TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 2 AIR QUALITY (STATEWIDE)
PART 100 GREENHOUSE GAS REPORTING – GENERAL PROVISIONS

20.2.100.1 ISSUING AGENCY: Environmental Improvement Board.
[20.2.100.1 NMAC - N, 01/01/10]

20.2.100.2 SCOPE: All persons who own or operate an applicable source of greenhouse gas emissions in the geographic area within the jurisdiction of the environmental improvement board.
[20.2.100.2 NMAC - N, 01/01/10]

20.2.100.3 STATUTORY AUTHORITY: Environmental Improvement Act, NMSA 1978, Section 74-1-8(A)(4), and Air Quality Control Act, NMSA 1978, Sections 74-2-1 et seq., including specifically Sections 74-2-5(B)(1) & 74-2-(5)(C)(5)(d) & (e).
[20.2.100.3 NMAC - N, 01/01/10]

20.2.100.4 DURATION: Permanent.
[20.2.100.4 NMAC - N, 01/01/10]

20.2.100.5 EFFECTIVE DATE: January 1, 2010 except where a later date is cited at the end of a section.
[20.2.100.5 NMAC - N, 01/01/10]

20.2.100.6 OBJECTIVE: The objective of this part is to establish requirements for the annual reporting of greenhouse gas emissions to the department.
[20.2.100.6 NMAC - N, 01/01/10]

20.2.100.7 DEFINITIONS: The definitions included in this part shall also apply to the terms used in 20.2.101 NMAC through 20.2.108 NMAC. The definitions included in 20.2.2 NMAC shall apply to the terms used in this part, unless such term is defined in this part.

A. "Accreditation and Verification Authority" or **"AVA"** means the department or any entity or entities to which the department assigns any of the responsibilities for oversight and execution of the accreditation and verification program established in 20.2.101 NMAC.

B. "Accuracy" means the closeness of the agreement between the result of the measurement and the true value of the particular quantity (or a reference value determined empirically using internationally accepted and traceable calibration materials and standard methods), taking into account both random and systematic factors.

C. "Acid gas" means a gas mixture that has been separated from natural gas and consists mostly of hydrogen sulfide or carbon dioxide and that may contain trace amounts of hydrocarbons, water, or other contaminants.

D. "Adverse verification statement" means a verification statement rendered by a verification body stating that the verification body cannot conclude that there is a reasonable level of assurance for an emissions data report.

E. "ASME" means the American society of mechanical engineers. Additional information regarding ASME test methods referenced in Parts 20.2.100 NMAC through 20.2.108 NMAC may be found at 20.2.100.12 NMAC.

F. "Asphalt" means a highly viscous liquid or semi-solid consisting mostly of bitumen and which is a residue by-product of petroleum refining.

G. "Asphalt blowing" means the process by which air is blown through liquid asphalt to remove contaminants such as volatile compounds and to increase viscosity.

H. "Associated gas" means a natural gas which is found in association with crude oil, either dissolved in crude oil or as a cap of free gas above the crude oil.

I. "ASTM" means the American society for testing and material. Additional information regarding ASTM test methods referenced in Parts 20.2.100 NMAC through 20.2.108 NMAC may be found at 20.2.100.12 NMAC.

J. "Barrel" or **"bbl"** means a volume equal to 42 U.S. gallons.

K. "Best available alternative data and methods" means, as an alternative to the emissions quantification methods <u>and specified data</u> required by 20.2.102 NMAC through 20.2.108 NMAC:

EXHIBIT A

(1) any methods and specified data required by U.S. environmental protection agency regulation for mandatory reporting of GHG emissions from the same activities and processes and for the same gases;

(2) the department's approved next best alternative methods from the quantification methodologies in 20.2.102 NMAC through 20.2.108 NMAC; or

(~~2~~3) other generally accepted methods for calculating greenhouse gas emissions organized by the same source categories and greenhouse gas species, using emissions factors and other data provided by the department.

L. **"Btu"** or **"BTU"** means British thermal unit.

M. **"Biomass"** means non-fossilized plants or parts of plants, animal waste, micro-organisms or any product made of either of these, and includes wood and wood products, agricultural residues and wastes, biologically derived organic matter found in municipal and industrial wastes, landfill gas, bio-alcohols, spent pulping liquor (black liquor), pulp fibers, sludge gas, and animal- or plant-derived oils.

N. **"Biomass fuels"** or **"biomass-derived fuels"** means fuels whose entire heat generating capacity is derived entirely from biomass.

O. **"Bottoming cycle"** means operation of a cogeneration unit in which the energy input to the system is first applied to a useful thermal energy application or process, and at least some of the reject heat emerging from the application or process is then used for electricity production.

P. **"Calcination"** means the thermal decomposition of carbonate-based minerals, into one or more oxides and carbon dioxide.

Q. **"Calcine"** means to heat a substance to a high temperature but below its melting or fusion point causing oxidation or reduction.

R. **"Calcined byproduct/waste type"** means lime kiln dust and other partially calcined materials and co-products generated during the production of one on the three types of quicklime.

S. **"Calcined byproduct ~~type~~ /waste sold"** means lime kiln dust and other calcined materials and coproducts, such as off-spec lime, that enters commerce.

T. **"Calcined ~~co~~ byproduct/waste not sold"** means any partially calcined co-product or partially calcined material produced during the calcination of limestone or other highly calcareous material that does not enter commerce as its own product or as part of another lime product. Types of calcined co-products/partially calcined material not sold include, but are not limited to, lime kiln dust, scrubber sludge, waste cores, and off-spec lime.

U. **"Carbon dioxide equivalent"** or **"CO2 equivalent"** or **"CO2e"** means a measure for comparing the global warming potentials of different greenhouse gases. By definition, carbon dioxide has a carbon dioxide equivalent of one, with the global warming potentials of other greenhouse gases stated relative to carbon dioxide.

V. **"Catalytic cracking"** means the process of breaking down larger, heavier, and more complex hydrocarbon molecules into simpler and lighter molecules through the use of a catalyst.

W. **"Catalytic reforming"** means the process of using controlled heat and pressure with catalysts to rearrange certain hydrocarbon molecules.

X. **"Cement"** means a building material that is produced by heating mixtures of limestone and other minerals or additives at high temperatures in a rotary kiln to form clinker, followed by cooling and grinding with blended additives to produce a finished powder.

Y. **"Cement kiln dust"** or **"CKD"** means the fine-grained, solid, highly alkaline waste removed from cement kiln exhaust gas by air pollution control devices, consisting of partly calcined kiln feed material, dust from cement kilns and bypass systems, including bottom ash and bypass dust.

Z. **"Cement manufacturing"** means all processes that are used to manufacture Portland, natural, masonry, pozzolanic, or other hydraulic cements.

AA. **"Cement plant"** means an industrial structure, installation, plant, or building primarily engaged in manufacturing Portland, natural, masonry, pozzolanic, and other hydraulic cements, and typically identified by NAICS code 327310.

AB. **"CH4"** means methane.

AC. **"Chemical oxygen demand"** or **"COD"** means the measure of the amount of organic compounds in water, in units of mass per unit volume of water, used to determine water quality.

AD. **"Clinker"** means the mass of fused material produced in a cement kiln from which finished cement is manufactured by milling and grinding.

AE. **"CO2"** means carbon dioxide.

AF. **"Coal"** means a combustible sedimentary rock composed primarily of carbon and classified as anthracite, bituminous, sub-bituminous, or lignite by the American society for testing and materials designation ASTM D388–05, "standard classification of coals by rank".

AG. **"Coal storage"** means coal storage piles located at any facilities that combust coal. Coal storage piles release fugitive CH4 emissions. Emissions covered by this source category include coal mining, post-mining activities, and coal-handling activities which release pressurized CH4 to the atmosphere, and release of adsorbed CH4 as the coal reaches equilibrium with the surrounding atmospheric conditions.

AH. **"Cogeneration unit"** means a stationary fuel combustion device which simultaneously generates electrical and thermal energy that is (i) used by the operator of the facility where the cogeneration unit is located; or (ii) transferred to another facility for use by that facility.

AI. **"Cogeneration system"** means individual cogeneration components including the prime mover (heat engine), generator, heat recovery, and electrical interconnection, configured into an integrated system that provides sequential generation of multiple forms of useful energy (usually electrical and thermal), at least one form of which the facility consumes on-site or makes available to other users for an end-use other than electricity generation.

AJ. **"Coke"** means a solid residue consisting mainly of carbon which is derived either from the cracking of petroleum hydrocarbons in a refinery coker unit (petroleum coke) or from the destructive distillation of low-ash, low-sulfur bituminous coal (coal coke).

AK. **"Combustion emissions"** means greenhouse gas emissions occurring during the exothermic reaction of a fuel with oxygen.

AL. **"Compliance period"** means, until such time as the department adopts a cap-and-trade program covering sources subject to 20.2.100 NMAC through 20.2.108 NMAC, a period of three calendar years.

AM. **"Conflict of interest"** means a situation in which, because of financial or other activities or relationships with other persons or organizations, a person or body is unable or potentially unable to render an impartial verification opinion of a potential client's greenhouse gas emissions, or the person or body's objectivity in performing verification services is or might be otherwise compromised.

AN. **"Continuous emissions monitoring system"** or **"CEMS"** means the total equipment required to obtain a continuous measurement of a gas concentration or emission rate from combustion or industrial processes.

AO. **"Crude oil"** means a combustible, liquid mixture found in natural underground reservoirs consisting of hydrocarbons and other organic compounds, or derived from tar sands, shale and coal.

AP. **"Data check"** means an independent calculation or checking of data conducted by a verifier to recreate the emissions for a discreet source included in an emissions data report.

AQ. **"Electricity generating unit"** or **"EGU"** means any combination of physically connected generator(s), reactor(s), boiler(s), combustion turbine(s), or other prime mover(s) operated together to produce electricity.

AR. **"Electricity generation source"** means:

(1) any combustion device that combusts solid, liquid, or gaseous fuel for the purpose of producing electricity either for sale or for use onsite. This includes cogeneration (combined heat and power) units;

(2) non-combustion CO2 emissions from acid gas scrubbers and acid gas reagent used at electricity generating facilities;

(3) fugitive emissions of HFC from cooling units that support electric power generation;

(4) fugitive CO2 emissions from geothermal electricity generation facilities; or

(5) fugitive CO2 emissions from coal storage at coal-fired electricity generating facilities.

AS. **"Electronics manufacturing"** means the use of fluorinated compounds in the manufacture of semiconductors. Many of these fluorinated compounds are greenhouse gases, and others may potentially generate greenhouse gases as by-products of various manufacturing processes.

AT. **"Emissions"** means the release of greenhouse gases into the atmosphere from sources and processes in a facility.

AU. **"Equipment leak"** means releases of fugitive greenhouse gas emissions from equipment including valves, pump seals, flanges, compressors, sampling connections, and open-ended lines and excluding storage tank emissions.

AV. **"Facility"** means all buildings, plants, structures, installations, and equipment that:

(1) emit or may emit GHG(s);

(2) are located on one or more contiguous or adjacent properties;

(3) are under common control of the same owner(s) or operator(s); and

(4) form a producing unit, function as a single integrated site, or have the same first two digits of the standard industrial classification or same first three digits of the North American industry classification system.

AW. "Feed" means the prepared and mixed materials, which include but are not limited to materials such as limestone, clay, shale, sand, iron ore, mill scale, cement kiln dust, green coke and fly ash, that are fed into a kiln, furnace, or other equipment type but which exclude fuels that are combusted.

AX. "Feedstock" means any raw material that is used in or upgraded by an industrial process but not combusted.

AY. "Flexigas" means a low BTU gaseous fuel produced through the gasification of coke.

AZ. "Fluid catalytic cracking unit" or **"FCCU"** means a process unit in a refinery in which crude oil or a crude oil-derived feedstock is charged and fractured into smaller molecules in the presence of a catalyst, or reacts with a contact material to improve feedstock quality for additional processing, and in which the catalyst or contact material is regenerated by burning off coke and other deposits. The unit includes, but is not limited to, the riser, reactor, regenerator, air blowers, spent catalyst, and all equipment for controlling air pollutant emissions and recovering heat.

BA. "Fluid coking" means a thermal cracking process utilizing the fluidized-solids technique to remove carbon (coke) for continuous conversion of heavy, low-grade oils into lighter products.

BB. "Fossil fuel" means a fuel consisting of the decomposed remains of ancient plants and animals.

BC. "Fuel" means solid, liquid or gaseous combustible material consisting of hydrocarbons and other compounds that is combusted or oxidized for the purpose of producing energy.

B~~C~~D. "Fuel analytical data" means any data collected about the mass, volume, flow rate, heat content, or carbon content of a fuel.

~~BD~~BE. "Fuel gas system" means a system of compressors, piping, knock-out pots, mix drums, sulfur removal units (if necessary) and flaring units (if necessary) that collects fuel gas from one or more sources for treatment (if necessary), and transports it to a stationary combustion unit.

~~BE~~BF. "Fugitive emissions" means the unintended or incidental emissions of greenhouse gases from the transmission, processing, storage, use, or transportation of fossil fuels, greenhouse gases or other substances, including but not limited to HFC emissions from refrigeration leaks, SF6 from electric power distribution equipment, methane from mined coal, and CO2 emitted from geyser steam or fluid used in geothermal generating facilities.

~~BF~~BG. "Full verification" means all verification services as provided in 20.2.101.101 NMAC.

~~BG~~BH. "General stationary combustion source" means any device that combusts solid, liquid, or gaseous fuel for the purpose of generating steam or providing useful heat or energy for industrial, commercial, or institutional use; or reducing the volume of waste by removing combustible matter. General stationary combustion sources include boilers, combustion turbines, engines, incinerators, and process heaters, and any other stationary combustion device the combustion greenhouse gas emissions of which are not specifically addressed under the provisions in 20.2.103 NMAC through 20.2.108 NMAC.

~~BH~~BI. "Generating unit" means any combination of physically connected generator(s), reactor(s), boiler(s), combustion turbine(s), or other prime mover(s) operated together to produce electricity.

~~BI~~BJ. "Global warming potential" or **"GWP factor"** means the radiative forcing of a greenhouse gas, calculated over a time interval of 100 years.

~~BJ~~BK. "GPA" means the gas processors association. Additional information regarding GPA test methods referenced in Parts 20.2.100 NMAC through 20.2.108 NMAC may be found at 20.2.100.12 NMAC.

~~BK~~BL. "Greenhouse gas", or **"GHG"** means any of the following: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).

~~BL~~BM. "High heat value" or **"HHV"** means the amount of heat energy released by the combustion of a unit quantity of a fuel, including the latent heat of vaporization of water embedded in the fuel.

~~BM~~BN. "Hydrocarbons" means chemical compounds consisting entirely of carbon and hydrogen.

~~BN~~BO. "Hydrofluorocarbons" or **"HFC"** means a class of GHGs consisting of hydrogen, fluorine, and carbon and primarily used as refrigerants, specifically those listed in table 100-1 in 20.2.100.700 NMAC.

~~BO~~BP. "Hydrogen plant" means a plant that produces hydrogen with steam hydrocarbon reforming, partial oxidation of hydrocarbons, or other processes.

~~BP~~BQ. "Hydrogen production" means the production of hydrogen gas by steam hydrocarbon reforming, partial oxidation of hydrocarbons, or other transformation of hydrocarbon feedstock. The hydrogen produced may be either transferred offsite or used onsite at petrochemical, ammonia production, refineries, and other plants.

~~BQ~~**BR**. **"Impregnated saw dust"** means saw dust containing resins, preservatives or other substances derived from fossil fuels.

~~BR~~**BS**. **"Independent Peer Reviewer"** means a Lead Verifier within a Verification Body who has not participated in conducting verification services for the current reporting year who provides an independent review of verification services rendered as required in 20.2.101.117 NMAC.

~~BS~~**BT**. **"ISO"** means the international organization for standardization. Additional information regarding ISO standards referenced in Parts 20.2.100 NMAC through 20.2.108 NMAC may be found at 20.2.100.12 NMAC.

~~BT~~**BU**. **"Kiln"** means thermally insulated chambers, or ovens, in which controlled temperature regimes are produced, used in the production of clinker, lime and other products, and which includes any associated preheater or precalciner devices.

~~BU~~**BV**. **"Lead production"** means the two primary production processes used to produce lead from lead concentrates, which are the sintering/smelting process and the direct smelting process. In addition, secondary production or recycling of lead, primarily from scrapped lead acid batteries, is included in the category.

~~BV~~**BW**. **"Less Intensive Verification"** means the verification services provided in interim years between full verifications; less intensive verification only requires risk assessment and data checks on an owner or operator's emissions data report based on the most current sampling plan developed as part of the most current full verification services. This level of verification may only be used if the verifier can provide findings with a reasonable level of assurance.

~~BW~~**BX**. **"Lime kiln dust"** or **"LKD"** means lime dust produced in the course of production of quick lime.

~~BX~~**BY**. **"Lime manufacturing"** means all processes that are used to manufacture quick lime (that is, calcium oxide or calcium-magnesium oxide). Lime is produced via the calcination of limestone or other highly calcareous materials such as dolomite, aragonite, chalk, coral, marble, and shell.

~~BY~~**BZ**. **"Lime type"** means any one of three types of quicklime derived from limestone containing varying percentages of magnesium carbonate. The three lime types are:

(1) high calcium quicklime, which is derived from limestone containing 0 to 5 percent magnesium carbonate;

(2) magnesian quicklime, which is derived from limestone containing 5 to 35 percent magnesium carbonate; and

(3) dolomitic quicklime, which is derived from limestone containing 35 to 46 percent magnesium carbonate.

~~BZ.~~**CA.** **"Liquefied petroleum gas"** or **"LPG"** means a group of gaseous hydrocarbons derived from crude oil refining or natural gas fractionation, and includes propane, propylene, normal butane, butane, butylene, isobutene and isobutylene.

~~CA~~**CB**. **"Low BTU gas"** means gases recovered from casing vents, vapor recovery systems, storage tanks and other components within the production process of crude oil, natural gas and petroleum products.

~~CB~~**CC**. **"Low Heat Value"** or **"LHV"** means the heat energy released through the combustion of a unit quantity of fuel, excluding the latent heat of vaporization of water embedded in the fuel.

~~CC~~**CD**. **"Material misstatement"** means an error or omission, or a collection of errors or omissions, that results in a determination that a verification statement contains a material misstatement under subsection A of 20.2.101.116 NMAC.

~~CD~~**CE**. **"Measurement-based"** means any of the various emission quantification methodologies that involve the determination of emissions by means of direct measurement of the flue gas flow, as well as the concentration of the relevant GHG(s) in the flue gas.

~~CE~~**CF**. **"MMBtu"** or **"MMBTU"** means million Btu.

~~CF~~**CG**. **"Municipal solid waste"** or **"MSW"** means waste products collected from households, commercial/retail units, or institutions.

~~CG~~**CH**. **"N2O"** means nitrous oxide.

C.~~H~~I. **"NAICS"** means the North American industry classification system.

~~CI~~**CJ**. **"Nameplate generating capacity"** means the maximum rated electrical power output of a generator under specific conditions designated by the manufacturer, expressed in megawatts (MW) or kilowatts (kW).

~~CJ~~**CK**. **"Net power generated"** means the gross electricity generation minus station service or unit service electricity requirements, expressed in megawatt hours (MWh) per year. In the case of cogeneration, this value is intended to include internal consumption of electricity for the purposes of a production process, as well as power put on the grid.

~~CK~~**CL. "Nickel and copper metal production"** means process-related sources at nickel and copper metal smelting and refining facilities including these processes that produce CO2 emissions: removal of impurities from nickel or copper ore concentrate using carbonate flux reagents (such as limestone [CaCO3] or dolomite [CaCO3MgCO3]), the use of other reducing agents to extract metals from their oxides (for example, metallurgical coke, coal, natural gas, and so forth), the use of material (for example, coke) for slag cleaning and the consumption of graphite or carbon electrodes in electric arc furnaces. Only those fuels that are used as reducing agents are included in this source category.

~~CL~~**CM. "O2"** means molecular oxygen, the chemical compound consisting of two atoms of oxygen.

~~CM~~**CN. "Off-spec lime"** means calcined or partially calcined limestone that is not sold as quicklime due to its chemical composition, size, sulfur content, or some other parameter. Off-spec lime may be a calcined byproduct/waste sold if it is mixed with another product. Off-spec lime that is not incorporated into another product is a calcined byproduct/waste not sold.

CO. "Perfluorocarbons" or **"PFC"** means synthetic compounds derived from hydrocarbons through the replacement of hydrogen with fluorine atoms.

~~CN~~**CP. "Petrochemical manufacturing"** means the manufacture of petrochemicals, including acrylonitrile, propylene, ethylene, ethylene dichloride, ethylene oxide, or methanol, from feedstocks derived from petroleum, or petroleum and natural gas liquids.

~~CO~~**CQ. "Petroleum"** means crude oil.

~~CP~~**CR. "Petroleum refinery"** or **"refinery"** means any facility engaged in producing gasoline, aromatics, kerosene, distillate fuel oils, residual fuel oils, lubricants, asphalt, or other products through distillation of petroleum or through redistillation, cracking, rearrangement or reforming of unfinished petroleum derivatives.

~~CQ~~**CS. "Petroleum refining"** means the processes used to produce gasoline, aromatics, kerosene, distillate fuel oils, lubricants, asphalt, or other products through distillation of petroleum or through redistillation, cracking, rearrangement or reforming of unfinished petroleum derivatives.

~~CR~~**CT. "Positive verification statement"** means a verification statement rendered by a verification body stating that the verification body can say with reasonable assurance that the submitted emissions data report is free of material misstatement and that the emissions data report conforms to the requirements of 20.2.100 NMAC through 20.2.108 NMAC.

~~CS~~**CU. "Power"** means electricity, except where the context makes clear that another meaning is intended.

~~CT~~**CV. "Pressure swing adsorption"** or **"PSA"** means a gas purification process which selectively concentrates target gas molecules using porous, high surface area solid adsorbents and elevated pressure.

~~CU~~**CW. "Prime mover"** means the type of equipment such as an engine or water wheel that drives an electric generator. Prime movers include, but are not limited to, reciprocating engines, combustion or gas turbines, steam turbines, microturbines, and fuel cells.

~~CV~~**CX. "Process"** means the intentional or unintentional reactions between substances or their transformation, including, but not limited to, the chemical or electrolytic reduction of metal ores, the thermal decomposition of substances, and the formation of substances for use as product or feedstock.

~~CW~~**CY. "Process emissions"** means the emissions from industrial processes (e.g., cement production, ammonia production) involving chemical or physical transformations other than fuel combustion. For example, the calcination of carbonates in a kiln during cement production or the oxidation of methane in an ammonia process results in the release of process CO2 emissions to the atmosphere. Emissions from fuel combustion to provide process heat are not part of process emissions, whether the combustion is internal or external to the process equipment.

~~CX~~**CZ. "Process vent"** means an opening where a gas stream is continuously or periodically discharged during normal operation.

~~CY~~**DA. "PSA off-gas"** means the impurity stream resulting from the sequential PSA pressurization/depressurization purification process.

~~CZ~~**DB. "Pure"** means consisting of at least 97 percent by mass of a specified substance.

~~DA~~**DC. "Purge gas"** means nitrogen, carbon dioxide, liquefied petroleum gas, or natural gas used to maintain a non-explosive mixture of gases in a flare header or provide sufficient exit velocity to prevent regressive flame travel back into the flare header.

~~DB~~**DD. "Quicklime"** or **"quick lime"** means a substance that consists of oxides of calcium and magnesium resulting from the calcination of limestone.

~~DC~~**DE. "Reasonable level of assurance"** for an emissions data report means the report satisfies subsection A of 20.2.101.101 NMAC.

~~DD~~**DF**. **"Recycled"** means a material that is reused or reclaimed.

~~DE~~**DG**. **"Refinery fuel gas"** or **"still gas"** means gas generated at a petroleum refinery or any gas generated by a refinery process unit, and that is combusted separately or in any combination with any type of gas or used as a chemical feedstock.

~~DF~~**DH**. **"Refinery fuel gas combustion"** means combustion by any device that is located at a petroleum refinery and combusts refinery fuel gas, still gas, flexigas, or associated gas.

~~DG~~**DI**. **"Reporting year"** means the calendar year for which emissions are being reported in the emissions data report.

~~DH~~**DJ**. **"Screening value"** or **"SV"** means the instrument reading (ppm) obtained when components, including but not limited to valves, pump seals, connectors, flanges, open-ended lines and other equipment components, are evaluated for leakage as described in United States environmental protection agency (U.S. EPA) method 21 - determination of volatile organic compound leaks**.**

~~DI~~**DK**. **"SF6"** means sulfur hexafluoride.

~~DJ~~**DL**. **"Sinter production"** means a process that produces a fused aggregate of fine iron-bearing materials suited for use in a blast furnace. The sinter machine is composed of a continuous traveling grate that conveys a bed of ore fines and other finely divided iron-bearing material and fuel (typically coke breeze), a burner at the feed end of the grate for ignition, and a series of downdraft windboxes along the length of the strand to support downdraft combustion and heat sufficient to produce a fused sinter product.

~~DK~~**DM**. **"SI units"** means the système international d'unités (international system of units).

~~DL~~**DN**. **"Small refiner"** means any petroleum refiner who owns or operates a refinery that has a crude oil throughput capacity equal to or less than 55,000 barrels per day.

~~DM~~**DO**. **"Solid biomass fuel"** means plants or parts of plants in their natural state or that may have been mechanically or chemically separated, but not chemically altered from the natural state.

~~DN~~**DP**. **"Standard conditions"** or **"standard temperature and pressure"** or **"STP"** means specified reference conditions of temperature and pressure used stating the volume or other properties of a gas. Standard conditions specified in either 20.2.100 NMAC through 20.2.108 NMAC include a temperature of 20 degrees Celsius (68 degrees Fahrenheit) and a pressure of 101.325 kPa (14.696 psi) according to international union of pure and applied chemistry standards, or a temperature of 60 degrees ~~Celsius (32 degrees~~ Fahrenheit) and a~~n absolute~~ pressure of ~~100~~101.325 kPa~~, according to standards of the national institute of standards and technology~~ (14.696 psi).

~~DO~~**DQ**. **"Standard cubic foot"** or **"scf"** means the amount of gas that would occupy a volume of one cubic foot if free of combined water at standard conditions. Where gas volume in units of scf is used in equations, the standard conditions for gas volume should be identical with the standard conditions assumed for other factors in that equation.

~~DP~~**DR**. **"Stationary combustion unit"** means any boiler, heater, furnace, kiln, turbine, internal combustion engine, incinerator or other non-mobile source device that combusts any solid, liquid, or gaseous fuel for purposes of producing useful heat or energy for industrial, commercial, or institutional use; or for purposes of reducing the volume of waste by removing combustible material.

~~DQ~~**DS**. **"Stationary fuel combustion emissions"** means greenhouse gas emissions from stationary combustion units, including cogeneration units.

~~DR~~**DT**. **"Steam reforming"** means the process by which methane and other hydrocarbons in natural gas are converted into hydrogen and carbon monoxide by reaction with steam over a catalyst.

~~DS~~**DU**. **"Storage tank"** means any tank, other container, or reservoir used for the storage of organic liquids, excluding tanks that are permanently affixed to mobile vehicles such as railroad tank cars, tanker trucks or ocean vessels.

~~DT~~**DV**. **"Sulfur recovery unit"** or **"SRU"** means a process unit that recovers elemental sulfur from gases that contain reduced sulfur compounds and other pollutants, usually by a vapor-phase catalytic reaction of sulfur dioxide and hydrogen sulfide.

~~DU~~**DW**. **"Supplemental firing"** means an energy input to the cogeneration facility used only in the thermal process of a topping cycle plant, or in the electricity generating or manufacturing process of a bottoming cycle plant.

~~DV~~**DX**. **"TAR"** means the intergovernmental panel on climate change third assessment report: climate change 2001.

~~DW~~**DY**. **"Topping cycle"** means operation of a cogeneration unit in which the energy input to the system is first used to produce electricity, and at least some of the reject heat from the electricity production process is then used to provide useful thermal output.

~~DX~~**DZ**. **"Total organic carbon"** or **"TOC"** means a measure of the amount of carbon in an organic compound and is used as a measure of water quality.

~~DY~~**EA**. **"Useful thermal output"** means the thermal energy made available in a cogeneration system for use in any industrial or commercial process, heating or cooling application, or delivered to other end users, i.e., total thermal energy made available for processes and applications other than electrical generation.

~~DZ~~**EB**. **"Verification"** means a systematic, independent and documented process for the evaluation of an operator's emissions data report against the reporting procedures and methods for calculating and reporting GHG emissions in 20.2.100 NMAC and 20.2.102 NMAC through 20.2.108 NMAC.

~~EA~~**EC**. **"Verification body"** means a firm accredited by the Accreditation and Verification Authority and recognized by the department or its designee, that is able to render a verification statement and provide verification services for operators subject to reporting under 20.2.100 NMAC through 20.2.108 NMAC.

~~EB~~**ED**. **"Verification cycle"** means three years of verification activities. Each verification cycle must include at least one year of full verification, and may include two years of less intensive verification, if eligible.

~~EC~~**EE**. **"Verification services"** means services provided during verification as specified in 20.2.101 NMAC, including but not limited to reviewing an operator's emissions data report, verifying its accuracy according to the standards specified in ~~this article~~20.2.100 NMAC through 20.2.108 NMAC, assessing the operator's compliance with this rule, and submitting a verification opinion to the department.

