

**COUNTY OF SAN DIEGO**  
**REPORT FORMAT AND CONTENT REQUIREMENTS**  
**GREENHOUSE GAS ANALYSES AND REPORTING**



**LAND USE AND ENVIRONMENT GROUP**

**Planning & Development Services  
Department of Public Works**

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## **PURPOSE**

The purpose of this document is to describe the content, format, and methods for greenhouse gas (GHG) analyses and reporting in documents for review by the County of San Diego. These report requirements apply to privately initiated and public discretionary projects.

The State of California has determined that projects may have GHG emissions that represent a cumulatively considerable contribution to the significant cumulative impact of climate change. The purpose of GHG analyses is to evaluate potentially significant cumulative impacts that may result from a proposed project.

These report requirements are intended to:

- Ensure the quality, accuracy, and completeness of reports and to aid in the ability to review reports in a consistent manner;
- Provide adequate information to make appropriate planning decisions and to make determinations regarding conformance with applicable regulations; and
- Increase the efficiency of the environmental review process and avoid unnecessary time delays.

The County reserves the right to update these report requirements as new information becomes available that relates to the analysis or reporting of GHG-related environmental effects.

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## **List of Acronyms**

|          |  |
|----------|--|
| AB 32    | Assembly Bill 32, The Global Warming Solutions Act of 2006 |
| APS      | Alternative Planning Strategy                              |
| ARB      | Air Resources Board  |
| BOS      | County of San Diego Board of Supervisors                   |
| CalEEMod | California Emission Estimator Model                        |
| CAP      | Climate action plan  |
| CAPCOA   | California Air Pollution Control Officers Association      |
| CEC      | California Energy Commission                               |
| CEQA     | California Environmental Quality Act                       |
| GHG      | Greenhouse Gas   |
| GWP      | Global Warming Potential                                   |
| ITE      | Institute of Transportation Engineers                      |
| kWh      | Kilowatt hour  |
| LCFS     | Low Carbon Fuel Standard                                   |
| LGOP     | Local Government Operations Protocol                       |
| MT       | Metric tons  |
| MMBTU    | Million British Thermal Units                              |
| MMT      | Million metric tons  |
| SB       | Senate Bill  |
| SMAQMD   | Sacramento Metropolitan Air Quality Management District    |
| SSIM     | Sustainable Systems Integrated Model                       |
| URBEMIS  | Urban Emissions Model                                      |
| EPA      | United States Environmental Protection Agency              |
| VMT      | Vehicle Miles Traveled                                     |

## 1.0 INTRODUCTION

The California Environmental Quality Act (CEQA) requires public agencies to review the environmental impacts of proposed projects and consider feasible alternatives and mitigation measures to reduce significant adverse environmental effects. The California Natural Resources Agency adopted amendments to the CEQA Guidelines to address GHG emissions, consistent with Legislature's directive in Public Resources Code section 21083.05 (enacted as part of SB97 (Chapter 185, Statutes 2007)).<sup>2,3</sup> These amendments took effect in 2010.

Local lead agencies have taken a variety of approaches to addressing GHG emissions impacts in the context of their local CEQA review process. This document provides guidance for analysis and requirements for reporting related to GHG emissions for County of San Diego CEQA documents, particularly for what constitutes an adequate GHG analysis report.

In addition to GHG emissions, another important component of climate change is adapting to the future effects of a changing climate. Changing climate conditions are expected to have serious repercussions for public health, biodiversity, water supply and flooding, agriculture and forestry, wildfire risk, public infrastructure and facilities, and other issues. Communities prone to these effects will need to analyze and mitigate the impacts of climate change on projects, identify areas most vulnerable to these impacts, and develop risk reduction strategies. The State of California intends to work collaboratively to address these impacts, as noted in the 2009 California Climate Adaptation Strategy.<sup>4</sup>

CEQA documents are required to include a discussion of relevant impacts of climate change on a project. Due to the specific nature of these potential effects on proposed projects, such impacts would typically be addressed in the other associated CEQA issue areas (water supply, water quality, habitat, wildfire risk, etc.), and only cross-referenced in the GHG section of the CEQA document. Typically, this topic will not appear in a GHG analysis report, but rather will be included in a different section of the relevant CEQA document. Therefore, the evaluation of the potential for impacts and relative intensity of climate change impacts on a project will be done by other environmental professionals and reported in the appropriate section/s.

These report requirements apply to most projects. In some cases, the format/content of the analysis may need to be revised, as appropriate, to fit unique circumstances for certain projects. Revisions in such cases require prior agreement with County staff.

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<sup>2</sup> The CEQA Guidelines are found in the California Code of Regulations, title 14, sections 15000-15387.

<sup>3</sup> The Natural Resources Agency, in consultation with the Office of Planning and Research (OPR), is required to certify, adopt, and amend the Guidelines at least once every two years.

<sup>4</sup> California Natural Resources Agency. (2009). California Climate Adaptation Strategy. Available online at: <http://www.climatechange.ca.gov/adaptation/>. Accessed July 16, 2011.

