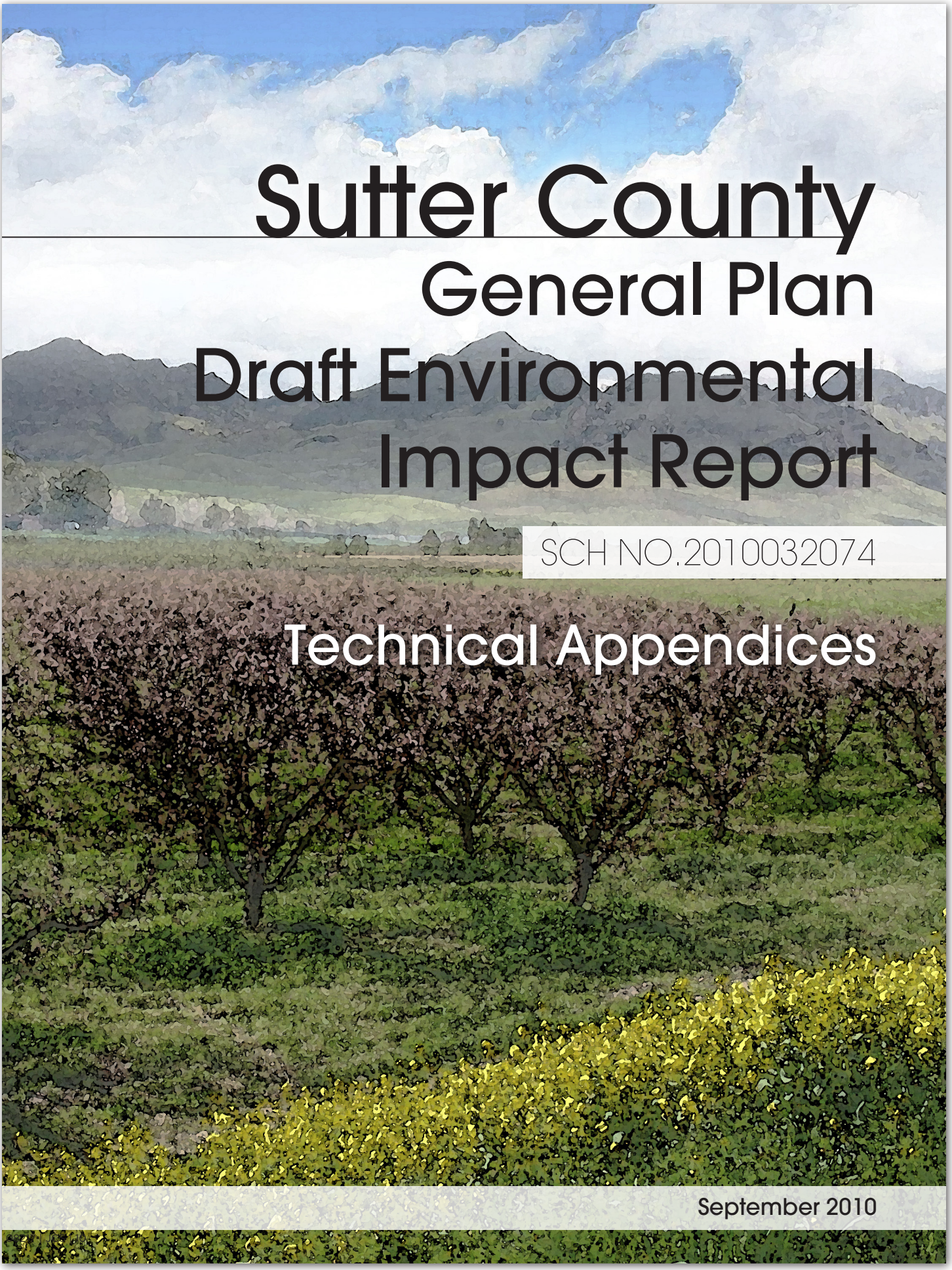

Sutter County General Plan Draft Environmental Impact Report

SCH NO.2010032074

Technical Appendices

September 2010

Sutter County General Plan
Draft Environmental Impact Report
Technical Appendices

Prepared for:

Sutter County

Prepared by:

PBS&J

September 2010

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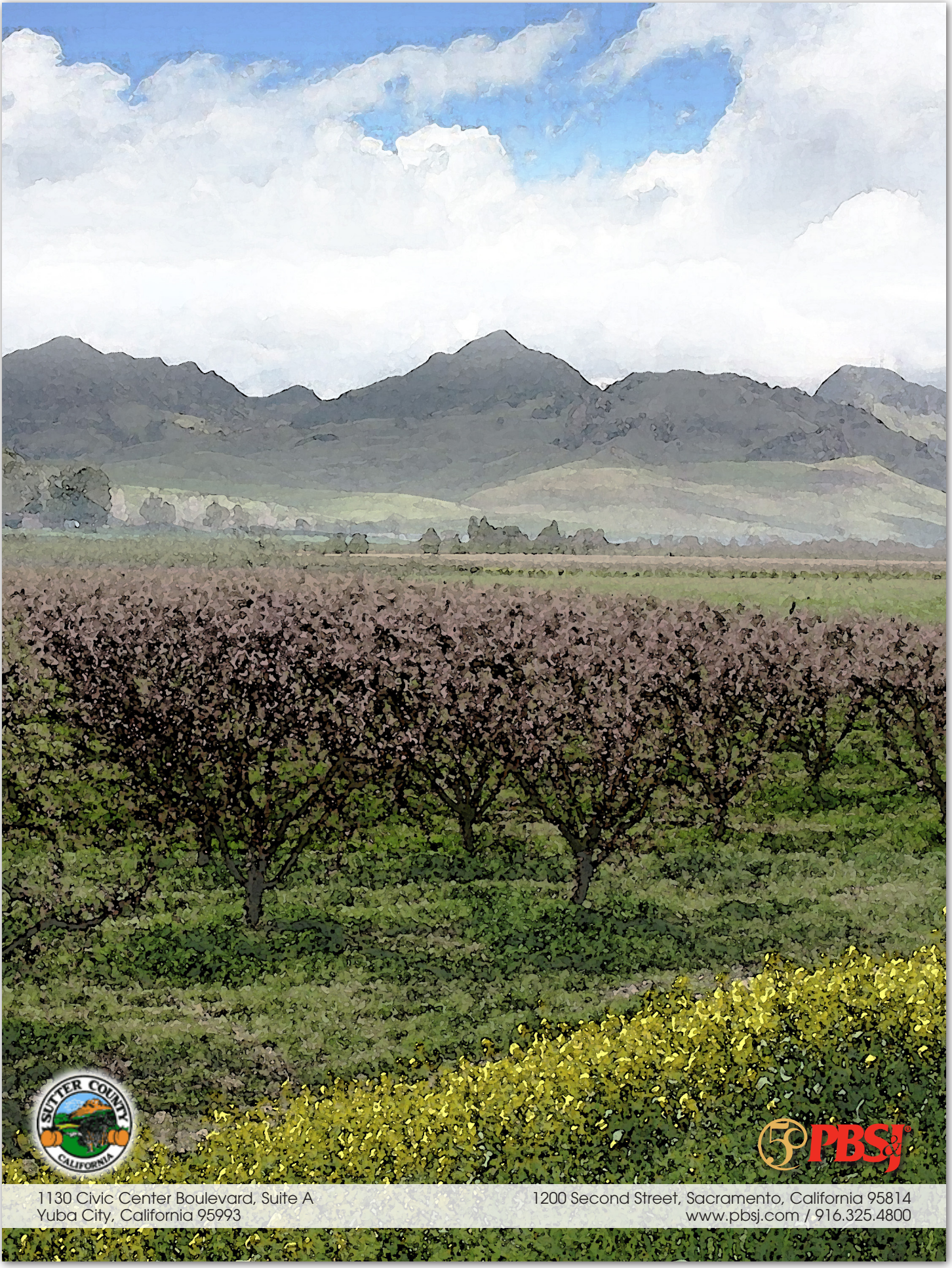
Appendices



1130 Civic Center Boulevard, Suite A
Yuba City, California 95993

1200 Second Street, Sacramento, California 95814
www.pbsj.com / 916.325.4800

APPENDICES

APPENDIX A
NOTICE OF PREPARATION

SUTTER COUNTY
GENERAL PLAN UPDATE

Date: March 22, 2010

To: Interested Parties

From: Steve Geiger, Principal Planner, Sutter County Community Services

Subject: **NOTICE OF PREPARATION FOR AN ENVIRONMENTAL IMPACT REPORT FOR THE SUTTER COUNTY 2030 GENERAL PLAN UPDATE AND SCOPING MEETING**

Public Comment Period: March 22, 2010 through April 20, 2010

Introduction

Sutter County will be the Lead Agency for preparation of an Environmental Impact Report (EIR) for the Sutter County 2030 General Plan Update (proposed project). The EIR is being prepared in compliance with the requirements set forth in the California Environmental Quality Act (CEQA). Pursuant to CEQA, the Lead Agency must issue a Notice of Preparation (NOP) to inform trustee and local agencies as well as the public that an EIR will be prepared. The EIR will evaluate the potential environmental impacts of the proposed project and recommend mitigation measures for any significant impact, as required.

The purpose of the NOP is to provide information describing the project and its potential environmental effects to enable comments regarding the scope and content of the information to be addressed in the EIR. Agencies should comment on such information as it relates to their statutory responsibilities in connection with the project.

The County is comprised of 607 square miles of land or approximately 389,000 acres. The boundaries of the 2030 General Plan or "Policy Area" encompass the entire county, except for the incorporated cities of Live Oak and Yuba City, as shown in Figure 1.

Project Background

The General Plan is a state-required legal document (Government Code section 65300) that provides guidance to local elected officials (decision makers) when making determinations pertaining to the allocation of resources and the future physical form and character of development in cities and counties. The General Plan is the official statement of a jurisdiction regarding the extent and types of development needed to achieve the community's physical, economic, social and environmental goals. The General Plan expresses the County's goals and articulates the County's development and growth intentions with respect to the rights and expectations of the general public, property owners, community interest groups, prospective investors, and business interests. The General Plan consists of individual sections or elements that address a specific issue area as well as provides a comprehensive land use planning framework.

Sutter County initiated its General Plan update process in late 2007. At that time, the County Board of Supervisors appointed a 25-member General Plan Advisory Committee (GPAC) to help direct and provide input on the General Plan update. In early 2008, the County prepared a Technical Background Report (TBR) and an Issues Report. The TBR presents the physical, social, and economic information required to support the preparation of the General Plan and serves as the base document from which subsequent planning policies and programs are formulated. The Issues Report identifies and describes the key physical, environmental, economic, cultural, and social issues to be considered in the General Plan update.

Since the beginning of the General Plan update process, the County has held two rounds of community workshops for a total of seven separate workshops. Input received at these workshops, as well as through stakeholder interviews, GPAC meetings, and a joint Planning Commission and Board of Supervisors workshop were used to prepare a set of guiding principles and a vision that established a conceptual foundation for the County's 2030 General Plan. The guiding principles and vision for the future were adopted by the County Board of Supervisors in June 2008. In late 2009, the Board of Supervisors gave staff direction to develop the Draft General Plan and prepare the required environmental documentation based on the Preferred Land Use Map.

The County's existing General Plan was adopted in 1996. Various elements of the General Plan have been amended over time, but the plan itself has not been comprehensively updated since its adoption. A new General Plan is necessary to reflect the current vision for growth in the County, as well as what resources to protect and how the quality of life is defined within Sutter County over the next twenty years.

Project Description

The 2030 General Plan defines comprehensive land use, noise, housing, circulation and infrastructure, public services, resource conservation, and public health and safety goals and policies for the entire County. The 2030 General Plan supports a broad continuation of the current land use pattern within the County, while affording new opportunities for growth and change. It balances the County's vision to maintain and enhance its high quality rural lifestyle, agricultural heritage, and natural resources, with a commitment to promoting a vibrant and sustainable economy that attracts diverse jobs and services.

The proposed General Plan is organized in the following elements:

- Land Use
- Agricultural Resources
- Housing
- Economic Development
- Mobility
- Infrastructure
- Public Services
- Environmental Resources
- Public Health and Safety
- Noise

Sutter County is a rural, agricultural area with over 94 percent of the County area designated for agricultural and open space uses, as shown in Table 1. As of July 2008, the County's total population is

estimated to be approximately 96,095 people, of which approximately 26 percent (25,000 people) live in the unincorporated portion of the County.

TABLE 1
EXISTING LAND USES

Land Use	Acres[1]	Percentage of Total County Land
Agricultural	322,240	83%
Residential	14,645	4%
Public and Vacant	2,293	0.6%
Commercial	1,424	0.4%
Industrial	1,743	0.4%
Open Space	44,581	11%
Transportation and Utilities	2,517	0.6%
Total	**389,443**	**100%**

Notes:
1. Includes acreages within incorporated cities and rural communities.
Source: Sutter County, 2008.

Within the County there are several rural communities including: Meridian, in the north part of the County adjacent to the western County boundary; Sutter, located in the north-central portion of the County abutting the Sutter Buttes; Robbins, located in the southwest between the Sacramento River and the Sutter Bypass along Highway 113; and the communities of Rio Oso, Trowbridge, Nicolaus, and East Nicolaus, all clustered near the convergence of the Bear and Feather rivers in the southeast portion of the County. Another small community found within the County that does not have an adopted community boundary is Pleasant Grove, located in the southeast portion of the County. There are also two incorporated cities – City of Yuba City and the City of Live Oak – within the County.

The General Plan identifies five new Growth Areas which include those portions of the County that are either in close proximity to, and may connect with, existing public infrastructure and services, can financially support the cost of independently providing such public services, or can rely on individual services with the intensity of uses correspondingly limited. The Growth Areas are described in more detail below.

1. Spheres of Influence (SOI) – The SOI for the County's incorporated cities, Yuba City and Live Oak, including the possible future expansion of Yuba City's SOI. It is intended that future growth in the SOI areas would occur subject to a comprehensive and coordinated City-County planning effort likely followed by annexation to and provision of urban services from the cities.

2. Sutter Pointe – The Sutter Pointe Specific Plan was approved in June 2009 and is located in the southern unincorporated portion of the County. Sutter Pointe is planned as a mixed-use urban

community and has been structured to fully fund required urban services and facilitate future incorporation as an independent new city.

3. Rural Planned Communities – There are two Rural Planned Communities designated by the 2030 General Plan; one in the community of Sutter, and the other overlapping the communities of East Nicolaus and Trowbridge. These areas are subject to future comprehensive planning processes to establish new mixed-use communities, provide a full level of public services, and consider possible future incorporation as new cities.

4. Industrial/Commercial Reserve – Industrial/Commercial Reserve land uses are located along the Highway 99 corridor, north and south of the City of Yuba City. While the potential exists that public services and infrastructure may be extended to these uses from Yuba City, the type and intensity of development may be limited by the County based upon the availability of such services.

5. Tudor Industrial/Commercial – Industrial/Commercial use along Highway 99 within the community of Tudor. The type and intensity of development allowed in this area may be limited by the County based upon the availability of public infrastructure and services.

Table 2 indicates the growth assumptions for the General Plan based on the number of new residential units, jobs, and increase in population. The Sutter Pointe Specific Plan is called out separately because it encompasses a large area of the County (7,500 acres) and was approved by the Board of Supervisors and the EIR certified in 2009. The 2030 General Plan does not propose making any land use changes to the Sutter Pointe Specific Plan.

To estimate the amount of new growth that is anticipated to occur within the County over the next 20 years, County staff considered a range of factors including existing infrastructure constraints, physical or environmental limitations and socioeconomic trends. Based on this analysis the County developed its Land Use Diagram and assigned specific land uses and densities/intensities to those new growth areas. Due to current market conditions and growth projections for the region, the County used density/intensity assumptions for new growth that are expected to occur within the timeframe of the General Plan, reflecting a foreseeable buildout scenario.

The EIR analysis focuses on the 2030 General Plan adjusted buildout assumptions that include full buildout of the Sutter Pointe project by 2030 or 2040.

TABLE 2
2030 SUTTER COUNTY GENERAL PLAN GROWTH ASSUMPTIONS

	Existing (2009)[1]	*Sutter Pointe Specific Plan*[2]	*2009-2030 Net New Growth*[3]	*2030 General Plan Adjusted Buildout*[4]
Total Units				
Low Density[5]	9,048	1,441	4,727	15,216
Medium Density	720	12,014	0[6]	12,110
High Density	0	4,025	450	4,475
Population[7]	28,505	46,758	14,885	88,420

Notes:
1. Source: Sutter County, 2009.
2. Sutter County, Sutter Pointe Specific Plan Draft EIR, December 2008. This project was approved by the Board of Supervisors on June 30, 2009. The project is not yet constructed.
3. Does not include Sutter Pointe Specific Plan.
4. The 2030 Sutter County General Plan only includes growth assumptions for the unincorporated county. Due to current market conditions and growth projections for the region, the County used density/intensity assumptions for new growth that are expected to occur within the timeframe of the General Plan, reflecting a foreseeable/adjusted buildout scenario.
5. Includes the following low density residential uses: AG-20, AG-40, AG-80, AG-RC, AP/APR, RAN, ER, and LDR.
6. No existing units would be lost, but approximately 78 acres currently designated as medium density residential would be redesignated as other uses. There is still the potential for new MDR units to be built on land designated for MDR in the 2030 General Plan.
7. Persons per household assumptions: low density = 2.93; medium density = 2.77; high density = 2.30. Persons per household rates from the Sutter County, Sutter Pointe Specific Plan Draft EIR, December 2008.

Potential Environmental Effects

The environmental analyses presented in the Draft EIR will describe the existing conditions in the County and surrounding areas. Relevant federal, state and local laws and regulations, including the current Sutter County General Plan goals and policies will be summarized. The methods of analysis and any assumptions that are important to understand the conclusions of the analysis will be described along with the standards of significance used to determine impacts of the project. Feasible mitigation measures will be identified for each significant impact. At this time it is anticipated that the following issue/technical sections will be addressed in the EIR:

- Aesthetics and Visual Resources
- Air Quality
- Biological Resources
- Climate Change
- Cultural Resources
- Geology and Seismicity
- Hazards and Hazardous Materials
- Hydrology, Flooding, Storm Drainage, and Water Quality
- Land Use and Agricultural Resources
- Noise
- Population, Housing and Employment
- Public Services (law enforcement, fire, emergency services, parks and recreation, schools, solid waste)
- Public Utilities (water supply, wastewater, dry utilities)
- Transportation/Circulation

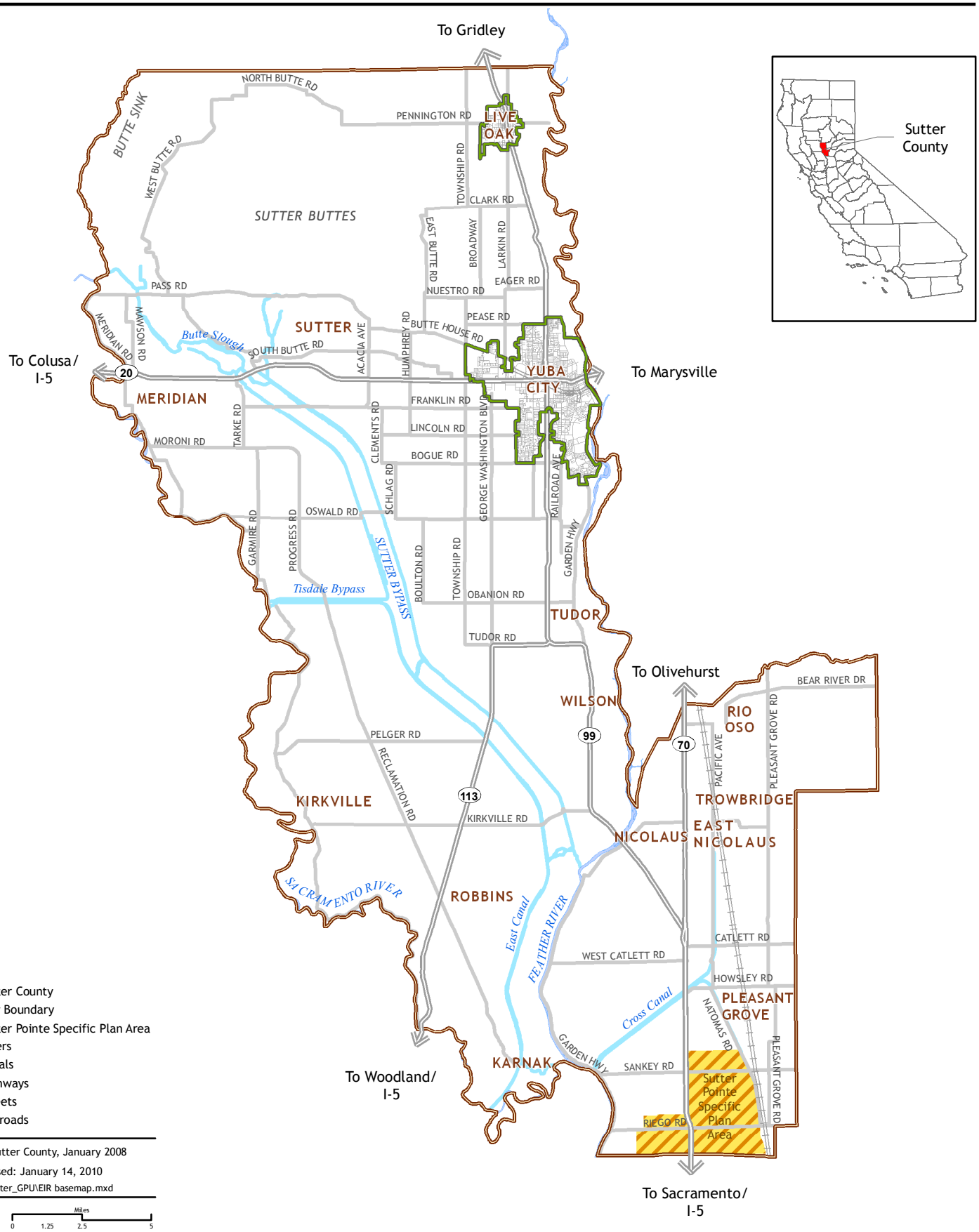
Public Scoping Meetings

Two public scoping meetings will be held on April 8, 2010 from 3:30 pm to 4:30 pm and from 6:00 pm to 7:00 pm in the Sutter County Health Department Auditorium, 1445 Veterans Memorial Circle, Yuba City, California.

Submitting Comments

Comments and suggestions regarding the scope of the EIR analysis are invited from all interested parties. Please submit your comments in writing (emails are acceptable) to Steve Geiger, Principal Planner (address below) by no later than 5:00 p.m. on April 20, 2010. Please include the contact person's full name and address if you wish to be added to the mailing list for future EIR-related notices. If you have any questions regarding the proposed 2030 General Plan or General Plan process, please contact Steve Geiger, contact information listed below.

Steve Geiger, Principal Planner
Sutter County Community Services
1130 Civic Center Blvd., Suite A
Yuba City, CA 95993
530.822.7400
sgeiger@co.sutter.ca.us



Legend

- Sutter County
- City Boundary
- Sutter Pointe Specific Plan Area
- Rivers
- Canals
- Highways
- Streets
- Railroads

Source: Sutter County, January 2008

Date Revised: January 14, 2010

D51366_Sutter_GPU\EIR basemap.mxd

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PBS&J

POLICY AREA
Figure 1

APPENDIX B
NOP COMMENT LETTERS

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov

April 13, 2010

Steve Geiger
Sutter County
1130 Civic Center Boulevard, Suite A
Yuba City, CA 95993

Dear Mr. Geiger:

The California Energy Commission has received the Sutter County's Notice of Preparation titled Sutter County 2030 General Plan Update EIR, SCH 2010032074 that was submitted on 3/22/2010 for comments due by 4/20/2010. After careful review, the Energy Commission has found the following:

We would like to assist in reducing the energy usage involved in your project. Please refer to the enclosed Appendix F of the California Environmental Quality Act for how to achieve energy conservation.

In addition, the Energy Commission's *Energy Aware Planning Guide* is also available as a tool to assist in your land use planning. For further information on how to utilize this guide, please visit www.energy.ca.gov/energy_aware_guide/index.html.

Thank you for providing us the opportunity to review/comment on your project. We hope that our comments will be helpful in your environmental review process.

If you have any further questions, please call Gigi Tien at (916) 651-0566.

Sincerely,

Bill Pfanner

BILL PFANNER
Supervisor, Local Energy & Land Use Assistance Unit
Special Projects Office
Fuels and Transportation Division
California Energy Commission
1516 Ninth Street, MS 23
Sacramento, CA 95814

Enclosure

Appendix F
ENERGY CONSERVATION

I. Introduction

The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:

(1) decreasing overall per capita energy consumption,
(2) decreasing reliance on natural gas and oil, and
(3) increasing reliance on renewable energy sources.

In order to assure that energy implications are considered in project decisions, the California Environmental Quality Act requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy.

Energy conservation implies that a project's cost effectiveness be reviewed not only in dollars, but also in terms of energy requirements. For many projects, lifetime costs may be determined more by energy efficiency than by initial dollar costs.

II. EIR Contents

Potentially significant energy implications of a project should be considered in an EIR. The following list of energy impact possibilities and potential conservation measures is designed to assist in the preparation of an EIR. In many instances, specific items may not apply or additional items may be needed.

A. Project Description may include the following items:
   1. Energy consuming equipment and processes which will be used during construction, operation, and/or removal of the project. If appropriate, this discussion should consider the energy intensiveness of materials and equipment required for the project.
   2. Total energy requirements of the project by fuel type and end use.
   3. Energy conservation equipment and design features.
   4. Initial and life-cycle energy costs or supplies.
   5. Total estimated daily trips to be generated by the project and the additional energy consumed per trip by mode.

B. Environmental Setting may include existing energy supplies and energy use patterns in the region and locality.

C. Environmental Impacts may include:
   1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project's life cycle including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
   2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.
   3. The effects of the project on peak and base period demands for electricity and other forms of energy.
   4. The degree to which the project complies with existing energy standards.
   5. The effects of the project on energy resources.
   6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

D. Mitigation Measures may include:
   1. Potential measures to reduce wasteful, inefficient and unnecessary consumption of energy during construction, operation, maintenance and/or removal. The discussion should explain why certain measures were incorporated in the project and why other measures were dismissed.
   2. The potential of siting, orientation, and design to minimize energy consumption, including transportation energy.
   3. The potential for reducing peak energy demand.
   4. Alternate fuels (particularly renewable ones) or energy systems.
   5. Energy conservation which could result from recycling efforts.

E. Alternatives should be compared in terms of overall energy consumption and in terms of reducing wasteful, inefficient and unnecessary consumption of energy.

F. Unavoidable Adverse Effects may include wasteful, inefficient and unnecessary consumption of energy during the project construction, operation, maintenance and/or removal that cannot be feasibly mitigated.

G. Irreversible Commitment of Resources may include a discussion of how the project preempts future energy development or future energy conservation.

H. Short-Term Gains versus Long-Term Impacts can be compared by calculating the energy costs over the lifetime of the project.

I. Growth Inducing Effects may include the estimated energy consumption of growth induced by the project.

STATE OF CALIFORNIA Arnold Schwarzenegger, *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

April 15, 2010

Steve Geiger
Sutter County
1130 Civic Center Boulevard, Suite A
Yuba City, CA 95993

Re: Notice of Preparation, Draft Environmental Impact Report (DEIR)
Sutter County 2030 General Plan Update EIR
SCH# 2010032074

Dear Mr. Geiger:

As the state agency responsible for rail safety within California, the California Public Utilities Commission (CPUC or Commission) recommends that development projects proposed near rail corridors be planned with the safety of these corridors in mind. New developments and improvements to existing facilities may increase vehicular traffic volumes, not only on streets and at intersections, but also at at-grade highway-rail crossings. In addition, projects may increase pedestrian traffic at crossings, and elsewhere along rail corridor rights-of-way. Working with CPUC staff early in project planning will help project proponents, agency staff, and other reviewers to identify potential project impacts and appropriate mitigation measures, and thereby improve the safety of motorists, pedestrians, railroad personnel, and railroad passengers.

The traffic impact study within the traffic/circulation section of the DEIR needs to specifically consider safety issues to at-grade railroad crossings. In addition to the potential impacts of the proposed project itself, the DEIR needs to consider cumulative rail safety-related impacts created by other projects.

In general, the major types of impacts to consider are collisions between trains and vehicles, and between trains and pedestrians. The proposed project has the potential to increase vehicular and pedestrian traffic in the vicinity.

Measures to reduce adverse impacts to rail safety need to be considered in the DEIR. General categories of such measures include:

- Installation of grade separations at crossings, i.e., physically separating roads and railroad track by constructing overpasses or underpasses
- Improvements to warning devices at existing highway-rail crossings
- Installation of additional warning signage
- Improvements to traffic signaling at intersections adjacent to crossings, e.g., traffic preemption

- Installation of median separation to prevent vehicles from driving around railroad crossing gates
- Prohibition of parking within 100 feet of crossings to improve the visibility of warning devices and approaching trains
- Installation of pedestrian-specific warning devices and channelization and sidewalks
- Construction of pull out lanes for buses and vehicles transporting hazardous materials
- Installation of vandal-resistant fencing or walls to limit the access of pedestrians onto the railroad right-of-way
- Elimination of driveways near crossings
- Increased enforcement of traffic laws at crossings
- Rail safety awareness programs to educate the public about the hazards of highway-rail grade crossings

Commission approval is required to modify an existing highway-rail crossing or to construct a new crossing.

Thank you for your consideration of these comments. We look forward to working with the County on this project. If you have any questions in this matter, please contact me at (415) 713-0092 or email at ms2@cpuc.ca.gov.

Sincerely,

Moses Stites
Rail Corridor Safety Specialist
Consumer Protection and Safety Division
Rail Transit and Crossings Branch
515 L Street, Suite 1119
Sacramento, CA 95814

DEPARTMENT OF TRANSPORTATION
DISTRICT 3
703 B STREET
P. O. BOX 911
MARYSVILLE, CA 95901-0911
PHONE (530) 741-4025
FAX (530) 741-4825
TTY (530) 741-4509

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April 22, 2010

032010SUT0010
Sutter County General Plan Update
Notice of Preparation
This letter supersedes the comment letter submitted on April 20, 2010

Mr. Steve Geiger
c/o Sutter County General Plan Update
1130 Civic Center Boulevard
Yuba City, CA 95993

Dear Mr. Geiger,

Thank you for the opportunity to review and comment on the Notice of Preparation for the Sutter County 2030 General Plan Update (GPU) Environmental Impact Report (EIR). The GPU is a priority for Caltrans, as the plan will provide direction for the future of Sutter County and the State Highway System (SHS) serving your community. Caltrans has the following comments:

Our focus for this document as it moves forward will be directed towards circulation and land use elements. The SHS provides major transportation corridors for Sutter County. It is important that the upcoming EIR adequately address all potentially significant impacts that the GPU will have on the SHS.

General

- The SHS is a major part of the circulation network in Sutter County and should be identified as such throughout both the General Plan itself, and the associated Environmental Documents.

- The County should protect adequate right-of-way for new and expanded SHS transportation facilities. Transportation Corridor Concept Reports (TCCRs) for State Route (SR) 20, SR 113, SR 70 and draft TCCR for SR 99 are available at: www.dot.ca.gov/dist3/departments/planning/systemplanning.html. These reports along with the SR 99 and I-5 Corridor System Management Plan (CSMP), found at www.corridormobility.org, for Sutter County provide information on the current and future projects as well as the future vision for these facilities. Where possible, the GPU should be consistent with these documents.

- In order to control operational integrity of the SHS, please include an access management policy controlling access to the SHS.

- As part of the circulation network, the operation and maintenance of the SHS is a shared responsibility between Sutter County and Caltrans. This should be reflected in a policy statement.

Traffic/Circulation

- The SHS is intended to facilitate inter-regional travel. The SHS within Sutter County operates with a high volume of commute and truck traffic. In order to maintain an acceptable level of service parallel routes need to be developed to provide an alternative to the SHS for local trips.

- A Traffic Impact Study (TIS), should be completed as part of the Circulation Element and include an analysis of impacts to the SHS. The TIS should include SR 20, SR 70, SR 99 and SR113. The TIS should consider all traffic impacts to all intersections, ramps, ramp intersections and mainline segments. Particular attention should be focused on the following intersections in the traffic analysis:
  - SR 99 and Oswald Road
  - SR 99 and O'Banion Road
  - SR 113 and George Washington Boulevard
  - SR 99 and Eager Road
  - SR 99 and Live Oak Boulevard

  The "Guide for the Preparation of Traffic Impact Studies", updated December 2002, can be downloaded at:
  http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf.
  We would like to meet with the County to review the scope of the TIS before the Study begins. Our office will be contacting you to schedule a scope review meeting.

Traffic Impact Fees

Freeways and Expressways serve local, intra-regional and inter-regional travel through Sutter County. It is imperative that new developments within the County that use State Highway facilities for intra-regional and local travel contribute fair share cost towards funding improvements that will be needed to maintain acceptable levels of service as development increases travel demand.

As noted in the NOP, new development will be subject to future comprehensive planning processes to establish new mixed-use communities and provide a full level of public services. Per our discussion of Traffic Impact Mitigation Fees (TIMF) below and the numerous verbal discussions that have taken place between Caltrans and the County over the duration of this GPU process, we strongly support the County in ensuring that new development is properly mitigated. This GPU is an ideal opportunity to ensure your community is prepared for upcoming development.

We suggest that a Nexus study be prepared for those portions of the County where development is planned, so that a TIMF program can be developed and implemented in the County. This action

would set up a fair and equitable mechanism to assess and collect TIMFs from all local projects needing mitigation. Caltrans is available to assist the County through this process.

Land Use

It is advantageous to develop general plans that include policies, strategies, and land development patterns that work to reduce vehicle trips and increase transit, walking and bicycling trips associated with future land development. SB375, recently signed into law, promotes the development of sustainable community strategies.

We suggest that the County consider including "Smart Growth" goals and policies into the General Plan, which can include the following:

- Establishing land use strategies to increase population and housing densities and make public transportation more viable. These strategies help to reduce sprawl and to conserve valuable farmland and open space.
- Placing housing closer to employment centers so as to promote a jobs/housing balance. This placement will decrease overall vehicle miles of travel resulting in less traffic congestion and the associated negative consequences.
- Supporting mixed-use development so that transit, bicycle, and pedestrian facilities are viable options to driving.

Hydrology

The GPU does not have any direct hydrological problems. Additional requirements (as cited in Appendix A) will be suggested when future applicants propose development on their parcels which require consistency with the General Plan.

Please provide our office with a copy of the Draft Environmental Impact Report and proposed TIS Scope of Work once available for this project. If you have any questions regarding these comments, please contact Sarah (Sadie) Smith, Local Development/Inter-Governmental Review Coordinator, at (530) 741-4004 or sarah_smith@dot.ca.gov.

Sincerely,

SUKHVINDER (SUE) TAKHAR, Chief
Office of Transportation Planning – North

Enclosure:
Appendix A

Appendix A
Hydrology Comments

Runoff from the proposed project that will enter the State's highway right of way and/or Caltrans drainage facilities, whether discharged directly or indirectly, must meet all RWQCB water quality standards prior to entering the State's highway right of way or Caltrans drainage facilities. The developer is responsible for insuring that runoff from the site meets these clean water standards (i.e., is free of oils, greases, metals, sands, sediment, etc.). This may be accomplished through the implementation of appropriate stormwater quality Best Management Practices (BMPs) (i.e., oil/water separators, clarifiers, infiltration systems, etc.) as applicable. Once installed, these systems must be properly maintained by the property owner.

No net increase to the surface water (stormwater) peak runoff discharge (100 year storm event) may be realized within the State's highway right of way and Caltrans drainage facilities as a result of the completion of the project. The developer is responsible for ensuring that stormwater runoff discharge from the project site that will enter the State's right of way and/or Caltrans drainage facilities, whether discharged directly or indirectly, does not increase peak flows within the State's highway right of way or the Caltrans drainage facility. This may be accomplished through the implementation of stormwater management BMPs (i.e., detention/retention ponds or basins, sub-surface galleries, on-site storage and/or infiltration ditches, etc.) as applicable. Once installed, these systems must be properly maintained by the property owner.

The proponent/developer must perpetuate, maintain or improve existing drainage patterns and/or facilities affected by the proposed development/project to the satisfaction of the State and Caltrans. This includes, but is not limited to, altering stormwater pathways and storage areas, whether engineered or naturally occurring. Altering existing drainage patterns and/or facilities without proper mitigation may lead to adverse drainage impacts to State highway facilities or to other local public or private properties. The proponent/developer may be held liable for future damages caused by diverted or increased drainage flows determined to be the result of the proposed development/project that were not properly mitigated for.

For the future developments detailed drainage plans, drawings and calculations need to be submitted with the IGR-CEQA project package as well as a hydrologic/hydraulic study or report. In order to adequately evaluate project impacts upon the State's right of way and Caltrans drainage facilities, the aforementioned documents will be required. Please request these documents from the project proponent and send them to D-3 Hydraulics in Marysville for review prior to final project approval.

DEPARTMENT OF TRANSPORTATION
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PHONE (530) 741-4025
FAX (530) 741-4825
TTY (530) 741-4509

Flex your power!
Be energy efficient!

March 15, 2010

Sutter County General Plan Update

Mr. Steve Geiger
c/o Sutter County General Plan Update
1130 Civic Center Boulevard
Yuba City, CA 95993

Dear Mr. Geiger

In anticipation of receiving the Environmental Impact Report (EIR) for the Sutter County General Plan we have prepared the following comments to advise the County our expectations regarding the upcoming EIR and General Plan Document. As you are aware, Caltrans and the County have met several times to-date regarding these points. We appreciate Sutter County's continued support and collaboration in this process.

Transportation/Traffic

Our focus for this document as it moves forward will be directed towards circulation and land use elements. The State Highway System (SHS) provides major transportation corridors for Sutter County. It is important that the EIR adequately address all potential significant impacts that the General Plan Update will have on the SHS.

A Traffic Impact Study (TIS), should be completed as part of the Circulation Element and include an analysis of impacts to the SHS. The TIS should include State Route (SR) 20, 70, 99 and 113. The TIS should consider all possible traffic impacts to all ramps, ramp intersections and mainline segments. The "Guide for the Preparation of Traffic Impact Studies", updated December 2002, can be downloaded at: http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf. We would like to meet with the County to review the scope of the TIS before the Study begins.

Freeways and Expressways serve both intra-regional and inter-regional travel through Sutter County. It is imperative that new developments within the County that use freeways and expressways for intra-regional and local travel contribute fair share cost towards funding improvements that will be needed to maintain acceptable level of service.

Impacts from single or small development and rural lot divisions often go through the California Environmental Quality Act (CEQA) process without assessment or collection of mitigation fees. Cumulatively, this segmented development is an impact on the transportation system as a whole. The county does not currently have a mechanism to assess and collect fees for these cumulative impacts. Therefore, funding for related improvements to the county and the State Highway System (SHS) are not collected.

We suggest that a Nexus study be prepared for those portions of the County where development is planned, so that a Traffic Impact Mitigation Fee (TIMF) program can be developed and implemented in the County. This action would set up a fair and equitable mechanism to assess and collect TIMFs from all local projects needing mitigation. Caltrans can assist the County in this process.

Land Use

It is advantageous to develop general plans that include policies, strategies, and land development patterns that work to reduce vehicle trips and increase transit, passenger rail, walking and bicycling trips associated with future land development. SB375, recently signed into law, promotes the development of sustainable community strategies.

We suggest that the County consider including "Smart Growth" goals and policies into the General Plan, which can include the following:

- Establishing land use strategies to increase population and housing densities and make public transportation more viable. These strategies help to reduce sprawl, conserve valuable farmland, and open space.
- Placing housing closer to employment centers so as to promote a jobs/housing balance. This placement will decrease overall vehicle miles of travel resulting in less traffic congestion and the associated negative consequences.
- Supporting mixed-use development so that transit, bicycle, and pedestrian facilities are viable options to driving.
- Locate future development in such a way to maximize existing infrastructure.

Hydrology

The general plan update does not have any direct hydrological problems. Additional requirements (as cited in Appendix A) will be suggested when future applicants propose development on their parcels which require consistency with the general plan.

Encroachment Permit

All work proposed and performed within the State right-of-way must be in accordance

with Caltrans' standards and require a Caltrans Encroachment Permit prior to commencing construction, surveying or other activities in the right-of-way. For more information on encroachment permits, the requirements, and an application form, please visit our web page at www.dot.ca.gov/doingbusiness and then click on "Encroachment Permits" or contact the Caltrans District 3, Office of Permits at (530) 741-4403.

Please provide our office with copies of any further actions regarding this project. If you have any questions regarding these comments, please contact Sarah (Sadie) Smith, Local Development/Inter-Governmental Review Coordinator, at (530) 741-4004.

Sincerely,

SUKHVINDER (SUE) TAKHAR, Chief
Office of Transportation Planning – North

Enclosure:
Appendix A

Appendix A
Hydrology Comments

Runoff from the proposed project that will enter the State's highway right of way and/or Caltrans drainage facilities, whether discharged directly or indirectly, must meet all RWQCB water quality standards prior to entering the State's highway right of way or Caltrans drainage facilities. The developer is responsible for insuring that runoff from the site meets these clean water standards (i.e., is free of oils, greases, metals, sands, sediment, etc.). This may be accomplished through the implementation of appropriate stormwater quality Best Management Practices (BMPs) (i.e., oil/water separators, clarifiers, infiltration systems, etc.) as applicable. Once installed, these systems must be properly maintained by the property owner.

No net increase to the surface water (stormwater) peak runoff discharge (100 year storm event) may be realized within the State's highway right of way and Caltrans drainage facilities as a result of the completion of the project. The developer is responsible for ensuring that stormwater runoff discharge from the project site that will enter the State's right of way and/or Caltrans drainage facilities, whether discharged directly or indirectly, does not increase peak flows within the State's highway right of way or the Caltrans drainage facility. This may be accomplished through the implementation of stormwater management BMPs (i.e., detention/retention ponds or basins, sub-surface galleries, on-site storage and/or infiltration ditches, etc.) as applicable. Once installed, these systems must be properly maintained by the property owner.

The proponent/developer must perpetuate, maintain or improve existing drainage patterns and/or facilities affected by the proposed development/project to the satisfaction of the State and Caltrans. This includes, but is not limited to, altering stormwater pathways and storage areas, whether engineered or naturally occurring. Altering existing drainage patterns and/or facilities without proper mitigation may lead to adverse drainage impacts to State highway facilities or to other local public or private properties. The proponent/developer may be held liable for future damages caused by diverted or increased drainage flows determined to be the result of the proposed development/project that were not properly mitigated for.

For the future developments detailed drainage plans, drawings and calculations need to be submitted with the IGR-CEQA project package as well as a hydrologic/hydraulic study or report. In order to adequately evaluate project impacts upon the State's right of way and Caltrans drainage facilities, the aforementioned documents will be required. Please request these documents from the project proponent and send them to D-3 Hydraulics in Marysville for review prior to final project approval.

California Natural Resources Agency
DEPARTMENT OF FISH AND GAME
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
(916) 358-2900
http://www.dfg.ca.gov

ARNOLD SCHWARZENEGGER, Governor
John McCamman, Director

APR 20 2010

April 20, 2010

Steve Geiger
Sutter County Community Services District
1130 Civic Center Boulevard, Suite A
Yuba City, CA 95993
FAX: (530) 822-7109

Dear Mr. Geiger:

The Department of Fish and Game (DFG) has reviewed the Notice of Preparation for a Draft Environmental Impact Report (DEIR) on the Sutter County 2030 General Plan Update (proposed project). The proposed project establishes several land use designations that include residential, commercial, industrial, mixed use and agricultural use. It establishes policies to accommodate an additional 22,000 dwelling units and 60,000 residents to the unincorporated county by the year 2030.

The DEIR should discuss and provide mitigation for the proposed project's impact on:

1. Fish and wildlife and their habitat, and contain information about the amounts and kinds of habitat present in the project area and how these habitats will be affected.

2. Habitats including oak woodland, riparian habitat, vernal pools and other wetlands. The project should avoid impacts to wetlands, and mitigation should be provided for any unavoidable impacts based upon the concept of no net loss of wetland habitat values or acreage.

3. Special status plants and animals; species listed or candidates to be listed under the California Endangered Species Act and the Federal Endangered Species Act as well as California Species of Special Concern and plants considered rare or endangered in California by the California Native Plant Society should be considered as part of this analysis.

The DEIR should provide an analysis of specific alternatives which reduce impacts to fish, wildlife, water quality and vegetative resources. Within the DEIR, a range of alternatives should be analyzed to ensure that all viable alternatives of the proposed project are fully considered and evaluated. A range of alternatives which avoid or otherwise minimize impacts to sensitive biological resources should be included. Specific alternatives should be evaluated in areas with lower resource sensitivity where appropriate.

The DEIR should consider and analyze whether implementation of the proposed project will result in reasonably foreseeable, potentially significant impacts subject to regulation by the DFG under section 1600 et. seq. of the Fish and Game Code. In general, such

impacts result whenever a proposed project involves work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel, including ephemeral streams and water courses.

The DEIR should discuss how the proposed project will be integrated and consistent with plans to develop a Yuba/Sutter Natural Communities Conservation Plan/Habitat Conservation Plan.

Pursuant to Public Resources Code Sections 21092 and 21092.2, the DFG requests written notification of proposed actions and pending decisions regarding this project. Written notifications should be directed to this office.

Thank you for the opportunity to review this project. If the DFG can be of further assistance please contact Ms. Julie Newman, Staff Environmental Scientist, at (530) 283-6866.

Sincerely,

Jeff Drongesen
Acting Environmental Program Manager

ec: Mr. Gary Hobgood
Mr. Dale Whitmore
Ms. Tracy McReynolds
Department of Fish and Game
North Central Region

To: Steve Geiger
Subject: RE: Comments on EIR for Sutter General Plan

-----Original Message-----
From: Joan Joaquin-Wood [mailto:joanwood@earthlink.net]
Sent: Sunday, April 18, 2010 6:25 PM
To: Steve Geiger
Cc: james gallagher Supe.; Larry Montna
Subject: Comments on EIR for Sutter General Plan

Steve Geiger, Principal Planner
Sutter County Community Services
1130-A Civic Center Blvd.
Yuba City CA 95993

Dear Mr. Geiger:
As you embark on the preparation of the EIR for the new Sutter County General Plan, I must again express grave concern over a Planned Rural Community in Sutter. When this proposal was first presented in 2008 it referred to maximum of 10,000 new homes! An alternative plan of "only" 5,000 homes was also mentioned. In the latest summary I have from your department, those numbers are no longer mentioned, but unfortunately there is reference to "new opportunities for growth and change, high quality rural lifestyle, and five new Growth Areas, including one in the community of Sutter SUBJECT TO FUTURE COMPREHENSIVE PLANNING PROCESSES TO ESTABLISH (a) NEW MIXED-USE COMMUNITY, PROVIDE A FULL LEVEL OF PUBLIC SERVICES, AND CONSIDER POSSIBLE FUTURE INCORPORATION AS (a) NEW CITY."

I urge you to delete this part of the projected General Plan. It is completely inappropriate. My family came to Sutter in 1919 and Joaquin and Peppard descendents have been farming there continuously since, adding several new parcels through the years and losing one due to inheritence taxes. Sutter County has remained primarily agricultural in spite of the assault in the last decade by scattershot ranchette and estate re-zoning that fortunately seems to be on the way out in the new General Plan.

There are about 3,000 residents in Sutter. There is no sewer system; we have leach lines. Several years ago an enterprising couple established a Community Water Services District there, ordered the residents to plug up their wells, and has been charging them for water from three new wells. Two of the new wells soon failed, and since then there has been a constant effort to find new wells. I have been approached twice in this regard, my farm being just east of the town.

The final argument against thousands of new homes in Sutter is the recent assessment of flood risk there. Sutter has not flooded in the memory of anyone now living, even though it is said that in the 19th century before the Sutter Bypass and the Wadsworth Canals were built that did occur. However with the support of software which no one is able to contradict it has been declared that Sutter runs a high risk of flooding within 100 or 200 years from the Feather River. (The Sacramento River though closer has not been analyzed.) In any event, if there is indeed a flood risk this is no place for thousands of new homes.

In short, I sincerely hope this Planned Rural Community for Sutter can be abandoned before it is committed in the General Plan. Thank you. Joan Joaquin Wood Box 303 Sutter 95982

Joan Wood

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
(916) 657-5390 - Fax

April 5, 2010

Steve Geiger
Sutter County
1130 Civic Center Boulevard, Suite A
Yuba City, CA 95993

RE: SCH#2010032074 Sutter County 2030 General Plan Update EIR: Sutter County.

Dear Mr.Geiger:

The Native American Heritage Commission (NAHC) has reviewed the Notice of Preparation (NOP) referenced above. The California Environmental Quality Act (CEQA) states that any project that causes a substantial adverse change in the significance of an historical resource, which includes archeological resources, is a significant effect requiring the preparation of an EIR (CEQA Guidelines 15064(b)). To comply with this provision the lead agency is required to assess whether the project will have an adverse impact on historical resources within the area of project effect (APE), and if so to mitigate that effect. To adequately assess and mitigate project-related impacts to archaeological resources, the NAHC recommends the following actions:

- ✓ Contact the appropriate regional archaeological Information Center for a record search. The record search will determine:
  - If a part or all of the area of project effect (APE) has been previously surveyed for cultural resources.
  - If any known cultural resources have already been recorded on or adjacent to the APE.
  - If the probability is low, moderate, or high that cultural resources are located in the APE.
  - If a survey is required to determine whether previously unrecorded cultural resources are present.
- ✓ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
  - The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure.
  - The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.
- ✓ Contact the Native American Heritage Commission for:
  - A Sacred Lands File Check. **USGS 7.5 minute quadrangle name, township, range and section required.**
  - A list of appropriate Native American contacts for consultation concerning the project site and to assist in the mitigation measures. **Native American Contacts List attached.**
- ✓ Lack of surface evidence of archeological resources does not preclude their subsurface existence.
  - Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5(f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
  - Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.
  - Lead agencies should include provisions for discovery of Native American human remains in their mitigation plan. Health and Safety Code §7050.5, CEQA §15064.5(e), and Public Resources Code §5097.98 mandates the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Sincerely,

Katy Sanchez

Katy Sanchez
Program Analyst
(916) 653-4040

CC: State Clearinghouse

Native American Contact List
Sutter county
April 5, 2010

Strawberry Valley Rancheria
Cathy Bishop, Chairperson
PO Box 667
Marysville , CA 95901
catfrmsac2@yahoo.com
916-501-2482
Maidu
Miwok

Enterprise Rancheria of Maidu Indians
Art Angle, Vice Chairperson
3690 Olive Hwy
Oroville , CA 95966
eranch@cncnet.com
(530) 532-9214
(530) 532-1768 FAX
Maidu

Enterprise Rancheria of Maidu Indians
Glenda Nelson, Chairperson
3690 Olive Hwy
Oroville , CA 95966
eranch@cncnet.com
(530) 532-9214
(530) 532-1768 FAX
Maidu

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources forthe proposed SCH# 2010032074 Sutter County 2030 General Plan Update EIR: Sutter County.

ARNOLD SCHWARZENEGGER
GOVERNOR

Cal EMA
CALIFORNIA EMERGENCY
MANAGEMENT AGENCY

MATTHEW R. BETTENHAUSEN
SECRETARY

April 5, 2010

Steve Geiger
Sutter County
1130 Civic Center Blvd., Suite A
Yuba City, CA 95993

RE: Notice of Preparation for a Draft Environmental Impact Report for Sutter County's General Plan Update, SCH# 2010032074

Dear Mr. Geiger:

Thank you for the opportunity to comment on your Notice of Preparation for a Draft Environmental Impact Report (DEIR) for the county's general plan update. In preparing the general plan and accompanying DEIR, the county should examine the sections of state planning law that involve potential hazards the county may face. For your information, I have underlined specific sections of state planning law where identification and analysis of hazards are discussed (see Attachment A).

Prior to the release of the draft general plan or within the DEIR, county staff or your consultants should examine each of the requirements in state planning law and determine if there are hazard issues within the community which the general plan should address. A table in the DEIR (or general plan) which identifies these specific issues and where they are addressed in the general plan would be helpful in demonstrating the county has complied with these requirements. If the DEIR determines that state planning law requirements have not been met, it should recommend that these issues be addressed in the general plan as a mitigation measure.