~~ED~~**EF**. **"Verification statement"** means the final written declaration rendered by a verification body attesting whether an operator's emissions data report is free of material misstatement and whether the emissions data report conforms to the requirements of 20.2.100 NMAC through 20.2.108 NMAC.

~~EE~~**EG**. **"Verification team"** means all of those working for a verification body, including all subcontractors, to provide verification services for an operator.

~~EF~~**EH**. **"Verifier"** means an individual employed or contracted by an accredited verification body who has been deemed competent by the verification body to carry out verification services as specified in 20.2.101 NMAC.

~~EG~~**EI**. **"Volatile organic compound"** or **"VOC"** means an organic compound containing at least one carbon atom and which evaporates or vaporizes readily under normal conditions, participates in atmospheric photochemical reactions, and excludes carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate.

~~EH~~**EJ**. **"Waste-derived fuel"** means a fuel typically derived from waste(s) and generally used as a substitute for conventional fossil fuels. Waste-derived fuels can include substances derived from fossil fuels such as waste oil, plastics, or solvents. Waste-derived fuels can also include fuels containing fractions of both fossil fuels and biomass, such as municipal solid waste, tires, dried sewage or impregnated saw dust. Waste-derived fuel does not include fuels which are pure biomass.

~~EI~~**EK**. **"Wastewater"** means any process water which contains oil, emulsified oil, or other organic compounds that are not recycled or otherwise used in a facility.

~~EJ~~**EL**. **"Wastewater emissions"** means releases of greenhouse gas emissions from wastewater and on-site wastewater treatment.

~~EK~~**EM**. **"Wastewater separator"** means equipment used to separate oils and water from locations downstream of process drains.

~~EL~~**EN**. **"Zinc production"** means the three primary production processes used to produce zinc, which are, electro-thermic distillation, pyrometallurgical, and electrolytic. In addition, secondary zinc production is also included in this category.

[20.2.100.7 NMAC - N, 01/01/10]

20.2.100.8 SEVERABILITY: If any provision of this part, or the application of such provision to any person or circumstance, is held invalid, the remainder of this part, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.

[20.2.100.8 NMAC - N, 01/01/10]

20.2.100.9 CONSTRUCTION: This part shall be liberally construed to carry out its purpose.

[20.2.100.9 NMAC - N, 01/01/10]

20.2.100.10 SAVINGS CLAUSE: Repeal or supersession of prior versions of this part shall not affect any administrative or judicial action initiated under those prior versions.

[20.2.100.10 NMAC - N, 01/01/10]

20.2.100.11 COMPLIANCE WITH OTHER REGULATIONS: Compliance with this part does not relieve a person from the responsibility to comply with any other applicable federal, state, or local regulations. [20.2.100.11 NMAC - N, 01/01/10]

~~**20.2.100.12 INCORPORATION BY REFERENCE:** The following documents shall be incorporated by reference into this part.~~

20.2.100.12 AVAILABILITY OF CITED DOCUMENTS: The following documents are cited in one or more of Parts 20.2.100 NMAC through 20.2.108 NMAC. In addition to being available from the following entities, the documents may be viewed at the New Mexico environment department air quality bureau [located at 1301 Siler Road, Building B, Santa Fe NM 87507].

A. The following materials are available for purchase from the ~~following addresses:~~ American society for testing and material (ASTM~~),~~) [located at 100 Barr Harbor Drive, P.O. Box ~~CB700~~C700, West Conshohocken, Pennsylvania 19428~~-B2959; and~~2959, or www.astm.org]; or the university microfilms international~~,~~ [located at 300 North Zeeb Road, Ann Arbor, Michigan 48106~~:~~].

(1) ASTM C0025-06 Standard Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime

(2) ASTM C0114-09 Standard Test Methods for Chemical Analysis of Hydraulic Cement

(3) ASTM C1301-95~~(~~ (reaffirmed 2001) Standard Test Method for Major and Trace Elements in Limestone and Lime by Inductively Coupled Plasma-Atomic Emission Spectroscopy and Atomic Absorption

(4) ASTM C1271-99~~(~~ (reaffirmed 2006) Standard Test Method for X-ray Spectrometric Analysis of Lime and Limestone

(5) ASTM D0240-02~~(~~ (reaffirmed 2007) Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter

(6) ASTM D0388-05, "standard classification of coals by rank"

(7) ASTM D1826-94~~(~~ (reaffirmed 2003) Standard Test Method for Calorific (Heating) Value of Gases in Natural Gas Range by Continuous Recording Calorimeter

(~~7~~8) ASTM D1945-03 Standard Test Method for Analysis of Natural Gas by Gas Chromatography

(~~8~~9) ASTM D1946-90~~(~~ (reaffirmed 2006) Standard Practice for Analysis of Reformed Gas by Gas Chromatography

(~~9~~10) ASTM D2502-04 Standard Test Method for Estimation of Molecular Weight (Relative Molecular Mass) of Petroleum Oils From Viscosity Measurements

(~~10~~11) ASTM D2503-92~~(~~ (reaffirmed 2007) Standard Test Method for Relative Molecular Mass (Molecular Weight) of Hydrocarbons by Thermoelectric Measurement of Vapor Pressure

(~~11~~12) ASTM D3238-95~~(~~ (reaffirmed 2005) Standard Test Method for Calculation of Carbon Distribution and Structural Group Analysis of Petroleum Oils by the n-d-M Method

(~~12~~13) ASTM D3588-98~~(~~ (reaffirmed 2003) Standard Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels

(~~13~~14) ASTM D4809-06 Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter (Precision Method)

(~~14~~15) ASTM D4891-89~~(~~ (reaffirmed 2006) Standard Test Method for Heating Value of Gases in Natural Gas Range by Stoichiometric Combustion

(~~15~~16) ASTM D5291-02~~(~~ (reaffirmed 2007) Standard Test Methods for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Petroleum Products and Lubricants

(~~16~~17) ASTM D5373-08 Standard Test Methods for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Laboratory Samples of Coal

(~~17~~18) ASTM D5468-02~~(~~ (reaffirmed 2007) Standard Test Method for Gross Calorific and Ash Value of Waste Materials

(~~18~~19) ASTM D5865-07A Standard Test Method for Gross Calorific and Ash Value of Waste Materials

(~~19~~20) ASTM D6866-08 Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis

(~~20~~21) ASTM D7459-08 Standard Practice for Collection of Integrated Samples for the Speciation of Biomass (Biogenic) and Fossil-Derived Carbon Dioxide Emitted from Stationary Emissions Sources

B. The following materials and other ASME standards are available for purchase from the American society of mechanical engineers (ASME~~),~~) [located at 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900~~: ASME Power Test Code~~, or www.asme.org]: ASME PTC 4 ~~(~~- 1988 Fired Steam Generators~~, 1998)~~.

C. The following materials are available for purchase from the American national standards institute (ANSI~~),~~) [located at 25 West 43rd Street, Fourth Floor, New York, New York 10036~~:~~, or www.ansi.org].

(1) ISO 14065:2007 greenhouse gases – requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition.

(2) ISO 17011:2004 conformity assessment – general requirements for accreditation bodies accrediting conformity assessment bodies.

D. The following materials are available for purchase from the ~~following address:~~ gas processors association (GPA~~), ~~) [located at 6526 East 60th Street, Tulsa, Oklahoma 74143, or www.gpaglobal.org]: Gas processors association (GPA) standard 2261-00 "analysis for natural gas and similar gaseous mixtures by gas chromatography."

E. The following document may be viewed at the department's air quality bureau [at the address above] or obtained from the California air resources board [at http://www.arb.ca.gov/fugitive/fugitive.htm]: California implementation guidelines for estimating mass emissions of fugitive hydrocarbon leaks at petroleum facilities, California air pollution control officers association (CAPCOA) and California air resources board (ARB), February 1999.

F. ~~Control of emissions from refinery flares, Rule 118, south coast air quality management district, amended November 4, 2005.~~The following materials are available for purchase from the U.S. government printing office [at the following address: U.S. government printing office, post office box 979050, Saint Lewis, Missouri, 63197-9000], and may be downloaded without charge [at www.bookstore.gpo.gov]:

(1) 40 CFR Part 60, including 40 CFR Part 60, Appendix A, Method 21

(2) 40 CFR Part 75

G. ~~U.S. EPA TANKS version 4.09D, US~~The following materials may be downloaded without charge from the U.S. environmental protection agency [at www.epa.gov/ttn/chief/software/tanks]: U.S. EPA TANKS version 4.09D, October 2005.

-[20.2.100.12 NMAC - N, 01/01/10]

20.2.100.13 to 20.2.100.99 [RESERVED]

20.2.100.100 APPLICABILITY:

A. **Thresholds**. Except as provided under paragraph C of this section 20.2.100.100 NMAC, the following applicability thresholds shall apply.

(1) For GHG emitted in calendar year 2010:

(a) Any owner or operator of a facility that emits 25,000 metric tons CO2e or more in combined emissions from the source categories specified in 20.2.102 NMAC through 20.2.108 NMAC shall be subject to the requirements of this part; and

(b) Any owner or operator of a facility that emits 10,000 metric tons or more, but less than 25,000 metric tons, of CO2e in combined emissions from the source categories specified in 20.2.102 NMAC through 20.2.108 NMAC may voluntarily report such emissions under this part. The contents of such emissions report shall be subject to the requirements of this part.

(2) Any owner or operator of a facility that in calendar year 2011 or any subsequent year emits 10,000 metric tons CO2e or more per year in combined emissions from the source categories specified in 20.2.102 NMAC through 20.2.108 NMAC shall be subject to the requirements of this part.

B. **Calculation of Threshold Emissions**. To calculate GHG emissions for comparison to the ~~10,000 metric ton CO2e per year~~ emission ~~threshold~~thresholds in Subsection A of 20.2.100.100 NMAC, the owner or operator shall calculate annual CO2e emissions, as follows.

(1) Estimate the annual emissions of CO2, CH4, N2O, HFC, PFC, and SF6 in metric tons for each unit, process, activity, or operation for which emission calculation methodologies are provided in 20.2.102 NMAC through 20.2.108 NMAC. The GHG emissions shall be calculated using methodologies specified in each applicable section.

(2) For stationary combustion units, carbon dioxide emissions from the combustion of biomass fuels shall be included in the calculations, with the following exceptions.

(a) Until such time as the department has made a determination regarding the carbon neutrality of any biomass fuels, a maximum of 15,000 metric tons of carbon dioxide emissions from the combustion of pure

solid biomass fuel may be excluded from calculation of GHG emissions for comparison to the 10,000 metric ton CO2e per year emission threshold in Subsection A of 20.2.100.100 NMAC, provided that total GHG emissions including emissions from solid biomass fuel are less than 25,000 metric tons CO2e.

(b) After such time as the department has made a determination regarding the carbon neutrality of any biomass fuels, the carbon dioxide emissions from the combustion of those fuels so determined to be carbon neutral may be excluded from calculation of GHG emissions for determining whether the 10,000 metric tons CO2e per year emission threshold in Subsection A of 20.2.100.100 NMAC has been met.

(3) Sum the total facility emissions for each GHG and calculate the metric tons of CO2e using equation 100-1 below.

$$CO_2e = \sum_{i=1}^{n} GHG_i \text{ x } GWP_i \qquad \textbf{Equation 100-1}$$

Where:

CO_2e = Carbon dioxide equivalent, metric tons/year.

GHG_i = Mass emissions of each greenhouse gas *i* emitted, metric tons/year.

GWP_i = Global warming potential for each greenhouse gas *i* from Table 100-1 in 20.2.100.700 NMAC.

n = The number of greenhouse gases emitted.

(4) For purposes of determining if an emission threshold has been met or exceeded, any CO2 that is captured for on-site use, on-site storage, or transfer off-site must be included in the emissions total.

C. Facilities that Reduce Emissions Below the Threshold. If the operations of a facility that is subject to this rule change such that emissions fall below 10,000 metric tons CO2e per year, then the following reporting requirements shall apply.

(1) If, prior to such emission reduction, the emissions report was subject to the verification requirements of 20.2.101 NMAC; then the owner or operator shall continue to submit emission reports until reported emissions are below 10,000 metric tons CO2e per year for a minimum of 3 consecutive years. If reported ~~emission~~ emissions are less than 10,000 metric tons CO2 per year during 3 consecutive years, then the owner or operator shall be exempted from further reporting until CO2e emissions again exceed 10,000 metric tons in any future calendar year.

(2) If, prior to such emission reduction, the emissions report was not subject to the verification requirements of 20.2.101 NMAC, then the owner or operator shall submit to the department a signed statement certifying that emissions are less than 10,000 metric tons CO2e during the prior year. After certifying that emissions are below 10,000 metric tons CO2e per year for 3 consecutive years, the owner or operator shall be exempted from further reporting until CO2e emissions again exceed 10,000 metric tons in any future calendar year.

(3) Notwithstanding the requirements of Paragraphs 1 and 2 of this subsection, a facility shall continue to submit an annual emissions report even if emissions fall below the reporting threshold for each year that the facility must surrender allowances under any applicable cap and trade program.

D. Demonstrations of Non-Applicability. Upon written request by the department, the owner or operator of any facility shall submit a demonstration that emissions have not exceeded one or more of the applicability criteria specified in this section in any year since 2010. Such demonstration shall be provided to the department within 20 working days of receipt of a written request.

E. Facilities Subject to Federal GHG Emissions Reporting Requirements. The provisions of 20.2.100.~~13~~101 NMAC shall apply to any owner or operator of any facility that is subject to federal mandatory greenhouse gas emissions reporting requirements.

[20.2.100.100 NMAC - N, 01/01/10]

20.2.100.101 FEDERAL GREENHOUSE GAS REPORTING:

A. The owner or operator of any facility submitting a greenhouse gas emissions report to the U.S environmental protection agency pursuant to federal mandatory reporting requirements shall submit to the department the same information in the report submitted to the U.S. environmental protection agency.

B. Greenhouse gas emissions reports required by Subsection A shall be submitted to the department no later than the date they are required by federal regulation to be submitted to the U.S. environmental protection agency.

C. The department may deem greenhouse gas emissions reports submitted pursuant to this section to have met the requirements of reporting under this part and parts 20.2.102 NMAC through 10.2.108 NMAC, provided that all applicable requirements of 20.2.101 NMAC (Greenhouse Gas Reporting – Verification Requirements) are met.

[20.2.100.101 NMAC - N, 01/01/10]

20.2.100.102 to 20.2.100.199 [RESERVED]

20.2.100.200 GENERAL GREENHOUSE GAS REPORTING REQUIREMENTS AND SCHEDULE:

A. General. Owners or operators that are subject to this rule must submit an annual GHG emissions report. Owners and operators must collect data; calculate GHG emissions; and follow the procedures for quality assurance, missing data, recordkeeping, and reporting as specified in 20.2.100 NMAC through 20.2.108 NMAC as applicable, except as provided in Subsection D of this section.

(1) A facility that commenced operation before January 1, 2010, must report emissions beginning in 2011 for GHGs emitted in calendar year 2010.

(2) A new facility that commences operation on or after January 1, 2010, must report emissions for the first calendar year in which the facility operates, beginning with the first operating month and ending on December 31 of that year. Each subsequent annual report must cover emissions for the calendar year, beginning on January 1 and ending on December 31.

B. Reporting and Verification Schedule.

(1) Annual GHG emissions reports must be submitted to the department by April 1 of each year for emissions in the previous calendar year.

(2) Reporters subject to the verification requirements of 20.2.101 NMAC~~, must~~ or voluntarily meeting the requirements of 20.2.101 NMAC shall complete their verification process, including submittal of a verification statement to the department, according to the following schedule:

(a) for reporting years 2010 through 2011, September 1 of the year following the reporting year; and

(b) for reporting years 2012 and later, ~~April~~June 1 of the year following the reporting year.

C. Submission of GHG Emissions Report. The annual GHG emissions report must be submitted to the department in the format specified by the department.

D. For the 2010 reporting year, the owner or operator may submit a report that applies best available alternative data and methods to develop emissions estimates, provided that the owner or operator demonstrates to the department that additional time is required to install equipment and establish procedures required by 20.2.100 NMAC through 20.2.108 NMAC. The owner or operator shall submit reports for 2011 and subsequent reporting years that meet all specifications in 20.2.100 NMAC through 20.2.108 NMAC.

E. Simplified Emission Calculation Methods for De Minimis Sources. The owner or operator may elect to designate as de minimis one or more sources or pollutants that collectively emit no more than 3 percent of the facility's total CO2e emissions, but not to exceed 20,000 metric tons CO2e. The owner or operator may estimate emissions for these de minimis sources using alternative methods to those required to be used by 20.2.102 NMAC through 20.2.108 NMAC. If verification of the emissions report is required by this rule, then the selection of any alternative GHG calculation method is subject to the concurrence of the verification team that the use of such methods provides reasonable assurance that the emissions so designated do not exceed the applicable de minimis limits. The operator shall separately identify and include in the emissions data report the emissions from designated de minimis sources.

F. To ensure accuracy of reported data and the ability to conduct audits or verifications of each emissions data report, the owner or operator shall establish and maintain data acquisition and handling activities that provide for the transparency and verifiability of emissions calculations and supporting information consistent with 20.2.100.400 NMAC.

G. GHG Emissions Report Revisions.

(1) The owner or operator shall maintain documentation to support any revisions made to a previously submitted annual GHG emissions report. Documentation for all revisions shall be retained by the operator for 7 years.

(2) If, after the verification deadline, a report subject to verification is found to contain an error, or accumulation of errors, greater than 5.0 percent of the total CO2e emissions reported, the owner or operator shall revise and resubmit an annual GHG emissions report within 60 days of the finding. To the extent possible, the revised report must correct all identified errors. A revised report will be accepted only if verified according to

20.2.101 NMAC and approved by the department. The department will send notification of approval or disapproval and an explanation of the reasons for any disapproval within 60 days of receipt of the revised report.

(3) If, after the report submittal deadline, a report not subject to verification is found to contain an error, or accumulation of errors, greater than 5.0 percent of the total CO2e emissions reported, the owner or operator shall revise and resubmit an annual GHG emissions report within 30 days of the finding. To the extent possible, the revised report must correct all identified errors. A revised report will be accepted only if approved by the department. The department will send notification of approval or disapproval and an explanation of the reasons for any disapproval within 60 days of receipt of the revised report.

(4) An owner or operator that voluntarily chooses to correct errors of 5.0 percent or less in total CO2e emissions reported may do so according to the following requirements:

(a) for reports subject to verification, a revised report will be accepted only if verified according to 20.2.101 NMAC and approved by the department; or

(b) for reports not subject to verification, a revised report will be accepted if approved by the department.

H. Where this rule specifies a choice between use of a fuel-based or mass balance-based calculation or use of a continuous emissions monitoring system (CEMS) to calculate CO2 emissions, the owner or operator shall make this choice and continue to use the method chosen for all future emissions data reports, unless the use of the alternative calculation method is approved in advance by the department.

[20.2.100.200 NMAC - N, 01/01/10]

20.2.100.201 to 20.2.100.299 [RESERVED]

20.2.100.300 CONTENTS OF THE GREENHOUSE GAS EMISSIONS REPORT: Each annual GHG emissions report shall contain the following information.

A. Facility name, identification number or numbers, physical address, mailing address, and NAICS code.

B. Reporting year.

C. Date of report submittal.

D. Total facility emissions aggregated from all applicable source categories in 20.2.102 NMAC through 20.2.108 NMAC expressed in metric tons of CO2e calculated using equation 100-1 of 20.2.100.100 NMAC, excluding emissions from CO2 that is captured and CO2 emissions from the combustion of biomass and biomass-derived fuels, which are reported separately.

E. Total facility emissions of CO2 from the combustion of biomass and biomass-derived fuels.

F. Total annual mass of CO2 captured for on-site use, on-site storage, or transfer off site, in metric tons.

H. Emissions from each applicable source category in 20.2.102 NMAC through 20.2.108 NMAC, expressed in metric tons per year of CO2, CH4, N2O, HFC, PFC, and SF6. CO2 emissions from the combustion of biomass and biomass-derived fuels shall be reported separately.

I. Emissions and other data for individual units, processes, activities, and operations as specified for each source category in 20.2.102 NMAC through 20.2.108 NMAC.

J. Emission factors developed or measured by the operator using approved source testing as provided under 20.2.102 NMAC through 20.2.108 NMAC. Combustion emission factors shall be provided in units of emissions per amount of fuel consumed, where fuel is reported in the units specified in this regulation.

K. Mass emissions from each designated de minimis source or pollutant, reported in metric tons per year of each GHG for which an alternative emission calculation method is used.

L. Name and contact information including e-mail address and telephone number of the person primarily responsible for preparing and submitting the emissions report.

M. A signed and dated statement provided by the owner or operator, or their designated representative, certifying that the report has been prepared in accordance with this rule and that, subject to verification, the statements and information contained in the emissions data report are true, accurate, and complete to the best of their knowledge.

[20.2.100.300 NMAC - N, 01/01/10]

20.2.100.301 to 20.2.100.399 [RESERVED]

20.2.100.400 DOCUMENT RETENTION AND RECORD-KEEPING REQUIREMENTS:

A. The owner or operator shall establish and maintain procedures for document retention and record keeping. The owner or operator shall retain all documents regarding the design, development and maintenance of the GHG inventory in paper, electronic or other usable format for a period of not less than 7 years following submission of each emissions data report. The retained documents, including GHG emissions data, shall be sufficient to allow for the verification of each emissions data report.

B. Upon request by the department, the owner or operator shall provide within 10 working days all documents and data used to develop an emissions data report.

C. In addition to information submitted as part of the emissions data report, the owner or operator shall retain, at a minimum, the following information, if applicable, for at least 7 years after the submission of the report:

(1) a list of all GHG sources (i.e., units, operations, processes, and activities) included in the emission estimates;

(2) all records and documents used to calculate emissions for each source, categorized by process and fuel or material type;

(3) documentation of the process for collecting emissions data;

(4) any GHG emissions calculations and methods used;

(5) all emission factors used for emission estimates, including documentation for any factors not provided in the rule;

(6) all input data used for emission estimates;

(7) documentation of biomass fractions for specific fuels;

(8) all other data submitted to the department under this rule, including the GHG emissions report;

(9) all computations made to gap-fill missing data;

(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 GHG emissions report;

(12) a log to be prepared for each reporting year, beginning January 1, documenting all procedural changes made in GHG accounting methods and changes to instrumentation for GHG emissions estimation; and

(13) documentation of the data acquisition and handling activities required by Subsection F of 20.2.100.200 NMAC.

D. For measurement-based methodologies, the following information, if applicable, also must be retained for at least 7 years after the submission of the emissions data report:

(1) list of all emission points monitored;

(2) collected monitoring data;

(3) any quality assurance and quality control information collected in accordance with the data acquisition and handling activities required by Subsection F 20.2.100.200 NMAC;

(4) a detailed technical description of the continuous measurement system, including documentation of any findings and approvals by federal, state or local agencies;

(5) raw and aggregated data from the continuous measurement system;

(6) a log book of all system down-times, calibrations, servicing, and maintenance of the continuous measurement system; and

(7) documentation of any changes in the continuous measurement system over time.

[20.2.100.400 NMAC - N, 01/01/10]

20.2.100.401 to 20.2.100.499 [RESERVED]

20.2.100.500 COMPLIANCE AND ENFORCEMENT:

A. Submission of false or misleading information to the department or a verification body shall constitute a single, separate violation of the requirements of ~~this article~~20.2.100 NMAC through 20.2.108 NMAC for each day after the information has been received by the department or verification body.

B. Each violation of this rule shall constitute a single, separate violation for each day the violation continues.

[20.2.100.500 NMAC - N, 01/01/10]

20.2.100.501 to 20.2.100.599 [RESERVED]

20.2.100.600 DESIGNATED REPRESENTATIVE:

A. General. Each owner or operator of a facility that is subject to this rule, shall select a designated representative that is responsible for certifying and submitting GHG emissions reports under this reporting rule.

B. Authorization of a Designated Representative. The designated representative of the facility shall be selected by a certificate of representation agreement that is signed by the designated representative and owners or operators of the facility. The designated representative must be an individual having responsibility for the overall operation of the facility or activity such as the position of the plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company.

C. Responsibility of the Designated Representative.

(1) The designated representative of the facility shall represent and by any representations, actions, inactions, or submissions, legally bind each owner and operator in all matters pertaining to this rule.

(2) Each GHG emission report submitted under this rule shall be signed by the designated representative and must contain the following certification statement: "I have been authorized to make this submission on behalf of the owners and operators of the facility. I certify under penalty of law that I have personally examined the information submitted in this document. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment."

D. Changing a Designated Representative. The designated representative may be changed at any time upon submission of a superseding certificate of representation. Notwithstanding any such change, all representations, actions, inactions, and submissions by the previous designated representative before time of the superseding certificate of representation shall continue to be binding on the owners and operators.

E. Changes in Owners or Operators. In the event of any change in ownership of the facility, any new owner or operator shall be deemed to be bound by the representations, actions, inactions, and submissions of the designated representative of the facility until such time as the designated representative is changed.

F. Certificate of Representation. The owner or operator shall submit a certificate of representation to the department and shall keep a copy on location at the facility. The certificate shall include the following information:

(1) identification of the facility for which the certificate of representation is submitted;

(2) the name, address, e-mail address (if any), telephone number, and facsimile transmission number (if any) of the designated representative;

(3) a list of the owners and operators;

(4) certification statements that the actions of the designated representative with respect to this rule are binding on the owners and operators, and that the designated representative has the necessary authority to carry out duties and responsibilities on behalf of the owners and operators; and

(5) the signature of the designated representative and owner(s) and operator(s), and the dates signed.

[20.2.100.600 NMAC - N, 01/01/10]

20.2.100.601 to 20.2.100.699 [RESERVED]

20.2.100.700 TABLE 100-1: GLOBAL WARMING POTENTIAL FACTORS FOR GREENHOUSE GASES.

Common Name	Formula	Chemical Name	GWP
Carbon dioxide	CO2		1
Methane	CH4		21
Nitrous oxide	N2O		310
Sulfur hexafluoride	SF6		23,900
Hydrofluorocarbons (HFCs)			
HFC-23	CHF3	trifluoromethane	11,700
HFC-32	CH2F2	difluoromethane	650
HFC-41	CH3F	fluoromethane	150
HFC-43-10mee	C5H2F10	1,1,1,2,3,4,4,5,5,5- decafluoropentane	1,300
HFC-125	C2HF5	pentafluoroethane	2,800

HFC-134	C2H2F4	1,1,2,2-tetrafluoroethane	1,000
HFC-134a	C2H2F4	1,1,1,2-tetrafluoroethane	1,300
HFC-143	C2H3F3	1,1,2-trifluoroethane	300
HFC-143a	C2H3F3	1,1,1-trifluoroethane	3,800
HFC-152	C2H4F2	1,2-difluoroethane	43
HFC-152a	C2H4F2	1,1-difluoroethane	140
HFC-161	C2H5F	fluoroethane	12
HFC-227ea	C3HF7	1,1,1,2,3,3,3- heptafluoropropane	2,900
HFC-236cb	C3H2F6	1,1,1,2,2,3-hexafluoropropane	1,300
HFC-236ea	C3H2F6	1,1,1,2,3,3-hexafluoropropane	1,200
HFC-236fa	C3H2F6	1,1,1,3,3,3-hexafluoropropane	6,300
HFC-245ca	C3H3F5	1,1,2,2,3-pentafluoropropane	560
HFC-245fa	C3H3F5	1,1,1,3,3-pentafluoropropane	950
HFC-365mfc	C4H5F5	1,1,1,3,3-pentafluorobutane	890
Perfluorocarbons (PFCs)			
Perfluoromethane	CF4	tetrafluoromethane	6,500
Perfluoroethane	C2F6	hexafluoroethane	9,200
Perfluoropropane	C3F8	octafluoropropane	7,000
Perfluorobutane	C4F10	decafluorobutane	7,000
Perfluorocyclobutane	c-C4F8	octafluorocyclobutane	8,700
Perfluoropentane	C5F12	dodecafluoropentane	7,500
Perfluorohexane	C6F14	tetradecafluorohexane	7,400

[20.2.100.700 NMAC - N, 01/01/10]

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 2 AIR QUALITY (STATEWIDE)
PART 101 GREENHOUSE GAS REPORTING - VERIFICATION REQUIREMENTS

20.2.101.1 ISSUING AGENCY: Environmental Improvement Board.
[20.2.101.1 NMAC - N, 01/01/10]

20.2.101.2 SCOPE: All persons who own or operate an applicable source of greenhouse gas emissions in the geographic areas within the jurisdiction of the environmental improvement board, and all persons providing verification services for greenhouse gas emissions reports submitted to the department.
[20.2.101.2 NMAC - N, 01/01/10]

20.2.101.3 STATUTORY AUTHORITY: Environmental Improvement Act, NMSA 1978, Section 74-1-8(A)(4), and Air Quality Control Act, NMSA 1978, Sections 74-2-1 et seq., including specifically Sections 74-2-5(B)(1) & 74-2-(5)(C)(5)(d) & (e).
[20.2.101.3 NMAC - N, 01/01/10]

20.2.101.4 DURATION: Permanent.
[20.2.101.4 NMAC - N, 01/01/10]

20.2.101.5 EFFECTIVE DATE: January 1, 2010 except where a later date is cited at the end of a section.
[20.2.101.5 NMAC - N, 01/01/10]

20.2.101.6 OBJECTIVE: The objective of this part is to establish requirements for the verification of annual reports of greenhouse gas emissions to the department.
[20.2.101.6 NMAC - N, 01/01/10]

20.2.101.7 DEFINITIONS: The definitions included in 20.2.100 NMAC shall apply to the terms used in this part. The definitions included in 20.2.2 NMAC shall apply to the terms used in this part, unless such term is defined in 20.2.100 NMAC.
[20.2.101.7 NMAC - N, 01/01/10]

20.2.101.8 SEVERABILITY: If any provision of this part, or the application of such provision to any person or circumstance, is held invalid, the remainder of this part, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.
[20.2.101.8 NMAC - N, 01/01/10]

20.2.101.9 CONSTRUCTION: This part shall be liberally construed to carry out its purpose.
[20.2.101.9 NMAC - N, 01/01/10]

20.2.101.10 SAVINGS CLAUSE: Repeal or supersession of prior versions of this part shall not affect any administrative or judicial action initiated under those prior versions.
[20.2.101.10 NMAC - N, 01/01/10]

20.2.101.11 COMPLIANCE WITH OTHER REGULATIONS: Compliance with this part does not relieve a person from the responsibility to comply with any other applicable federal, state, or local regulations.
[20.2.101.11 NMAC - N, 01/01/10]

20.2.101.12 INCORPORATION BY REFERENCE: Each document listed in 20.2.100.12 NMAC and cited in this part shall be incorporated by reference into this part.
[20.2.101.12 NMAC - N, 01/01/10]

20.2.101.13 to 20.2.101.99 [RESERVED]

20.2.101.100 APPLICABILITY AND SCOPE OF VERIFICATION REQUIREMENTS:

A. Except as provided in Subsections B through D of this section, owners or operators are required to obtain annual verification for a facility that in 2011 or any calendar year thereafter emits 25,000 metric tons CO2e or more per year in combined emissions from one or more of the source categories specified in 20.2.100 NMAC through 20.2.108 NMAC ~~in any calendar year starting on or after 2010~~.