For all projects, applicants and consultants are encouraged to coordinate with County staff prior to initiating the GHG analysis and through the analysis and documentation in order to promote a more efficient and successful process.

## **2.0 DATA NEEDS FOR GREENHOUSE GAS ANALYSES**

Depending on the specific project type, a range of data inputs will be needed to complete a GHG analysis. For some projects, detailed data may not yet be available. For example, detailed information may not be available at the land subdivision stage that is available at the site plan review stage. It is routine in air quality, GHG, and other types of analysis to create assumptions that guide the analysis. The County anticipates that assumptions will be needed in some cases in order to complete the analysis. Performance standards for mitigation may be needed in cases where there is not yet enough detail to analyze the effectiveness of mitigation. Regardless of the approach, all assumptions must be acceptable to the County and data must be verifiable and referenced in the analysis report.

Data needs include, but are not necessarily limited to:

1. For construction emissions, the report must include the following project-specific information verified by the project engineer or other knowledgeable party, as relevant to the project:
  - a. Numbers, types, and capacities (horsepower) of equipment; estimated daily usage and dates of operation.
  - b. Material and waste transport distances (i.e., distances to collect and dispose of fill material, aggregate, etc.)
  - c. Number of workers, vendors, and commute distances.
  - d. Low Carbon Fuel Standard (LCFS), Pavley/Corporate Average Fuel Economy (CAFE) standards, and/or other applicable GHG-reducing policies estimated for the year/s of construction.
2. For operational emissions, the report must include the following project-specific information, as relevant to the project:
  - a. Transportation Emissions (project-level or County-specific fleet data)
    - i. Annual vehicle miles traveled per year (VMT/yr) and trips attributable to the project, including VMT distributed by speed bin, if possible.<sup>5</sup> The report must present the rationale for (1) the VMT

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<sup>5</sup> “Speed bin” is a simple way of showing the distribution of trips by speed. Instead of reporting each increment, travel demand is presented by the amount of VMT that occurs between 0 and 5 miles per hour, 5 to 10 miles per hour, etc.

used in deriving GHG estimates, including an accounting for the relationships between project land uses and surrounding land uses, as well as the transportation network; (2) VMT in relation to the project's location, density, design, access to non-automobile transportation facilities, travel behavior of inhabitants, and other relevant characteristics that affect travel demand and mode choice; and (3) plans, VMT, and trips in relation to the origin and destination.

- ii. Pavley, LCFS, and other appropriate reductions associated with statewide reduction measures should be estimated for the year 2020, along with an explanation of the reductions taken.<sup>6</sup>
  - iii. The vehicle fleet composition (age and vehicle class/type) and an explanation of how it will affect future LCFS, Pavley, and vehicle efficiency reductions taken under AB 32/Scoping Plan. County-specific data should be used in absence of detailed vehicle fleet data for a particular project (i.e., traffic study with detailed trip and VMT estimates by vehicle class). Projects that anticipate a vehicle fleet that is different than the Countywide average fleet must provide a project-specific fleet.<sup>7</sup>
- b. Landscaping Emissions estimated using equipment or fuel type, capacity (horsepower), and annual use factors.
- c. Electricity and Natural Gas Emissions
- i. Electricity consumption (kWh/yr) and natural gas consumption (MMBTU/yr) by land use.<sup>8</sup>
  - ii. Local electricity and natural gas use estimated by land use type. This information can come from local utilities and/or the California Energy Commission (CEC), unless project-specific data are available.<sup>9</sup>

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<sup>6</sup> When using the County's "Performance Threshold," Pavley I and emissions attributable to previous requirements for a 20% renewable energy portfolio (RPS) may not be used as a part of the minimum percentage mitigation. Please refer to the County's "*Guidelines for Determining Significance, Climate Change*," under separate cover, for more direction.

<sup>7</sup> The fleet mix used to calculate GHG emissions should be consistent with the fleet mix used to calculate other air pollutant emissions.

<sup>8</sup> For a plan, if a local municipal electricity provider is within the operational boundaries of interest, care must be taken to avoid double counting, i.e. delivered energy/sales within the boundary without counting energy, waste heat, or hydrogen delivered elsewhere, or natural gas combustion used to produce any of the above.

<sup>9</sup> It is sometimes difficult to calculate GHG reductions associated with energy-efficient designs or mitigation related to building efficiency since Title 24/20 (buildings/appliances) are performance standards, and the actual numbers and types of building materials and equipment used for individual projects may not be known at the time of analysis.

