by all industrial sectors at the individual meter level, if available, as specified in section 95103(a)(2). For example, if natural gas is combusted in two separately-metered boilers, fuel consumption is reported both at the meter level and at the facility level. Guidance on stock accounting and prorating fuel use is provided in Chapter 13.

When fuel consumption data are also used for emissions calculations, additional accuracy requirements apply. See Chapter 4 for additional guidance on data collection and data quality considerations when developing a GHG inventory program.

5.5 Which emissions sources and GHGs must be included?

Sector-specific emissions sources and reporting requirements are described in Chapters 7 through 12. In general, operators identify, calculate and report emissions[6] from the following stationary sources:

- stationary combustion,
- process,
- fugitive, and
- *de minimis*.

Operators will calculate and report each greenhouse gas separately, when specified in the sector-specific requirements:

- CO_2
- CO_2 from combustion of biomass-derived fuel
- N_2O
- CH_4
- SF_6
- HFC by compound
- PFC by compound

[4] May provide a single contact person, e-mail, and phone contact for all facilities listed.
[5] Regulations to implement the California Global Warming Solutions Act of 2006 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.) are contained in Subchapter 10: Climate Change.
[6] Include emissions during routine maintenance, start-ups, shutdowns, upsets and downtime.

In general, all facilities subject to reporting are required to report their on-site stationary combustion emissions of carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4) by fuel type combusted. CO_2 emissions from combustion of biomass-derived fuels must be separately identified and reported. Operators who use a continuous emissions monitoring system (CEMS) may report CO_2 for combined fossil fuel combustion (not separated by each fuel type), but must still break out biogenic CO_2 if applicable. Both stationary combustion and process CO_2 emissions may be reported together when monitored with a CEMS.

Some industrial sectors, such as cement and refineries, also must report their process emissions, which occur from chemical processes or other non-combustion activities. Fugitive emissions from facilities are required to be reported when specified. For example, sulfur hexafluoride (SF_6) and hydrofluorocarbon (HFC) use is prevalent in and must be reported for electricity generating facilities. The regulation does not currently designate a PFC reporting requirement.

See sector-specific guidance to determine whether emissions must be reported at levels below the facility level. For example, the electricity sector reports combustion emissions of CO_2, N_2O, and CH_4 for each generating unit, as well as for the facility, unless metering or monitoring equipment are not in place to provide this information.

Reporters must also provide their consumption of purchased or acquired electricity and thermal energy; these requirements will assist facilities in evaluating changes in their fossil-fuel-based carbon footprints.

5.6 Am I required to report mobile source emissions?

Reporting of mobile source emissions is optional, as specified in section 95103(a)(4). You may choose to calculate and report CO_2, CH_4 and N_2O emissions from mobile combustion associated with your facility operations. Use the methodology found in section 95125(i) to calculate on-road mobile emissions. Additional guidance is provided in Chapter 13 on common methods.

5.7 What additional supporting information must be included in my report?

Additional supporting information may include:

- emission factors developed or measured by the operator using approved source testing[7]
- efficiency metrics
- production data
- feedstock consumption data

5.8 May I include voluntary or optional information?

If you identify additional GHG emissions sources not covered by any of the reporting methods, you may include them in your annual emissions data report. The on-line reporting tool includes an option for reporting additional GHG source emissions. You

[7] See Sections 95125(b)(4) or 95125(h)(3). Additional guidance is provided in Appendix B.

simply need to access this option, identify the source and report emissions. GHG emissions from sources not covered by the regulation and reported voluntarily are still subject to verifier review. ARB staff welcomes discussion of these additional sources and quantification methods outside the formal reporting process.

When you are deciding on data collection procedures or whether to report certain categories of emissions that are optional, you are encouraged to consult widely-accepted GHG reporting and accounting principles. Chapter 4 provides additional guidance on recommended GHG reporting and accounting principles.

5.9 I have concerns about maintaining the confidentiality of portions of my report. How is sensitive information protected?

As specified in section 95106, emissions data is public information and cannot be designated as confidential. The reporting tool will enable an operator to designate information that is not emissions data as confidential, if the operator has reason to believe such data would breach trade secrets or should otherwise be exempt from disclosure under the California Public Records Act.[8] If a member of the public requests such data ARB may seek further justification for the claim of confidentiality from the operator. ARB staff makes the final determination on questions of data confidentiality, following review of the justification and consideration of applicable laws and codes. ARB handles requests for confidentiality in accordance with the procedures specified in title 17, California Code of Regulations, sections 91000 to 91022, which can be found in Appendix C.