We note that state planning law includes a requirement for consultations with state agencies in regard to information related to hazards. Cal EMA would be happy to share all available information at our disposal to facilitate the county's ability to comply with state planning and environmental laws.

If you have any questions about these comments, please contact Andrew Rush at (916) 845-8269 or andrew.rush@OES.ca.gov.

Sincerely,

Dennis Castrillo

Dennis Castrillo
Environmental Officer

cc: State Clearinghouse

3650 SCHRIEVER AVENUE • MATHER, CA 95655
RECOVERY BRANCH
(916) 845-8200 [OFFICE] • (916) 845-8385 [FAX]

Attachment A
Hazards and State Planning Law Requirements

General Plan Consistency

65300.5. In construing the provisions of this article, the Legislature intends that the general plan and elements and parts thereof comprise an integrated, internally consistent and compatible statement of policies for the adopting agency.

Seven Mandated Elements

65302. The general plan shall consist of a statement of development policies and shall include a diagram or diagrams and text setting forth objectives, principles, standards, and plan proposals. The plan shall include the following elements:

(a) A land use element that designates the proposed general distribution and general location and extent of the uses of the land for housing, business, industry, open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, and other categories of public and private uses of land. The location and designation of the extent of the uses of the land for public and private uses shall consider the identification of land and natural resources pursuant to paragraph (3) of subdivision (d). The land use element shall include a statement of the standards of population density and building intensity recommended for the various districts and other territory covered by the plan. The land use element shall identify and annually review those areas covered by the plan that are subject to flooding identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources. The land use element shall also do both of the following:

(1) Designate in a land use category that provides for timber production those parcels of real property zoned for timberland production pursuant to the California Timberland Productivity Act of 1982, Chapter 6.7 (commencing with Section 51100) of Part 1 of Division 1 of Title 5.

(2) Consider the impact of new growth on military readiness activities carried out on military bases, installations, and operating and training areas, when proposing zoning ordinances or designating land uses covered by the general plan for land, or other territory adjacent to military facilities, or underlying designated military aviation routes and airspace.

(A) In determining the impact of new growth on military readiness activities, information provided by military facilities shall be considered. Cities and counties shall address military impacts based on information from the military and other sources.

(B) The following definitions govern this paragraph:

(i) "Military readiness activities" mean all of the following:

(I) Training, support, and operations that prepare the men and women of the military for combat.

(II) Operation, maintenance, and security of any military installation.

(III) Testing of military equipment, vehicles, weapons, and sensors for proper operation or suitability for combat use.

(ii) "Military installation" means a base, camp, post, station, yard, center, homeport facility for any ship, or other activity under the jurisdiction of the United States Department of Defense as defined in paragraph (1) of subsection (e) of Section 2687 of Title 10 of the United States Code.

(b) A circulation element consisting of the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, any military airports and ports, and other local public utilities and facilities, all correlated with the land use element of the plan.

(c) A housing element as provided in Article 10.6 (commencing with Section 65580).

(d) (1) A conservation element for the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources. The conservation element shall consider the effect of development within the jurisdiction, as described in the land use element, on natural resources located on public lands, including military installations. That portion of the conservation element including waters shall be developed in coordination with any countywide water agency and with all district and city agencies, including flood management, water conservation, or groundwater agencies that have developed, served, controlled, managed, or conserved water of any type for any purpose in the county or city for which the plan is prepared. Coordination shall include the discussion and evaluation of any water supply and demand information described in Section 65352.5, if that information has been submitted by the water agency to the city or county.

(2) The conservation element may also cover all of the following:

(A) The reclamation of land and waters.

(B) Prevention and control of the pollution of streams and other waters.

(C) Regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan.

(D) Prevention, control, and correction of the erosion of soils, beaches, and shores.

(E) Protection of watersheds.

(F) The location, quantity and quality of the rock, sand and gravel resources.

(3) Upon the next revision of the housing element on or after January 1, 2009, the conservation element shall identify rivers, creeks, streams, flood corridors, riparian habitats, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management.

(e) An open-space element as provided in Article 10.5 (commencing with Section 65560).

(f) (1) A noise element which shall identify and appraise noise problems in the community. The noise element shall recognize the guidelines established by the Office of Noise Control in the State Department of Health Care Services and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:

(A) Highways and freeways.

(B) Primary arterials and major local streets.

(C) Passenger and freight on-line railroad operations and ground rapid transit systems.

(D) Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.

(E) Local industrial plants, including, but not limited to, railroad classification yards.

(F) Other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment.

(2) Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive.

(3) The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.

(4) The noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards.

(g) (1) A safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence, liquefaction, and other seismic hazards identified pursuant to Chapter 7.8 (commencing with Section 2690) of Division 2 of the Public Resources Code, and other geologic hazards known to the legislative body; flooding; and wild land and urban fires. The safety element shall include mapping of known seismic and other geologic hazards. It shall also address evacuation routes, military installations, peakload water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

(2) The safety element, upon the next revision of the housing element on or after January 1, 2009, shall also do the following:

(A) Identify information regarding flood hazards, including, but not limited to, the following:

(i) Flood hazard zones. As used in this subdivision, "flood hazard zone" means an area subject to flooding that is delineated as either a special hazard area or an area of moderate or minimal hazard on an official flood insurance rate map issued by the Federal Emergency Management Agency. The identification of a flood hazard zone does not imply that areas outside the flood hazard zones or uses permitted within flood hazard zones will be free from flooding or flood damage.

(ii) National Flood Insurance Program maps published by FEMA.

(iii) Information about flood hazards that is available from the United States Army Corps of Engineers.

(iv) Designated floodway maps that are available from the Central Valley Flood Protection Board.

(v) Dam failure inundation maps prepared pursuant to Section 8589.5 that are available from the Office of Emergency Services.

(vi) Awareness Floodplain Mapping Program maps and 200-year flood plain maps that are or may be available from, or accepted by, the Department of Water Resources.

(vii) Maps of levee protection zones.

(viii) Areas subject to inundation in the event of the failure of project or nonproject levees or floodwalls.

(ix) Historical data on flooding, including locally prepared maps of areas that are subject to flooding, areas that are vulnerable to flooding after wildfires, and sites that have been repeatedly damaged by flooding.

(x) Existing and planned development in flood hazard zones, including structures, roads, utilities, and essential public facilities.

(xi) Local, state, and federal agencies with responsibility for flood protection, including special districts and local offices of emergency services.

(B) Establish a set of comprehensive goals, policies, and objectives based on the information identified pursuant to subparagraph (A), for the protection of the community from the unreasonable risks of flooding, including, but not limited to:

(i) Avoiding or minimizing the risks of flooding to new development.

(ii) Evaluating whether new development should be located in flood hazard zones, and identifying construction methods or other methods to minimize damage if new development is located in flood hazard zones.

(iii) Maintaining the structural and operational integrity of essential public facilities during flooding.

(iv) Locating, when feasible, new essential public facilities outside of flood hazard zones, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities or identifying construction methods or other methods to minimize damage if these facilities are located in flood hazard zones.

(v) Establishing cooperative working relationships among public agencies with responsibility for flood protection.

(C) Establish a set of feasible implementation measures designed to carry out the goals, policies, and objectives established pursuant to subparagraph (B).

(3) After the initial revision of the safety element pursuant to paragraph (2), upon each revision of the housing element, the planning agency shall review and, if necessary, revise the safety element to identify new information that was not available during the previous revision of the safety element.

(4) Cities and counties that have flood plain management ordinances that have been approved by FEMA that substantially comply with this section, or have substantially equivalent provisions to this subdivision in their general plans, may use that information in the safety element to comply with this subdivision, and shall summarize and incorporate by reference into the safety element the other general plan provisions or the flood plain ordinance, specifically showing how each requirement of this subdivision has been met.

(5) Prior to the periodic review of its general plan and prior to preparing or revising its safety element, each city and county shall consult the California Geological Survey of the Department of Conservation, the Central Valley Flood Protection Board, if the city or county is located within the boundaries of the Sacramento and San Joaquin Drainage District, as set forth in Section 8501 of the Water Code, and the Office of Emergency Services for the purpose of including information known by and available to the department, the office, and the board required by this subdivision.

(6) To the extent that a county's safety element is sufficiently detailed and contains appropriate policies and programs for adoption by a city, a city may adopt that portion of the county's safety element that pertains to the city's planning area in satisfaction of the requirement imposed by this subdivision.

Consistency with Airport Land Use Plans

65302.3. (a) The general plan, and any applicable specific plan prepared pursuant to Article 8 (commencing with Section 65450), shall be consistent with the plan adopted or amended pursuant to Section 21675 of the Public Utilities Code.

Review of Safety Element

65302.5. (a) At least 45 days prior to adoption or amendment of the safety element, each county and city shall submit to the Division of Mines and Geology of the Department of Conservation

one copy of a draft of the safety element or amendment and any technical studies used for developing the safety element. The division may review drafts submitted to it to determine whether they incorporate known seismic and other geologic hazard information, and report its findings to the planning agency within 30 days of receipt of the draft of the safety element or amendment pursuant to this subdivision. The legislative body shall consider the division's findings prior to final adoption of the safety element or amendment unless the division's findings are not available within the above prescribed time limits or unless the division has indicated to the city or county that the division will not review the safety element. If the division's findings are not available within those prescribed time limits, the legislative body may take the division's findings into consideration at the time it considers future amendments to the safety element. Each county and city shall provide the division with a copy of its adopted safety element or amendments. The division may review adopted safety elements or amendments and report its findings. All findings made by the division shall be advisory to the planning agency and legislative body.

(1) The draft element of or draft amendment to the safety element of a county or a city's general plan shall be submitted to the State Board of Forestry and Fire Protection and to every local agency that provides fire protection to territory in the city or county at least 90 days prior to either of the following:

(A) The adoption or amendment to the safety element of its general plan for each county that contains state responsibility areas.

(B) The adoption or amendment to the safety element of its general plan for each city or county that contains a very high fire hazard severity zone as defined pursuant to subdivision (b) of Section 51177.

(2) A county that contains state responsibility areas and a city or county that contains a very high fire hazard severity zone as defined pursuant to subdivision (b) of Section 51177, shall submit for review the safety element of its general plan to the State Board of Forestry and Fire Protection and to every local agency that provides fire protection to territory in the city or county in accordance with the following dates as specified, unless the local government submitted the element within five years prior to that date:

(A) Local governments within the regional jurisdiction of the San Diego Association of Governments: December 31, 2010.

(B) Local governments within the regional jurisdiction of the Southern California Association of Governments: December 31, 2011.

(C) Local governments within the regional jurisdiction of the Association of Bay Area Governments: December 31, 2012.

(D) Local governments within the regional jurisdiction of the Council of Fresno County Governments, the Kern County Council of Governments, and the Sacramento Area Council of Governments: June 30, 2013.

(E) Local governments within the regional jurisdiction of the Association of Monterey Bay Area Governments: December 31, 2014.

(F) All other local governments: December 31, 2015.

(3) The State Board of Forestry and Fire Protection shall, and a local agency may, review the draft or an existing safety element and report its written recommendations to the planning agency within 60 days of its receipt of the draft or existing safety element. The State Board of Forestry and Fire Protection and local agency shall review the draft or existing safety element and may

offer written recommendations for changes to the draft or existing safety element regarding both of the following:
(A) Uses of land and policies in state responsibility areas and very high fire hazard severity zones that will protect life, property, and natural resources from unreasonable risks associated with wildland fires.
(B) Methods and strategies for wildland fire risk reduction and prevention within state responsibility areas and very high hazard severity zones.
(b) Prior to the adoption of its draft element or draft amendment, the board of supervisors of the county or the city council of a city shall consider the recommendations made by the State Board of Forestry and Fire Protection and any local agency that provides fire protection to territory in the city or county. If the board of supervisors or city council determines not to accept all or some of the recommendations, if any, made by the State Board of Forestry and Fire Protection or local agency, the board of supervisors or city council shall communicate in writing to the State Board of Forestry and Fire Protection or to the local agency, its reasons for not accepting the recommendations.

Open Space Plans

65560. (a) "Local open-space plan" is the open-space element of a county or city general plan adopted by the board or council, either as the local open-space plan or as the interim local open-space plan adopted pursuant to Section 65563.
(b) "Open-space land" is any parcel or area of land or water that is essentially unimproved and devoted to an open-space use as defined in this section, and that is designated on a local, regional or state open-space plan as any of the following:
(1) Open space for the preservation of natural resources including, but not limited to, areas required for the preservation of plant and animal life, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays and estuaries; and coastal beaches, lakeshores, banks of rivers and streams, and watershed lands.
(2) Open space used for the managed production of resources, including but not limited to, forest lands, rangeland, agricultural lands and areas of economic importance for the production of food or fiber; areas required for recharge of groundwater basins; bays, estuaries, marshes, rivers and streams which are important for the management of commercial fisheries; and areas containing major mineral deposits, including those in short supply.
(3) Open space for outdoor recreation, including but not limited to, areas of outstanding scenic, historic and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas which serve as links between major recreation and open-space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.
(4) Open space for public health and safety, including, but not limited to, areas which require special management or regulation because of hazardous or special conditions such as earthquake fault zones, unstable soil areas, flood plains, watersheds, areas presenting high fire risks, areas required for the protection of water quality and water reservoirs and areas required for the protection and enhancement of air quality.

COUNTY OF PLACER
Community Development/Resource Agency

Michael J. Johnson, AICP
Agency Director

PLANNING

April 20, 2010

Steve Geiger, Principal Planner
Sutter County Community Services
1130 Civic Center Blvd., Suite A
Yuba City, CA 95993

Subject: Sutter County 2030 General Plan Update, Notice of Preparation

Dear Mr. Geiger,

Thank you for the opportunity to provide comments on the Notice of Preparation for the Sutter County 2030 General Plan Update. During preparation of the General Plan Update, Placer County will want to coordinate the conservation planning efforts of Sutter County (and Yuba County), particularly as it relates to the preparation of the Sutter/Yuba Natural Communities Conservation Plan. As the General Plan policy document is being prepared, we would ask that you consider language that provides a template for joint planning efforts and regional coordination and cooperation.

Our conservation planning effort, the Placer County Conservation Plan, abuts Sutter County for the entire length of Western Placer County. We share a common hydrology for salmonids in Auburn Ravine and Coon Creek, and there is the potential for species recovery efforts, including habitat restoration along the shared County line, to be of mutual benefit to our respective efforts.

Similarly, we would be concerned about the establishment of any new major urban/suburban land uses along the shared County line (with the exception of Sutter Pointe – an approved project) that has the potential to introduce incompatible land uses adjacent to the proposed PCCP reserve system (see enclosed map). To this end, we request that proposed comprehensive planning efforts for the future growth of the East Nicolaus and Trowbridge communities include appropriate agricultural and open space buffers along our shared boundary with particular emphasis on Coon Creek and its natural floodplains.

Placer County requests that the General Plan DEIR Transportation analysis include the following roadways and analyses:

A) **Placer Parkway**: This regional connector should be shown to be built out to freeway standards with interchanges at both Hwy 99 and 65. The DEIR should examine how the roadway will be incorporated into the land use plans and transportation network between Sutter and Placer Counties and the implications of implementation/ timing for both the roadway and interchanges within Sutter County. The DEIR should discuss how construction of the road and interchanges will be funded.

B) **Riego Road**: This roadway is being designated as a 6 lane high speed thoroughfare within Sutter County to complement a similar design for Baseline Road within Placer County. The DEIR should examine the implications of the timing for improving this roadway as well as discuss how construction of the road and intersection improvements will be funded. Placer County, Sutter County and the City of Roseville are developing a joint MOU to address the cross jurisdictional impacts, but this will not resolve all funding issues. Traffic management systems (ITS) and techniques should be discussed and evaluated as potential mitigations to impacts.

C) **Baseline Road**: This roadway has been designed as a high speed thoroughfare with few intersections and no driveways to accommodate projected high volumes of inter-jurisdictional traffic within Placer County. The traffic analysis should examine the impacts to Riego Road and Baseline Road of utilizing a similar design standard.

D) **Watt Avenue**: This regional connector should be included at an ultimate 6 lane standard.

E) **Nicholas Road**: This regional roadway connector should be examined and improved as appropriate, commensurate with future traffic volumes.

2. The DEIR traffic analysis needs to examine impacts to Placer County roads from vehicles traveling from Sutter County through Placer County to access roads leading into Roseville and Sacramento County. Roads to be included in this analysis are Base Line Road, Watt Avenue, Walerga Road, Locust Road, Brewer Road, Sunset Blvd. West, E. Catlett and Moore Road

3. The traffic analysis needs to examine the need for, and provision of, additional east-west roadways providing access into Placer County.

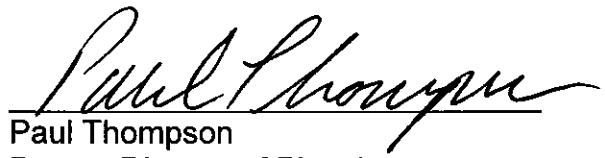
4. The DEIR should examine the existing and future conditions at the Riego Road RR crossing and impacts to vehicles traveling between jurisdictions.

5. The DEIR and General Plan should show how bicycle and pedestrian facilities can be extended or connected between Sutter County, Placer County, Sacramento County and the City of Roseville.

6. Transit: The DEIR should address regional and commuter transit services between Sutter County and Placer County/City of Roseville. In addition, coordinated bi-County commuter bus service downtown Sacramento should be examined. What transit facilities will Sutter County provide to encourage and facilitate use of transit or other alternative forms of transportation? How will the proposed transit systems integrate with existing or proposed systems in adjacent communities? What levels of service will be provided? Are they comparable with systems in adjacent communities? If not, will residents drive to adjacent communities to utilize commuter transit systems? How will transit system funding for operations and maintenance be provided?

Placer County looks forward to the opportunity to review the Draft EIR and requests to be included on the circulation list for the Draft EIR and to receive all future notices for this project. If you have any questions or wish to discuss any of these issues further, I can be reached directly at (530)745-3044.

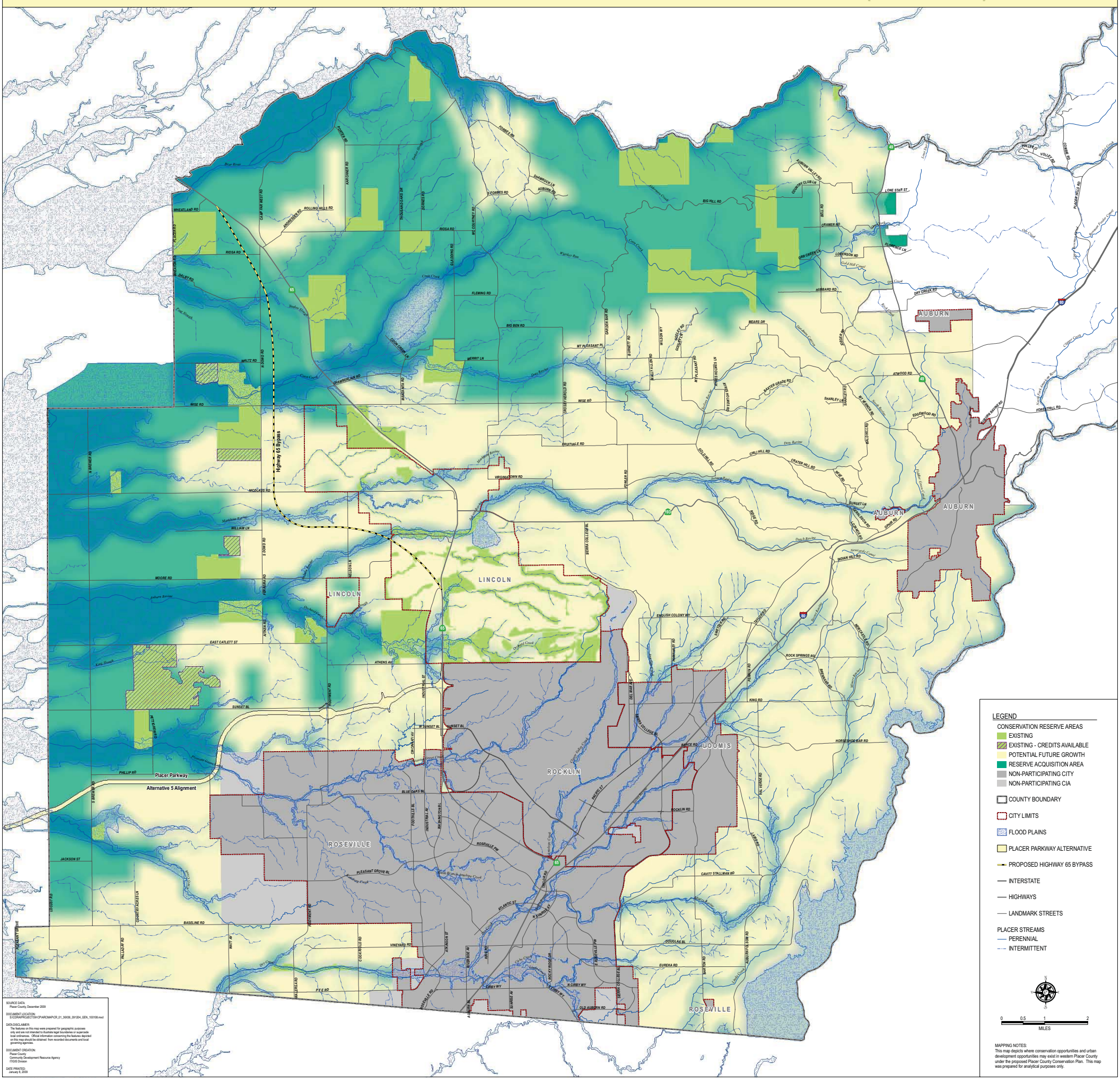
Sincerely,



Paul Thompson
Deputy Director of Planning
(530) 745-3044

cc: Supervisor Rockholm, District 1 Supervisor
Supervisor Weygandt, District 2 Supervisor
Thomas Miller, Chief Executive Officer
Michael Johnson, Agency Director
Loren Clark, Assistant Planning Director
Wes Zicker, Director Department of Engineering and Surveying
Andrew Gaber, Department of Public Works Transportation
Phil Frantz, Department of Engineering and Surveying

PCCP ALTERNATIVE INCLUDING BOS DISTRICT 5 (12-4-09)



SOUTH PLACER
REGIONAL
TRANSPORTATION
AUTHORITY

City of Lincoln • City of Rocklin • City of Roseville • Placer County

April 15, 2010

Steve Geiger, Principal Planner
Sutter County Community Services
1130 Civic Center Blvd., Suite A
Yuba City, CA 95993

RE: NOP for Sutter County 2030 General Plan Update EIR

Dear Steve,

Thank you for the Notice of Preparation (NOP) for the Environmental Impact Report (EIR) for the Sutter County 2030 General Plan Update. Some of the proposed project's technical background documents refer to and illustrate the Placer Parkway. The Parkway is also mentioned in some of the Sutter Pointe Specific Plan references.

The proposed Placer Parkway is a high priority regional transportation project. It is a part of the Sacramento Council of Area Governments (SACOG) Metropolitan Transportation Plan 2035 (MTP 2035) and its Metropolitan Transportation Improvement Program (MTIP 2009/12). The Placer Parkway will connect State Route (SR 99) at Sankey Road to SR 65 at Whitney Ranch Parkway. The Federal Highway Administration (FHWA), Caltrans, and the South Placer Regional Transportation Authority (SPRTA) are completing a Tier 1 environmental review (FHWA-CA-FEIS-2009-46 and SCH No. 2003092069) to select and preserve a 500-foot to 1,000-foot wide corridor. The identification of a precise roadway alignment within the selected corridor for a four-lane (ultimate six-lane) freeway with up to five interchanges will be the subject of a later Tier 2 EIR.

On December 3, 2009, the SPRTA Board certified the Final Program EIR and adopted Findings, a Statement of Overriding Considerations, and a Mitigation Monitoring & Reporting Program for CEQA compliance (SPRTA Board Resolution #09-06). The Board also selected the Placer Parkway corridor – Alternative #5 with a No-Access Buffer (SPRTA Board Resolution #09-07). Please see the enclosed map. FHWA is expected to complete the Record of Decision for NEPA compliance soon.

Sutter County has been a planning partner for the Placer Parkway since the late 1990s. The County has been a part of the planning process and development of the Placer Parkway Corridor Preservation Tier 1 EIS/EIR, which began in 2003. The proposed General Plan Update project and its EIR should identify the selected Placer Parkway corridor via map and policies.

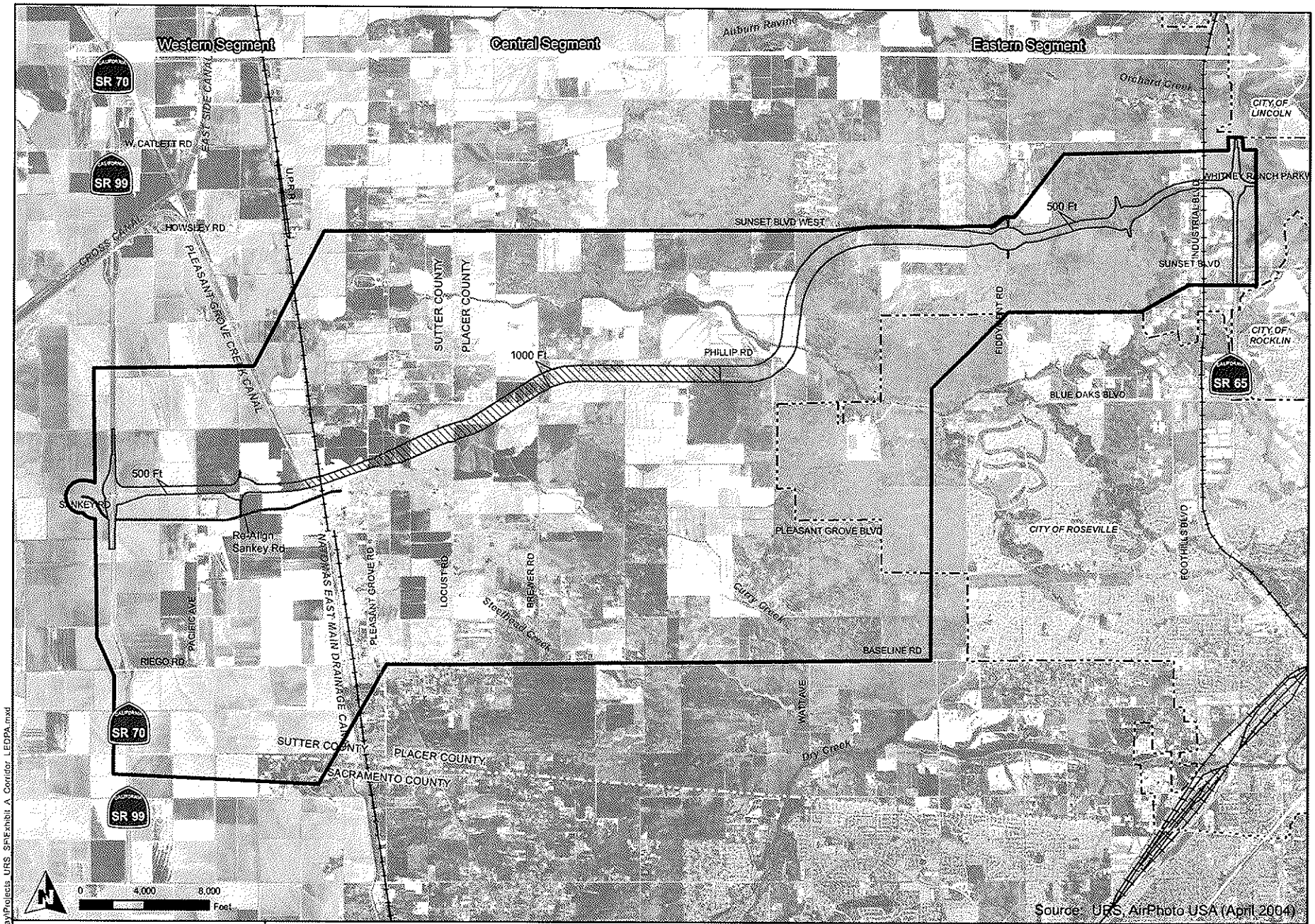
SPRTA appreciates Sutter County's cooperation and participation in the Placer Parkway planning and environmental process. If you have any questions, please contact me at 530.823.4030.

Sincerely,

Celia McAdam, AICP
Executive Director

Enclosure – Selected Placer Parkway Corridor with No-Access Buffer

Copies: Gary Sweeten, Federal Highway Administration
Laura Walsh, Caltrans
Loren Clark, Placer County Planning
Denise Heick, URS


Western Segment
Central Segment
Eastern Segment
Auburn Ravine
Orchard Creek
CITY OF LINCOLN
SR 70
SR 99
W. CATLETT RD
EAST SIDE CANAL
U.P.R.R.
HOWSLEY RD
CROSS CANAL
PLEASANT GROVE CREEK CANAL
SUTTER COUNTY
PLACER COUNTY
SUNSET BLVD WEST
500 Ft
WHITNEY RANCH PARKW
SUNSET INDUSTRIAL BLVD
SUNSET BLVD
FIDDYMENT RD
CITY OF ROCKLIN
1000 Ft
PHILLIP RD
SR 65
BLUE OAKS BLVD
500 Ft
SANKEY RD
Re-Align Sankey Rd
PLEASANT GROVE BLVD
CITY OF ROSEVILLE
FOOTHILLS BLVD
PLEASANT GROVE RD
LOCUST RD
BREWER RD
Steelhead Creek
Curry Creek
BASELINE RD
RIEGO RD
PACIFIC AVE
WATT AVE
Dry Creek
SUTTER COUNTY
PLACER COUNTY
SACRAMENTO COUNTY
0
4,000
8,000
Feet
Source: URS, AirPhoto USA (April 2004)
Study Area Boundary
Multiple Easements
City Boundary
County Boundary
SOUTH PLACER REGIONAL TRANSPORTATION AUTHORITY
Placer Parkway
Corridor Preservation
Tier 1 EIS/EIR
Selected Placer Parkway Corridor
with No-Access Buffer
Exhibit A
Resolution No. 09-07
December 3, 2009
U:\GIS\Placer_Parkway\Projects_URS_SP\Exhibit_A_Corridor_LEDPA.mxd

Resolution 09-07 -- Exhibit B

Terms of a No-Access Easement for the Buffer Area Adjacent to Placer Parkway (August 5, 2009)

The following briefly outlines the attributes of an easement that could be used as a vehicle to preclude interchanges along proposed alternative 5 for the proposed Placer Parkway from 3,250 feet west of the western boundary of the Reason Farms Retention Basin panhandle to the Natomas East Main Drainage Canal, as shown on the attached figure.

- The easement will be in the form of a conservation easement created pursuant to California Civil Code Section 815.

- The easement will be perpetual in duration. The no-access provision will be binding on successive owners for the purpose of retaining the land predominantly in its natural, scenic, historical, agricultural, forested or open-space condition. (Cal. Civ. Code §§815.1, 815.2.)

- Instrument creating the conservation easement will be recorded in the county where the land is located. (Cal. Civ. Code §815.5.)

- The easement will be held by a tax-exempt nonprofit organization qualified under Section 501(c)(3) of the Internal Revenue Code and qualified to do business in California which has as its primary purpose the preservation, protection, or enhancement of land in its natural, scenic, historical, agricultural, forested, or open-space condition or use.

- If the easement will not be accepted by such non-profit organization, or if the organization is no longer able to hold the easement, the first priority shall be to convey it to a federal agency or to a state government entity such as the California Department of Fish and Game. Failing that, the NEPA/404 agencies will work together through the NEPA/404 process to identify and to concur on an acceptable conservation easement holder.

- The terms of the easement may be enforced in court, and violation of the easement may result in damages, including the cost of restoration.

- Under Subdivision Map Act, city or county must generally deny approval of a tentative map if the land is subject to an open-space easement, agricultural conservation easement, or conservation easement.

- Easement will include Grantor's covenant not to allow access to right of way from adjacent land, and not to participate in planning or construction of interchange(s) between highway project and any surface streets from 3,250 feet west of the western boundary of the Reason Farms Retention Basin panhandle to the Natomas East Main Drainage Canal. Easement to expressly provide that covenant is specifically enforceable. May also identify certain third party beneficiaries with right to enforce covenant.

- The covenant not to allow access will include a specific prohibition regarding interchange structures in the airspace over the property.

CITY of YUBA CITY COMMUNITY DEVELOPMENT

1201 CIVIC CENTER BOULEVARD, YUBA CITY, CA 95993 • (530) 822-4700/822-4629 • FAX (530) 822-4694

April 20, 2010

Mr. Steve Geiger, Principal Planner
Sutter County Community Services Department
1130 Civic Center Boulevard, Suite A
Yuba City, CA 95993

Subject: Comments on the *Notice of Preparation* for the Sutter County General Plan Update

Dear Mr. Geiger,

Thank you for the opportunity to review and comment on the *Notice of Preparation (NOP)* for the Sutter County General Plan Update. City of Yuba City staff has reviewed the NOP for the proposed project and would like to offer the following comments for your consideration in the forthcoming Draft Environmental Impact Report (EIR) and related General Plan Update.

Land Use

1. The NOP identifies five new Growth Areas as part of the General Plan Update, two of which have the potential to affect Yuba City. These include: the areas immediately north and south of the City's existing Sphere of Influence (SOI), including the possible future expansion of Yuba City's SOI; and the Industrial/Commercial Reserve land uses located along the Highway 99 corridor, north and south of Yuba City. Recognizing the importance of a collaborative planning process for these areas, the elected officials from the City of Yuba City and Sutter County mutually supported entering into some form of agreement (such as a Memorandum of Understanding) for this inter-agency coordination effort.

   The City looks forward to working with the County on the land use issues associated with these areas, especially with regards to the proposed land use policies for the Industrial/Commercial Reserve areas. To ensure that these areas are well planned with the appropriate levels of public services and infrastructure, the EIR should address what restrictions will be placed on those properties prior to their development (i.e. preparation of a Master Plan or Specific Plan).

Transportation/Circulation

2. A traffic analysis should be completed which identifies and evaluates potential impacts (and mitigation measures) to existing and planned roadways within Yuba City and along the State Highway system (within and outside city limits).

3. The traffic analysis should explore the potential for a bypass alternative around the city limits to address potential impacts upon Highway 99.

4. The EIR (and General Plan) should address how bicycle and pedestrian facilities can be extended and connected between Sutter County and Yuba City.

Water/Wastewater Facilities

5. The City's 2005 Urban Water Management Plan and its 2006 Wastewater Systems Master Plan Update do not include infrastructure improvements for the areas outside the City's SOI. The EIR should identify and evaluate potential impacts (and mitigation measures) to City water and wastewater facilities if future projects are to be served with City water and sewer infrastructure improvements. If projects are not to be served with City water and sewer infrastructure, it should be demonstrated that independent systems can be maintained and operated long term.

Hydrology

6. The EIR should address how potential development will be impacted by the forthcoming restrictions associated with the impending 200 year floodplain mapping.

7. The EIR should identify and evaluate potential impacts (and mitigation measures) to existing drainage facilities (Live Oak Canal and Gilsizer Slough).

Parks and Recreation

8. The proposed residential development within the growth areas adjacent to Yuba City raises questions about the potential impacts upon the City's existing and planned parks. The EIR should identify and evaluate the potential impacts (and mitigation measures) upon the City's park improvements, both at the neighborhood park level and the larger regional parks level that are planned in the SOI.

Fire Protection

9. The EIR should identify and evaluate any potential impacts (and mitigation measures) upon existing and planned Yuba City fire protection services including the need for new fire station(s) as residential and non-residential development occurs in the two aforementioned growth areas.

10. The analysis related to water infrastructure improvements should also address the requirement for project specific fire protection improvements needed to comply with existing and new fire protection requirements (e.g. the new statewide residential sprinkler requirement effective January 1, 2011).

11. The EIR should recognize Yuba City's existing Gate Ordinance which addresses public access to properties in need of fire protection services.

Rural/Urban Edge Treatment

12. The City and County continue to work together on a well-defined rural/urban edge treatment that is designed to protect the County's valuable agricultural resources from encroachment by urban development in Yuba City. Conversely, the edge treatment is also intended to preserve the integrity of urban development within the boundaries of the city and prevent leap-frog development across the rural/urban boundary. Although the coordination effort on this edge treatment is on-going, the EIR should address this project and incorporate its future outcomes and designs.

Thank you for your consideration of the above comments. If you have any questions please contact me at (530) 822-5135.

Sincerely,

Aaron Busch
Community Development Director

APPENDIX C
AIR QUALITY

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name:

Project Name: Sutter County - Existing

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	721.81	133.28	467.38	0.02	1.33	1.32	164,163.25

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1,751.86	2,608.94	21,191.66	13.63	2,315.57	461.26	1,390,972.42

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	2,473.67	2,742.22	21,659.04	13.65	2,316.90	462.58	1,555,135.67

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	9.89	128.67	58.84	0.00	0.25	0.24	163,506.29
Hearth - No Summer Emissions							
Landscape	73.37	4.61	408.54	0.02	1.08	1.08	656.96
Consumer Products	477.88						
Architectural Coatings	160.67						
TOTALS (lbs/day, unmitigated)	721.81	133.28	467.38	0.02	1.33	1.32	164,163.25

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	1,115.84	1,656.73	13,519.89	8.66	1,469.33	292.75	883,610.46
Condo/townhouse general	88.79	131.83	1,075.85	0.69	116.92	23.30	70,313.83
General office building	370.26	593.82	4,759.26	3.10	528.17	105.15	316,292.10
General light industry	176.97	226.56	1,836.66	1.18	201.15	40.06	120,756.03
TOTALS (lbs/day, unmitigated)	1,751.86	2,608.94	21,191.66	13.63	2,315.57	461.26	1,390,972.42

Operational Settings:

Does not include correction for passby trips

6/30/2010 2:28:08 PM

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	3,016.00	9.24	dwelling units	9,048.00	83,603.52	844,395.56
Condo/townhouse general	45.00	9.24	dwelling units	720.00	6,652.80	67,193.28
General office building		22.11	1000 sq ft	1,359.52	30,058.99	303,595.79
General light industry		3.49	1000 sq ft	3,279.68	11,446.08	115,605.44
					131,761.39	1,330,790.07

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.5	1.8	97.9	0.3
Light Truck < 3750 lbs	19.3	3.6	86.6	9.8
Light Truck 3751-5750 lbs	19.7	1.5	98.0	0.5
Med Truck 5751-8500 lbs	9.3	1.1	97.8	1.1
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	64.0	36.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	44.4	55.6
Med-Heavy Truck 14,001-33,000 lbs	1.5	6.7	20.0	73.3
Heavy-Heavy Truck 33,001-60,000 lbs	1.9	0.0	5.3	94.7
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	65.0	35.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	8.3	75.0	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.1	10.1	10.1	10.1	10.1	10.1
Rural Trip Length (miles)	10.1	10.1	10.1	10.1	10.1	10.1
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: P:\Projects - All Employees\D50000+\51363.00 Sutter Co GPU\Phase 7 EIR\Staff Folders\Chris\Sutter County - Reduced.urb924

Project Name: Sutter County - Reduced

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1,680.21	307.30	830.94	0.03	2.38	2.36	379,790.48

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1,516.24	1,401.87	15,199.95	40.39	6,810.33	1,286.03	4,169,810.65

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	3,196.45	1,709.17	16,030.89	40.42	6,812.71	1,288.39	4,549,601.13

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	22.91	299.59	147.84	0.00	0.57	0.56	378,692.33
Hearth - No Summer Emissions							
Landscape	122.83	7.71	683.10	0.03	1.81	1.80	1,098.15
Consumer Products	1,134.18						
Architectural Coatings	400.29						
TOTALS (lbs/day, unmitigated)	1,680.21	307.30	830.94	0.03	2.38	2.36	379,790.48

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	501.51	460.40	5,033.45	13.28	2,234.52	422.13	1,370,817.55
Apartments high rise	82.22	75.48	825.19	2.18	366.33	69.20	224,733.08
Condo/townhouse general	182.99	167.99	1,836.59	4.85	815.33	154.03	500,180.26
General office building	523.47	524.99	5,627.44	15.10	2,553.93	482.00	1,559,588.22
General light industry	226.05	173.01	1,877.28	4.98	840.22	158.67	514,491.54
TOTALS (lbs/day, unmitigated)	1,516.24	1,401.87	15,199.95	40.39	6,810.33	1,286.03	4,169,810.65

Operational Settings:

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Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	5,054.67	9.24	dwelling units	15,164.00	140,115.36	1,303,072.84
Apartments high rise	40.10	9.24	dwelling units	2,486.00	22,970.64	213,626.95
Condo/townhouse general	345.81	9.24	dwelling units	5,533.00	51,124.92	475,461.75
General office building		22.11	1000 sq ft	7,244.85	160,183.64	1,489,707.88
General light industry		3.49	1000 sq ft	15,097.76	52,691.18	490,028.00
					427,085.74	3,971,897.42

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.9	0.0	100.0	0.0
Light Truck < 3750 lbs	19.1	0.0	99.0	1.0
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	32.5	67.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	91.7	8.3

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	9.3	9.3	9.3	9.3	9.3	9.3
Rural Trip Length (miles)	9.3	9.3	9.3	9.3	9.3	9.3
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: P:\Projects - All Employees\D50000+\51363.00 Sutter Co GPU\Phase 7 EIR\Staff Folders\Chris\Sutter County - Buildout.urb924

Project Name: Sutter County - Buildout

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	2,563.91	418.91	940.69	0.03	2.72	2.69	519,148.27

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	2,937.20	2,622.47	28,421.40	75.56	12,740.14	2,405.73	7,799,533.68

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	5,501.11	3,041.38	29,362.09	75.59	12,742.86	2,408.42	8,318,681.95

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	31.34	410.65	208.66	0.00	0.78	0.77	517,971.57
Hearth - No Summer Emissions							
Landscape	131.68	8.26	732.03	0.03	1.94	1.92	1,176.70
Consumer Products	1,606.88						
Architectural Coatings	794.01						
TOTALS (lbs/day, unmitigated)	2,563.91	418.91	940.69	0.03	2.72	2.69	519,148.27

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	537.76	493.68	5,397.24	14.24	2,396.03	452.64	1,469,895.37
Apartments high rise	148.00	135.87	1,485.40	3.92	659.42	124.57	404,537.63
Condo/townhouse general	400.51	367.68	4,019.72	10.61	1,784.50	337.11	1,094,737.57
General office building	878.22	880.77	9,441.05	25.34	4,284.68	808.65	2,616,492.06
General light industry	972.71	744.47	8,077.99	21.45	3,615.51	682.76	2,213,871.05
TOTALS (lbs/day, unmitigated)	2,937.20	2,622.47	28,421.40	75.56	12,740.14	2,405.73	7,799,533.68

Operational Settings:

6/30/2010 2:57:32 PM

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	5,420.00	9.24	dwelling units	16,260.00	150,242.40	1,397,254.31
Apartments high rise	72.18	9.24	dwelling units	4,475.00	41,349.00	384,545.70
Condo/townhouse general	756.88	9.24	dwelling units	12,110.00	111,896.40	1,040,636.52
General office building		22.11	1000 sq ft	12,154.55	268,737.10	2,499,255.11
General light industry		3.49	1000 sq ft	64,966.07	226,731.59	2,108,603.79
					798,956.49	7,430,295.43

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.9	0.0	100.0	0.0
Light Truck < 3750 lbs	19.1	0.0	99.0	1.0
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	32.5	67.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	91.7	8.3

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	9.3	9.3	9.3	9.3	9.3	9.3
Rural Trip Length (miles)	9.3	9.3	9.3	9.3	9.3	9.3
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

APPENDIX D
BIOLOGICAL RESOURCES – CNDDB, USFWS THREATENED AND ENDANGERED SPECIES, CNPS RARE AND ENDANGERED PLANTS INVENTORY

California Department of Fish and Game
Natural Diversity Database
Sutter County GPU EIR
CNDDB Query for Sutter County, California.

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	Actinemys marmorata western pond turtle	ARAAD02030			G3G4	S3	SC
2	Agelaius tricolor tricolored blackbird	ABPBXB0020			G2G3	S2	SC
3	Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	unknown code...	G2G3	S2S3	SC
4	Anthicus antiochensis Antioch Dunes anthicid beetle	IICOL49020			G1	S1	
5	Anthicus sacramento Sacramento anthicid beetle	IICOL49010			G1	S1	
6	Antrozous pallidus pallid bat	AMACC10010			G5	S3	SC
7	Athene cunicularia burrowing owl	ABNSB10010			G4	S2	SC
8	Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened		G3	S2S3	
9	Branta hutchinsii leucopareia cackling (=Aleutian Canada) goose	ABNJB05035	Delisted		G5T4	S2	
10	Buteo swainsoni Swainson's hawk	ABNKC19070		Threatened	G5	S2	
11	Carduelis lawrencei Lawrence's goldfinch	ABPBY06100			G3G4	S3	
12	Cicindela hirticollis abrupta Sacramento Valley tiger beetle	IICOL02106			G5TH	SH	
13	Coastal and Valley Freshwater Marsh	CTT52410CA			G3	S2.1	
14	Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
15	Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened		G3T2	S2	
16	Dipodomys californicus eximius Marysville California kangaroo rat	AMAFD03071			G4T1	S1	SC
17	Great Valley Cottonwood Riparian Forest	CTT61410CA			G2	S2.1	
18	Great Valley Mixed Riparian Forest	CTT61420CA			G2	S2.2	
19	Great Valley Willow Scrub	CTT63410CA			G3	S3.2	
20	Grus canadensis tabida greater sandhill crane	ABNMK01014		Threatened	G5T4	S2	
21	Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3			G4	S2.2	2.2
22	Lasiurus blossevillii western red bat	AMACC05060			G5	S3?	SC
23	Lasiurus cinereus hoary bat	AMACC05030			G5	S4?	
24	Laterallus jamaicensis coturniculus California black rail	ABNME03041		Threatened	G4T1	S1	

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
25	Layia septentrionalis Colusa layia	PDAST5N0F0			G2	S2.2	1B.2
26	Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered		G3	S2S3	
27	Linderiella occidentalis California linderiella	ICBRA06010			G3	S2S3	
28	Monardella douglasii ssp. venosa veiny monardella	PDLAM18082			G5T1	S1.1	1B.1
29	Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1			G4T2	S2.1	1B.1
30	Northern Hardpan Vernal Pool	CTT44110CA			G3	S3.1	
31	Nycticorax nycticorax black-crowned night heron	ABNGA11010			G5	S3	
32	Perognathus inornatus inornatus San Joaquin pocket mouse	AMAFD01061			G4T2T3	S2S3	
33	Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020			G2	S2	SC
34	Pseudobahia bahiifolia Hartweg's golden sunburst	PDAST7P010	Endangered	Endangered	G2	S2.1	1B.1
35	Riparia riparia bank swallow	ABPAU08010		Threatened	G5	S2S3	
36	Silene verecunda ssp. verecunda San Francisco campion	PDCAR0U213			G5T2	S2.2	1B.2
37	Thamnophis gigas giant garter snake	ARADB36150	Threatened	Threatened	G2G3	S2S3	
38	Trichocoronis wrightii var. wrightii Wright's trichocoronis	PDAST9F031			G4T3	S1.1	2.1

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 100331060236

Database Last Updated: December 1, 2009

No quad species lists requested.

County Lists

Sutter County

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana aurora draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Candidate Species

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (C)

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be

found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be June 29, 2010.

CNPS Inventory of Rare and Endangered Plants

Status: Plant Press Manager window with 12 items - Fri, Mar. 26, 2010 13:31 c

Reformat list as: Standard List - with Plant Press controls

ECOLOGICAL REPORT

scientific	family	life form	blooming	communities	elevation	CNPS
Astragalus tener var. ferrisiae	Fabaceae	annual herb	Apr-May	•Meadows and seeps (Medws)(vernally mesic) •Valley and foothill grassland (VFGrs)(subalkaline flats)	2 - 75 meters	List 1B.1
Centromadia parryi ssp. rudis	Asteraceae	annual herb	May-Oct	•Valley and foothill grassland (VFGrs) •Vernal pools (VnPls)/alkaline, vernally mesic, seeps, sometimes roadsides	0 - 100 meters	List 4.2
Hesperevax caulescens	Asteraceae	annual herb	Mar-Jun	•Valley and foothill grassland (VFGrs)(mesic, clay) •Vernal pools (VnPls) (shallow)	0 - 505 meters	List 4.2
Hibiscus lasiocarpos var. occidentalis	Malvaceae	perennial rhizomatous herb emergent	Jun-Sep	•Marshes and swamps (MshSw)(freshwater)	0 - 120 meters	List 1B.2
Layia septentrionalis	Asteraceae	annual herb	Apr-May	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/sandy, serpentinite	100 - 1095 meters	List 1B.2
Microseris sylvatica	Asteraceae	perennial herb	Mar-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Great Basin scrub (GBScr) •Pinyon and juniper woodland (PJWld) •Valley and foothill grassland (VFGrs)(serpentinite)	45 - 1500 meters	List 4.2
				•Cismontane woodland		

Monardella douglasii ssp. venosa	Lamiaceae	annual herb	May-Jul	(CmWld) •Valley and foothill grassland (VFGrs)/heavy clay	60 - 410 meters	List 1B.1
Navarretia cotulifolia	Polemoniaceae	annual herb	May-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/adobe	4 - 1830 meters	List 4.2
Navarretia leucocephala ssp. bakeri	Polemoniaceae	annual herb	Apr-Jul	•Cismontane woodland (CmWld) •Lower montane coniferous forest (LCFrs) •Meadows and seeps (Medws) •Valley and foothill grassland (VFGrs) •Vernal pools (VnPls)/mesic	5 - 1740 meters	List 1B.1
Navarretia nigelliformis ssp. nigelliformis	Polemoniaceae	annual herb	Apr-Jun	•Valley and foothill grassland (VFGrs)vernally mesic •Vernal pools (VnPls) sometimes/clay, sometimes serpentinite	100 - 1000 meters	List 4.2
Silene verecunda ssp. verecunda	Caryophyllaceae	perennial herb	Mar-Jun(Aug) Months in parentheses are uncommon.	•Coastal bluff scrub (CBScr) •Chaparral (Chprl) •Coastal prairie (CoPrr) •Coastal scrub (CoScr) •Valley and foothill grassland (VFGrs)/sandy	30 - 645 meters	List 1B.2
Trichocoronis wrightii var. wrightii	Asteraceae	annual herb	May-Sep	•Meadows and seeps (Medws) •Marshes and swamps (MshSw) •Riparian forest (RpFrs) •Vernal pools (VnPls)/alkaline	5 - 435 meters	List 2.1

APPENDIX E
CLIMATE CHANGE

DRAFT

SUTTER COUNTY
CLIMATE ACTION PLAN

Prepared for:

Sutter County
1130 Civic Center Blvd., Suite A
Yuba City, CA 95993
Prepared by:

650 East Hospitality Lane, Suite 450
San Bernardino, California 92408

July 2010

ACKNOWLEDGEMENTS

This Sutter County Climate Action Plan is the outcome of work contributed by a number of individuals. We wish to thank all individuals who contributed to the success of this report, in particular:

Sutter County, Community Services Department, Lisa Wilson, Planning Manager

Sutter County, Community Services Department, Steve Geiger, Principal Planner

Sutter County, Public Works, Water Resources Division, Daniel W. Peterson, P.E., CFM Chief

Sutter County, Public Works, Fleet Management , Robert Starr, Deputy Director of General Services

Sutter County, Public Works, Fleet Management, Al Sawyer, Assistant Public Works Director

Sutter County, Public Works, Maintenance, Frosty Southard

Sutter County, Public Works, Fleet Management, Polly Morris, Accountant I

Sutter County, Purchasing, Dori Montgomery

Sutter County, , Public Works, Guadalupe Rivera, Associate Civil Engineer

Sutter County, Department of Agriculture, Laura Poma, Executive Secretary

Pacific Gas and Electric Company (PG&E), Green Communities and Innovator Pilots, John Bohman, Customer Energy Efficiency

Recology Yuba Sutter, Terry Bentley

EXECUTIVE SUMMARY

The County of Sutter is committed to reducing greenhouse gas (GHG) emissions in an effort to provide a more livable, equitable and economically vibrant community. By using energy more efficiently, harnessing renewable energy to power our buildings, enhancing access to sustainable transportation modes, and recycling our waste, we can keep dollars in our local economy, create new green jobs and improve community quality of life. These efforts toward reducing GHG emissions must be done in coordination with the County of Sutter's (County) land use decisions. The foundation of planning land use decisions are the General Plan policies and programs.