- iii. Utility-specific emission factors or, for electricity, electricity portfolio composition (% fuel type) in metric tons for the baseline year.<sup>10</sup>

d. Solid Waste Emissions

- i. Waste-in-place at the baseline year (for detailed landfill modeling) and/or annual landfilled solid waste (tons per year), incinerated waste (tons per year), and waste characterization (e.g., paper, food, wood/textiles, plant debris, other), for the baseline year if known.
- ii. Waste generation by land use type. Future estimation of waste characterization due to anticipated regulatory changes should be provided, where possible, but care must be taken not to double count reductions (i.e., benefits from local or state recycling programs should not be subtracted from future estimates of waste generation/characterization), if they are built into those estimates.
- iii. Average round-trip haul distances from the project to the nearest landfill; with LCFS and other appropriate vehicle reductions taken for the year 2020.
- iv. Percent and amount of methane captured and used and/or flared (if any) (e.g., million standard cubic feet).
- v. Locally relevant information on moisture content of relevant landfill facilities should be used in place of model defaults.

e. Water and Wastewater Emissions

- i. Estimated water and wastewater demand by land use. In general, defaults from emissions estimate models should not be used to estimate water and wastewater demand for industrial projects, since there is a great degree of variance among different specific industrial end uses. Specific demand estimates for the proposed use should be used instead.
- ii. Demand by percentage of indoor vs. outdoor, local vs. imported, and groundwater vs. surface water, where available. Southern California pumping emission factors for surface water from the CEC must be used. Groundwater pumping emission factors from Electric Power Research Institute or other sources can be used.

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<sup>10</sup> Sometimes future estimates of CO<sub>2</sub> emission factors are available from local utilities. However, these are difficult to implement since the assumptions used in estimating energy intensities may not be known at the time of analysis, and care must be taken not to double count future GHG reductions due to regulatory actions (Green Buildings, Renewable Portfolio Standard, and local programs).



- iii. Electricity emission factors from local utilities, where available.
  - iv. Facility influent biological oxygen demand in mg/L at the relevant wastewater treatment plant and effluent nitrogen, if available, with the type of treatment plant and processes (i.e., conventional, well-operated secondary treatment plant, tertiary treatment plant, etc.).
  - v. Annual average (inflow and outflow) flow rate (million gallons) for water treatment facilities.
- f. Other Equipment, Facilities, or Vehicle Emissions
- i. Fuel consumption by fuel type in MMBTU for any other equipment, facilities, or vehicles not addressed by above fuel data inputs.<sup>11</sup>
  - ii. Fuel-, location-, and project-specific GHG emission factors.
- g. Industrial Emissions
- i. Identify industrial facilities emitting CO<sub>2</sub> or any commercial or industrial facilities containing large amounts of refrigerants or other high-GWP GHGs (supermarkets, cold storage or freezing facilities, semiconductor or photovoltaic film manufacturers, fire suppression systems, etc.). The Climate Registry general reporting protocol (GRP) and the California Air Resources Board's (ARB) Local Government Operations Protocol (LGOP) require estimates of GWPs from IPCC's Second Assessment Report consistent with international reporting protocols. GWP estimates should be consistent with direction in these protocols.<sup>12,13</sup>
- h. Agricultural GHG emissions
- i. Identify agricultural processes emitting GHGs, including buildings and equipment, enteric fermentation, soil management, manure management, and residue burn. Provide emissions estimates based on best available science.

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<sup>11</sup> For plans, similar to electricity generation, care must be taken not to double count where there are industrial facilities employing cogeneration or exporting electricity/waste heat.

<sup>12</sup> The Climate Registry. 2008 (May). General Reporting Protocol. Version 1.1. Accurate, transparent, and consistent measurement of greenhouse gases across North America. Available online at: <http://www.theclimateregistry.org/downloads/GRP.pdf>. Accessed December 29, 2011.

<sup>13</sup> California Air Resources Board (ARB). 2010 (May). Local Government Operations Protocol for the quantification and reporting of greenhouse gas emissions inventories. Version 1.1. Available online at: [http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo\\_protocol\\_v1\\_1\\_2010-05-03.pdf](http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf). Accessed December 29, 2011.

i. Sequestration

- i. Provide estimates based on best available science for carbon sequestration that would occur due to implementation of the project or plan. Sequestration calculations should reflect the “net” value, accounting for any removal of vegetation due to the project.

3. If the Efficiency Threshold is used, residential population and employment estimates at buildout will be required, along with an explanation of the methods and assumptions used.

### **3.0 ANALYSIS**

Signed in August 2007, Senate Bill (SB) 97 acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. The amended guidelines establish two new guidance questions in the Environmental Checklist of the CEQA Guidelines Appendix G. Consistent with CEQA Guidelines Appendix G, implementation of the proposed project would have a significant impact if it:

- Generates GHG emissions, either directly or indirectly, that may have a significant effect on the environment; or
- Conflicts with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

The amendments do not establish a quantitative GHG emission threshold. The lead agency develops, adopts, and applies thresholds of significance (see the County’s “*Guidelines for Determining Significance, Climate Change*,” under separate cover). Under the state guidance, lead agencies are also allowed to incorporate thresholds developed by other agencies or experts.

#### **3.1 GHG Guidelines for Determining Significance**

The County of San Diego “*Guidelines for Determining Significance, Climate Change*” document was prepared to identify the emissions level for which a project would have significant GHG impacts, in accordance with CEQA. It also determined the emissions level that would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions to 1990 levels by the year 2020. If a project generates GHG emissions above the threshold level, the project would contribute substantially to cumulative climate change effects, and it would have a significant climate change impact.