B. When the operation of a facility subject to the requirements of this section is changed such that the operator has reported less than 25,000 metric tons of CO2e emissions for a calendar year, the operator shall obtain verification of annual emissions reports for the lesser of three subsequent calendar years or for those years remaining in the current compliance period. If CO2e emissions of a facility subject to the requirements of this section again exceed 25,000 metric tons in any calendar year the provisions of Subsection A of this section apply.

C. Calculation of GHG emissions for comparison to the 25,000 metric tons CO2e threshold in Subsection B of 20.2.101.100 NMAC shall be performed as specified in 20.2.100.100 NMAC. Carbon dioxide emissions from the combustion of biomass fuels shall be included in the determination regarding verification applicability, with the following exceptions.

(1) Until such time as the department has made a determination regarding the carbon neutrality of any biomass fuels, a maximum of 15,000 metric tons of carbon dioxide emissions from the combustion of pure solid biomass fuel may be excluded from calculation of GHG emissions for comparison to the 25,000 metric ton CO2e per year verification threshold in Subsection A of this section.

(2) After such time as the department has made a determination regarding the carbon neutrality of any biomass fuels, the carbon dioxide emissions from the combustion of those fuels determined to be carbon neutral may be excluded from calculation of GHG emissions for determining whether the 25,000 metric tons CO2e per year verification threshold in Subsection A of this section has been met.

D. Notwithstanding Subsections B and C of this section, any facility subject to a cap-and-trade program for CO2e emissions established by the department shall obtain verification of reported annual emissions.

E. Owners or operators may exclude from the scope of verification those carbon dioxide emissions from the combustion of biomass fuels that the department has deemed carbon neutral.

F. Owners or operators of any facility not required to obtain annual verification as specified in this section may voluntarily obtain verification of their emissions report, provided that all requirement related to verification and other reporting requirements in 20.2.100 NMAC through 20.2.108 NMAC are met.

[20.2.101.100 NMAC - N, 01/01/10]

20.2.101.101 REQUIREMENTS FOR ANNUAL VERIFICATION OF EMISSIONS DATA REPORTS:

A. Verification bodies shall conduct verification processes and design verification procedures to determine whether there is a reasonable level of assurance for each separate emissions data report every year of the verification cycle. The verification team shall find that there is a reasonable level of assurance for an emissions data report only if the report:

(1) contains no material misstatement; and

(2) conforms to the requirements of 20.2.100 NMAC through 20.2.108 NMAC.

B. The verification body must provide verification services in compliance with this part.

C. Facility owners or operators required to obtain annual verification shall be subject to full verification requirements in the first year that verification is required for an emissions data report. Upon completion of a positive verification statement under full verification requirements, the facility owner or operator may be eligible for two years of less intensive verification services as described in section 20.2.100.107 NMAC. This cycle may be repeated in subsequent three-year cycles; however, full verification requirements shall apply at least once every three years.

D. Facility owners or operators required to obtain annual verification shall obtain full verification services if any of the following apply:

(1) there has been a change in the verification body from the previous year; or

(2) a verification body issued an adverse verification statement for that facility's previous year's emissions data report.

[20.2.101.101 NMAC - N, 01/01/10]

20.2.101.102 ACCREDITATION REQUIREMENTS FOR VERIFICATION BODIES:

A. The accreditation requirements specified in this section shall apply to all verification bodies providing verification services under this rule.

B. A verification body shall be qualified to conduct verification services for the emissions reports submitted to the department as required by 20.2.100 NMAC through 20.2.108 NMAC only if:

(1) the AVA has determined that the verification body has demonstrated knowledge of the reporting requirements in 20.2.100 NMAC through 20.2.108 NMAC; and

(2) it is accredited to ISO 14065 through a program developed under ISO 17011 by an accreditation body that is a member of the International Accreditation Forum, Inc.

C. Prior to January 1, 2013, accreditation by the California air resources board under Title 17, California Code of Regulation, Section 95132, may be substituted for the accreditation required under paragraph 2 of Subsection B of this section.

[20.2.101.102 NMAC - N, 01/01/10]

20.2.101.103 REQUIREMENTS FOR VERIFICATION SERVICES: The following verification services must be provided for each emissions data report.

A. As part of the verification services, the verification team shall review documents submitted, assess risks of a material misstatement, develop a verification plan (that includes a sampling plan), evaluate the emissions data report against the verification requirements, and assess the materiality of errors, omissions and misstatements identified.

B. The verification team shall request any information and documents needed for verification services. Such information shall include, but is not limited to, original records and supporting data for the emissions data report.

[20.2.101.103 NMAC - N, 01/01/10]

20.2.101.104 COMPOSITION OF VERIFICATION TEAM: A verification team must include the following:

A. a lead verifier;

B. an independent peer reviewer; and

C. any subcontractor elected to provide verification services under 20.2.101.105 NMAC.

[20.2.101.104 NMAC - N, 01/01/10]

20.2.101.105 SUBCONTRACTING: The following requirements shall apply to any verification body that elects to subcontract verification services.

A. The primary verification body must assume full legal responsibility for verification services performed by subcontracted verifiers or verification bodies.

B. A verification body or verifier acting as a subcontractor to the primary verification body will not further subcontract that same work to another firm or individual.

C. A verification body or verifier acting as a subcontractor is subject to all conflict of interest requirements in 20.2.101.107 NMAC.

D. A verification body or verifier acting as a subcontractor must be identified by the primary verification body as part of the verification team.

[20.2.101.105 NMAC - N, 01/01/10]

20.2.101.106 CONFLICT OF INTEREST SUBMITTAL REQUIREMENTS FOR ACCREDITED VERIFICATION BODIES. Before the start of any work related to providing verification services to an owner or operator, a verification body must first be authorized in writing by the AVA to provide verification services. To obtain authorization the verification body shall submit to the AVA a self-evaluation of the potential for any conflict of interest that the verification body, entities related to the verification body, and members of the verification team including subcontractors, may have with the owner or operator or their related entities for which it will perform verification services. For the purposes of this section, the term member refers to staff on the verification team, in the verification body and any subcontractors. The submittal shall include all of the following.

A. Identification of whether the potential for conflict of interest is high, low, or medium based on factors specified in this section.

B. An organizational chart of the business structure of the verification body, including its related entities and brief description of the primary work done by the verification body and related entities.

C. Identification of whether any member of the verification body, entities related to the verification body, or the verification team including subcontractors has previously provided verification services for the owner or operator or its related entities and, if so, the years in which such verification services were provided.

D. Identification of whether any member of the verification body, entities related to the verification body, or the verification team including subcontractors, has engaged in any non-verification services of any nature

with the owner or operator or related entities, in any jurisdiction, during the previous three years. The verification body must also disclose any services listed under Subsections A through C of 20.2.101.107 NMAC it has provided to the owner or operator, regardless of when these services occurred.

E. If non-verification services have previously been provided, the following information shall also be submitted: identification of the nature and location of the work performed for the owner or operator and whether the work is similar to the type of work to be performed during verification, such as emissions inventory auditing, energy efficiency, renewable energy, or other work with implications for the operator's greenhouse gas emissions or the accounting of greenhouse gas emissions or electricity transactions.

F. The nature of past, present or future relationships the verification body, entities related to the verification body, and members of the verification team including subcontractors have with the owner or operator or related entity including:

(1) instances when any member has performed or intends to perform work for the owner or operator;

(2) identification of whether work is currently being performed for the owner or operator and, if so, the nature of the work;

(3) whether any member has any contracts or other arrangements to perform work for the owner or operator or a related entity;

(4) identification of how much work was performed in each of the last three years, as a percentage of the verification body's total gross income for each of the last three years;

(5) identification of how much work related to greenhouse gases or electricity transactions was performed for the owner or operator or related entities in each of the last three years, as a percentage of the verification body's income for each of the last three years; and

(6) identification of how much work was performed by each subcontractor for the operator in each of the last three years, as a percentage of each subcontractor's total gross income for each of the last three years.

G. Explanation of how the amount and nature of work previously performed is such that any member of the verification team's credibility and lack of bias should not be under question.

H. A list of names of the verification team members that will perform verification services for the owner or operator and a description of any instances of personal or family relationships with management or employees of the owner or operator that potentially represent a conflict of interest.

I. Identification of any other circumstances or relevant information known to the verification body or owner or operator that could result in a conflict of interest, or any situation where the appearance of impartiality could undermine confidence in the verification body's ability to assess the reported emissions.

[20.2.101.106 NMAC - N, 01/01/10]

20.2.101.107 CONFLICT OF INTEREST REQUIREMENTS FOR VERIFICATION BODIES: The conflict of interest provisions of this section shall apply to the verification body, entities related to the verification body, and the verification team accredited according to the requirements of ~~the WCI to perform verification services for the WCI program.~~20.2.101.102 NMAC. Member for purposes of this section means any employee or subcontractor of the verification body or entities related to the verification body. Member also includes any individual with a majority equity share in the verification body or entities related to the verification body.

A. The potential for a conflict of interest shall be deemed to be high where:

(1) the verification body and owner or operator share any management staff or board of directors membership, or any of the management staff of the owner or operator have been employed by the verification body, or vice versa, within the previous three years; or

(2) within the previous three years, any member of the verification body, any entity related to the verification body, and the verification team has provided to the owner or operator any of the following non-verification services:

(a) designing, developing, implementing, or maintaining an inventory or information or data management system for facility greenhouse gases, or, where applicable, electricity transactions;

(b) developing greenhouse gas emission factors or other greenhouse gas-related engineering analysis;

(c) designing energy efficiency, renewable power, or other projects which explicitly identify greenhouse gas reductions as a benefit;

(d) preparing or producing greenhouse gas-related manuals, handbooks, or procedures specifically for the reporting facility;

(e) appraisal services of carbon or greenhouse gas liabilities or assets;

(f) brokering in, advising on, or assisting in any way in carbon or greenhouse gas-related markets;

(g) managing any health, environment or safety functions which explicitly identify greenhouse gas reductions as a benefit;

(h) bookkeeping or other services related to the accounting records or financial statements, unless those services have been limited to financial auditing;

(i) any service related to information systems, unless those systems will not be part of the verification process, and excluding third-party auditor or registration services;

(j) appraisal and valuation services, both tangible and intangible related to GHG emissions or reductions inventories;

(k) fairness opinions and contribution-in-kind reports in which the verification body has provided its opinion on the adequacy of consideration in a transaction, unless the resulting services shall not be part of the verification process;

(l) any actuarially oriented advisory service involving the determination of amounts recorded in financial statements and related accounts;

(m) any internal audit service of GHG emissions management systems that has been outsourced by the operator that relates to the owner's or operator's internal accounting controls, financial systems or financial statements, unless no consulting or advice was provided as part of the audit;

(n) acting as a broker-dealer (registered or unregistered), promoter or underwriter on behalf of the owner or operator;

(o) any legal services related to GHG emissions; or

(p) expert services to the owner or operator or his or her legal representative for the purpose of advocating his or her interests in litigation or in a regulatory or administrative proceeding or investigation involving GHG emissions, unless providing only factual testimony.

B. The potential for a conflict of interest shall also be deemed to be high where any staff member of the verification body, entity related to the verification body, or the verification team has provided verification services for the owner or operator for six consecutive years or within three years of the termination of a previous GHG verification contract with the owner or operator. If a verification body or verification team member has been providing verification services for an owner or operator in a greenhouse gas reporting or reductions program other than ~~WCI~~a program in which the state of New Mexico is a party within the past three years, those years of services will count towards the six consecutive year limit in the ~~WCI~~this subsection.

C. The potential for a conflict of interest shall be deemed high where the ~~Independent Peer Reviewer~~independent peer reviewer for the verification team has provided verification or non-verification services for the operator during the current reporting year.

D. The potential for a conflict of interest shall be deemed to be low where no potential for a conflict of interest is found under this section and any non-verification services provided by all members of the verification body and the verification team to the owner or operator within the last three years are valued at less than five percent of the verification body's revenue.

E. The verification body shall deem the potential for a conflict of interest to be medium if the potential for a conflict of interest is not deemed to be either low or high as specified in Subsections A through D of this section.

F. If a verification body deems the potential for conflict of interest to be medium and wishes to provide verification services for the owner or operator, then:

(1) the verification body shall submit, in addition to the self-evaluation, a plan to avoid, neutralize, or mitigate the potential conflict of interest situation; and

(2) the AVA shall evaluate the conflict of interest mitigation plan and determine whether verification services may proceed, as provided in subsection G of 20.2.101.107 NMAC.

G. Conflict of Interest Determinations. The AVA shall review the self-evaluation submitted by the verification body and determine whether the verification body is authorized to perform verification services for the owner or operator.

(1) The AVA shall notify the verification body in writing when the conflict of interest evaluation information submitted under 20.2.101.106 NMAC is deemed complete. Within 45 days after deeming the evaluation information complete, the AVA shall determine whether the verification body is authorized to proceed with verification and shall so notify the verification body.

(2) If the AVA determines the verification body or any member of the verification team has any threats specified in Subsections A through C of this section, the AVA shall find a high potential conflict of interest and verification services may not proceed.

(3) If the AVA determines that there is a low potential conflict of interest, verification services may proceed.

(4) If the AVA determines that the verification body and verification team have a medium potential for a conflict of interest, the AVA shall evaluate the conflict of interest mitigation plan and may request additional information from the applicant to complete the determination. In determining whether verification services may proceed, the AVA may consider factors including, but not limited to, the nature of previous work performed, the current and past relationships between the verification body and its subcontractors with the owner or operator, and the cost of the verification services to be performed. If the AVA determines that these factors when considered in combination with the mitigation plan demonstrate a low level of potential conflict of interest, then the AVA will authorize the verification body to provide verification services.

H. Monitoring Conflict of Interest Situations.

(1) After commencement of verification services, the verification body shall monitor and immediately make full disclosure in writing to the AVA regarding any potential for a conflict of interest situation that arises. This disclosure shall include a description of actions that the verification body has taken or proposes to take to avoid, neutralize, or mitigate the potential for a conflict of interest.

(2) The verification body shall monitor arrangements or relationships that may be present for a period of one year after the completion of verification services. During that period, within 30 calendar days of any change in arrangements or relationships with the owner or operator for which the verification body has provided verification services that may create a medium or high threat of conflict of interest, the verification body shall notify the AVA of the change and provide a description of the nature of the change. The AVA will make a conflict of interest determination under Subsection G of this section.

(3) The verification body shall report to the AVA any changes in its organizational structure, including mergers, acquisitions, or divestitures that may have created a medium or high threat of conflict of interest for one year after completion of verification services within 30 days and submit an evaluation of how the change(s) impacts the potential for conflict of interest.

(4) The AVA may invalidate a verification finding if a medium or high threat of a conflict of interest has arisen for the verification body or any member of the verification team and, in the case of a medium threat, the threat has not been adequately mitigated. In such a case, the owner or operator shall be provided 180 calendar days to have their emissions report verified by a different verification body.

(5) If the verification body or its subcontractor(s) are found to have violated the conflict of interest requirements of this section, the AVA may rescind its accreditation for any appropriate period of time. Additionally, the AVA may separately revoke its recognition of an accredited verification body under 20.2.101.124 NMAC.

[20.2.101.107 NMAC - N, 01/01/10]

20.2.101.108 NOTICE OF VERIFICATION SERVICES: Prior to commencing verification services for a facility owner or operator, the verification body shall submit a notice of verification services to the AVA. Verification activities shall not proceed for 15 business days or until the verification body receives written approval to proceed from the AVA, whichever is earlier. If the AVA does not respond to the verification body within 15 business days, the verification body may begin to conduct verification activities.

[20.2.101.108 NMAC - N, 01/01/10]

20.2.101.109 PRELIMINARY ACTIVITIES:

A. The verification team shall discuss with the owner or operator the scope and objective of the verification services and obtain information from the owner or operator necessary to develop a verification plan. Such information shall include but is not limited to:

(1) information to allow the verification team to develop a general understanding of facility or entity boundaries, operations, emissions sources, electricity transactions, as applicable;

(2) information about the data management system used to track GHG emissions, electricity transactions, and other required measurement data as applicable;

(3) information regarding the training or qualifications of personnel involved in developing the GHG emissions data report;

(4) description of the specific methodologies used to quantify and report GHG emissions, electricity transactions, and other required data as applicable;

(5) records of measured data related to emissions and operations for the prior and current period;

(6) inventory of sources and their associated emissions for the reporting period; and

(7) any prior verification reports, if applicable.

B. In developing the verification plan, the verifier shall:

(1) gain an understanding of the organization and the processes that emit greenhouse gases;

(2) conduct a risk assessment to evaluate inherent, control and detection risk;

(3) conduct preliminary analytical testing to identify anomalies in the data;

(4) conduct a sensitivity analysis to assess the relative contribution of each source in the inventory to the reported annual emissions; and

(5) consider any other relevant developments at the facility, in the regulations, or legal environment.

[20.2.101.109 NMAC - N, 01/01/10]

20.2.101.110 SAMPLING PLAN: As part of the verification procedures, the verification team shall develop a sampling plan that, when combined with the other verification procedures, provides sufficient and appropriate evidence to allow the verifier to arrive at a conclusion. The sampling plan shall be designed to achieve the specified verification objective.

A. The sampling plan shall consider:

(1) statistical versus non-statistical approaches;

(2) design of the sample, including the population characteristics;

(3) stratification (categorization of population into subgroups);

(4) emission weighted selection;

(5) sample size; and

(6) sample selection.

B. As relevant information becomes available during the course of verification activities, the verification team must modify the sampling plan as necessary to address emerging potential issues of material misstatement or nonconformance with the requirements of this rule.

[20.2.101.110 NMAC - N, 01/01/10]

20.2.101.111 VERIFICATION PLAN:

A. Accounting for requirements set by this part, the verification plan shall document:

(1) the scope of the verification;

(2) the level of assurance;

(3) the verification standard;

(4) the verification criteria;

(5) the objectives of the verification;

(6) the timing of the verification, including site visits;

(7) the nature of the communications required;

(8) the resources required to conduct the verification, including the role of verification team members; and

(9) the nature, timing and extent of the verification procedures, including the sampling plan.

B. The verification body shall retain the verification plan in paper, electronic, or other format for a period of not less than seven years following the submission of each verification statement.

[20.2.101.111 NMAC - N, 01/01/10]

20.2.101.112 SITE VISITS: In years for which full verification services are required under Subsection C of 20.2.101.101 NMAC, at least one member of the verification team shall at a minimum make one onsite site visit to each facility for which an emissions data report is submitted. The verification team member(s) shall also conduct an onsite visit of the headquarters or other location of central data management, if different from the facility location. During the site visit, the verification team member(s) shall perform all of the following tasks.

A. Observe whether all sources at the site are represented in the emissions report as specified in 20.2.102 NMAC through 20.2.108 NMAC as applicable to the owner or operator.

B. Assess whether the source inventory is identified, categorized, and reported appropriately. Collect evidence as to explanations for data anomalies identified in the verification plan.

C. Understand the data trail used by the owner or operator to measure, quantify, and report greenhouse gas emissions and, when applicable, electricity transactions.

D. Understand and evaluate the associated data controls used by the owner to ensure the completeness and accuracy of the data.

[20.2.101.112 NMAC - N, 01/01/10]

20.2.101.113 AVAILABILITY OF INFORMATION AND DOCUMENTATION: Owners or operators shall make available to the verification team all information and documentation used to calculate and report emissions, electricity transactions, and other information required under this rule, as applicable.

[20.2.101.113 NMAC - N, 01/01/10]

20.2.101.114 DATA CHECKS: To determine the reliability of the submitted emissions data report, the verification team shall use data checks as defined in 20.2.100.7 NMAC. The verification team shall conduct data checks throughout the verification process and shall focus first on the largest and most uncertain estimates of emissions and electricity transactions.

A. In establishing the verification plan, the verification team shall use professional judgment to determine the number of data checks required for the team to conclude with reasonable assurance whether the reported emissions are free of material misstatement and the emissions data report otherwise conforms to the requirements of this rule.

B. The verification team shall choose emissions sources for data checks based on their relative sizes and risks of material misstatement as indicated in the verification plan;

C. The verification team, through the conformance assessment, shall ensure that the appropriate methodologies and emission factors have been applied for the emissions sources for sampled data covered under 20.2.102 NMAC through 20.2.108 NMAC.

[20.2.101.114 NMAC - N, 01/01/10]

20.2.101.115 EMISSIONS DATA REPORT MODIFICATIONS: If as a result of review by the verification team and prior to completion of a verification statement the owner or operator chooses to make improvements or corrections to the submitted emissions data report, a revised emissions data report must be submitted to the department as specified by Section 20.2.101.118 NMAC. The owner or operator shall maintain documentation to support any revisions made to the initial emissions data report. Documentation for all emissions data report submittals shall be retained by the operator for seven years pursuant to Section 20.2.100.400 NMAC.

[20.2.101.115 NMAC - N, 01/01/10]

20.2.101.116 MATERIALITY AND CONFORMANCE ASSESSMENT CRITERIA: The verifier shall determine if the annual emissions report is prepared in such a way that it satisfies Subsection A of 20.2.101.101 NMAC.

A. A verification team shall determine that an emission data report contains a material misstatement if either Paragraph 1 or 2 is true.

(1) Based on the verification team's own determination of the level of emissions subject to verification based on the sampling plan, the verification team concludes that total reported emissions are less than 95 percent accurate using equation 101-1:

$$PA = 100 - [(SOU/TRE) \times 100)] \qquad \textbf{Equation 101-1}$$

Where:

PA = Percent accuracy

SOU = The net result of summing overstatements and understatements resulting from errors, omissions and misreporting

TRE = Total reported emissions

(2) The individual or aggregate effect of one or more errors, omissions or misstatements identified in the course of verification make it probable that the judgment of a reasonable person regarding the total reported emissions would have been changed or influenced by the error, omission or misrepresentation.

B. To assess conformance with this rule the verification team shall review the methods and factors used to develop the emissions data report for adherence to the requirements of this rule.

C. The verification team shall keep a log of any issues identified in the course of verification activities that may affect determinations of material misstatement and nonconformance, and how those issues were resolved.

[20.2.101.116 NMAC - N, 01/01/10]

20.2.101.117 COMPLETION OF VERIFICATION: Completion of verification services shall include the following.

A. Verification Statement. Upon completion of the verification services required by this part, the verification body shall ~~complete~~prepare either a positive or an adverse verification statement, for each emissions data report, ~~and~~based on its finding during the verification process. The verification body shall provide ~~that statement~~the verification statements to the owner or operator and the ~~department~~AVA according to the schedule specified in Subsection B of 20.2.100.200 NMAC. Before ~~that~~each statement is completed, the verification body shall have the verification services and findings of the verification team independently reviewed and approved by an independent peer reviewer.

B. ~~The verification body shall provide either a positive or adverse verification statement to the reporter and to the department based on its findings during the verification process.~~

~~**C.**~~ The lead verifier in the verification team shall attest on the verification statement that the verification team has carried out all verification services as required by this rule, and the independent peer reviewer shall attest to his or her independent review on behalf of the verification body and his or her concurrence with the verification findings. If the independent peer reviewer does not determine that the verification team has carried out all verification services as required by the rule or if the independent peer reviewer rejects the verification team's findings, then the verification body cannot issue a positive verification statement.

~~**D**~~**C.** The verification body shall provide to the owner or operator a detailed verification report. The verification report shall at minimum include the detailed comparison of the data checks with the submitted emissions data report, errors, omissions and misstatements identified during the course of the verification, any corrections made to the original annual emissions report as a result of the verification, and observations about the data management systems that are connected to the errors, omissions and misstatements identified, as well as any qualifying comments on findings during verification services. The detailed verification report shall be made available to the department upon request.

[20.2.101.117 NMAC - N, 01/01/10]

20.2.101.118 REVIEW AND REVISIONS TO VERIFICATION REPORT: Prior to the verification body providing an adverse verification statement pursuant to Subsection B of 20.2.101.117 NMAC, the owner or operator shall be provided at least 14 working days to modify the emissions data report to correct any material misstatement or nonconformance found by the verification team. The modified report and verification statement must be submitted to the department before the applicable verification deadline, unless the operator makes a request to the department as follows.

A. If the owner or operator and the verification body cannot reach agreement on modifications to the emissions data report that result in a positive verification statement, the operator may petition the AVA to make a final decision as to the verifiability of the submitted emissions data report.

B. If the AVA determines that the emissions data report does not meet the standards and requirements specified in ~~this article~~20.2.100 NMAC through 20.2.108 NMAC, the owner or operator shall have the opportunity to submit within 60 calendar days of the date of this decision any emissions data report revisions that address the AVA's determination, for re-verification of the emissions data report. In re-verifying a revised emissions data report, the verification body and verification team shall be subject to the requirements in 20.2.101.118 NMAC through 20.2.101.120 NMAC.

C. Upon provision of the verification statement to the AVA, the emissions data report shall be considered final and no changes shall be made except as provided in 20.2.101.115 NMAC or 20.2.101.118 NMAC. All verification requirements of this rule shall be considered complete upon provision of the verification statement.

[20.2.101.118 NMAC - N, 01/01/10]

20.2.101.119 RESPONSIBILITY FOR INFORMING ACCREDITATION BODY OF DISPUTE: In addition to initiating the dispute resolution process specified in 20.2.101.118 NMAC, the owner or operator and verification body shall inform the applicable accreditation body of the dispute.

[20.2.101.119 NMAC - N, 01/01/10]

20.2.101.120 VOIDING OF POSITIVE VERIFICATION STATEMENT: The AVA may make void the positive verification statement submitted by the verification body if:

A. the AVA finds a high level of conflict of interest existed between a verification body and an owner or operator; or

B. an emissions data report that received a positive verification statement fails an audit by the AVA.

[20.2.101.120 NMAC - N, 01/01/10]

20.2.101.121 AVAILABILITY OF DATA: Upon request by the AVA, the owner or operator shall provide the data used to generate an emissions data report, including all data available to a verification body. The AVA may also review the full verification report given by the verification body to the owner or operator. The full verification report shall be provided to the AVA upon request.

[20.2.101.121 NMAC - N, 01/01/10]

20.2.101.122 VERIFICATION SERVICES AUDIT: Upon written notification by the AVA, the verification body shall make itself available for a verification services audit.

[20.2.101.122 NMAC - N, 01/01/10]

20.2.101.123 DURATION OF VERIFICATION SERVICES BY ONE VERIFICATION BODY: Facility owners or operators subject to annual verification shall not use the same verification body for a period of more than six consecutive years. If a facility owner or operator is required or elects to contract with another verification body, they may contract verification services from the previous verification body only after not using the previous verification body for at least three years. If a verification body or verification team member has been providing verification services for an owner or operator in a greenhouse gas reporting or reductions program other than the department's within the previous three years, those years of services will count towards the six consecutive year limit in this section.

[20.2.101.123 NMAC - N, 01/01/10]

20.2.101.124 REVOCATION OF RECOGNITION: The AVA may review, and for good cause, work to revoke or modify the accreditation status of a recognized verification body. If a recognized verification body is suspended in any other mandatory or voluntary GHG reporting or trading program, that verification body will not be allowed to provide any verification services until that suspension ends. If a recognized verification body has its accreditation revoked under any other mandatory or voluntary GHG reporting or trading program, that verification body will no longer be allowed to provide verification services under this part until it is reaccredited.