To further this commitment, Sutter County has established policies that incorporate environmental responsibility into its daily management of residential, commercial and industrial growth, education, energy and water use, air quality, transportation, waste reduction, economic development, and open space and natural habitats.

As a foundation in these efforts, the County has developed a baseline GHG emissions inventory, a methodology for tracking and reporting emissions in the future, and recommendations for GHG reduction strategies. An indicator of the success of these efforts will be a measured reduction in greenhouse gas (GHG) emissions using the protocols discussed herein.

Sutter County has elected to be green and sustainable. Sutter County's community of residents, workers, and visitors strive together to balance ecological, economic, and social needs to ensure a clean, healthy and safe environment for all current members of society and for generations to come.

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LIST OF ACRONYMS

AB 32	Assembly Bill 32, The California Climate Change Solutions Act of 2006
ADWF	Average Daily Wastewater Flow
ARRA	American Recovery & Reinvestment Act
BAU	Business as usual scenario
BTU	British thermal unit
CARB	California Air Resources Board
CAA	Clean Air Act
CAAQS	California Ambient Air Quality
Cal EPA	California Environmental Protection Agency
Cal Recycle	California Department of Resources Recycling and Recovery
CANHP	California New Home Program
CAO	County Administrative Officer
CAS	California Climate Adaption Strategy
CAT	Climate Action Team
CCAT	California Climate Action Team
CCAR	California Climate Action Registry
CCR	California Code of Regulations
CCTP	Climate Change Technology Program
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFC	Chlorofluorocarbons
C_2F_6	Hexafluoroethane
CF_4	Carbon Tetrafluoride
CH_4	Methane
CIWB	California Integrated Waste Board
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Equivalent Carbon dioxide
CREB	Clean Renewable Energy Bonds
CSD	Community Services District
CSI	California Solar Initiative
CTC	California Transportation Commission
CWSRF	Clean Water State Revolving Funds
DKM	dekatherm
DPM	Diesel Particulate Matter
EECGB	Energy Efficiency Community Block Grant
EMFAC2007	On-Road Emission Factors published by the CARB in 2007
ESCO	Energy Service Company

FRAQMD	Feather River Air Quality Management District
GCC	Global Climate Change
GHG	Greenhouse Gas
GRT	GHG Reduction Team
GWhs	Gigawatt Hours
GWP	Global Warming Potential
HFC	Hydrofluorocarbons
HFC-23	Trifluoromethane
HFC-134	Hydrofluorocarbon 134
HFC-152a	Difluoroethane
IIP	Interregional Improvement Program (IIP)
IPCC	Intergovernmental Panel on Climate Change
ITS	Intelligent Transportation Systems
Lbs/year	Pounds per Year
LEED	Leadership in Energy and Environmental Design
MMBTU	Million Metric BTUs
MMT	Million Metric Tonne
MMT CO_2e	Million Metric Tonne Carbon Dioxide Equivalent
MT	Metric Tonne
MT CO_2e	Metric Tonne Carbon Dioxide Equivalent
MWh	Megawatt hours
MWh/year	Megawatt hours per year
N_2O	Nitrous Oxide
NSHP	New Solar Home Program
O_3	Ozone
PFC	Tetrafluoromethane
PG&E	Pacific Gas and Electric
RCRA	Resource Conservation and Recovery Act
RIP	Regional Improvement Program
RTIP	Regional Transportation Improvement Program
SACOG	Sacramento Area Council of Governments
SIP	State Implementation Plan
SF_6	Sulfur Hexafluoride
STEP	Septic Tank Effluent Pumping system
STIP	State Transportation Improvement Plan
URBEMIS 2007	Urban Emissions Model, version 9.2 published in June 2007
USEPA	United States Environmental Protection Agency
VMT	Vehicle miles traveled
WWD No1	Water Works District Number 1

Section 1 Introduction

The County of Sutter is committed to reducing greenhouse gas (GHG) emissions in an effort to provide a more livable, equitable and economically vibrant community. By using energy more efficiently, harnessing renewable energy to power our buildings, enhancing access to sustainable transportation modes, and recycling our waste, we can keep dollars in our local economy, create new green jobs and improve community quality of life. These efforts toward reducing GHG emissions must be done in coordination with the County of Sutter's (County) land use decisions. The foundation of planning land use decisions are the General Plan policies and programs.

The policies and programs of the County General Plan are intended to underlie most land use decisions. Preparing, adopting, implementing, and maintaining a general plan serves to:

- Define the community's environmental, social, and economic goals;
- Provide citizens with information about their community and to provide them with opportunities to participate in the planning and decision-making processes of their community;
- Coordinate the community and environmental protection activities among local, regional, state and federal agencies; and
- Guide in the development of the community.

The Environmental Resources and Infrastructure Elements of the General Plan address a number of different natural resources within the County that must be managed properly. Among these resources are energy, air quality, and the control of GHG emissions. Goals within these elements specifically speak to energy conservation and air quality. In order to achieve these goals and to provide a more livable, equitable and economically vibrant community, the County has committed to prepare and implement the Sutter County Climate Action Plan (CAP) to ensure the impact of development on air quality is minimized, energy conserved, and that land use decisions made by the County and all internal operations within the County are consistent with adopted state legislation.

This section describes the purpose and goals of the CAP; describes the relationship of the CAP to the County General Plan, provides background information on GHG emissions; and summarizes the regulatory framework surrounding GHG emissions and climate change.

1.1 Purpose

The CAP was designed under the premise that the County, and the community it represents, is uniquely capable of addressing emissions associated with sources under the County's jurisdiction and that the County's emission reduction efforts should coordinate with the state strategies of reducing emissions in order to accomplish these reductions in an efficient and cost effective manner. The County developed this document with the following purposes in mind:

- Create a GHG emissions baseline from which to benchmark GHG reductions;
- Provide a plan that is consistent with and complementary to: the GHG emissions reduction efforts being conducted by the State of California through the Global Warming Solutions Act (AB 32); the Federal Government through the actions of the Environmental Protection Agency; and the global community through the Kyoto Protocol;
- Guide the development, enhancement, and implementation of actions that aggressively reduce GHG emissions; and
- Provide a policy document with specific implementation measures meant to be considered as part of the planning process for future development projects.

1.2 Goals

To fulfill the purposes of the CAP, the County identified the following goals to be achieved:

- Provide a list of specific actions that will reduce GHG emissions, giving the highest priority to actions that provide the greatest reduction in GHG emissions and benefits to the community at least cost;
- To reduce emissions attributable to Sutter County to levels consistent with the target reductions of AB 32; and
- Establish a qualified reduction plan for which future development within the County can tier and thereby streamline the environmental analysis necessary under the California Environmental Quality Act (CEQA).

1.3 Relationship to the County General Plan

The General Plan includes a series of linked documents including technical reports, and elements containing goals, policies, and implementation programs that provide direction to the County on managing its resources and how future development will occur.

The CAP is a separately bound document that will provide another implementation tool of the General Plan to guide development in the County. The CAP focuses development on attaining the various goals and policies of the General Plan and all community plans relative to greenhouse gas emissions and to achieve the goals outlined in Section 1.2 above.

1.4 Background

The CAP achieves the purpose and goals described above by providing:

- An analysis of GHG emissions and sources attributable to the County of Sutter;
- Estimates on how those emissions are expected to increase;
- Recommended policies and actions that can reduce GHG emissions to meet State, Federal and International targets;
- A timeline of implementation; and
- A defined tracking and reporting mechanism that will measure progress toward the goals.

In order to understand this process, the reader needs to know a few facts about GHG emissions, the climate change impacts anticipated within the County of Sutter, and the international, federal, state, and local regulatory framework designed to address climate change. The following information provides a brief background on these topics. A more complete description of the greenhouse effect, GHG emissions, and general climate change impacts can be found in Appendix A of this document.

1.4.1 Greenhouse Gases

Parts of the Earth's atmosphere act as an insulating blanket of just the right thickness, trapping sufficient solar energy to keep the global average temperature in a suitable range. The "blanket" is a collection of atmospheric gases called "greenhouse gases," based on the idea that these gases also trap heat like the glass walls of a greenhouse. These gases, consisting mainly of water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and chlorofluorocarbons (CFCs), all act as effective global insulators, reflecting back to earth infrared radiation. Human activities, such as producing electricity and driving internal combustion vehicles, emit these gases into the atmosphere.

Due to the successful global bans on chlorofluorocarbons (primarily used as refrigerants, aerosol propellants and cleaning solvents), Sutter County does not generate significant emissions of these GHGs. This also includes other synthesized gases such as hydrofluorocarbons (HFCs) and carbon tetrafluoride (CF_4) which have been banned and are no longer available on the market. Because of the ban, the County of Sutter will not generate emissions of these GHGs and therefore, they are not considered any further in this document.

Another GHG with a high global warming potential is sulfur hexafluoride (SF_6), which is mainly used as a gaseous dielectric medium in electric switchgear of high voltage electric transmission lines and medical use in retinal detachment surgery and ultrasound imaging. In both uses, SF_6 is not released to the atmosphere and therefore, it is not considered further in this document.

Because GHGs have variable potencies, a common metric of carbon dioxide equivalents (CO_2e) is used to report the combined potency from all of the GHGs. The potency each GHG has in the atmosphere is measured as a combination of the volume of its emissions and its global warming potential[1], and is expressed as a function of the potency with respect to the same mass of CO_2. Thus, by multiplying the individual gas by its global warming potential, the emissions of each individual gas can be measured in terms of metric tons of CO_2e (MT CO_2e).

1.5 Regulatory Setting

In an effort to stabilize GHG emissions and reduce impacts associated with climate change, international agreements, as well as federal and state actions were implemented beginning as early as 1988. The international, federal, state, regional, and local government agencies discussed below work jointly, as well as individually, to address GHG emissions through legislation, regulations, planning, policy-making, education, and a variety of programs.

1.5.1 International and Federal

1.5.1.1 Kyoto Protocol

The United States participated in the United Nations Framework Convention on Climate Change (UNFCCC) (signed on March 21, 1994). The Kyoto Protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. It has been estimated that if the commitments outlined in the Kyoto Protocol are met, global GHG emissions could be reduced by an estimated 5 percent from 1990 levels during the first commitment period of 2008–2012. It should be noted that although the United States is a signatory to the Kyoto Protocol, Congress has not ratified the Protocol and the United States is not bound by the Protocol's commitments.

In anticipation of providing an updated international treaty for the reduction of GHG emissions, representatives from 170 countries met in Copenhagen in December 2009 to ratify

[1] The potential of a gas or aerosol to trap heat in the atmosphere.

an updated UNFCCC agreement (Copenhagen Accord). The Copenhagen Accord, a voluntary agreement between the United States, China, India, and Brazil, recognizes the need to keep global temperature rise to below 2 ^{0}C and obliges signatories to establish measures to reduce greenhouse gas emissions and to prepare to provide help to poorer countries in adapting to Climate Change. It is anticipated that the Copenhagen Accord will be finalized and signed by representatives of the participating governments by the end of 2010.

1.5.1.2 Climate Change Technology Program

The United States has opted for a voluntary and incentive-based approach toward emissions reductions in lieu of the Kyoto Protocol's mandatory framework. The Climate Change Technology Program (CCTP) is a multi-agency research and development coordination effort (which is led by the Secretaries of Energy and Commerce) that is charged with carrying out the President's National Climate Change Technology Initiative.

1.5.1.3 United States Environmental Protection Agency

The United States Environmental Protection Agency (USEPA) is responsible for implementing federal policy to address global climate change. The Federal government administers a wide array of public-private partnerships to reduce GHG intensity generated by the United States. These programs focus on energy efficiency, renewable energy, methane and other non-CO_2 gases, agricultural practices, and implementation of technologies to achieve GHG reductions. The USEPA implements several voluntary programs that substantially contribute to the reduction of GHG emissions.

In Massachusetts v. Environmental Protection Agency (Docket No. 05–1120), argued November 29, 2006 and decided April 2, 2007, the U.S. Supreme Court held that the USEPA has authority to regulate greenhouse gases, and the USEPA's reasons for not regulating this area did not fit the statutory requirements. As such, the U.S. Supreme Court ruled that the USEPA should be required to regulate CO_2 and other greenhouse gases as pollutants under Section 202(a)(1) of the federal Clean Air Act (CAA).

The USEPA issued a Final Rule for mandatory reporting of GHG emissions in October of 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufactures of heavy-duty and off-road vehicles and vehicle engines, and requires annual

reporting of emissions. The Final Rule was effective December 29,2009, with data collection to begin on January 1,2010, and the first annual reports due in March of 2011. This rule does not regulate the emission of GHGs it only requires the monitoring and reporting of greenhouse gas emissions for those sources above certain thresholds (USEPA 2009). USEPA adopted a Final Endangerment Finding for the six defined GHGs on December 7, 2009. The Endangerment Finding is required before USEPA can regulate GHG emissions under Section 202(a)(1) of the CAA in fulfillment of the U.S. Supreme Court decision.

On May 13, 2010, the USEPA issued a final rule that establishes a common sense approach to addressing greenhouse gas emissions from stationary sources under the CAA permitting programs. This final rule sets a threshold of 75,000 tons per year for GHG emissions. New and existing industrial facilities that meet or exceed that threshold will require a permit under the New Source Review Prevention of Significant Deterioration (PSD) and title V Operating Permit programs. This rule will take effect on January 2, 2011.

1.5.2 State

1.5.2.1 California Air Resources Board

The California Air Resources Board, a part of the California Environmental Protection Agency (CalEPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, sets state ambient air quality standards (California Ambient Air Quality Standards (CAAQS)), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB has primary responsibility for the development of California's State Implementation Plan (SIP), for which it works closely with the federal government and the local air districts.

1.5.2.2 Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets:

- By 2010, California shall reduce GHG emissions to 2000 levels;
- By 2020, California shall reduce GHG emissions to 1990 levels; and

- By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

The first California Climate Action Team (CCAT) Report to the Governor in 2006 contained recommendations and strategies to help meet the targets in Executive Order S-3-05. In April 2010, the Draft California Action Team (CAT) Biennial Report expanded on the policy oriented 2006 assessment. The new information detailed in the CAT Assessment Report includes development of revised climate and sea-level projections using new information and tools that have become available in the last two years; and an evaluation of climate change within the context of broader social changes, such as land-use changes and demographic shifts (CCAT 2010). The action items in the report focus on the preparation of the Climate Change Adaptation Strategy, required by Executive Order S-13-08, described below.

1.5.2.3 Assembly Bill 32, The California Global Warming Solutions Act of 2006.

In 2006, the California State Legislature adopted AB 32, the California *Global Warming Solutions Act of 2006*. AB 32 focuses on reducing GHG in California. GHGs as defined under AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. AB 32 required CARB to adopt rules and regulations that would achieve greenhouse gas emissions equivalent to 1990 statewide levels by 2020. On or before June 30, 2007, CARB was required to publish a list of discrete early action GHG emission reduction measures that would be implemented by 2010. The law further required that such measures achieve the maximum technologically feasible and cost effective reductions in GHGs from sources or categories of sources to achieve the statewide greenhouse gas emissions limit for 2020.

CARB published its final report for Proposed Early Actions to Mitigate Climate Change in California in October 2007. This report described recommendations for discrete early action measures to reduce GHG emissions. The measures included are part of California's strategy for achieving GHG reductions under AB 32. Three new regulations are proposed to meet the definition of "discrete early action greenhouse gas reduction measures," which include the following: a low carbon fuel standard; reduction of HFC-134a emissions from non-professional servicing of motor vehicle air conditioning systems; and improved landfill methane capture (CARB 2007). CARB estimates that by 2020, the reductions from those three measures would be approximately 13-26 million metric tons (MMT) CO_2e.

Under AB 32, CARB has the primary responsibility for reducing GHG emissions. CARB has published a staff report titled *California 1990 GHG Emissions Level and 2020 Emissions Limit* (CARB 2007) that determined the statewide levels of GHG emissions in 1990 to be 427 MMT CO_2e. Additionally, in December 2008, CARB adopted the *Climate Change Scoping Plan*, which outlines the State's strategy to achieve the 2020 GHG limit. This Scoping Plan proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve the environment, reduce dependence on oil, diversify energy sources, save energy, create new jobs, and enhance public health. The plan emphasizes a cap-and-trade program, but also includes the discrete early actions.

1.5.2.4 Senate Bill 97 (SB 97)

SB 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directed the California Office of Planning and Research (OPR) to develop draft State CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions" and directed the Resources Agency to certify and adopt the State CEQA Guidelines.

On April 13, 2009, OPR submitted the proposed amendments to the Secretary for Natural Resources. The Natural Resources Agency conducted formal rulemaking in 2009, certified, and adopted the amendments in December 2009. The California Office of Administrative Law codified into law the amendments in March 2010. The amendments became effective in June 2010 and provide regulatory guidance with respect to the analysis and mitigation of the potential effects of GHG emissions.

CEQA Guidelines § 15183.5, Tiering and Streamlining the Analysis of GHG Emissions, was added as part of the CEQA Guideline amendments and describes the criteria needed in a Climate Action Plan that would allow for the tiering and streamlining of CEQA analysis for subsequent development projects. The following quote is from the CEQA Guideline amendments:

"§15183.5. Tiering and Streamlining the Analysis of Greenhouse Gas Emissions.

(a) Lead agencies may analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate plan to reduce greenhouse gas emissions. Later project-specific environmental

documents may tier from and/or incorporate by reference that existing programmatic review. Project-specific environmental documents may rely on an EIR containing a programmatic analysis of greenhouse gas emissions as provided in section 15152 (tiering), 15167 (staged EIRs) 15168 (program EIRs), 15175-15179.5 (Master EIRs), 15182 (EIRs Prepared for Specific Plans), and 15183 (EIRs Prepared for General Plans, Community Plans, or Zoning).

(b) Plans for the Reduction of Greenhouse Gas Emissions. Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.

(1) Plan Elements. A plan for the reduction of greenhouse gas emissions should:

(A) Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;

(B) Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;

(C) Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;

(D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;

(E) Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels;

(F) Be adopted in a public process following environmental review.

(2) Use with Later Activities. A plan for the reduction of greenhouse gas emissions, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis of later projects. An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. If there is substantial evidence that the effects of a particular project may be cumulatively considerable notwithstanding the project's compliance with the specified requirements in the plan for the reduction of greenhouse gas emissions, an EIR must be prepared for the project."

One of the goals of the CAP is to allow programmatic level review and mitigation of GHG emissions that allows for the streamlining of CEQA review for subsequent development projects. To accomplish this, the CAP framework is designed to fulfill the requirements identified in CEQA Guidelines § 15183.5, above.

1.5.2.5 Executive Order S-13-08

On November 14, 2008, Governor Schwarzenegger issued Executive Order S-13-08, the Climate Adaptation and Sea Level Rise Planning Directive, which provides clear direction for how the State should plan for future climate impacts. Executive Order S-13-08 calls for the implementation of four key actions to reduce the vulnerability of California to climate change:

- Initiate California's first statewide Climate Change Adaptation Strategy (CAS) that will assess the State's expected climate change impacts, identify where California is most vulnerable, and recommend climate adaptation policies;
- Request that the National Academy of Sciences establish an expert panel to report on sea level rise impacts in California in order to inform State planning and development efforts;
- Issue interim guidance to State agencies for how to plan for sea level rise in designated coastal and floodplain areas for new and existing projects; and
- Initiate studies on critical infrastructure projects and land-use policies vulnerable to sea level rise.

The 2009 CAS report summarizes the best known science on climate change impacts in the state to assess vulnerability, and outlines possible solutions that can be implemented within and

across state agencies to promote resiliency. This is the first step in an ongoing, evolving process to reduce California's vulnerability to climate impacts. (California Natural Resources Agency 2009).

1.5.2.6 California Code of Regulations (CCR) Title 24, Part 6

CCR Title 24, Part 6: *California's Energy Efficiency Standards for Residential and Nonresidential Buildings* (Title 24) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Electricity production by fossil fuels results in GHG emissions and energy efficient buildings require less electricity. Therefore, increased energy efficiency results in decreased GHG emissions.

The Energy Commission adopted 2008 Standards on April 23, 2008 and the Building Standards Commission approved them for publication on September 11, 2008. These updates became effective on August 1, 2009. The Energy Commission adopted the 2008 changes to the Building Energy Efficiency Standards for several reasons:

- To provide California with an adequate, reasonably priced, and environmentally sound supply of energy;
- To respond to AB 32, the Global Warming Solutions Act of 2006, which mandates that California must reduce its GHG emissions to 1990 levels by 2020;
- To pursue California energy policy, which states that energy efficiency is the resource of first choice for meeting California's energy needs;
- To act on the findings of California's Integrated Energy Policy Report (IEPR) that concludes that the Standards are the most cost effective means to achieve energy efficiency, expects the Building Energy Efficiency Standards to continue to be upgraded over time to reduce electricity and peak demand, and recognizes the role of the Standards in reducing energy related to meeting California's water needs and in reducing GHG emissions;
- To meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of state building codes; and
- To meet the Executive Order in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards.

1.5.3 Regional

The Feather River Air Quality Management District (FRAQMD) is responsible to promote and improve the air quality of Sutter and Yuba counties. This is accomplished through monitoring, evaluation, education, implementation of control measures to reduce emissions from stationary

sources, permitting and inspection of pollution sources, enforcement of air quality regulations, and by supporting and implementing measures to reduce emissions from motor vehicles. The FRAQMD contains stationary-, area-, and mobile-source control measures designed to bring the area into compliance with the state ozone standards. Sutter County is part of the Sacramento Valley Air Basin (SVAB). The SVAB consists of the northern half of the Central Valley and approximates the drainage basin for the Sacramento River and its tributaries. The SVAB is bounded on the west by the Coast Range, on the north by the Cascade Range, on the east by the Sierra Nevada, and on the south by the San Joaquin Valley Air Basin.

Currently the FRAQMD has not established guidance for the evaluation of GHGs or the establishment of a Climate Action Plan, opting instead to recommend the use of existing methodologies. The FRAQMD specifically cites the California Air Pollution Control Officers Association, and California Natural Resources Agency's Climate Change Portal, and the Office of the Attorney General among others for assistance in evaluating GHG emissions.

Section 2 Methodology

2.1 Overview

The methodology to prepare the GHG inventories in the CAP incorporates the protocols, methods, and emission factors found in the California Climate Action Registry (CCAR) General Reporting Protocol (version 3.1, January 2009), and the Local Government Protocol (version 1.1, May 2010). The Local Government Protocol (version 1.1, May 2010) categorizes GHG emissions into three distinct scopes that provide a way of organizing the CAP's development.

Definition of Local Government Protocol:

- **Scope 1 Emissions** includes all "direct" sources of GHG emissions from sources that are owned or controlled by the County including (but not limited to): production of electricity, heat, or steam in owned or controlled boilers, furnaces, etc; transportation (using corporate or fleet vehicles) of materials, products, waste, and community members; and fugitive emissions (from unintentional leaks of GHGs directly into the atmosphere).

- **Scope 2 Emissions** account for "indirect" sources of GHG emissions from the generation of purchased utilities consumed by the County. A purchased utility is defined as one that is bought or otherwise brought into the jurisdictional authority of the local government, but not physically generated in power plants owned and/or operated by the local government. Scope 2 emissions physically occur at locations outside of the jurisdictional boundaries and direct control of the local government and thus are separated from direct emissions reported by the utility company or local government in order to avoid double counting.

- **Scope 3 Emissions** is considered an optional reporting category that allows for the treatment of all other "indirect emissions". Scope 3 emissions are a consequence of the activities of the local government, but occur from sources not owned or controlled by the local government.

Because Scope 3 emissions are indirect emissions that are attributable to emissions sources that are not owned or controlled by Sutter County, they are not considered in this CAP. Scope 1

emissions are characterized and named in this report as “direct emissions.” Scope 2 emissions are characterized and named as “indirect source emissions.”

The analysis relative to the CAP employs both quantitative and qualitative components. The quantitative analysis contains an inventory of the County’s GHG emissions, while the qualitative component involves compliance with the emission reduction strategies contained in federal, State, and local legislation.

The analysis is tailored to include all historic, existing, and projected emission sources within the County while providing, to the fullest extent feasible, a comprehensive analysis of GHG impacts and mitigation measures available to reduce impacts. The Global Warming Solutions Act of 2006 (AB 32) established a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gas emissions. The law mandates the reduction of CO_2e emissions in California to 1990 levels by 2020.

2.2 GHG Emissions in Sutter County

The first step in developing the CAP was to establish an existing inventory of Sutter County’s GHG emissions. The purpose of this inventory is to identify and categorize the major sources and quantities of GHG emissions currently being produced by the County’s residents, businesses and municipal operations. The CAP established 2008 for the determination of the existing inventory. The inventory provides a framework on which to design programs and actions that specifically target reductions by emissions sources. The inventory also serves as a reference against which to measure the County’s progress towards reducing GHG emissions over time, and documentation for potential emission trading opportunities.

The CAP establishes 1990 as the target year, in conformance with the AB 32 target goals. AB 32 mandates the reduction of the State's GHG emissions to 1990 levels by the year 2020 and requires that CARB implement regulations to achieve these reductions. Finally, the CAP estimates the anticipated emissions for 2020 based on expected growth in land use.

In estimating Sutter County’s total greenhouse gas emissions, data from County, regional, and State agencies were used. For community energy statistics, the following agencies and County departments were consulted: the Sutter County Community Services, Sutter County Department of Public Works, and Pacific Gas & Electric Company (PG&E). Agriculture data

sources included Sutter County Department of Agriculture, CARB, and the FRAQMD. Transportation data sources included Sutter County Public Works Department (Airport), California Department of Transportation, Amtrak, CARB, and the California Department of Motor Vehicles. Solid waste data was gathered from California Integrated Waste Board (CIWB), California Department of Resources Recycling and Recovery (Cal Recycle) and Recology Ostrom Road Landfill.

In cases where specific historical or forecast data was not available, estimates were made by extrapolating from existing data based on growth in land use. General estimate calculations and assumptions are compiled in Appendices B through G. All of the contributors to greenhouse gas emissions (kilowatt-hours of electricity generated by fossil fuel combustion in power plants, natural gas in therms, vehicle travel in vehicle miles traveled, solid waste in tons) are expressed in the common unit of tons of CO_2e released into the atmosphere in a given year.

Sutter County's main contribution to GHGs is carbon dioxide. The County will directly generate emissions of CO_2 primarily in the form of vehicle exhaust, consumption of natural gas for heating and agriculture production. Sutter County will also generate emissions from methane and nitrous oxide. Methane is directly generated from agricultural production, natural gas and petroleum systems, and wastewater treatment. Nitrous oxide results predominately from agricultural production and motor vehicle use.

2.3 Calculation of GHGs

The following summarizes the basis of the GHG calculations by emission source. The emissions calculations follow the California Climate Action Registry (CCAR) General Reporting Protocol, version 3.1 (January 2009), Local Government Protocol, version 1.1 (May 2010), the Urban Forestry Protocol, version 1.1 (Climate Action Reserve, March 2010) and CARB's Mandatory GHG Reporting Regulations (Title 17, California Code of Regulations, Sections 95100 et seq.). These protocols are consistent with the methodology and emission factors endorsed by Feather River Air Quality Management District, the CARB and USEPA. In cases where the various protocols do not contain specific source emission factors, current industry standards or AP 42, emission factors published by USEPA, were used.

Equations used in the calculations of GHG's are included in Appendix B. Specific calculations of GHG emissions for 1990, 2008, and 2020 inventories are included in Appendices C through G.

When data was not available for 1990, estimations for this inventory were based on square footage of land use given a 15 percent reduction from existing values. 2020 data was calculated based on the anticipated development levels or as a fraction of the utility projections for 2030 build-out levels as documented in the County's General Plan Update.

In this CAP, Business-As-Usual (BAU) refers to the continued operations and development of the County without the inclusion of recently-adopted sustainability initiatives. The BAU scenario describes how emissions would be in year 2020, if the emissions inventory continued to grow strictly based upon the land use growth projections for the County and the naturally occurring events that might change the character of emissions. Therefore, BAU follows a fairly linear growth pattern of emissions with minor changes associated with the increasing density that is naturally occurring due to the continued urbanization of the County. There is a modest reduction in vehicle miles traveled based upon continued urbanization, but BAU does not include the programs that the Sutter County is implementing in the General Plan update and this CAP.

GHG emissions are typically segregated into direct and indirect sources as discussed above. However, direct and indirect sources are not completely independent of each other and are often combined into other more encompassing categories. For example, although natural gas combustion is a direct source and electricity generation is an indirect source, they both are typically discussed under a heading of "Energy" when policies are put in place to reduce emissions. Therefore, this CAP discusses emissions with respect to the general source categories of Energy, Solid Waste, Landscape Emissions, Transportation, and Agriculture as discussed below.

2.3.1 Energy

2.3.1.1 Electricity:

The County emits CO_2, CH_4, and N_2O through the use of electricity. Annual electricity usage obtained from PG&E (PG&E 2010) for the existing inventory, was used in determining electricity consumption and generation emission estimates for the 1990 inventory based on a growth of 15 percent between 1990 and 2008. For 2020, the emissions estimates were estimated as a percentage of the anticipated 2030 build-out usage. Development in 2020 is anticipated to be approximately 40 percent of the planned build-out development for 2030.

PG&E provides electricity from a variety of sources including natural gas, nuclear, Large Hydroelectric, renewable and coal. Each of these sources of electricity emits different amounts of GHGs. Therefore, emissions from electricity was determined by multiplying the annual usage in megawatt hours per year (MWh/year) by the PG&E emission factors appropriate to the inventory year for CO_2, CH_4, and N_2O.

2.3.1.2 Natural Gas Combustion:

The County emits GHGs from the combustion of natural gas. The annual natural gas usage for the County in million British Thermal Units (MMBTUs) was multiplied by the respective emissions factors for CO_2, CH_4, and N_2O to determine the emissions from natural gas combustion, typically used for heating. Existing inventory consumption levels were obtained for from PG&E and 1990 and 2020 consumption estimates were determined as described under electricity.

2.3.1.3 Potable Water:

Electricity is needed to move and treat water. Water Works District No. 1 (WWD #1) is responsible for providing water and wastewater services to the Community of Robbins (Sutter County 2010). The water system currently operates one active ground water well, one backup ground water well and one storage tank that provides the Community's residents with potable water. The active ground water well incorporates treatment for iron and manganese. The remainder of the water in the County is drawn from wells associated with the individual land uses. The amount of electricity consumed by the individual wells cannot be segregated out of the total electrical consumption from these individual land uses. In order to avoid the double counting of emissions, the electricity used to draw water from individual wells is included in the electricity consumption of these land uses and is not included in the water usage calculations. Existing inventory consumption levels were obtained from Sutter County while 1990 and 2020 consumption estimates were determined as described under electricity.

Electricity from potable water supplied by the WWD #1 is calculated by multiplying annual gallons of water purchased by a conversion factor for the amount of MWh of electricity used to treat and transport the water to the County. Emissions are then determined for electrical consumption as discussed above.

2.3.1.4 Waste Water Treatment:

Portions of Sutter County's wastewater are treated by a Septic Tank Effluent Pumping (STEP) system. The majority of the County is served by individual on-site septic systems with leach lines. The individual on-site septic systems do not result in onsite GHG emissions. However, the individual on-site septic systems require pumping every five years. The pumped contents are then treated. The combined treatment of wastewater from the STEP system and the on-site septic systems totals on average 10 million gallons of wastewater per year using primary and secondary treatment technology. The Rio Ramaza Community Services District (CSD) is responsible for providing wastewater services to the Community of Rio Ramaza. Currently, the nine homes in the Rio Ramaza Subdivision are served by 1.5 miles of sewer line, a sewer lift station and two wastewater ponds. Treatment capacity is 10,000 gallons per day (gpd), but the existing Average Daily Wastewater Flow (ADWF) is only 1,400 gpd. As a conservative estimate of wastewater generation, 100 percent of all of the potable water is assumed to be exported as wastewater. As with potable water, emissions from wastewater are determined based on the electricity needed to pump and treat the wastewater.

2.3.2 Solid Waste Management

Emissions from solid waste are determined as the sum of emissions generated by transportation from its source to the landfill, the equipment used in its disposal at the landfill, and the fugitive emissions from decomposition in landfills. Annual solid waste tonnage data for the existing inventory was provided by Cal Recycle, California Integrated Waste Board, the Yuba/Sutter JPA Solid Waste Management and Recology Ostrom Road Landfill.

Emissions from the transportation of solid waste is determined based on the annual pounds per year (lbs/year) of total waste disposed in landfills, the density of the waste, the capacity of the hauling trucks, the average number of miles traveled by each truck, and the CO_2, CH_4, and N_2O emissions generated per mile traveled.

Emissions from the equipment used at the landfills is typically calculated by determining the average hours of operation per day, the number of days of operation, and the emission factors for disposal equipment for CO_2, CH_4, and N_2O as determined from CARB off-road mobile source emission factors. However, these emissions are not included in the following inventories

because the landfills are not under the jurisdiction of the County and therefore the County has no direct control over the emissions generated from onsite operations.

Fugitive emissions of methane from the decomposition of solid waste are calculated based on the annual waste generation multiplied by the respective emission factors for waste production for CH_4. Although CO_2 is a bi-product of waste decomposition, the USEPA considers these emissions to be natural and not anthropogenic. Therefore they are not included in the emissions inventory. Nitrous Oxide is not a bi-product of decomposition and therefore no fugitive emissions of nitrous oxide are anticipated from this source.

2.3.3 Landscape Emissions

Emissions of CO_2, CH_4, and N_2O are generated by the use of landscape equipment through the combustion of gasoline. CO_2 emissions were determined directly through URBEMIS2007 for the existing and 2020 inventories, and based on a 15 percent reduction from existing for 1990. URBEMIS2007 is a computer software package that is used for modeling projected emissions of air quality pollutants including carbon dioxide. From the CO_2 emissions, the approximate number of gallons of gasoline consumed through landscape equipment use was calculated. This number was then multiplied by emission factors presented in the General Reporting Protocol, version 3.1 (CCAR 2010) to determine both CH_4 and N_2O emissions.

2.3.4 Transportation:

2.3.4.1 On-Road Vehicles

Carbon dioxide emissions from vehicles were calculated utilizing EMFAC2007 emission factors for the 1990, existing and 2020 inventories. The Emission Factors (EMFAC) model was developed by the Air Resources Board and used to calculate emission rates for on-road motor vehicles from light-duty passenger vehicles to heavy-duty trucks that operate on highways, freeways, and local roads in California. Motor vehicle emissions of CH_4, and N_2O were calculated using USEPA emission factors for on-road vehicles based on the total annual mileage driven (as obtained from URBEMIS2007) multiplied by their respective emission factors by year. Vehicle miles are determined through URBEMIS based on the number of dwelling units for residential land use types, or the square footage of commercial and industrial land use types, and trip rates provided for the General Plan Update (PBSJ 2010). URBEMIS2007 assumes that all vehicles are either gasoline or diesel powered. The estimates therefore do not account for electrical,

biodiesel (a blend of diesel and vegetable oil), or hydrogen powered systems. Any electrically powered vehicle which draws its power from a residence, commercial, or industrial land use will be accounted for in the electrical usage for the County. Vehicle trips for 1990 were estimated by backcasting from the existing land use and transportation data. Predicted 2020 BAU vehicle trips were estimated by using General Plan build-out conditions and interpolating back to year 2020.

2.3.4.2 Airport

The Sutter County airport accommodates approximately 77 planes for private and agricultural use. The GHG emissions from the usage of the aircraft were calculated based on the annual fuel consumption and the emission factors for airplane fuel for CO_2, CH_4, and N_2O. The consumption of fuel from an airport of this size is a minor portion of the total transportation emissions for the County. Fuel consumption for 1990 was backcasted from existing levels while the number of planes and approximate fuel usage for 2020 was assumed to be identical to the existing inventory based on an anticipated minor decrease in agricultural production between existing and 2020.

2.3.5 Agriculture

Agricultural procedures contribute directly to emissions of greenhouse gases through a variety of processes. Assessment of non-carbon-dioxide emissions are from the following source categories: enteric fermentation in domestic livestock, livestock manure management, rice and other crop cultivation, and field burning of agricultural residues.

Livestock emissions are divided into two categories based on the emissions source: enteric fermentation and manure management. Enteric fermentation is defined as a fermentation process that takes place in the stomach of ruminant animals. This process produces methane that is released through belching and flatulence. Manure management is the process of gathering and disposing of manure from livestock. Management practices vary by type of livestock, but in the case of dairy cows, manure is often collected and stored in lagoons. As the manure breaks down, methane is released.

Methane and nitrous oxide are the primary greenhouse gases emitted from crop cultivation and associated activities. Rice cultivation and field burning of agricultural residues are contributing sources of CH_4 (USEPA 2009b).

Agricultural related emissions for 1990 and existing (2008) were based on County and state records. Agricultural related emissions for year 2020 were estimated using General Plan build-out conditions and interpolating back to year 2020. Agricultural trends over the last few years have indicated a reduction in acreage harvested with the trend continuing into future years. The 2020 inventory presents a conservative estimate of agricultural activity with the only reduction in agriculture from existing levels being associated with the known development of agricultural land within the Sutter Pointe Specific Plan Area. The growth rates were determined from anticipated General Plan Update Build-out levels for 2030

Section 3 Greenhouse Gas Emissions Inventory

The emissions inventory identifies and categorizes the major sources and quantities of GHG emissions being produced by County residents, businesses, and municipal operations using the best available data. Using historic emissions and business-as-usual (BAU) practices as a basis, the inventory includes GHG emissions as projected for the 1990 target, 2008 existing, and 2020 future years.

Land use, from an emissions inventory perspective, deals strictly with emissions as related to land use types. For example, emissions from single family homes include aspects of transportation, waste generation and energy consumption. Therefore land use, as addressed here, strictly provides an alternative breakdown of the net yearly GHG emissions by general land use types. With respect to land use, industrial processes refers to all warehouse, light industrial, and industrial uses throughout the County; residential incorporates all single, multi family and congregate care dwelling units; and commercial encompasses all other uses within the County. Details on the various land use categories and how emissions were modeled for these categories are included in Appendix B.

3.1 1990 Emissions Inventory

In 1990, the County of Sutter's total GHG annual emissions were approximately 1.3 million tons CO_2e. The following tables and figures (Table 3-1, Table 3-2, Table 3-3, Table 3-4, Table 3-5, and Table 3-6; and Figure 3-1, Figure 3-2, and Figure 3-3), summarize the 1990 emissions by emissions category.

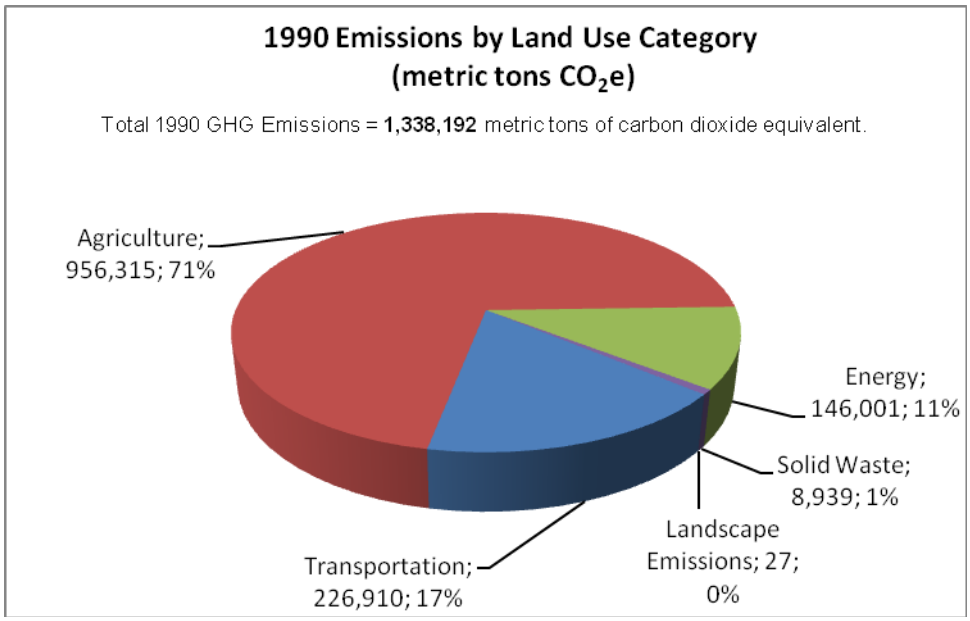
3.1.1 1990 Net Total Emissions

Table 3-1 summarizes the net 1990 County emissions of CO_2e as broken down by category. Each of these categories is further broken down in Tables 3-2 through 3-6 below. Figure 3-1 is a graphical representation of Table 3-1. A detailed breakdown of 1990 emissions by category is available in Appendix C.

Table 3-1: 1990 Net Total Emissions

Net Total Emissions	
Category	**Metric tons of CO_2e**
Energy	146,001
Solid Waste	8,938
Landscape Emissions	27
Agriculture	956,315
Transportation	226,910
Total	**1,338,192**

Figure 3-1: 1990 Emissions by Emissions Category (MT CO_2e)



3.1.2 1990 Energy Emissions

Emissions associated with 1990 energy were based on the emissions data and energy production collected by PG&E. Energy accounted for approximately 11 percent of the total emissions produced in 1990. This constitutes the third largest sector of emissions. Table 3-2 summarizes the emissions from energy generation and/or consumption with respect to electricity and natural gas. Electricity generation is determined based on the electricity purchased by Sutter County from PG&E used to meet the electric loads within the County. A detailed breakdown of 1990 energy emissions is available in Appendix C.

Table 3-2: 1990 Energy Emissions

Energy Emissions	
Sources:	**Metric tons of CO_2e**
Electric	55,823
Natural Gas	90,178
Total	**146,001**

3.1.3 1990 Solid Waste Emissions

Table 3-3 summarizes the 1990 County emissions from the transportation, and decomposition of solid waste generated with the County. Solid-waste-related emissions represent approximately one percent of the total GHG emissions generated by the Sutter County in 1990. A detailed breakdown of 1990 solid waste emissions is available in Appendix C.

Table 3-3: 1990 Solid Waste Emissions

Solid Waste Emissions	
Source	**Metric tons of CO_2e**
Solid Waste Disposal	8,939
Total	**8,939**

3.1.4 1990 Landscape Emissions

Table 3-4 summarizes the 1990 County emissions from Landscape activities. Landscape-related emissions represent less than 1 percent of the total GHG emissions generated by the County in 1990. Data is not available to accurately determine the emissions with respect to planting trees or fertilizer use or carbon sink from CO_2 sequestration. A detailed breakdown of 1990 Landscape Emissions is available in Appendix C.

Table 3-4: 1990 Landscape Emissions

Landscape Emissions	
Sources:	**Metric tons of CO_2e**
Landscape Emissions	27
Total	**27**

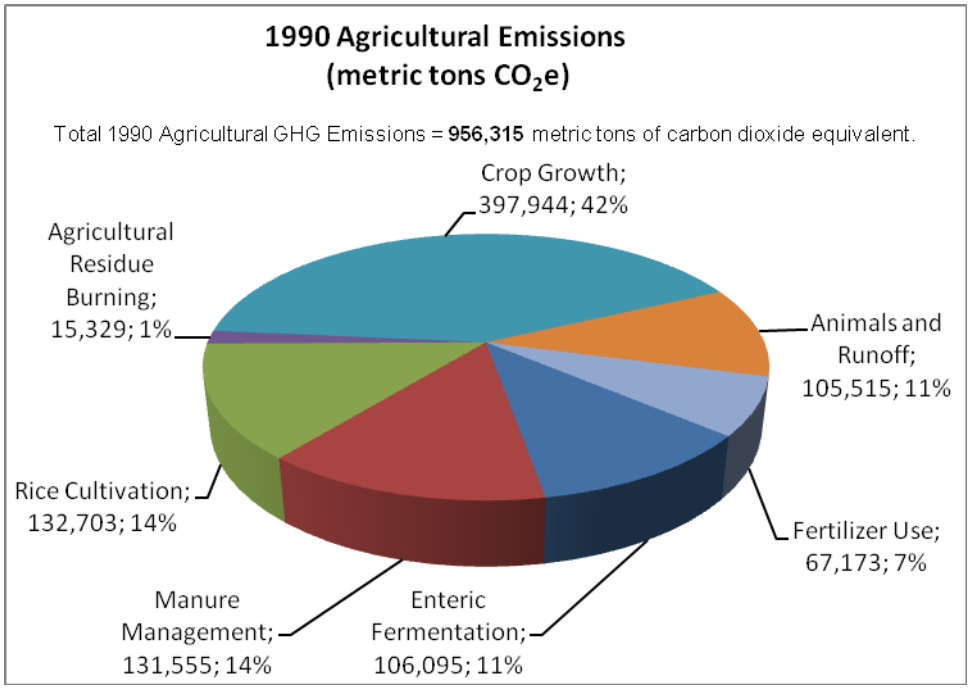
3.1.5 1990 Agricultural Emissions

Table 3-5 summarizes the 1990 County emissions with respect to agricultural activities. Agricultural emissions represent the majority of the County's emissions, accounting for 71 percent. Table 3-5 and Figure 3-2 represent the breakdown of agricultural emissions by activity. A detailed breakdown of 1990 Agricultural emissions is available in Appendix C. Note that rice is separated out from other crops because of the way rice grows. Rice requires inundation which causes anaerobic soil conditions that produces methane emissions. Other crops do not have this set of circumstances.

Table 3-5: 1990 Agricultural Emissions

Agriculture	
Sources:	**Metric tons of CO_2e**
Enteric Fermentation	106,095
Manure Management	131,555
Rice Cultivation	132,703
Agricultural Residue Burning	15,329
Crop Growth	397,944
Animals and Runoff	105,515
Fertilizer Use	67,173
Total	**956,315**

Figure 3-2: 1990 Agricultural Emissions (MT CO_2e)



3.1.6 1990 Transportation Emissions

Table 3-6 summarizes the 1990 County emissions with respect to airport usage and vehicle miles traveled for all vehicles with trip origins or destinations in the County. Details on the vehicle fleet and emissions calculations can be found in Appendices B and C. Transportation emissions do not include pass-through traffic on the freeways within the County, accounting only for vehicle trips related to the County land uses as starting points or destinations. The total vehicle miles traveled (VMT) related to these trips includes the total commute whether or not the entire trip is within County boundaries. Transportation-related emissions represent approximately 17 percent of the total GHG emissions generated by the County in 1990.

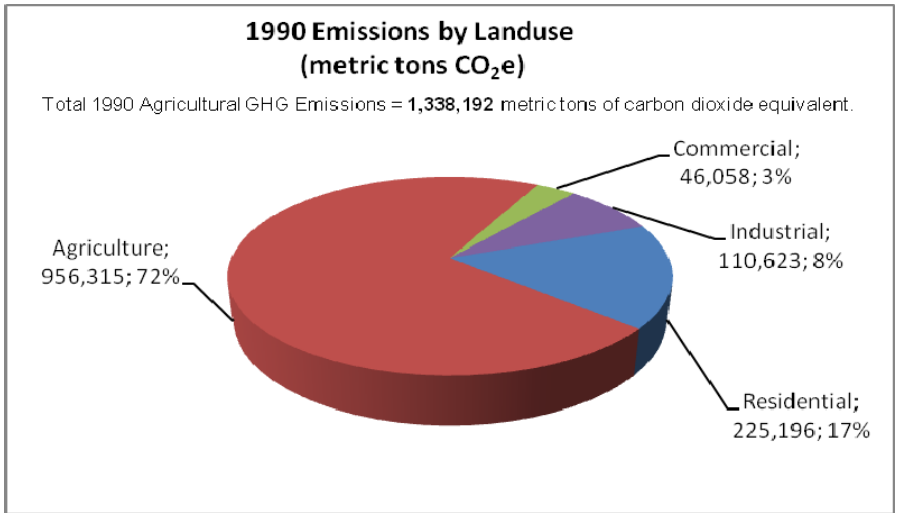
Table 3-6: 1990 Transportation Emissions

Transportation Emissions	
Source:	**Metric tons of CO_2e**
On-Road Vehicles	226,778
Airport Operations	132
Total	**226,910**

3.1.7 1990 Emissions by Land Use

This section provides a breakdown of the total 1990 GHG emissions for the County by land use categories as shown in Figure 3-3. A detailed breakdown of 1990 emissions as organized by individual land use is available in Appendix C.

Figure 3-3: 1990 Emissions by Land Use (MT CO_2e)



3.2 2008 Emissions Inventory

The County emitted approximately 1.2 MMT of CO_2e in 2008. The following tables and figures (Table 3-7, through Table 3-12; and Figures 3-4, 3-5, and 3-6) summarize the emissions by emissions category.

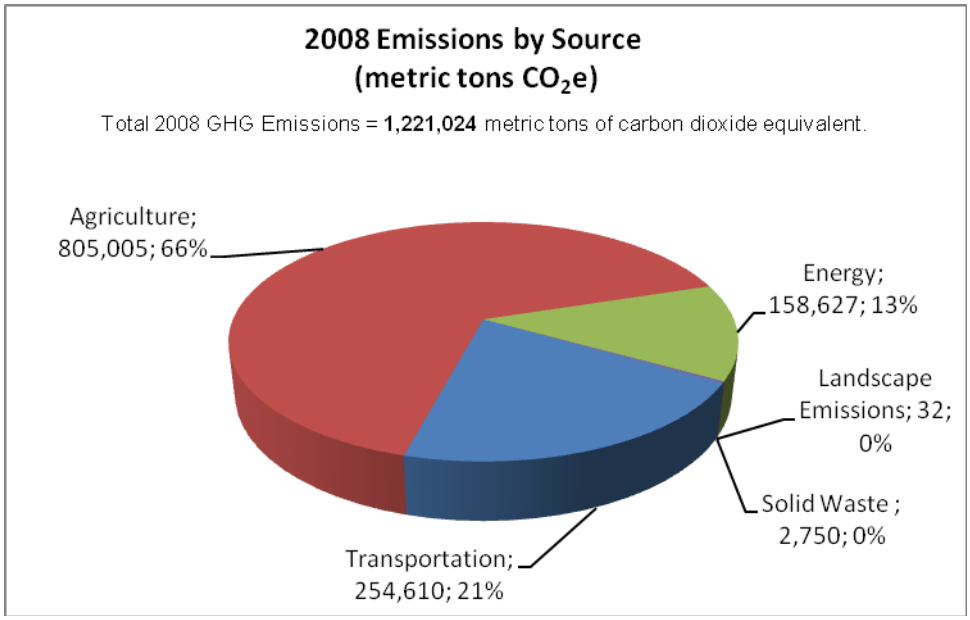
3.2.1 2008 Net Total Emissions

Table 3-7 summarizes the net 2008 County emissions of CO_2e as broken down by emissions category. Each of these categories is further broken down in Tables 3-7 through 3-10 below. Figure 3-4 is a graphical representation of Table 3-6. A detailed breakdown of 2008 emissions by category is available in Appendix D.

Table 3-7: 2008 Net Total Emissions

Net Total Emissions	
Emissions Category	**Metric tons of CO_2e**
Energy	158,627
Solid Waste	2,750
Landscape Emissions	32
Agriculture	805,005
Transportation	254,610
Total	**1,221,024**

Figure 3-4: 2008 Emissions Generated by Emissions Category (MT CO_2e)



3.2.2 2008 Energy Emissions

Table 3-8 summarizes the emissions from energy generation and/or consumption with respect to electricity and natural gas. Energy related emissions represent approximately 13 percent of the total GHG emissions generated by the County in 2008. A detailed breakdown of 2008 energy emissions is available in Appendix D.

Table 3-8: 2008 Energy Emissions

Energy Emissions	
Sources:	**Metric tons of CO_2e**
Electric	52,186
Natural Gas	106,441
Total	**158,627**

3.2.3 2008 Solid Waste Emissions

Table 3-9 summarizes the 2008 County emissions from the transportation, disposal, and decomposition of solid waste generated within the County. Solid-waste-related emissions represent less than one percent of the total GHG emissions generated by the County in 2008. A detailed breakdown of 2008 solid waste emissions is available in Appendix D.

Table 3-9: 2008 Solid Waste Emissions

Solid Waste	
Source	**Metric tons of CO_2e**
Solid Waste Disposal	2,750
Total	**2,750**

3.2.4 2008 Landscape Emissions

Table 3-10 summarizes the 2008 County emissions from landscaping activities. The primary source of emissions from landscaping activities results from the use of landscape equipment. Landscape related emissions represent less than 1 percent of the total GHG emissions generated by Sutter County in 2008. Data is not available to accurately determine emissions with respect to planting trees or fertilizer use. A detailed breakdown of 2008 Landscape emissions is available in Appendix D.