### **3.2 Screening Criteria**

The County developed operational and construction screening criteria to use in determining whether or not additional information is needed to evaluate the significance of impacts upon initial project review. The screening levels were developed to allow for efficient and accurate evaluation of a project's potential to exceed the significance threshold for GHG emissions. Please see the County's "*Guidelines for Determining Significance, Climate Change*," Table 3.

Proposed projects of the same type and equal to or smaller than the sizes presented would have a less-than-cumulatively considerable contribution to the significant cumulative impact of climate change. If a proposed project is the same type and equal to or smaller than the project size listed, the GHG emissions for that project would not exceed 2,500 MT CO<sub>2</sub>e per year (the Bright Line Threshold). No GHG analysis report is required for these projects. If the project would comply with the screening criteria, at least one CAP measure should be incorporated. Please refer to the "*County of San Diego CAP Compliance Checklist for Greenhouse Gas Analysis*," for more detail.

### **3.3 Greenhouse Gas Analyses and Reporting**

Projects with proposed development in excess of the screening criteria would be required to prepare a project-specific analysis. Proposed developments that do not fit into the categories identified also require a project-specific GHG analysis. Detail for the required analysis is included in the following sections.

## **4.0 REPORT FORMAT REQUIREMENTS**

The GHG analysis must consider the potential effects and sources of GHG emissions for all aspects of the project. The analysis identifies whether impacts are significant, and proposes mitigation measures for identified impacts. A conclusion related to whether the project has residual impacts or has been mitigated must be made and supported with facts. All reports must follow the format outline presented below.

### **4.1 Format Outline**

The County requires that GHG analyses follow the numbering and format presented below:

**Cover Page**  
**Table of Contents**  
**Glossary of Terms and Acronyms**  
**Executive Summary**

**1.0 Introduction and Project Description.** This section includes a summary of the current state of the science with respect to GHGs and climate change and the purpose of the report. A brief project description and general location is required, but it must include all elements of the project

that would or could generate GHG emissions, with an estimated timeframe for project implementation. This section would also identify the project design and location features that will have the effect of reducing GHG emissions.

- 2.0 Environmental Setting.** This includes a description of the existing environmental conditions or setting, without the project, which constitutes the baseline physical conditions for determining the project's impacts.
- 3.0 Regulatory Setting.** This includes a discussion of the existing regulatory environment pertaining to GHG emissions.
- 4.0 Guidelines for Determining Significance.** This includes identification and justification of the selected significance threshold/s used to assess impacts.
- 5.0 Impact Analysis.** This includes a discussion and quantification of GHG emissions attributable to project construction and operations. Provide the discussion of input parameters and assumptions used to estimate these values, as required in Section 2.0, "Data Needs for Greenhouse Gas Analyses."
- 6.0 Impact Summary.** This includes a discussion of whether any aspect of the project construction or operational GHG emissions would exceed the significance threshold/s and whether the construction or operational emissions, without mitigation, would result in a cumulatively considerable contribution to the significant cumulative impact of climate change.
- 7.0 Plan, Policy, Regulatory Conflicts.** This includes a discussion of whether the proposed project would conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.
- 8.0 Mitigation.** This includes a discussion of feasible construction and operational mitigation necessary to reduce or avoid impacts.
- 9.0 Residual Impacts and Conclusion.** Where mitigation is necessary, this includes a determination of whether the identified mitigation would be sufficient to reduce GHG emissions to a less-than-cumulatively-considerable level and factual support for conclusions.
- 10.0 References.** This includes data sources and persons contacted in support of the analysis.
- 11.0 Appendix.** This includes spreadsheets used in emission calculations and all modeling inputs and results. Other background or technical information

may be provided in an appendix, with references from the body of the report.

CEQA documents will include a discussion of the potential impacts of climate change on a project. As noted previously, impacts would typically be addressed in the relevant CEQA issue areas (water supply, water quality, habitat, wildfire risk, etc.), and cross-referenced in the GHG section. The GHG analysis report does not address these issues.

## **4.2 Content**

Additional guidance for the content of a GHG analysis is provided below, based on the outline presented above.

### **4.2.1 Cover Page**

The cover page shall include the following information:

- Project common name
- Project numbers (i.e. TM, ZAP, etc.) including the environmental log number (ER)
- Date (original report date plus all revisions) must be revised during each iteration of the draft report
- Name of County Approved CEQA Consultant preparing document, firm name (if applicable), and address
- Signature of County Approved CEQA Consultant
- Project proponent's name and address
- The following statement: Prepared for The County of San Diego

### **4.2.2 Table of Contents**

The table of contents should include tables, maps, and figures and should follow the recommended order and format outlined in this document. Page numbers should be assigned, when possible, especially to all the pertinent tables and figures. Titles of each attachment/appendix should be listed in the order in which they are referenced in the document.

### **4.2.3 Glossary of Terms and Acronyms**

This section should provide a list of terms and acronyms used in the study.

#### **4.2.4 Executive Summary**

This section should provide a brief summary of the project, the potential impacts, project design measures, and proposed mitigation (if applicable). No new information should be provided in the summary that is not further explained elsewhere in the document. The purpose of the summary is to provide a quick reference for the public and decision-makers. Therefore, the language should be less technical than that used in the remainder of the document.