[20.2.101.124 NMAC - N, 01/01/10]

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 2 AIR QUALITY (STATEWIDE)
PART 102 GREENHOUSE GAS REPORTING - GENERAL STATIONARY COMBUSTION

20.2.102.1 ISSUING AGENCY: Environmental Improvement Board.
[20.2.102.1 NMAC - N, 01/01/10]

20.2.102.2 SCOPE: All persons who own or operate an applicable source of greenhouse gas emissions in the geographic area within the jurisdiction of the environmental improvement board.
[20.2.102.2 NMAC - N, 01/01/10]

20.2.102.3 STATUTORY AUTHORITY: Environmental Improvement Act, NMSA 1978, Section 74-1-8(A)(4), and Air Quality Control Act, NMSA 1978, Sections 74-2-1 et seq., including specifically Sections 74-2-5(B)(1) & 74-2-(5)(C)(5)(d) & (e).
[20.2.102.3 NMAC - N, 01/01/10]

20.2.102.4 DURATION: Permanent.
[20.2.102.4 NMAC - N, 01/01/10]

20.2.102.5 EFFECTIVE DATE: January 1, 2010 except where a later date is cited at the end of a section.
[20.2.102.5 NMAC - N, 01/01/10]

20.2.102.6 OBJECTIVE: The objectives of this part are:

A. To specify greenhouse gas emissions from general stationary combustion sources that shall be included in determining applicability of greenhouse gas reporting and verification requirements under 20.2.100 NMAC and 20.2.101 NMAC;

B. To specify methods of calculation and sampling, analysis and measurement requirements for greenhouse gas emissions from general stationary combustion sources; and

C. To specify the information, in addition to the information required by 20.2.100 NMAC, that shall be included for general stationary combustion source emissions in annual reports to the department by the owner or operator of any facility meeting the applicability requirements in 20.2.100 NMAC.

[20.2.102.6 NMAC - N, 01/01/10]

20.2.102.7 DEFINITIONS: The definitions included in 20.2.100 NMAC shall apply to the terms used in this part. The definitions included in 20.2.2 NMAC shall apply to the terms used in this part, unless such term is defined in 20.2.100 NMAC.
[20.2.102.7 NMAC - N, 01/01/10]

20.2.102.8 SEVERABILITY: If any provision of this part, or the application of such provision to any person or circumstance, is held invalid, the remainder of this part, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.
[20.2.102.8 NMAC - N, 01/01/10]

20.2.102.9 CONSTRUCTION: This part shall be liberally construed to carry out its purpose.
[20.2.102.9 NMAC - N, 01/01/10]

20.2.102.10 SAVINGS CLAUSE: Repeal or supersession of prior versions of this part shall not affect any administrative or judicial action initiated under those prior versions.
[20.2.102.10 NMAC - N, 01/01/10]

20.2.102.11 COMPLIANCE WITH OTHER REGULATIONS: Compliance with this part does not relieve a person from the responsibility to comply with any other applicable federal, state, or local regulations.
[20.2.102.11 NMAC - N, 01/01/10]

~~**20.2.102.12 INCORPORATION BY REFERENCE:** Each document listed in 20.2.100.12 NMAC and cited in this part shall be incorporated by reference into this part.~~

20.2.102.12 AVAILABILITY OF CITED DOCUMENTS: Additional information regarding documents cited in this part may be found at 20.2.100.12 NMAC.
[20.2.102.12 NMAC - N, 01/01/10]

20.2.102.13 to 20.2.102.99 [RESERVED]

20.2.102.100 REPORTING REQUIREMENTS*:* In addition to meeting the requirements in 20.2.100 NMAC, the emissions data report shall include the following information for each facility with stationary combustion sources.

A. Annual greenhouse gas emissions in metric tons, reported as follows:
- **(1)** total CO2 emissions for fossil and biomass fuels, reported by fuel type;
- **(2)** total CH4 emissions, reported by fuel type; and
- **(3)** total N2O emissions, reported by fuel type.

B. Annual fuel consumption, reported as follows:
- **(1)** for gases, reported in units of thousands of standard cubic feet;
- **(2)** for liquids, reported in units of gallons;
- **(3)** for non-biomass solids, reported in units of short tons; and
- **(4)** for biomass solid fuels, reported in units of bone dry short tons~~ or bone dry metric tons~~.

C. Average carbon content of each fuel, if used to compute CO2 emissions.

D. Average high heat value of each fuel, if used to compute CO2 emissions.

E. Annual steam generation in pounds or kilograms, for units that burn biomass fuels or municipal solid waste.

[20.2.102.100 NMAC - N, 01/01/10]

20.2.101.102 to 20.2.102.199 [RESERVED]

20.2.102.200 CALCULATION OF CARBON DIOXIDE EMISSIONS: For each fuel, the owner or operator shall calculate CO2 mass emissions using one of the four calculation methodologies specified in this section, subject to the restrictions in Subsection E of 20.2.102.200 NMAC.

A. Calculation methodology 1. Calculate the annual CO2 mass emissions by substituting a fuel-specific default CO2 emission factor, a default high heat value, and the annual fuel consumption into the equation 102-1.

$$CO_2 = Fuel \times HHV \times EF \times CF \times 0.001$$ **Equation 102-1**

Where:

CO_2	=	Annual CO_2 mass emissions for the specific fuel type (metric tons).
Fuel	=	Mass or volume of fuel combusted per year (express mass in short tons for solid fuel, volume in thousands of standard cubic feet for gaseous fuel, and volume in gallons for liquid fuel).
HHV	=	Default high heat value of the fuel, from column 3 of Table 102-1 (MMBtu per mass or MMBtu per volume, as applicable).
EF	=	Fuel-specific default CO_2 emission factor, from column 5 of Table 102-1 (kg CO_2/MMBtu).
CF	=	Conversion factor of 0.024 (gallons to barrels) for petroleum products, only; 1.0 for all other fuels.
0.001	=	Conversion factor from kilograms to metric tons.

B. Calculation methodology 2. Calculate the annual CO2 mass emissions using a default fuel-specific CO2 emission factor, ~~and~~ a high heat value provided by the supplier or measured by the owner or operator, ~~using~~ and equation 102-2, except for emissions from the combustion of biomass fuels and municipal solid waste, for which the owner or operator may instead elect to use the method shown in equation 102-3.

(1) For any type of fuel for which an emission factor is provided in Table 102-1 in 20.2.102.300 ~~NMAC~~NMAC or Table 102-2 in 20.2.102.301 NMAC~~ use equation 102-2~~, except biomass fuels and municipal solid waste when the owner or operator elects to use the method in Paragraph 2 of Subsection B of 20.2.102.200 NMAC, use equation 102-2.

$$CO_2 = \sum_{p=1}^{n} Fuel_p \times HHV_p \times EF \times 0.001$$ **Equation 102-2**

Where:

CO_2	=	Annual CO_2 mass emissions for a specific fuel type (metric tons).
n	=	Number of required heat content measurements for the year, as specified in ~~section 202~~ Subsection A of 20.2.102. 202 NMAC.
$Fuel_p$	=	Mass or volume of the fuel combusted during the measurement period "p" (express mass in short tons for solid fuel, volume in thousands of standard cubic feet for gaseous fuel, and volume in gallons for liquid fuel).
HHV_p	=	High heat value of the fuel for the measurement period (MMBtu per mass or volume).
EF	=	Fuel-specific default CO_2 emission factor, from column 5 of Table 102-1 or from Table 102-2 (kg CO_2/MMBtu).
0.001	=	Conversion factor from kilograms to metric tons.

(2) For biomass solid fuels and municipal solid waste, use either equation 102-2 above or equation 102-3.

$$CO_2 = Steam \times B \times EF \times 0.001$$ **Equation 102-3**

Where:

CO_2	=	Annual CO_2 mass emissions from biomass solid fuel or municipal solid waste combustion (metric tons).
Steam	=	Total mass of steam generated by biomass solid fuel or municipal solid waste combustion during the reporting year (lb steam).
B	=	Ratio of the boiler's design rated heat input capacity to its design rated steam output capacity (MMBtu/lb steam).
EF	=	Default emission factor for biomass solid fuel or municipal solid waste, from column 5 of Table 102-1 (kg CO_2/MMBtu).
0.001	=	Conversion factor from kilograms to metric tons.

C. Calculation methodology 3. Calculate the annual CO2 mass emissions by using measurements of fuel carbon content or molar fraction (for gaseous fuels only), conducted by the owner or operator or provided by the fuel supplier, and the quantity of fuel combusted, using the applicable equation in this subsection. For emissions from the combustion of biomass fuels and municipal solid waste, the owner or operator may elect to use either equation 102-4 or equation 102-5.

(1) For a solid fuel, use equation 102-4.

$$CO_2 = \sum_{i=1}^{n} Fuel_i \times CC_i \times 3.664 \times 0.907$$ **Equation 102-4**

Where:

CO_2	=	Annual CO_2 mass emissions from the combustion of the specific solid fuel (metric tons).
n	=	Number of carbon content determinations for the year, as specified in Subsection A of 20.2.102.202 NMAC.
$Fuel_i$	=	Mass of the solid fuel combusted in measurement period "i" (short tons).
CC_i	=	Carbon content of the solid fuel, from the fuel analysis results for measurement period "i" (percent by weight, expressed as a decimal fraction, e.g., 95% = 0.95).
3.664	=	Ratio of molecular weights, CO_2 to carbon.
0.907	=	Conversion factor from short tons to metric tons.

(2) For biomass fuels or municipal solid waste, use either equation 102-4 above or equation 102-5.

$$CO_2 = Steam \times B \times EF \times 0.001$$ **Equation 102-5**

Where:

CO_2	=	Annual CO_2 mass emissions from biomass solid fuel or municipal solid waste combustion (metric tons).

Steam = Total mass of steam generated by biomass solid fuel or municipal solid waste combustion during the reporting year (lb steam).

B = Ratio of the boiler's design rated heat input capacity to its design rated steam output capacity (MMBtu/lb steam).

EF = Default emission factor for biomass solid fuel or municipal solid waste, from column 5 of Table 102-1, (kg CO_2/MMBtu), adjusted no less often than every third year as provided in subparagraph (b) of paragraph (5) of subsection A of 20.2.102.202 NMAC.

0.001 = Conversion factor from kilograms to metric tons.

(3) For a liquid fuel, use equation 102-6.

$$CO_2 = \sum_{i=1}^{n} 3.664 \times Fuel_i \times CC_i \times 0.001$$ **Equation 102-6**

Where:

CO_2 = Annual CO_2 mass emissions from the combustion of the specific liquid fuel (metric tons).

n = Number of required carbon content determinations for the year, as specified in ~~section 202~~ Subsection A of 20.2.102.202 NMAC.

$Fuel_i$ = Volume of the liquid fuel combusted in measurement period "i" (gallons).

CC_i = Carbon content of the liquid fuel, from the fuel analysis results for measurement period "i" (kg C per gallon of fuel).

3.664 = Ratio of molecular weights, CO_2 to carbon.

0.001 = Conversion factor from kg to metric tons.

(4) For a gaseous fuel, use equation 102-7.

$$CO_2 = \sum_{i=1}^{n} 3.664 \times Fuel_i \times CC_i \times \frac{MW}{MVC} \times 0.001$$ **Equation 102-7**

Where:

CO_2 = Annual CO_2 mass emissions from combustion of the specific gaseous fuel (metric tons).

n = Number of required carbon content and molecular weight determinations for the year, as specified in ~~section 202~~ Subsection A of 20.2.102.202 NMAC.

$Fuel_i$ = Volume of the gaseous fuel combusted in period "i" (a day or month, as applicable) (scf).

CC_i = Average carbon content of the gaseous fuel, from the fuel analysis results for the period "i" (day or month, as applicable) (kg C per kg of fuel).

MW = Molecular weight of the gaseous fuel, from fuel analysis (kg/kg-mole).

MVC = Molar volume conversion factor (849.5 scf per kg-mole for STP of 20°C and 1 atmosphere or 836 scf per kg-mole for STP of 60°F, and 1 atmosphere).

3.664 = Ratio of molecular weights, CO_2 to carbon.

0.001 = Conversion factor from kg to metric tons.

D. Calculation methodology 4. Calculate the annual CO2 mass emissions from all fuels combusted in a unit, by using data from continuous emission monitoring systems (CEMS) as specified in Paragraphs 1 through 7 of Subsection D of 20.2.102.200 NMAC.

(1) For a facility that combusts fossil fuels or biomass fuels and operates CEMS in response to federal, state or local regulation, use CO2 or O2 concentrations and flue gas flow measurements to determine hourly CO2 mass emissions using methodologies provided in 40 CFR Part 75, Appendix F.

(a) The owner or operator shall report CO2 emissions for the reporting year in metric tons based on the sum of hourly CO2 mass emissions over the year, converted to metric tons.

(b) If the owner or operator of a facility that combusts biomass fuels uses O2 concentrations to calculate CO2 concentrations, annual source testing must demonstrate that calculated CO2 concentrations when compared to measured CO2 concentrations meet the relative accuracy test audit (RATA) requirements in 40 CFR Part 60, Appendix B, Performance Specification 3.

(2) For a facility that combusts waste-derived fuels (as defined in 20.2.100 NMAC and listed in Table

102-2 of 20.2.102.301 NMAC, including municipal solid waste), and operates a CEMS in response to federal, state, provincial, or local regulations use CO2 concentrations and flue gas flow measurements to determine hourly CO2 mass emissions using methodologies provided in 40 CFR Part 75, Appendix F.

(a) Annual CO2 emissions shall be reported in metric tons based on the sum of hourly CO2 mass emissions over the year.

(b) Emissions calculations shall not be based on O2 concentrations.

(3) The owner or operator of a facility that combusts waste-derived fuels and calculates CO2 emissions using the methodology provided in Paragraph 2 of Subsection D of 20.2.102.200 NMAC shall determine the portion of emissions associated with the combustion of biomass~~-derived fuels~~ using the method provided in Subsection F of 20.2.102.200 NMAC.

(4) An owner or operator who uses CEMS data to report CO2 emissions from a facility that co-fires fossil fuels with biomass fuels or waste-derived fuels that are partly biomass ~~fuels~~ shall determine the portion of total CO2 emissions separately assigned to the fossil fuel and the biomass ~~fuels~~ using the method provided in Subsection F of 20.2.102.200 NMAC, if applicable. The owner or operator who co-fires pure biomass fuels with fossil fuels may elect to calculate CO2 emissions for the fossil fuels using methods designated in Subsection A of 20.2.102.200 NMAC or Paragraph 1 of Subsection B of 20.2.102.200 NMAC, as applicable, by fuel type and then calculate biomass fuel emissions by subtracting the fossil fuel related emissions from the total CO2 emissions determined using the CEMS based methodology.

(5) For any units for which CO2 emissions are reported using CEMS data, the owner or operator is relieved of the requirement to separately report CO2 process emissions from combustion emissions for that unit or to report emissions separately for different fossil fuels for that unit when only fossil fuels are co-fired. In this circumstance, owner or operator shall still report fuel use by fuel type as otherwise required.

(6) If a facility is subject to requirements in 40 CFR Part 60 or 40 CFR Part 75 and the owner or operator chooses to add devices to an existing CEMS for the purpose of measuring CO2 concentrations or flue gas flow, the owner or operator shall select and operate the added devices pursuant to the requirements in 40 CFR Part 60 or Part 75 that apply to the facility. If the facility is subject to both 40 CFR Part 60 and 40 CFR Part 75, the owner or operator shall select and operate the added devices pursuant to the requirements in 40 CFR Part 75.

(7) If a facility does not have a CEMS and the owner or operator chooses to add one in order to measure CO2 concentrations, the owner or operator shall select and operate the CEMS pursuant to the requirements in 40 CFR Part 75.

(a) The owner or operator shall use CO2 concentrations and flue gas flow measurements to determine hourly CO2 mass emissions using methodologies provided in 40 CFR Part 75, Appendix F.

(b) The owner or operator shall report CO2 emissions for the report year in metric tons based on the sum of hourly CO2 mass emissions over the year, converted to metric tons.

(c) Owners or operators who add CEMS under this ~~article~~part are subject to specifications in Paragraphs 1 through 6 of Subsection D of 20.2.102.200 NMAC, if applicable.

E. Use of the four CO2 calculation methodologies. Use of the four CO2 emissions calculation methodologies described in Subsections A through D of 20.2.102.200 NMAC is subject to the following requirements and restrictions.

(1) Calculation methodology 1 may not be used by a facility that is subject to the verification requirements of 20.2.101 NMAC, except for stationary combustion units that combust natural gas with a high heat value between 975 and ~~1,150~~1,100 Btu per cubic foot. Otherwise, calculation methodology 1 may be used for any type of fuel for which a default CO2 emission factor and a default high heat value for the fuel is specified in Table 102-1 of 20.2.102.300 NMAC.

(2) Calculation methodology 2 may not be used by a facility that is subject to the verification requirements of 20.2.101 NMAC, except for stationary combustion units that combust natural gas with a high heat value between 975 and ~~1,150~~1,100 Btu per cubic foot. Otherwise, calculation methodology 2 may be used for any type of fuel combusted for which a default CO2 emission factor for the fuel is specified in Table 102-1 of 20.2.102.300 NMAC or Table 102-2 of 20.2.102.301 NMAC.

(3) Calculation methodology 3 may be used for a unit of any size combusting any type of fuel, except when the use of calculation methodology 4 is required.

(4) Calculation methodology 4 may be used for a unit of any size combusting any type of fuel, and shall be used for any combustion unit with a CEMS that is required by any federal or state regulation and that includes both a stack gas volumetric flow rate monitor and a CO2 concentration monitor.

F. Mixtures of biomass fuel and fossil fuel.

(1) The owner or operator that combusts fuels or fuel mixtures for which the biomass fraction is

known or can be documented shall use the applicable equations in Subsections A through C of 20.2.102.200 NMAC to determine the fossil fuel fraction of CO2 emissions and shall determine the biomass fraction of CO2 emissions by subtracting the fossil fuel fraction from the total emissions.

(2) The owner or operator that combusts fuels or fuel mixtures for which the biomass fraction is unknown or cannot be documented (for example, municipal solid waste or tire-derived fuels) shall determine the biomass ~~fuel~~ portion of CO2 emissions using ASTM D6866-08, as specified in this ~~subsection~~paragraph. This procedure is not required for fuels that contain less than 5.0 percent biomass ~~fuel~~ by weight or for waste-derived fuels that are less than 30 percent by weight of total fuels combusted in the year for which emissions are being reported, except where the owner or operator wishes to report a biomass ~~fuel~~ fraction of CO2 emissions.

~~(1~~ (a) The owner or operator shall conduct ASTM D6866-08 analysis on a representative fuel or exhaust gas sample at least every three months, and shall collect exhaust gas samples over at least 24 consecutive hours following the standard practice specified by ASTM D7459-08.

~~(2~~ (b) The owner or operator shall divide total CO2 emissions between biomass fuel emissions and non-biomass fuel emissions using the average proportions of the samples analyzed for the year for which emissions are being reported.

~~(3~~ (c) If there is a common fuel source to multiple units at the facility, the owner or operator may elect to conduct ASTM D6866-08 testing for one of the units.

G. Refinery fuel gas combustion. For combustion of refinery fuel gas, the provisions of 20.2.104.201 NMAC also apply.

[20.2.102.200 NMAC - N, 01/01/10]

20.2.102.201 CALCULATION OF METHANE AND NITROUS OXIDE EMISSIONS: Calculate the annual CH4 and N2O mass emissions from stationary fuel combustion sources using the procedures in Subsections A, B and C of this section, as appropriate.

A. If the heat content of the fuel is not measured for CO2 estimation, calculate CH4 and N2O emissions using equation 102-8.

$$CH_4 \text{ or } N_2O = Fuel \times HHV_D \times EF \times 0.001$$ **Equation 102-8**

Where:

CH_4 or N_2O	=	Combustion emissions from specific fuel type, metric tons CH_4 or N_2O per year.
Fuel	=	Mass or volume of fuel combusted ~~for the measurement period, p,~~ , specified by fuel type, ~~units~~ unit of mass (short tons) or volume (thousands of scf, barrel) per ~~unit time~~year.
HHV_D	=	Default high heat value specified by fuel type provided in Table 102-1, MMBtu per unit of mass or volume.
EF	=	Default CH_4 or N_2O emission factor provided in Table 102-3, kg CH_4 or N_2O per MMBtu.
0.001	=	Factor to convert kg to metric tons.

B. If the heat content of the fuel is measured for CO2 estimation, calculate CH4 and N2O emissions using equation 102-9.

$$CH_4 \text{ or } N_2O = \sum_{p=1}^{n} Fuel_p \times HHV_p \times EF \times 0.001$$ **Equation 102-9**

Where:

CH_4 or N_2O	=	CH_4 or N_2O emissions from a specific fuel type, metric tons CH_4 or N_2O per year.
$Fuel_p$	=	Mass or volume of fuel combusted for the measurement period p, specified by fuel type, unit of mass (short tons) or volume (thousands of scf, barrel) per year.
HHV_p	=	High heat value measured for the measurement period, p, specified by fuel type, MMBtu per unit mass or volume.
EF	=	Default emission factor provided in Table 102-3, kg CH_4 or N_2O per MMBtu.
0.001	=	Factor to convert kg to metric tons.

C. For biomass and municipal solid waste combustion, the owner or operator may elect to use equation 102-10 to estimate CH4 and N2O emissions.

$$CH_4 \text{ or } N_2O = Steam \times B \times EF \times 0.001$$ **Equation 102-10**

Where:

CH_4 or N_2O	=	Annual CH_4 or N_2O emissions from the combustion of a municipal solid waste (metric tons).
Steam	=	Total mass of steam generated by municipal solid waste combustion during the reporting year (lb steam).
B	=	Ratio of the boiler's ~~maximum~~design rated heat input capacity to its design rated steam output (MMBtu/lb steam).
EF	=	Fuel-specific emission factor for CH_4 or N_2O, from Table 102-3 (kg CH_4 or N_2O per MMBtu).
0.001	=	Conversion factor from kilograms to metric tons.

D. The owner or operator may elect to calculate CH4 or N2O emissions using source-specific emission factors derived from source tests conducted at least annually under the supervision of the department. Upon approval of a source test plan, the source test procedures in that plan shall be repeated in each future year to update the source specific emission factors annually.

E. Use of the Four CO2 Calculation Methodologies. Use of the four CH4 and N2O emissions calculation methodologies described in Subsection A through D of this section is subject to the following requirements and restrictions.

(1) The calculation in Subsection A of this section may not be used by a facility that is subject to the verification requirements of 20.1.101 NMAC, except for stationary combustion units that combust natural gas with a high heat value between 975 and ~~1,150~~1,100 Btu per cubic foot. Otherwise, the calculation in Subsection A of this section may be used for any type of fuel for which a default CH4 or N2O emission factor and a default high heat value for the fuel is specified in Table 102-3.

(2) The calculation in Subsection B of this section may be used for a unit of any size combusting any type of fuel.

(3) The calculation in Subsection C of this section may only be used for biomass or municipal solid waste combustion.

(4) The calculation in Subsection D of this section may be used for a unit of any size combusting any type of fuel.

[20.2.102.201 NMAC - N, 01/01/10]

20.2.102.202 SAMPLING, ANALYSIS AND MEASUREMENT REQUIREMENTS

A. Fuel Sampling Requirements. The owner or operator shall conduct fuel sampling or receive fuel sampling results from the fuel supplier at the frequency specified in this subsection.

(1) Once for each new fuel shipment or delivery or on a monthly basis for middle distillates (diesel, gasoline, fuel oil, kerosene), residual oil, liquid waste-derived fuels, and LPG (ethane, propane, isobutene, n-butane, or unspecified LPG)**.**

(2) Monthly for natural gas, associated gas, and mixtures of low Btu gas.

(3) Monthly for gases derived from biomass including landfill gas and biogas from wastewater treatment or agricultural processes.

(4) Monthly for solid fuels, as specified below.

(a) The monthly solid fuel sample shall be a composite sample of weekly samples.

(b) The solid fuel shall be sampled at a location after all fuel treatment operations but before fuel mixing and the samples shall be representative of the fuel chemical ~~and physical~~ characteristics ~~immediately prior to combustion~~, including the moisture content at the time the fuel is weighed.

(c) Each weekly sub-sample shall be collected at a time (day and hour) of the week when the fuel consumption rate is representative and unbiased.

(d) Four weekly samples (or a sample collected during each week of operation during the month) of equal mass shall be combined to form the monthly composite sample.

(e) The monthly composite sample shall be homogenized and well mixed prior to withdrawal of a sample for analysis.

(f) One in twelve composite samples shall be randomly selected for additional analysis of its discrete constituent samples. This information will be used to monitor the homogeneity of the composite.

(5) For biomass fuels and waste-derived fuels, the following may apply in lieu of Paragraph 4 of this subsection.

(a) If CO2 emissions are calculated using Paragraph 1 of Subsection C of 20.2.102.200 NMAC, the source-specific carbon content is determined annually. Upon approval of a source test plan by the

department, the source test procedures in that plan shall be repeated in subsequent years to update the source specific emission factors annually.

(b) If CO2 emissions are calculated using Paragraph 2 of Subsection C of 20.2.102.200 NMAC (biomass fuels and municipal solid waste only), the owner or operator shall adjust the emission factor, in kg CO2/MMBtu not less frequently than every third year, through a stack test measurement of CO2 and use of the applicable ASME performance test code to determine heat input from all heat outputs, including the steam, flue gases, ash and losses.

B. Fuel Consumption Monitoring Requirements.

(1) Facilities may determine fuel consumption on the basis of direct measurement or recorded fuel purchase or sales invoices measuring any stock change (measured in million Btu, gallons, million standard cubic feet, short tons or bone dry short, tons) using the following equation: fuel consumption in the reporting year equals total fuel purchases minus total fuel sales plus amount stored at beginning of year minus amount stored at year end.

(2) Fuel consumption measured in Btu values shall be converted to the required metrics of mass or volume using heat content values that are either provided by the supplier, measured by the facility, or provided in Table 102-1 of 20.2.102.300 NMAC.

(3) All oil and gas flow meters (except for gas billing meters) shall be calibrated prior to the first year for which GHG emissions are reported under this rule, using an applicable flow meter test method listed in 20.2.102.12 NMAC or the calibration procedures specified by the flow meter manufacturer. Fuel flow meters shall be recalibrated either annually or at the minimum frequency specified by the manufacturer.

(4) For fuel oil, tank drop measurements may also be used.

(5) Equipment used to measure solid fuel consumption at a facility shall be calibrated prior to the first year for which GHG emissions are reported under this rule, using a test method listed in 20.2.100.12 NMAC or the calibration procedures specified by the equipment manufacturer. Equipment shall be recalibrated either annually or at the minimum frequency specified by the manufacturer.

C. Fuel Heat Content Monitoring Requirements. High heat values shall be based on the results of fuel sampling and analysis received from the fuel supplier or determined by the owner or operator, in either case using an applicable analytical method listed in 20.2.100.12 NMAC.

(1) For gases, use ASTM D1826-94, ASTM D3588-98, ASTM D4891-89, or GPA standard 2261-00. The owner or operator may alternatively elect to use on-line instrumentation that determines heating value accurate to within plus or minus 5.0 percent. Where existing on-line instrumentation provides only low heat value, the owner or operator shall convert the value to high heat value according to Equation 102-11 below. For natural gas, a value of 1.11 shall be used for the conversion factor (CF) in equation 102-11. For refinery fuel gas and mixtures of refinery fuel gas, a weekly average fuel system-specific conversion factor (CF) shall be derived either by concurrent LHV instrumentation measurements and HHV determined by on-line instrumentation or laboratory analysis as part of the daily carbon content determination, or by the HHV/LHV ratio obtained from the laboratory analysis of the daily samples.

$$HHV = LHV \times CF$$

Equation 102-11

Where:

HHV = fuel or fuel mixture high heat value (Btu/scf).
LHV = fuel or fuel mixture low heating value (Btu/scf).
CF = conversion factor.

(2) For middle distillates and oil, or liquid waste-derived fuels, use ASTM D0240-02 or ASTM D4809-06.

(3) For solid biomass-derived fuels, use ASTM D5865-07A.

(4) For waste-derived fuels, use ASTM D5865-07A or ASTM D5468-02. Owners or operators who combust waste-derived fuels that are not pure biomass fuels shall determine the biomass fuel portion of CO2 emissions using the method specified in Subsection F of 20.2.102.200 NMAC, if applicable.

D. Fuel Carbon Content Monitoring Requirements. Fuel carbon content and either molecular weight or molar fraction for gaseous fuels shall be based on the results of fuel sampling and analysis received from the fuel supplier or determined by the owner or operator, in either case using an applicable analytical method listed in 20.2.100.12 NMAC.

(1) For coal and coke, solid biomass fuels, and waste derived fuels; use ASTM D5373-08.

(2) For liquid fuels, use the following ASTM methods. For petroleum-based liquid fuels and liquid

waste-derived fuels, use ASTM D5291-02, ultimate analysis of oil or computations based on ASTM D3238-95 and either ASTM D2502-04 or ASTM D2503-92.

(3) For gaseous fuels, use ASTM D1945-03 or ASTM D1946-90. The owner or operator may alternatively elect to use on-line instrumentation that determines fuel carbon content accurate to plus or minus 5.0 percent.

(4) Measure the carbon content for fuel gas and flexigas using either ASTM D1945-03 or ASTM D1946-90. Where these methods do not adequately quantify all major hydrocarbons, then an owner or operator may request use of an alternative ASTM or other method approved by the department.

E. Fuel Analytical Data Capture. When the applicable emissions estimation methodologies in 20.2.102 NMAC through 20.2.108 NMAC require periodic collection of fuel analytical data for an emissions source, the owner or operator shall demonstrate every reasonable effort to obtain a fuel analytical data capture rate of one hundred percent for each report year.