Table 3-10: 2008 Landscape Emissions

Landscape Emissions	
Sources:	**Metric tons of CO_2e**
Landscape Emissions	32
Total	**32**

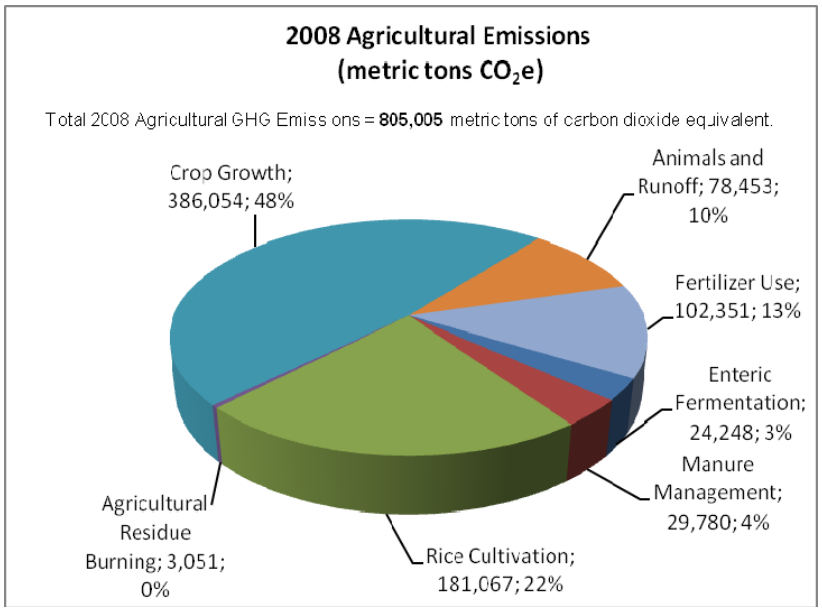
3.2.5 2008 Agricultural Emissions

Table 3-11 summarizes the 2008 County emissions with respect to agricultural activities within the County. Agricultural emissions represent the majority of the County emissions (66%). Table 3-11 and Figure 3-5 represent the breakdown of agricultural emissions by activity. A detailed breakdown of 2008 Agricultural emissions is available in Appendix D.

Table 3-11: 2008 Agricultural Emissions

Agriculture	
Sources:	**Metric tons of CO_2e**
Enteric Fermentation	24,248
Manure Management	29,780
Rice Cultivation	181,067
Agricultural Residue Burning	3,051
Crop Growth	386,054
Animals and Runoff	78,453
Fertilizer Use	102,351
Total	**805,005**

Figure 3-5: 2008 Agricultural Emissions (MT CO_2e)



3.2.6 2008 Transportation Emissions

Table 3.12 summarizes the 2008 County emissions with respect to airport operations and vehicle miles traveled. Transportation emissions do not include pass-through traffic on the freeways within Sutter County and only account for vehicle trips related to Sutter County land uses as starting points and destinations. Transportation-related emissions represent approximately 21 percent of the total GHG indirect sources of emissions generated within Sutter County. A detailed breakdown of 2008 transportation emissions is available in Appendix D.

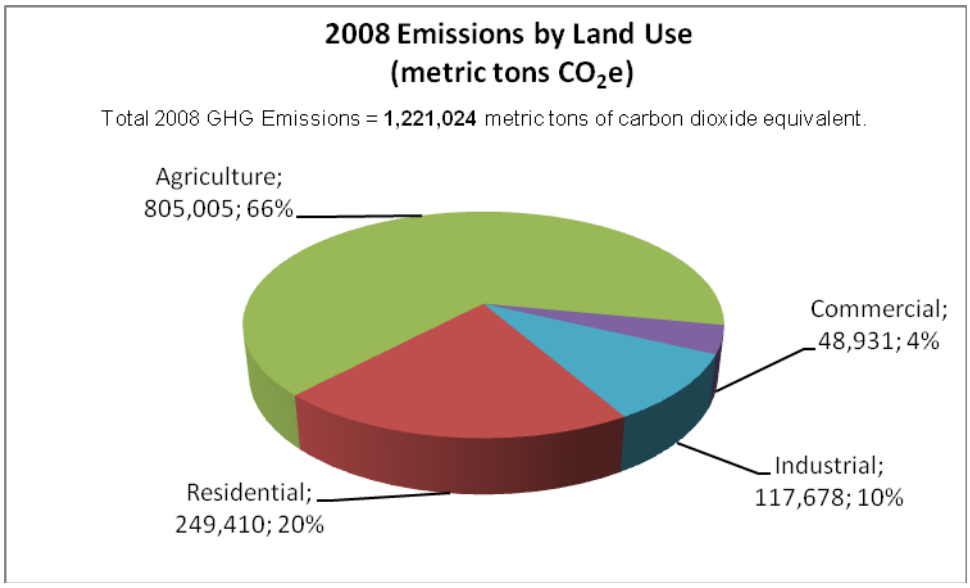
Table 3-12: 2008 Transportation Emissions

Transportation Emissions	
Sources:	**Metric tons of CO_2e**
On-Road Vehicles	254,455
Airport Operations	155
Total	**254,610**

3.2.7 2008 Emissions by Land Use

This section provides a breakdown of the total 2008 GHG emissions for the County by land use categories (Figure 3-6). A detailed breakdown of 2008 emissions by land use is available in Appendix D.

Figure 3-6: 2008 Emissions by Land Use (MT CO_2e)



3.3 2020 Business as Usual (BAU) Emissions Inventory

In 2020, Sutter County is projected to emit a total of 1.5 MMT of CO_2e from business-as-usual. Business-as-usual refers to continued operations and development of the County according to 2008 policies, without the inclusion of proposed reduction or sustainability initiatives described in Chapter 4.

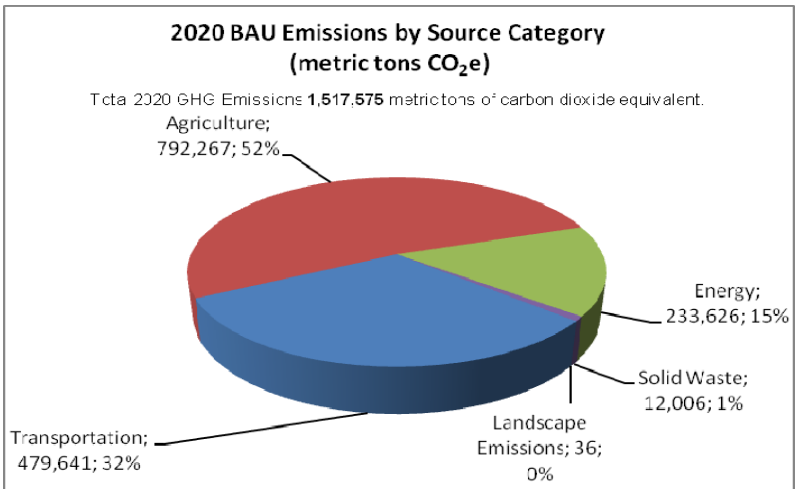
3.3.1 2020 BAU Net Total Emissions

Table 3-14 summarizes the net 2020 County emissions of CO_2e as broken down by emissions source category. Each of these categories is further broken down in Tables 3-15 through 3-19 below. Figure 3-7 is a graphical representation of Table 3-14. A detailed breakdown of 2020 emissions by category is available in Appendix E.

Table 3-14: 2020 BAU Net Total Emissions

Net Total Emissions	
Emissions Category	**Metric tons of CO_2e**
Energy	233,626
Solid Waste	12,006
Landscape Emissions	36
Agriculture	792,267
Transportation	479,641
Total	1,517,575

Figure 3-7: 2020 BAU Emissions Generated by Source (MT CO_2e)



3.3.2 2020 BAU Energy Emissions

Table 3-15 summarizes the emissions from energy generation and/or consumption with respect to electricity and natural gas. The total also includes indirect energy emissions associated with pumping and treating potable water and wastewater. Energy related emissions represent approximately 15 percent of the total GHG emissions generated by Sutter County in 2020. A detailed breakdown of 2020 energy emissions is available in Appendix E.

Table 3-15: 2020 BAU Energy Emissions

Energy Emissions	
Sources:	**Metric tons of CO_2e**
Electric	83,234
Natural Gas	150,392
Total	**233,626**

3.3.3 2020 BAU Solid Waste Emissions

Table 3-16 summarizes the 2020 County emissions from the transportation, disposal, and decomposition of solid waste generated within the County. Solid-waste-related emissions represent approximately one percent of the total GHG emissions generated by Sutter County in 2020. A detailed breakdown of 2020 solid waste emissions is available in Appendix E.

Table 3-16: 2020 BAU Solid Waste Emissions

Solid Waste	
Source	**Metric tons of CO_2e**
Solid Waste Disposal	12,006
Total	12,006

3.3.4 2020 BAU Landscape Emissions

Table 3-17 summarizes the 2020 County emissions from landscaping activities. The primary source of emissions results from the use of landscape equipment. Landscape related emissions represent less than one percent of the total GHG emissions generated by Sutter County in 2020. A detailed breakdown of 2020 Landscape emissions is available in Appendix E.

Table 3-17: 2020 BAU Landscape Emissions

Landscape Emissions	
Sources:	**Metric tons of CO_2e**
Landscape Emissions	36
Total	**36**

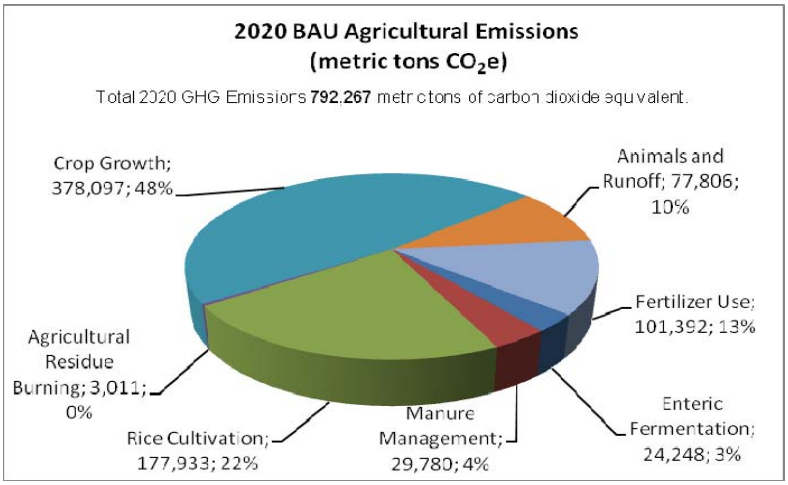
3.3.5 2020 BAU Agricultural Emissions

Table 3-18 summarizes the 2020 County emissions with respect to agricultural activities within the County. Agricultural emissions represent the majority of the County emissions accounting for 52 percent of all emissions. Table 3-18 and Figure 3-8 represent the breakdown of agricultural emissions by activity. A detailed breakdown of 2020 Agricultural emissions is available in Appendix E.

Table 3-18: 2020 BAU Agricultural Emissions

Agriculture	
Sources:	**Metric tons of CO_2e**
Enteric Fermentation	24,248
Manure Management	29,780
Rice Cultivation	177,933
Agricultural Residue Burning	3,011
Crop Growth	378,097
Animals and Runoff	77,806
Fertilizer Use	101,392
Total	**792,267**

Figure 3-8: 2020 BAU Agricultural Emissions (MT CO_2e)



3.3.6 2020 BAU Transportation Emissions

Table 3-19 summarizes the 2020 County emissions with respect to airport operations and vehicle miles traveled. Transportation emissions do not include pass-through traffic on the freeways within Sutter County and only account for vehicle trips related to Sutter County land uses as starting points and destinations. Transportation-related emissions represent approximately 32 percent of the total GHG emissions generated by Sutter County in 2020. A detailed breakdown of 2020 transportation emissions is available in Appendix E.

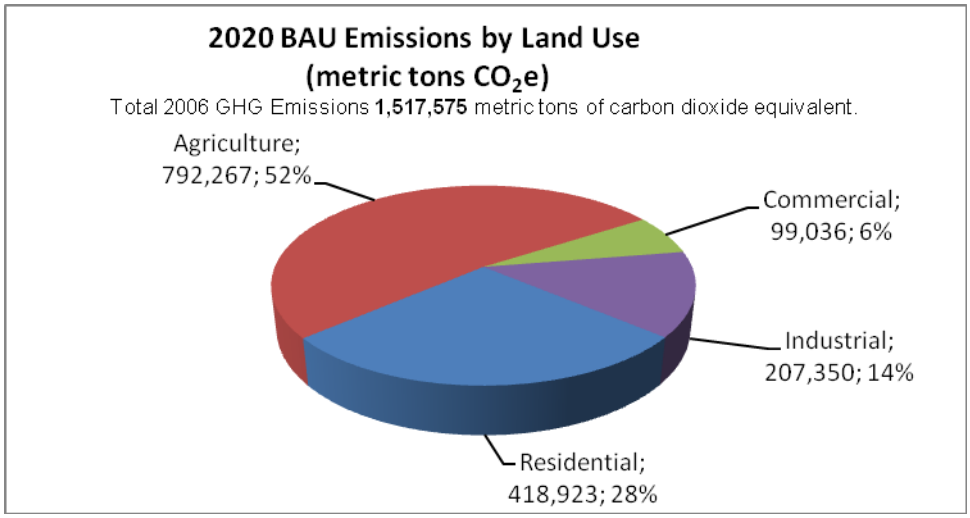
Table 3-19: 2020 BAU Transportation Emissions

Transportation Emissions	
Sources:	**Metric tons of CO_2e**
On-Road Vehicles	479,486
Airport Operations	155
Total	**479,641**

3.3.7 2020 BAU Emissions by Land Use

This section provides a breakdown of the total 2020 GHG emissions for Sutter County by land use categories (Figure 3-9). A detailed breakdown of 2020 emissions by land use is available in Appendix E.

Figure 3-9: 2020 BAU Emissions by Land Use (MT CO_2e)



3.4 2030 Business as Usual (BAU) Emissions Inventory

In 2030, Sutter County is projected to emit a total of 1.8 MMT of CO_2e from business-as-usual. The business-as-usual emissions are based on the projected 2030 build outs from the County's General Plan without the inclusion of the proposed reduction measures or sustainability initiatives discussed in Chapter 4.

3.4.1 2030 BAU Net Total Emissions

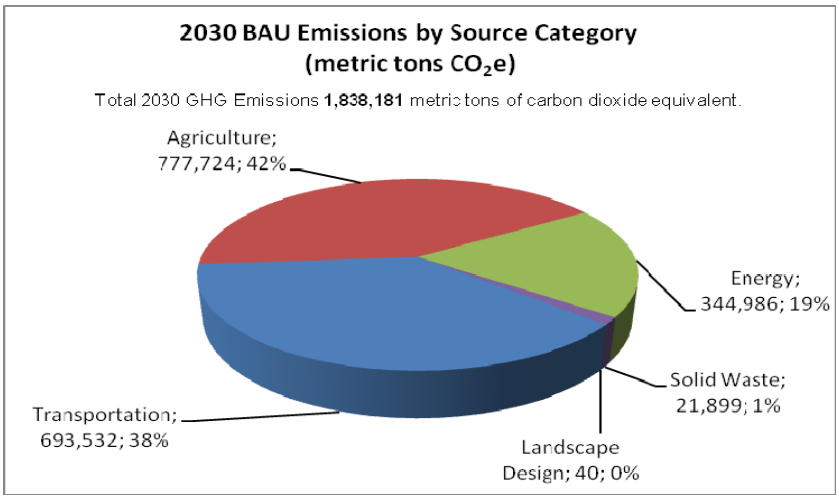
Table 3-20 summarizes the net 2020 County emissions of CO_2e as broken down by emissions sources category. Each of these categories is further broken down in Tables 3-21 through 3-25

below. Figure 3-10 is a graphical representation of Table 3-20. A detailed breakdown of 2030 energy emissions is available in Appendix F.

Table 3-20: 2030 BAU Net Total Emissions

Net Total Emissions	
Emissions Category	**Metric tons of CO_2e**
Energy	334,986
Solid Waste	21,899
Landscape Emissions	40
Agriculture	777,724
Transportation	693,532
Total	1,838,181

Figure 3-10:2030 BAU Emissions Generated by Source (MT CO_2e)



3.4.2 2030 BAU Energy Emissions

Table 3-21 summarizes the emissions from energy generation and/or consumption with respect to electricity and natural gas. The total also includes indirect energy emissions associated with pumping and treating potable water and wastewater. Energy related emissions represent approximately 19 percent of the total GHG emissions generated by Sutter County in 2030. A detailed breakdown of 2030 energy emissions is available in Appendix F.

Table 3-21: 2030 BAU Energy Emissions

Energy Emissions	
Sources:	**Metric tons of CO_2e**
Electric	129,434
Natural Gas	215,552
Total	**344,986**

3.4.3 2030 BAU Solid Waste Emissions

Table 3-22 summarizes the 2030 County emissions from the transportation, disposal, and decomposition of solid waste generated within the County. Solid-waste-related emissions represent approximately one percent of the total GHG emissions generated by Sutter County in 2030. A detailed breakdown of 2030 solid waste emissions is available in Appendix F.

Table 3-22: 2020 BAU Solid Waste Emissions

Solid Waste	
Source	**Metric tons of CO_2e**
Solid Waste Disposal	21,899
Total	21,899

3.4.4 2030 BAU Landscape Emissions

Table 3-23 summarizes the 2030 County emissions from landscaping activities. The primary source of emissions results from the use of landscape equipment. Landscape related emissions represent less than one percent of the total GHG emissions generated by Sutter County in 2030. A detailed breakdown of 2030 Landscape emissions is available in Appendix F.

Table 3-23: 2030 BAU Landscape Emissions

Landscape Emissions	
Sources:	**Metric tons of CO_2e**
Landscape Emissions	40
Total	**40**

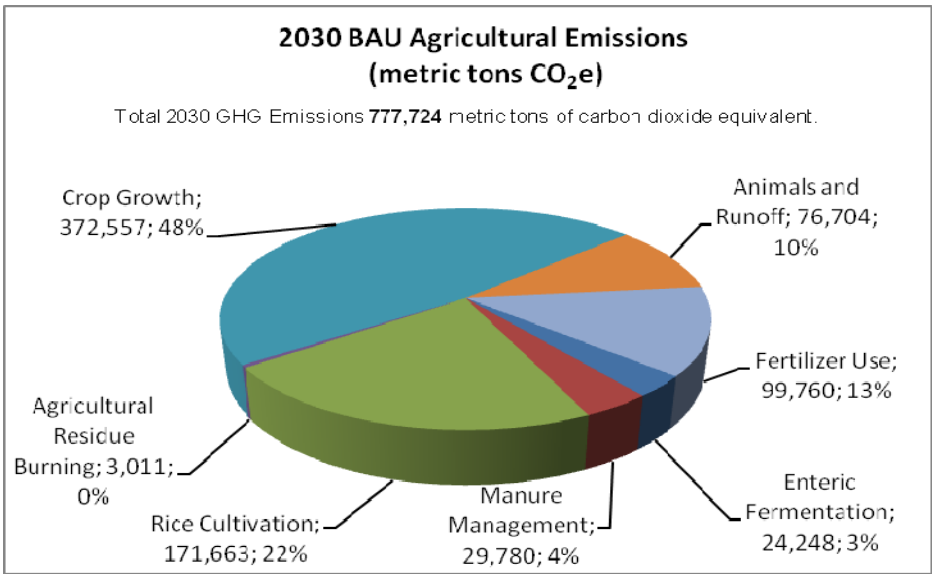
3.4.5 2030 BAU Agricultural Emissions

Table 3-24 summarizes the 2030 County emissions with respect to agricultural activities within the County. Agricultural emissions represent the majority of the County emissions accounting for 42 percent of all emissions. Table 3-24 and Figure 3-11 represent the breakdown of agricultural emissions by activity. A detailed breakdown of 2030 Agricultural emissions is available in Appendix F.

Table 3-24: 2030 BAU Agricultural Emissions

Agriculture	
Sources:	**Metric tons of CO_2e**
Enteric Fermentation	24,248
Manure Management	29,780
Rice Cultivation	177,933
Agricultural Residue Burning	3,011
Crop Growth	372,557
Animals and Runoff	76,704
Fertilizer Use	99,760
Total	**777,724**

Figure 3-11:2030 BAU Agricultural Emissions (MT CO_2e)



3.4.6 2030 BAU Transportation Emissions

Table 3-25 summarizes the 2030 County emissions with respect to airport operations and vehicle miles traveled. Transportation emissions do not include pass-through traffic on the

freeways within Sutter County and only account for vehicle trips related to Sutter County land uses as starting points and destinations. Transportation-related emissions represent approximately 38 percent of the total GHG emissions generated by Sutter County in 2030. A detailed breakdown of 2030 transportation emissions is available in Appendix F.

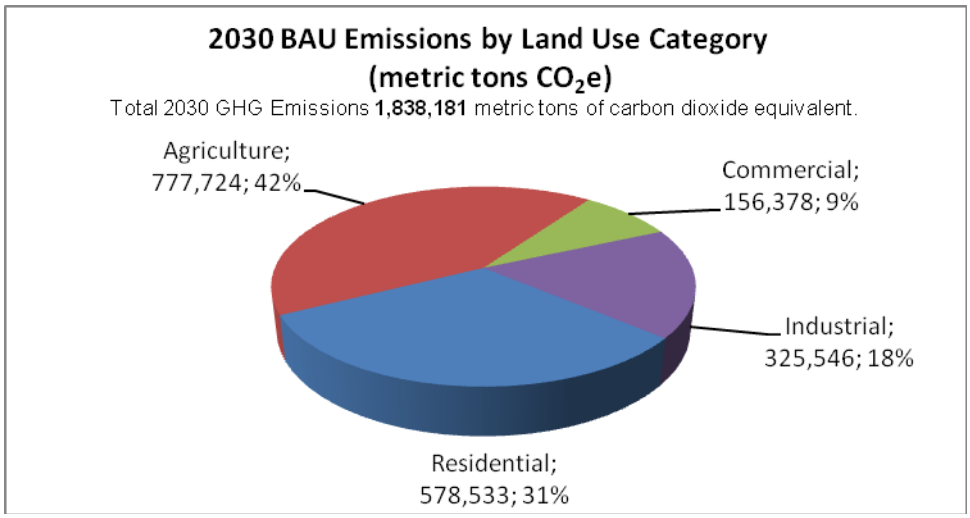
Table 3-25: 2030 BAU Transportation Emissions

Transportation Emissions	
Sources:	**Metric tons of CO_2e**
On-Road Vehicles	693,377
Airport Operations	155
Total	**693,532**

3.4.7 2030 BAU Emissions by Land Use

This section provides a breakdown of the total 2030 GHG emissions for Sutter County by land use categories (Figure 3-12). A detailed breakdown of 2030 emissions by land use is available in Appendix F.

Figure 3-12:2030 BAU Emissions by Land Use (MT CO_2e)



3.4.8 Net Emissions Comparison by Year

The County's total emissions for 2008 are lower than the emissions in 1990; however, emissions per capita have increased between these two years. During this time, Sutter County experienced a decrease in population in unincorporated areas due to an expansion of Yuba City.

The population of the unincorporated areas was 32,710 in 1990 and only 24,245 in 2008. Several other factors attributed to a reduction of emissions between 1990 and 2008. One of these factors is that while solid waste generation has increased between 1990 and 2008, the marked decrease in solid waste emissions is attributed to the installation of methane gas collection systems at the land fill in 2004, which resulted in the reduction in methane released to the atmosphere. The collected gas was initially burned by flaring.

The 1.5 MMT of CO_2e of GHG emissions for 2020 is an estimated increase of 296,551 MT CO_2e above 2008 levels and 179,384 MT CO_2e above 1990 levels following business-as-usual projections. This level of increase is lower than the state average and is paired with a strong projected increase in population, resulting in a lower level of per capita emissions.. The per capita emissions for business-as-usual in 2020 are based on the projected residential growth that results in the 2020 population forecasted at 42,875.

The 2030 BAU emissions of 1.8 MMT of CO_2e is an estimated increase of 617,157 MT CO_2e above 2008 levels and nearly 500,000 MT CO_2e above 1990 levels. This level of increase paired with a doubling of population from 1990 results in a low level of per capita emissions. The per capita emissions for business-as-usual in 2030 are based on the projected residential growth which results in the 2030 population forecasted at 65,475.

The reduced per capita emissions in the 2020 and 2030 business-as-usual scenarios are due to a combination of factors including the continued increase in development density of Sutter County which results in a modest decrease in vehicle miles traveled per vehicle trip, methane from the solid waste collection systems being used as fuel for electric generation starting in 2009 through 2020, as well as a continued reduction in rice production and other agricultural operations. Table 3-26 shows a comparison of Net Emission Totals and Per Capita Emissions for 1990, 2008, 2020 BAU, and 2030 BAU emissions.

Table 3-26: Net Total Emissions by Year

Net Total Emissions and Per Capita Emissions				
	Metric tons of CO_2e			
Source Category	**1990**	**2008**	**2020 BAU**	**2030 BAU**
Energy	146,001	158,627	223,626	344,986
Solid Waste	8,939	2,750	12,006	21,899
Landscape Emissions	27	32	36	40
Agriculture	956,315	805,005	792,267	777,724
Transportation	226,910	254,610	479,641	693,532
Total	**1,338,192**	**1,221,024**	**1,517,576**	**1,838,181**
Population	**32,710**	**24,245**	**42,875**	**65,475**
Per Capita Emissions	**40.9**	**50.4**	**35.4**	**28.1**

Section 4 GHG Emissions Reduction Programs and Regulations

The state of California has set specific targets for reducing greenhouse gas emissions from the burning of fossil fuels in both power plants and vehicles by adopting various regulations. In addition, State energy efficiency and renewable requirements provide another level of reductions. In order to provide credit to the County for regulatory actions already taken or planned by the State of California, this CAP first evaluates the greenhouse gas reductions that will occur within the County as a result of these actions. These will be identified in the CAP as R1 reduction measures. The R1 measures are included here to show all of the anticipated reduction strategies identified in the AB 32 Scoping Plan for implementation at the State Level that will ultimately result in a reduction of greenhouse gas emissions at the County level. The R1 measures are not administered or enforced by the County, but the County - by describing them herein- substantiates the reductions applied in association with these State Measures.

R2 and R3 reduction measures are measures that will be incorporated at the County level to provide additional reductions in greenhouse gas emissions. R2 measures are those measures that can be quantified to show the value of the reduction from the incorporation of those measures. R3 measures are measures that, although they provide a vehicle through which reductions in emissions will occur, cannot be quantified at this time. The R3 measures are supportive measures or methods of implementation for the R2 measures. For example, R3-E2: Energy Efficiency Training and Public education, is a measure that provides education to inform people of the programs, technology, and potential funding available to them to be more energy efficient, thereby providing the incentives to participate in the voluntary programs detailed in R2-E1 through R2-E7. R3-E2 is supportive of measures R2-E1 through R2-E7 because it will provide more publicity, reduce the perceived challenge of being energy efficient, and provide information on potential rebates and other funding programs which will make retrofits more accessible to everyone. Therefore, although by itself R3-E2 cannot be quantified, its implementation provides a level of assurance that the reduction goals specified in the R2 measures will be achieved. A complete list of assumptions and reductions for each of the R1 and R2 measures is included in Appendix G.

The following reduction measures are organized herein by source category (energy, solid waste, landscape emissions, agriculture, transportation, and industrial) then by R1, R2, and R3

measure. The method to be used for numbering the mitigation measures will be to list the R designation (R1, R2, or R3) then an abbreviation of the source category, followed by the order number. So, R1-E1 is the first R1 measure within the energy category, R1-E2 is the second measure within the energy category, and so on. The source category abbreviations are as follows: E – energy; W – solid waste; L – landscape emissions; A – agriculture; T – transportation; and I – industrial.

4.1 Energy

4.1.1 R1 Energy Reduction Measures

The following list of R1 building energy efficiency related measures are those measures that California has identified in the AB 32 Scoping Plan that will result in emission reductions within the County.

R1-E1: Renewable Portfolio Standard for Building Energy Use

Senate Bills (SBs) 1075 (2002) and 107 (2006) created the State's Renewable Portfolio Standard (RPS), with an initial goal of 20 percent renewable energy production by 2010. Executive Order (EO) S-14-08 establishes a RPS target of 33 percent by the year 2020 and requires State agencies to take all appropriate actions to ensure the target is met. The 33 percent RPS by 2020 goal is supported by the California Air Resources Board (CARB), though its feasibility is not certain due to current limitations in production and transmission of renewable energy.

R1-E2 and R1-E3: AB1109 Energy Efficiency Standards for Lighting (Residential and Commercial Indoor and Outdoor Lighting)

Assembly Bill (AB1109) mandated that the California Energy Commission (CEC) on or before December 31, 2008, adopt energy efficiency standards for general purpose lighting. These regulations, combined with other State efforts, shall be structured to reduce State-wide electricity consumption in the following ways:

- R1-E2: At least 50 percent reduction from 2007 levels for indoor residential lighting by 2018; and
- R1-E3: At least 25 percent reduction from 2007 levels for indoor commercial and outdoor lighting by 2018.

R1-E4: Electricity Energy Efficiency (AB32)

This measure captures the emission reductions associated with electricity energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2 reductions as described in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"), the County's adopted Green Building ordinance (effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 21.3 $MMTCO_2e$, representing 17.5 percent of emissions from all electricity in the State. This measure includes the following strategies:

- "Zero Net Energy" buildings (buildings that combine energy efficiency and renewable generation so that they, based on an annual average, extract no energy from the grid);
- Broader standards for new types of appliances and for water efficiency;
- Improved compliance and enforcement of existing standards;
- Voluntary efficiency and green building targets beyond mandatory codes;
- Voluntary and mandatory whole-building retrofits for existing buildings;
- Innovative financing to overcome first-cost and split incentives for energy efficiency, on-site renewables, and high efficiency distributed generation;
- More aggressive utility programs to achieve long-term savings;
- Water system and water use efficiency and conservation measures;
- Additional industrial and agricultural efficiency initiatives; and
- Providing real time energy information technologies to help consumers conserve and optimize energy performance.

R1-E5: Natural Gas Energy Efficiency (AB32)

This measure captures the emission reductions associated with natural gas energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2 reductions, as described in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"), the County's adopted Green Building ordinance (effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 4.3 $MMTCO_2e$, representing 6.2 percent of

emissions from all natural gas combustion in the State. This measure includes the following strategies:

- "Zero Net Energy" buildings (buildings that combine energy efficiency and renewable generation so that they, based on an annual average, extract no energy from the grid);
- Broader standards for new types of appliances and for water efficiency;
- Improved compliance and enforcement of existing standards;
- Voluntary efficiency and green building targets beyond mandatory codes;
- Voluntary and mandatory whole-building retrofits for existing buildings;
- Innovative financing to overcome first-cost and split incentives for energy efficiency, on-site renewables, and high efficiency distributed generation;
- More aggressive utility programs to achieve long-term savings;
- Water system and water use efficiency and conservation measures;
- Additional industrial and agricultural efficiency initiatives; and
- Providing real time energy information technologies to help consumers conserve and optimize energy performance.

R1-E6: Increased Combined Heat and Power (AB32)

This measure captures the reduction in building electricity emissions associated with the increase of combined heat and power activities, as outlined in CARB's AB32 Scoping Plan. The Scoping Plan suggests that increased combined heat and power systems, which capture "waste heat" produced during power generation for local use, will offset 30,000 GWh State-wide in 2020. Approaches to lowering market barriers include utility-provided incentive payments, a possible combined heat and power portfolio standard, transmission and distribution support systems, or the use of feed-in tariffs. By 2020, this requirement will reduce emissions in California by approximately 6.7 $MMTCO_2e$, representing 7.6 percent of emissions from all electricity in the State.

R1-E7: Industrial Efficiency Measures (AB32)

This measure captures the reduction in industrial building energy emissions associated with the energy efficiency measures for industrial sources included in CARB's AB32 Scoping Plan. By 2020, this requirement will reduce emissions in California by approximately 1.0 $MMTCO_2e$, representing 3.9 percent of emissions from all industrial natural gas combustion in the State. CARB proposes the following possible State-wide measures:

- Oil and gas extraction;
- GHG leak reduction from oil and gas transmission;
- Refinery flare recovery process improvements; and

- Removal of methane exemption from existing refinery regulations.

R1-E8: Renewable Portfolio Standard (33 percent by 2020) Related to Water Supply and Conveyance

This measure would increase electricity production from eligible renewable power sources to 33 percent by 2020. A reduction in GHG emissions results from replacing natural gas-fired electricity production with zero GHG-emitting renewable sources of power. By 2020, this requirement will reduce emissions from electricity used for water supply and conveyance in California by approximately 21.3 $MMTCO_2e$, representing 15.2 percent of emissions from electricity generation (in-State and imports).

4.1.2 R2 Energy Reduction Measures

The following list of R2 measures are candidate measures the County can incorporate into the County CAP related to building energy efficiency to achieve an AB 32 compliant reduction target.

R2-E1: Residential Energy Efficiency Program

This measure involves the adoption of a program that facilitates energy efficient design for all new residential buildings within the Sutter Pointe Specific Plan to be 20% beyond the current Title 24 Standards which will implement the new development requirements set forth in the Sutter Pointe Specific Plan EIR. This energy efficiency requirement for the Sutter Pointe Specific Plan is equal to that of the LEED for Homes and ENERGY STAR programs.

The 2008 Title 24 Energy Standards were adopted by the Energy Commission on April 23, 2008 with the 2008 Residential Compliance Manual adopted by the Commission on December 17, 2008. Compliance with the 2008 standards went into effect January 1, 2010. In an effort to meet the overall goal of the California Energy Efficiency Strategic Plan of reaching zero net energy for residential buildings by 2020, the stringency of the Title 24 Energy Standards as regulated and required by the State will continue to increase every three years. As energy efficiency standards increase the County may want to periodically re-evaluate their percentage beyond Title 24 goal to ensure it is still a feasibly achievable goal.

As described in the Sutter Pointe Specific Plan DEIR and to facilitate the implementation of this program, the County could provide all developers within the Sutter Pointe Specific Plan and those developments electing to participate in the voluntary reduction programs with a list of

potentially feasible GHG reduction measures that reflect the current state of the regulatory environment prior to design development. The developer will then submit to the County a mitigation report demonstrating which of the proposed reduction measures are feasible as well as why the unselected measures are infeasible. The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (100 points) the developer will meet the requirements of this measure. This system will assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following**:**

- Install energy efficient appliances, including air conditioning and heating units, dishwashers, water heaters, etc
- Install solar water heaters;
- Install top quality windows and insulation;
- Install energy efficient lighting;
- Optimize conditions for natural heating, cooling and lighting by building siting and orientation;
- Use features that incorporate natural ventilation;
- Install light-colored "cool" pavements, and strategically located shade trees along all bicycle and pedestrian routes; and
- Incorporate skylights; reflective surfaces, and natural shading in building design and layouts.

Sutter Pointe is implementing a pilot solar program which will offer solar as a standard feature on a percentage of homes in the Phase 1 development stage and as an upgrade for all homes. Given the success of the program it will be continued through the additional phases of the specific plan development.

Residential developments within the unincorporated portions of Sutter County that are not within the Sutter Pointe Specific Plan are encouraged to participate in the volunteer Residential Energy Efficiency Program. This volunteer program would set a minimum goal of achieving energy efficiency of 5% greater than current Title 24 Standards. Incentives to participate in this volunteer program include prioritization and streamlining of the application process for residential projects that achieve the minimum goal. The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (33 points, which is based upon the estimated reduction in emissions resulting from the energy efficiency improvements) the developer will meet the requirements of this measure. This system will assure flexibility in the implementation of this reduction measure. Although not

limited to these actions, this reduction goal can be achieved through the incorporation of the strategies outlined in the bullet points above.

R2-E2: Residential Renewable Energy Program

This measure facilitates the voluntary incorporation of renewable energy (such as photovoltaic panels) into new residential developments. For participating developments, renewable energy application should be such that the new home's projected energy use from the grid is reduced by 50%. The California Energy Commissions' New Solar Homes Partnership is a component of the California Solar Initiative and provides rebates to developers of 6 or more units where 50% of the units include solar power. In addition this measure would encourage that all residents be equipped with "solar ready" features where feasible, to encourage future installation of solar energy systems. These features should include the proper solar orientation (south facing roof sloped at 20^{O} to 55^{O} from the horizontal), clear access on south sloped roofs, electrical conduit installed for solar electric system wiring, plumbing installed for solar hot water systems, and space provided for a solar hot water tank. The incentive program should provide enough funding and other incentives as shown in the R3 measures to result in approximately fifty percent of new residential development participation in this program, thereby resulting in a 25% reduction in electrical consumption from new residential developments.

As an alternative to, or in support of, providing onsite renewable energy, the project proponent can buy into a purchased energy offset program that will allow for the purchase of electricity generated from renewable energy resources offsite. Purchased energy offsets (or a combination of incorporated renewables and purchased offsets) must be equal to 25% of the total projected energy consumption for the development. See R3-E3 for further details on the financing program.

R2-E3: Residential Retrofit Implementation Program

This measure would initiate a County program that facilitates the incorporation of energy reduction measures for residential buildings undergoing major renovations. AB 811 is a potential funding source to the County for implementing incentive programs to encourage residences within the County to undertake energy efficiency retrofitting and reducing energy consumption in retrofitted homes by a minimum of 15%. Similar to the strategy for the new development, the County will develop a menu of options with points assigned to them for

retrofit projects. As long as a developer meets the required point allotment (100 points) the developer will meet the requirements of this measure. This system will be provided to assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Replace inefficient air conditioning and heating units with new energy efficient models;
- Replace older, inefficient appliances with new energy efficient models;
- Replace old windows and insulation with top-quality windows and insulation;
- Install solar panels and/or solar water heaters;
- Replace inefficient and incandescent lighting with energy efficient lighting; and
- Weatherize the existing building to increase energy efficiency.

R2-E4: Residential Renewable Retrofit Program

This measure will initiate an incentive program that encourages residents to retrofit their homes with photovoltaic panels such that 50% of all of the home's electrical usage is offset. The California Energy Commission's Solar Initiative has incentives available to home owners.

R2-E5: Commercial Energy Efficiency Program

This measure involves the adoption of a County Program that facilitates the energy efficient design for all new commercial buildings within Sutter Pointe to be 20% beyond the current Title 24 Standards which expands the new development requirements set forth in the Sutter Pointe Specific Plan EIR. This voluntary energy efficiency requirement is 10% greater than the minimum requirements of the LEED and ENERGY STAR programs. As energy efficiency standards increase the County may want to periodically re-evaluate their percentage beyond Title 24 goal to ensure it is still a feasibly achievable goal.

As described in R2-E1 above, the County could provide all developers with a list of potentially feasible GHG reduction measures that reflect the current state of the regulatory environment. The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (100 points) the developer will meet the requirements of this measure. This system will provide flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Install energy efficient appliances, including air conditioning and heating units, dishwashers, water heaters, etc.;
- Install and solar water heaters;

- Install top quality windows and insulation;
- Install energy efficient lighting;
- Optimize conditions for natural heating, cooling and lighting by building siting and orientation;
- Use features that incorporate natural ventilation;
- Install light-colored "cool" pavements, and strategically located shade trees along all bicycle and pedestrian routes; and
- Incorporate skylights; reflective surfaces, and natural shading in building design and layouts.

The Sutter Pointe Specific Plan requires all non-residential buildings (25,000 sq feet or more) to install Energy Star (or equivalent) cool roofing systems and energy efficient furnaces. These features are intended to reduce energy consumption for non-residential projects.

Commercial developments within the unincorporated portions of Sutter County that are not within the Sutter Pointe Specific Plan are encouraged to participate in the volunteer Commercial Energy Efficiency Program. This volunteer program would set a minimum goal of achieving energy efficiency of 5% greater than current Title 24 Standards. Incentives to participate in this volunteer program include prioritization and streamlining of the application process for commercial projects that achieve the minimum goal. The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (33 points) the developer will meet the requirements of this program. This system will assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the strategies outlined in the bullet points above.

R2-E6: Commercial/Industrial Renewable Energy Program

This measure would facilitate the voluntary incorporation of renewable (solar or other renewable) energy generation into the design and construction of new commercial, office, and industrial development. Renewable energy generation shall be incorporated such that a minimum of 20% of the project's total energy needs are offset. In addition this measure would encourage all facilities be equipped with "solar ready" features where feasible, to facilitate future installation of solar energy systems. These features should include the proper solar orientation (south facing roof sloped at 20^{O} to 55^{O} from the horizontal), clear access on south sloped roofs, electrical conduit installed for solar electric system wiring, plumbing installed for solar hot water systems, and space provided for a solar hot water tank.

As an alternative to, or in support of, providing onsite renewable energy, the project proponent can buy into an offset program that will allow for the purchase of renewable energy resources offsite. Purchased energy offsets (or a combination of incorporated renewables and purchased offsets) must be equal 20% of the total projected energy consumption for the development. See R3-E3 for further details on the financing program.

R2-E7: Commercial/Industrial Retrofit Program

This measure encourages all commercial or industrial buildings undergoing major renovations to reduce their energy consumption by a minimum of 20%. As with the new development, a menu of options will be provided to assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Replace inefficient air conditioning and heating units with new energy efficient models;
- Replace older, inefficient appliances with new energy efficient models;
- Replace old windows and insulation with top-quality windows and insulation;
- Install solar water heaters;
- Replace inefficient and incandescent lighting with energy efficient lighting; and
- Weatherize the existing building to increase energy efficiency.

R2-E8: Agricultural Alternative Energy Program

This program combines Agricultural Draft Policies AG 3.7 (Alternative Energy), and AG 4.3 (New Technologies) to support the incorporation and expansion of existing and new technologies to increase the energy efficiency and profitability of agricultural processes throughout Sutter County.

R2-E9: Water Use Reduction Initiative

This initiative would reduce emissions associated with electricity consumption for water treatment and reduction and therefore are included with the energy reductions. This measure encourages the County to adopt a per capita water use reduction goal in support of the Governors Executive Order S-14-08 which mandates the reduction of water use of 20 percent per capita. The County's adoption of a water use reduction goal would introduce requirements for new development and would provide cooperative support for water purveyors that are required to implement these reductions for existing developments. The County would also provide internal reduction measures such that County facilities will support this reduction

requirement. The following represent potential programs that can be implemented to attain this reduction goal.

Water Conservation Program:

Under this program the excessive watering of landscaping, excessive fountain operation, watering during peak daylight hours, water of non-permeable surfaces, excessive water use for noncommercial washing, and water use resulting in flooding or runoff would be prohibited. In addition the program would encourage efficient water use for construction activities, the installation of low-flow toilets and showerheads for all new developments, use of drought-tolerant plants with efficient landscape watering systems for all new developments, recycling of water used for cooling systems, use of pool covers, and the posting of water conservation signage at all hotels.

Sutter Pointe Water Conservation and Efficiency Requirement

Under the provisions in the Sutter Pointe Specific Plan EIR, new developments within the Sutter Pointe Specific Plan area are required to adhere to the following water conservation and efficiency measures:

- With the exception of ornamental shade trees, use water-efficient landscapes with native, drought-resistant species in all public areas and commercial landscaping. Use water-efficient turf in parks and other turf-dependant spaces;
- Install the infrastructure to use reclaimed water for landscape irrigation and/or washing cars;
- Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls;
- Design buildings and lots to be water efficient. Only install water-efficient fixtures and appliances;
- Restrict water methods (prohibit systems that apply water to non-vegetated surfaces) and control runoff. Prohibit business from using pressure washers for cleaning driveways, parking lots, sidewalks, and street surfaces;
- Provide education about water conservation and available programs and incentives; and
- Construct driveways to single family detached residences, multi-family residences, and parking lots with pervious surfaces.

New Development Incentives:

Provide incentives for developers to comply with the California Green Building Standards Code as requirements for all new development. Under this Code new developments are required to reduce indoor potable water use by 20% beyond the Energy Policy Act of 1992

fixture performance requirements, and to reduce outdoor potable water use by 50% from a mid-summer baseline average consumption through irrigation efficiency, native plant selection, the use of recycled water and/or captured rainwater for example.

Water Meter Program:

Encourage water providers to install water meters for all County homes not using wells. This would provide for a better accounting of County water usage and provide potential costing per usage to help offset costs of the implementation of water conservation programs.

Water Efficiency Pricing Program

Under this program, the County would encourage water suppliers to adopt a water conservation pricing schedule (i.e. tiered rate) to encourage efficient water use. Notices could be provided in each billing showing water use budgets and the relationship between the budget and the actual usage.

Water Efficiency Retrofit Program:

This program would encourage upgrades in water efficiency for renovations or additions of residential, commercial, office, and industrial properties equivalent to that of new developments. The County would work with local water purveyors to achieve consistent standards, and to develop, approve, and review procedures for implementation.

Water Efficiency Training and Education:

Under this measure the County, in coordination with local water purveyors, would implement a public information and education program that promotes water conservation. The program could include certification programs for irrigation designers, installers, and managers, as well as classes to promote the use of drought tolerant, native species and xeriscaping.

Increased Recycled Water Use:

Promote the use of municipal wastewater and graywater for agricultural, industrial and irrigation purposes. This measure would be subject to approval of the State Health Department and compliance with Title 22 provisions. This measure would facilitate the following:

- Inventory of non-potable water uses that could be substituted with recycled or graywater;
- Determination of the feasibility of producing and distributing recycled water for groundwater replenishment;

- Determine the associated energy/GHG tradeoffs for treatment/use vs. out of basin water supply usage; and
- Cooperation and coordination with responsible agencies to encourage the use of recycled water where energy tradeoffs are favorable.

4.1.3 R3 Energy Reduction Measures

The following R3 measures enhance and/or insure the reductions accounted for within the R2 measures through education programs or are measures that will reduce emissions but cannot be quantified.

R3-E1: Energy Efficient Development, and Renewable Energy Deployment Facilitation and Streamlining

This measure would encourage the County to identify and remove regulatory and procedural barriers to the implementation of green building practices and the incorporation of renewable energy systems. This could include the updating of codes and zoning requirements and guidelines. This measure could be further enhanced by providing incentives for energy efficient projects such as priority in the reviewing, permitting, and inspection process. Additional incentives could include permit streamlining and CEQA streamlining in exchange for incorporating green building practices or renewable energy systems.

R3-E2: Energy Efficiency Training & Public Education

This measure would provide public education and publicity about energy efficiency measures and reduction programs available within the County, including rebates and incentives available for residences and businesses. In addition, this measure would provide training in green building materials, techniques, and practices for all plan review and building inspection staff.

R3-E3: Energy Efficiency and Solar Energy Financing

This measure would facilitate the incorporation of innovative, grant funded or low-interest financing programs for energy efficiency and renewable energy projects for both existing and new developments. This would include financing for heating, ventilation, air conditioning, lighting, water heating equipment, insulation, weatherization, and residential and commercial renewable energy. A few potential options for funding this measure include:

- Use the money from offset purchases (see R2-E2 and R2-T6) to provide grants to allow for the offset of some of the cost to existing residents in making energy efficiency upgrades;

- Target local funds to assist affordable housing developers to incorporate renewable energy sources and energy efficiency design features into low-income housing during development or through retrofit programs.
- Establish a Finance District, approve a bond purchase, and administer agreements to allow property owners to implement energy efficiency retrofits or designs and/or install renewable systems. Under this provision repayment could be incorporated as a special tax on the property owner's property tax bill.
- Funding of other incentives to encourage the use of renewable energy sources and energy efficient equipment and lighting.

R3-E4: Cross-Jurisdictional Coordination

Under this reduction measure the County would coordinate with other local governments, special districts, nonprofit, and other organizations in order to optimize energy efficiency and renewable resource development and usage throughout the County. This would allow for economies of scale and shared resources to more effectively implement these environmental enhancements.

R3-E5: Alternative Energy Development Plan

The accomplishment of this measure would encourage the County to work with PG&E to explore the possibilities for producing energy by renewable means within the built environment. This would be developed to identify appropriate alternative energy facilities (i.e., photovoltaic) for use within residential and commercial developments. This could also incorporate the use of wind or additional solar installation in more remote areas. The Alternative Energy Development Plan will encourage the establishment of County policies and ordinances to address how alternative energy production would be conducted. This measure would identify the most optimal locations and the best means by which to avoid noise, aesthetics and other land use compatibility conflicts. Another provision of this Plan could be to identify possible sites for the production of renewable energy using local renewable sources such as solar, wind, small hydro, and/or biogas. This would encourage adopting measures to protect these resources and providing right-of-way easements, utility easements, or by setting aside land for future development of these potential production sites.

R3-E6: Energy Compliance Documentation

Sutter County currently requires energy compliance documentation and testing with third party certification for new developments. This program could be expanded to include certification of compliance with the R2 measures as well as providing incentives for the

completion of energy audits and certification of existing buildings. The measure enhances and supports the energy efficiency reduction programs R2-E1 through R2-E9.

4.2 Solid Waste

4.2.1 R1 Solid Waste Measure

The following R1 solid waste related measure is a measure that California has identified in the AB 32 Scoping Plan that will result in emission reductions within the County.

R1-W1: Waste Measures

The CARB AB32 Scoping Plan recommends three measures for reducing emissions from Municipal Solid Waste at the State level, including: 1) landfill methane control; 2) increase the efficiency of landfill methane capture; and 3) high recycling/zero waste. CARB is in the process of developing a discrete early action program for methane recovery (1), which was adopted in early 2010. This measure is expected to result in a 1.0 $MMTCO_2e$ reduction by 2020. Other measures proposed by CARB include increasing efficiency of landfill methane capture (2) and instituting high recycling/zero waste policies (3). Potential reductions associated with these measures are still to be determined. CARB estimates a preliminary one-time cost for adoption of these measures to be approximately $70 per ton of CO_2 reduced. Capital cost is estimated to be approximately $3,440,000 and annual operation cost is estimated to be approximately $706,400 per landfill.

4.2.2 R2 Solid Waste Measures

The following list of R2 measures are candidate measures the County can incorporate into the County CAP related to building energy efficiency to achieve an AB 32 compliant reduction target.

R2-W1: County Diversion Program

This measure would implement a County wide waste diversion plan to further the goal of diverting 75% of all waste from landfills by 2020. The following is a potential list of waste reduction measures that will further strengthen existing waste reduction/diversion programs.

- Provide outreach and education programs for residential, commercial, and industrial land uses in order to further promote existing County diversion programs;
- Increase disposal fees and/or reduce residential pick-up frequency;

- Encourage businesses to adopt a voluntary procurement standard and prioritize those products that have less packaging, are reusable, recyclable, or compostable;
- Support State level policies that provide incentives for efficient and reduced packaging waste for commercial products;
- Expand list of recyclable materials;
- Work with Recology to develop and provide waste audits;
- Make recycling and composting opportunities mandatory at all public events;
- Establish an appliance end-of-life requirement;
- For new developments, require the use of recycled-content materials, or recycled materials;
- Require a minimum of 15% of materials used in construction be sourced locally, as feasible; and
- Encourage the use of recycled building materials and cement substitutes for new developments.

R2-W2: Construction Diversion Program

This reduction measure would encourage a diversion of 60% of construction waste by 2020. This provides a 10% increase in diversion beyond AB2176, § 42911, that requires development projects to provide adequate areas for collecting and loading recyclable materials and ensures a 50% diversion rate prior to being issued a building permit.

R2-W3: Sutter Pointe Solid Waste Reduction Measures

All development within the Sutter Pointe Specific Plan area would be required to abide by the following solid waste reduction measures:

- Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard);
- Provide interior and exterior storage areas for recyclables and green waste at all buildings;
- Provide adequate recycling containers in public areas, including parks, school grounds, golf courses, and pedestrian zones in areas of mixed-use development; and
- Provide education and publicity about reducing waste and available recycling services.

4.2.3 R3 Solid Waste Measures

The following R3 measures enhance and/or insure the reductions accounted for within the R2 measures through education programs that help participation and compliance of the R2 measures identified above.

R3-W1: Encourage Increased Efficiency of the Gas to Energy System at Landfills.

In 2009, the Recology Ostrom Landfill instituted a Gas to Energy System which converts 66% of the methane captured to energy. This measure would encourage Recology to keep current with upgrades in efficiencies to waste to energy systems and to upgrade as feasible when significant increases in conversion efficiencies are available.

R3-W2: Waste Education Program

This measure would build on the Sutter Pointe education program to provide County wide public education and increased publicity about commercial and residential recycling. This measure would educate the public about waste reduction options available at both residential and commercial levels, including composting, grass recycling, and waste prevention, and available recycling services.