#### **4.2.5 Introduction and Project Description**

This section summarizes relevant facts related to global climate change and GHG emissions, including the causes of global climate change, sources of GHG emissions, and potential environmental effects of global climate change. This section can provide a summary, with a reference to the Appendix where the majority of this information is provided. Any new relevant facts will be highlighted and explained.

A brief project description and general location is required, but it must include all elements of the project that would or could generate GHG emissions, with an estimated timeframe for project implementation. This section highlights those aspects of a project's location or design that would have the effect of reducing potential GHG emissions. For example, the project may be located in an area with frequent transit access and have a design that is oriented to transit facilities or may have energy efficiency features incorporated beyond existing code requirements. There are many potential project location and design components that can be included as a part of the project description and summarized here.

#### **4.2.6 Environmental Setting**

The existing condition section of the document addresses the whole of the setting and describes the existing land use and the surrounding area. This section will include a discussion of predominant meteorological conditions in the project area. This section should also include a summary of relevant GHG inventories for the state, region, and/or local areas, as available. This section provides the baseline for determining the project's impacts.

#### **4.2.7 Regulatory Setting**

This section identifies federal, state, regional, and local laws, rules, regulations, plans, and policies that define the regulatory framework for GHG emissions and climate change. Consider providing a summary with updated information, as necessary, and incorporating by reference sections of the County's "*Guidelines for Determining Significance, Climate Change*" document to ensure that there is an adequate discussion of the relevant regulatory setting. This section specifies the state, regional, and local plans and programs aimed at reducing GHG emissions, including any applicable climate action plan or GHG reduction program that are directly applicable to the proposed project.

#### 4.2.8 Guidelines for Determining Significance

This section must reference the County of San Diego's "Guidelines for Determining Significance, Climate Change" document as the source of the significance thresholds used for the data analysis. Identify the specific County implementing threshold/s used for determining significance of GHG emissions in this section with the appropriate justification for the selection of the threshold/s to assess project impacts.

#### 4.2.9 Impact Analysis

The purpose of this section is to provide a summary of the methodology and analysis of GHG emissions attributable to the project. This analysis includes GHG emissions that would be generated by project construction and operations. The report shall clearly identify the input parameters, assumptions, and computer model/s and/or off-model calculation methodologies used to estimate GHG emissions.

Land use development projects typically include the following sources of GHG emissions:

- Construction-related emissions;
- Operational emissions associated with: mobile sources; on-site fuel combustion for space and water heating; landscape maintenance equipment; fireplaces/stoves; off-site emissions at utility providers associated with the project's electricity and water and wastewater demands; and solid waste generation and disposal.

The analysis report will account for each relevant source of GHG emissions, but will not include "life cycle" emissions embodied in manufactured materials, for example, that were manufactured to meet general market demand, regardless of whether any particular project proceeds.<sup>14</sup> The approach for construction and operational emissions is described below.

#### Construction Emissions

Construction-related exhaust emissions would be generated by sources, such as off-road heavy-duty diesel- and gasoline-powered equipment, trucks hauling materials to the site, and worker commute trips.

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<sup>14</sup> In order to clarify whether lifecycle emissions should be a part of CEQA analyses, 2010 amendments to the CEQA Guidelines removed the term "lifecycle," since "the term could refer to emissions beyond those that could be considered indirect effects of a project as that term is defined in section 15358 of the State CEQA Guidelines." California Natural Resources Agency. 2009 (December). *Final Statement of Reasons for Regulatory Action. Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97.*

Methodologies for quantifying construction GHGs include using the most recent version of the Urban Land Use Emissions (URBEMIS) model (currently 9.2.4) or the California Emission Estimator Model (CalEEMod) for proposed land use development projects. Tools and models used to estimate GHG emissions are updated over time and new tools become available. Emissions models or off-model calculation methods may be used. The emissions model/s to be used for analysis must be verified and approved by the County as a part of the scoping process prior to preparing the analysis report.

It should be noted that URBEMIS gives the modeled emissions output in tons. If URBEMIS is used, conversion of the URBEMIS output to metric tons by multiplying by 0.91 is necessary. Emissions are to be estimated for the year(s) in which construction is intended to occur. URBEMIS does not generate emissions estimates for CH<sub>4</sub> or N<sub>2</sub>O and if URBEMIS is used, the output must be supplemented in order to provide estimates of other GHGs.

For linear construction projects, such as construction of a new roadway, road widening, roadway overpass, levees, or pipelines, one recommended model is the most recent version of the Roadway Construction Emissions Model, which is maintained by, and available from the Sacramento Metropolitan Air Quality Management District (SMAQMD). Please refer to SMAQMD's web site for more information: <http://www.airquality.org/ceqa/index.shtml>. The Roadway Construction Emissions Model is a spreadsheet-based model that uses basic project information (e.g., total construction months, project type, total project area, equipment types and numbers) to estimate a construction schedule and quantify GHG emissions attributable to construction equipment, haul trucks, and worker commute trips associated with linear construction projects.