(1) If the owner or operator is unable to obtain fuel analytical data such that more than 20 percent of emissions from a source cannot be directly accounted for, the emissions from that source shall be considered unverifiable for the report year.

(2) If the fuel analytical data capture rate is at least eighty percent but less than one hundred percent for any emissions source identified in 20.2.102 NMAC through 20.2.108 NMAC, the owner or operator shall use the mean of the fuel analytical data results captured to substitute for the missing values for the period of missing data.

F. Procedure for Interim Fuel Analytical Data Collection.

(1) In the event of an unforeseen breakdown of fuel analytical data monitoring equipment required for the emissions estimation methodologies in sections 20.2.102 NMAC through 20.2.108 NMAC, the department may authorize an owner or operator to use an interim data collection procedure if the department determines that the owner or operator has satisfactorily demonstrated that:

(a) the breakdown may result in a loss of more than 20 percent of the source's fuel data for the reporting year, such that emissions for the affected source could not be verified under the provisions of 20.2.101 NMAC;

(b) the fuel analytical data monitoring equipment cannot be promptly repaired or replaced without shutting down a process unit significantly affecting facility operations, or that the monitoring equipment must be replaced and replacement equipment is not immediately available;

(c) the interim procedure will not remain in effect longer than is reasonably necessary for repair or replacement of the malfunctioning data monitoring equipment; and

(d) the request was submitted within 30 calendar days of the breakdown of the fuel analytical data monitoring equipment.

(2) An owner or operator seeking approval of an interim data collection procedure must, within 30 days of the monitoring equipment breakdown, submit a written request to the department that includes all of the following:

(a) the proposed start date and end date of the interim procedure;

(b) a detailed description of what data are affected by the breakdown;

(c) a discussion of the accuracy of data collected during the interim procedure compared with the data collected under the owner or operator's usual equipment-based method;

(d) a demonstration that no feasible alternative procedure exists that would provide more accurate emissions data; and

(e) a demonstration that the proposed interim procedure meets the criteria specified in Paragraph (1) of this subsection.

(3) The department may limit the duration of the interim data collection procedure or include other conditions of approval to ensure the criteria in paragraph (1) of this subsection are met.

(4) When approving an interim data collection procedure, the department shall determine whether the accuracy of data collected under the procedure is reasonably equivalent to data collected from properly functioning monitoring equipment, and if it is not, the relative accuracy to assign for purposes of assessing possible material misstatement under 20.2.101.116 NMAC.

[20.2.102.202 NMAC - N, 01/01/10]

20.2.102.203 to 20.2.102.299 [RESERVED]

20.2.102.300 TABLE 102-1: DEFAULT CARBON CONTENT, HEAT CONTENT, AND CARBON DIOXIDE EMISSION FACTORS FROM STATIONARY COMBUSTION BY FUEL TYPE

1

Fuel Type	Carbon Content	High Heat Value/ Heat Content	CO2 Emission Factor	CO2 Emission Factor
Coal and Coke	**kg C / MMBtu**	**MMBtu / Short Ton**	**kg CO2 / Short Ton**	**kg CO2 / MMBtu**
Anthracite	28.26	25.09	2,597.94	103.54
Bituminous	25.49	24.93	2,328.35	93.40
Sub-bituminous	26.48	17.25	1,673.64	97.02
Lignite	26.30	14.21	1,369.32	96.36
Unspecified (Residential/Commercial)	26.00	22.07	2,118.67	95.26
Unspecified (Industrial Coking)	25.56	26.27	2,461.17	93.65
Unspecified (Other Industrial)	25.63	22.05	2,082.89	93.91
Unspecified (Electric Power)	25.76	19.93	1,884.86	94.38
Coke	27.85	24.80	2,530.65	102.04
Natural Gas (By Heat Content)	**kg C / MMBtu**	**~~Btu /~~MMBtu / 1,000 Standard cubic foot**	**kg CO2 / 1,000 Standard cubic foot**	**kg CO2 / MMBtu**
975 to 1,000 Btu / scf	14.73	n/a	n/a	53.97
1000 to 1,025 Btu / scf	14.43	n/a	n/a	52.87
1025 to 1,050 Btu / scf	14.47	n/a	n/a	53.02
1050 to 1,075 Btu / scf	14.58	n/a	n/a	53.42
1075 to 1,100 Btu / scf	14.65	n/a	n/a	53.68
Greater than 1,100 Btu / scf	14.92	n/a	n/a	54.67
Unspecified (Weighted U.S. Average)	14.47	1,027	~~0.0544~~54.4	53.02
Petroleum Products	**kg C / MMBtu**	**MMBtu / Barrel**	**kg CO2 / gallon**	**kg CO2 / MMBtu**
Asphalt & Road Oil	20.62	6.636	11.94	75.55
Aviation Gasoline	18.87	5.048	8.31	69.14
Distillate Fuel Oil (#1, 2 & 4)	19.95	5.825	10.14	73.10
Jet Fuel	19.33	5.670	9.56	70.83
Kerosene	19.72	5.670	9.75	72.25
LPG (energy use)	17.19	3.861	5.79	62.98
Propane	17.20	3.824	5.74	63.02
Ethane	16.25	2.916	4.13	59.54
Isobutane	17.75	4.162	6.44	65.04
n-Butane	17.72	4.328	6.69	64.93
Lubricants	20.24	6.065	10.71	74.16
Motor Gasoline	19.33	5.218	8.80	70.83
Residual Fuel Oil (number 5 and 6)	21.49	6.287	11.79	78.74
Crude Oil	20.33	5.800	10.29	74.49
Naphtha (less than 401 degrees F)	18.14	5.248	8.30	66.46
Natural Gasoline	18.24	4.620	7.35	66.83
Other Oil (greater than 401 degrees F)	19.95	5.825	10.14	73.10
Pentanes Plus	18.24	4.620	7.35	66.83
Petrochemical Feedstocks	19.37	5.428	9.17	70.97
Petroleum Coke	27.85	6.024	14.64	102.04
Still Gas	17.51	6.000	9.17	64.16
Special Naphtha	19.86	5.248	9.09	72.77
Unfinished Oils	20.33	5.825	10.33	74.49
Waxes	19.81	5.537	9.57	72.58
Other Solid Fuels	**kg C / MMBtu**	**MMBtu /**	**kg CO2 / Short**	**kg CO2 /**

		Short Ton	Ton	MMBtu
Biomass derived fuels (solid); wood and wood waste (12 percent moisture content) or other solid biomass fuels	25.60	15.38	1,442.62	93.80
Municipal Solid Waste (MSW)	24.74	8.7	~~906~~788.7	90.65
Peat	29.07	8.83	940.66	106.53
Biomass-derived Fuels (Gas)	**kg C / MMBtu**	**Btu / Standard cubic foot**	**kg CO2 / Standard cubic ft.**	**kg CO2 / MMBtu**
Biogas (includes landfill gas and manure biogas)	28.4	Varies	Varies	104.06
Note: Heat content factors are based on high heat values (HHV). The emission factors for biogas include both the CO2 from combustion and the pass-through CO2, which are assumed to be in equal proportions.				

[20.2.102.300 NMAC - N, 01/01/10]

20.2.102.301 TABLE 102-2: DEFAULT CARBON DIOXIDE EMISSION FACTORS FROM STATIONARY COMBUSTION FOR WASTE DERIVED FUELS

Fuel Type	**kg CO2 / MMBtu**
Waste Oil	78
Tires	90
Plastics	79
Solvents	78
Impregnated Saw Dust	79
Other Fossil Based Wastes	84
Dried Sewage Sludge	116
Mixed Industrial Waste	88
Municipal Solid Waste	See Table 102-1
Note: emission factors are based on high heat values (HHV); values were converted from LHV to HHV assuming that LHV are 5 percent lower than HHV for solid and liquid fuels.	

[20.2.102.301 NMAC - N, 01/01/10]

20.2.102.302 TABLE 102-3: DEFAULT METHANE AND NITROUS OXIDE EMISSION FACTORS FROM STATIONARY COMBUSTION BY FUEL TYPE

Fuel Type	**CH4 Emission Factor (kg CH4/ MMBtu)**	**N2O Emission Factor (kg N2O / MMBtu)**
Asphalt	0.003	0.0006
Aviation Gasoline	0.003	0.0006
Coal	0.01	0.0015
Crude Oil	0.003	0.0006
Digester Gas	0.0009	0.0001
Distillate	0.003	0.0006
Gasoline	0.003	0.0006
Jet Fuel	0.003	0.0006
Kerosene	0.003	0.0006
Kraft Black Liquor	~~0.0026~~0.03	~~0.0021~~0.005
Landfill Gas	0.0009	0.0001
LPG	0.001	0.0001
Lubricants	0.003	0.0006
Municipal Solid Waste	0.03	0.004
Naphtha	0.003	0.0006
Natural Gas	0.0009	0.0001

Fuel Type	CH4 Emission Factor (kg CH4/ MMBtu)	N2O Emission Factor (kg N2O / MMBtu)
Natural Gas Liquids	0.003	0.0006
Other Biomass Fuels	0.03	0.004
Petroleum Coke	0.003	0.0006
Propane	0.001	0.0001
Refinery Gas	0.0009	0.0001
Residual Fuel Oil	0.003	0.0006
Tires	0.003	0.0006
Waste Oil	0.03	0.004
Waxes	0.003	0.0006
Wood (Dry)	0.03	0.004
Note: Heat content factors are based on high heat values (HHV).		

[20.2.102.302 NMAC - N, 01/01/10]

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 2 AIR QUALITY (STATEWIDE)
PART 103 GREENHOUSE GAS REPORTING - ELECTRICITY GENERATION

20.2.103.1 ISSUING AGENCY: Environmental Improvement Board.
[20.2.103.1 NMAC - N, 01/01/10]

20.2.103.2 SCOPE: All persons who own or operate an applicable source of greenhouse gas emissions in the geographic area within the jurisdiction of the environmental improvement board.
[20.2.103.2 NMAC - N, 01/01/10]

20.2.103.3 STATUTORY AUTHORITY: Environmental Improvement Act, NMSA 1978, Section 74-1-8(A)(4), and Air Quality Control Act, NMSA 1978, Sections 74-2-1 et seq., including specifically Sections 74-2-5(B)(1) & 74-2-(5)(C)(5)(d) & (e).
[20.2.103.3 NMAC - N, 01/01/10]

20.2.103.4 DURATION: Permanent.
[20.2.103.4 NMAC - N, 01/01/10]

20.2.103.5 EFFECTIVE DATE: January 1, 2010 except where a later date is cited at the end of a section.
[20.2.103.5 NMAC - N, 01/01/10]

20.2.103.6 OBJECTIVE: The objectives of this part are:

A. To specify greenhouse gas emissions from electricity generation sources that shall be included in determining applicability of greenhouse gas reporting and verification requirements under 20.2.100 NMAC and 20.2.101 NMAC;

B. To specify methods of calculation and sampling, analysis and measurement requirements for greenhouse gas emissions from electricity generation sources; and

C. To specify the information, in addition to the information required by 20.2.100 NMAC, that shall be included for electricity generation source emissions in annual reports to the department by the owner or operator of any facility meeting the applicability requirements in 20.2.100 NMAC.

[20.2.103.6 NMAC - N, 01/01/10]

20.2.103.7 DEFINITIONS: The definitions included in 20.2.100 NMAC shall apply to the terms used in this part. The definitions included in 20.2.2 NMAC shall apply to the terms used in this part, unless such term is defined in 20.2.100 NMAC.
[20.2.103.7 NMAC - N, 01/01/10]

20.2.103.8 SEVERABILITY: If any provision of this part, or the application of such provision to any person or circumstance, is held invalid, the remainder of this part, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.
[20.2.103.8 NMAC - N, 01/01/10]

20.2.103.9 CONSTRUCTION: This part shall be liberally construed to carry out its purpose.
[20.2.103.9 NMAC - N, 01/01/10]

20.2.103.10 SAVINGS CLAUSE: Repeal or supersession of prior versions of this part shall not affect any administrative or judicial action initiated under those prior versions.
[20.2.103.10 NMAC - N, 01/01/10]

20.2.103.11 COMPLIANCE WITH OTHER REGULATIONS: Compliance with this part does not relieve a person from the responsibility to comply with any other applicable federal, state, or local regulations.
[20.2.103.11 NMAC - N, 01/01/10]

~~**20.2.103.12 INCORPORATION BY REFERENCE:** Each document listed in 20.2.100.12 NMAC and cited in this Part shall be incorporated by reference into this part.~~

20.2.103.12 AVAILABILITY OF CITED DOCUMENTS: Additional information regarding documents cited in this part may be found at 20.2.100.12 NMAC.
[20.2.103.12 NMAC - N, 01/01/10]

20.2.103.13 to 20.2.103.99 [RESERVED]

20.2.103.100 REPORTING REQUIREMENTS: In addition to meeting the requirements in 20.2.100 NMAC, the emissions data report shall include the following information for each electricity generating unit.

A. Annual greenhouse gas emissions in metric tons, reported as follows:

(1) total CO2 emissions for fossil fuels, reported by fuel type;

(2) total CO2 emissions for all biomass fuels combined;

(3) total CH4 emissions for fuels combined; and

(4) total N2O emissions for all fuels combined.

B. Annual fuel consumption:

(1) for gases, report in units of standard cubic feet;

(2) for liquids, report in units of gallons;

(3) for non-biomass solids, report in units of short tons; and

(4) for biomass-derived solid fuels, report in units of bone dry short tons.

C. Average carbon content of each fuel, if used to compute CO2 emissions as specified in 20.2.103.200 NMAC.

D. Average high heat value of each fuel, if used to compute CO2 emissions as specified 20.2.103.200 NMAC.

E. The nameplate generating capacity in megawatts and net power generated in the reporting year in megawatt hours.

F. For each cogeneration unit, indicate whether topping or bottoming cycle and provide useful thermal output as applicable, in MMBtu. Where steam or heat is acquired from another facility for the generation of electricity, report the provider and amount of acquired steam or heat in MMBtu. Where supplemental firing has been applied to support electricity generation or industrial output, report this purpose and fuel consumption by fuel type using the units in Subsection B of 20.2.103.~~200~~100 NMAC.

G. Process CO2 emissions from acid gas scrubbers and acid gas reagent.

H. Fugitive emissions of HFC from cooling units that support power generation.

I. Fugitive CO2 emissions from geothermal facilities.

J. Fugitive CO2 emissions from coal storage at coal-fired electricity generating facilities shall be reported as specified in 20.2.108 NMAC.
[20.2.103.100 NMAC - N, 01/01/10]

20.2.103.101 to 20.2.103.199 [RESERVED]

20.2.103.200 CALCULATION OF GREENHOUSE GAS EMISSIONS:

A. Calculation of CO2 Emissions. Owners or owners or operators shall use CEMS to measure CO2 emissions if required to operate a CEMS by any other federal or state regulation. Owners or operators not required to operate a CEMS by another regulation may use either CEMS or the calculation methods specified in Paragraphs 1 through 7 of this subsection. Owners or operators using CEMS to determine CO2 emissions shall comply with the provisions in Subsection D of 20.2.102.200 NMAC.

(1) Natural gas. For electric generating units combusting natural gas, use one of the following methods.

(a) If the high heat value is greater than or equal to 975 and less than or equal to 1,100 Btu/scf, use either:

(i) the measured carbon content of the fuel and calculation methodology 3 in Subsection C of 20.2.102.200 NMAC*;* or

(ii) the measured heat content of the fuel and the calculation methodology 2 in Subsection B of 20.2.102.200 NMAC provided the facility is not subject to the verification requirements of 20.2.101 NMAC.

(b) If the high heat value is less than 975 or greater than 1,100 Btu/scf, use the measured carbon content of the fuel and the calculation methodology 3 in Subsection C of 20.2.102.200 NMAC.

(2) Coal or petroleum coke. For electric generating units combusting coal or petroleum coke, use the measured carbon content of the fuel and calculation methodology 3 in Subsection C of 20.2.102.200 NMAC.

(3) Middle distillates, gasoline, residual oil, or liquid petroleum gases. For electric generating units combusting middle distillates (such as diesel, fuel oil, or kerosene), gasoline, residual oil, or LPG (such as ethane, propane, isobutene, n-butane, or unspecified LPG), use one of the following methods:

(a) the measured carbon content of the fuel and calculation methodology 3 in Subsection C of 20.2.102.200 NMAC; or

(b) the measured heat content of the fuel and calculation methodology 2 in Subsection B of 20.2.102.200 NMAC provided the facility is not subject to the verification requirements of 20.2.101 NMAC.

(4) Refinery fuel gas, flexigas, or associated gas. For electric generating units combusting refinery fuel gas, flexigas, or associated gas, use the methods specified in 20.2.104 NMAC**.**

(5) Landfill gas, biogas, or biomass. For electricity generating units combusting landfill gas, biogas, or biomass, use one of the following methods:

(a) the measured carbon content of the fuel and calculation methodology 3 provided in Subsection C of 20.2.102.200 NMAC; or

(b) the measured heat content of the fuel and calculation methodology 2 in Subsection B of 20.2.102.200 NMAC provided the facility is not subject to the verification requirements of 20.2.101 NMAC.

(6) Municipal solid waste. Electricity generating units combusting municipal solid waste may use the measured steam generated, the default carbon content emission factor in Table 102-1 in 20.2.102.300 NMAC, and the calculation methodology in Paragraph 2 of Subsection B of 20.2.102.200 NMAC provided the facility is not subject to the verification requirements of 20.2.101 NMAC. If the facility is subject to the verification requirements of 20.2.101 NMAC, the owner or operator shall use CEMS to measure CO2 emissions in accordance with Subsection D of 20.2.102.200 NMAC, or calculate emissions using steam flow and a CO2 emission factor according to the provisions of Paragraph 2 of Subsection C of 20.2.102.200 NMAC.

(7) Start-up fuels. The owners or operators of generating facilities that primarily combust biomass-derived fuels but combust fossil fuels during start-up, shut-down, or malfunction operating periods only, shall calculate CO2 emissions from fossil fuel combustion using one of the following methods:

(a) the default emission factors from Table 102-1 in 20.2.102.300 NMAC and in Table 102-2 in 20.2.102.301 NMAC and calculation methodology 1 provided in Subsection A of 20.2.102.200 NMAC;

(b) the measured heat content of the fuel and calculation methodology 2 provided in Subsection B of 20.2.102.200 NMAC;

(c) the measured carbon content of the fuel and calculation methodology 3 provided in Subsection C of 20.2.102.200 NMAC; or

(d) for combustion of refinery fuel gas, the measured heat content and carbon content of the fuel, and the calculation methodology provided in 20.2.104 NMAC.

(8) Co-fired electricity generating units. For electricity generating units that combust more than one type of fuel, the owner or operator shall calculate CO2 emissions as follows.

(a) For co-fired electricity generators that burn only fossil fuels, CO2 emissions shall be determined using one of the following methods.

(i) A continuous emission monitoring system in accordance with calculation methodology 4 in Subsection D of 20.2.102.200 NMAC. Owners or operators using this method need not report emissions separately for each fossil fuel.

(ii) For units not equipped with a continuous emission system, calculate the CO2 emissions separately for each fuel type using the methods specified in Paragraphs 1 through 4 of this subsection.

(b) For co-fired electricity generators that burn biomass-derived fuel with a fossil fuel, CO2 emissions shall be determined using one of the following methods.

(i) A continuous emission monitoring system in accordance with calculation methodology 4 in Subsection D of 20.2.102.200 NMAC. Owners or operators using this method shall determine the portion of the total CO2 emissions attributable to the biomass-derived fuel and portion of the total CO2 emissions attributable to the fossil fuel using the methods specified in Paragraph 4 of Subsection D of 20.2.102.200 NMAC.

(ii) For units not equipped with a continuous emission system, calculate the CO2 emissions separately for each fuel type using the methods specified in Paragraphs 1 through 7 of this subsection.

B. Calculation of CH4 and N2O emissions. Owner or operators of electricity generating units shall use the methods specified in 20.2.102.201 NMAC to calculate the annual CH4 and N2O emissions. For coal combustion, use the default CH4 emission factor in Table 102-3 in 20.2.102.302 NMAC.

C. Calculation of CO2 emissions from acid gas scrubbing. Owner or operators of electricity generating units that use acid gas scrubbers or add an acid gas reagent to the combustion unit shall calculate the annual CO2 emissions from these processes using equation 103-1 if these emissions are not already accounted for in

CO2 emissions determined using a continuous emissions monitoring system.

$$CO_2 = S \times R \times \left(CO_{2\,MW} / Sorbent_{MW}\right)$$ **Equation 103-1**

Where:

CO_2	=	CO_2 emitted from sorbent for the report year, metric tons;
S	=	Limestone or other sorbent used in the report year, metric tons;
R	=	Ratio of moles of CO_2 released upon capture of one mole of acid gas;
$CO_{2\,MW}$	=	Molecular weight of carbon dioxide (44);
$Sorbent_{MW}$	=	Molecular weight of sorbent (if calcium carbonate, 100).

D. Calculating fugitive HFC emissions from cooling units. Owners or operators of electricity generating facilities shall calculate fugitive HFC emissions for each HFC compound used in cooling units that support power generation or are used in heat transfers to cool stack gases using either the methodology in Paragraph 1 or Paragraph 2 of this subsection**.** The owner or operator is not required to report GHG emissions from air or water cooling systems or condensers that do not contain HFCs.

(1) Use equation 103-2 to calculate annual HFC emissions.

Equation 103-2

$$HFC = HFC_{inventory} + HFC_{purchases/acquisitions} - HFC_{sales/disbursements} + HFC_{\Delta capacity}$$

Where:

HFC	=	Annual fugitive HFC emission, metric tons;
$HFC_{inventory}$	=	The difference between the quantity of HFC in storage at the beginning of the year and the quantity in storage at the end of the year. Stored HFC includes HFC contained in cylinders (such as 115-pound storage cylinders), gas carts, and other storage containers. It does not include HFC gas held in operating equipment. The change in inventory will be negative if the quantity of HFC in storage increases over the course of the year.
$HFC_{purchases/acquisitions}$	=	The sum of all HFC acquired from other entities during the year either in storage containers or in equipment.
$HFC_{sales/disbursements}$	=	The sum of all the HFC sold or otherwise transferred offsite to other entities during the year either in storage containers or in equipment.
$HFC_{\Delta capacity}$	=	The net change in the total nameplate capacity (i.e. the full and proper charge) of the cooling equipment). The net change in capacity will be negative if the total nameplate capacity at the end of the year is less than the total nameplate capacity at the beginning of the year.

(2) Use service logs to document HFC usage and emissions from each cooling unit. Service logs should document all maintenance and service performed on the unit during the report year, including the quantity of HFCs added to or removed from the unit, and include a record at the beginning and end of each report year. The owner or operator may use service log information along with the following simplified material balance equations 103-3 to quantify fugitive HFCs from unit installation, servicing, and retirement, as applicable. The owner or operator shall include the sum of HFC emissions from the applicable equations in the greenhouse gas emissions data report.

$$HFC_{Install} = R_{new} - C_{new}$$ **Equation 103-3**

$$HFC_{Service} = R_{recharge} - R_{Recover}$$

$$HFC_{Retire} = C_{retire} - R_{retire}$$

Where:

$HFC_{Install}$ = HFC emitted during initial charging/installation of the unit, kilograms;
$HFC_{Service}$ = HFC emitted during use and servicing of the unit for the report year, kilograms;
HFC_{Retire} = HFC emitted during the removal from service/retirement of the unit, kilograms;
R_{new} = HFC used to fill new unit (omit if unit was pre-charged by the manufacturer), kilograms;
C_{new} = Nameplate capacity of new unit (omit if unit was pre-charged by the manufacturer), kilograms;
$R_{recharge}$ = HFC used to recharge the unit during maintenance and service, kilograms;
$R_{recover}$ = HFC recovered from the unit during maintenance and service, kilograms;
C_{retire} = Nameplate capacity of the retired unit, kilograms; and
R_{retire} = HFC recovered from the retired unit, kilograms.

E. Fugitive CO2 emissions from geothermal facilities. Owners or operators of geothermal electricity generating facilities shall calculate the fugitive CO2 emissions using one of the following methods:

(1) Calculate the fugitive CO2 emissions using equation 103-4*:*

$$CO_2 = 7.53 \times Heat \times 0.001$$ **Equation 103-4**

Where:

CO_2 = CO_2 emissions, metric tons per year;
7.53 = Default fugitive CO_2 emission factor for geothermal facilities, kg per MMBtu; and
Heat = Heat taken from geothermal steam or fluid, MMBtu/yr.

(2) Calculate CO2 emissions using a source specific emission factor approved by the department.
[20.2.103.200 NMAC - N, 01/01/10]

20.2.103.201 to 20.2.103.299 [RESERVED]

20.2.103.300 SAMPLING, ANALYSIS AND MEASUREMENT REQUIREMENTS:

A. CO2, CH4 and N2O Emissions from Fuel Combustion. Owners or operators using CEMS to estimate CO2 emissions from fuel combustion shall comply with the requirements in Subsection D of 20.2.102.200 NMAC. Owners or operators using methods other than CEMS shall comply with the applicable fuel sampling, fuel consumption monitoring, heat content monitoring, and carbon content monitoring specified in 20.2.102.202 NMAC.

B. CO2 Emissions from Acid Gas Scrubbing. Owners or operators of electricity generating units that use acid gas scrubbers or add an acid gas reagent to the combustion unit shall measure the amount of limestone or other sorbent used during the reporting year.

C. CO2 Emissions from Geothermal Facilities. Owners or operators of geothermal facilities shall measure the heat recovered from geothermal steam. If using a source specific emission factor instead of the default factor, the owner or operator shall conduct an annual test of the CO2 emission rate using a method approved by the department. The owner or operator shall submit a test plan to the department for approval. Once approved, the annual tests shall be conducted in accordance with the approved test plan under the supervision of the department.
[20.2.103.300 NMAC - N, 01/01/10]

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 2 AIR QUALITY (STATEWIDE)
PART 104 GREENHOUSE GAS REPORTING - REFINERIES

20.2.104.1 ISSUING AGENCY: Environmental Improvement Board.
[20.2.104.1 NMAC - N, 01/01/10]

20.2.104.2 SCOPE: All persons who own or operate an applicable source of greenhouse gas emissions in the geographic area within the jurisdiction of the environmental improvement board.
[20.2.104.2 NMAC - N, 01/01/10]

20.2.104.3 STATUTORY AUTHORITY: Environmental Improvement Act, NMSA 1978, Section 74-1-8(A)(4), and Air Quality Control Act, NMSA 1978, Sections 74-2-1 et seq., including specifically Sections 74-2-5(B)(1) & 74-2-(5)(C)(5)(d) & (e).
[20.2.104.3 NMAC - N, 01/01/10]

20.2.104.4 DURATION: Permanent.
[20.2.104.4 NMAC - N, 01/01/10]

20.2.104.5 EFFECTIVE DATE: January 1, 2010 except where a later date is cited at the end of a section.
[20.2.104.5 NMAC - N, 01/01/10]

20.2.104.6 OBJECTIVE: The objectives of this part are:

A. To specify greenhouse gas emissions from petroleum refining, refinery fuel gas combustion, and hydrogen production sources that shall be included in determining applicability of greenhouse gas reporting and verification requirements under 20.2.100 NMAC and 20.2.101 NMAC;

B. To specify methods of calculation and sampling, analysis and measurement requirements for greenhouse gas emissions from petroleum refining, refinery fuel gas combustion, and hydrogen production sources; and

C. To specify the information, in addition to the information required by 20.2.100 NMAC, that shall be included for petroleum refining, refinery fuel gas combustion, and hydrogen production source emissions in annual reports to the department by the owner or operator of any facility meeting the applicability requirements in 20.2.100 NMAC.

[20.2.104.6 NMAC - N, 01/01/10]

20.2.104.7 DEFINITIONS: The definitions included in 20.2.100 NMAC shall apply to the terms used in this part. The definitions included in 20.2.2 NMAC shall apply to the terms used in this part, unless such term is defined in 20.2.100 NMAC.
[20.2.104.7 NMAC - N, 01/01/10]

20.2.104.8 SEVERABILITY: If any provision of this part, or the application of such provision to any person or circumstance, is held invalid, the remainder of this part, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.
[20.2.104.8 NMAC - N, 01/01/10]

20.2.104.9 CONSTRUCTION: This part shall be liberally construed to carry out its purpose.
[20.2.104.9 NMAC - N, 01/01/10]

20.2.104.10 SAVINGS CLAUSE: Repeal or supersession of prior versions of this part shall not affect any administrative or judicial action initiated under those prior versions.
[20.2.104.10 NMAC - N, 01/01/10]

20.2.104.11 COMPLIANCE WITH OTHER REGULATIONS: Compliance with this part does not relieve a person from the responsibility to comply with any other applicable federal, state, or local regulations.
[20.2.104.11 NMAC - N, 01/01/10]

~~**20.2.104.12 INCORPORATION BY REFERENCE:** Each document listed in 20.2.100.12 NMAC and cited in this part shall be incorporated by reference into this part.~~

20.2.104.12 AVAILABILITY OF CITED DOCUMENTS: Additional information regarding documents cited in this part may be found at 20.2.100.12 NMAC.

[20.2.104.12 NMAC - N, 01/01/10]

20.2.104.13 to 20.2.104.99 [RESERVED]

20.2.104.100 REPORTING REQUIREMENTS FOR PETROLEUM REFINERIES: In addition to the information required by 20.2.100 NMAC, the annual emissions report shall contain the following information reported for the facility.