4.3 Landscape Emissions

The following R3 measures are related to landscape strategies that will help reduce greenhouse gas emissions and can be incorporated into development projects without additional cost. These measures strategically place trees and other landscape mechanisms that create shade to reduce the heat island effect within parking lots and adjacent to buildings, which in turn, reduces the temperature of buildings and cars during the summer.

R3-L1: Expand County Tree Planting

This program evaluates the feasibility of expanding tree planting within the County. This includes the evaluation of potential carbon sequestration (the process by which carbon is taken from the environment and stored. In the case of trees and vegetation this happens by the conversion of carbon into biomass –leaves, wood, etc.) from different tree species, potential reductions of building energy use from shading, and GHG emissions associated with pumping water used for irrigation. Implement a forestry program if GHG emissions reductions exceed GHG emissions associated with implementation and water use. The Sutter Pointe Specific Plan EIR requires commercial and retail development to exceed shading requirements by a minimum of 10% and to plant low emission trees.

R3-L2: Heat Island Plan

The implementation of this measure would include expanding the Sutter Pointe guidelines for cool roofs, cool pavements, and strategically placed shade trees, and parking lot shading to

the entire County. Further, County wide Design Guidelines could need to be amended to include that all new developments and major renovations (additions of 25,000 square feet or more) would be encouraged to incorporate the following strategies such that heat gain would be reduced for 50% of the non-roof impervious site landscape (including parking, roads, sidewalks, courtyards, and driveways). The strategies include:

- Shading (within 5 years of occupancy);
- Paving materials with a Solar Reflective Index (SRI)of at least 29;
- Open grid pavement system; or
- Covered parking (with shade or cover having an SRI of at least 29).

4.4 Agriculture

4.4.1 R1 Agriculture Measure

The following R1 agriculture related measure is a measure that California has identified in the AB 32 Scoping Plan that will result in emission reductions within the County.

R1-A1: Methane Capture at Large Dairies

This is an AB 32 voluntary measure to encourage the installation of methane digesters to capture methane emissions at large dairies. By 2020, this requirement will reduce emissions in California by approximately one (1) $MMTCO_2e$, representing 7.8 percent of CH_4 and N_2O emissions from manure management and enteric fermentation at dairies in the State.

4.4.2 R2 Agriculture Measure

The following R2 measure is a candidate measure the County can incorporate into the County CAP related to agricultural practices and efficiencies to achieve an AB 32 compliant reduction target.

R2-A1: Agricultural Water Management

Encourage the agricultural community to be cognizant of the necessity of water conservation and to provide access to information on technologies to reduce potable water usage where feasible. This would encourage the County in conjunction with the local water purveyors to explore the feasibility of and promote using recycled water while maintaining water quality and quantity necessary for agriculture purposes. Further, this would encourage the County to explore the feasibility of and promote water management. This measure enhances the Agricultural policies AG 3.1 (Efficient Water Management), 3.2 (Water

Conservation and Recycling), 3.3 (Water Quality and Quantity), and 3.5 (Groundwater Resources).

4.4.3 R3 Agriculture Measure

The following R3 measure enhances and/or insures the reductions accounted for within the R2 measures through education programs that help participation and compliance of the R2 measures identified above.

R3-A1: Promote Soil Management Practices

Under this reduction measure the County would promote soil management practices that reduce nitrogen dioxide emissions through strategies such as fertilizer management, nitrification inhibitors, water management, and efficient use of fossil fuels. In addition, encourage the use of "cover" crops during fallow periods to prevent erosion and nutrient leaching and promote carbon sequestration. This could be used to enhance Agricultural Policy AG 3.8 (Chemical Use) which supports the efforts of growers to follow state and federal regulations concerning the use of pesticides, herbicides, and manufactured fertilizers.

4.5 Transportation

4.5.1 R1 Transportation Measures

The following list of R1 transportation related measures are those measures that California has identified in the AB 32 Scoping Plan that will result in emission reductions within the County.

R1-T1: Assembly Bill 1493: Pavley I

Assembly Bill (AB) 1493 (Pavley) required the California Air Resources Board (CARB) to adopt regulations that will reduce GHG from automobiles and light-duty trucks by 30 percent below 2002 levels by the year 2016, effective with 2009 models. By 2020, this requirement will reduce emissions in California by approximately 16.4 MMT of carbon dioxide equivalents ($MMTCO_2e$), representing 17.3 percent of emissions from passenger/light-duty vehicles in the State.

R1-T2: Assembly Bill 1493: Pavley II

California committed to further strengthening the AB1493 standards beginning in 2017 to obtain a 45 percent GHG reduction from 2020 model year vehicles. This requirement will reduce emissions in California by approximately 4.0 $MMTCO_2e$, representing 2.5 percent of emissions from passenger/light-duty vehicles in the State.

R1-T3: Executive Order S-1-07 (Low Carbon Fuel Standard)

The Low Carbon Fuel Standard (LCFS) will require a reduction of at least ten (10) percent in the carbon intensity of California's transportation fuels by 2020. By 2020, this requirement will reduce emissions in California by approximately 15 $MMTCO_2e$, representing 6.9 percent of emissions from passenger/light-duty vehicles in the State.

R1-T4: Tire Pressure Program

The AB32 early action measure involves actions to ensure that vehicle tire pressure is maintained to manufacturer specifications. By 2020, this requirement will reduce emissions in California by approximately 0.55 $MMTCO_2e$, representing 0.3 percent of emissions from passenger/light-duty vehicles in the State.

R1-T5: Low Rolling Resistance Tires

This AB32 early action measure would increase vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.3 $MMTCO_2e$, representing 0.2 percent of emissions from passenger/light-duty vehicles in the State.

R1-T6: Low Friction Engine Oils

This AB32 early action measure would increase vehicle efficiency by mandating the use of engine oils that meet certain low friction specifications. By 2020, this requirement will reduce emissions in California by approximately 2.8 $MMTCO_2e$, representing 1.7 percent of emissions from passenger light-duty vehicles in the State.

R1-T7: Cool Paints and Reflective Glazing

This AB32 early action measure is based on measures to reduce the solar heat gain in a vehicle parked in the sun. By 2020, this requirement will reduce emissions in California by approximately 0.89 $MMTCO_2e$, representing 0.6 percent of emissions from passenger/light-duty vehicles in the State.

R1-T8: Goods Movement Efficiency Measures

This AB32 early action measure targets system wide efficiency improvements in goods movement to achieve GHG reductions from reduced diesel combustion. By 2020, this

requirement will reduce emissions in California by approximately 3.5 $MMTCO_2e$, representing 1.6 percent of emissions from all mobile sources (on-road and off-road) in the State.

R1-T9: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)

This AB32 early action measure would increase heavy-duty vehicle (long-haul trucks) efficiency by requiring installation of best available technology and/or CARB approved technology to reduce aerodynamic drag and rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.93 $MMTCO_2e$, representing 1.9 percent of emissions from heavy-duty vehicles in the State.

R1-T10: Medium and Heavy-Duty Vehicle Hybridization

The implementation approach for this AB 32 measure is to adopt a regulation and/or incentive program that reduce the GHG emissions of new trucks (parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks) sold in California by replacing them with hybrids. By 2020, this requirement will reduce emissions in California by approximately 0.5 $MMTCO_2e$, representing 0.2 percent of emissions from all on-road mobile sources in the State. This reduction is also equivalent to a 1.0 percent reduction of emissions from all heavy-duty trucks in the State.

4.5.2 R2 Transportation Measures

The following list of R2 measures are candidate measures the County can incorporate into the County Climate Action Plan (CAP) to achieve an AB 32 compliant reduction target.

R2-T1: Employment Based Trip and VMT Reduction

Implementation of this measure would require adopting a voluntary trip reduction ordinance that promotes commuter-choice programs, employer transportation management, guaranteed ride home programs and commuter assistance and outreach type programs intended to reduce commuter vehicle miles traveled. A guaranteed ride home program is a program that ensures employees that take advantage of carpooling opportunities are guaranteed a safe ride home should the employee miss the carpool pick-up time due to work related activities. This could be as simple as the employer paying for taxi service for the employee. Surveys within California have shown that ridesharing increases by 5% when a guaranteed ride home program is available. This measure would require employers with more than 100 employees within the unincorporated County to establish a trip reduction plan that

would incorporate annual employee commute surveys, marketing of commute alternatives, ride matching assistance, and transit information at a minimum. This reduction measure adds to and enhances Mobility Policies 2.G-2 and 2.G-3.

The Sutter Pointe development, in addition to the above ordinance, and in accordance with its Master Air Quality Mitigation Plan (MAQMP), will provide the following services and programs that will enhance the reduction of VMT within this Specific Plan Area. The following elements of the Sutter Pointe MAQMP are included within R2-T1 because they will reduce GHG emissions and further the County's goal of achieving the reduction target:

- Sutter Pointe will create a Transportation Management Association (TMA) with the primary goal of providing alternative mode use programs and services to the residents, employers, and employees, as well as managing transit services.
- Employment of a Transportation Coordinator (TC) will be required for all commercial/industrial development with 500 or more employees. The primary role of the TC will be to act as a liaison between the TMA and their employer and employees to disseminate information and facilitate trip reduction programs.

R2-T2: Land use Based Trip and VMT Reduction Policies

The demand for transportation is influenced by the density and geographic distribution of people and places. Whether neighborhoods have sidewalks or bike paths, whether homes are within walking distance of shops or transit stops will influence the type and amount of transportation that is utilized. By changing the focus of land use from automobile centered transportation, a reduction in vehicle miles traveled will occur. Implementation of Policies LU1.2 (Balanced Land Use Pattern), LU1.3 (Adequate Land Use Supply), LU 3.5 (Infill Development), LU 3.9 (Rural Hubs), LU 3.12 (Mixed Use); Mobility Policies M 3.1 (Transit Service for Residents), M 3.2 (Transit in New Development), M 3.3 (Transit Integration); and Agricultural Policies AG 4.4 (Farmworker Housing), AG 4.6 (Local Processing), AG 4.7 (Local Purchasing), and AG 4.12 (Support Uses) will all work together to provide a reduction in VMT for the County, by changing the focus of land use away from vehicle centered transportation to the increased densities and lay-outs that foster the implementation and use of alternate modes of transportation.

R2-T3: Preferential Parking

Implementation of this reduction measure would encourage the County to adopt a comprehensive parking program for public and private parking lots that facilitate carpooling and

alternate transportation. Incentives to encourage carpooling and the use of alternate transportation methods could include:

- Providing reserved preferential parking spaces for car-share, carpool, and ultra-low or zero emission vehicles;
- Provide larger parking spaces that can accommodate vans used for ride-sharing programs and reserve them for vanpools; and include adequate passenger waiting/loading areas;
- Consider restricting the number of parking spaces within the County by sharing parking among different land uses where feasible. For example in areas where there are multiple land uses provide resident restricted parking during nighttime hours (7pm to 7am) and open the parking lot for use by patrons of the surrounding commercial buildings during daytime hours; and
- Provide convenient pedestrian pathways through parking areas.

The development within the Sutter Pointe Specific Plan area requires, as part of the MAQMP, that developments with 100 or more employees provide the minimum required parking and develop the sites to facilitate alternate modes of transportation.

R2-T4: Roadway Improvements including Signal Synchronization and Transportation Flow Management

This reduction builds on Mobility Goals M 1 and M 2, and Agricultural Policy AG 4.1 and supports (through the policies associated with those goals) modification of arterial roadways to promote and support multimodal transportation options for automobiles, transit, and trucks. In addition, this measure results in the maintenance of existing regional transportation systems to support the local, national, and global movement of agricultural products. These modifications include, but are not limited to, synchronization of signals, improvement of traffic flow, the development of parallel roadways, and support for the extension of freight rail into Sutter County's industrial areas.

R2-T5: Increase the Use of Ridesharing as an Alternative to Single Occupancy Vehicle Use

Mobility Implementation Programs M 3-A, M 3-B, and M 3-C promote the use of ridesharing throughout the County by strengthening the transportation network within the Unincorporated County as well as between the Unincorporated County and the Cities within the County. Encouraging community car-sharing through employers will further enhance the use of these services and support the underlying goal of reducing congestion and providing viable alternatives to automobile use. Further reductions in VMT could be obtained through assistance

provided by a Transportation Management Agency (TMA). A TMA could oversee or provide assistance with the creation of rideshare incentives for employees such as gas cards, carpool awards, educational seminars, commuter-choice programs, commuter-tax benefits, guaranteed ride-home programs, commuter assistance and outreach, parking incentives, and the encouragement of telecommuting and compressed work weeks. This reduction measure will also be enhanced by the requirements of the MAQMP as discussed in R2-T1 above.

R2-T6: Provide a Comprehensive System of facilities for Non-motorized Transportation

Mobility Goal M 5, and Land Use policies LU 1.10 (Efficient Land Use Patterns) and LU 4.8 (Quality New Development) require the County to address bicycle and pedestrian facilities. These goals and policies should: encourage the creation of bike lanes and walking paths directed to the location of schools, provide adequate bicycle parking; and encourage the development of bicycle stations, attended parking, and other attended bicycle support facilities at intermodal hubs. Bicycle stations are full-service bicycle facilities that in addition to providing secure, guarded bicycle parking could include other amenities such as "valet" bicycle service, showers, bicycle rentals, or repair services. These types of requirements are intended for large residential and non-residential development as well as large employers (500 or more employees). In addition, the establishment of multi-use trails that promote off-street bicycle and pedestrian travel as well as secure bicycle racks along these pathways will encourage their use.

The development within the Sutter Pointe Specific Plan area requires, as part of the MAQMP, bicycle and pedestrian connectivity where projects will be required to support bicycling and walking through providing amenities or incorporating convenient access to/within the project sites. Amenities and site design for these developments may include:

- Proximity to bike lanes;
- Elimination of impediments to bicycle and pedestrian circulation;
- Secure bicycle storage;
- Bicycle and pedestrian incentive programs; and
- Showers and lockers.

R2-T7: Expand Renewable Fuel/Low-Emission Vehicle Use

Implementation of the following would promote the expanded use of renewable fuel and low-emission vehicles:

- Collaboration between local and regional governments and business to foster the increased use of renewable fuels. This can be accomplished by coordinating the siting of new alternative fueling/recharging locations for example.
- Providing preferential parking for ultra low-, zero- emission, and alternative fuel vehicles;
- Collaboration with energy providers to ensure the availability of necessary facilities and infrastructure to encourage the use of privately owned zero emission vehicles. This can be accomplished by having conveniently located charging and fueling stations for these vehicles.
- Provide incentives for taxicabs to use gas-electric hybrid vehicles or, at a minimum, smaller more fuel-efficient vehicles.

New developments within the Sutter Pointe Specific Plan area (as provided in the EIR for the area) will be required to provide the necessary facilities and infrastructure in all land use types to encourage the use of low or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations). In addition industrial and commercial land uses will require all forklifts, yard trucks, or vehicles that are predominantly used onsite at non-residential land uses to be electric-powered or powered by biofuels that are produced from waste products, or shall use other technologies that do not rely on direct fossil fuel consumption.

R2-T8: Transit Infrastructure Development within the Sutter Pointe Specific Plan

The Sutter Pointe Specific Plan EIR has included the following requirements regarding transportation. The inclusion of these requirements will facilitate the reduction of vehicle miles traveled and help to reduce greenhouse gas emissions throughout the County. A Conceptual Transit Plan has been developed for Sutter Pointe that includes plans for phased transit service which will begin as soon as 50 interested riders have been identified. There are four phases of transportation improvement within the Sutter Pointe development as follows:

- Phase 1 will extend past 2020 based on anticipated residential development. The primary focus of this phase is for the TMA to facilitate or develop and market rideshare initiatives including car and vanpool programs, commuter bus services, incorporation of transit stops for the Yuba-Sutter Transit system, and Airporter services to and from Sacramento International Airport.
- Phase 2 of the Sutter Pointe Transit Plan would incorporate an expansion of Sutter Pointe Transit Commuter Express Service.
- Phase 3 would increase Sacramento commuter service capacity, expand commuter service to Placer County, establish midday service to Sacramento and provide commute services to the Sutter Pointe Business Park from adjacent communities. With warranted

demand, dedicated peak hour trips serving the Sutter Pointe business and industrial parks could be added from the Yuba City/Marysville area.

- Phase 4 would incorporate further expansion of the Sutter Pointe commuter bus services to Sacramento and Placer County, develop local transit services, and expand neighboring regional transit services.

4.5.3 R3 Transportation Measure

The following R3 measure enhances and/or insures the reductions accounted for within the R2 measures through education programs or are measures that will reduce emissions but cannot be quantified.

R3-T1: Regional Land Use & Transportation Coordination

Mobility implementation programs M 3-A and M 3-B, in conjunction with Mobility policy M 3.3 (Transit integration), and Land use policies 4.15 (Mix of uses), promotes the development and use of transit between the incorporated and unincorporated portions of the County as well as within the Unincorporated County. This reduction measure will also be enhanced by the requirements of the MAQMP as discussed in R2-T1 above.

4.6 Industrial

The following list of R1 industrial related measures are those measures that California has identified in the AB 32 Scoping Plan that will result in emission reductions within the County. This section describes GHG emission reductions for the existing and proposed national, state, or regional industrial fuel combustion measures that will result in future GHG reductions for the industrial sector and do not require significant County action.

R1-I1: Oil and Gas Extraction Combustion Related GHG Emission Reduction

This AB 32 measure would reduce combustion emissions from oil and gas extraction. By 2020, this requirement will reduce emissions in California by approximately 1.8 MMT CO_2e, representing 13 percent of combustion emissions from oil and gas extraction in the State.

R1-I2: Stationary Internal Combustion Engine Electrification

This AB 32 measure would affect owners and operators of industrial and commercial engines over 50 horsepower used as primary power sources by replacing internal combustion engines with electric motors. By 2020, this requirement will reduce emissions in California by approximately 0.3 $MMTCO_2e$, representing 0.5 percent of combustion emissions from industrial sources (non-coal) in the State.

Section 5 Total Estimated Reductions

In 2020, Sutter County is projected to emit a total of 1.5 MMT of CO_2e without the incorporation of the reduction measures shown in Section 4. With their incorporation, the County emissions for 2020 are estimated to be reduced to 1.28 MMT CO_2e. Emission reductions estimated for year 2020 were based on the accomplishments likely to be achieved as based on the incorporation of the measures detailed in Section 4. A detailed description of the reduction calculations, including assumptions and percentage reduction, is included as Appendix H.

In 2030, the County is project to emit a total of 1.8 MMT of CO_2e following a business-as-usual scenario. With the extension of statewide reduction measures, future revision of measures to achieve the 2020 reduction goal, and inclusion of General Plan policies aimed to reduce emissions, 2030 emissions are expected to reduce to 1.34 MMT of CO_2e.

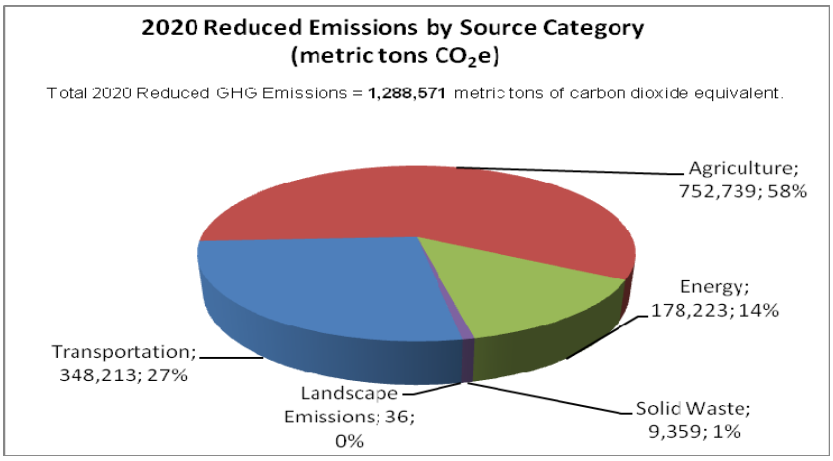
5.1 Reduced 2020 Emissions

Table 5-1 summarizes the net reduced 2020 County emissions of CO_2e as broken down by Emissions category. Each of these categories is further broken down in Tables 3-2 through 3-6. Figure 5-1 is a graphical representation of Table 5-1. A detailed breakdown of reduced 2020 emissions by category is available in Appendix H.

Table 5-1: Reduced 2020 Net Total Emissions

Net Total Emissions	
Emissions Category	**Metric tons of CO_2e**
Energy	178,223
Solid Waste	9,359
Landscape Emissions	36
Agriculture	752,739
Transportation	348,213
Total	**1,288,571**

Figure 5-1: Reduced 2020 Emissions by Emissions Category (MT CO_2e)



5.1.1 Reduced 2020 Energy Emissions

Table 5-2 summarizes the emissions from energy generation and/or consumption with respect to the reduced quantities of electricity and natural gas estimated for the County in 2020. Reduced 2020 energy-related emissions represent approximately 14 percent of the total GHG emissions generated by Sutter County. A detailed breakdown of reduced 2020 energy emissions is available in Appendix H.

Table 5-2: Reduced 2020 Energy Emissions

Energy Emissions	
Sources:	**Metric tons of CO_2e**
Electric	46,600
Natural Gas	131,623
Total	**178,223**

5.1.2 Reduced 2020 Solid Waste Emissions

Table 5-3 summarizes the reduced 2020 County emissions from the transportation, disposal, and decomposition of solid waste generated within the County. Solid-waste-related emissions represent approximately one percent of the total reduced GHG emissions generated by the County in 2020. A detailed breakdown of these emissions is available in Appendix H.

Table 5-3: Reduced 2020 Solid Waste Emissions

Solid Waste	
Source	**Metric tons of CO_2e**
Solid Waste Disposal	9,359
Total	9,359

5.1.3 Reduced 2020 Landscape Emissions

Table 5-4 summarizes the reduced 2020 emissions from Landscape activates. Landscape related emissions represent less than one percent of the total reduced GHG emissions generated by Sutter County in 2020. A detailed breakdown of 2020 Landscape Emissions is available in Appendix H.

Table 5-4: Reduced 2020 Landscape Emissions

Landscape Emissions	
Sources:	**Metric tons of CO_2e**
Landscape Emissions	36
Total	**36**

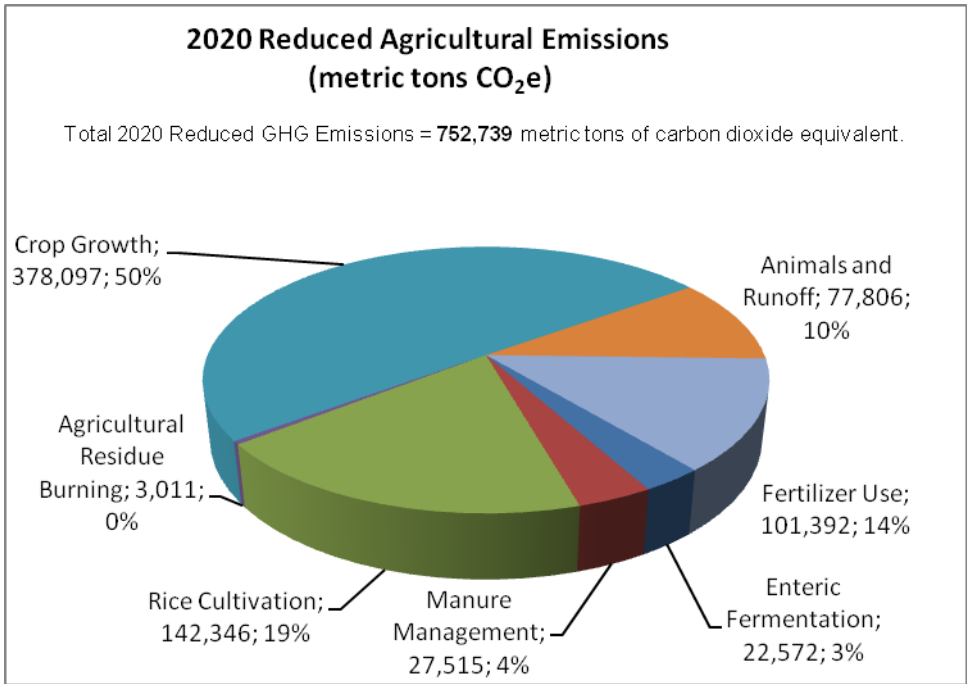
5.1.4 Reduced 2020 Agricultural Emissions

Table 5-5 summarizes the reduced 2020 County emissions with respect to agricultural activities. Reduced Agricultural emissions represent the majority of the County emissions accounting for 58 percent of all emissions. Table 5-5 and Figure 5-2 represent the breakdown of the 2020 reduced agricultural emissions by activity. A detailed breakdown of reduced 2020 Agricultural emissions is available in Appendix H.

Table 5-5: Reduced 2020 Agricultural Emissions

Agriculture	
Sources:	**Metric tons of CO_2e**
Enteric Fermentation	22,572
Manure Management	27,515
Rice Cultivation	142,346
Agricultural Residue Burning	3,011
Crop Growth	378,097
Animals and Runoff	77,806
Fertilizer Use	101,392
Total	**752,739**

Figure 5-2: Reduced 2020 Agricultural Emissions (MT CO_2e)



5.1.5 Reduced 2020 Transportation Emissions

Table 5-6 summarizes the reduced 2020 County emissions with respect to airport operations and vehicle miles traveled. Transportation emissions do not include pass-through traffic on the freeways within Sutter County and only account for vehicle trips related to County land uses as starting points and destinations. Transportation-related emissions represent approximately 27 percent of the total GHG emissions generated by the County in 2020. A detailed breakdown of 2020 transportation emissions is available in Appendix H.

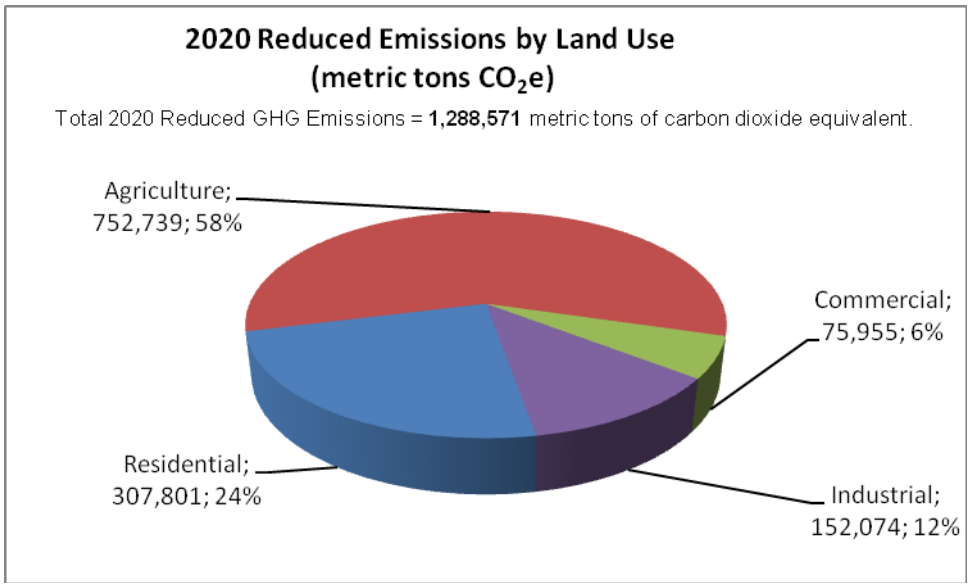
Table 5-6: Reduced 2020 Transportation Emissions

Transportation Emissions	
Sources:	**Metric tons of CO_2e**
On-Road Vehicles	348,058
Airport Operations	155
Total	**348,213**

5.1.6 Reduced 2020 Emissions by Land Use

This section provides a breakdown of the total reduced 2020 GHG emissions for Sutter County by land use categories (Figure 5-3). A detailed breakdown of 2020 emissions by land use is available in Appendix H.

Figure 5-3: Reduced 2020 Emissions by Land Use (MT CO_2e)



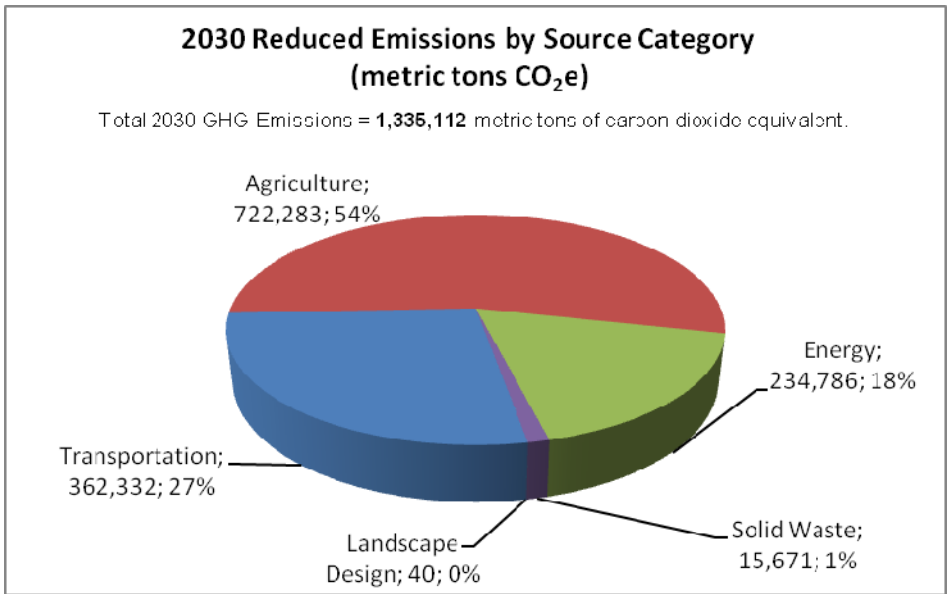
5.2 Reduced 2030 Emissions

Table 5-7 summarizes the net reduced 2030 County emissions of CO_2e as broken down by Emissions category. Each of these categories is further broken down in Tables 5-8 through 5-12. Figure 5-4 is a graphical representation of Table 5-7. A detailed breakdown of reduced 2030 emissions by category is available in Appendix H.

Table 5-7: Reduced 2030 Net Total Emissions

Net Total Emissions	
Emissions Category	**Metric tons of CO_2e**
Energy	234,786
Solid Waste	15,671
Landscape Emissions	40
Agriculture	722,283
Transportation	362,332
Total	**1,335,112**

Figure 5-4: Reduced 2030 Emissions by Emissions Category (MT CO_2e)



5.2.1 Reduced 2030 Energy Emissions

Table 5-8 summarizes the emissions from energy generation and/or consumption with respect to the reduced quantities of electricity and natural gas estimated for the County in 2030. Reduced 2030 energy-related emissions represent approximately 18 percent of the total GHG emissions generated by Sutter County. A detailed breakdown of reduced 2030 energy emissions is available in Appendix I.

Table 5-8: Reduced 2030 Energy Emissions

Energy Emissions	
Sources:	**Metric tons of CO_2e**
Electric	60,768
Natural Gas	174,018
Total	**234,786**

5.2.2 Reduced 2030 Solid Waste Emissions

Table 5-9 summarizes the reduced 2030 County emissions from the transportation, disposal, and decomposition of solid waste generated within the County. Solid-waste-related emissions represent approximately one percent of the total reduced GHG emissions generated by the County in 2030. A detailed breakdown of these emissions is available in Appendix I.

Table 5-9: Reduced 2030 Solid Waste Emissions

Solid Waste	
Source	**Metric tons of CO_2e**
Solid Waste Disposal	15,671
Total	15,671

5.2.3 Reduced 2030 Landscape Emissions

Table 5-10 summarizes the reduced 2030 emissions from Landscape activates. Landscape related emissions represent less than one percent of the total reduced GHG emissions generated by Sutter County in 2030. A detailed breakdown of 2030 Landscape Emissions is available in Appendix I.

Table 5-10: Reduced 2030 Landscape Emissions

Landscape Emissions	
Sources:	**Metric tons of CO_2e**
Landscape Emissions	40
Total	**40**

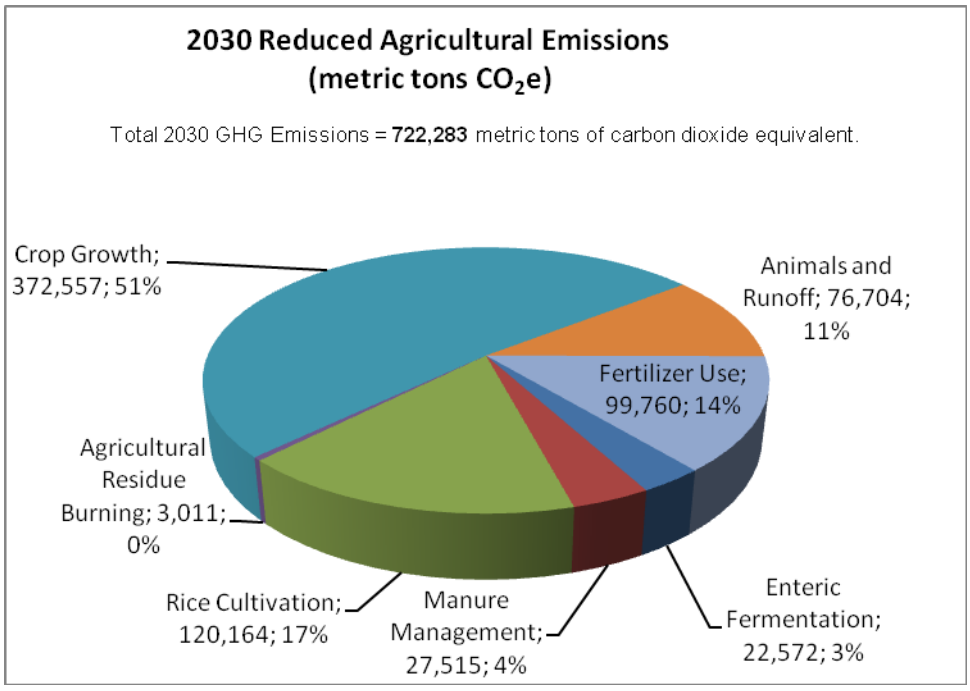
5.2.4 Reduced 2030 Agricultural Emissions

Table 5-11 summarizes the reduced 2030 County emissions with respect to agricultural activities. Reduced Agricultural emissions represent the majority of the County emissions accounting for 54 percent of all emissions. Table 5-11 and Figure 5-5 represent the breakdown of the 2030 reduced agricultural emissions by activity. A detailed breakdown of reduced 2030 Agricultural emissions is available in Appendix I.

Table 5-11: Reduced 2030 Agricultural Emissions

Agriculture	
Sources:	**Metric tons of CO_2e**
Enteric Fermentation	22,572
Manure Management	27,515
Rice Cultivation	120,164
Agricultural Residue Burning	3,011
Crop Growth	372,557
Animals and Runoff	76,704
Fertilizer Use	99,760
Total	**722,283**

Figure 5-5: Reduced 2030 Agricultural Emissions (MT CO_2e)



5.2.5 Reduced 2030 Transportation Emissions

Table 5-12 summarizes the reduced 2030 County emissions with respect to airport operations and vehicle miles traveled. Transportation emissions do not include pass-through traffic on the freeways within Sutter County and only account for vehicle trips related to County land uses as starting points and destinations. Transportation-related emissions represent approximately 27 percent of the total GHG emissions generated by the County in 2030. A detailed breakdown of 2030 transportation emissions is available in Appendix I.

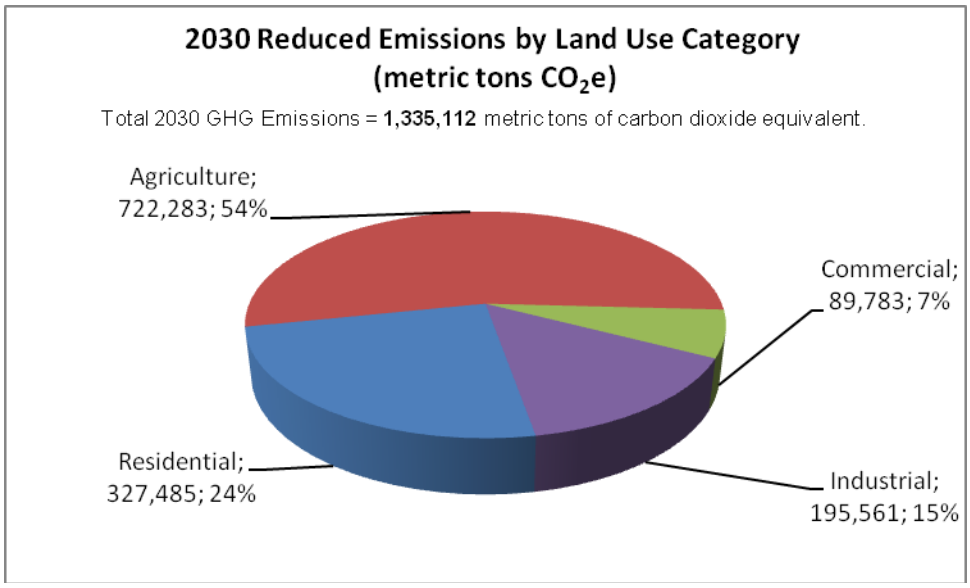
Table 5-12: Reduced 2030 Transportation Emissions

Transportation Emissions	
Sources:	**Metric tons of CO_2e**
On-Road Vehicles	362,245
Airport Operations	87
Total	**362,332**

5.2.6 Reduced 2030 Emissions by Land Use

This section provides a breakdown of the total reduced 2030 GHG emissions for Sutter County by land use categories (Figure 5-3). A detailed breakdown of 2030 emissions by land use is available in Appendix I.

Figure 5-6: Reduced 2030 Emissions by Land Use (MT CO_2e)



5.3 Net Emissions Comparison by Year

The 1.28 MMT of CO_2e of Reduced GHG emissions for 2020 is an estimated decrease of 229,005 MT CO_2e from 2020 BAU and a decrease of 49,621 MT CO_2e from 1990 levels. Table 5-13 shows a comparison between the 1990 and 2020 levels, including what the 2020 BAU emissions would have been without the implementation of, and what they are anticipated to be with, the inclusion of the proposed reduction measures.

Implementing the reduction measures and policies through to 2030 would put 2030 emissions at 1.34 MMT of CO_2e. This results in a 503,069 MT CO_2e decrease from the 2030 BAU emissions and puts 2030 emissions 3,080 MT CO_2e below 1990 levels. Table 5-14 shows a comparison between 1990 emissions and 2030 emissions for both the BAU scenario and the reduced scenario.

Table 5-13: Net Total 2020 Emissions Comparison

Net Total Emissions and Per Capita Emissions			
		Metric tons of CO_2e	
Source Category	**1990**	**BAU 2020**	**Reduced 2020**
Energy	146,001	233,626	178,223
Solid Waste	8,938	12,006	9,359
Landscape Emissions	27	36	36
Agriculture	956,315	792,267	752,739
Transportation	226,910	479,641	348,213
Total	**1,338,192**	**1,517,576**	**1,288,571**
Population	**32,710**	**42,875**	**42,875**
Per Capita Emissions	**40.9**	**35.4**	**30.1**
Note: Mass emissions of CO_2e shown in the table are rounded to the nearest whole number and per capita emissions are rounded to the nearest tenth. Totals shown may not add up due to rounding.			

Implementing the reduction measures and policies through to 2030 would put 2030 emissions at 1.34 MMT of CO_2e. This results in a 503,069 MT CO_2e decrease from the 2030 BAU emissions and puts 2030 emissions 3,080 MT CO_2e below 1990 levels. Table 5-14 shows a comparison between 1990 emissions and 2030 emissions for both the BAU scenario and the reduced scenario.

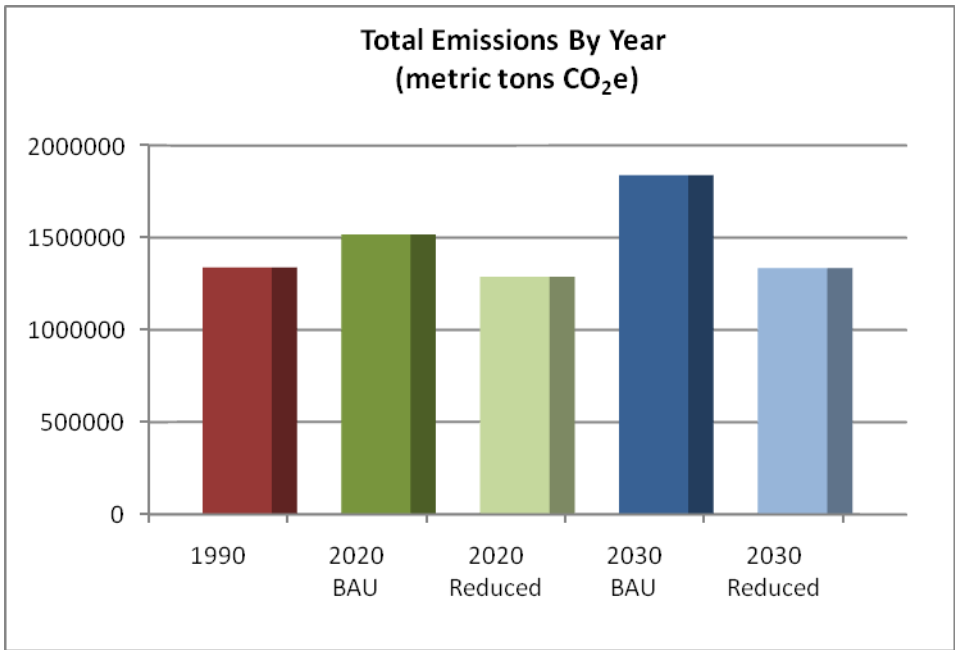
Table 5-14: Net Total 2030 Emissions Comparison

Net Total Emissions and Per Capita Emissions			
		Metric tons of CO_2e	
Source Category	**1990**	**BAU 2030**	**Reduced 2030**
Energy	146,001	344,986	234,786
Solid Waste	8,938	21,899	15,671
Landscape Emissions	27	40	40
Agriculture	956,315	777,724	722,283
Transportation	226,910	693,532	362,332
Total	**1,338,192**	**1,838,181**	**1,335,112**
Population	**32,710**	**65,475**	**65,475**
Per Capita Emissions	**40.9**	**28.1**	**20.4**
Note: Mass emissions of CO_2e shown in the table are rounded to the nearest whole number and per capita emissions are rounded to the nearest tenth. Totals shown may not add up due to rounding.			

Section 6 Conclusions

This Sutter County Climate Action Plan serves as a guide to help the County continue development with the objectives of conserving resources and reducing GHG emissions. This document also serves as a technical resource for the preparation of the County's current General Plan and other land use related documents that may require evaluation and documentation of GHG emissions. Figure 6-1 shows a comparison between Reduced 2020 and 2030 emissions and the 1990,2020 BAU, and 2030 BAU levels.

Figure 6-1: Total Emissions by Year (MT CO_2e)



A target has been set to reduce GHG emission emissions to 1990 levels by the year 2020 County-wide consistent with the State reduction goals in AB 32. The CARB Scoping Plan provides the State with reduction strategies designed to meet the reduction goal of AB 32. The County has a reduction strategy, as described in Section 4, which will allow the County to achieve the State reduction goal of reducing to 1990 level emissions by 2020. Such programs include the County's energy efficiency programs, solar rebates, conservation programs, incentives and ordinances. In some cases, implementation will require the cooperation of other agencies, private businesses, and residents. The success of these measures will be tracked using indicators and targets such as those described in this CAP. Even with the anticipated growth in unincorporated Sutter County,

the slow growth rate and modernization of vehicle fleets, combined with the continued implementation of the proposed R2 and R3 measures, will ensure a reduction of County-wide GHG emissions by approximately 229,005 MT CO_2e by 2020 from the levels expected under a 2020 Business as Usual (BAU) scenario and a reduction of 49,621 MT CO_2e from 1990 levels. Additionally, with the expansion of the reduction measures outlined for the 2020 target and inclusion of GHG reduction policies in the County's General Plan, the expected reduction by 2030 is 503,069 MT CO_2e from a business as usual scenario and 3,080 MT CO_2e below 1990 levels.

Section 7 Implementation

This section describes implementation steps for the CAP to support achievement of the GHG reduction goals for the community at large. Success in meeting the County's GHG emission reduction goal will depend on cooperation, innovation, and participation by the County and residents, businesses, and government entities in the County's land use jurisdiction with regards to implementing the CAP. This section outlines key steps that the County will follow for the implementation of this CAP.

7.1 STEP 1—Administration and Staffing

The County will appoint an Implementation Coordinator to coordinate implementation of this CAP. The Implementation Coordinator will oversee and document implementation of the reduction measures and provide periodic monitoring of emissions.

The Implementation Coordinator will, at a minimum, include the following departments, but will be expanded as needed to ensure coordinated leadership in plan implementation:

- County Administrative Office—The CAO's office can provide economic, financial, and administrative guidance and support to the Implementation Coordinator.
- Planning Division (Community Services Dept.)—Planning can provide expertise in the project entitlement process and provide long-term planning support.

7.2 STEP 2—Financing and Budgeting

The Implementation of the CAP will require creative, continuing, and committed financing in order to work. Local, regional, state, and federal public sources of funding will be needed along with the substantial involvement of the private sector. The County Implementation will take into account the costs and staff resources throughout implementation of the plan as well as the financial benefits and cost savings. The following different financing options will be explored by the County:

- State and Federal Grants and Low-interest Loans —As described below there are a variety of grant and loan programs that exist in various sectoral areas.
- Support from Local Businesses, Non-Profits, and Agencies—Opportunities for public/private partnerships (like the existing PG&E partnerships) exist to provide cooperation on many aspects of the CAP including energy efficiency retrofits, waste minimization, transit promotion, and education.
- Self-Funding and Revolving Fund Programs—Innovative programs to fund residential solar investments.

- Agreements with Private Investors—Energy service companies (ESCOs) and other private companies can finance up-front investments in energy efficiency and then be reimbursed through revenues from energy savings.
- Taxes and Bonds—Various municipalities have used targeted finance instruments for solar, transportation, vehicle improvements, and landfill methane controls.

Given that financing is key to implementing many measures, a review of current and potential funding sources was completed for the different sectors covered in this CAP and is presented below to help early phase implementation of the CAP. Whether at the federal, western regional or state level, it appears likely that there will be some form of a cap and trade system in place within several years. This system, depending on its particular character, is likely to influence energy prices (such as for electricity, natural gas, and vehicle fuels), and may make currently cost-ineffective measures more economically feasible in the medium term and allow the financing of a broader range of plan measures.

7.2.1 Energy Efficiency and Renewable Energy Financing

Federal Energy Efficiency Community Block Grants (EECBG). As part of the stimulus package (the "American Recovery and Reinvestment Act" or ARRA), signed into law by President Obama in spring 2009, block grants are available for energy efficiency planning and improvements in the building, transportation, and other sectors. The purpose of the EECBG Program is to assist eligible entities in creating and implementing strategies to: reduce fossil fuel emissions in a manner that is environmentally sustainable and that maximizes, to the greatest extent practicable, benefits for local and regional communities; reduce the total energy use of the eligible entities; and improve energy efficiency in the building sector, the transportation sector, and other appropriate sectors. Eligible activities include: development of an energy efficiency and conservation strategy; technical consultant services; residential and commercial building energy audits; financial incentive programs; energy efficiency retrofits; energy efficiency and conservation programs for buildings and facilities; development and implementation of certain transportation programs; building codes and inspections; certain distributed energy projects; material conservation programs; reduction and capture of methane and greenhouse gases from landfills and dairies; efficiency traffic signals and street lighting; renewable energy technologies on government buildings; and other appropriate activity.

Federal Tax Credits for Energy Efficiency. On October 3, 2008, President Bush signed into law the "Emergency Economic Stabilization Act of 2008." This bill extended tax credits for

energy efficient home improvements (windows, doors, roofs, insulation, HVAC, and non-solar water heaters). These residential products during 2008 were not eligible for a tax credit, as tax credits had expired at the end of 2007. The bill also extended tax credits for solar energy systems and fuel cells to 2016. New tax credits were established for small wind energy systems and plug-in hybrid electric vehicles. Tax credits for builders of new energy efficient homes and tax deductions for owners and designers of energy efficient commercial buildings were also extended. (See: http://www.energystar.gov/index.cfm?c=products.pr_tax_credits.)

PG&E Energy Efficiency / Renewable Energy Incentives

- Savings By Design (for new non-residential construction)—Design assistance, owner incentives, and design team incentives.
- Standard Performance Contract Incentives—Lighting ($0.05/kWh), Air Conditioning and Refrigeration ($0.14/kWh), other ($0.08/kWh).
- California New Homes Program (CANHP)—New Residential Construction: approximately $500–$2,000 / home.
- Direct Install Program (business customers with less than 100 kW demand)—Free energy analysis; free lighting, refrigeration, and LED exit sign upgrades; free installation.
- Retrocommissioning Program—Free analysis, incentives for implementing energy efficiency measures, and free training.
- California Solar Initiative (CSI) and New Solar Homes Partnership (NSHP)—Solar rebate program for existing (CSI) and new (NSHP) buildings: ~$2.50/Watt installed.
- Industrial Energy Efficiency Program.
- Various other commercial incentive/rebate programs (see http://www.sce.com/brs/commercial/).

Clean Renewable Energy Bonds. Clean renewable energy bonds (CREBs) can be used by certain entities—primarily in the public sector—to finance renewable energy projects. The list of qualifying technologies is generally the same as that used for the federal renewable energy production tax credit. CREBs may be issued by electric cooperatives, government entities (states, cities, counties, territories, Indian tribal governments, or any political subdivision thereof), and certain lenders. The advantage of CREBs is that they are issued—theoretically—with a zero (0) percent interest rate. The borrower pays back only the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest. (See http://www.irs.gov/irb/2007-14_IRB/ar17.html.)

AB 811 Financing Districts. AB 811 permits the creation of assessment districts to finance installation of distributed generation renewable energy sources or energy efficiency

improvements that are permanently fixed to residential, commercial, industrial, or other real property. The use of such a district can remove the up-front cost or up-front financing as an impediment to property owners who would like to install energy efficiency upgrades or renewable energy systems. Financing is repaid through the property tax bill and repayment obligations remain with the property when it is sold to a new owner.

7.2.2 Transportation Financing

Federal Energy Efficiency Community Block Grants (EECBG). As described above, eligible activities include development and implementation of certain transportation programs and efficiency traffic signals and street lighting.

Measure I. Measure I authorizes the County Transportation Authority to impose a half cent retail transactions and use tax applicable in the incorporated and unincorporated areas of the County. By approving Measure I, County voters guaranteed that all of the funds collected would be expended in the County for certain types of transportation projects. Measure I will generate approximately $200 million for transportation improvements in the County throughout the life of the 20-year sales tax.

Regional Improvement Program (RIP). The Regional Improvement Program (RIP) is funded from 75 percent of the funds made available for transportation capital improvement projects under the State Transportation Improvement Program (STIP). This program targets urban projects that are needed to improve transportation within the region. The Sacramento Area Council of Governments (SACOG) recommends to the California Transportation Commission (CTC) the selection of these projects, which can include state highway improvements, local roads, public transit, intercity rail, grade separations, and more.

Interregional Improvement Program (IIP). The Interregional Improvement Program (IIP) is funded from 25 percent of the funds made available for transportation capital improvement projects under the STIP. This program targets projects that are needed to improve interregional movement of people and goods. Caltrans recommends to the CTC the selection of these projects, which can include state highway improvements, intercity passenger rail, mass transit guide ways, or grade separation projects. SACOG supports or recommends the most cost-effective projects for implementation.

Regional Transportation Improvement Program. SACOG develops the Regional Transportation Improvement Program (RTIP). The RTIP is a listing of all capital transportation projects proposed over a six (6)-year period for the SACOG region. Projects include highway improvements, transit, rail and bus facilities, carpool lanes, signal synchronization, intersection improvements, freeway ramps, and other related improvements. In the SACOG region, updates are made to the RTIP every two (2) years, during even-numbered years.