Construction-related emissions can also be estimated using emission factors from the OFFROAD model developed by ARB or emissions factors from the United States Environmental Protection Agency's (EPA) AP-42, Compilation of Air Pollutant Emission Factors, as appropriate. Please refer to EPA's website for more information: <http://www.epa.gov/ttnchie1/ap42/>.

The analysis report shall disclose the model outputs for construction-related GHG emissions in the technical report, and treat these emissions as a net increase in total GHG emissions. For consistency, the project's total construction-related GHG emissions shall be reported in units of metric tons CO<sub>2</sub>e in the technical report and in the CEQA document.

For use with the Efficiency Threshold, construction emissions will be amortized over the expected (long-term) operational life of a project, which can conservatively be estimated at 20 years, unless evidence is provided demonstrating a longer or shorter project life. Average building life could change over time, with changes in building materials and construction techniques.

For use with the Bright Line Threshold, construction emissions will be analyzed and reported, but not included as a part of the total project emissions compared with the



Bright Line Threshold. The Bright Line Threshold was set at a level that would account for both operational and construction emissions attributable to new development projects developed in San Diego County through 2020.

For projects that propose stationary sources, the Stationary Source Threshold shall be used. This threshold is used to evaluate operational stationary source emissions. Construction emissions are to be analyzed and reported separately.

## **Operational Emissions**

Operational GHG emissions may be both direct and indirect emissions and would be generated by area, mobile, and stationary sources. Direct area-source emissions are associated with activities, such as combustion of natural gas and landscaping fuels, as well as wood-burning or pellet stoves. Direct on- and off-site mobile-source emissions of GHGs would include project-generated vehicle trips for residents, employees, and visitors. Water and wastewater generation would result in direct and indirect, off-site emissions of GHGs. Solid waste emissions result from disposal and decomposition of waste. Indirect emissions sources include stationary-source emissions from electricity generation at off-site utility providers that would supply power to the proposed project site.

## **Direct Emissions**

Direct emissions from area- and mobile-sources associated with the operation of land use development projects will be estimated using a County-approved model or County-approved off-model calculation methods. The emissions model/s to be used for analysis must be verified and approved by the County as a part of the scoping process prior to preparing the analysis report.

For land use projects, URBEMIS and CalEEMod both quantify emissions from area sources (e.g., natural gas fuel combustion for space and water heating, wood stoves and fireplace combustion, landscape maintenance equipment) and operational-related emissions (mobile sources). Where default consumption or emission factors are outdated (e.g., natural gas emissions in URBEMIS), project emissions should be estimated using current and appropriate data provided by the CEC and/or ARB.

URBEMIS and CalEEMod use mobile source emission factors and Institute of Transportation Engineers (ITE) trip generation rates to calculate GHG emissions and total vehicle trips. URBEMIS does not generate emissions estimates for CH<sub>4</sub> or N<sub>2</sub>O and if URBEMIS is used, the output must be supplemented in order to provide estimates of other GHGs.

The default trip generation and trip length information included in these models should be adjusted to reflect project-specific conditions. The determination of VMT used in deriving GHG estimates must be thoroughly explained in the report. VMT estimates account for the relationships between project land uses and surrounding land uses, as well as the transportation network. VMT estimates should reflect aspects of the

project's location, density, design, access to non-automobile transportation facilities, travel behavior of inhabitants, and other relevant characteristics that affect travel demand and mode choice. Starting, as well as running emissions should be estimated (both vehicle start-ups and vehicle running emissions).<sup>15</sup>

There are many tools available that are routinely used to derive more accurate measures of VMT, including estimates that are sensitive to the surrounding land context, urban design elements, access to non-automobile travel options, density, demographics, and other important factors. Default values should be used only if detailed information about the project is not known at the time of analysis. A detailed explanation will be required to justify these methods, and the GHG analyst is advised to obtain prior authorization for their use.

The analysis report must incorporate and justify the adjustments to a project's emission totals to reflect reductions from adopted state regulations, such as Pavley clean car standards and the Low Carbon Fuel Standard so that it is clear that the adjustments are appropriate. URBEMIS does not currently include these state regulations into the mobile source emissions factors. Adjustments using methodology consistent with ARB, including a post-processor model, should be incorporated into the results. CalEEMod currently includes these regulations in the emission factors, and no further adjustment is necessary when using that model.<sup>16</sup> If feasible, the analyst should consider including estimates for mobile high global warming potential (GWP) emissions using methods consistent with ARB's Local Government Operations Protocol (LGOP).<sup>17</sup> If the project is using the Performance Threshold, mitigation identified toward the 16% target cannot include the effects of the Pavley I clean car standard or the 20% Renewable Portfolio Standard.<sup>18</sup> Renewable Portfolio Standards beyond 20% can be included toward the minimum 16% mitigation requirement. For the other implementing thresholds, all applicable and adopted statewide measures can be included in the GHG emissions estimates.

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<sup>15</sup> If using the Performance Threshold, VMT estimates using County-approved standard trip rates and trip lengths for the pre-mitigation scenario can be compared to project-specific trip rates and lengths for the post-mitigation scenario. Please refer to the County's "*Guidelines for Determining Significance, Climate Change*," under separate cover, for more direction.