A. CO2 emissions from catalyst regeneration, in metric tons.

B. CO2, N2O, and CH4 emissions from process vents, in metric tons.

C. CO2 and CH4 emissions from asphalt production, in metric tons.

D. CO2 emissions from sulfur recovery units, in metric tons.

E. CO2, N2O, and CH4 emissions as specified in 20.2.102.200 NMAC and 20.2.201 NMAC from stationary combustion units other than flares and control devices.

F. CO2, N2O, and CH4 emissions from flares and other control devices, in metric tons.

G. CH4 emissions from above-ground storage tanks, in metric tons.

H. CH4 and N2O emissions from on-site wastewater treatment, in metric tons.

I. CH4 emissions from oil-water separators, in metric tons.

J. CH4 emissions from equipment leaks, in metric tons.

K. Feedstock consumption by type for all feedstocks which result in GHG emissions in the reporting year (including petroleum coke) in units of million standard cubic feet for gases, gallons for liquids, short tons for non-biomass solids, and bone dry short tons for biomass-derived solid fuels.

L. Fuel consumption by fuel type consumed in the reporting year, in units of million standard cubic feet for gases, gallons for liquids, short tons for non-biomass solids, and bone dry short tons for biomass-derived solid fuels.

[20.2.104.101 NMAC - N, 01/01/10]

20.2.104.101 REPORTING REQUIREMENTS FOR REFINERY FUEL GAS COMBUSTION: In addition to the information required by 20.2.100 NMAC, the annual emissions report shall contain the following information reported for the facility.

A. Annual CO2, CH4, and N2O emissions from refinery fuel gas combustion in metric tons.

B. Annual fuel consumption in units of million standard cubic feet.

C. Average carbon content of each fuel, if used to compute CO2 emissions.

D. Average high heat value of each fuel, if used to compute CO2 emissions.

[20.2.104.101 NMAC - N, 01/01/10]

20.2.104.102 REPORTING REQUIREMENTS FOR HYDROGEN PRODUCTION: In addition to the information required by 20.2.100 NMAC, the annual emissions report shall contain the following information reported for the facility.

A. The noncombustion CO2 emissions from the hydrogen production process, in metric tons.

B. If estimating emissions using the mass balance approach in Subsection B of 20.2.104.202 NMAC, annual feedstock consumption by feedstock type (including petroleum coke) reported in units of million standard cubic feet for gases, gallons for liquids, short tons for non-biomass solids, and bone dry short tons for biomass-derived solid fuels.

C. Annual hydrogen produced, in units of million standard cubic feet.

D. For stationary combustion units not otherwise specified in this part, report CO2, N2O, and CH4 emissions as specified in 20.2.102 NMAC.

[20.2.104.101 NMAC - N, 01/01/10]

20.2.104.103 to 20.2.104.199 [RESERVED]

20.2.104.200 CALCULATION OF GREENHOUSE GAS EMISSIONS FOR PETROLEUM REFINERIES: The owner or operator shall calculate GHG emissions using the methods in paragraphs (A) through (I) of this section.

A. Catalyst Regeneration. For units equipped with CEMS, owners or operators shall calculate CO2 process emissions resulting from catalyst regeneration using CEMS in accordance with 20.2.102 NMAC. In the absence of CEMS data, the owner or operator shall use the methods in paragraphs (A)(1) through (A)(3) of this section.

(1) The owner or operator shall calculate process CO2 emissions from the continuous regeneration of catalyst material in fluid catalytic cracking units (FCCU) and fluid cokers using Equations 104-1, 104-2, and 104-3.

$$CO_2 = \sum_{d=1}^{n} CR_d \times CF \times 3.664 \times 0.001$$ **Equation 104-1**

Where:

CO_2	=	CO_2 emissions (metric tons/yr)
n	=	number of days of operation in the report year
CR_d	=	daily average coke burn rate (kg/day)
CF	=	carbon fraction in coke burned
3.664	=	ratio of molecular weights, ~~CO_2~~carbon dioxide to carbon
0.001	=	conversion factor ~~–~~from kg to metric tons

Equation 104-2

$$CR_d = \left[\sum_{i=1}^{n} [K_1 Q_r \times (\%CO_2 + \%CO) + K_2 Q_a - K_3 Q_r \times [\%CO/2 + \%CO_2 + \%O_2] + K_3 Q_{oxy} \times (\%O_{oxy})]_i \right] / n$$

Where:

CR_d	=	daily average coke burn rate (kg/day or lb/day)
K_1, K_2, K_3	=	material balance and conversion factors (K_1, K_2, and K_3 from Table 104-1
n	=	number of hours per day
Q_r	=	volumetric flow rate of exhaust gas before entering the emission control system (dscm/min or dscf/min)
Q_a	=	volumetric flow rate of air to regenerator as determined from control room instrumentation (dscm/min or dscf/min)
$\%CO_2$	=	CO_2 concentration in regenerator exhaust, percent by volume – dry basis
%CO	=	CO concentration in regenerator exhaust, percent by volume – dry basis
$\%O_2$	=	O_2 concentration in regenerator exhaust, percent by volume – dry basis
Q_{oxy}	=	volumetric flow rate of O_2 enriched air to regenerator as determined from control room instrumentation (dscm/min or dscf/min)
$\%O_{xy}$	=	O_2 concentration in O_2 enriched air stream inlet to regenerator, percent by volume – dry basis

$$Q_r = (79 \times Q_a + (100 - \%Q_{xy}) \times Q_{oxy}) / (100 - \%CO_2 - \%CO - \%O_2)$$ **Equation 104-3**

Where:

Q_r	=	volumetric flow rate of exhaust gas from regenerator before entering the emission control system (dscm/min or dscf/min)
Q_a	=	volumetric flow rate of air to regenerator, as determined from control room instrumentation (dscm/min or dscf/min)
$\%Q_{xy}$	=	oxygen concentration in oxygen enriched air stream, percent by volume – dry basis
Q_{oxy}	=	volumetric flow rate of O_2 enriched air to regenerator as determined from catalytic cracking unit control room instrumentation (dscm/min or dscf/min)
$\%CO_2$	=	carbon dioxide concentration in regenerator exhaust, percent by volume – dry basis

%CO = CO concentration in regenerator exhaust, percent by volume – dry basis. When no auxiliary fuel is burned and a continuous CO monitor is not required, assume %CO to be zero

$\%O_2$ = O_2 concentration in regenerator exhaust, percent by volume – dry basis

(2) The owner or operator shall calculate process CO2 emissions resulting from periodic catalyst regeneration using Equation 104-4.

$$CO_2 = \sum_{i=1}^{n} CRR \times \left(CF_{spent} - CF_{regen}\right)_i \times 3.664 \times 0.001 \qquad \textbf{Equation 104-4}$$

Where:

CO_2 = CO_2 emissions (metric tons/yr)

CRR = mass of catalyst regenerated (~~mass~~kg/regeneration cycle)

CF_{spent} = weight fraction carbon on spent catalyst

CF_{regen} = weight fraction carbon on regenerated catalyst (default = 0)

n = number of regeneration cycles in report year

3.664 = ratio of molecular weights, ~~CO_2~~carbon dioxide to carbon

0.001 = conversion factor ~~–~~from kg to metric tons

(3) The owner or operator shall calculate process CO2 emissions resulting from continuous catalyst regeneration in operations other than FCCUs and fluid cokers (e.g. catalytic reforming) using Equation 104-5.

$$CO_2 = CC_{irc} \times (CF_{spent} - CF_{regen}) \times H \times 3.664 \qquad \textbf{Equation 104-5}$$

Where:

CO_2 = CO_2 emissions (metric tons/yr)

CC_{irc} = average catalyst regeneration rate (metric tons/hr)

CF_{spent} = weight carbon fraction on spent catalyst

CF_{regen} = weight carbon fraction on regenerated catalyst (default = 0)

H = hours regenerator was operational (hr/yr)

3.664 = ratio of molecular weights, CO_2 to carbon

B. Process Vents. Except for process emissions reported under other requirements of this regulation, the owner or operator shall calculate process emissions of CO2, CH4, and N2O from process vents using Equation 104-6.

$$E_x = \sum_{i=1}^{n} VR_i \times F_{xi} \times (MW_x / MVC) \times VT_i \times 0.001 \qquad \textbf{Equation 104-6}$$

Where:

E_x = emissions of x (metric tons/yr), where x = CO_2, N_2O, or CH_4

VR_i = vent rate for venting event i (scf/unit time~~ or m^3/unit time~~)

F_{xi} = molar fraction of x in vent gas stream during event i

MW_x = molecular weight of x (kg/kg-mole)

MVC = molar volume conversion (849.5 scf/kg-mole for STP of 20°C and 1 atmosphere or 836 scf/kg-mole for STP of 60°F, and 1 atmosphere~~ or 24.06 m^3/kg-mole for STP of 20°C and 1 atmosphere, or 23.67 m^3/kg-mole for STP of 60°F and 1 atmosphere~~)

VT_i = time duration of venting event i, in units of time used for VR_i

n = number of venting events in report year

0.001 = conversion factor ~~–~~from kg to metric tons

C. Asphalt Production. The owner or operator shall calculate CO2 and CH4 process emissions from asphalt blowing activities using Equations 104-7 and 104-8.

$$CH_4 = (M_A \times EF \times MW_{CH4} / MVC) \times (1 - DE) \times 0.001 \qquad \textbf{Equation 104-7}$$

Where:

CH_4	=	CH_4 emissions (metric tons/yr)
M_A	=	mass of asphalt blown (10^3 bbl/yr)
EF	=	emission factor (EF = 2,555 scf $CH_4/10^3$ bbl~~ or 72.35 m^3 $CH_4/10^3$ bbl~~)
MW_{CH4}	=	CH_4 molecular weight (16.04 kg/kg-mole)
MVC	=	molar volume conversion factor (849.5 scf/kg-mole, for STP of 20°C and 1 atmosphere or ~~24.06 m^3/kg-mole for STP of 20°C and 1 atmosphere, or 23.67 m^3~~836 scf/kg-mole for STP of 60°F, and 1 atmosphere)
DE	=	control measure destruction efficiency (DE = 98% expressed as 0.98)
0.001	=	conversion factor ~~–~~from kg to metric tons

$$CO_2 = (M_A \times EF \times MW_{CH4} / MVC) \times DE \times 2.743 \times 0.001$$

Equation 104-8

Where:

CO_2	=	CO_2 emissions (metric tons/yr)
M_A	=	mass of asphalt blown (10^3 bbl/yr)
EF	=	emission factor (EF = 2,555 scf $CH_4/10^3$ bbl~~ or 72.35 m^3 $CH_4/10^3$ bbl~~)
MW_{CH4}	=	CH_4 molecular weight (16.04 kg/kg-mole)
MVC	=	molar volume conversion factor (849.5 scf/kg mole, for STP of 20°C and 1 atmosphere or ~~24.06 m^3/kg-mole for STP of 20°C and 1 atmosphere, or 23.67 m^3~~836 scf/kg-mole for STP of 60°F, and 1 atmosphere)
DE	=	control measure destruction efficiency (DE = 98% expressed as 0.98)
2.743	=	~~CH_4~~ratio of molecular weights, carbon dioxide to ~~CO_2 conversion factor~~ methane
0.001	=	conversion factor ~~–~~from kg to metric tons

D. Sulfur Recovery. The owner or operator shall calculate CO2 process emissions from sulfur recovery units (SRUs) using Equation 104-9. For the molecular fraction (MF) of CO2 in the sour gas, use either a default factor of 0.20 or a source specific molecular fraction value approved by the department and derived from source tests conducted at least once per calendar year under the supervision of the department.

$$CO_2 = FR \times MW_{CO2} / MVC \times MF \times 0.001$$

Equation 104-9

Where:

CO_2	=	emissions of CO_2 (metric tons/yr)
FR	=	volumetric flow rate of acid gas to SRU (scf/year~~ or m^3/year~~)
MW_{CO2}	=	molecular weight of CO_2 (44 kg/kg-mole)
MVC	=	molar volume conversion (849.5 scf/ kg-mole, for STP of 20°C and 1 atmosphere or 836 scf/kg-mole, for STP of 60°F, and 1 atmosphere~~ or 24.06 m^3/kg-mole for STP of 20°C and 1 atmosphere, or 23.67 m^3/kg-mole for STP of 60°F and 1 atmosphere~~)
MF	=	molecular fraction (%) of CO_2 in sour gas (default MF = 20% expressed as 0.20)
0.001	=	conversion factor ~~–~~from kg to metric tons

E. Flares and Other Control Devices.

(1) The owner or operator shall calculate and report CO2, CH4 and N2O emissions resulting from the combustion of flare pilot and purge gas using the appropriate method(s) specified in 20.2.102 NMAC.

(2) The owner or operator shall calculate and report CO2 emissions resulting from the combustion of hydrocarbons routed to flares for destruction as follows.

(a) If the flare is equipped with a continuous flow and high heat value monitors, use Equation 104-10.

[Original Equation] $$CO_2 = Flare_N \times HHV \times (0.001 \times EmF)$$

Equation 104-10

[Revised Equation] $$CO_2 = Flare_n \times HHV \times (0.001 \times EmF)$$

Where:

CO_2 = CO_2 emissions (metric tons/year)

~~$Flare_N$~~$Flare_n$ = volume of flare gas ~~(m^3~~for flare n (MMscf/yr)

HHV = High heat value for refinery fuel or flare gas (MMBtu/MMscf~~ or J/m^3~~)

0.001 = conversion factor ~~–~~from kg to metric tons

EmF = default CO_2 emission factor (60 kg CO_2/MMBtu~~ or 5.7 kg/kJ~~)

(b) If the flare is equipped with a continuous flow and carbon content monitors, use Equation 104-11.

$$CO_2 = Flare_n \times CC_n \times (MW_n / MVC) \times 3.664 \times 0.001$$ **Equation 104-11**

Where:

CO_2 = CO_2 emissions (metric tons/year)

~~$Flare_N$~~$Flare_n$ = volume of flare gas for flare n (scf/yr or m^3/yr)

~~CC_N~~CC_n = carbon content of flare gas for flare n (kg of carbon/kg of fuel)

~~MW_N~~MW_n = molecular weight of flare gas for flare n

MVC = molar volume conversion factor (849.5 scf/kg- mole for STP of 20°C and 1 atmosphere or 836 scf/kg-mole for STP of 60°F, and 1 atmosphere~~ or 24.06 m^3/kg-mole for STP of 20°C and 1 atmosphere, or 23.67 m^3/kg-mole for STP of 60°F and 1 atmosphere~~)

3.664 = ratio of molecular weights, CO_2 to carbon

0.001 = conversion factor ~~–~~from kg to metric tons

(c) If the flare is not equipped with a continuous flow monitor and HHV or carbon content monitor, use Equation 104-12.

$$CO_2 = RFT \times EF_{NMHC} \times CF_{NMHC} \times 3.664 \times 0.001$$ **Equation 104-12**

Where:

CO_2 = CO_2 emissions (metric tons/year)

RFT = refinery feed input (m^3/yr)

EF_{NMHC} = non-methane hydrocarbon emission factor (EF_{NMHC} = 0.002 kg/m^3 throughput)

CF_{NMHC} = conversion factor~~— NMHC~~, non-methane hydrocarbon to carbon (CF_{NMHC}= 0.6)

3.664 = ratio of molecular weights, ~~CO_2~~carbon dioxide to carbon

0.001 = conversion factor ~~–~~from kg to metric tons

(3) The owner or operator who uses methods other than flares (e.g. incineration, combustion as a supplemental fuel in heaters or boilers) to destroy low Btu gases (e.g. coker flue gas, gases from vapor recovery systems, casing vents and product storage tanks) shall calculate CO2 emissions using Equation 104-13. The owner or operator shall determine CC(sub)A and MW(sub)A quarterly using methods specified in 20.2.102 NMAC and use the annual average values of CC(sub)A and MW(sub)A to calculate CO2 emissions.

$$CO_2 = GV_A \times CC_A \times MW_A / MVC \times 3.664 \times 0.001$$ **Equation 104-13**

Where:

CO_2 = CO_2 emissions (metric tons/year)

GV_A = volume of gas A destroyed annually (scf/year~~ or m^3/year~~)

CC_A = carbon content of gas A (kg C/kg fuel)
MW_A = molecular weight of gas A
MVC = molar volume conversion factor (849.5 scf/kg-mole for STP of 20°C and 1 atmosphere or 836 scf/kg-mole for STP of 60°F, and 1 atmosphere~~ or 24.06 m^3/kg-mole for STP of 20°C and 1 atmosphere, or 23.67 m^3/kg-mole for STP of 60°F and 1 atmosphere~~)
3.664 = ratio of molecular weights, ~~CO_2~~carbon dioxide to carbon
0.001 = conversion factor ~~–~~from kg to metric tons

F. Storage Tanks. For above-ground storage tanks containing crude oil, asphalt, naphtha, and distillate oils that are not equipped with vapor recovery technology, the owner or operator shall calculate CH4 emissions using the U.S. EPA TANKS Model (Version 4.09D). For crude oil, naphtha, and distillate oils, use the default chemical databases for crude oil (RVP 5), distillate fuel oil No. 2, and jet naphtha (JP4), respectively. For asphalt, use the data in Table 104-4 to create an asphalt chemical database. The annual throughput for each storage tank must be distributed equally across the twelve months of the year and the single-component liquid option selected. The total VOC emission values generated by the model shall be converted to methane emissions using:

(1) A default conversion factor of 0.6 (CH4 equals 0.6 times VOC); or

(2) Species specific conversion factors determined by storage tank headspace vapor analysis using a sampling and analysis methodology approved by the department.

G. Wastewater Treatment.

(1) The owner or operator shall calculate CH4 emissions from wastewater treatment using Equation 104-14.

$$CH_4 = [(Q \times COD_{qave}) - S] \times B \times MCF \times 0.001$$ **Equation 104-14**

Where:
CH_4 = emission of methane (tons/yr)
Q = volume of wastewater treated (m^3/yr)
COD_{qave} = average of quarterly determinations of chemical oxygen demand of the wastewater (kg/m^3)
S = organic component removed as sludge (kg COD/yr)
B = methane generation capacity (B = 0.25 kg CH_4/kg COD)
MCF = methane correction factor for anaerobic decay (0-1.0) from Table 104-2
0.001 = conversion factor ~~–~~from kg to metric tons

(2) The owner or operator shall calculate N2O emissions from wastewater treatment using Equation 104-15.

$$N_2O = Q \times N_{qave} \times EF_{N2O} \times 1.571 \times 0.001$$ **Equation 104-15**

Where:
N_2O = emissions of N_2O (metric tons/yr)
Q = volume of wastewater treated (m^3/yr)
N_{qave} = average of quarterly determinations of ~~N~~nitrogen in effluent (kg N/m^3)
EF_{N2O} = emission factor for N_2O from discharged wastewater (0.005 kg N_2O-N/kg N)
1.571 = conversion factor ~~–~~from kg N_2O-N to kg N_2O
0.001 = conversion factor ~~–~~from kg to metric tons

H. Oil-Water Separators. The owner or operator shall calculate CH4 emissions from oil-water separators using Equation 104-16. For the non-methane hydrocarbon (NMHC) to methane conversion factor, owners or operators shall use either a default factor of 0.6 or species specific conversion factors determined by analysis using a sampling and analysis methodology approved by the department.

$$CH_4 = EF_{sep} \times V_{water} \times CF_{NMHC} \times 0.001$$ **Equation 104-16**

Where:
CH_4 = emission of methane (tons/yr)
EF_{sep} = NMHC (non methane hydrocarbon) emission factor (kg/m^3) from Table 104-3.

V_{water} = volume of waste water treated by the separator (m^3/yr)
CF_{NMHC} = NMHC to CH_4 conversion factor
0.001 = conversion factor ~~–~~from kg to metric tons

I. Equipment leaks. The owner or operator shall calculate CH4 emissions for all components in natural gas, refinery fuel gas, and PSA off-gas systems as follows:

(1) Components shall be identified as one of the following classification types: valve, pump seal, connector, flange, open-ended line. Owners or operators shall use the component identification and counting methodology and screening methods found in method 3 in the ~~publication [~~California implementation guidelines for estimating mass emissions of fugitive hydrocarbon leaks at petroleum facilities (CAPCOA, 1999)~~] which is incorporated by reference in Subsection H of 20.2.100.12 NMAC~~. Owners or operators shall conduct screenings at the frequency interval required by the department. Owners or operators shall measure and record emissions using instrumentation capable of detecting methane.

(2) The VOC emissions shall be calculated using the following methods.

(a) For components where the measured screening value (SV) is indistinguishable from zero when corrected for background, owners or operators shall calculate VOC emissions using Equation 104-17.

$$E_{VOC-0} = \sum_{i=1}^{6} CC_i \times ZF_{i0} \times t \qquad \textbf{Equation 104-17}$$

Where:
E_{VOC-0} = zero component VOC emission (kg/screening period)
i = component type (1 = valve, 2 = pump seal, 3 = other, 4 = connector, 5 = flange, 6 = open-ended line)
CC_i = number of i components where SV = 0
ZF_{i0} = zero VOC emission factor (kg/hr) for component i from Table 104-5
t = time (hours) since last screening

(b) For leaking components, owners or operators shall calculate VOC emissions using the following methods.

(i) For screening values between background and 9,999 ppm, the owner or operator shall calculate the VOC emissions using Equation 104-18~~ [200-18]~~.

[Original Equation]

$$E_{VOCL-C} = \sum_{i=1}^{6}\sum_{n=1}^{n} \left(\sigma_i \times SV_n^{\beta i}\right) \times t$$

Equation 104-18

[Revised Equation]

$$E_{VOCL-C} = \sum_{i=1}^{6}\sum_{j=1}^{n} \left(\sigma_i \times SV_{i,j}^{\beta i}\right) \times t_{i,j}$$

Where:
E_{VOCL-C} = leaking components VOC emissions (kg/screening period)
i = component type (1=valve, 2=pump seal, 3=others, 4=connector, 5=flange, 6=open ended-line)
n = number of ~~i~~ components of type i
σ_i = correlation equation coefficient for component type i from Table 104-5
SV_n = screening value for component ~~n~~j of type i
βi = correlation equation exponent for component type i from Table 104-5
~~t~~$t_{i,j}$ = time ~~(hours)~~ component j of type i has been leaking ~~–~~(hours); default value is time from last screening

(ii) For screening values greater than 9,999 ppm, the owner or operator shall calculate the VOC emissions using Equation 104-19.

$$E_{VOCP} = \sum_{i=1}^{6} CC_i \times PF_{iP} \times t \qquad \textbf{Equation 104-19}$$

Where:

E_{VOCP} = VOC emissions for components pegged over SV 9,999 ppm (kg/screening period)

i = component type (1=valve, 2=pump seal, 3=others, 4=connector, 5=flange, 6=open-ended line)

CC_i = number of ~~i~~ components of type i pegged over 9,999 ppm

PF_{iP} = VOC emission factor (kg/hr) for component type i pegged over 9,999 ppm from Table 104-5

t = time component of type i has been leaking (hours~~) –~~); default value is time ~~since~~from last screening

(c) The owner or operator shall calculate CH4 emissions using Equation 104-20. Owners or operators shall use system specific determinations of gas composition and methane content (refinery fuel gas, natural gas, associated gas, flexigas, low Btu gas), where available, to determine a VOC to methane conversion factor. The sampling and analysis methodology must be approved by the department. When representative data is not available, owners or operators shall use the default value of 0.6 for a VOC to methane conversion factor.

[Original Equation]

$$CH_4 = \sum_{1}^{n} \left(E_{VOC-0} + E_{VOC-LC} + E_{VOCP}\right)_n \times CF_{VOC} \times 0.001$$

Equation 104-20

[Revised Equation]

$$CH_4 = \sum_{i=1}^{n} \left(E_{VOC-0} + E_{VOC-LC} + E_{VOCP}\right)_i \times CF_{VOC} \times 0.001$$

Where:

CH_4 = methane emissions (metric tons/year)

n = number of screenings/year

E_{VOC-0} = zero component VOC emissions (kg/screening period)

E_{VOC-LC} = leaking component VOC emissions (kg/screening period)

E_{VOCP} = VOC emissions for components pegged over 9,999 ppm (kg/screening period)

CF_{VOC} = VOC to CH_4 conversion factor (default CF_{VOC}=0.6)

0.001 = conversion factor ~~–~~from kg to metric tons

[20.2.104.200 NMAC - N, 01/01/10]

20.2.104.201 CALCULATION OF GREENHOUSE GAS EMISSIONS FOR REFINERY FUEL GAS COMBUSTION

A. Calculation of CO2 Emissions. Owners and operators shall calculate daily CO2 emissions for each fuel gas system using any of the methods specified in paragraphs (A)(1) through (A)(5) of this section. Calculate the total annual CO2 emissions from combustion of all fuel gas by summing the CO2 emissions from each fuel gas system.

(1) Use a CEMS that complies with the provisions in Subsection D of 20.2.102.200~~(D)~~ NMAC.

(2) Calculate CO2 emissions from each refinery fuel gas system and flexigas system using measured carbon content and molecular weight of the gas and Equation 104-21.

(a) For refinery fuel gas, the daily carbon content shall be determined a minimum of 3 times a day (once every 8 hours) using on-line instrumentation or discrete laboratory analysis using the methods specified in 20.2.104.301 NMAC.

(b) For flexigas, the daily carbon content shall be determined once per day using the methods specified in 20.2.104.301 NMAC.

$$CO_2 = \sum_{i=1}^{n} Fuel_i \times CC_i \times \frac{MW}{MVC} \times 3.664 \times 0.001$$

Equation 104-21

Where:

CO_2 = Carbon dioxide emissions, metric tons/year.

$Fuel_i$ = Daily refinery fuel or flexigas combusted (scf).

CC_i = Daily sample of carbon content of the fuel (kg C/kg fuel).
MW = Daily sample of molecular weight of fuel (kg/kg-mole).
MVC = Molar volume conversion factor (849.5 scf/kg-mole for STP of 20°C and 1 atmosphere, or 836 scf/kg-mole for STP of 60°F and 1 atmosphere).
3.664 = ~~Conversion factor for carbon~~Ratio of molecular weights, carbon dioxide to carbon ~~dioxide~~.
0.001 = Conversion factor ~~for~~from kg to metric tons.
n = Number of days in a year.

(3) Calculate CO2 emissions from each fuel gas system and flexigas system using Equation 104-22 and a daily average high heat value that is monitored using a continuous on-line instrument.

$$CO_2 = \sum_{i=1}^{n} HHV_i \times Fuel_i \times EF_{CO2,i} \times 0.000001 \qquad \textbf{Equation 104-22}$$

Where:
CO_2 = CO_2 emissions resulting from the combustion of fuel gas from an individual fuel gas system (metric tons/yr).
HHV_i = Daily average high heat value of fuel gas, derived from a continuous analyzer and integrated over a 24-hour period (Btu/scf).
$Fuel_i$ = Daily fuel consumption from all fuel combustion units burning gas from the system (scf/d).
$EF_{CO2,i}$ = Daily CO_2 emission factor for an individual fuel gas system, developed using Equation 104-23 (metric tons CO_2/MMBtu).
0.000001 = Conversion factor for Btu to MMBtu.
n = Number of days per year.

$$EF_{CO2,i} = CC/HHV \times MW/MVC \times 3.664 \times 1{,}000 \qquad \textbf{Equation 104-23}$$

Where:
$EF_{CO2,i}$ = Daily CO_2 emission factor for an individual fuel gas system (metric tons CO_2/MMBtu).
CC = Daily sample of gas carbon content for a fuel gas system, collected according to subparagraph (a) of paragraph (3) of subsection A of this section (Section 201 of 20.2.104 NMAC) (kg carbon/kg fuel).
HHV = Daily sample of gas high heat value for a fuel gas system, collected according to subparagraph (a) of paragraph (3) of subsection A of this section (Section 201 of 20.2.104 NMAC) (Btu/scf).
MW = Refinery fuel A molecular weight (kg/kg-mole).
MVC = Molar volume conversion (849.5 scf/ kg-mole, for STP of 20°C and 1 atmosphere, or 836 scf/kg-mole for STP of 60°F and 1 atmosphere).
3.664 = ~~Conversion factor for carbon~~Ratio of molecular weights, carbon dioxide to carbon ~~dioxide~~.
1,000 = Conversion factor ~~for~~from kg/Btu to metric tons/MMBtu.

(a) For Equation 104-23, the carbon content shall be determined once per day by on-line instrumentation or by laboratory analysis of a representative sample using the methods specified in 20.2.104.301 NMAC. The HHV shall be determined from either the same sample used to conduct the carbon analysis or from on-line instrumentation using the hourly average value that coincides with the same hour in which the carbon content was determined.

(b) For facilities that meet the definition of a small refiner in 20.2.100.7 NMAC, the emissions measurements and calculations for Equations 104-22 and 104-23 may be conducted weekly.

(4) For associated gas, low heat content gas, or other fossil fuels, follow the requirements for general stationary source combustion sources in Subsections B or C of 20.2.102.200 NMAC, as appropriate for each fuel.

(5) Where individual fuels are mixed prior to combustion, the owner or operator may choose to calculate CO2 emissions for each fuel prior to mixing instead of using the methods in paragraphs (A)(1), (A)(2), or (A)(3) of this section. In this case, the owner or operator must determine the fuel flow rate and appropriate fuel specific parameters (such as carbon content or HHV) of each fuel stream prior to mixing, calculate CO2 emissions

for each fuel stream, and sum the emissions of the individual fuel streams to determine total CO2 emissions from the mixture. CO2 emissions for each fuel stream must be estimated using the following methods.