7.2.3 Waste Reduction Financing

Resource Conservation Funds 2009. The USEPA Region 9 is soliciting proposals to fund projects that address solid waste reduction and management. Funds will be awarded pursuant to Section 8001 of the Resource Conservation and Recovery Act (RCRA), 42 USC §6981. Funding will be in the form of cooperative agreements and/or grants. Funds will be awarded to applicants carrying out projects that serve the following states and territories: Arizona, California, Hawaii, Nevada, the U.S. territories in the Pacific Ocean, and the lands in Indian Country belonging to over 140 federally recognized tribes which fall under USEPA Region 9's geographic area. The aim of this funding is to support innovative ideas with the goal of fostering positive change. Projects may include studies, surveys, investigations, demonstrations, training, and public education programs. All demonstration projects must demonstrate applications, technologies, methods, or approaches that are new, innovative, or experimental. A demonstration project that is carried out through a routine or established practice is not eligible for funding. Under this announcement, USEPA Region 9 anticipates awarding approximately two (2) to four (4) cooperative agreements and/or grants totaling approximately $120,000. USEPA Region 9 anticipates that each grant or cooperative agreement will range in size from approximately $20,000 to $100,000. See http://www.epa.gov/region09/funding/rcra.html for additional details.

California Integrated Waste Management Board Grants and Loans. The CIWMB offers funding opportunities authorized by legislation to assist public and private entities in the safe and effective management of the waste stream. See http://www.ciwmb.ca.gov/grants/ for more details.

7.2.4 Water Conservation and Treatment Financing

Clean Water State Revolving Funds. CWSRFs fund water quality protection projects for wastewater treatment, nonpoint source pollution control, and watershed and estuary management. CWSRFs have funded over $63 billion, providing over 20,700 low-interest loans to date. (See http://www.epa.gov/owm/cwfinance/cwsrf/index.htm for more details.) CWSRF's offer:

- Low Interest Rates, Flexible Terms—Nationally, interest rates for CWSRF loans average 2.1 percent, compared to market rates that average 4.3 percent. For a CWSRF program offering this rate, a CWSRF funded project would cost 18 percent less than projects funded at the market rate. CWSRFs can fund 100 percent of the project cost and provide flexible repayment terms up to 20 years.
- Funding for Nonpoint Source Pollution Control and Estuary Protection—CWSRFs provided more than $240 million in 2007 to control pollution from nonpoint sources and for estuary protection, more than $2.6 billion to date.
- Assistance to a Variety of Borrowers—The CWSRF program has assisted a range of borrowers including municipalities, communities of all sizes, farmers, homeowners, small businesses, and nonprofit organizations.
- Partnerships with Other Funding Sources—CWSRFs partner with banks, nonprofits, local governments, and other federal and state agencies to provide the best water quality financing source for their communities.

7.3 STEP 3—Timeline and Prioritization

The County will develop an implementation schedule based on the completion of the full cost effectiveness analysis and the Climate Finance Plan. Prioritization will be based on the following factors:

- Cost effectiveness;
- GHG reduction efficiency;
- Availability of funding;
- Level of County Control;
- Ease of implementation; and
- Time to implement.

In general consideration of these factors, the following is an outline of key priorities for three (3) phases starting in 2010 through 2020.

- Phase 1 (2010–2012): Development of key ordinances (such as a green building ordinance, warehouse solar program, expansion of waste diversion goal to 60 percent, etc.), completion of key planning efforts (e.g., Climate Finance Plan, regional land use/transportation planning); implementation of most cost-effective measures (e.g.

energy efficiency retrofits, first tier landfill controls, rideshare/carpool measures, etc.); and support of voluntary efforts.

- Phase 2 (2013–2015): Continued implementation of first tier measures, implementation of second tier measures (expand waste reduction target to 70 percent, new building solar requirements, next level of landfill controls, etc.); and implementation of key planning outcomes from Phase 1 (transit-oriented development, etc.)
- Phase 3 (2015–2020): Continued implementation of first and second tier measures, implementation of third tier of measures (expand waste reduction target to 75 percent, next level of landfill controls, etc.).

Because the goals of this CAP are aggressive, success in meeting the CAP goals depend on some flexibility in the GHG reduction actions. The County is committed to flexibility in implementing the reduction measures and meeting the goals of this CAP. Many of the reduction measures in this Plan may be implemented through a menu of options. The goals of each reduction measure can often be achieved through a variety of means, especially those related to building energy efficiency. For example, the County will develop energy efficient design programs (measures R2-E3 and R2-E4). Compliance with the energy efficient design programs can be achieved through many combinations of actions including (but not limited to): installing energy efficient appliances, lighting, and HVAC systems; installing solar panels and solar water heaters; siting and orienting buildings to optimize conditions for natural heating, cooling, and lighting; installing top-quality windows and insulation; and incorporating natural shading, skylights, and reflective surfaces. Table 7-1 presents the potential timeline and phasing schedule for the GHG reduction measures. Note that some of the reduction measures occur within all three phases. As an example, transit infrastructure has discrete early, mid-term and long-term phasing before completion. The details of transit infrastructure phasing can be found in the Sutter Pointe Conceptual Transit Plan (2008). Other reduction measures, such as energy efficiency retrofits will be staged within the three phases to allow for staggered funding of the retrofit incentives.

Table 7-1: GHG Reduction Measure Timeline and Phasing Schedule

Potential Phasing for the R2 GHG Reduction Measures	
Reduction Measure:	**Phase**
Energy Reduction Measures	
R2-E1: Residential Energy Efficiency Program	1
R2-E2: Residential Renewable Energy Program	2
R2-E3: Residential Retrofit Implementation Program	1, 2, 3
R2-E4: Residential Renewable Retrofit Program	1, 2, 3
R2-E5: Commercial Energy Efficiency Program	1
R2-E6: Commercial/Industrial Renewable Energy Program	2
R2-E7: Commercial/Industrial Retrofit Program	1, 2, 3
R2-E8: Agricultural Alternative Energy Program	1, 2 ,3
R2-E9: Water Use Reduction Initiative	1
Solid Waste	
R2-W1: County Diversion Program	1
R2-W2: Construction Diversion Program	1
R2-W3: Sutter Pointe Solid Waste Reduction Measures	1
Agriculture	
R2-A1: Agricultural Water Management	1
Transportation	
R2-T1: Employment Based Trip and VMT Reduction	1
R2-T2: Land use Based Trip and VMT Reduction Policies	1
R2-T3: Preferential Parking	1
R2-T4: Roadway Improvements including Signal Synchronization and Transportation Flow Management	1, 2, 3
R2-T5: Increase the Use of Ridesharing as an Alternative to Single Occupancy Vehicle Use	1
R2-T6: Provide a Comprehensive System of facilities for Non-motorized Transportation	1, 2, 3
R2-T7: Expand Renewable Fuel/Low-Emission Vehicle Use	1, 2, 3
R2-T8: Transit Infrastructure Development within the Sutter Pointe Specific Plan	1, 2, 3

7.4 STEP 4—Public Participation

The citizens and businesses in Sutter County are integral to the success of GHG reduction efforts. Their involvement is essential in order to reach the reduction goals because this CAP depends on a combination of state and local government efforts, public and private sources of finance, and the voluntary commitment, creativity, and participation of the community at large. The Sutter County Board of Supervisors recognizes that prosperity and economic development cannot be achieved at the expense of our environment. The County must strike a balance

between development and environmental stewardship to keep our economy strong and, at the same time, protect our environment. The County will educate stakeholders such as businesses, business groups, residents, developers, and property owners about the CAP and encourage participation in efforts to reduce GHG emissions in all possible sectors.

7.5 STEP 5—Project Review

The CEQA guidelines support projects that lower the carbon footprint of new development, and encourage programmatic mitigation strategies that may include reliance on adopted regional blueprint plans, CAPs, and general plans that meet regional and local GHG emissions targets and that have also undergone CEQA review. The criteria needed to use adopted plans in evaluating impacts of GHG emissions from subsequent development projects is found in CEQA Guidelines § 15183.5. Once adopted, the CAP fulfills these requirements. The County is responsible for ensuring that new projects conform to these guidelines and meet the goals and requirements outlined in this CAP.

The County will implement the reduction measures for new development during the CEQA review, through the use of a County GHG Significance Threshold document based upon the CAP. The County GHG Significance Threshold document will provide guidance for the analysis of development projects and divide projects into two broad categories based upon the CEQA review they are going through. The screening table will provide a menu of reduction options. If a project can obtain 100 points from the screening table, the mitigated project will implement pertinent reduction measures such that it meets the reduction goals of the CAP and a less than significant finding can be made for the Project. The menu of options in the screening table is tied to the R2 Measures in the CAP such that 100 points will meet the emission reductions associated with the R2 Measures. This menu allows for maximum flexibility for projects to meet its reduction allocation.

The methodology discussed above and described in more detail in the forthcoming County GHG Significance Threshold document will be consistent with the analysis and quantification methodology used in the CAP.

Once the screening tables are completed they will also serve to document the implementation of reduction measures. Using the screening tables as a reduction measure monitoring tool is described in more detail in Section 7.6 below.

7.6 STEP 6—Monitoring and Inventorying

The County will create a system for monitoring the implementation of this CAP and adjusting the plan as opportunities arise. As the plan is implemented and as technology changes, the CAP should be revised to take advantage of new and emerging technology. If promising new strategies emerge, the County will evaluate how to incorporate these strategies into the CAP. Further, state and federal action will also result in changes which will influence the level of Sutter County emissions.

Screening tables completed during project review, as described in Section 7.5 above, will serve as documentation of the implementation of reduction measures. The County shall retain the completed screening tables in order to maintain a record of the types and levels of implementation of each of the R2 measures. The point values in the completed screening tables also document the estimated levels of emission reductions anticipated during implementation. By maintaining these records, the County can monitor the CAP reduction measure implementation and compare the anticipated emission reductions with the goals for the CAP over time.

The GHG inventory will be periodically updated in coordination with the three (3) phases noted above: 2012 (to update with the Regional Transportation Plan outputs and Phase 1 progress); 2015 (to review Phase 2 progress, allow for course corrections to keep progress on target for 2020, and to develop post-2020 forecasts for use in planning for after 2020); and 2020 (to establish baseline for post-2020 GHG reduction planning). The County will also implement a monitoring and reporting program to evaluate the effectiveness of reduction measures with regards to progress towards meeting the goals of the CAP.

To provide periodic updates to the CAP inventory of GHG emissions, the County will use an MS Excel format emissions inventory tool. This tool will include all the emission factors and emission sources specific to Sutter County. The tool will be designed such that County staff can input, selected vehicle count provided by the California Department of Transportation, and the level of energy consumed in the County provided to them by the utilities, and the tool will quantify emissions for the Unincorporated Areas.

The CAP Implementation Coordinator shall be responsible for maintaining records of reduction measure implementation and insuring that the periodic updates to the emissions inventory are completed using the MS Excel based emission inventory tool.

7.7 STEP 7—Beyond 2020

As described above under the discussion of Reduction Goals, 2020 is only a milestone in GHG reduction planning. Executive Order S-03-05 calls for a reduction of GHG emissions to a level 80 percent below 1990 levels by 2050, and this level is consistent with the estimated reductions needed to stabilize atmospheric levels of CO2 at 450 parts per million (ppm). Thus, there will be a need to start planning ahead for the post-2020 period.

The General Plan Update Draft Environmental Impact Report (EIR) describes the level of emissions and how the County will continue to maintain the reduction target in the intervening period between 2020 and General Plan Buildout in 2030. That analysis anticipates that California will continue strengthening the energy efficiency requirements in Title 24 and that PG&E will realize the renewable portfolio. In addition, by 2020 it is anticipated that all transit infrastructure will be completed within the Sutter Pointe Specific Plan area. The Sutter Pointe Conceptual Transit Plan (2008) describes in detail the buildout of transit infrastructure. The CAP demonstrates achievement of the 2020 reduction target by retrofitting five percent of the residential and commercial buildings by 2020. The General Plan Update Draft EIR also anticipates that between years 2020 and 2030 the amount of residential retrofits will increase to thirty percent and commercial building retrofits will increase to thirty-five percent of the older building stock in Unincorporated County areas. Finally, the General Plan Update Draft EIR requires as mitigation that between years 2020 and 2030 that there is an eighty percent diversion rate of non-construction related solid waste and a seventy percent diversion rate for construction related solid waste. The increases in the building retrofit program and solid waste diversion insure that the County continues to reduce emissions and exceed the 2020 reduction target in the years 2020 through 2030.

However, there are many uncertainties in predicting emissions in post-2020. Federal programs and policies for the near term are likely to be well underway; market mechanisms like a cap and trade system may be in force and will be influencing energy and fuel prices; and continuing technological change in the fields of energy efficiency, alternative energy generation,

vehicles, fuels, methane capture, and other areas will have occurred. In addition, by 2015, the County will be at the approximate midway point between plan implementation and the reduction target and after development of key ordinances and implementation of cost-effective measures. At that point, the County will have implemented the first two (2) phases of this CAP and will have a better understanding of the effectiveness and efficiency of different reduction strategies and approaches. For all of these reasons, it is important that the County prepare and update the CAP for the post 2020 period toward the latter half of the CAP implementation period.

Therefore, it is anticipated that the County will commence planning for the post-2020 period at the approximate midway point between plan implementation and the reduction target and after development of key ordinances and implementation of cost-effective measures. At that point, it is anticipated the County will have implemented the first two (2) phases of this CAP and will have a better understanding of the effectiveness and efficiency of different reduction strategies and approaches. Further, the State's regulations under AB 32 would have been fully in force since 2012; federal programs and policies for the near term are likely to be well underway; market mechanisms like a cap and trade system are likely to be in force and will be influencing energy and fuel prices; and continuing technological change in the fields of energy efficiency, alternative energy generation, vehicles, fuels, methane capture, and other areas will have occurred. The County will then be able to take the local, regional, state, and federal context into account. The new plan will include a specific target for GHG reductions for 2030, 2040, and 2050. The targets will be consistent with broader state and federal reduction targets and with the scientific understanding of the needed reductions by 2050.

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Appendix A: The Greenhouse Effect, Greenhouse Gases, and Climate Change Impacts

GLOBAL CLIMATE CHANGE

Parts of the Earth's atmosphere act as an insulating blanket of just the right thickness, trapping sufficient solar energy to keep the global average temperature in a suitable range. The 'blanket' is a collection of atmospheric gases called 'greenhouse gases' (GHGs) based on the idea that the gases also 'trap' heat like the glass walls of a greenhouse. These gases, mainly water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone, and chlorofluorocarbons (CFCs) all act as effective global insulators, reflecting back to earth visible light and infrared radiation. Human activities such as producing electricity and driving vehicles have contributed to the elevated concentration of these gases in the atmosphere. This in turn, is causing the Earth's temperature to rise. A warmer Earth may lead to changes in rainfall patterns, much smaller polar ice caps, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

Leading scientists around the world agree that Global Warming Potential is a reality and that human activities are disrupting the earth's climate by intensifying the greenhouse effect.

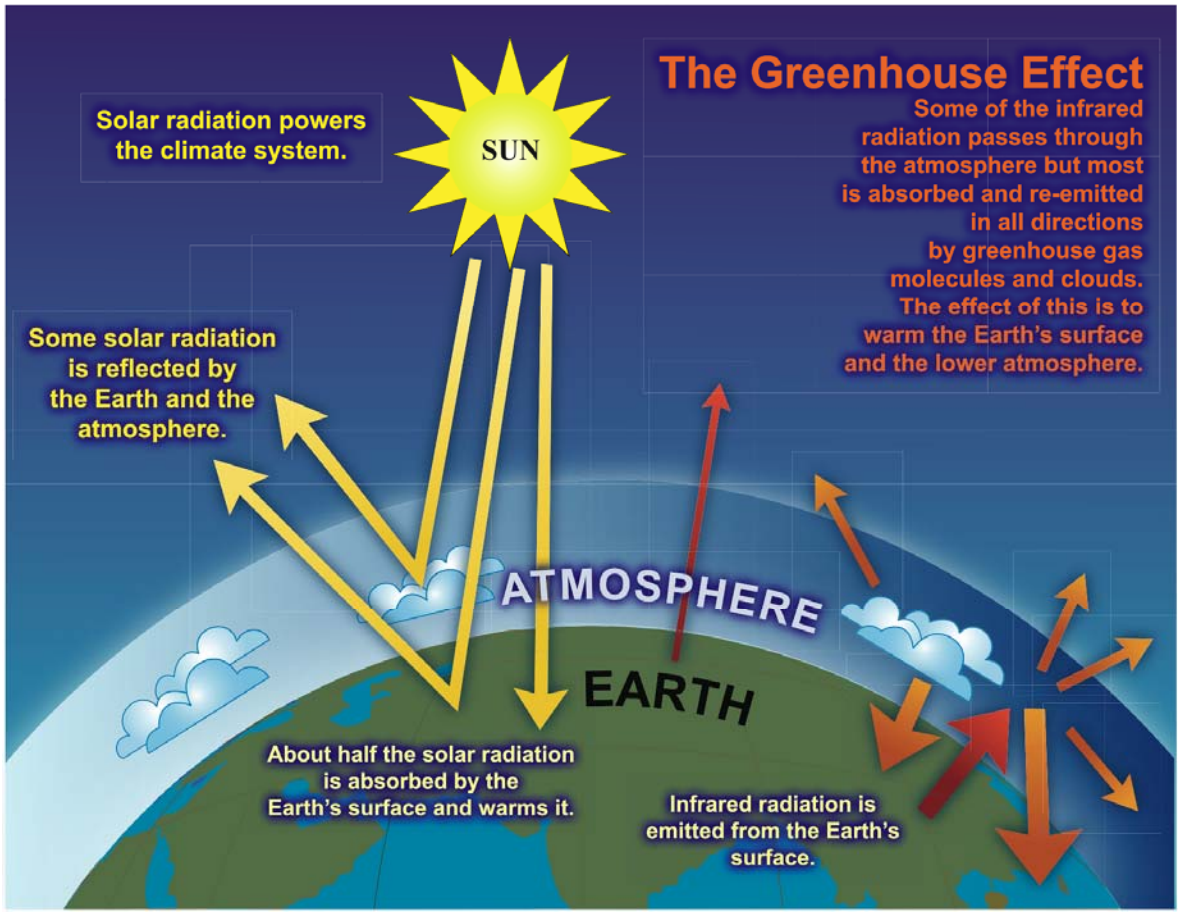
1. THE GREENHOUSE EFFECT

A balance of naturally occurring gases dispersed in the atmosphere determines the Earth's climate by trapping solar heat. This phenomenon is known as the greenhouse effect. As sunlight passes through our atmosphere, the incoming solar radiation is eradiated from the Earth's surface as heat energy. Greenhouse gases trap some of this reradiated energy, which warms the Earth. Figure A-1 illustrates the Greenhouse Gas Effect.

2. GLOBAL WARMING

The natural "greenhouse effect" allows the Earth to remain warm, and sustain life, and helps determine the existing climate. The increased consumption of fossil fuels (wood, coal, gasoline, etc.) has substantially increased atmospheric levels of greenhouse gases. As atmospheric concentrations of greenhouse gases rise, so do temperatures. Over time this rise in temperatures would result in climate change. Theories concerning climate change and global warming existed as early as the late 1800s. By the late 1900s the understanding of the Earth's atmosphere had advanced to the point where many climate scientists began to accept that the Earth's climate is changing. Today, many climate scientists agree that some warming has occurred over the past century and will continue through this century.

Figure A.1 - The Greenhouse Gas Effect



Source: IPPC, 2008

The United Nations Intergovernmental Panel on Climate Change predicts that changes in the Earth's climate will continue through the 21st century and that the rate of change may increase significantly in the future because of human activity. Many researchers studying California's climate believe that changes in the earth's climate have already affected California and will continue to do so in the future.

3. GREENHOUSE GASES

Changes in climate result from radiative forcings and feedbacks. Radiative forcing is the difference between the radiation energy entering the Earth's atmosphere and the radiation energy leaving the atmosphere. Greenhouse gases allow solar radiation to penetrate the Earth's atmosphere but slow the release of atmospheric heat. A feedback is an internal process that amplifies or dampens the climate's response to a specific forcing. For example; the heat trapped by the atmosphere may cause temperatures to rise or may alter wind and weather patterns. A gas or aerosol's global warming potential (GWP) is its ability to trap heat in the atmosphere. It is

the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas."[1]

Individual GHGs have varying global warming potential (GWP) and atmospheric lifetimes. The carbon dioxide equivalent (CO_2e) is a consistent methodology for comparing greenhouse gas emissions since it normalizes the various greenhouse gases to a consistent metric. The reference gas for GWPs is carbon dioxide, which has a GWP of one. By comparison, methane's GWP is 21, as CH_4 has a greater global warming effect than CO_2 on a molecule-to-molecule basis.[2] In order to combine the impacts of multiple greenhouse gases, the carbon dioxide equivalent metric is used. CO_2e is the total amount of each individual greenhouse gas multiplied by that gas's GWP.

Atmospheric lifetimes vary from 1.5 (HFC-152a) to 50,000 years (tetrafluoromethane). One teragram (equal to one million metric tons) of carbon dioxide equivalent (Tg CO_2 Eq.) is the mass emissions of an individual GHG multiplied by its GWP. The atmospheric lifetime and GWP of selected greenhouse gases are also summarized in Table A.1.

Table A.1 Global Warming Potentials and Atmospheric Lifetimes

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100 year time horizon)
Carbon Dioxide	50 - 200	1
Methane	12 ± 3	21
Nitrous Oxide	120	310
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC: Tetrafluoromethane (CF4)	50,000	6,500
PFC: Hexafluoroethane (C2F6)	10,000	9,200
Sulfur Hexafluoride (SF6)	3,200	23,900
Source: U.S. Environmental Protection Agency, 2006.		

Of all greenhouse gases in the atmosphere, water vapor is the most abundant, important, and variable. It is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. The main source of water vapor is evaporation from the oceans (approximately 85 percent).

[1] U.S. Environmental Protection Agency (EPA). 2006a. The U.S. Greenhouse Gas Emissions and Sinks: Fast Facts. Office of Atmospheric Programs.

[2] EPA, 2006. Non CO_2 Gases Economic Analysis and Inventory. Global Warming Potentials and Atmospheric Lifetimes. www.epa.gov/nonco2/econ-inv/table.html

Other sources include evaporation from other water bodies, sublimation (change from solid to gas) from ice and snow, and transpiration from plant leaves.

Ozone is also a greenhouse gas; however, unlike other GHGs, ozone in the troposphere is relatively short-lived and therefore is not global in nature. It is difficult to make an accurate determination of the contribution of ozone precursors (nitrogen oxides and volatile organic compounds) to global climate change (GCC).

Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light. Cloud formation can also be affected by aerosols. Sulfate aerosols are emitted when fuel containing sulfur is burned. Black carbon (or soot) is emitted during bio mass burning and incomplete combustion of fossil fuels. Particulate matter regulation has been lowering aerosol concentrations in the United States; however, global concentrations are likely increasing.

Carbon Dioxide

The natural production and absorption of carbon dioxide (CO_2) is achieved through the terrestrial biosphere and the ocean. However, humankind has contributed to the alteration of the natural carbon cycle by burning coal, oil, natural gas, and wood. Since the industrial revolution began in the mid 1700s, each of these human-caused activities has increased in scale and distribution. Carbon dioxide was the first GHG demonstrated to be increasing in atmospheric concentration with the first conclusive measurements being made in the last half of the 20th century. Prior to the industrial revolution, concentrations were fairly stable at 280 ppm. Today, they are around 370 ppm, an increase of well over 30 percent[3]. Left unchecked, the concentration of carbon dioxide in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources. This will result in an average global temperature rise of at least two degrees Celsius (3.6 ^{O}F)[4].

Carbon dioxide emissions are directly generated primarily in the form of vehicle exhaust and in the consumption of natural gas for heating. Carbon dioxide emissions are also generated from natural gas combustion and indirectly through the use of electricity. Other indirect sources of carbon dioxide include the use of potable water and generation of wastewater (potable water and wastewater treatment generates greenhouse gases), and the generation of solid waste.

[3] U.S. Environmental Protection Agency, Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks, Third Edition, September 2006.
[4] Intergovernmental Panel on Climate Change, Climate Change 2001: The Scientific Basis, Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate. http://www.ipcc.ch/pub/reports.htm. 2001.

Methane

Methane (CH_4) is an extremely effective absorber of radiation, though its atmospheric concentration is less than carbon dioxide and its lifetime in the atmosphere is brief (10-12 years), compared to some other GHGs (such as carbon dioxide, nitrous oxide, and CFCs). Methane has both natural and anthropogenic (human) sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas and mining coal have added to the atmospheric concentration of methane[5].

Nitrous Oxide

Concentrations of nitrous oxide (N_2O) also began to rise at the beginning of the industrial revolution. Microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen, produce nitrous oxide. The use of fertilizers has increased over the last century. Global concentration for nitrous oxide in 1998 was 314 ppb, and in addition to agricultural sources for the gas, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load[6].

Chlorofluorocarbons

Chlorofluorocarbons (CFCs) have no natural source, but were synthesized for use as refrigerants, aerosol propellants and cleaning solvents. Since their creation in 1928, concentrations of CFCs in the atmosphere have been rising. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely successful, so much so that levels of the major CFCs in the atmosphere are now remaining static or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years. Since they are also a GHG, along with such other long-lived synthesized gases as CF_4 (carbontatrafuoride) and SF_6 (sulfurhexafluoride), they are of concern. Another set of synthesized compounds called HFCs (hydrofluorcarbons) are also considered GHGs, though they are less stable in the atmosphere and therefore have a shorter lifetime and less of an impact[7]. CFCs, CF_4, SF_6 and HFCs have been banned and are no longer available on the market.

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[5] U.S. Environmental Protection Agency, Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks, Third Edition, September 2006.

[6] U.S. Environmental Protection Agency, Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks, Third Edition, September 2006.

[7] U.S. Environmental Protection Agency, Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks, Third Edition, September 2006.

4. HUMAN AND CULTURAL CAUSES OF CLIMATE CHANGE

Like all other animals, humans participate in the natural carbon cycle, but there are important differences between human and animal activities. By burning coal, oil, and natural gas, humans are adding carbon dioxide (CO_2) to the atmosphere much faster than the carbon in rocks is released through natural processes. Clearing and burning forests to create agricultural land converts organic carbon to carbon dioxide gas. The oceans and land plants are absorbing a portion, but not nearly all of the CO_2 added to the atmosphere by human activities. Human climate drivers include heat-trapping emissions from cars and power plants, aerosols from pollution, and soot particles.

5. IMPACTS FROM GREENHOUSE GAS EMISSIONS

Global Impacts

While in some cases global climate change may temporarily improve certain aspects of a region, such as lengthening the growing season, it is estimated that the ecology of the natural world will not be able to adjust quickly enough to prevent widespread environmental degradation[8]. In California, it is likely that warmer temperatures will result in frequent and longer periods of drought. The majority of the scientific community has stated that beyond doubt, global climate change will be one of the most significant challenges the globe will face in the twenty-first century, and will impact almost every system we depend upon for survival.

Just as humans are affected by climate change, so too are plants and animals. Animals must breathe the same air and are subject to the same types of negative health effects as humans. Certain plants and trees may absorb air pollutants that can stunt their development or cause premature death.

There are also numerous impacts to the human economy including lost workdays due to illness, a desire on the part of business to locate in areas with a healthy environment, and increased expenses from medical costs. Pollutants may also lower visibility and cause damage to property. Certain air pollutants are responsible for discoloring painted surfaces, eating away at stones used in buildings, dissolving the mortar that holds bricks together, and cracking tires and other items made from rubber.

The United States has the highest per capita emissions of GHGs in the world, 22 tons of CO_2 per person per year (see figure 1-2). With only five percent of the world's population, the United

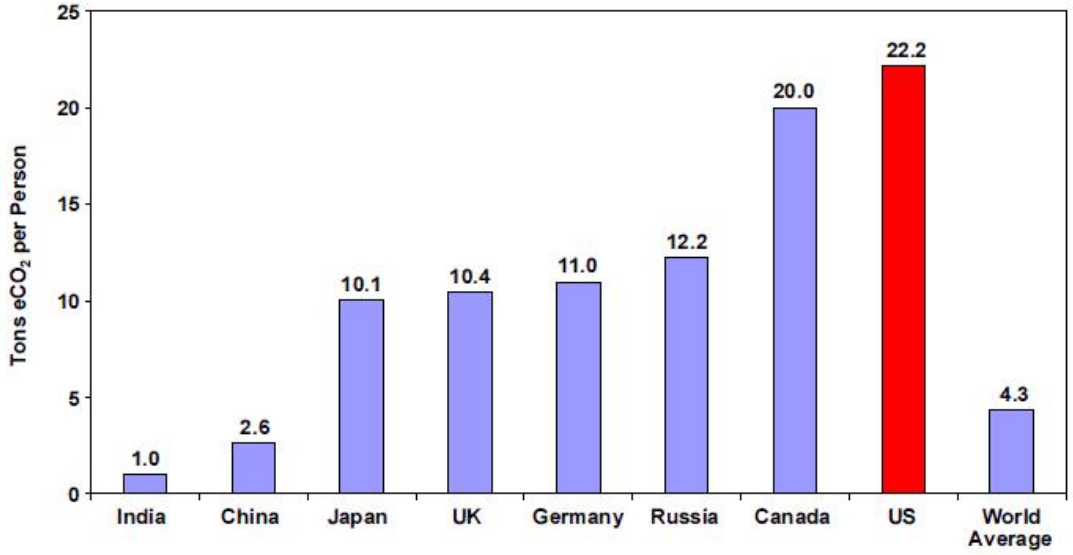
[8] Intergovernmental Panel on Climate Change, Climate Change 2001: The Scientific Basis, Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate. http://www.ipcc.ch/pub/reports.htm. 2001.

States is responsible for 24 percent of the world's CO_2 emissions. California, despite its strong environmental regulations, is the second largest greenhouse gas polluting state in the nation, and emits 2% of global human-generated emissions. Its largest contribution of CO_2 is from vehicle emissions.

According to the International Panel on Climate Change (IPCC), the following are current worldwide statistics for CO_2 concentrations[9]:

- The atmospheric concentration of carbon dioxide (CO_2) during the last two decades has increased at the rate of 0.4% every year.
- Current CO_2 concentrations are higher than they have been in the last 420,000 years, and according to some research, the last 20 million years.
- About three-quarters of the CO_2 emissions produced by human activity during the past 20 years are due to the burning of fossil fuels.

Figure A-2 – Per Capita CO_2 Emissions from 2001



Source: Energy Information Administration, 2001.

Human Health

According to the Pew Center's report on Human Health and Climate Change, health threats may depend on surpassing a threshold level of a climate factor such as significant change in temperature, precipitation, or storm frequency. Once that threshold has passed, the incidence of disease may drastically increase.

[9] Intergovernmental Panel on Climate Change, Sixteen Years of Scientific Assessment in Support of the Climate Convention, http://www.ipcc.ch/about/anniversarybrochure.pdf. December 2004.

Environmental factors play a significant role in some diseases carried by insects. Warming could make tick-borne Lyme disease more prevalent. Mosquito-borne diseases such as West Nile virus, Dengue Fever, and Malaria could acquire new ranges and access to previously unexposed populations. For example, the temperature range at which the malaria-carrying mosquito lives is sensitive to a mere one-degree in temperature change; thus an overall increase in global temperatures will increase the land areas where it may spread disease. These temperature changes affect not only the mosquitoes, but also disturb and in some cases decrease the habitats of its natural predators.

Ecosystems

Scientists predict serious consequences of global warming. The rapid, unprecedented increase in temperatures accelerates the water cycle, which then increases the occurrence, variability, and severity of storms and drought. Such extreme climate events will potentially disrupt ecosystems and damage food and water supplies. In addition, increased temperatures cause thermo-expansion of the oceans and accelerate the melting of the icecaps, thereby raising the overall level of the oceans. The sea-level rise may have multiple outcomes, including significant environmental disturbances, coastline destruction, major population displacement and economic disruption.

While there is some degree of uncertainty, scientists are able to predict many of the challenges that climate change presents to ecosystems. Warmer temperatures may force some species to higher altitudes or more northern latitudes. This migration may be prevented by human developments that literally block the path as well as non-native species that can out-compete native plants and animals in new locations or make those areas uninhabitable. For example, there is evidence that certain butterflies, often a species that is used to indicate the health of an ecosystem, are moving further north, and are seldom seen in the southern reaches of their range. In addition, warmer temperatures have enabled the Jeffrey pine beetle to have more than one birth cycle per season, lengthening the amount of time this pest is able to damage trees. Furthermore, human impact other than greenhouse gas emissions will exacerbate challenges to ecosystems attempting to reestablish at higher elevations or new locations. According to the UCS report, “In many parts of California, fragmentation of the landscape by human developments, invasions by nonnative species, and air pollution may limit the reestablishment of native ecosystems.”[10]

[10] Union of Concerned Scientists and The Ecological Society of America, 1999 Confronting climate change in California.pdf, November 1999.

Impacts to California

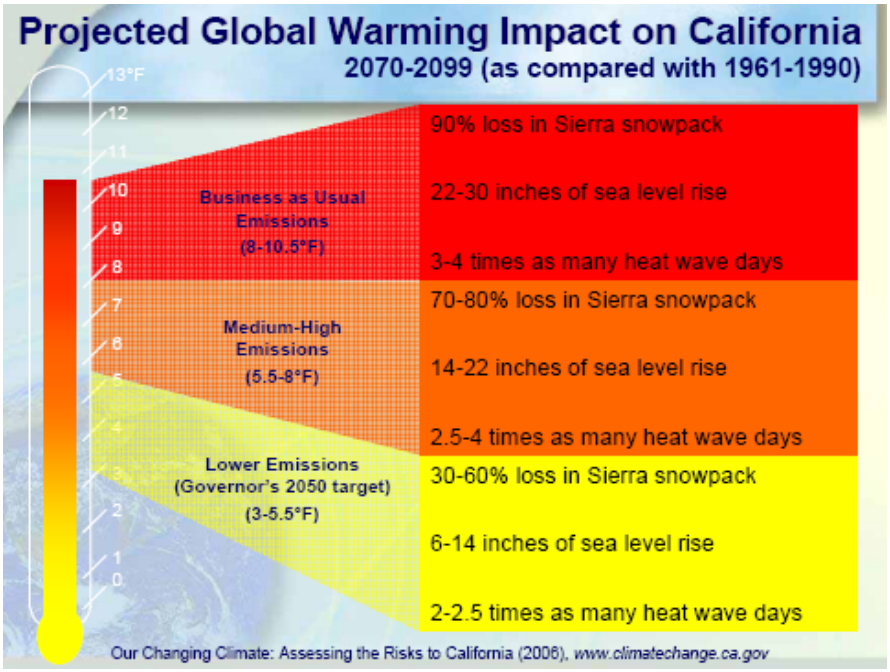
While it is a global problem, influenced by an array of interrelated factors, climate change is also a regional and local problem, with serious impacts foreseen for California, the Northern California Area, and Placer County.

The impacts of climate change will be variable and widespread. Global and local climate change will impact weather, sea-level rise, water resources, ecosystems, human health, economy, and infrastructure.

Projected future climate change may affect California in a variety of ways. Public health can suffer due to greater temperature extremes and more frequent extreme weather events, increases in transmission of infectious disease, and increases in air pollution. Agriculture is especially vulnerable to altered temperature and rainfall patterns, and new pest problems. Forest ecosystems would face increased fire hazards and would be more susceptible to pests and diseases. The Sierra snowpack that functions as the state's largest reservoir could shrink by one third by 2060, and to half its historic size by 2090. Runoff that fills reservoirs will start in midwinter, not spring, and rain falling on snow will trigger more flooding. The California coast is likely to face a rise in sea level that could threaten its shorelines. Sea level rise and storm surges could lead to flooding of low-lying property, loss of coastal wetlands, erosion of cliffs and beaches, saltwater contamination of drinking water, and damage to roads, causeways, and bridges. Figure A-3 illustrates potential impacts from global warming on California (2070-2099)[11].

[11] California Energy Commission, Our Changing Climate Assessing Risks to California: CEC-500-2006-077, 2006.

Figure A- 3 – Projected Global Warming Impacts on California (2070-2099)



Ultimately, in the next few decades, the impacts of climate change on weather in Sutter County, like the rest of California, will see warmer overall temperatures and an increase in precipitation events, with an increase of intensity and frequency of rainstorms.

Climate and Weather

There is a key difference between climate and weather. According to the National Science Foundation report on climate change in California, "Weather is the day-to-day phenomena we experience—sun, rain, fog, warm, cold, wind—that vary greatly. Climate is long term statistical patterns of weather…and is reflected in average temperatures, rainfall, and other weather events at a given location, and climate change is signaled by long-term changes in those averages"[12].

In 1999, the Union of Concerned Scientists and the Ecological Society of America published a report called *Confronting Climate Change in California*, which describes the predicted impacts of climate change in California. According to this report, California has had a 2 °F increase in temperature over the past 100 years, and annual precipitation has decreased by 10-25% in some regions The report also noted that most climate change models predict a temperature increase of 4° F in California in the next 20 to 40 years. These models also projected a decrease in the number of long dry spells, and an annual precipitation increase of 20-30% (with a range of 10-50%) in spring and fall, with somewhat larger increases in winter. One model reveals a large

[12] National Science Foundation, The Potential Consequences of Climate Variability and Change for California, The California Regional Assessment "*A Report of the California Regional Assessment Group*" For the U.S. Global Change Research Program, June 2002.

increase in precipitation over California, particularly in the form of rain, but with dry areas to the east of the Sierra. This regional model projects that winter precipitation over the coastal areas and the Sierra will increase by 25% or more, with an associated risk of increases in winter mud slides and flooding[13].

Much of the anticipated changes in climate will depend on the frequency and strength of the El Niño-Southern Oscillation phenomenon (ENSO). Most global climate change models indicate the possibility of more frequent ENSO events. El Niño historically happens every two to seven years off the west coast of South America, as a result of changes in ocean currents and prevailing winds over the Pacific Ocean. These changes bring warm water from the western oceans, displacing the nutrient-rich cold water that normally wells up on the western coasts of the Americas from deep in the ocean. These changes bring more frequent and extreme weather anomalies, including severe droughts and floods, hurricanes and winter storms. According to the National Science Foundation, "the invasion of warm water disrupts both the marine food chain and the economies of coastal communities that are based on fishing and related industries"[14] The effects of El Niño in California vary across the state, but in the past have included abnormally frequent winter rains and storms, and abnormally dry summers and associated wildfires The 1982-83 El Niño, the strongest event in recorded history, brought $8 billion in economic impacts and $100 million in California alone.

Water Resources

Climate change impacts will bring an additional burden to California's already over-taxed water supply system. According to the IPCC there will be an increase in the number of intense precipitation days and flood frequencies in basins driven by snowmelt, such as California's Central Valley.[15] For this type of basin, the accumulation of snow in winter is the essential "water tower" that stores water until the spring's warmer temperatures begins to melt the snow, forming the streams and rivers that supply the entire watershed with water for the duration of the summer.

Even under normal climatic conditions, 80% of California's annual rainfall occurs in the winter and is stored in the snowpacks of the various mountain ranges. The warmer temperatures associated with climate change will increase rainstorms and decrease snowstorms, shorten the overall snowfall season, and accelerate the rate of spring snowmelt, ultimately leading to more rapid,

[13] Union of Concerned Scientists and The Ecological Society of America, 1999 Confronting climate change in California.pdf, November 1999.

[14] National Science Foundation, The Potential Consequences of Climate Variability and Change for California, The California Regional Assessment "*A Report of the California Regional Assessment Group*" For the U.S. Global Change Research Program, June 2002.

[15] Intergovernmental Panel on Climate Change, Climate Change 2001: The Scientific Basis, Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate. http://www.ipcc.ch/pub/reports.htm. 2001.

earlier, and greater spring runoff. The anticipated early spring floods are likely to be followed by excessively dry summers.

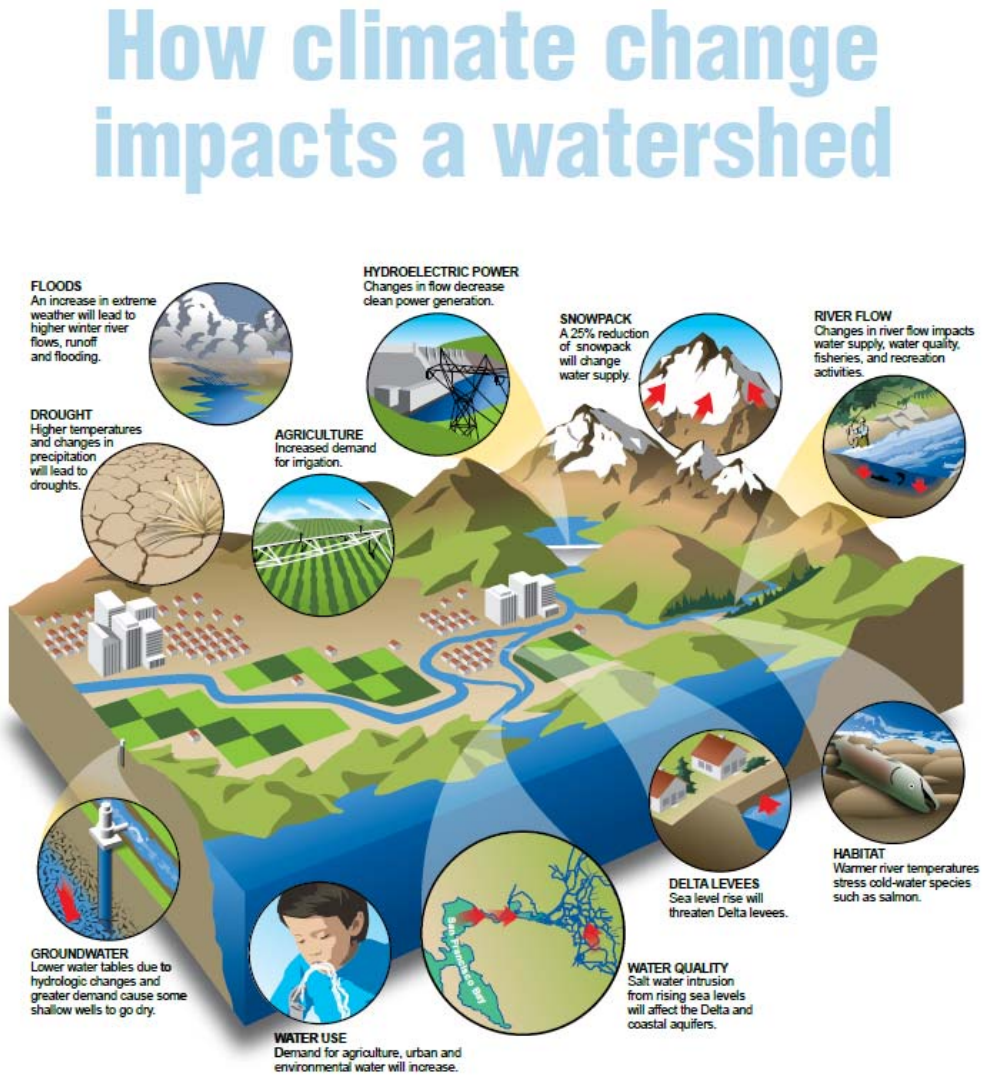
California's water supply is already under stress. According to the Union of Concerned Scientists and The Ecological Society of America, "Currently, every major water supply source in California is at its limit of sustainability, and options for increasing water imports are severely limited"[16]. A combination of natural and human activities is causing this depletion of California water supplies as well as water intrusion and chemical contamination. According to the Union of Concerned Scientists, 95% of the state's wetlands have already been destroyed.

In the past, California Water Resources on a statewide basis has allowed California to meet most of its agricultural and urban water management objectives and flood management objectives in most years. Generally, during a single dry year or two, surface and groundwater storage can maintain most water deliveries, but can result in critically low water reserves. Longer droughts can create numerous problems, including extreme fire danger, economic harm to urban and rural communities, loss of crops, and the potential for species collapse and degraded water quality in some regions. Water demand in California is already increasing because of population expansion. In addition, demand for water for irrigation rises with warmer temperatures. Summers with higher temperatures and even less rainfall and runoff than usual will exacerbate demands for water in California.

Climate change magnifies the problems that exist with an aging water infrastructure and growing population. While recent bond measures have provided a down payment for improving California's water and flood systems, climate change presents an ongoing risk that requires a long-term commitment of funding that is properly matched to anticipated expenditures, beneficiaries and responsible parties.

[16] The Union of Concerned Scientists and The Ecological Society of America, Confronting Climate Change in California Ecological Impacts on the Golden State, November 1999.

Figure A-4 – How Climate Change Impacts a Watershed



Source: California Department of Water Resources 2008

Appendix B: Summary, Assumptions and General Formulas

Sutter County
Green House Gas Emissions
Inventory Summary

	Reduced 2020	BAU [1] 2020	% increase from 2008	2008	% increase from 1990	1990
Transportation[2]						
Source:	**MT of CO_2e**	**MT of CO_2e**		**MT of CO2e**		**MT of CO2e**
1 On-Road Vehicles	348,058	479,486	88.44%	254,455	12.20%	226,778
2 Airport Operations	155	155	0.00%	155	17.65%	132
Total	348,213	479,641	88.38%	254,610	12.21%	226,910
Energy[3]						
Sources:	**MT of CO2e**	**MT of CO_2e**		**MT of CO2e**		**MT of CO2e**
1 Electric	46,600	83,234	59.49%	52,186	-6.51%	55,823
2 Natural Gas	131,623	150,392	41.29%	106,441	18.03%	90,179
Total	178,223	233,626	47.28%	158,627	8.65%	146,001
Solid Waste[4]						
Source	**MT of CO2e**	**MT of CO_2e**		**MT of CO2e**		**MT of CO2e**
1 Solid Waste Disposal	9,359	12,006	336.56%	2,750	-69.23%	8,939
2 Green Waste Recycling	DNA					
3 Materials Recycling	DNA					
Total	9,359	12,006	336.56%	2,750	-69.23%	8,939
Landscape Design[5]						
Sources:	**MT of CO2e**	**MT of CO_2e**		**MT of CO2e**		**MT of CO2e**
1 Landscape Maintenance Emissions	36	36	12.50%	32	20.41%	27
2 Carbon sink from CO_2 sequestration	DNA					
Total	36	36	12.50%	32	20.41%	27
Agriculture[6]						
Sources:	**MT of CO2e**	**MT of CO_2e**		**MT of CO2e**		**MT of CO2e**
1 Enteric Fermentation	22,572	24,248	0.00%	24,248	-77.14%	106,095
2 Manure Management	27,515	29,780	0.00%	29,780	-77.36%	131,555
3 Rice Cultivation	142,346	177,933	-1.73%	181,067	36.44%	132,703
4 Agricultural Residue Burning	3,011	3,011	-1.33%	3,051	-80.09%	15,329
5 Crop Growth	378,097	378,097	-2.06%	386,054	-2.99%	397,944
6 Animals and Runoff	77,806	77,806	-0.82%	78,453	-25.65%	105,515
7 Fertilizer Use	101,392	101,392	-0.94%	102,351	52.37%	67,173
Total	752,739	792,267	-1.58%	805,005	-15.82%	956,315
Net Total Emissions						
Category	**MT of CO2e**	**MT of CO_2e**		**MT of CO2e**		**MT of CO2e**
Energy	178,223	233,626	47.28%	158,627	8.65%	146,001
Solid Waste	9,359	12,006	336.56%	2,750	-69.23%	8,939
Landscape Design	36	36	12.50%	32	20.41%	27
Agriculture	752,739	792,267	-1.58%	805,005	-15.82%	956,315
Transportation	348,213	479,641	88.38%	254,610	12.20%	226,910
Total	**1,288,571**	**1,517,576**	*24.29%*	**1,221,024**	*-8.76%*	**1,338,192**
Does the County Meet the AB 32 Reduction Goals[7]?	**Yes**					

[1] Business-As-Usual (BAU) refers to continued operations and development of the County without the inclusion of recently-adopted sustainability initiatives. The BAU scenario describes how emissions would be in year 2020, if the emissions inventory continued to grow strictly based upon the land use growth projections for the County and the naturally occurring events that might change the character of emissions.

[2] The relatively small increase in emissions between 1990 and 2008 (12.16%), and between 2008 and 2020 (30.48%) in transportation emissions is due to the increases in efficiency and decreases in emissions from onroad vehicles over the years between 1990 and now. These are incorporated into the emission factors provided by EMFAC for the years modeled. Therefore, although the amount of vehicle miles traveled increased between 1990 and 2008 and then again between 2008 and 2020, the increase in vehicle miles traveled is not directly proportional to the increase in emissions.

Sutter County
Green House Gas Emissions
Inventory Summary

[3] The reduction in emissions from electricity usage between 1990 and 2008 is due to the efficiencies and emission reductions that have been incorporated by PG&E over those 18 years. Electrical usage in 2008 was provided by PG&E at approximately 218 million kWhs. Electrical usage in 1990 was estimated at approximately 208 million kWhs (a 15% change). However, the PG&E specific emission factor for CO2 in 1990 was 620 lbs/MWh, where in 2008 it was 524 lbs/MWh. Therefore, the efficiencies and emission reductions provided by PG&E have resulted in a County wide decrease in emissions even with an increase in electricity use during this period.

[4] The generation of solid waste between 1990 and 2008 increased by approximately 15% due to County growth, however the incorporation of a methane capture system at the landfill has resulted in the decrease in emissions between this same period. The primary source of greenhouse gas emissions from a landfill is the generation of methane from the decomposition of solid waste. In 1990 there was no system in place to capture the methane and therefore the methane was released unchecked into the environment. In the 2008 baseline year, the Recology Ostrom Road Landfill was flaring the methane gas, thereby reducing the amount released into the environment. Further in 2009 The Recology Ostrom Road Landfill began a gas-energy conversion which further reduces the emissions of methane gas which results in even less emissions from waste generation. As the progression of technology increases, there is less methane released to the environment per ton of waste landfilled.

[5] Offroad landscape equipment emissions for the 2008 and 2020 emissions were determined from the URBEMIS model which takes into account the modeling year and projected emissions factors for future years with respect to landscape fuels and technology available. This is the reason for the smaller than expected increase in emissions during this period.

[6] Actual agricultural data was obtained for the County for 1990 and 2008, therefore the resulting decrease in emissions is due to the decrease in the amount of acreage cultivated and the number of animals raised between 1990 and 2008. Agriculture in 2020 was conservatively forecasted. It was assumed that the only reduction in agriculture was as a result of the growth of the Sutter Pointe Community anticipated by 2020. Total growth in 2030 is estimated at 7,527 acres within the Sutter Pointe Specific Plan Area. Approximately 1/3 of that (2,509 acres) is anticipated to be built out by 2020. Given that 70% of the existing Sutter Pointe Specific Plan area is cultivated with rice and the remaining 30% is fallow, it was anticipated that by 2020 there would be a total reduction in rice cultivation of 1,756 acres.

[7] AB 32 sets a statewide reduction goal of achieving greenhouse gas emissions equivalent to 1990 statewide levels by 2020.

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Modeling Assumptions for Greenhouse Gas Emissions

Assumptions

[1] 2008 Electrical Data provided by PG&E for unincorporated Sutter County. Projections for 2030 by PBSJ (2010 GP Update EIR). 1990 historical data and 2020 projections were not available. Electrical usage was estimated for these years as follows:
- 1990 usage estimated as a 0.86% decrease per year for a total of a 15% reduction from existing year usage for all land uses.
- 2020 estimate based on % of total buildout to occur in 2020.

[2] Water is provided by Water Works District NO. 1. This water is supplied to the community of Robbins. There are approximately eighty eight residential connections and approximately five commercial/industrial connections. Other residents of unincorporated Sutter have private wells. Water usage is not metered therefore distribution between residential and commercial was determined based number of connections. Water consumption data was available for 2008 only. Projections for 2030 by PBSJ (2010 GP Update EIR). 1990 and 2020 usage were determined as follows:
- 1990 usage estimated as a 0.86% decrease per year for a total of a 15% reduction from existing year usage for all land uses.
- 2020 estimate based on % of total buildout to occur in 2020.

[3] Sutter County Solid Waste is conducted under a joint powers agreement with Yuba County and the cities of Live Oak, Marysville Wheatland, Yuba City and the City of Gridley in Butte County. Data received from State of California Calrecycle.gov and Recology Ostrom Road Landfill services the Yuba/Sutter JPA. Projections for 2030 by PBSJ (2010 GP Update EIR). Waste generation data only available for 2008. 1990 and 2020 data estimated as follows:
- 1990 generation estimated as a 0.86% decrease per year for a total of a 15% reduction from existing year usage for all land uses.
- 2020 estimate based on % of total buildout to occur in 2020.

[4] Assumes average one way distance of 27.7 miles from waste source to landfill.