<sup>16</sup> If the County's Performance Threshold is used, CalEEMod output will need to be adjusted to remove LCFS from pre-mitigated emissions in order to calculate the percentage reduction associated with LCFS in the post-mitigation scenario. Please refer to the County's "*Guidelines for Determining Significance, Climate Change*," under separate cover, for more direction.

<sup>17</sup> California Air Resources Board (ARB). 2010 (May). Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories. Version 1.1. Available: [http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo\\_protocol\\_v1\\_1\\_2010-05-03.pdf](http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf). Accessed September 29, 2011.

<sup>18</sup> Other significance threshold efforts have relied on 28-30% as the reduction from business as usual conditions in order to achieve the 2020 emissions limit. However, ARB revised the business as usual estimate downward recently.

## Indirect Emissions

The analysis will report incremental increases in energy production, water consumption, wastewater generation, and solid waste disposal associated with operational-related activities to estimate the project's total GHG emissions.

URBEMIS does not provide modeled emissions from indirect sources of emissions, such as those emissions that would occur off-site at utility providers associated with the project's energy, water, and waste requirements. Therefore, these estimates must be developed using methodology consistent with ARB's LGOP if URBEMIS is used. CalEEMod includes estimates of indirect emissions. Default values can be used if detailed information about the project is not known at the time of analysis, but the estimate may require updating when project details are known. The report should address the adequacy of the calculation based on assumptions and the need for future adjustment when project details are available.

The analysis will include an estimate of the electricity consumption for the project in 2020. If project-specific information is not available, data from the CEC for electrical demand per household or per square foot of commercial/light industrial space may be used to estimate the project's electricity consumption. Utility-specific emission factors from the LGOP will be used to quantify associated GHG emissions.

Project-specific water demand and wastewater generation is the best source to use to estimate GHG emissions associated with these sources. Water consumption data based on California Green Building Standards Code may be used if project-specific information is not available. However, the County recommends that the analyst obtain project-specific water demand, whenever feasible. CEC routinely reports data on water-related energy use in California, which accounts for the electricity consumption associated with the conveyance, storage, treatment, distribution, wastewater collection, treatment, and discharge sectors of the water use cycle. Refer to data reported for southern California for the projects within San Diego County. Indoor versus outdoor water use should be estimated based upon assumptions or references included in the report. Once the level of electricity consumption related to water use is estimated, the emission factors from the LGOP will be used to quantify associated GHG emissions.

Solid waste generated by the proposed project would also contribute to GHG emissions. The analyst should obtain project-specific estimates of solid waste generation and disposal. Waste disposal rates by land use and overall composition of municipal solid waste in California can be based on information available from CalRecycle (<http://www.calrecycle.ca.gov/>). Emission factors from the LGOP should be used to quantify associated GHG emissions.<sup>19</sup> Project-specific information should be used for trip lengths to the relevant landfill, as well as moisture content.

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<sup>19</sup> California Air Resources Board (ARB). 2010 (May). Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories. Version 1.1. Available: [http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo\\_protocol\\_v1\\_1\\_2010-05-03.pdf](http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf). Accessed September 29, 2011.

In cases where the analyst may need to estimate a project's GHG emissions manually, including industrial process emissions, the County recommends using the LGOP, as appropriate, for guidance, as well as documents referenced in this protocol document. The most current version of the LGOP may be downloaded from ARB's website.

#### **4.2.10 Impact Summary**

The impact summary discusses whether incremental construction and operational GHG emissions attributable to the project would exceed the identified significance threshold/s and the resulting determination of whether the construction and operational GHG emissions, without mitigation, would represent a cumulatively considerable contribution to the significant cumulative impact of climate change. The GHG emissions will be compared with the applicable threshold of significance. If annual emissions of operational GHGs do not exceed the threshold of significance, the project would result in a less-than-cumulatively considerable contribution to the significant cumulative impact of climate change. If annual emissions do exceed the threshold of significance, feasible mitigation is required to reduce or avoid significant effects.

#### **4.2.11 Plan, Policy, Regulatory Conflicts**

The report should provide a discussion of whether the proposed project would conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. This discussion of policies, programs, and regulations should not include those that do not relate to the proposed project.

This discussion should include a discussion of the relationship between the project and the County's Climate Action Plan. Projects that could have cumulatively considerable GHG emissions impacts should incorporate relevant measures from the County's Climate Action Plan. If the project would comply with the screening criteria, at least one CAP measure should be incorporated. Please refer to the "*County of San Diego CAP Compliance Checklist for Greenhouse Gas Analysis*," which clearly illustrates how to comply with the CAP.

#### **4.2.12 Mitigation**

##### **Mitigation Measures**

Where GHG emissions exceed the applicable threshold/s of significance, all available, feasible mitigation measures are required to reduce the project's GHG emissions. The analysis report discusses the reduction of emissions associated with the proposed mitigation measures and quantifies the benefits of mitigation, where feasible. Performance standards for mitigation may be needed in cases where there is not yet enough detail to quantify the effectiveness of mitigation.