[8] Government Code section 6250 et seq.

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CHAPTER 6: VERIFICATION

(Guidance for Regulation Sections 95103, 95130-95133)

Third-party verification of 2009 emission levels is required for all reporters beginning in 2010. Verification is optional for reporters in 2009.

Verification of emissions data reports and requirements for verifiers are specified in Subarticle 4, Sections 95130-95133. ARB intends to issue a separate guidance document specific to these requirements. This chapter of the reporting guidance provides basic information that may be helpful to operators. It also addresses special considerations that arise for verification of "best available" data in 2009.

6.1 What are the general requirements for emissions report verification?

The Regulation requires emission data reports and their underlying data to be verified by independent third-party verifiers, an internationally accepted practice for GHG reporting programs. The independent third parties must be accredited by ARB. Verifiers, whether employed in the private sector or at air districts, must possess requisite experience and have been trained through an ARB-approved training course. Verification by qualified teams, working under the auspices of accredited verification bodies, helps to ensure completeness, accuracy, and consistency in the reported GHG data, and that the methods specified in the regulation have been correctly applied.

Based on industry classifications, facility operators must have their data verified either annually or triennially, as specified in regulation section 95103(c). Where facilities combine more than one reporting sector, the more stringent verification schedule applies. Verification is optional for the 2009 emissions submittal (CY 2008 emissions), but all future submittals require verification on a schedule consistent with the Regulation.

The Regulation allows for a three year verification cycle. The first year requires a comprehensive effort that includes site visits. For operators requiring annual verification, the second and third years of the cycle may be limited to data checks based on the latest sampling plan that resulted in a positive verification opinion. For operators requiring triennial verification, this cycle allows for years two and three to be entirely optional. Facility operators must change verification bodies at least once every six years to avoid complacency and potential conflicts of interest.

The purpose of this chapter is to provide guidance on the requirements of sections 95103 and 95130 through 95133 of the mandatory GHG reporting regulation. As described more specifically in Chapter 1 of this document, this guidance does not add to, substitute for, or amend the regulatory requirements as written in these or other sections of the regulation [Subchapter 10, Article 2, sections 95100 to 95133, title 17, California Code of Regulations].

6.2 What is ARB's role as my facility or company considers a verification body?

ARB will post a list of accredited verification bodies on its web site. The facility operator may only use an ARB-accredited verification body to provide verification services and submit a verification opinion on its behalf.

Arrangements between the facility operator and verification body are approved by ARB before verification services can begin. The verification body will be required to complete an assessment of any potential for conflict of interest between itself and the facility reporter. ARB staff must find this potential for conflict acceptable before the verification body is cleared to provide verification services to the facility reporter. Section 95133 provides detail on how the conflict of interest findings are conducted and what specific actions constitute an unacceptable level of potential conflict of interest.

ARB staff will also check that the *verification team* assigned to the facility reporter by the verification body has the skill set that is required for the complexity level of that facility. The regulation identifies sector specific verifiers to conduct verification of cement plants, refineries and hydrogen plants, and electricity transactions.

6.3 What's needed to assure a positive verification opinion?

The verification team will provide verification services as required in section 95131 of the regulation. When during the course of verification the verification team finds errors, the facility operator will be asked to correct those errors if possible. To maintain independence and prevent any conflicts of interest, the verification team cannot provide any consulting services on how to correct those errors, but is required to alert the facility reporter about areas where there are errors.

To enable a positive verification opinion, a GHG emissions data report must be found by the verification team to be free of material misstatement and to conform to the requirements of the regulation. For an emissions report to be free of material misstatement, the verification team must find that the report contains no errors that could not result in facility-wide CO_2e emissions being less than 95 percent accurate. This means that errors in emissions estimation adding up to 5 percent of the overall facility CO_2e emissions are allowed. For an emissions report to conform to the requirements of the regulation means that regulation standards and methods were observed by the operator in report preparation.