[1] 2008 Natural Gas Data provided by PG&E for unincorporated Sutter County. Projections for 2030 by PBSJ (2010 GP Update EIR). 1990 historical data and 2020 projections were not available. Natural Gas usage was estimated for these years as follows:
- 1990 usage estimated as a 0.86% decrease per year for a total of a 15% reduction from existing year usage for all land uses.
- 2020 estimate based on % of total buildout to occur in 2020.

			Growth			
Land Use Data	**2008**	**2020**	**from 2008**	**from 2020**	**2030**	**% total growth in 2020**
Residential Units	9,768	15,181	13,415	8,002	23,183	40.35%
Total com/ind	4,644,200	11,747,232	17,703,400	10,600,368	22,347,600	40.12%

County Data Sources

[1] *Source:* *PG&E John Bohman, Green Communities and Innovator Pilots, received 02/16/2010*

Note: Average estimated per year reduction that will result in the 15% reduction from existing that is standard practice for backcasting from existing to 1990 levels.

[2] *Source:* Department of Water Usage *Sutter County Water Works #1*

[3] *Source:* *Source: State of California, CalRecycle, Disposal Reporting System (DRS),http://www.calrecycle.ca.gov/lgcentral/Reports/ReportViewer.aspx?OriginJurisdictionIDs=593&ReportYear=2008&ReportName=ReportEDRSJurisDisposalByFacility, accessed 03/10/2010*

[4] *Source:* Google Maps; http://maps.google.com/maps?f=d&source=s_d&saddr=Schlag+Rd+%26+Hughes+Rd,+Meridian,+Sutter,+California+95957&daddr=5900+Ostrom+Road,+Wheatland,+CA&hl=en&geocode=&mra=ls&sll=39.093175,-121.567565&sspn=0.398089,0.615921&ie=UTF8&z=11&layer=c&pw=2 ; accessed 4/16/2010

Urbemis deviations from County data:

Trip rates utilized for Urbemis modeling were provided from DKS, Sutter County Traffic Travel Demand Forecast Model Validation and Difference in VMT and ADT due to rounding error in the Urbemis model. Schools and parks have been incorporated into the commercial category in the traffic model. Sutter Airport has been incorporated into the industrial category.

Mobile Source Emissions

	CO_2	CH_4	N_2O	**Abbreviations**
Onroad Emission Factors (g/mile)				
Non Cat passenger Car [5]	480.735	0.1696	0.0197	EF_{MMV}, EF_{NMV}
Cat passenger Car [5]	403.474	0.1355	0.0504	EF_{MMV}, EF_{NMV}
Diesel Passenger Car [5]	373.824	0.0006	0.0012	EF_{MMV}, EF_{NMV}
Non cat light-duty truck [5]	476.139	0.1908	0.0218	EF_{MMV}, EF_{NMV}

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Modeling Assumptions for Greenhouse Gas Emissions

Cat light duty truck [5]	438.471	0.1516	0.0639	EF_{MMV}, EF_{NMV}
Diesel Light duty Truck [5]	358.258	0.0011	0.0017	EF_{MMV}, EF_{NMV}
Non Cat light-duty truck 2 [5]	476.685	0.1908	0.0218	EF_{MMV}, EF_{NMV}
Cat light duty truck 2 [5]	431.99	0.1516	0.0639	EF_{MMV}, EF_{NMV}
Diesel Light duty truck 2 [5]	369.35	0.0011	0.0017	EF_{MMV}, EF_{NMV}
Non Cat Medium duty Truck [5]	605.047	0.4181	0.0473	EF_{MMV}, EF_{NMV}
Cat med duty truck [5]	649.935	0.2356	0.1317	EF_{MMV}, EF_{NMV}
Diesel Med duty truck [5]	362.668	0.0051	0.0048	EF_{MMV}, EF_{NMV}
Non Cat lite-heavy duty truck [5]	567.895	0.4181	0.0473	EF_{MMV}, EF_{NMV}
Cat Light-heavy duty truck [5]	567.895	0.2356	0.1317	EF_{MMV}, EF_{NMV}
Diesel Lite-heavy duty truck [5]	642	0.0051	0.0048	EF_{MMV}, EF_{NMV}
Non Cat lite-heavy duty truck 2 [5]	567.895	0.4181	0.0473	EF_{MMV}, EF_{NMV}
Cat Light-heavy duty truck 2 [5]	567.895	0.2356	0.1317	EF_{MMV}, EF_{NMV}
Diesel Lite-heavy duty truck 2 [5]	642	0.0051	0.0048	EF_{MMV}, EF_{NMV}
Non Cat med-heavy duty truck [5]	567.895	0.4181	0.0473	EF_{MMV}, EF_{NMV}
Cat med-heavy duty truck [5]	567.895	0.2356	0.1317	EF_{MMV}, EF_{NMV}
Diesel med-heavy duty truck [5]	1505	0.0051	0.0048	EF_{MMV}, EF_{NMV}
Non cat Heavy Duty truck [5]	567.895	0.4181	0.0473	EF_{MMV}, EF_{NMV}
Cat heavy duty truck [5]	567.895	0.2356	0.1317	EF_{MMV}, EF_{NMV}
Diesel heavy duty truck [5]	1924.234	0.0051	0.0048	EF_{MMV}, EF_{NMV}
Non Cat Other Bus [5]	567.895	0.4181	0.0473	EF_{MMV}, EF_{NMV}
Cat other bus [5]	567.895	0.2356	0.1317	EF_{MMV}, EF_{NMV}
Diesel Other Bus [5]	1505	0.0051	0.0048	EF_{MMV}, EF_{NMV}
Non Cat Urban Bus [5]	567.895	0.4181	0.0473	EF_{MMV}, EF_{NMV}
Cat Urban Bus [5]	567.895	0.2356	0.1317	EF_{MMV}, EF_{NMV}
Diesel Urban Bus [5]	3020.114	0.0051	0.0048	EF_{MMV}, EF_{NMV}
Non cat motorcycle [5]	107.73	0.0672	0.0069	EF_{MMV}, EF_{NMV}
Cat motorcycle [5]	0.0000	0.0672	0.0069	EF_{MMV}, EF_{NMV}
Diesel Motorcycle [5]	0.0000	0	0	
Non Cat School Bus [5]	567.895	0.4181	0.0473	EF_{MMV}, EF_{NMV}
Cat School Bus [5]	567.895	0.2356	0.1317	EF_{MMV}, EF_{NMV}
Diesel School Bus [5]	1505	0.0051	0.0048	EF_{MMV}, EF_{NMV}
Non Cat Motor home [5]	567.895	0.4181	0.0473	EF_{MMV}, EF_{NMV}
Cat Motor home [5]	567.895	0.2356	0.1317	EF_{MMV}, EF_{NMV}
Diesel Motor home [5]	1505	0.0051	0.0048	EF_{MMV}, EF_{NMV}
Aviation Gasoline (kg/g) [6]	8.32	-	-	EF_{Caf}
Aviation Gasoline (gr/g) [7]	-	7.04	0.11	EF_{Maf}, EF_{Naf}

[5] *Source:* CH_4 & N_2O: EPA Climate Leaders Greenhouse Gas Inventory Protocol Core Module Guidance: Direct Emissions from Mobile Combustion Sources; May 2008. EPA430-K-08-004 retrieved: http://www.epa.gov/climateleaders/documents/resources/mobilesource_guidance.pdf

Source: CO_2 emission Factors determined by EMFAC for 1990 emissions

Note: CO_2 emissions taken directly from URBEMIS, for 2008 and 2020, shown CO_2 emission factors are for 1990 only.

[6] *Source: California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.3)*

[7] *Source: California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.6)*

Landscape and Wood Burning Hearth Emissions

	CO_2	CH_4	N_2O	
gasoline emission factor (lbs/gallon) [8]	19.4			EF_{Cgg}
gasoline emission factor (gr/gallon) [7]		0.50	0.22	EF_{MF}, EF_{NF}
MMBtu/short ton [9]	15.38	-	-	
Kg/MMBtu Residential [9]	93.87	0.316	0.0042	EF_{Cwood}, EF_{Mwood}, EF_{Nwood}
Kg/MMBtu Commercial [9]	93.87	0.316	0.0042	
Kg/MMBtu Manufacturing [9]	93.87	0.032	0.0042	

Abbreviations

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Modeling Assumptions for Greenhouse Gas Emissions

[8] *Source: http://www.epa.gov/oms/climate/420f05001.htm*

[9] *Source: California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C7) For CO_2, (Table C8) for CH_4 and N_2O)*

Natural Gas

		CO_2	CH_4	N_2O	Abbreviations
Residential (kg/MMBtu)	SFR [9]	53.07	0.005	0.0001	EFCng, EFMng, EFNng
	MFR [9]	53.07	0.005	0.0001	EF_{Cng}, EF_{Mng}, EF_{Nng}
Commercial (kg/MMBtu)	Com [9]	53.07	0.005	0.0001	EF_{Cng}, EF_{Mng}, EF_{Nng}
Industrial (kg/MMBtu)	Ind [9]	53.07	0.001	0.0001	EF_{Cng}, EF_{Mng}, EF_{Nng}

Electricity

		CO_2	CH_4	N_2O	Abbreviations
	1990 [10]	620	0.0067	0.0037	EFCele, EFMele, EFNele
2008+ (lbs/MWh)	2008 [10]	524	0.0302	0.0081	EF_{Cele}, EF_{Mele}, EF_{Nele}
	2020 [10]	524	0.0302	0.0081	EF_{Cele}, EF_{Mele}, EF_{Nele}

[10] *Source: California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C2,E2-E3)*

Source: PG&E: GHG Data Requests, Fact Sheet GHG Data.pdf, Email from John Bohman January 11, 2010 (CO_2 emission rate 2003-2009)

Solid Waste

	CO_2	CH_4	N_2O	Not Gas Dependent	Abbreviations
Residential (waste tons/cuyd) [11]				0.1125	d
Non-commercial (waste tons/cuyd) [11]				0.225	d
Truck capacity (cy/truck) [12]				33	C_T
Offroad emission factors (lbs/hr) [13]	Composite Values				EF_{CWD}, EF_{MWD}, EF_{NWD}
diesel offroad emission factor (gr/gallon) [14]		0.058	0.026		
diesel emission factor (lbs/gallon) [15]	22.2				EF_{Cdg}
(gr/mile) [14]	3464.1638	0.0051	0.0048		EF_{CWT}, EF_{MWT}, EF_{NWT}
(kg/gallon) [6]	10.15				
miles/gallon [16]	2.93				
Landfill w/o recovery [17]		0.52			EF_{MWF}
Landfill w/ Flaring [17]		0.13			EF_{MWF}
Landfill w/ electric gen [17]		0.07			EF_{MWF}
National Average [17]		0.27			EF_{MWF}
Landfill w/ Combination		0.09			
% CH4 to generate electricity				66.67%	
% CH4 flared				33.33%	

[11] *Source: EPA Standard Volume-to-Weight Conversion Factor obtained from http://www.epa.gov/osw/conserve/tools/recmeas/docs/guide_b.pdf, accessed January 18, 2010.*

[12] *Source: Heil Website (http://www.heil.com/products/python.asp) accessed 1/18/2010 & http://www.tigerdude.com/garbage/frontload/index.html accessed 1/18/2010.*

[13] *Source: SCAQMD OffroadEF07_25.xls (http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html)*

[14] *Source: California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.4)*

[15] *Source: http://www.epa.gov/oms/climate/420f05001.htm*

[16] *Source: Waste Management's LNG Truck Fleet: Final Results January 2001. (pg 14)*

[17] *Source: EPA Solid Waste Management and Greenhouse Gases; A life-cycle assessment of emissions and Sinks, 3rd edition, September 2006.*

(GWP of CH4 is 21, therefore to convert MTCO2e of Methane to MTCH4 divide MTCO2e by 21)

(all our calculations are in short tons, converted to metric tons after combining)

Sutter County
Modeling Assumptions for Greenhouse Gas Emissions

Standard Conversion Rates:

	CO_2	CH_4	N_2O	Not Gas Dependent		Abbreviations
gr/lb [17]				453.59291		C_2
lbs/short ton [17]				2000		
metric tons/short ton [17]				0.907185		
kg/ short ton [17]				907.18474		
kg/metric ton [17]				1000		C_3
g/metric ton [17]				1,000,000		C_6
lbs/metric ton [17]				2204.62		C_1
therms per MMBTU [17]				0.10		
kWh/Mg (potable water) [18]				3,500		C_4
kWh/MG (waste water) [18]				1,911		C_5
Waste Water % of Potable [19]				% indoor	% outdoor	
SFR				65	35	$\%_{in}$, $\%_{out}$
MFR				82	18	$\%_{in}$, $\%_{out}$
COM				71	29	$\%_{in}$, $\%_{out}$
IND				80	20	$\%_{in}$, $\%_{out}$
GWP	1	21	310			
Gallons/Acre foot [20]				325,851.43		

[17] *Source: California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Appendix B)*

[18] *Source: California Energy Commission "Refining Estimates of Water-related Energy Uses in California", December 2006, CEC-500-2006-118*

[19] *Source: Integrated Water Resources Plan (IRP), MWD Report No. 1107, March 1996. (accessed from http://esce.ucr.edu/soilwater/summer2000.html)*

[20] *Source:* http://onlineconversion.com/volume.htm

Average Square footage for dwelling units		[21]	[21]	[21]	***Schools*** [22]		
Average Square Footage per student	***Year***	***SFR***	***MFR***	***Retire***	***Elem***	***Middle***	***High***
	1990	2160	1000	1000	59	80	95
	2008	2508	1238	1238	73	80	95
	2020	2508	1238	1238	73	80	95

[21] *Source: US Census Bureau retrieved: http://www.census.gov/const/www/charindex.html#multiunit; 2/10/2010 (SFR and MFR*

[21] *Source: Retirement copied MFR until better data is available.*

[22] *Source: California Department of Education Complete Schools Report, May 23 2007. (elementary, junior high, high school)*

		[23]	[23]	[24]	[24]	[25]	[26]
Average Square Footage per student	***Year***	***J. College***	***University***	***Hotel***	***Motel***	***Congregate***	***Hospital***
Average square foot per bed (hotel/motel)	1990	206	206	512.82	512.82	400	357.14
Average square foot per bed (hospital)	2008	238	238	512.82	512.82	400	357.14
Average square foot per bed (congregate ca	2020	238	238	512.82	512.82	400	357.14

[23] *Source: American School & University "Median square footage of building maintained per FTE student, Penton Media 2009. (College & University)*

[24] *Source: Energy Star Space Use Information - Hotel/Motel retrieved: https://www.energystar.gov/istar/pmpam/help/Hotel_Motel_Space_Use_Information.htm 2/11/2010*

[25] *Source: Congregate care based on 2 people per room (State Assisted Living Policy 1998 Section 1, http://aspe.hhs.gov/daltcp/reports/98state1.htm) and*

[26] *Source Energy Star Space Use Information - Hospitals Retrieved: https://www.energystar.gov/istar/pmpam/help/Hospital_(Acute_Care_and_Children_s)_Space_Use_Information.htm 2/11/2010*

Note: since accurate data for 2009 and beyond is not available at this time, it is assumed to remain the same for all future years. Data will be updated as available.

Note: When data was unavailable for individual years, the data for the closest prior year was used.

Sutter County
Modeling Assumptions for Greenhouse Gas Emissions

Agricultural

	CO_2	CH_4	N_2O			Abbreviations
Density of Methane (kg/m^3) [27]		0.678				C_7
# of hectares/acre [27]				0.4046945		C_{10}
Ratio CH_4-C [27]		0.005				R_{CH4-C}
Conversion CH_4-C to Full Mol. Wt. [27]		1.33				C_{11}
Emission factor for liquid systems (kg N_2O-N/kg N) [27]			0.001			EF_{NML}
Emission factor for solid systems (kg N_2O-N/kg N) [27]			0.02			EF_{NMS}
Ratio N_2O:N_2 [C_{10}] [27]			1.57			C_9
Volitazition percent for all non-PRP ag soils [27]			0.2			$\%_{VI}$
Volitazition percent for manure management [27]			0			$\%_{VM}$
Rate NH_3-NO_X [27]			0.01			$EF_{NH3-NOX}$
Emission Factor for pastures, ranges, and paddocks [27]			0.02			EF_{PRP}
Emission factor for ground application [27]			0.0125			EF_{NV}
Cwt (hundred weight)				100	lbs	
Volitazition of synthetic fertilizers [27]			0.1			V_{FS}
Volitazition of organic fertilizers [27]			0.2			V_{FO}
% leached from soils [27]			0.3			$\%_{Leach}$
Leaching Factor (kg N_2O-N / kg N) [27]			0.025			F_{leach}
Nitrogen Content of Non-manure Organics [27]			0.041			N_{ORG}
Emission factor for soils (kg N2O-N/kgN) [27]			0.01			EF_{NDE}
N2O Emissions from Volitazition [27]			0.01			EF_{NIE}
N content of aboveground biomass for N-fixing crop production [27]			0.03			C_8
:mission Factor for Temperate zone Histols (kg N2O-N / ha_yr) [27]			8			EF_{NHT}
Emission Factor for Subtropic zone Histols (kg N_2O-N / ha_yr) [27]			12			EF_{NHS}
N_2O-N Emissions Ratio [R_{N20_N}] [27]			0.007			R_{N2O-N}
% of target year applied [27]			0.65			C_{12}
% of following year applied [27]			0.35			C_{13}
Cotton (lbs/bale) [28]				480	lbs	
average population growth per year [29]				0.40%		
Reduction of acres of rice for 2020 [30]				1756		

[27] *Source:* EPA State Inventory Tool for Agriculture, July 2008.

[28] *Source:* http://www.spectrumcommodities.com/pdf/convfactY2K.pdf

[29] *Source:* State of California, Department of Finance, California County Population Estimates and Components of Change by Year, July 1, 2000-2009. Sacramento, California, December 2009.

[30] *Note:* *In 2009 70% of the Sutter Pointe area is utilized as rice agriculture, the remaining 30% is fallow. 2020 build out of Sutter Pointe is estimated at 1/3 of 2030 buildout acreage (or 2,509 acres). Since 70% of existing is utilized for rice growth, 70% of the Sutter Pointe acreage from 2020 buildout is estimated to be reduced from existing acreage potential for rice.*

Sutter County
Modeling Assumptions for Greenhouse Gas Emissions

Reduction Assumptions

	units		*Square feet* total	total		
	2008	**2020**	**2008**	**2020**	**Growth**	
Total						
SF Residential	5,163	5,804	12,948,804	14,556,432	641	1,607,628
MF Residential	4,605	9,377	5,700,990	11,608,726	4,772	5,907,736
Industrial			3,279,680	7,951,216		4,671,536
Commercial (including mixed use)			1,364,520	3,796,016		2,431,496
Totals	9,768	15,181	23,293,994	37,912,390	5,413	14,618,396
Sutter Pointe						
SF Residential	0	0	0	0	0	0
MF Residential	20	2,610	24,760	3,231,180	2,590	3,206,420
Industrial			233,600	2,708,600		2,475,000
Commercial (including mixed use)			45,600	1,067,933		1,022,333
Totals	20	2,610	303,960	7,007,713	2,590	6,703,753
Unincorporated Sutter County						
SF Residential	5,163	5,804	12,948,804	14,556,432	641	1,607,628
MF Residential	4,585	6,767	5,676,230	8,377,546	2,182	2,701,316
Industrial			3,046,080	5,242,616		2,196,536
Commercial (including mixed use)			1,318,920	2,728,083		1,409,163
Totals	9,748	12,571	22,990,034	30,904,677	2,823	7,914,643

* Residential is split from Commercial/Industrial with respect to utility usage.

	2020
% growth in residential	55.42%
% growth in commercial/industrial	152.94%
%growth in commercial	178.19%
% growth in industrial	142.44%
% of development in 2020 that existed in 2008	61.44%
% of development in 2020 from Growth	38.56%
% of 2020 growth from Sutter Pointe	45.86%
% of 2020 total from Sutter Pointe	18.48%

% total 2020 residential that is growth	35.66%	% total 2020 commercial that is growth	64.05%
% of total 2020 residential development from Sutter Pointe	17.19%	% of total 2020 commercial from Sutter Pointe	28.13%
% of growth from residential within Sutter Pointe	47.85%	% of growth from com within Sutter Pointe	42.05%
% total 2020 commercial & industrial that is growth	60.47%	% total 2020 industrial that is growth	58.75%
% of total 2020 industrial & commercial from Sutter Pointe	32.15%	% of total 2020 industrial from Sutter Pointe	34.07%
% of growth from com/ind within Sutter Pointe	49.24%	% of growth from ind within Sutter Pointe	52.98%
% total 2020 growth that is commercial & ind	16.63%		

Sutter County
Modeling Assumptions for Greenhouse Gas Emissions

Conceptual Transit Plan		
# of dwelling units for Phase 1		7600
# of dwelling uints by 2020		2610
% of Phase 1 completed by 2020	[33]	0.3434211
% of Construction/Demolition waste ir	[34]	0.29

[33] Source HDR 2008. The Sutter Pointe Conceptual Transit Plan
[34] Source CIMWB 2009. California 2008 Statewide Characterization Study, August

Carbon Dixoide Formula Sheet

Sutter County

A. Direct Sources

A1-4. Mobile (Construction Equipment, Motor Vehicles, Landscape Equipment, and Wood Burning Hearth)

Carbon dioxide emissions from construction, motor vehicles, landscape, and wood burning hearth emissions are provided from URBEMIS in short tons per year. Short tons are converted to metric tons by multiplying by 0.09071847.

Emissions from airports:

Emissions of carbon dioxide from airports (in particular airplanes) are calculated using the following equation:

$$\mathbf{E_{Caf} = (U_{Aaf} * EF_{Caf}) / C_3}$$

Where:

E_{caf} = Annual emissions of CO_2 from airport fuel (MT/year).

U_{aaf} = Annual usage of aviation fuel (gallons/year).

EF_{Caf} = Emission factor for aviation fuel (kg/gallon)

C_3 = Conversion factor from kg to metric tons. (1,000 kg/MT)

A5. Stationary Sources (Natural Gas)

Emissions of carbon dioxide from natural gas usage are calculated using the following equation:

$$\mathbf{E_{Cng} = (U_{Ang} * EF_{Cng}) / C_3}$$

Where:

E_{Cng} = Annual emissions of CO_2 from Natural Gas (MT/year).

U_{Ang} = Annual usage of natural gas (MMBTU/year).

EF_{Cng} = Emission factor for natural gas usage (kg/MMbtu)

C_3 = Conversion factor from kg to metric tons. (1,000 kg/MT)

B. Indirect Sources

B1. Electricity

Emissions of carbon dioxide from electricity usage are calculated using the following equation:

$$\mathbf{E_{Cele} = (U_{Ae} * EF_{Cele}) / C_1}$$

Where:

E_{Cele} = Annual emissions of CO_2 from Electricity (MT/year).

U_{Ae} = Annual usage of electricity (MWh/year).

EF_{Cele} = Emission factor for electrical usage (lbs/MWh).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

Sutter County

B2. Potable Water

Emissions of Carbon Dioxide from potable water treatment and transportation for domestic uses are calculated using the following equation:

$$E_{Cpot} = (U_{epot} * EF_{Cele})/C_1$$

Where:

E_{Cpot} = Annual Emissions of CO_2 from electricity used for potable water treatment and transportation (MT/year).

U_{epot} = Annual electricity usage for potable water treatment and transportation (MWh/year).

= $U_{Apot} * C_4$

U_{Apot} = Annual water usage (MG/yr)

C_4 = Conversion factor for determining kWhs used to treat water.

EF_{Cele} = Emission factor for electrical usage (lbs/MWh).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

B3. Solid Waste

Emissions of carbon dioxide from solid waste is a summation of the emissions from solid waste transport, and the use of equipment at disposal sites. CO2 emissions from decomposition (treatment) are considered non-anthropogenic and are not included as part of the emissions inventory. In addition, CO_2 from landfilled waste is partially sequestered and therefore acts as a carbon sink.

$$E_{CTSW} = E_{CWT} + E_{CWD} - E_{CWF}$$

Where:

E_{CTSW} = Annual Emissions of carbon dioxide from solid waste (MT/year).

E_{CWT} = Annual emissions of CO_2 from solid waste transportation (MT/year).

E_{CWD} = Annual emissions of CO_2 from solid waste disposal, (MT/year).

E_{CWF} = Annual emissions of CO_2 from waste disposal (MT/year).

B3a. Anthropogenic Carbon

E_{CWF} = Fugitive emissions of carbon dioxide are considered anthropogenic and are not included in this analysis.

B3b. Exhaust Emissions (Hauling Trucks)

Emissions of carbon dioxide from solid waste transportation are calculated using the following equations:

$$E_{CWT} = (((U_{SW} / d) / C_T) * M * EF_{CWT}) / C_6$$

Where:

E_{CWT} = Annual emissions of CO_2 from solid waste transportation (MT/year).

U_{SW} = Annual waste production for disposal and treatment (tons/year).

d = Average solid waste density, (tons/cubyc yard.)

C_T = Average truck load capacity.

M = Average trip mileage (round trip from source to landfill).

EF_{CWT} = Emission factor for hauling trucks.

C_6 = Conversion factor from gr to metric tons.

Sutter County

B3c. Exhaust Emissions (Disposal Equipment)

Emissions of carbon dioxide from disposal equipment are calculated using the following equation:

$$E_{CWD} = (EF_{CWD} * h * n) / C_1$$

Where:

E_{CWD} = Annual emissions of carbon dioxide from solid waste disposal, MT/year.

EF_{CWD} = Emission factor for disposal equipment, lbs/hr (SCAQMD off-Road Mobile Source Emission Factors, 2007).

h = Operating hours (% of day attributed to project waste generation - Total hours of operation of facility per day times the percentage of total annual waste attributable to Project generation).

n = Days per year. (Number of days per year the landfill is open to disposal).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

Note: Emissions from onsite equipment is only relevant if the project has control over landfill operations.

B4. Wastewater

Emissions of carbon dioxide from waste water treatment are calculated using the following equation:

$$E_{CWW} = (U_{eWW} * EF_{Cele})/C_1$$

Where:

E_{CWW} = Annual Emissions of CO_2 from electricity used for potable water treatment and transportation (MT/year).

U_{eWW} = Annual electricity usage for waste water treatment and transportation (MWh/year).
= $(U_{Apot} * \%_{in}) * C_5$

U_{Apot} = Annual potable water used (MG/yr)

$\%_{in}$ = Percentage of potable water used indoors.

C_5 = Conversion factor for determining MWh used per MG of waste water treated.

EF_{Cele} = CO_2 Emission factor for electrical usage (lbs/MWh).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

Methane Formula Sheet

Sutter County

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Emissions of methane from construction vehicles are calculated using the following equations:

$$E_{MCON} = ((U_{AG} * EF_{MHDV}) / C_6)$$

Where:

E_{MCON} = Annual emissions of methane from construction vehicle exhaust (MT/year)

U_{AG} = Annual gallons of gas used by construction vehicles

= $(E_{CCON} * C_1) / EF_{Cdg}$

E_{CCON} = Annual emissions of CO_2 from Construction Vehicles (from URBEMIS).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

EF_{Cdg} = Conversion of CO_2 from lbs to gallons for diesel.

EF_{MHDV} = Emission factor for heavy duty vehicles, gr/gallon.

C_6 = Conversion factor from gr to MT.

A2. Mobile Source (Motor Vehicles)

Emissions of methane from motor vehicles are calculated using the following equations:

$$E_{MMV} = ((M * EF_{MMV}) / C_6)$$

Where:

E_{MMV} = Annual emissions of methane from motor vehicles, MT/year.

M = Annual mileage for motor vehicles, miles/year (from Urbemis2007 9.2.4 output).

EF_{MMV} = Emission factor for motor vehicles, gr/mile by vehicle type

C_6 = Conversion factor from gr to MT.

Emissions from aviation fuel

Emissions of methane from aviation fuel usage are calculated in two steps.

$$E_{Maf} = (U_{Aaf} * EF_{Maf}) / C_6$$

Where:

E_{maf} = Annual emissions of methane from aviation fuel use (MT/year).

U_{aaf} = Gallons of fuel per year

EF_{Maf} = Emission factor for methane for aviation fuel.

C_6 = Conversion factor from gr to MT.

A3. Mobile Source (Landscape Equipment)

Emissions of methane from landscape equipment are calculated in two steps.

$$E_{Mls} = ((G_F * EF_{MF}) / C_6)$$

Where:

E_{Mls} = Annual emissions of methane from landscape equipment (MT/year).

G_F = Gallons of fuel per year

= $(E_{Cls} * C_1) / EF_{Cgg}$

E_{Cls} = Annual emissions of CO_2 from landscaping (from URBEMIS).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

EF_{Cgg} = Conversion of CO_2 from lbs to gallons.

EF_{MF} = Emission factor for methane for motor gasoline.

C_6 = Conversion factor from gr to MT.

A4. Wood Burning Hearth Emissions

Emissions of methane from wood burning hearths are calculated as follows.

$$E_{Mwood} = ((M_{wood} * EF_{Mwood}) / C_3)$$

Where:

E_{Mwood} = Annual emissions of methane from wood burning hearths (MT/year).

M_{wood} = Heat content of the wood in MMBtu

= E_{Cwood} * HC_{Cwood}

E_{Cwood} = Emissions of tons of CO_2 estimated for wood burning hearths.

HC_{Cwood} = MMBTUs per ton of CO_2 from burning wood.

EF_{Mwood} = Emission factor for methane for wood burning;.

C_3 = Conversion factor from kg to MT.

A5. Stationary Source (Cooling and Heating) - Natural Gas

Emissions of methane from natural gas consumption are calculated using the following equation:

$$E_{Mng} = (U_{Ang} * EF_{Mng}) / C_3$$

Where:

E_{Mng} = Annual emissions of methane from natural gas consumption (MT/year).

U_{Ang} = Annual natural gas usage, MMBTUs/year.

EF_{Mng} = Emission factor for natural gas usage.

C_3 = Conversion factor from kg to metric tons. (1,000 kg/MT)

B. Indirect Sources

B1. Electricity

Emissions of methane from electricity usage are calculated using the following equation:

$$E_{Mele} = (U_{Ae} * EF_{Mele}) / C_1$$

Where:

E_{Mele} = Annual emissions of CH_4 from Electricity (MT/year).

U_{Ae} = Annual usage of electricity (MWh/year).

EF_{Mele} = Emission factor for electrical usage (lbs/MWh).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

B2. Potable Water

Emissions of methane from potable water treatment and transportation for domestic uses are calculated using the following equation:

$$E_{Mpot} = (U_{epot} * EF_{Mele}) / C_1$$

Where:

E_{Mpot} = Annual Emissions of CH_4 from electricity used for potable water treatment and transportation (MT/year).

U_{epot} = Annual electricity usage for potable water treatment and transportation (MWh/year).

= U_{Apot} * C_4

U_{Apot} = Annual usage of potable water (MG/yr)

C_4 = Conversion factor for determining kWhs used to treat water.

EF_{Mele} = Emission factor for electrical usage (lbs/MWh).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

B3. Solid Waste

Emissions of methane from solid waste is a summation of the emissions from solid waste treatment, transport, and the use of equipment at disposal sites

$$\mathbf{E_{MTSW} = E_{MWF} + E_{MWT} + E_{MWD}}$$

Where:

E_{MTSW} = Annual Emissions of CH_4 from solid waste (MT/year).

E_{MWF} = Annual emissions of CH_4 from solid waste disposal and treatment (MT/year).

E_{MWT} = Annual emissions of CH_4 from solid waste transportation (MT/year).

E_{MWD} = Annual emissions of CH_4 from solid waste disposal, (MT/year).

B3a. Fugitive Emissions

Fugitive emissions of methane from solid waste disposal treatment are calculated using the following equation:

$$\mathbf{E_{MWF} = U_{SW} * EF_{MWF}}$$

Where:

E_{MWF} = Annual emissions of CO_2 from solid waste disposal and treatment (MT/year).

U_{SW} = Annual waste production for disposal and treatment (tons/year).

EF_{MWF} = Emission factor for waste production.

B3b. Exhaust Emissions (Hauling Trucks)

Emissions of methane from solid waste transportation are calculated using the following equations:

$$\mathbf{E_{MWT} = ((((U_{SW} / d) / C_T) * M * EF_{MWT}) / C_6)}$$

Where:

E_{MWT} = Annual emissions of CH_4 from solid waste transportation (tons/year).

U_{SW} = Annual waste production for disposal and treatment (tons/year).

d = Average solid waste density (tons/cubic yard).

C_T = Average truck load capacity.

M = Average trip mileage (round trip from source to landfill).

EF_{MWT} = Emission factor for hauling trucks.

C_6 = Conversion factor from gr to MT;.

B3c. Exhaust Emissions (Disposal Equipment)

Emissions of methane from disposal equipment are calculated using the following equation:

$$\mathbf{E_{MWD} = (EF_{MWD} * h * n) / C_1}$$

Where:

E_{MWD} = Annual emissions of methane from solid waste disposal, MT/year.

EF_{MWD} = Emission factor for disposal equipment, lbs/hr (SCAQMD off-Road Mobile Source Emission Factors, 2007). (Equation needs to be repeated for each piece of equipment, then all emissions summed).

h = Operating hours (% of day attributed to project waste generation - Total hours of operation of facility per day times the percentage of total annual waste attributable to Project generation).
n = Days per year. (Number of days per year the landfill is open to disposal).
C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).
Note: Emissions from onsite equipment is only relevant if the project has control over landfill operations.

B4. Wastewater

Emissions of methane from waste water treatment are calculated using the following equation:

$$E_{MWW} = (U_{eWW} * EF_{Mele}) / C_1$$

Where:

E_{MWW} = Annual emissions of methane from waste water treatment, MT/year.
U_{eWW} = Annual electricity usage for transport and treatment of waste water
= $(U_{Apot} * \%_{in}) * C_5$
U_{Apot} = Annual usage of potable water (MG/yr)
$\%_{in}$ = % of potable water used indoors.
C_5 = Conversion factor for determining MWh used per MG of waste water treated.
EF_{Mele} = Emission factor for electrical usage (lbs/MWh).
C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

Nitrous Oxide Formula Sheet

Sutter County

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Emissions of nitrous oxide from construction vehicles are calculated using the following equations:

$$\mathbf{E_{NCON} = ((U_{AG} * EF_{NHDV}) / C_6)}$$

Where:

E_{NCON} = Annual emissions of nitrous oxide from construction vehicle exhaust (MT/year)

U_{AG} = Annual gallons of gas used by construction vehicles

= $(E_{CCON} * C_1) / EF_{Cdg}$

E_{CCON} = Annual emissions of CO_2 from Construction Vehicles (from URBEMIS).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

EF_{Cdg} = Conversion of CO_2 from lbs to gallons.

EF_{NHDV} = Emission factor for heavy duty vehicles, gr/gallon.

C_6 = Conversion factor from gr to MT.

A2. Mobile Source (Motor Vehicles)

Emissions of nitrous oxide from motor vehicles are calculated using the following equations:

$$\mathbf{E_{NMV} = ((M * EF_{NMV}) / C_6)}$$

Where:

E_{NMV} = Annual emissions of nitrous oxide from motor vehicles, MT/year.

M = Annual mileage for motor vehicles, miles/year (from Urbemis2007 9.2.4 output).

EF_{NMV} = Emission factor for motor vehicles, gr/mile by vehicle type

C_6 = Conversion factor from gr to MT.

Emissions from aviation fuel

Emissions of nitrous oxide from aviation fuel usage are calculated in two steps.

$$\mathbf{E_{Naf} = (U_{Aaf} * EF_{Naf}) / C_6}$$

Where:

E_{naf} = Annual emissions of nitrous oxide from aviation fuel usage (tons/year).

U_{aaf} = Gallons of fuel per year

EF_{Naf} = Emission factor for nitrous oxide for aviation fuel usage.

C_6 = Conversion factor from gr to MT.

A3. Mobile Source (Landscape Equipment)

Emissions of nitrous oxide from landscape equipment are calculated in two steps.

$$\mathbf{E_{Nls} = ((G_F * EF_{NF}) / C_6)}$$

Where:

E_{Nls} = Annual emissions of nitrous oxide from landscape equipment (tons/year).

G_F = Gallons of fuel per year

= $(E_{Cls} * C_1) / EF_{Cgg}$

E_{cls} = Annual emissions of CO_2 from landscaping (from URBEMIS).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

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EF_{Cgg} = Conversion of CO_2 from lbs to gallons.
EF_{NF} = Emission factor for nitrous oxide for motor gasoline.
C_6 = Conversion factor from gr to MT.

A4. Wood Burning Hearth Emissions
Emissions of nitrous oxide from wood burning hearths are calculated as follows.

$$\mathbf{E_{Nwood} = ((M_{wood} * EF_{Nwood}) / C_3)}$$

Where:

E_{Mwood} = Annual emissions of nitrous oxide from wood burning hearths (MT/year).
M_{wood} = Heat content of the wood in MMBtu
= E_{Cwood} * HC_{Cwood}
E_{Cwood} = Emissions of tons of CO_2 estimated for wood burning hearths.
HC_{Cwood} = MMBTUs per ton of CO_2 from burning wood.
EF_{Nwood} = Emission factor for nitrous oxide for wood burning.
C_3 = Conversion factor from kg to MT; 1,000 kg/MT

A5. Stationary Source (Cooling and Heating)
Emissions of nitrous oxide from natural gas consumption are calculated using the following equation:

$$\mathbf{E_{Nng} = (U_{Ang} * EF_{Nng}) / C_3}$$

Where:

E_{Nng} = Annual emissions of nitrous oxide from natural gas consumption (MT/year).
U_{Ang} = Annual natural gas usage, MMBTUs/year.
EF_{Nng} = Emission factor for natural gas usage;
C_3 = Conversion factor from kg to metric tons. (1,000 kg/MT)

B. Indirect Sources
B1. Electricity
Emissions of nitrous oxide from electricity usage are calculated using the following equation:

$$\mathbf{E_{Nele} = (U_{Ae} * EF_{Nele}) / C_1}$$

Where:

E_{Nele} = Annual emissions of N_2O from Electricity (MT/year).
U_{Ae} = Annual usage of electricity (MWh/year).
EF_{Nele} = Emission factor for electrical usage (lbs/MWh).
C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

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B2. Potable Water

Emissions of nitrous oxide from potable water treatment and transportation for domestic uses are calculated using the following equation:

$$E_{Npot} = (U_{epot} * EF_{Nele})/C_1$$

Where:

E_{Npot} = Annual Emissions of N_2O from electricity used for potable water treatment and transportation (MT/year).

U_{epot} = Annual electricity usage for potable water treatment and transportation (MWh/year).
= $U_{Apot} * C_4$

U_{Apot} = Annual usage of potable water (MG/yr)

C_4 = Conversion factor for determining kWhs used to treat water.

EF_{Nele} = Emission factor for electrical usage (lbs/MWh).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

B3. Solid Waste

Emissions of nitrous oxide from solid waste is a summation of the emissions from solid waste transportation, and the use of equipment at disposal sites. There are no fugitive emissions from nitrous oxide with respect to solid waste, therefore emissions from treatment are not included in the emissions inventory.

$$E_{NTSW} = E_{NWT} + E_{NWD}$$

Where:

E_{NTSW} = Annual Emissions of CH_4 from solid waste (MT/year).

E_{NWT} = Annual emissions of CH_4 from solid waste transportation (MT/year).

E_{NWD} = Annual emissions of CH_4 from solid waste disposal, (MT/year).

B3b. Exhaust Emissions (Hauling Trucks)

Emissions of nitrous oxide from solid waste transportation are calculated using the following equation:

$$E_{NWT} = ((((U_{SW} / d) / C_T) * M * EF_{NWT}) / C_6)$$

Where:

E_{NWT} = Annual emissions of N_2O from solid waste transportation (tons/year).

U_{SW} = Annual waste production for disposal and treatment (tons/year).

d = Average solid waste density (tons/cubic yard).

C_T = Average truck load capacity.

M = Average trip mileage (round trip from source to landfill).

EF_{NWT} = Emission factor for hauling trucks.

C_6 = Conversion factor from gr to MT; 1,000,000 gr/MT.

Sutter County

B3c. Exhaust Emissions (Disposal Equipment)

Emissions of nitrous oxide from disposal equipment are calculated using the following equation:

$$E_{NWD} = (EF_{NWD} * h * n) / C_1$$

Where:

E_{NWD} = Annual emissions of nitrous oxide from solid waste disposal, MT/year.

EF_{NWD} = Emission factor for disposal equipment, lbs/hr (derived from SCAQMD off-Road Mobile Source Emission Factors, 2007). (Equation needs to be repeated for each piece of equipment, then all emissions summed).

h = Operating hours (% of day attributed to project waste generation - Total hours of operation of facility per day times the percentage of total annual waste attributable to Project generation).

n = Days per year. (Number of days per year the landfill is open to disposal).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

Note: Emissions from onsite equipment is only relevant if the project has control over landfill operations.

B4. Wastewater

Emissions of nitrous oxide from waste water treatment are calculated using the following equation:

$$E_{NWW} = (U_{eWW} * EF_{Nele}) / C_1$$

Where:

E_{NWW} = Annual emissions of nitrous oxide from waste water treatment, MT/year.

U_{eWW} = Annual electricity usage for transport and treatment of waste water

= $(U_{Apot} * \%_{in}) * C_5$

U_{Apot} = Annual usage of potable water (MG/yr)

$\%_{in}$ = % of potable water used indoors.

C_5 = Conversion factor for determining MWh used per MG of waste water treated.

EF_{Nele} = Emission factor for electrical usage (lbs/MWh).

C_1 = Conversion factor from lbs to metric tons (1 MT = 2204.62 lbs).

Agricultural Formula Sheet

Sutter County

CM1: Methane emissions from Enteric Fermentation

$$E_{MEF} = (U_{Aani} * EF_{MEF}) / C_3$$

Where:

E_{MEF} = Emissions of methane from Enteric Fermentation (MT/yr).
U_{Aani} = Number of each type of animal (by type)
EF_{MEF} = Emission Factor for enteric fermentation by year and animal type.
C_3 = Conversion factor from kg to metric tons. (1,000 kg/MT)

CM2: Methane emissions from manure management

$$E_{MMM} = ((U_{Aani}/1000) * TAM * VS * C_6 * B_O * MCF * C_7) / C_3$$

Where:

E_{MMM} = Emissions of methane from manure management (MT/yr).
U_{Aani} = Number of each type of animal (by type)
TAM = Typical animal mass by animal and year (kg/head)
VS = Volatile solids produced in kgVS/1000kg animal mass/day
C_6 = 365 days per year
B_O = Maximum methane producing capacity by animal type
MCF = The extent to which methane producing capacity is realized for a given manure management system (weighted average for state by animal type).
C_7 = Density of methane 0.678 kg/m^3
C_3 = Conversion factor from kg to metric tons. (1,000 kg/MT)

CM3: Methane emissions from rice cultivation

$$E_{MRC} = (U_{AC} * C_{10} * EF_{PS}) / C_3$$

Where:

E_{MRC} = Emissions of methane from rice cultivation.
U_{AC} = Annual rice cultivation in acres
C_{10} = Conversion of acres to hectares.
EF_{PS} = Emission factor for primary season harvest;
C_3 = Conversion factor from kg to metric tons. (1,000 kg/MT)

CM4: Methane emissions from agricultural residue burning

$$E_{MARB} = (U_C * R_{RC} * F_{RB} * F_{DM} * BE * CE * CC) * R_{CH4-C} * C_{11})$$

Where:

E_{MARB} = Emissions of methane from agricultural residue burning (MT/yr).
U_C = Annual crop production in metric tons.
R_{RC} = Residue to crop ratio by crop.
F_{RB} = Fraction of residue burned by crop.
F_{DM} = Fraction of residue from dry matter
BE = Burning efficiency per crop

CE = Combustion efficiency per crop
CC = Carbon content of crop
R_{CH4-C} = Ratio of emissions CH_4-C
C_{11} = Conversion from CH_4-C to full molecular weight of carbon.

CN1: Nitrous Oxide from Manure Management:

$$\mathbf{E_{NMM} = ((((N_T * \%_{AL}) + (N_T * \%_{SS}) + (N_T * \%_{DP})) * EF_{NML}) + (((N_T * \%_{SS}) + (N_T * \%_{DP}) + (N_T * \%_P) * EF_{NMD})) / C_3}$$

Where:

E_{NMM} = Emissions of nitrous oxide from manure management (MT/yr).
N_T = Total Nitrogen excreted in kgs
= $U_{Aani} * (TAM/1000) * K_N * C_6$
U_{Aani} = Number of each type of animal (by type)
TAM = Typical animal mass by animal and year (kg/head) divided by 1000
K_N = Nitrogen excreted in kg/ 1000 kg mass/day by animal type.
C_6 = 365 days per year
$\%_{AL}$ = % manure associated with anaerobic lagoons (Relevant to dairy cows, swine, and layers).
$\%_{LS}$ = % manure associated with liquid/slurry (relevant to diary cows, swine, and layers).
$\%_{DP}$ = % manure associated with deep pits (relevant to swine for liquid and dairy cows for solid systems), and for dry lots (relevant for feedlot beef).
$\%_{SS}$ = % manure associated with solid storage (relevant for dairy cows, swine, and layers), and managed solid systems (relevant for dairy heifers), and for sheep on and off feed).
$\%_P$ = % manure associated with pastures (relevant for beef not on feed), and poultry (relevant for layers without bedding, and broilers and turkey with litter).
EF_{NML} = Emission factor for nitrous oxide from liquid systems
EF_{NMS} = Emission factor for nitrous oxide from solid systems
C_3 = Conversion factor from kg to metric tons. (1,000 kg/MT)

CN2: Nitrous Oxide emissions from animals and runoff:

$$\mathbf{E_{NAAS} = E_{NIA} + E_{NDA} + E_{NL}}$$

Where:

E_{NAAS} = Emissions of nitrous oxide from agricultural soils resulting from animal manure and runoff (MT/yr).

$\mathbf{E_{NIA}}$ = Emissions of nitrous oxide indirectly from animals (MT/yr).
= $((N_T * \%_{VI} * EF_{NH3-NOX}) / C_3) * C_9$
N_T = Total Nitrogen excreted in kgs
$\%_{VI}$ = % indirect volitazation.
$EF_{NH3-NOX}$ = Rate of conversion from NH_3 to NO_X.
C_3 = Conversion factor from kg to metric tons. (1,000 kg/MT)
C_9 = Molecular weight ratio N_2O:N_2

E_{NDA} = Emissions of nitrous oxide directly from animals (MT/yr).
= $((M_{PRP} + M_{AS}) * C_9) + (M_{PRP} * C_9)$
M_{PRP} = Manure from Pasture, Range and Paddocks
= $(N_{UM} * EF_{PRP}) / C_3$
M_{AS} = Manure applied to soils
= $((N_M + N_{DS}) * (1-\%_{VI}) * EF_{NV}) / C_3$
N_{UM} = Unmanaged Nitrogen
= $U_{Aani} * (\text{sum all } \%_{UMS}) * TAM * K_N * C_6$
U_{Aani} = Number of each type of animal (by type)
TAM = Typical animal mass by animal and year (kg/head) divided by 1000
K_N = Nitrogen excreted in kg/ 1000 kg mass/day by animal type.
C_6 = 365 days per year
$\%_{UMS}$ = % of manure from each unmanaged system for each animal type and year.
Dairy Cows: pasture; dairy heifers: pasture, range and paddock; not on feed beef: pasture; swine: pasture; turkey: range; sheep (based on type of feed); goats: pasture; and horses: pasture.
EF_{PRP} = Emission factor for pastures, ranges and paddocks.
N_M = Managed Nitrogen
= $U_{Aani} * (\text{sum all } \%_{MS}) * TAM * K_N * C_6$
$\%_{MS}$ = % of manure from each managed system for each animal type and year.
Dairy Cows: anaerobic lagoons, liquid/slurry, solid storage, deep pit; dairy heifers: managed; feedlot beef: dry lot; swine: solid storage, liquid slurry, anaerobic lagoon, and deep pit; turkey: solid storage, liquid slurry, anaerobic lagoon, and without bedding.
NDS = Unmanaged Nitrogen from daily spread of manure
= $U_{Aani} * (\text{sum all } \%_{DS}) * TAM * K_N * C_7$
$\%_{DS}$ = % of daily spread manure for dairy cows and dairy heifers only.
EF_{NV} = Emission factor for ground application of manure.

E_{NL} = Emissions of nitrous oxide from leaching (MT/yr).
= $([(((N_{UVS} + N_{UVO}) / C_3) * \%_{Leach}) + ((N_T * (1-\%_{VM}) * \%_{Leach}) / C_3)] * F_{Leach}) * C_9$
N_{UVS} = Unvolatilized Nitrogen from synthetic fertilizer. - See CN4: Nitrous Oxide emissions from Fertilizer use.
N_{UVO} = Unvolatilized Nitrogen from organic fertilizer. - See CN4: Nitrous Oxide emissions from Fertilizer use.
$\%_{Leach}$ = Percent leached from soils
F_{Leach} = Leaching Factor (kg N_2O-N / kg N)
$\%_{VM}$ = % volitazation from manure management.

CN3: Nitrous Oxide from Crop Growth:

$$E_{NCG} = E_{NLeg} + E_{NRes} + E_{NHis}$$

Where:

E_{NCG} = Emissions of nitrous oxide from crop growth (MT/yr).

E_{NLeg} = Emissions of nitrous oxide from legumes (nitrogen fixing crops)
= $(F_{NT} / C_3) * EF_{NDE} * C_9$

F_{NT} = Total nitrogen fixed in soil by all crops (formula below is to be repeated for each applicable crop and then totaled.

= $U_C * C_3 * (1 - R_{RC}) * F_{DM} * C_8$

U_C = Total crop production in tons

C_3 = Conversion factor from kg to metric tons. (1,000 kg/MT)

R_{RC} = Residue crop-mass ratio for given crop

F_{DM} = Residue fraction that is dry matter by crop

C_8 = Nitrogen content of aboveground biomass for N-fixing crop production

EF_{NDE} = Emission factor for soils (kg N_2O-N/kg N) 0.01

C_9 = Molecular weight ratio $N_2O:N_2$ 1.57

E_{NRES} = Emissions of nitrous oxides from crop residues (MT/yr).

= $(N_{RS} / C_3) * EF_{DIR} * C_9$

N_{RS} = Total nitrogen returned to soil from crop residue degradation. (Formula below is repeated for each applicable crop then totaled).

= $(U_C * C_3) * R_{RC} * F_{DM} * F_{RA} * NC$

F_{RA} = Fraction of residue applied to soil by crop.

N_{CR} = Nitrogen content of crop residue.

E_{NHIS} = Emissions of nitrous oxide from soil histols (based on climate zone of project) (MT/yr).

= $((((U_{CT} * C_{10}) * EF_{NHT}) + ((U_{CT} * C_{10}) * EF_{NHS}))*C_9) / C_3$

U_{CT} = Total crop production in acres planted

C_{10} = Conversion from acres to hectares 0.40469446 ha/acre

EF_{NHT} = Emission Factor for Temperate zone Histols (kg N_2O-N / ha_yr)

EF_{NHS} = Emission Factor for Subtropic zone Histols (kg N_2O-N / ha_yr)

CN4: Nitrous Oxide emissions from fertilizer use

$$E_{FU} = E_{ND} + E_{NID}$$

Where:

E_{FU} = Emissions of nitrous oxide from fertilizer use (MT/yr)

E_{ND} = Direct emissions of nitrous oxide from fertilizer use (MT/yr).

= $((N_{UVS} + N_{UVO}) / C_3) * EF_{NDE} * C_9$

EF_{NDE} = Emission factor for N_2O in soils (kg N2O-N/kgN) 0.01

C_9 = Molecular weight ratio $N_2O:N_2$

C_3 = Conversion factor from kg to metric tons. (1,000 kg/MT)

N_{UVS} = Unvolitazied nitrogen from application of synthetic fertilizer.

= $((U_{F1S} * C_{12}) + (U_{F2S} * C_{13})) * (1-V_{FS})$

U_{F1S} = Annual synthetic fertilizer use (in kg N) for target year (Determined as a percentage of total state usage based on acres planted)

= $(U_{FS} * \%_P) * \%_{FS} * 1000$

U_{FS} = Total fertilizer use for the state.

$\%_P$ = % of total acres planted. (Total project acres planted divided by total state acres planted) for that year.

$\%_{FS}$ = % usage of synthetic fertilizers for that year.

U_{F2S} = Annual synthetic fertilizer use (in kg N) for next growing year (Determined as a percentage of total state usage based on acres planted). Can be estimated if future year.

= $(U_{FS} * \%_{P}) * \%_{FS} * 1000$

V_{FS} = Volatization of synthetic fertilizers

C_{12} = Constant % of target year applied.