(a) For natural gas and associated gas, use the appropriate methodology specified in Subsections B or C of 20.2.102.200 NMAC.

(b) For refinery fuel gas and flexigas, use the methodology in either paragraph (A)(2) or (A)(3) of this section.

(c) For low heat content gas, use the methodology in paragraph (A)(2) of this section.

B. Calculation of CH4 and N2O Emissions. Owners and operators shall use the methods specified in 20.2.102.201 NMAC to calculate the annual CH4 and N2O emissions.

[20.2.104.200 NMAC - N, 01/01/10]

20.2.104.202 CALCULATION OF GREENHOUSE GAS EMISSIONS FOR HYDROGEN PRODUCTION: The owner or operator shall calculate and report CO2 process emissions from hydrogen production using the methods in paragraphs (A) or (B) of this section.

A. Continuous Emission Monitoring Systems. The owner or operator may calculate CO2 process emissions using CEMS. The owner or operator must comply with the requirements in 20.2.102 NMAC.

B. Feedstock Material Balance. The owner or operator may calculate CO2 process emissions using ~~the following method~~equation 104-24. The factor S shall be used only for CO2 and/or CH4 emissions that are calculated and reported using applicable methods specified in this regulation. For example, carbon species in unconverted feedstock contained in PSA off-gas and hydrogen plant product that is diverted to fuel gas systems, fed to downstream units, or diverted to flare may be included in the factor S provided the CO2 or CH4 emissions are reported using other methods in this regulation.

$$CO_2(Feedstock) = \sum_{i=1}^{n} \sum_{j=1}^{y} \left[\left(FS_j \times CF_j \right) - S_j \right] \times 3.664 \times 0.001 \qquad \textbf{Equation 104-24}$$

Where:

CO_2 (Feedstock)	=	CO_2 emitted from feedstock (metric tons/year).
n	=	Days of operation per year.
FS_j	=	Feedstock ~~b~~j consumption rate (scf/day).
CF_j	=	Carbon content of feedstock j (kg C/scf feedstock).
y	=	Total number of feedstocks.
S_j	=	Carbon accounted for elsewhere (kg C/day).
3.664	=	ratio of molecular weights, ~~CO_2~~carbon dioxide to carbon
0.001	=	conversion factor – kg to metric tons

[20.2.104.200 NMAC - N, 01/01/10]

20.2.104.203 to 20.2.104.299 [RESERVED]

20.2.104.300 SAMPLING, ANALYSIS AND MEASUREMENT REQUIREMENTS FOR PETROLEUM REFINERIES:

A. Catalyst Regeneration.

(1) For FCCUs and fluid coking units, the owners or operators shall measure the following parameters.

(a) The daily oxygen concentration in the oxygen enriched air stream inlet to the regenerator.

(b) Continuous measurements of the volumetric flow rate of air and oxygen enriched air entering the regenerator.

(c) Continuous or weekly periodic measurements of the CO2, CO and O2 concentrations in the regenerator exhaust gas.

(d) Daily determinations of the carbon content of the coke burned.

(e) The number of days of operation.

(2) For periodic catalyst regeneration, the owners or operators shall measure the following parameters.

(a) The mass of catalyst regenerated in each regeneration cycle.

(b) The weight fraction of carbon on the catalyst prior to and after catalyst regeneration.

(3) For continuous catalyst regeneration in operations other than FCCUs and fluid cokers, the owners or operators shall measure the following parameters.

(a) The hourly catalyst regeneration rate.

(b) The weight fraction of carbon on the catalyst prior to and after catalyst regeneration.

(c) The number of hours of operation.

B. Process vents. Owners or operators shall measure the following parameters for each process vent

(1) The vent flow rate for each venting event.

(2) The molar fraction of CO2, N2O, and CH4 in the vent gas stream during each venting event.

(3) The duration of each venting event.

C. Asphalt Production. Owners or operators shall measure the mass of asphalt blown.

D. Sulfur Recovery. The owner or operator shall measure the volumetric flow rate of acid gas to the SRU. If using source specific molecular faction value instead of the default factor, the owner or operator shall conduct an annual test of the CO2 content using methods approved by the department. The owner or operator shall submit a test plan to the department for approval. Once approved, the annual tests shall be conducted in accordance with the approved test plan under the supervision of the department.

E. Flares and Other Control Devices. The owner or operator shall measure the following.

(1) If using the method specified in subparagraph (a) of paragraph (2) of subsection E of 20.2.104.200 NMAC, monitor the flow rate and high heat value of the flare gas using continuous monitors.

(2) If using the method specified in subparagraph (b) of paragraph (2) of subsection E of 20.2.104.200 NMAC, monitor the flow rate and carbon content of the flare gas using continuous monitors.

(3) If using the method specified in paragraph (3) of subsection E of 20.2.104.200 NMAC, monitor the volume of gas destroyed annually (determined to accuracy of plus or minus 7.5 percent) and the carbon content.

F. Storage Tanks. The owner or operator shall measure the annual throughput of crude oil, naphtha, distillate oil, asphalt, and gas oil for each storage tank using flow meters.

G. Wastewater Treatment. Owners or operators shall measure the following parameters.

(1) The daily volume of waste water treated.

(2) The quarterly chemical oxygen demand of the wastewater.

(3) The amount of sludge removed and the organic content of the sludge.

(4) The quarterly nitrogen content of the wastewater.

H. Oil-Water Separators. Owners or operators shall measure the daily volume of waste water treated by the oil-water separators.

I. Equipment Leaks. Owners or operators shall measure screening values for each valve, pump seal, connector, flange, and open-ended line used in natural gas, refinery fuel gas, and PSA off-gas systems using the methods specified under correlation equation method in the publication [CAPCOA (1999)] specified in subsection G of 20.2.100.12 NMAC and an instrument capable of detecting methane. Owners or operators shall conduct screenings at the frequency interval required by the department.

[20.2.104.300 NMAC - N, 01/01/10]

20.2.104.301 SAMPLING, ANALYSIS AND MEASUREMENT REQUIREMENTS FOR REFINERY FUEL GAS COMBUSTION:

A. Measure the fuel consumption rate daily using methods specified in subsection B of 20.2.102.202 NMAC.

B. Measure the carbon content for fuel gas and flexigas using either ASTM D1945-03 or ASTM D1946-90. Where these methods do not adequately quantify all major hydrocarbons, then an owner or operator may request use of an alternative ASTM or other method approved by the department.

C. Measure high heat value using the monitoring requirements specified in 20.2.102.202(C) NMAC for gaseous fuels.

[20.2.104.301 NMAC - N, 01/01/10]

20.2.104.302 SAMPLING, ANALYSIS AND MEASUREMENT REQUIREMENTS FOR HYDROGEN PRODUCTION:

A. Owners or operators using CEMS to estimate CO2 emissions shall comply with the monitoring requirements in 20.2.102 NMAC.

B. Owners or operators using the method in subsection B of 20.2.104.202 NMAC shall perform the following monitoring.

(1) The owner or operator shall measure the feedstock consumption rate daily.

(2) The owner or operator shall collect samples of each feedstock consumed and analyze each sample for carbon content using the methods specified in subsection D of 20.2.102.202 NMAC. For natural gas feedstock not mixed with another feedstock prior to consumption, samples shall be collected and analyzed once per month. For all other feedstocks, samples shall be collected and analyzed daily. The samples shall be collected from a location in the feedstock handling system that provides samples representative of the feedstock consumed in the hydrogen production process.

(3) Owners or operators shall measure the hydrogen produced daily.

(4) Owners or operators shall measure the CO2 and CO collected daily.

[20.2.104.302 NMAC - N, 01/01/10]

20.2.104.303 to 20.2.104.399 [RESERVED]

20.2.104.400 TABLE 104-1: COKE BURN RATE MATERIAL BALANCE AND CONVERSION FACTORS

	(kg min)/(hr dscm percent)	(lb min)/(hr dscf percent)
K(sub)1	0.2982	0.0186
K(sub)2	2.0880	0.1303
K(sub)3	0.0994	0.0062

[20.2.104.400 NMAC - N, 01/01/10]

20.2.104.401 TABLE 104-2: DEFAULT METHANE CONVERSION FACTOR (MCF) VALUES FOR INDUSTRIAL WASTEWATER

Type of Treatment and Discharge Pathway or System	Comments	MCF	Range
Untreated			
Sea, river and lake discharge	Rivers with high organic loading may turn anaerobic, however this is not considered here	0.1	0 - 0.2
Treated			
Aerobic treatment plant	Well maintained, some CH4 may be emitted from settling basins	0	0 – 0.1
Aerobic treatment plant	Not well maintained, overloaded	0.3	0.2 – 0.4
Anaerobic digester for sludge	CH4 recovery not considered here	0.8	0.8 – 1.0
Anaerobic reactor	CH4 recovery not considered here	0.8	0.8 – 1.0
Anaerobic shallow lagoon	Depth less than 2 meters	0.2	0 – 0.3
Anaerobic deep lagoon	Depth more than 2 meters	0.8	0.8 – 1.0
Note: MCF = methane conversion factor (the fraction of waste treated anaerobically).			

[20.2.104.401 NMAC - N, 01/01/10]

20.2.104.402 TABLE 104-3: EMISSION FACTORS FOR OIL/WATER SEPARATORS

Separator Type	Emission factor (EFsep) kg NMHC/cubic meter wastewater treated
Gravity type, uncovered	0.111
Gravity type, covered	0.0033
Gravity type, covered and connected to destruction device	0
Dissolved air flotation type or induced air flotation device; uncovered	0.004 [1]
Dissolved air flotation type or induced air flotation device; covered	.000120 [1]

Dissolved air flotation type or induced air flotation device; uncovered; covered and connected to a destruction device	0
Notes: Emission factors do not include ethane. [1] Emission factors for these types of separators apply where they are installed as secondary treatment systems.	

[20.2.104.400 NMAC - N, 01/01/10]

20.2.104.403 TABLE 104-4: DATA FOR PREPARING THE ASPHALT CHEMICAL DATABASE

Parameter	Database Entry
Liquid Molecular Weight	1000
Vapor Molecular Weight	105
Liquid Density (lb/gal. at 60 degrees Fahrenheit)	8.0925
Antoine's Equation Constants (using K)	A = 75350.06
	B = 9.00346

[20.2.104.403 NMAC - N, 01/01/10]

20.2.104.404 TABLE 104-5: FUGITIVE EMISSIONS FROM GAS SERVICE COMPONENTS

Component Type / Service Type	Default Zero Factor (kg/hr) Zf(sub)i0	Correlation Equation (kg/hr)		Pegged Factor (kg/hr) 10,000 ppm (SV greater than 9,999) PF(sub)iP-10
		Coefficient (sigma sub i)	Exponent (beta sub i)	
Valves (1)	0.0000078	0.00000227	0.747	0.064
Pump seals (2)	0.000019	0.0000507	0.622	0.089
Others (3)	0.0000040	0.00000869	0.642	0.082
Connectors (4)	0.0000075	0.00000153	0.736	0.030
Flanges (5)	0.00000031	0.00000453	0.706	0.095
Open-ended lines (6)	0.0000020	0.00000190	0.724	0.033
Note: The "Others" component type ~~shoudl~~should be applied to any component type other than connectors, flanges, open-ended lines, pump seals, or valves. The "Others" component type includes: instruments, loading arms, pressure relief valves, vents, compressors, dump lever arms, diaphragms, drains, hatches, meters, and polished rods stuffing boxes.				

[20.2.104.404 NMAC - N, 01/01/10]

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 2 AIR QUALITY (STATEWIDE)
PART 105 GREENHOUSE GAS REPORTING - PETROCHEMICAL MANUFACTURING

20.2.105.1 ISSUING AGENCY: Environmental Improvement Board.
[20.2.105.1 NMAC - N, 01/01/10]

20.2.105.2 SCOPE: All persons who own or operate an applicable source of greenhouse gas emissions in the geographic areas within the jurisdiction of the environmental improvement board.
[20.2.105.2 NMAC - N, 01/01/10]

20.2.105.3 STATUTORY AUTHORITY: Environmental Improvement Act, NMSA 1978, Section 74-1-8(A)(4), and Air Quality Control Act, NMSA 1978, Sections 74-2-1 et seq., including specifically Sections 74-2-5(B)(1) & 74-2-(5)(C)(5)(d) & (e).
[20.2.105.3 NMAC - N, 01/01/10]

20.2.105.4 DURATION: Permanent.
[20.2.105.4 NMAC - N, 01/01/10]

20.2.105.5 EFFECTIVE DATE: January 1, 2010 except where a later date is cited at the end of a section.
[20.2.105.5 NMAC - N, 01/01/10]

20.2.105.6 OBJECTIVE: The objectives of this part are:

A. To specify greenhouse gas emissions from petrochemical manufacturing sources that shall be included in determining applicability of greenhouse gas reporting and verification requirements under 20.2.100 NMAC;

B. To specify methods of calculation and sampling, analysis and measurement requirements for greenhouse gas emissions from petrochemical manufacturing sources; and

C. To specify the information, in addition to the information required by 20.2.100 NMAC, that shall be included for petrochemical manufacturing source emissions in annual reports to the department by the owner or operator of any facility meeting the applicability requirements in 20.2.100 NMAC.

[20.2.105.6 NMAC - N, 01/01/10]

20.2.105.7 DEFINITIONS: The definitions included in 20.2.100 NMAC shall apply to the terms used in this part. The definitions included in 20.2.2 NMAC shall apply to the terms used in this part, unless such term is defined in 20.2.100 NMAC.
[20.2.105.7 NMAC - N, 01/01/10]

20.2.105.8 SEVERABILITY: If any provision of this part, or the application of such provision to any person or circumstance, is held invalid, the remainder of this part, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.
[20.2.105.8 NMAC - N, 01/01/10]

20.2.105.9 CONSTRUCTION: This part shall be liberally construed to carry out its purpose.
[20.2.105.9 NMAC - N, 01/01/10]

20.2.105.10 SAVINGS CLAUSE: Repeal or supersession of prior versions of this part shall not affect any administrative or judicial action initiated under those prior versions.
[20.2.105.10 NMAC - N, 01/01/10]

20.2.105.11 COMPLIANCE WITH OTHER REGULATIONS: Compliance with this part does not relieve a person from the responsibility to comply with any other applicable federal, state, or local regulations.
[20.2.105.11 NMAC - N, 01/01/10]

~~**20.2.105.12 INCORPORATION BY REFERENCE:** Each document listed in 20.2.100.12 NMAC and cited in this Part shall be incorporated by reference into this part.~~

20.2.105.12 AVAILABILITY OF CITED DOCUMENTS: Additional information regarding documents cited in this part may be found at 20.2.100.12 NMAC.
[20.2.105.12 NMAC - N, 01/01/10]

20.2.105.13 to 20.2.105.99 [RESERVED]

20.2.105.100 REPORTING REQUIREMENTS: The emissions data report shall include the following information for each petrochemical manufacturing facility. In addition to the information required by 20.2.100 NMAC, the annual emissions report shall contain the following information.

A. CO2, N2O, and CH4 emissions from combustion of fuels in the stationary combustion unit in metric tons, as specified in 20.2.102 NMAC.

B. CO2, N2O, and CH4 emissions from flares and other oxidizers in metric tons, as specified in Subsection A of 20.2.105.200 NMAC.

C. CO2, N2O, and CH4 emissions from process vents in metric tons, as specified in Subsection B of 20.2.105.200 NMAC.

D. CH4 emissions tons from equipment leaks in metric, as specified in Subsection C of 20.2.105.200 NMAC.

E. Annual consumption of feedstock by type for all feedstocks that result in GHG emissions in million standard cubic feet for gases, gallons for liquids, short tons for non-biomass solids, and bone dry short tons for biomass-derived solid fuels.
[20.2.105.101 NMAC - N, 01/01/10]

20.2.105.~~__~~101 to 20.2.105.199 [RESERVED]

20.2.105.200 CALCULATION OF GREENHOUSE GAS EMISSIONS:

A. Flares and Other Oxidizers. The owner or operator shall calculate GHG emissions from flares and oxidation control devices as follows:

(1) calculate CO2, CH4 and N2O emissions resulting from the combustion of flare pilot and purge gas using the appropriate method(s) specified in 20.2.102 NMAC; and

(2) calculate CO2 emissions for each gas destroyed in a flare or other oxidation control device using equation 105-1.

$$CO_2 = \sum_{i=1}^{n} GV_i \times CC_i \times \frac{MW_i}{MVC} \times 3.664 \times 0.001 \qquad \textbf{Equation 105-1}$$

Where:

CO_2	=	CO_2 emissions (metric tons/year).
GV_i	=	Volume of gas *i* destroyed annually (scf/year).
CC_i	=	Average annual carbon content of gas *i* (kg C/kg fuel).
MW_i	=	Average annual molecular weight of gas *i.*
MVC	=	Molar volume conversion factor (849.5 scf/kg-mole for STP of 20°C and 1 atmosphere or 836 scf/kg-mole, for STP of 60°F, and 1 atmosphere).
3.664	=	Ratio of molecular weights, CO_2 to carbon.
0.001	=	Conversion factor, kg to metric tons.
n	=	Number of gases destroyed.

B. Process Vents. Except for process emissions calculated pursuant to Subsection A or C of this section, the owner or operator shall calculate process emissions of CO2, CH4, and N2O from process vents using equation 105-2.

$$E_x = \sum_{i=1}^{n} VR_i \times F_{xi} \times \frac{MW_x}{MVC} \times VT_i \times 0.001 \qquad \textbf{Equation 105-2}$$

Where:

E_x = Emissions of x (metric tons/yr), where x = CO_2, N_2O, or CH_4.
VR_i = Vent rate for venting event i (scf/unit time).
F_{xi} = Molar fraction of x in vent gas stream during event i.
MW_x = Molecular weight of x (kg/kg-mole).
MVC = Molar volume conversion (849.5 scf/kg-mole for STP of 20°C and 1 atmosphere or 836 scf/kg-mole for STP of 60°F, and 1 atmosphere).
VT_i = Time duration of venting event i (same units of time used for VR_i).
n = Number of venting events.
0.001 = Conversion factor, kg to metric tons.

C. Equipment Leaks. The owner or operator shall calculate CH4 emissions for each valve, pump seal, connector, flange, open-ended line, and other components in natural gas, fuel gas, and off-gas systems as follows:

(1) Identify and screen each valve, pump seal, connector, flange, open-ended line, and other components in natural gas, fuel gas, and off-gas systems using the monitoring method in 20.2.105.300 NMAC.

(2) Use the results of the component screening and the following equations to calculate VOC emissions.

(a) For components where the measured screening value is equal to zero when corrected for background, calculate VOC emissions using equation 105-3 and the appropriate default emission factors from table 105-1 in 20.2.105.400 NMAC.

$$E_{VOC-0} = \sum_{i=1}^{6} CC_i \times ZF_{i0} \times t \qquad \textbf{Equation 105-3}$$

Where:
E_{VOC-0} = Emissions from components with a screening value equal to zero, when corrected for background (kg/screening period).
i = Component type (valve, pump seal, other, connector, flange, open-ended line).
CC_i = Number of i components where the screening value is 0.
ZF_{i0} = Default zero factor for component i from Table 105-1 (kg/hr).
t = Time since last screening (hours/screening period).

(b) For components where the measured screening value, corrected for background, is between 0 and 10,000 ppm, calculate VOC emissions using equation 105-4 and the appropriate default factors from table 105-1 in 20.2.105.400 NMAC.

[Original Equation]

$$E_{VOCL-C} = \sum_{i=1}^{6} \sum_{n=1}^{n} \left(\sigma_i \times SV_n^{\beta i}\right) \times t$$

Equation 105-4

[Revised Equation]

$$E_{VOCL-C} = \sum_{i=1}^{6} \sum_{j=1}^{n} \left(\sigma_i \times SV_j^{\beta i}\right) \times t$$

Where:
E_{VOCL-C} = Emissions from components with screening values, corrected for background, between 0 and 10,000 ppm (kg/screening period).
i = Component type (valve, pump seal, others, connector, flange, open ended-line).
n = Number of type *i* components.
σ_i = Correlation equation coefficient for component type *i* from Table 105-1.
~~SV_n~~SV_j = Screening value for component ~~*n*~~*j*.
β_i = Correlation equation exponent for component type *i* from Table 105-1.
t = Time component has been leaking (default value is time from last screening) (hours/screening period).

(c) For components where the screening value, corrected for background, is greater than or equal to 10,000 ppm, calculate VOC emissions using equation 105-5 and the appropriate default factors from table

105-1 in 20.2.105.400 NMAC.

$$E_{VOCP} = \sum_{i=1}^{6} CC_i \times PF_{iP} \times t \qquad \textbf{Equation 105-5}$$

Where:

E_{VOCP} = Emissions from components with screening values, corrected for background, greater than or equal to 10,000 ppm (kg/screening period).

i = Component type (1=valve, 2=pump seal, 3=others, 4=connector, 5=flange, 6=open-ended line).

CC_i = Number of type *i* components with screening values greater than 9,999 ppm.

PF_{iP} = VOC emission factor for component type *i* pegged over 9,999 ppm from Table 105-1 (kg/hr).

t = Time component has been leaking (default value is time since last screening) (hours/screening period).

(3) Calculate CH4 emissions using equation 105-6 and either a default factor of 0.6 for the VOC to CH4 conversion factor [CF(sub)VOC] or a site-specific conversion factor calculated from the composition and methane content of the gas.

[Original Equation] $$CH_4 = \sum_{1}^{n} \left(E_{VOC-0} + E_{VOC-LC} + E_{VOCP}\right)_n \times CF_{VOC} \times 0.001$$

Equation 105-6

[Revised Equation] $$CH_4 = \sum_{i=1}^{n} \left(E_{VOC-0} + E_{VOC-LC} + E_{VOCP}\right)_i \times CF_{VOC} \times 0.001$$

Where:

CH_4 = CH_4 emissions (metric tons/year).

n = Number of screenings/year.

E_{VOC-0} = Emissions from components with a screening value equal to zero, when corrected for background (kg/screening period).

E_{VOC-LC} = Emissions from components with screening values, corrected for background, between 0 and 10,000 ppm (kg/screening period).

E_{VOCP} = Emissions from components with screening values, corrected for background, greater than or equal to 10,000 ppm (kg/screening period).

CF_{VOC} = VOC to CH_4 conversion factor (default $CF_{VOC} = 0.6$).

0.001 = Conversion factor (kg to metric tons).

[20.2.105.200 NMAC - N, 01/01/10]

20.2.105.201 to 20.2.105.299 [RESERVED]

20.2.105.300 MONITORING REQUIREMENTS:

A. Flares and Other Oxidizers. The owner or operator shall measure:

(1) the volume of each gas destroyed annually determined to an accuracy of plus or minus 5 percent; and

(2) the carbon content and molecular weight of each gas quarterly using the methods specified in 20.2.102.202 NMAC and calculate the annual average values for carbon content and molecular weight for each gas destroyed.

B. Process Vents. The owner or operator shall measure the following parameters for each process vent:

(1) the gas flow rate for each venting event;

(2) the molar fraction of CO2, N2O, and CH4 in the vent gas stream during each venting event; and

(3) the duration of each venting event.

C. Equipment Leaks. The owner or operator shall screen each valve, pump seal, connector, flange, and open-ended line used in natural gas, fuel gas, and off-gas systems using the methods specified in the method 3 correlation equation method in the publication [CAPCOA (1999)]~~ which is incorporated by reference in Subsection H of 20.2.100.12 NMAC~~, and an instrument capable of detecting methane. The owner or operator shall perform screenings at the frequency interval required by the department. The instrumentation used for screening shall be

capable of detecting methane.

D. Feedstock Consumption. The owner or operator shall measure the feedstock consumption using the same plant instruments used for accounting purposes, such as weigh hoppers or belt weigh feeders.

[20.2.105.300 NMAC - N, 01/01/10]

20.2.105.301 to 20.2.105.399 [RESERVED]

20.2.105.400 TABLE 105-1: FUGITIVE EMISSIONS FROM GAS SERVICE COMPONENTS

Component Type / Service Type	Default Zero Factor (kg/hr) Zf(sub)i0	Correlation Equation (kg/hr)		Pegged Factor (kg/hr) 10,000 ppm (SV greater than 9,999) PF(sub)iP-10
		Coefficient (sigma sub i)	Exponent (beta sub i)	
Valves (1)	0.0000078	0.00000227	0.747	0.064
Pump seals (2)	0.000019	0.0000507	0.622	0.089
Others (3)	0.0000040	0.00000869	0.642	0.082
Connectors (4)	0.0000075	0.00000153	0.736	0.030
Flanges (5)	0.00000031	0.00000453	0.706	0.095
Open-ended lines (6)	0.0000020	0.00000190	0.724	0.033
Note: The "Others" component type should be applied to any component type other than connectors, flanges, open-ended lines, pump seals, or valves. The "Others" component type includes: instruments, loading arms, pressure relief valves, vents, compressors, dump lever arms, diaphragms, drains, hatches, meters, and polished rods stuffing boxes.				

[20.2.105.400 NMAC - N, 01/01/10]

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 2 AIR QUALITY (STATEWIDE)
PART 106 GREENHOUSE GAS REPORTING - CEMENT MANUFACTURING

20.2.106.1 ISSUING AGENCY: Environmental Improvement Board.
[20.2.106.1 NMAC - N, 01/01/10]

20.2.106.2 SCOPE: All persons who own or operate an applicable source of greenhouse gas emissions in the geographic areas within the jurisdiction of the environmental improvement board.
[20.2.106.2 NMAC - N, 01/01/10]

20.2.106.3 STATUTORY AUTHORITY: Environmental Improvement Act, NMSA 1978, Section 74-1-8(A)(4), and Air Quality Control Act, NMSA 1978, Sections 74-2-1 et seq., including specifically Sections 74-2-5(B)(1) & 74-2-(5)(C)(5)(d) & (e).
[20.2.106.3 NMAC - N, 01/01/10]

20.2.106.4 DURATION: Permanent.
[20.2.106.4 NMAC - N, 01/01/10]

20.2.106.5 EFFECTIVE DATE: January 1, 2010 except where a later date is cited at the end of a section.
[20.2.106.5 NMAC - N, 01/01/10]

20.2.106.6 OBJECTIVE: The objectives of this part are:

A. To specify greenhouse gas emissions from cement manufacturing sources that shall be included in determining applicability of greenhouse gas reporting and verification requirements under 20.2.100 NMAC and 20.2.101 NMAC;

B. To specify methods of calculation and sampling, analysis and measurement requirements for greenhouse gas emissions from cement manufacturing sources; and

C. To specify the information, in addition to the information required by 20.2.100 NMAC, that shall be included for cement manufacturing source emissions in annual reports to the department by the owner or operator of any facility meeting the applicability requirements in 20.2.100 NMAC.

[20.2.106.6 NMAC - N, 01/01/10]

20.2.106.7 DEFINITIONS: The definitions included in 20.2.2 NMAC and 20.2.100 NMAC shall apply to the terms used in this part. The definitions included in 20.2.2 NMAC shall apply to the terms used in this part, unless such term is defined in 20.2.100 NMAC.
[20.2.106.7 NMAC - N, 01/01/10]

20.2.106.8 SEVERABILITY: If any provision of this part, or the application of such provision to any person or circumstance, is held invalid, the remainder of this part, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.
[20.2.106.8 NMAC - N, 01/01/10]

20.2.106.9 CONSTRUCTION: This part shall be liberally construed to carry out its purpose.
[20.2.106.9 NMAC - N, 01/01/10]

20.2.106.10 SAVINGS CLAUSE: Repeal or supersession of prior versions of this part shall not affect any administrative or judicial action initiated under those prior versions.
[20.2.106.10 NMAC - N, 01/01/10]

20.2.106.11 COMPLIANCE WITH OTHER REGULATIONS: Compliance with this part does not relieve a person from the responsibility to comply with any other applicable federal, state, or local regulations.
[20.2.106.11 NMAC - N, 01/01/10]

~~**20.2.106.12 INCORPORATION BY REFERENCE:** Each document listed in 20.2.100.12 NMAC and cited in this part shall be incorporated by reference into this part.~~

20.2.106.12 AVAILABILITY OF CITED DOCUMENTS: Additional information regarding documents cited in this part may be found at 20.2.100.12 NMAC.
[20.2.106.12 NMAC - N, 01/01/10]

20.2.106.13 to 20.2.106.99 [RESERVED]

20.2.106.100 REPORTING REQUIREMENTS: In addition to meeting the requirements in 20.2.100 NMAC, the emissions data report shall include the following information for the facility.

A. Total emissions of CO2, CH4, and N2O in metric tons.

B. Monthly and annual CO2 process emissions from calcination (metric tons) and the following information.

(1) ~~Plant~~Monthly plant specific clinker emission ~~factor (kg~~factors (metric tons CO2/metric ton clinker):

(a) ~~quantity~~monthly quantities of clinker produced (metric tons);

(b) monthly total ~~lime (CaO) content~~calcium contents of clinker, expressed as calcium oxide (CaO) (weight fraction);

(c) monthly total magnesium contents of clinker, expressed as oxide (MgO) ~~content of clinker~~ (weight fraction); ~~and~~

(d) ~~total~~ monthly calcium contents of non-carbonate ~~(CO2) content of clinker~~raw materials entering the kiln, expressed as calcium oxide (CaO) (weight fraction);

(e) Monthly magnesium contents of non-carbonate raw materials entering the kiln, expressed as magnesium oxide (MgO) (weight fraction); and

(f) Monthly quantities of non-carbonate raw materials entering the kiln (metric tons).