The 5 percent materiality threshold for verification is different than the ±5 percent accuracy requirement for fuel use measurement required by section 95103(a)(9). Because the verification process allows for the inherent uncertainty associated with allowed instrumentation and emission factors, these additional uncertainties are outside the materiality threshold. The materiality threshold requires that emission factors and calculation methods be applied correctly, to ensure that no significant errors have been made in the operator's emissions calculation. Errors may be made that result in an overstatement or understatement of emissions, but as long as the absolute errors result in a less than 5 percent error in total facility CO_2e emissions, the emissions data report is deemed acceptable.

At the end of the verification process, the verification body will provide the facility operator with a detailed verification report. That report must be retained by the operator for 5 years as part of the documentation requirements of the regulation. The verification body will also provide a verification opinion to the facility operator and to ARB. The verification opinion may be a positive verification opinion or adverse verification opinion. To receive a positive verification opinion the GHG emissions data report must be free of any material misstatement and must conform to regulation requirements.

6.4 What if my facility uses alternate methods for the 2009 emissions report, as the regulation permits?

There are only limited circumstances in which a positive verification finding can result where alternative data and methods have been substituted for the data and methods specified in the regulation.

In order to deliver a positive verification opinion, a verification body must attest that the emissions data report is both

- free of material misstatement, and
- in conformance with the requirements of the regulation.

In cases where use of best available data and methods results in a facility emissions total that the verification body cannot find with reasonable assurance is within 95 percent of the actual facility emissions total, material misstatement is found and a positive verification finding cannot be issued. In cases where conformance with the requirements of the regulation cannot be found because alternative data or estimation methods were used, a positive verification finding is also problematic.

However, given that the provisions of the regulation include the optional substitution of best available data and methods in the 2009 reports, staff believes it is reasonable to permit a positive verification finding in cases where the verification body finds no material misstatement results from use of the alternative data and methods (i.e., where reported total emissions derived from the available data and methods are found with reasonable assurance by the verification body to be 95 percent accurate). This finding could be made regardless of the reporter's inability to use prescribed methods during the transition year. In such cases, ARB believes it will also be necessary for the reporter to obtain full verification services, rather than less intensive verification services, for the second year (2010) emission data report. This is because the sampling plan should be revised once new equipment or monitoring systems become available that deliver the data needed to support methods meeting regulation specifications.

ARB staff understands that a reporter may pursue the formal verification that is optional in 2009 with some reluctance. Staff nonetheless encourages reporters to undergo an informal verification process in the first year of reporting even if they are using "best available data and methods." Even if no verification opinion is submitted to ARB, working with a verifier will provide an opportunity for reporters to understand

how the verification process works and the role of a verifier when verification is required beginning in 2010.

As an important cautionary note, verifiers and operators must always be careful that any verification services do not include consulting by the verifier on how to develop a GHG emissions inventory, if that same verifier is then used to verify the resulting GHG emissions inventory. This would violate the principle of independent review, a cornerstone concept of third-party verification.

6.5 Is there an appeals process if I don't agree with the verifier?

There may be instances where a facility operator and a verification body have a disagreement over a verification opinion for an emissions data report. If this happens, either party may use the process outlined in section 95131 for an appeal to the Executive Officer to make the final decision. All parties are held to this decision, and the request for an appeal must be made before a verification opinion is provided to ARB and before the applicable verification deadline has passed.

6.6 What are the consequences of not undergoing verification when required? What happens if the verification opinion is adverse?

If a facility operator engages a verification body and submits a verification opinion by the applicable verification deadline, then all verification obligations are considered to be met. It is considered a violation of the regulation if a facility operator or its verification body do not meet the verification deadline. ARB will attempt to determine the cause of the late verification opinion and, if needed, take appropriate enforcement action against either the reporter or verification body.

If a facility operator's emissions data report receives an adverse verification opinion and is submitted by the applicable verification deadline, the verification requirement is still considered to be met. Repeated adverse verification findings may alert ARB staff that the reporter is failing to follow the requirements of the regulation. As such, ARB staff will want to determine the underlying problem and work with the reporter to ensure future reports are able to receive positive verification opinions.

6.7 Can ARB participate in the verification?

As part of its program oversight, ARB staff may participate in any verification to audit the performance of verifiers. Facility operators and verifiers are required to share the information used as part of the verification process with ARB staff that participate in the verification. ARB may also audit an emissions data report after a verification opinion has been provided, or in the absence of a verification opinion. Section 95131 of the regulation also allows for the Executive Officer to reverse a verification opinion under certain circumstances.