The County recommends using guidance in the California Air Pollution Control Officers Association (CAPCOA) document, "*Quantifying Greenhouse Gas Mitigation Measures*"

to estimate the effectiveness of proposed mitigation.<sup>20</sup> There are many available tools to estimate the effectiveness of various mitigation strategies, including URBEMIS, CalEEMod, and spatially sensitive models, such as INDEX, I-PLACE<sup>3</sup>S, Sustainable Systems Integrated Model (SSIM), and others.<sup>21</sup> If mitigation from these models is used, specifically from URBEMIS, report authors should reference the user manuals/guides and demonstrate that the selected mitigation measures and reduction estimates are appropriate for the project.

If mitigation reduces total project emissions or project emissions per service population below the relevant type-specific implementing threshold, then the impact would be considered less than significant and no additional mitigation is necessary.

Stating that mitigation is not financially feasible without providing evidence to support this claim is not acceptable. Full mitigation may not be financially feasible, but the applicant must provide evidence to County staff to support a conclusion regarding the feasibility of mitigation. Any unmitigated significant impacts would require an EIR with a statement of overriding considerations from the decision making body (the Planning Commission or Board of Supervisors).

The County does not have a standard list of mitigation that would be required for projects with potentially significant GHG emissions impacts. The type, character, and level of mitigation depend entirely on the project type, size, location, context, and other factors. The availability of mitigation measures changes over time, as well, with new technologies, building materials, building and design practices, and other changes. The County recommends that report authors refer to current guidance from CAPCOA, ARB, OPR, and CEC to determine applicable mitigation measures and estimate their effectiveness.

## **Design Features**

Projects can be located, designed, and operated in a way that reduces GHG emissions, in addition to providing other benefits. In general, analysis reports should account for project design features that reduce GHG emissions.

Federal, state, regional, or local standards or requirements that apply to projects and reduce potential GHG emissions may also be required as a part of project design or operational features. Project design features that reflect existing regulations can be included as a part of mitigation targets unless those requirements were used in deriving the significance threshold. The “design features” section of the report should list elements of the project that reduce GHG emissions – both those that are in response to existing regulations and those that are voluntarily included.

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<sup>20</sup> Available: <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf>

<sup>21</sup> As noted previously, the emissions model/s to be used for analysis must be verified and approved by the County as a part of the scoping process prior to preparing the analysis report.

## **Enforcement**

It is envisioned that projects that exceed the screening criteria and significance thresholds would be larger discretionary projects that would likely include ongoing permits such as major use permits (even minor use permits) or site plans. These projects would have ongoing GHG emissions mitigation enforced through the conditions of the project permits. In the event that the project is a subdivision or required only a one-time approval, enforcement of ongoing GHG emissions mitigation would require application of an additional permit or easement to ensure the mitigation is satisfied.

### **4.2.13 Residual Impacts and Conclusion**

Where mitigation is required to address significant impacts, the report must indicate the effectiveness of proposed mitigation measures. The report must make the determination of whether the identified mitigation is sufficient to reduce GHG emissions to a less-than-cumulatively-considerable level and factual support for conclusions. Quantification of mitigation measures is required, where feasible. The analysis report must clearly compare the total annual amount of mitigated GHGs with the applicable threshold of significance. If the implementation of proposed project would reduce GHG emissions to a level below the threshold of significance, the impact would be reduced to a less-than-cumulatively considerable level. If mitigated levels still exceed the applicable threshold/s of significance, the incremental impact related to global climate change would remain significant and unavoidable. This section shall include a section called “Summary of Recommended Project Design Features, Impacts & Mitigation,” which will be used by County staff to support the preparation of findings.

### **4.2.14 References**

The report references include citations to related factual data used to support the analysis and conclusions related to GHG emissions. The references section will include a summary of the data sources and persons contacted in support of the analysis.

### **4.2.15 Appendices**

Appendices or attachments to the report will include (in the order referenced to in the document) all spreadsheets used in emission calculations and all modeling inputs and results. Any assumptions or changes to default values must be explained. Other background or technical information may be provided in an appendix, as appropriate, with references to such information from the body of the report.

## 5.0 REFERENCES

- California Air Pollution Control Officer's Association (CAPCOA). 2010 (August). Quantifying Greenhouse Gas Mitigation Measures. A Resource for Local Government to Assess Emission Reduction from Greenhouse Gas Mitigation Measures. Available: <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf> Accessed July 16, 2011.
- California Air Resources Board (ARB). 2010 (May). Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories. Version 1.1. Available: [http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo\\_protocol\\_v1\\_1\\_2010-05-03.pdf](http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf). Accessed September 29, 2011.
- California Natural Resources Agency. (2009). California Climate Adaptation Strategy. Available online at: <http://www.climatechange.ca.gov/adaptation/>. Accessed July 16, 2011.
- California Natural Resources Agency. 2009 (December). Final Statement of Reasons for Regulatory Action. Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97.
- The Climate Registry. 2008 (May). General Reporting Protocol. Version 1.1. Accurate, transparent, and consistent measurement of greenhouse gases across North America. Available online at: <http://www.theclimateregistry.org/downloads/GRP.pdf>. Accessed December 29, 2011.