(2) ~~Cement~~Monthly cement kiln dust (CKD) emission ~~factor (kg~~factors (metric tons CO2/metric ton CKD discarded):

(a) monthly plant specific CKD calcination ~~rate~~rates (unitless ratio); and

(b) ~~quantity~~monthly quantities of CKD discarded (metric tons).

C. CO2 process emissions from organic carbon oxidation (metric tons) and the following information:

(1) amount of raw material consumed in the report year (metric tons); and

(2) organic carbon content of raw material (weight fraction).

D. CO2, CH4, and N2O emissions (in metric tons) from fuel combustion in all kilns combined, following the calculation methods and reporting requirements specified in Subsection C of 20.2.106.200 NMAC.

E. CO2, CH4, and N2O emissions (in metric tons) from all other fuel combustion units combined (kilns excluded), following the calculation methods and reporting requirements specified in 20.2.102 NMAC.

F. If a continuous emissions monitor is used to measure CO2 emissions from kilns, then the requirements of Subsections B, C, and D of this section do not apply for CO2. Cement plants that measure CO2 emissions using CEMS shall report fuel usage by fuel type for kilns.

G. Owners or operators of cement plants shall also comply with the reporting requirements for any other applicable source category in 20.2.102 NMAC through 20.2.108 NMAC, including but not limited to the following:

(1) coal fuel storage as specified in 20.2.108 NMAC;

(2) electricity generating as specified in 20.2.103 NMAC; and

(3) cogeneration systems as specified in 20.2.103 NMAC.

[20.2.106.101 NMAC - N, 01/01/10]

20.2.106.101 to 20.2.106.199 [RESERVED]

20.2.106.200 CALCULATION OF GREENHOUSE GAS EMISSIONS:

A. Determine CO2 emissions as specified using either of the following:

(1) use a continuous emissions monitoring system (CEMS) as specified in 20.2.102.200 NMAC; or

(2) calculate the sum of CO2 process emissions from kilns and CO2 fuel combustion emissions from kilns using the calculation methodologies specified in Subsections B and C of this section.

B. Process CO2 emissions calculation methodology. Calculate total CO2 process emissions as the sum of emissions from calcination, using the method specified in Paragraph 1 of this subsection; and from organic

carbon oxidation, using the method specified in Paragraph 2 of this subsection. Use equation 106-1 to calculate total CO2 process emissions.

$$CO_2\ process = CO_2\ calcination\ +\ CO_2\ raw\ material \qquad \textbf{Equation 106-1}$$

(1) Calcination emissions. Calculate CO2 process emissions from calcination using equation 106-2 and a plant-specific clinker emission factor and a plant-specific cement kiln dust (CKD) emission factor as specified in this section.

$$CO_{2-C} = \sum_{i=1}^{12} [(Cli \times EF_{Cli}) + (Q_{CKD} \times EF_{CKD})] \qquad \textbf{Equation 106-2}$$

Where:

$CO_{2\text{-}C}$ = CO_2 emissions from calcination, metric ~~tones~~tons/yr.

Cli = Monthly quantity of clinker produced, metric tons/month.

EF_{Cli} = Monthly clinker emission factor, metric tons CO_2/metric ton clinker, computed as specified in subparagraph (a) of paragraph (1) of subsection B of this section (~~Section 200 of~~ 20.2.106.200 NMAC).

Q_{CKD} = Monthly quantity of CKD discarded (i.e., not recycled to the kiln), metric tons/month.

EF_{CKD} = Monthly CKD emission factor, computed as specified in subparagraph (b) of paragraph (1) of subsection B of this section (~~Section 200 of~~ 20.2.106.200 NMAC).

(a) ~~Monthly clinker~~Clinker emission factor. Calculate a ~~monthly~~ plant-specific clinker emission factor ~~(EFCli)~~[EF(sub)Cli] for each ~~report year~~month based on monthly measurements of the weight ~~fraction~~fractions of ~~measured CaO, MgO and CO2 (carbonate~~calcium (as CaO) and magnesium (as MgO) content in the clinker and in the non-carbonate raw materials entering the kiln, using equation 106-3, which assumes complete calcination of all carbonate ~~remaining~~ in the ~~clinker is associated with the calcium~~feedstock.

Equation 106-3

[Original Equation]

$$EF_{Cli} = [(CaO\ content - \frac{CO2\ Content}{Molecular\ ratio\ CO2/CaO}) \times Molecular\ ratio\ of\ CO_2/CaO]$$
$$+ [(MgO\ Content) \times Molecular\ ratio\ of\ CO_2/MgO]$$

[Revised Equation]

$$EF_{\text{Cli}} = \left[CaO_{Cli} - \left(\frac{CaO_{NCRM} \times NCRM}{Cli} \right) \right] \times MR_{CaO} + \left[MgO_{Cli} - \left(\frac{MgO_{NCRM} \times NCRM}{Cli} \right) \right] \times MR_{MgO}$$

Where:

~~CaO Content (by weight) = Total CaO content of Clinker (including calcined and uncalcined) (wt. fraction).~~

~~CO_2 Content (by weight) = Total CO_2 content of Clinker (wt. fraction).~~

EF_{Cli} = Monthly clinker emission factor, metric tons CO_2/metric ton clinker

CaO_{Cli} = Monthly total Ca content of clinker expressed as CaO (weight fraction).

CaO_{NCRM} = Monthly Ca content of non-carbonate raw materials entering the kiln, expressed as CaO (weight fraction).

NCRM = Monthly quantity of non-carbonate raw materials entering the kiln (metric tons).

Cli = Monthly quantity of clinker produced in kiln (metric tons).

MR_{CaO} = Molecular weight ratio of CO2/CaO = 0.785.

~~MgO Content (by weight) = Total MgO content of Clinker (including calcined and uncalcined) (wt. fraction).~~

MgO_{Cli} = Monthly total Mg content of clinker expressed as MgO (weight fraction).
MgO_{NCRM} = Monthly Mg content of non-carbonate raw materials entering the kiln, expressed as weight fraction of MgO.
MR_{MgO} = Molecular weight ratio of CO2/MgO = 1.092.

(b) ~~Monthly~~ CKD emission factor. If CKD is generated and not recycled back to the kiln, then calculate a ~~monthly~~ plant-specific monthly CKD emission factor based on monthly sampling. The CKD emission factor shall be calculated using equation 106-4 and a plant-specific CKD calcination rate as specified in equation 106-5.

$$EF_{CKD} = \frac{\dfrac{EFCli}{1+EFCli} \times d}{1 - \left(\dfrac{EF_{Cli}}{1+EF_{Cli}} \times d \right)}$$ **Equation 106-4**

Where:
EF_{CKD} = Monthly CKD emission factor, ~~kg~~metric tons CO_2/metric ton CKD discarded.
EF_{Cli} = Clinker emission factor, determined according to Equation 106-3.
d = CKD calcination rate, determined according to Equation 106-5.

$$d = 1 - \frac{fCO_{2CKD} \times (1 - fCO_{2RM})}{(1 - fCO_{2CKD}) \times fCO_{2RM}}$$ **Equation 106-5**

Where:
d = CKD calcination rate (unitless ratio).
fCO_{2CKD} = Weight fraction of carbonate CO_2 in the CKD.
fCO_{2RM} = Weight fraction of carbonate CO_2 in the raw material.

(2) Organic carbon oxidation emissions. Calculate CO2 process emissions from the total organic content in raw materials by using equation 106-6.

$$CO_{2-RM} = TOC_{RM} \times RM \times 3.664$$ **Equation 106-6**

Where:
$CO_{2\text{-}RM}$ = CO_2 emissions from raw material oxidation, metric tons.
TOC_{RM} = Total organic carbon content in raw material (~~wt.~~weight fraction), measured using the method in subsection C of 20.2.106.300 NMAC or using a default of 0.002 (0.2%).
RM = Amount of raw material consumed (metric tons/yr).
3.664 = The CO_2 to carbon molar ratio.

C. Fuel Combustion Emissions in Kilns. Calculate CO2, CH4, and N2O emissions from stationary fuel combustion following the calculation methods specified in 20.2.102 NMAC. Cement plants that combust pure biomass-derived fuels and combust fossil fuels only during periods of start-up, shut-down, or malfunction may report CO2 emissions from fossil fuels using the emission factor methodology in Subsection A of 20.2.102.200 NMAC. "Pure" means that the biomass-derived fuels account for 97 percent of the total amount of carbon in the fuels burned.
[20.2.106.200 NMAC - N, 01/01/10]

20.2.106.201 to 20.2.106.299 [RESERVED]

20.2.106.300 SAMPLING, ANALYSIS AND MEASUREMENT REQUIREMENTS:

A. Determine the plant-specific weight fractions of total calcium (as CaO) and total magnesium (as MgO~~, total carbonate CO2~~) in clinker and in non-carbonate raw material entering the kiln using ASTM C0114-09. Determine the weight fraction of carbonate CO2 in the CKD and the weight fraction of carbonate CO2 in the raw material using ASTM C0114-09. The monitoring must be conducted monthly from clinker, non-carbonate raw material, and CKD samples drawn from bulk storage.

B. If not using the default value of 0.002 for total organic carbon content in raw materials [TOC(sub)RM] in equation 106-5 in Paragraph 2 of Subsection B of 20.2.106.200 NMAC, the total organic carbon content of raw materials must be determined annually using ASTM Method C0114-9. The analysis must be conducted on sample material drawn from bulk raw material storage for each category of raw material.

C. The quantity of clinker produced must be determined by direct weight measurement using the same plant instruments used for accounting purposes, such as weigh hoppers or belt weigh feeders.

D. The quantity of CKD discarded must be determined by direct weight measurement using the same plant instruments used for accounting purposes, such as weigh hoppers or belt weigh feeders.

E. The quantity of raw materials consumed (i.e. limestone, sand, shale, iron oxide, ~~and~~ alumina, and non-carbonate raw material) must be determined by direct weight measurement using the same plant instruments used for accounting purposes, such as weigh hoppers or belt weigh feeders.

[20.2.106.300 NMAC - N, 01/01/10]

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 2 AIR QUALITY (STATEWIDE)
PART 107 GREENHOUSE GAS REPORTING - LIME MANUFACTURING

20.2.107.1 ISSUING AGENCY: Environmental Improvement Board.
[20.2.107.1 NMAC - N, 01/01/10]

20.2.107.2 SCOPE: All persons who own or operate an applicable source of greenhouse gas emissions in the geographic areas within the jurisdiction of the environmental improvement board.
[20.2.107.2 NMAC - N, 01/01/10]

20.2.107.3 STATUTORY AUTHORITY: Environmental Improvement Act, NMSA 1978, Section 74-1-8(A)(4), and Air Quality Control Act, NMSA 1978, Sections 74-2-1 et seq., including specifically Sections 74-2-5(B)(1) & 74-2-(5)(C)(5)(d) & (e).
[20.2.107.3 NMAC - N, 01/01/10]

20.2.107.4 DURATION: Permanent.
[20.2.107.4 NMAC - N, 01/01/10]

20.2.107.5 EFFECTIVE DATE: January 1, 2010 except where a later date is cited at the end of a section.
[20.2.107.5 NMAC - N, 01/01/10]

20.2.107.6 OBJECTIVE: The objectives of this part are:

A. To specify greenhouse gas emissions from lime manufacturing sources that shall be included in determining applicability of greenhouse gas reporting and verification requirements under 20.2.100 NMAC and 20.2.101 NMAC;

B. To specify methods of calculation and sampling, analysis and measurement requirements for greenhouse gas emissions from lime manufacturing sources; and

C. To specify the information, in addition to the information required by 20.2.100 NMAC, that shall be included for lime manufacturing source emissions in annual reports to the department by the owner or operator of any facility meeting the applicability requirements in 20.2.100 NMAC.

[20.2.107.6 NMAC - N, 01/01/10]

20.2.107.7 DEFINITIONS: The definitions included in 20.2.2 NMAC and 20.2.100 NMAC shall apply to the terms used in this part. The definitions included in 20.2.2 NMAC shall apply to the terms used in this part, unless such term is defined in 20.2.100 NMAC.
[20.2.107.7 NMAC - N, 01/01/10]

20.2.107.8 SEVERABILITY: If any provision of this part, or the application of such provision to any person or circumstance, is held invalid, the remainder of this part, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.
[20.2.107.8 NMAC - N, 01/01/10]

20.2.107.9 CONSTRUCTION: This part shall be liberally construed to carry out its purpose.
[20.2.107.9 NMAC - N, 01/01/10]

20.2.107.10 SAVINGS CLAUSE: Repeal or supersession of prior versions of this part shall not affect any administrative or judicial action initiated under those prior versions.
[20.2.107.10 NMAC - N, 01/01/10]

20.2.107.11 COMPLIANCE WITH OTHER REGULATIONS: Compliance with this part does not relieve a person from the responsibility to comply with any other applicable federal, state, or local regulations.
[20.2.107.11 NMAC - N, 01/01/10]

~~**20.2.107.12 INCORPORATION BY REFERENCE:** Each document listed in 20.2.100.12 NMAC and cited in this Part shall be incorporated by reference into this part.~~

20.2.107.12 AVAILABILITY OF CITED DOCUMENTS: Additional information regarding documents cited in this part may be found at 20.2.100.12 NMAC.
[20.2.107.12 NMAC - N, 01/01/10]

20.2.107.13 to 20.2.107.99 [RESERVED]

20.2.107.100 REPORTING REQUIREMENTS: In addition to the information required by 20.2.100 NMAC, the annual emissions data report shall contain the following information.

A. Total emissions of CO2, CH4, and N2O in metric tons.

B. CO2 process emissions from quick lime production (metric tons) and the following information.

(1) For lime production:

(a) the emission factor (kg CO2/metric ton) for each lime type for each month;

(b) the quantity of each type of lime produced (metric tons) each month;

(c) the calcium oxide (CaO) content (weight fraction) of each lime type for each month; and

(d) the magnesium oxide (MgO) content (weight fraction) of each lime type for each month.

(2) For the production of calcined byproducts and wastes:

(a) the emission factor (kg CO2/metric ton) for each calcined byproduct/waste type for each ~~month~~calendar quarter;

(b) the quantity of each type of calcined byproduct/waste type produced each ~~month~~calendar quarter;

(c) the calcium oxide (CaO) content (weight fraction) of each calcined byproduct/waste type for each ~~month~~calendar quarter; and

(d) the magnesium oxide (MgO) content (weight fraction) of each calcined byproduct/waste type for each ~~month~~calendar quarter.

C. CO2, CH4, and N2O emissions from fuel combustion in all kilns combined, following the calculation methods and reporting requirements specified in Subsection C of 20.2.107.200 NMAC (metric tons).

D. CO2, CH4, and N2O emissions from all other fuel combustion units combined (kilns excluded), following the calculation methods and reporting requirements specified in 20.2.102 NMAC (metric tons).

E. If a continuous emissions monitor is used to measure CO2 emissions from kilns, then the requirements of Subsections B and C of this section do not apply for CO2.

F. Owners and operators of lime plants shall also comply with the reporting requirements for any other applicable source category in 20.2.102 NMAC through 20.2.108 NMAC including but not limited to the following:

(1) coal fuel storage as specified in 20.2.108 NMAC;

(2) electricity generating as specified in 20.2.103 NMAC; and

(3) cogeneration systems as specified in 20.2.103 NMAC.

[20.2.107.101 NMAC - N, 01/01/10]

20.2.107.101 to 20.2.107.199 [RESERVED]

20.2.107.200 CALCULATION OF GREENHOUSE GAS EMISSIONS:

A. Determine process CO2 emissions as specified under either Paragraphs 1 or 2 of this subsection.

(1) Continuous emissions monitoring systems (CEMS) as specified in Subsection D of 20.2.102.200 NMAC.

(2) Calculate the sum of CO2 process emissions from kilns and CO2 fuel combustion emissions from kilns using the calculation methodologies specified in Subsections B and C of this section.

B. Process CO2 emissions calculation methodology. Calculate total CO2 process emissions as the sum of emissions from quick lime production, using the method specified in Paragraph 1 of this subsection.

(1) CO2 process emissions. Calculate CO2 emissions from ~~quick lime~~ the production ~~from~~of each ~~kiln~~ type of quick lime using equation 107-1 ~~and~~, a plant-specific quick lime emission factor, and a plant-specific ~~lime kiln dust (LKD)~~calcined byproduct/waste emission factor as specified in this section.

[Original Equation]

$$CO_2 = \sum_{i}^{12}\sum_{j}^{y}\left[QL_{ij} \times EF_{QL_{ij}}\right] + \sum_{k}^{4}\sum_{l}^{z}\left[LKD_{kl} \times EF_{LKD_{kl}}\right]$$

Equation 107-1

[Revised Equation]

$$CO_2 = \sum_{i=1}^{12}\sum_{j=1}^{y}\left[QL_{ij} \times EF_{QL_{ij}}\right] + \sum_{k=1}^{4}\sum_{l=1}^{z}\left[CBW_{kl} \times EF_{CBW_{kl}}\right]$$

Where:

CO_2	=	CO_2 emissions in metric tons/yr.
QL	=	Monthly quantity of quick lime produced, metric tons.
EF_{QL}	=	Monthly quick lime emission factor, metric tons CO_2/metric ton quick lime computed as specified in paragraph (2) of subsection B of this section (Section 200 of 20.2.107 NMAC).
~~LKD~~CBW	=	Quarterly quantity of calcined byproduct/waste, including lime kiln dust (LKD), scrubber sludge and other calcined wastes, produced ~~annually~~, metric tons.
~~EF_{LKD}~~EF_{CBW}	=	Quarterly calcined byproduct/waste emission factor, computed as specified in paragraph (3) of subsection B of this section (Section 200 of 20.2.107 NMAC).
i	=	Month.
j	=	Lime type.
k	=	Quarter.
l	=	Calcined byproduct/waste type.
y	=	Total number of lime types.
z	=	Total number of calcined byproduct/waste types.

(2) Monthly quick lime emission factor. Calculate a plant-specific quick lime emission factor [EF(sub)QL] for each ~~kiln~~type of quick lime and month based on the percent of measured CaO and MgO content in quick lime and using equation 107-2.

$$EF_{QL} = (CaO\ \ content \times Molecular\ \ ratio\ \ of\ CO_2 / CaO) + (MgO\ \ content \times Molecular\ \ ratio\ \ CO_2 / MgO)$$

Equation 107-2

Where:

CaO content ~~(by weight)~~	=	Total CaO content of quick lime (by weight).
Molecular ratio of CO_2/CaO	=	0.785.
MgO content ~~(by weight)~~	=	Total MgO content of quick lime (by weight).
Molecular ratio of CO_2/MgO	=	1.092.

(2) ~~Monthly LKD~~Quarterly Calcined Byproduct/Waste Emission Factor. ~~If LKD is generated and not recycled back to the kiln, then calculate a plant-specific LKD emission factor for each kiln and month.~~ The ~~LKD~~calcined byproduct/waste emission factor shall be calculated using equation 107-3.

[Original Equation]

$$EF_{LKD} = [(CaO\ \ content - uncalcined\ \ CaO) \times Molecular\ \ ratio\ \ of\ CO_2 / CaO] + [(MgO\ \ Content - uncalcined\ \ MgO) \times Molecular\ \ ratio\ \ of\ CO_2 / MgO]$$

[Revised Equation]

$$EF_{CBW} = [(CaO\ \ content) \times Molecular\ \ ratio\ \ of\ CO_2 / CaO] + [(MgO\ \ Content) \times Molecular\ \ ratio\ \ of\ CO_2 / MgO]$$

Equation 107-3

Where:

~~EF_{LKD}~~	~~=~~	~~LKD~~
EF_{CBW}	=	Calcined byproduct/waste emission factor.

CaO Content~~ (by weight)~~	=	Total CaO content of ~~LKD, including~~ calcined ~~and uncalcined (weight fraction).~~
~~Uncalcined CaO (by weight)~~	~~=~~	~~Uncalcined CaO content of LKD~~byproduct/waste (weight fraction).
Molecular ratio of CO_2/CaO	=	0.785.
MgO content~~ (by weight)~~	=	Total MgO content of ~~LKD, including~~ calcined ~~and uncalcined (weight fraction).~~
~~Uncalcined MgO~~	~~=~~	~~Uncalcined MgO content of LKD~~byproduct/waste (weight fraction).
Molecular ratio of CO_2/MgO	=	1.092.

C. Fuel Combustion Emissions in Kilns. Calculate CO2, CH4, and N2O emissions from stationary fuel combustion emissions following the calculation methods specified in 20.2.102 NMAC. Operators of lime manufacturing plants that primarily combust biomass-derived fuels and combust fossil fuels only during periods of start-up, shut-down, or malfunction may report CO2 emissions from fossil fuels using the emission factor methodology in Subsection A of 20.2.102.200 NMAC. "Pure" means that the biomass-derived fuels account for 97 percent of the total amount of carbon in the fuels burned.
[20.2.107.200 NMAC - N, 01/01/10]

20.2.107.201 to 20.2.107.299 [RESERVED]

20.2.107.300 SAMPLING, ANALYSIS AND MEASUREMENT REQUIREMENTS: ~~Determine~~The owner or operator shall determine the chemical composition (percent total CaO and percent total MgO) of each lime type and each calcined byproduct/waste type by laboratory analysis on a monthly basis for each lime type, and a quarterly basis for each calcined byproduct/waste type. This determination shall be performed according to the procedures in the analytical methods section of the national lime association's CO2 emissions calculation protocol for the lime industry, English units version, February 5, 2008, including ASTM methods C0025-6, C1301-95 or C1271-99. Samples for analysis of the calcium oxide and magnesium oxide content of each lime type and each calcined byproduct/waste type shall be collected during the same month or quarter as the production data. At least one sample shall be collected monthly for each lime type produced during the month and quarterly for each calcined byproduct/waste type produced during the quarter.

A. The quantity of lime produced and sold shall be estimated monthly using direct measurements (such as rail and truck scales) of lime sales for each lime type, and adjusted to take into account the difference in beginning- and end-of-period inventories of each lime type. The inventory period shall be annual at a minimum.

B. The quantity of calcined byproduct/waste sold shall be estimated quarterly using direct measurements (such as rail and truck scales) of calcined byproduct/waste sales for each calcined byproduct/waste type, and adjusted to take into account the difference in beginning- and end-of-period inventories of each calcined byproduct/waste type. The inventory period shall be annual at a minimum. The quantity of calcined byproduct/waste not sold shall be determined no less often than quarterly for each calcined/byproduct waste type using direct measurements (such as rail and truck scales), or a calcined byproduct/waste generation rate (i.e., calcined byproduct/waste produced as a factor of lime production).
[20.2.107.300 NMAC - N, 01/01/10]

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 2 AIR QUALITY (STATEWIDE)
PART 108 GREENHOUSE GAS REPORTING – COAL STORAGE

20.2.108.1 ISSUING AGENCY: Environmental Improvement Board.
[20.2.108.1 NMAC - N, 01/01/10]

20.2.108.2 SCOPE: All persons who own or operate an applicable source of greenhouse gas emissions in the geographic areas within the jurisdiction of the environmental improvement board.
[20.2.108.2 NMAC - N, 01/01/10]

20.2.108.3 STATUTORY AUTHORITY: Environmental Improvement Act, NMSA 1978, Section 74-1-8(A)(4), and Air Quality Control Act, NMSA 1978, Sections 74-2-1 et seq., including specifically Sections 74-2-5(B)(1) & 74-2-(5)(C)(5)(d) & (e).
[20.2.108.3 NMAC - N, 01/01/10]

20.2.108.4 DURATION: Permanent.
[20.2.108.4 NMAC - N, 01/01/10]

20.2.108.5 EFFECTIVE DATE: January 1, 2010 except where a later date is cited at the end of a section.
[20.2.108.5 NMAC - N, 01/01/10]

20.2.108.6 OBJECTIVE: The objectives of this part are:

A. To specify greenhouse gas emissions from coal storage sources that shall be included in determining applicability of greenhouse gas reporting and verification requirements under 20.2.100 NMAC and 20.2.101 NMAC;

B. To specify methods of calculation and sampling, analysis and measurement requirements for greenhouse gas emissions from coal storage sources; and

C. To specify the information, in addition to the information required by 20.2.100 NMAC, that shall be included for coal storage source emissions in annual reports to the department by the owner or operator of any facility meeting the applicability requirements in 20.2.100 NMAC.

[20.2.108.6 NMAC - N, 01/01/10]

20.2.108.7 DEFINITIONS: The definitions included in 20.2.100 NMAC shall apply to the terms used in this part. The definitions included in 20.2.2 NMAC shall apply to the terms used in this part, unless such term is defined in 20.2.100 NMAC.
[20.2.108.7 NMAC - N, 01/01/10]

20.2.108.8 SEVERABILITY: If any provision of this part, or the application of such provision to any person or circumstance, is held invalid, the remainder of this part, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.
[20.2.108.8 NMAC - N, 01/01/10]

20.2.108.9 CONSTRUCTION: This part shall be liberally construed to carry out its purpose.
[20.2.108.9 NMAC - N, 01/01/10]

20.2.108.10 SAVINGS CLAUSE: Repeal or supersession of prior versions of this part shall not affect any administrative or judicial action initiated under those prior versions.
[20.2.108.10 NMAC - N, 01/01/10]

20.2.108.11 COMPLIANCE WITH OTHER REGULATIONS: Compliance with this part does not relieve a person from the responsibility to comply with any other applicable federal, state, or local regulations.
[20.2.108.11 NMAC - N, 01/01/10]

~~**20.2.108.12 INCORPORATION BY REFERENCE:** Each document listed in 20.2.100.12 NMAC and cited in this Part shall be incorporated by reference into this part.~~

20.2.108.12 AVAILABILITY OF CITED DOCUMENTS: Additional information regarding documents cited in this part may be found at 20.2.100.12 NMAC.
[20.2.108.12 NMAC - N, 01/01/10]

20.2.108.13 to 20.2.108.99 [RESERVED]

20.2.108.100 REPORTING REQUIREMENTS*:* In addition to meeting the requirements in 20.2.100 NMAC, the emissions data report shall include the following information at the facility level.

A. Annual total methane emissions from coal storage, in metric tons.
B. Annual coal purchases in tons.
C. Source of coal purchases:
(1) coal basin;
(2) state; and
(3) coal mine type (surface or underground).

[20.2.108.100 NMAC - N, 01/01/10]

20.2.108.101 to 20.2.108.199 [RESERVED]

20.2.108.200 CALCULATION OF METHANE EMISSIONS FROM COAL STORAGE: The owner or operator shall calculate fugitive CH4 emissions from coal storage piles using equation 108-5 and the default CH4 emission factors for post-mining operations provided in Table 108-1 in 20.2.108.400 NMAC.

$$CH_4 = \sum_i \left(PC_i \times EF_i\right) \times 0.04228 \,/\, 2{,}204.6 \qquad \textbf{Equation 108-1}$$

Where:

CH_4	=	Fugitive emissions from coal storage piles for each coal category *i*, metric tons CH_4 per year.
PC_i	=	Purchased coal for each coal category i, tons per year.
EF_i	=	Default CH_4 emission factor specified by location and mine type that coal originated from, provided in Table 108-1, scf CH_4 per ton of coal.
0.04228	=	Methane conversion factor to convert scf to lbs.
2,204.6	=	Factor to convert lbs to metric tons.

[20.2.108.200 NMAC - N, 01/01/10]

20.2.108.201 to 20.2.108.299 [RESERVED]

20.2.108.301 SAMPLING, ANALYSIS AND MEASUREMENT REQUIREMENTS FOR COAL STORAGE: Facilities shall determine the quantity of coal purchased by either:

A. using records provided by the coal supplier, or
B. monitoring coal purchase quantities using the same plant instruments used for accounting purposes, such as weigh hoppers or belt weigh feeders.

[20.2.108.301 NMAC - N, 01/01/10]

20.2.108.302 to 20.2.108.399 [RESERVED]

20.2.108.400 TABLE 108-1: DEFAULT FUGITIVE METHANE EMISSION FACTORS FROM POST-MINING COAL STORAGE AND HANDLING (CUBIC FEET OF METHANE PER SHORT TON)

Coal Origin		**~~Coal Mine Type~~Post-Mining Emission Factors scf CH4/ton coal**	
~~Coal Basin~~	**~~States~~**	**~~Surface Post-Mining Factors~~**	**~~Underground Post-Mining Factors~~**
Coal Basin	**States**	**Coal Mine Type**	
		Surface Mines	**Underground Mines**
Rockies (Piceance Basin)	Arizona, California, Colorado, New Mexico, Utah	10.8	63.8
Rockies (Uinta Basin)		5.2	32.3
Rockies (San Juan Basin)		2.4	34.1
Rockies (Green River Basin)		10.8	80.3
Rockies (Raton Basin)		10.8	41.6
Northern Great Plains	Montana, North Dakota, Wyoming	1.8	5.1
West Interior (Forest City, Cherokee Basins)	Arkansas, Iowa, Kansas, Louisiana, Missouri, Oklahoma, Texas	11.1	20.9
West Interior (Arkoma Basin)		24.2	107.6
West Interior (Gulf Coast Basin)		10.8	41.6

[20.2.108.400 NMAC - N, 01/01/10]