C_{13} = Constant % of following year applied.

N_{UVO} = Unvolitazied nitrogen from application of non-manure organic fertilizer.

= $[((U_{F1DM} * C_{12}) + (U_{F2DM} * 0C_{13})) + ((U_{F1ASS} * C_{12}) + (U_{F2ASS} * C_{13})) + ((U_{F1OO} * C_{12}) + (U_{F2OO} * C_{13}))] * N_{org} * (1-V_{FO})$

U_{F1DM} = Annual dried manure fertilizer use (in kg N) for target year (Determined as a percentage of total state usage based on acres planted)

= $(U_{FS} * \%_{P}) * \%_{FDM} * 1000$

U_{F2DM} = Annual dried manure fertilizer use (in kg N) for next growing year (Determined as a percentage of total state usage based on acres planted). Can be estimated if future year.

= $(U_{FS} * \%_{P}) * \%_{FDM} * 1000$

$\%_{FDM}$ = % of fertilizer from dried manure

U_{F1ASS} = Annual Sewage sludge fertilizer use (in kg N) for target year (Determined as a percentage of total state usage based on acres planted)

= $(U_{FS} * \%_{P}) * \%_{FASS} * 1000$

U_{F2ASS} = Annual sewage sludge fertilizer use (in kg N) for next growing year (Determined as a percentage of total state usage based on acres planted). Can be estimated if future year.

= $(U_{FS} * \%_{P}) * \%_{FASS} * 1000$

$\%_{FASS}$ = % of fertilizer from annual sewage sludge

U_{F1OO} = Annual other organic fertilizer use (in kg N) for target year (Determined as a percentage of total state usage based on acres planted)

= $(U_{FS} * \%_{P}) * \%_{FOO} * 1000$

U_{F2OO} = Annual other organic use (in kg N) for next growing year (Determined as a percentage of total state usage based on acres planted). Can be estimated if future year.

= $(U_{FS} * \%_{P}) * \%_{FOO} * 1000$

$\%_{FOO}$ = % of other organic fertilizers used

N_{ORG} = Nitrogen Content of Non-manure Organics

V_{FO} = Volitazation of organic fertilizers

E_{NID} = Indirect emissions of nitrous oxide from fertilizer use (MT/yr).

= $((N_{VS} + N_{VO}) / C_3) * EF_{NIE} * C_9$

EF_{NIE} = N_2O emissions from volitazation

C_9 = Molecular weight ratio N_2O:N_2

N_{VS} = Volatized nitrogen from application of synthetic fertilizer.

= $((U_{F1S} * C_{12}) + (U_{F2S} * C_{13})) * V_{FS}$

N_{VO} = Volatized nitrogen from application of non-manure organic fertilizer.

= $[((U_{F1DM} * C_{12}) + (U_{F2DM} * C_{13})) + ((U_{F1ASS} * C_{12}) + (U_{F2ASS} * C_{13})) + ((U_{F1OO} * C_{12}) + (U_{F2OO} * C13))] * N_{org} * V_{FO}$

CN5. Emissions on N_2O from agricultural residue burning

$$E_{NARB} = (U_C * R_{RC} * F_{RB} * F_{DM} * BE * CE * CC) * R_{N20\text{-}N} * C_9)$$

Where:

E_{MARB} = Emissions of methane from agricultural residue burning (MT/yr)

U_C = Annual crop production in metric tons

R_{RC} = Residue to Crop ratio by crop.

F_{RB} = Fraction of residue burned by crop.

F_{DM} = Fraction of residue from dry matter

BE = Burning efficiency per crop

CE = Combustion efficiency per crop

NC = Nitrogen content of crop

$R_{N2O\text{-}N}$ = Ratio of emissions N_2O-N

C_9 = Molecular weight ratio N_2O:N_2

Appendix C: 1990 URBEMIS Output and GHG Calculations

Sutter County
Emissions by Source
1990
Inventory
By Source

Transportation		
	Source:	**Metric tons of CO_2e**
1	On-Road Vehicles	226,778
2	Airport Operations	132
	Total	**226,910**

Energy		
	Sources:	**Metric tons of CO_2e**
1	Electric	55,823
2	Natural Gas	90,179
	Total	**146,001**

Solid Waste		
	Source	**Metric tons of CO_2e**
1	Solid Waste Disposal	8,939
2	Green Waste Recycling	No Data Available
3	Materials Recycling	No Data Available
	Total	**8,939**

Landscape Emissions		
	Sources:	**Metric tons of CO_2e**
1	Landscape Emissions	27
2	Carbon sink from CO_2 sequestration	No Data Available
	Total	**27**

Agriculture		
	Sources:	**Metric tons of CO_2e**
1	Enteric Fermentation	106,095
2	Manure Management	131,555
3	Rice Cultivation	132,703
4	Agricultural Residue Burning	15,329
5	Crop Growth	397,944
6	Animals and Runoff	105,515
7	Fertilizer Use	67,173
	Total	**956,315**

Net Total Emissions		
	Category	**Metric tons of CO_2e**
	Energy	146,001
	Solid Waste	8,939
	Landscape Emissions	27
	Agriculture	956,315
	Transportation	226,910
	Total	**1,338,192**

Sutter County
Emissions by Land Use
1990
Inventory
By Land Use Category

Source Type		CO_2e MT/yr			
		CO_2	CH_4	N_2O	combined CO_2e
Residential	AG/ER	148,617.83	6,045.92	4,719.60	159,383
	Low Density Residential	51,774.17	2,106.18	1,644.14	55,524
	Medium Density Residential	9,592.99	390.31	304.69	10,288
	High Density Residential	0.00	0.00	0.00	0
	Total Residential	**209,984.98**	**8,542.42**	**6,668.44**	**225,196**
Commercial	Park	165.15	2.91	2.25	170
	Commercial	44,511.23	776.38	600.10	45,888
	Mixed Use	0.00	0.00	0.00	0
	Total Commercial	**44,676.39**	**779.29**	**602.35**	**46,058**
Industrial	Industrial	107,379.26	1,796.24	1,447.66	110,623
	Total Industrial	**107,379.26**	**1,796.24**	**1,447.66**	**110,623**
Agriculture		0.00	373,212.42	583,102.45	956,315
	Total	**362,040.63**	**384,330.36**	**591,820.89**	**1,338,192**

*For consistency with 2008 and 2020 inventories, High Density Residential and Mixed use categories are listed although there is no land designated as such for 1990.

Sutter County
Input data for Green House Gas Emissions
1990

Land Use Type (units)	Total Trips	Total VMT	Total Trips (2008)	Total VMT (2008)	Unit Totals	Unit Type
AG/ER	40,550	447,512	47,706	526,485	4,386	du
Low Density Residential	30,513	336,739	35,897	396,164	3,300	du
Medium Density Residential	5,655	62,407	6,653	73,420	612	du
High Density Residential	0	0	0	0	0	du
Park	5	62	6	73	23,718,729.69	Sq/ft
Commercial	25,550	288,589	30,059	339,516	1,154,864.75	Sq/ft
Mixed Use	0	0	0	0	0.00	du
Industrial	9,729	109,453	11,446	128,768	2,785,973.60	Sq/ft
Total	**112,002.63**	**1,244,762.45**	**131767.8**	**1464426.41**		

Sutter County
Input data for Green House Gas Emissions
1990

Land Use Type (units)	Natural gas usage rate (MMBTU/yr)	Kilowatt-hour/ year	Potable Water Usage (gallons/year)	Solid Waste (lbs/year)	% of square footage - Res/Non-Res	% of Total square footage
AG/ER	161,670.35	59,267,390.8	25,291,790.47	18,510,113.63	0.7078	0.5466
Low Density Residential	56,321.36	20,647,075.8	8,810,941.52	6,448,267.49	0.2466	0.1904
Medium Density Residential	10,436.90	3,826,106.8	1,632,754.37	1,194,976.42	0.0457	0.0353
High Density Residential	0.00	0.0	0.00	0.00	0.0000	0.0000
Park	1,396.03	123,300.6	2,192.81	8,465.40	0.0011	0.0003
Commercial	378,387.76	33,420,178.6	594,353.46	2,256,538.07	0.2927	0.0666
Mixed Use	0.00	0.0	0.00	0.00	0.0000	0.0000
Industrial	912,833.16	80,623,769.0	1,433,834.82	5,443,593.35	0.7062	0.1608
Total	**1,521,045.55**	**197,907,821.60**	**37,765,867.45**	**33,861,954.37**		

Sutter County
Input data for Green House Gas Emissions
1990

City Parks

Year	# of City Parks	Estimated SQ / "building"	Estimated Buildings per
1990	9	500	1
2008	10	500	1

Airports

Year	# of planes	Gallons fuel per day	Annual days of operation	Annual Fuel Usage (g/yr)
1990	65	43	365	15,513
2008	77	50	365	18,250

Operational(*2a,b) / Area Scenario(*3a,b)	Vehicle			Natural Gas			Total Vehicle + Natural Gas
	(lbs/day)	Winter (lbs/day)	tons/Year	Summer	Winter	Year	
1990	1,169,087.35	1,033,279.91	205,096.82	0.00	0.00	0.00	205,096.82
2008	1,375,396.88	1,215,623.42	241,290.38	0.00			241,290.38

Area Scenario(*3b,c)	Landscaping			Hearth		
	Summer	Winter	Year	Summer	Winter	Year
1990	322.66	0.00	29.04	0.00	223,467.50	9,162.17
2008	379.60	0.00	34.16	0.00	262,902.94	10,779.02

Vehicle Type	Fleet %		Non-Catalyst		Catalyst		Diesel	
Light Auto	39.50	0.3950	2.00	0.0200	97.50	0.9750	0.50	0.0050
Light Truck <3,750 lbs	19.30	0.1930	4.10	0.0410	85.50	0.8550	10.40	0.1040
Light Truck 3,751-5,750 lbs	19.70	0.1970	2.00	0.0200	97.50	0.9750	0.50	0.0050
Med Truck 5,751-8,500 lbs	9.30	0.0930	1.10	0.0110	97.80	0.9780	1.10	0.0110
Lite-Heavy Truck 8,501-10,000 lbs	2.50	0.0250	0.00	0.0000	64.00	0.6400	36.00	0.3600
Lite-Heavy Truck 10,001-14,000 lbs	0.90	0.0090	0.00	0.0000	44.40	0.4440	55.60	0.5560
Med-Heavy Truck 14,001 - 33,000 lbs	1.50	0.0150	6.70	0.0670	20.00	0.2000	73.30	0.7330
Heavy-Heavy Truck 33,001-60,000 lbs	1.90	0.0190	0.00	0.0000	5.30	0.0530	94.70	0.9470
Other bus	0.10	0.0010	0.00	0.0000	0.00	0.0000	100.00	1.0000
Urban bus	0.00	0.0000	0.00	0.0000	0.00	0.0000	100.00	1.0000
Motorcycle	4.00	0.0400	70.00	0.7000	30.00	0.3000	0.00	0.0000
School Bus	0.10	0.0010	0.00	0.0000	0.00	0.0000	100.00	1.0000
Motor Home	1.20	0.0120	8.30	0.0830	75.00	0.7500	16.70	0.1670

Disposal Facility	Jurisdiction?	No		Type of Facility:	Landfill w/o recovery		year began:	?
Landfill	Landfill Total Annual (tons)	City's % of Total	Daily Hours of Facility	Hours attributed to	Days per year of operation	% Waste delivered	Distance (one way)	Round Trip Distance (miles)
Recology Landfill	16,930.81	1.00	9	9.00	313.00	100	4.81	9.62
		0.00		0.00		0		
		0.00		0.00		0		
		0.00		0.00		0		
		0.00		0.00		0		
				9.00	313.00	**Total**		**9.62**

Sutter County
Input data for Green House Gas Emissions
1990

Electrical Usage (kWh/yr)

83,739,736 Total Residential Electrical Usage 1990
114,168,493 Total Non-Residential Electrical Usage 1990

1990	*% decrease*	*2008*	
		Residential	
31,989	15.00%	37,634	County facilities located in Yuba City
182	15.00%	214	County facilities located in Live Oak City
21,654	15.00%	25,475	County facilities located in Unincorporated Sutter
71,124,951	15.00%	83,676,413	Residential in Unincorporated Sutter County
		Non-Residential	
5,153,007	15.00%	6,062,361	County facilities located in Yuba City
75,107	15.00%	88,361	County facilities located in Live Oak City
674,059	15.00%	793,010	County facilities located in Unincorporated Sutter
108,266,321	15.00%	127,372,142	Commercial in Unincorporated Sutter County

Water Usage

Total Gal/Yr	*% decrease*	*2008*	
35,735,097	15.00%	42,041,290.32	Residential (gallons per year)
2,030,403	15.00%	2,388,710	Non-Residential (gallons/year)

Solid Waste for Unincorporated Sutter County

33,861,616 lbs/year - 1990
39,837,195.00 2006 lbs/year

Natural Gas Data (Provided by PG&E)

228,426 Total Natural gas usage rate (MMBTU/yr) - Residential
1,292,631 Total Natural gas usage rate (MMBTU/yr) - Non-Residential

1990	*2008*		
228,426	268,737	TotalResidential Natural gas usage rate (MMBTU/yr)	
		MMBTU	***Therms***
		14	135
		0	2
		0	0
		268,723	2687229
1,292,631	1,520,742	Total Commercial Natural gas usage rate (MMBTU/yr)	
		MMBTU	***Therms***
		14,856	148564
		312	3116
		501	5014
		1,505,073	15050730

Sutter County
Input data for Agriculture
1990

	Enteric Fermentation Emission Factor (EF_{MEF})	Typical Animal Mass - kg- (TAM)	Volatile Solids -kg VS/1000kg mass/day- (VS)	Max CH_4 Capacity - m^3CH_4/kg VS- (B_O)	K-Nitrogen - kg/day/1000kg animal mass- (K_N)	Number of Head
	EF used	EF used	EF used	EF used	EF used	
Dairy Cow						
Dairy Cows	138.4	604.0	10.2	0.2	0.4	31,625
Swine						
Market 120-179 lbs	1.5	67.8	5.4	0.5	0.4	8591
Poultry						
Hens > 1 yr	N/A	1.8	10.8	0.4	0.8	215630
Turkeys	N/A	6.8	9.7	0.4	0.7	94177.5
Other						
Sheep on Feed	8.0	27.0	9.2	0.4	0.4	23965
Goats	5.0	64.0	9.5	0.2	0.5	94177.5

Sutter County
Input data for Agriculture
1990

	Residue/Crop Ratio (R_{RC})	Fraction Residue Burned (F_{RB})	Fraction Dry Matter (F_{DM})	Burning Efficiency (BE)	Combustion Efficiency (CE)	Carbon Content (CC)	Fraction of Residue Applied (F_{RA})	Nitrogen Content of Residue (NC)
	EF used	EF used	EF used	EF used	EF used	EF used	EF used	EF used
Hay (inc Alfalfa)	0.0	0.00	0.85	0.00	0.00	0.00	0.00	N/A
Barley	1.2	0.03	0.93	0.93	0.88	0.45	0.90	0.01
Dry Edible Beans	2.1	0.00	0.87	0.00	0.00	0.00	1.60	0.02
Corn	1.0	0.03	0.91	0.93	0.88	0.45	0.90	0.01
Corn for Grain	1.0	0.00	0.91	0.00	0.00	0.00	0.90	0.01
Oats	1.3	0.00	0.92	0.00	0.00	0.00	0.90	0.01
Rice	1.4	0.75	0.91	0.93	0.88	0.38	1.00	0.01
Sorghum	1.4	0.00	0.91	0.00	0.00	0.00	0.90	0.01
All Wheat	1.3	0.03	0.93	0.93	0.88	0.44	0.90	0.01
Sugar Beet	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vegetable Crops & Fruit Trees	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Safflower & Sunflower	2.1	0.03	0.87	0.93	0.88	0.45	0.90	0.02

Sutter County
Input data for Agriculture
1990

		Growing Season Emission Factor		
Primary		**EF used**	**Entered**	**Default**
		210		210
Rattoon		780		780
		State	***Project***	***% of State ($\%_P$)***
Total acres	1990	8,093,357	230,466.00	0.0284759
Total acres	1991	7,600,890	210,639.19	0.0277124
Climate Zone	Temperate	Yes	Sub Tropic	No

	1990					1991				
	Primary (Acres Harvested)	**Annual Yield**	**Unit of Yield**	**Annual Yield (MT/yr)**	**State Acres Harvested**	**Primary (Acres Harvested)**	**Annual Yield**	**Unit of Yield**	**Annual Yield (MT/yr)**	**State Acres Harvested**
Hay (inc Alfalfa)	10,953	40,350	tons	36,605	1,630,000	11,289	41,588	tons	37,728	1,680,000
Barley	4,996	5,959	tons	5,406	230,000	3,475	4,145	tons		160,000
Dry Edible Beans	19,984	15,977	tons	14,494	166,000	18,058	14,437	tons	13,097	150,000
Corn	3,500	70,000	tons	63,503	210,000	3,500	70,000	tons	63,503	210,000
Corn for Grain	2,200	7,898	tons	7,165	160,000	1,581	5,677	tons	5,150	115,000
Oats	2,114	2,169	tons	1,968	45,000	2,114	2,169	tons	1,968	45,000
Rice	74,356	273,237	tons	247,877	395,000	67,015	246,259	tons	223,403	356,000
Sorghum	802	2,005	tons	1,819	9,000	802	2,005	tons	1,819	9,000
All Wheat	18,090	44,483	tons	40,354	619,000	12,917	31,763	tons	28,815	442,000
Sugar Beet	5,371	131,590	tons	119,376	169,000	5,339	130,811	tons	118,670	168,000
Vegetable Crops & Fruit Trees	77,020	711,612	tons	645,564	3,211,479	74,422	687,607	tons	623,787	3,103,145
Safflower & Sunflower	11,080	12,033	tons	10,916	74,778	10,127	10,997	tons	9,977	68,345

Sutter County
Input data for Green House Gas Emissions
1990
Inventory
Carbon Dioxide

A. Direct Sources

A1-4. Mobile (Construction Equipment, Motor Vehicles, Landscape Equipment, and wood burning Hearths)

Con (MT/yr)	Motor Vehicles (MT/yr)	Landscape (MT/yr) (E_{Cls})	Hearth	MT/yr
0.00	217,009.87	26.34	8,311.78	**225,347.99**
0.00	0.96	0.00		

Fuel emissions from Airports

Annual Fuel Usage (U_{AAF})	kg/gallon (EF_{CAF})	kg/MT (C_3)	MT/yr (E_{CAF})
15,512.50	8.32	1,000.00	**129.06**

Mobile Source (Motor Vehicles)

Unit Type	miles/yr (M)	gr/mile (EF_{CMV})	gr/MT (C_6)	tons/yr (E_{CMV})
Non Cat passenger Car	3,589,273	480.74	1,000,000	1,725.49
Cat passenger Car	174,977,035	403.47	1,000,000	70,598.68
Diesel Passenger Car	897,318	373.82	1,000,000	335.44
Non cat light-duty truck	3,595,179	476.14	1,000,000	1,711.80
Cat light duty truck	74,972,634	438.47	1,000,000	32,873.33
Diesel Light duty Truck	9,119,478	358.26	1,000,000	3,267.13
Non Cat light-duty truck 2	1,790,093	476.69	1,000,000	853.31
Cat light duty truck 2	87,267,028	431.99	1,000,000	37,698.48
Diesel Light duty truck 2	447,523	369.35	1,000,000	165.29
Non Cat Medium duty Truck	464,788	605.05	1,000,000	281.22
Cat med duty truck	41,323,885	649.94	1,000,000	26,857.84
Diesel Med duty truck	464,788	362.67	1,000,000	168.56
Non Cat lite-heavy duty truck	0	567.90	1,000,000	0.00
Cat Light-heavy duty truck	7,269,413	567.90	1,000,000	4,128.26
Diesel Lite-heavy duty truck	4,089,045	642.00	1,000,000	2,625.17
Non Cat lite-heavy duty truck 2	0	567.90	1,000,000	0.00
Cat Light-heavy duty truck 2	1,815,536	567.90	1,000,000	1,031.03
Diesel Lite-heavy duty truck 2	2,273,509	642.00	1,000,000	1,459.59
Non Cat med-heavy duty truck	456,610	567.90	1,000,000	259.31
Cat med-heavy duty truck	1,363,015	567.90	1,000,000	774.05
Diesel med-heavy duty truck	4,995,450	1,505.00	1,000,000	7,518.15
Non cat Heavy Duty truck	0	567.90	1,000,000	0.00
Cat heavy duty truck	457,519	567.90	1,000,000	259.82
Diesel heavy duty truck	8,174,909	1,924.23	1,000,000	15,730.44
Non Cat Other Bus	0	567.90	1,000,000	0.00
Cat other bus	0	567.90	1,000,000	0.00
Diesel Other Bus	454,338	1,505.00	1,000,000	683.78
Non Cat Urban Bus	0	567.90	1,000,000	0.00
Cat Urban Bus	0	567.90	1,000,000	0.00
Diesel Urban Bus	0	3,020.11	1,000,000	0.00
Non cat motorcycle	12,721,472	107.73	1,000,000	1,370.48
Cat motorcycle	5,452,060	0.00	1,000,000	0.00
Diesel Motorcycle	0	0.00	1,000,000	0.00
Non Cat School Bus	0	567.90	1,000,000	0.00
Cat School Bus	0	567.90	1,000,000	0.00
Diesel School Bus	454,338	1,505.00	1,000,000	683.78
Non Cat Motor home	452,521	567.90	1,000,000	256.98
Cat Motor home	4,089,045	567.90	1,000,000	2,322.15
Diesel Motor home	910,494	1,505.00	1,000,000	1,370.29
			Total (MT/year)	**217,009.87**

Sutter County
Input data for Green House Gas Emissions
1990
Inventory
Carbon Dioxide

A5. Stationary Sources (Natural Gas)

Unit Type	MMBTU/yr (U_{Ang})	kg/MMBTU (EF_{Cng})	kg/MT (C_3)	MT/yr (E_{Cng})
AG/ER	161,670	53.07	1,000.00	8,579.85
Low Density Residential	56,321	53.07	1,000.00	2,988.97
Medium Density Residential	10,437	53.07	1,000.00	553.89
High Density Residential	0	53.07	1,000.00	0.00
Park	1,396	53.07	1,000.00	74.09
Commercial	378,388	53.07	1,000.00	20,081.04
Mixed Use	0	53.07	1,000.00	0.00
Industrial	912,833	53.07	1,000.00	48,444.06
			Total (MT/year)	**80,721.89**

B. Indirect Sources

B1. Electricity

Unit Type	kWh/yr	Unit	Unit type	MWh/yr (U_{Ae})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{Cele})
AG/ER	59267390.8	4,386	du	59,267.39	620.00	2,204.62	16,667.63
Low Density Residential	20647075.8	3,300	du	20,647.08	620.00	2,204.62	5,806.53
Medium Density Residential	3826106.8	612	du	3,826.11	620.00	2,204.62	1,076.01
High Density Residential	0	0	du	0.00	620.00	2,204.62	0.00
Park	123300.628	23,718,730	Sq/ft	123.30	620.00	2,204.62	34.68
Commercial	33420178.6	1,154,865	Sq/ft	33,420.18	620.00	2,204.62	9,398.68
Mixed Use	0	0	Sq/ft	0.00	620.00	2,204.62	0.00
Industrial	80623769	2,785,974	Sq/ft	80,623.77	620.00	2,204.62	22,673.63
						Total (MT/year)	**55,657.14**

B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWh/yr (U_{epot})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{Cpot})
AG/ER	du	4,386	25.2918	3.50	88.52	620.00	2,204.62	24.89
Low Density Residential	du	3,300	8.8109	3.50	30.84	620.00	2,204.62	8.67
Medium Density Residential	du	612	1.6328	0.01	0.02	804.54	2,000	0.01
High Density Residential	du	0	0.0000	0.01	0.00	804.54	2,000	0.00
Park	Sq/ft	23,718,730	0.0022	3.50	0.01	620.00	2,204.62	0.00
Commercial	Sq/ft	1,154,865	0.5944	3.50	2.08	620.00	2,204.62	0.59
Mixed Use	Sq/ft	0	0.0000	3.50	0.00	620.00	2,204.62	0.00
Industrial	Sq/ft	2,785,974	1.4338	3.50	5.02	620.00	2,204.62	1.41
							Total (MT/year)	**35.57**

Sutter County
Input data for Green House Gas Emissions
1990
Inventory
Carbon Dioxide

B3. Solid Waste

B3a. Anthropogenic Carbon

CO_2 emissions are considered anthropogenic and are not counted in this inventory.

Source: EPA Solid Waste Management and Greenhouse Gases; A life-cycle assessment of emissions and Sinks, 3rd edition, September 2006.

B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{CWT})	g/MT (C_6)	tons/yr (E_{CWT})
AG/ER	9,255.06	0.1125	33	9.62	3,464.164	1,000,000	83.08
Low Density Residential	3,224.13	0.1125	33	9.62	3,464.164	1,000,000	28.94
Medium Density Residential	597.49	0.1125	33	9.62	3,464.164	1,000,000	5.36
High Density Residential	0.00	0.1125	33	9.62	3,464.164	1,000,000	0.00
Park	4.23	0.2250	33	9.62	3,464.164	1,000,000	0.02
Commercial	1,128.27	0.2250	33	9.62	3,464.164	1,000,000	5.06
Mixed Use	0.00	0.2250	33	9.62	3,464.164	1,000,000	0.00
Industrial	2,721.80	0.2250	33	9.62	3,464.164	1,000,000	12.22
						Total (MT/year)	**134.68**

B4. Wastewater

Unit Type	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG	MWh/yr (U_{eWW})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{CWW})
AG/ER	25.2918	0.65	16.43967	1.911	31.4162094	620.00	2,205	8.84
Low Density Residential	8.8109	0.82	7.224938	1.911	13.8068565	620.00	2,205	3.88
Medium Density Residential	1.6328	0.82	1.338896	1.911	2.55863026	620.00	2,205	0.72
High Density Residential	0.0000	0.82	0	1.911	0	620.00	2,205	0.00
Park	0.0022	0.71	0.001562	1.911	0.00298498	620.00	2,205	0.00
Commercial	0.5944	0.71	0.422024	1.911	0.80648786	620.00	2,205	0.23
Mixed Use	0.0000	0.71	0	1.911	0	620.00	2,205	0.00
Industrial	1.4338	0.8	1.14704	1.911	2.19199344	620.00	2,205	0.62
							Total (MT/year)	14.28

C. Reserved for AG emissions for CH_4 and N_2O, not applicable for CO_2.

Sutter County
Input data for Green House Gas Emissions
1990
Inventory
Carbon Dioxide

D. Summary Table

Source Type		Emissions, MT /yr	CO_2E metric tons/yr
Direct	Construction equipment	0.00	0.00
	Motor vehicles & Aircraft	217138.93	217,138.93
	Landscape equipment	26.34	26.34
	Cooling and heating	89033.67	89,033.67
Total direct, tons/yr		**306198.94**	**306198.94**
Indirect	Electricity	55657.14	55,657.14
	Potable water	35.57	35.57
	Solid waste	134.68	134.68
	Wastewater	14.28	14.28
Total indirect, tons/yr		**55,841.68**	**55,841.68**
Total, tons/yr		**362,040.62**	**362,040.62**
Global warming potential index		**1**	

Source Type		Emissions, MT/yr	CO_2e metric tons/yr
Residential	AG/ER	148,617.83	148,617.83
	Low Density Residential	51,774.17	51,774.17
	Medium Density Residential	9,592.99	9,592.99
	High Density Residential	0.00	0.00
	Total Residential	**209,984.98**	**209,984.98**
Commercial	Park	165.15	165.15
	Commercial	44,511.23	44,511.23
	Mixed Use	0.00	0.00
	Total Commercial	**44,676.39**	**44,676.39**
Industrial	Industrial	107,379.26	107,379.26
	Total Industrial	**107,379.26**	**107,379.26**
Total, tons/yr		**362,040.63**	**362,040.63**
Global warming potential index		1	

Sutter County
Input data for Green House Gas Emissions
1990
Inventory
Methane

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Unit Type	gallons/yr (U_{AG})	gr/gallon (EF_{MHDV})	gr/MT (C_6)	MT/yr (E_{MCON})
Construction Equipment	0.00	0.0580	1,000,000	**0.00**

A2. Mobile Source (Motor Vehicles)

Unit Type	miles/yr (M)	gr/mile (EF_{MMV})	gr/MT (C_6)	tons/yr (E_{MMV})
Non Cat passenger Car	3,589,273	0.1696	1,000,000	0.61
Cat passenger Car	174,977,035	0.1355	1,000,000	23.71
Diesel Passenger Car	897,318	0.0006	1,000,000	0.00
Non cat light-duty truck	3,595,179	0.1908	1,000,000	0.69
Cat light duty truck	74,972,634	0.1516	1,000,000	11.37
Diesel Light duty Truck	9,119,478	0.0011	1,000,000	0.01
Non Cat light-duty truck 2	1,790,093	0.1908	1,000,000	0.34
Cat light duty truck 2	87,267,028	0.1516	1,000,000	13.23
Diesel Light duty truck 2	447,523	0.0011	1,000,000	0.00
Non Cat Medium duty Truck	464,788	0.4181	1,000,000	0.19
Cat med duty truck	41,323,885	0.2356	1,000,000	9.74
Diesel Med duty truck	464,788	0.0051	1,000,000	0.00
Non Cat lite-heavy duty truck	0	0.4181	1,000,000	0.00
Cat Light-heavy duty truck	7,269,413	0.2356	1,000,000	1.71
Diesel Lite-heavy duty truck	4,089,045	0.0051	1,000,000	0.02
Non Cat lite-heavy duty truck 2	0	0.4181	1,000,000	0.00
Cat Light-heavy duty truck 2	1,815,536	0.2356	1,000,000	0.43
Diesel Lite-heavy duty truck 2	2,273,509	0.0051	1,000,000	0.01
Non Cat med-heavy duty truck	456,610	0.4181	1,000,000	0.19
Cat med-heavy duty truck	1,363,015	0.2356	1,000,000	0.32
Diesel med-heavy duty truck	4,995,450	0.0051	1,000,000	0.03
Non cat Heavy Duty truck	0	0.4181	1,000,000	0.00
Cat heavy duty truck	457,519	0.2356	1,000,000	0.11
Diesel heavy duty truck	8,174,909	0.0051	1,000,000	0.04
Non Cat Other Bus	0	0.4181	1,000,000	0.00
Cat other bus	0	0.2356	1,000,000	0.00
Diesel Other Bus	454,338	0.0051	1,000,000	0.00
Non Cat Urban Bus	0	0.4181	1,000,000	0.00
Cat Urban Bus	0	0.2356	1,000,000	0.00
Diesel Urban Bus	0	0.0051	1,000,000	0.00
Non cat motorcycle	12,721,472	0.0672	1,000,000	0.85
Cat motorcycle	5,452,060	0.0672	1,000,000	0.37
Diesel Motorcycle	0	0	1,000,000	0.00
Non Cat School Bus	0	0.4181	1,000,000	0.00
Cat School Bus	0	0.2356	1,000,000	0.00
Diesel School Bus	454,338	0.0051	1,000,000	0.00
Non Cat Motor home	452,521	0.4181	1,000,000	0.19
Cat Motor home	4,089,045	0.2356	1,000,000	0.96
Diesel Motor home	910,494	0.0051	1,000,000	0.00
			Total (MT/yr)	**65.12**

Sutter County
Input data for Green House Gas Emissions
1990
Inventory
Methane

Emissions from Aviation Fuel

Gasoline gallons/ year (U_{AAF})	gr/gallon (EF_{Maf})	gr/MT (C_6)	MT/yr (E_{Maf})
15,512.50	7.04	1,000,000	**0.11**

A3. Mobile Source (Landscape Equipment)

Gasoline gallons/ year (G_F)	gr/gallon (EF_{MF})	gr/MT (C_6)	MT/yr (E_{Mls})
2,993.40	0.50	1,000,000	**0.0015**

A4. Wood burning Hearth

MMBtu	kg/MMBtu (EF_{Mwood})	kg/MT (C_3)	MT/yr (E_{Mls})
127,835.18	0.32	1,000	**40.40**

A5. Stationary Source (Cooling and Heating) - Natural Gas

Land Use Type	Unit Type	Units	MMBTUs/yr (U_{Ang})	kg/MMBTU (EF_{Mng})	kg/MT (C_3)	MT/yr (E_{Mng})
AG/ER	du	4,386	161,670.35	0.005	1,000	0.8084
Low Density Residential	du	3,300	56,321.36	0.005	1,000	0.2816
Medium Density Residential	du	612	10,436.90	0.005	1,000	0.0522
High Density Residential	du	0	0.00	0.005	1,000	0.0000
Park	Sq/ft	23,718,730	1,396.03	0.005	1,000	0.0070
Commercial	Sq/ft	1,154,865	378,387.76	0.005	1,000	1.8919
Mixed Use	Sq/ft	0	0.00	0.005	1,000	0.0000
Industrial	Sq/ft	2,785,974	912,833.16	0.001	1,000	0.9128
					Total (MT/yr)	**3.95**

B. Indirect Sources
B1. Electricity

Land Use Type	Unit Type	Units	kWh/year	MWh/yr (U_{Ae})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	tons/yr (E_{Mele})
AG/ER	du	4,386	59,267,391	59,267	0.0067	2,205	0.180
Low Density Residential	du	3,300	20,647,076	20,647	0.0067	2,205	0.063
Medium Density Residential	du	612	3,826,107	3,826	0.0067	2,205	0.012
High Density Residential	du	0	0	0	0.0067	2,205	0.000
Park	Sq/ft	23,718,730	123,301	123	0.0067	2,205	0.000
Commercial	Sq/ft	1,154,865	33,420,179	33,420	0.0067	2,205	0.102
Mixed Use	Sq/ft	0	0	0	0.0067	2,205	0.000
Industrial	Sq/ft	2,785,974	80,623,769	80,624	0.0067	2,205	0.245
						Total (MT/yr)	**0.601**

Sutter County
Input data for Green House Gas Emissions
1990
Inventory
Methane

B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWH/yr (U_{epot})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	tons/yr (E_{Mpot})
AG/ER	du	4,386	25.29179	3.50	88.52	0.0067	2,205	0.00
Low Density Residential	du	3,300	8.81094	3.50	30.84	0.0067	2,205	0.00
Medium Density Residential	du	612	1.63275	3.50	5.71	0.0067	2,205	0.00
High Density Residential	du	0	0.00000	3.50	0.00	0.0067	2,205	0.00
Park	Sq/ft	23,718,730	0.00219	3.50	0.01	0.0067	2,205	0.00
Commercial	Sq/ft	1,154,865	0.59435	3.50	2.08	0.0067	2,205	0.00
Mixed Use	Sq/ft	0	0.00000	3.50	0.00	0.0067	2,205	0.00
Industrial	Sq/ft	2,785,974	1.43383	3.50	5.02	0.0067	2,205	0.00
							Total (MT/yr)	**0.00**

B3. Solid Waste
B3a. Fugitive Emissions

Unit Type	Unit Type	unit	tons/yr (U_{SW})	MT CO_2e/ton (EF_{MWF})	MT CO_2e/yr (E_{MWF})
AG/ER	du	4,386	9,255.06	0.520000	4,812.63
Low Density Residential	du	3,300	3,224.13	0.520000	1,676.55
Medium Density Residential	du	612	597.49	0.520000	310.69
High Density Residential	du	0	0.00	0.520000	0.00
Park	Sq/ft	23,718,730	4.23	0.520000	2.20
Commercial	Sq/ft	1,154,865	1,128.27	0.520000	586.70
Mixed Use	Sq/ft	0	0.00	0.520000	0.00
Industrial	Sq/ft	2,785,974	2,721.80	0.520000	1,415.33
				Total (MT/yr)	**8,804.11**

B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{MWT})	gr/MT (C_6)	tons/yr (E_{MWT})
AG/ER	9,255.0568	0.1125	33	9.62	0.00510	1,000,000	0.000122
Low Density Residential	3,224.1337	0.1125	33	9.62	0.00510	1,000,000	0.000043
Medium Density Residential	597.4882	0.1125	33	9.62	0.00510	1,000,000	0.000008
High Density Residential	0.0000	0.1125	33	9.62	0.00510	1,000,000	0.000000
Park	4.2327	0.2250	33	9.62	0.00510	1,000,000	0.000000
Commercial	1,128.2690	0.2250	33	9.62	0.00510	1,000,000	0.000007
Mixed Use	0.0000	0.2250	33	9.62	0.00510	1,000,000	0.000000
Industrial	2,721.7967	0.2250	33	9.62	0.00510	1,000,000	0.000018
						Total (MT/yr)	**0.000198**

Sutter County
Input data for Green House Gas Emissions
1990
Inventory
Methane

B3c. Exhaust Emissions (Disposal Equipment)

Vehicle Type	# of equip	lbs/hr (EF_{MWD})	hrs/day (h)	days/yr (n)	lbs/MT (C_1)	MT/yr (E_{MWD})
Excavator	0	0.0164	9.00	313	2,205	0.00
Grader	0	0.0185	9.00	313	2,205	0.00
Off-Highway Tractor	0	0.0243	9.00	313	2,205	0.00
Off-Highway Truck	0	0.0260	9.00	313	2,205	0.00
Rubber Tired Dozer	0	0.0342	9.00	313	2,205	0.00
Disposal Facility run by City?					No	0.00
					Total (MT/yr)	**0.00**

B4. Wastewater

Land Use Type	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG (C_5)	MWh/yr (U_{eWW})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	MT/yr (E_{MWW})
AG/ER	25.29179	65	16.44	1.91	31.42	0.0067	2,205	0.000095
Low Density Residential	8.81094	82	7.22	1.91	13.81	0.0067	2,205	0.000042
Medium Density Residential	1.63275	82	1.34	1.91	2.56	0.0067	2,205	0.000008
High Density Residential	0.00000	82	0.00	1.91	0.00	0.0067	2,205	0.000000
Park	0.00219	71	0.00	1.91	0.00	0.0067	2,205	0.000000
Commercial	0.59435	71	0.42	1.91	0.81	0.0067	2,205	0.000002
Mixed Use	0.00000	71	0.00	1.91	0.00	0.0067	2,205	0.000000
Industrial	1.43383	80	1.15	1.91	2.19	0.0067	2,205	0.000007
							Total (MT/yr)	0.000154

C. See Methane Emissions from AG Formula Spreadsheet (entered into table below under commercial AG)

Sutter County
Input data for Green House Gas Emissions
1990
Inventory
Methane

D. Summary Table

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Direct	Construction equipment	0.00	0.00
	Motor vehicles & Aviation Fuel	65.2292	1369.8132
	Landscape equipment	0.0015	0.0315
	Cooling and heating	44.3498	931.3458
	Industrial		
Total direct, tons/yr		**109.58**	**2,301.19**
Indirect	Electricity	0.6015	12.6315
	Potable water	0.0004	0.0084
	Solid waste	8,804.1083	8,804.1123
	Wastewater	0.0002	0.0032
Total indirect, tons/yr		**8,804.71**	**8,816.76**
Total from Agriculture		**17,772.02**	**373,212.42**
Total, tons/yr		***26,686.31***	***384,330.37***
Global warming potential index		**21**	

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Residential	AG/ER	4,871.2985	6,045.92
	Low Density Residential	1,696.9878	2,106.18
	Medium Density Residential	314.4814	390.31
	High Density Residential	0.0000	0.00
	Total Residential	**6,882.77**	**8,542.42**
Commercial	Park	2.2347	2.91
	Commercial	595.7251	776.38
	Mixed Use	0.0000	0.00
	Total Commercial	**597.96**	**779.29**
Industrial	Industrial	1,433.4551	1,796.24
Total Industrial		**1,433.4551**	**1,796.24**
Total from Agriculture		**17,772.02**	**373,212.42**
Total, tons/yr		***26,686.20***	***384,330.36***
Global warming potential index		21	

Sutter County
Input data for Green House Gas Emissions
1990
Inventory
Nitrous Oxide

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Unit Type	gallons/yr (U_{AG})	gr/gallon (EF_{NHDV})	gr/MT (C_6)	MT/yr (E_{NCON})
Non cat heavy-duty truck	0.00	0.0260	1,000,000	**0.00000**

A2. Mobile Source (Motor Vehicles)

Unit Type	miles/yr (M)	gr/mile (EF_{NMV})	gr/MT (C_6)	MT/yr (E_{NMV})
Non Cat passenger Car	3,589,273	0.0197	1,000,000	0.07071
Cat passenger Car	174,977,035	0.0504	1,000,000	8.81884
Diesel Passenger Car	897,318	0.0012	1,000,000	0.00108
Non cat light-duty truck	3,595,179	0.0218	1,000,000	0.07837
Cat light duty truck	74,972,634	0.0639	1,000,000	4.79075
Diesel Light duty Truck	9,119,478	0.0017	1,000,000	0.01550
Non Cat light-duty truck 2	1,790,093	0.0218	1,000,000	0.03902
Cat light duty truck 2	87,267,028	0.0639	1,000,000	5.57636
Diesel Light duty truck 2	447,523	0.0017	1,000,000	0.00076
Non Cat Medium duty Truck	464,788	0.0473	1,000,000	0.02198
Cat med duty truck	41,323,885	0.1317	1,000,000	5.44236
Diesel Med duty truck	464,788	0.0048	1,000,000	0.00223
Non Cat lite-heavy duty truck	0	0.0473	1,000,000	0.00000
Cat Light-heavy duty truck	7,269,413	0.1317	1,000,000	0.95738
Diesel Lite-heavy duty truck	4,089,045	0.0048	1,000,000	0.01963
Non Cat lite-heavy duty truck 2	0	0.0473	1,000,000	0.00000
Cat Light-heavy duty truck 2	1,815,536	0.1317	1,000,000	0.23911
Diesel Lite-heavy duty truck 2	2,273,509	0.0048	1,000,000	0.01091
Non Cat med-heavy duty truck	456,610	0.0473	1,000,000	0.02160
Cat med-heavy duty truck	1,363,015	0.1317	1,000,000	0.17951
Diesel med-heavy duty truck	4,995,450	0.0048	1,000,000	0.02398
Non cat Heavy Duty truck	0	0.0473	1,000,000	0.00000
Cat heavy duty truck	457,519	0.1317	1,000,000	0.06026
Diesel heavy duty truck	8,174,909	0.0048	1,000,000	0.03924
Non Cat Other Bus	0	0.0473	1,000,000	0.00000
Cat other bus	0	0.1317	1,000,000	0.00000
Diesel Other Bus	454,338	0.0048	1,000,000	0.00218
Non Cat Urban Bus	0	0.0473	1,000,000	0.00000
Cat Urban Bus	0	0.1317	1,000,000	0.00000
Diesel Urban Bus	0	0.0048	1,000,000	0.00000
Non cat motorcycle	12,721,472	0.0069	1,000,000	0.08778
Cat motorcycle	5,452,060	0.0069	1,000,000	0.03762
Diesel Motorcycle	0	0	1,000,000	0.00000
Non Cat School Bus	0	0.0473	1,000,000	0.00000
Cat School Bus	0	0.1317	1,000,000	0.00000
Diesel School Bus	454,338	0.0048	1,000,000	0.00218
Non Cat Motor home	452,521	0.0473	1,000,000	0.02140
Cat Motor home	4,089,045	0.1317	1,000,000	0.53853
Diesel Motor home	910,494	0.0048	1,000,000	0.00437
			Total (MT/yr)	**27.10**

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Emissions from Aviation Fuel

Gasoline gallons/ year (U_{Aaf})	gr/gallon (EF_{Naf})	gr/lbs (C_6)	MT/yr (E_{Nls})
15,512.50	0.11000	1000000	**0.001706**

A3. Mobile Source (Landscape Equipment)

Gasoline gallons/ year	gr/gallon (EF_{Nls})	gr/lbs (C_6)	MT/yr (E_{Nls})
2,993.40	0.22000	1000000	**0.000659**

A4. Wood burning Hearth

MMBtu	kg/MMBtu (EF_{Mwood})	kg/MT (C_3)	MT/yr (E_{Mls})
127,835.18	0.00420	1000	**0.536908**

A5. Stationary Source (Cooling and Heating)

Land Use Type	Unit Type	Units	MMBTUs/yr (U_{Ang})	kg/MMBTU (EF_{Nng})	kg/MT (C_3)	MT/yr (E_{Nng})
AG/ER	du	4,386	161,670.35	0.0001	1,000	0.016167
Low Density Residential	du	3,300	56,321.36	0.0001	1,000	0.005632
Medium Density Residential	du	612	10,436.90	0.0001	1,000	0.001044
High Density Residential	du	0	0.00	0.0001	1,000	0.000000
Park	Sq/ft	23718729.69	1,396.03	0.0001	1,000	0.000140
Commercial	Sq/ft	1154864.75	378,387.76	0.0001	1,000	0.037839
Mixed Use	Sq/ft	0.00	0.00	0.0001	1,000	0.000000
Industrial	Sq/ft	2785973.60	912,833.16	0.0001	1,000	0.091283
					Total (MT/yr)	**0.152105**

B. Indirect Sources
B1. Electricity

Land Use Type	Unit Type	Units	kWh/yr	MWh/yr (U_{Ae})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{Nele})
AG/ER	du	4385.79	59,267,391	59,267	0.0037	2,205	0.09947
Low Density Residential	du	3300.17	20,647,076	20,647	0.0037	2,205	0.03465
Medium Density Residential	du	611.61	3,826,107	3,826	0.0037	2,205	0.00642
High Density Residential	du	0.00	0	0	0.0037	2,205	0.00000
Park	Sq/ft	23718729.69	123,301	123	0.0037	2,205	0.00021
Commercial	Sq/ft	1154864.75	33,420,179	33,420	0.0037	2,205	0.05609
Mixed Use	Sq/ft	0.00	0	0	0.0037	2,205	0.00000
Industrial	Sq/ft	2785973.60	80,623,769	80,624	0.0037	2,205	0.13531
						Total (MT/yr)	**0.33215**

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B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWH/yr (U_{epot})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{Npot})
AG/ER	du	4385.79	25.2917905	3.50	88.52	0.0037	2,205	0.000
Low Density Residential	du	3300.17	8.8109415	3.50	30.84	0.0037	2,205	0.000
Medium Density Residential	du	611.61	1.6327544	3.50	5.71	0.0037	2,205	0.000
High Density Residential	du	0.00	0.0000000	3.50	0.00	0.0037	2,205	0.000
Park	Sq/ft	23718729.69	0.0021928	3.50	0.01	0.0037	2,205	0.000
Commercial	Sq/ft	1154864.75	0.5943535	3.50	2.08	0.0037	2,205	0.000
Mixed Use	Sq/ft	0.00	0.0000000	3.50	0.00	0.0037	2,205	0.000
Industrial	Sq/ft	2785973.60	1.4338348	3.50	5.02	0.0037	2,205	0.000
							Total (MT/yr)	**0.000**

B3. Solid Waste

B3a. Fugitive Emissions No Fugitive Nitrous Oxide Emissions

B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{NWT})	gr/MT (C_6)	MT/yr (E_{NWT})
AG/ER	9,255.06	0.1125	33	9.62	0.0048	1,000,000	0.000115
Low Density Residential	3,224.13	0.1125	33	9.62	0.0048	1,000,000	0.000040
Medium Density Residential	597.49	0.1125	33	9.62	0.0048	1,000,000	0.000007
High Density Residential	0.00	0.1125	33	9.62	0.0048	1,000,000	0.000000
Park	4.23	0.2250	33	9.62	0.0048	1,000,000	0.000000
Commercial	1,128.27	0.2250	33	9.62	0.0048	1,000,000	0.000007
Mixed Use	0.00	0.2250	33	9.62	0.0048	1,000,000	0.000000
Industrial	2,721.80	0.2250	33	9.62	0.0048	1,000,000	0.000017
						Total (MT/yr)	**0.000187**

B3c. Exhaust Emissions (Disposal Equipment)

Vehicle Type	# of equip.	lbs/hr (EF_{NWD})	hrs/day (h)	days/yr (n)	lbs/MT (C_1)	tons/yr (E_{NWD})
Excavator	0	0.0074	9.00	313	2,205	0.00
Grader	0	0.0083	9.00	313	2,205	0.00
Off-Highway Tractor	0	0.0109	9.00	313	2,205	0.00
Off-Highway Truck	0	0.0117	9.00	313	2,205	0.00
Rubber Tired Dozer	0	0.0153	9.00	313	2,205	0.00
Disposal Facility run by City?					No	0.00
					Total, tons/yr	**0.00**

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B4. Wastewater

Land Use Type	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG (C_5)	MWh/yr (U_{eWW})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{NWW})
AG/ER	25.29	65	16.44	1.91	31.4162	0.0037	2204.62	0.0000527
Low Density Residential	8.81	82	7.22	1.91	13.8069	0.0037	2204.62	0.0000232
Medium Density Residential	1.63	82	1.34	1.91	2.5586	0.0037	2204.62	0.0000043
High Density Residential	0.00	82	0.00	1.91	0.0000	0.0037	2204.62	0.0000000
Park	0.00	71	0.00	1.91	0.0030	0.0037	2204.62	0.0000000
Commercial	0.59	71	0.42	1.91	0.8064	0.0037	2204.62	0.0000014
Mixed Use	0.00	71	0.00	1.91	0.0000	0.0037	2204.62	0.0000000
Industrial	1.43	80	1.15	1.91	2.1920	0.0037	2204.62	0.0000037
							Total (MT/yr)	**0.0000852**

C. See Nitrous Emissions from AG Formula Spreadsheet (entered into table below under commercial AG)
D. Summary Table

Source Type		Emissions, tons/yr	CO_2e metric tons/yr
Direct	Construction equipment	0.00000	0.00
	Motor vehicles + aviation fuel	27.1017	8,401.53
	Landscape equipment	0.0007	0.20
	Cooling and heating	0.6890	213.59
Total direct, tons/yr		**27.7914**	**8,615.33**
Indirect	Electricity	0.3321	102.97
	Potable water	0.0002	0.07
	Solid waste	0.0002	0.06
	Wastewater	0.0001	0.03
Total indirect, tons/yr		**0.3326**	**103.12**
Total From Agriculture		**1,880.98**	**583,102.45**
Total, tons/yr		***1,909.10***	***591,820.89***
Global warming potential index		**310**	

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Residential	AG/ER	15.2238	4,719.60
	Low Density Residential	5.3034	1,644.14
	Medium Density Residential	0.9828	304.69
	High Density Residential	0.0000	0.00
	Total Residential	**21.5100**	**6,668.44**
Commercial	Park	0.0073	2.25
	Commercial	1.9357	600.10
	Mixed Use	0.0000	0.00
	Total Commercial	**1.9430**	**602.35**
Industrial	Industrial	4.6696	1,447.66
	Total Industrial	**4.6696**	**1,447.66**
Total from Agriculture		**1,880.98**	**583,102.45**
Total, tons/yr		**1,909.10**	**591,820.89**
Global warming potential index		310	

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CM. Methane

CM1. Enteric Fermentation

Source	Number - Head/year (U_{Aani})	Emission Factor kg CH_4/head (EF_{MEF})	Conversion factor kg to MT (C_3)	MT CH_4/year (E_{MEF})
Dairy Cow				
Dairy Cows	31,625.00	138.39	1000.0	4,376.67
Others				
Sheep	23,965.00	8.00	1000.0	191.72
Goats	94,177.50	5.00	1000.0	470.89
Swine	8,591.00	1.50	1000.0	12.89
			Total	**5,052.16**

CM2. Manure Management

Source	Number - 1000s Head/year (U_{Aani})	Typical Animal Mass kg/head (TAM)	Volatile Solids Produced kgVS/1000kg/year (VS)	Max CH_4 capacity m^3CH_4/kgVS (B_O)	Extent Capacity Realized (MCF)	Density of Methane (C_8)	MT CH_4/year (E_{MMM})
Dairy Cow							
Dairy Cows	31.625	604.0	3722.3	0.24	0.488	0.678	5,646.70
Market 120-179 lbs	8.591	67.8	1971.0	0.48	0.471	0.678	175.9764243
Poultry							
Layers							
Hens > 1 yr	215.63	1.8	3942.0	0.39	0.088	0.678	35.51676336
Turkeys	94.1775	6.8	3540.5	0.36	0.015	0.678	8.301262033
Other							
Sheep on Feed	23.965	27.0	3361.7	0.36	0.012	0.678	6.370993072
Goats	94.1775	64.0	3478.5	0.17	0.012	0.678	28.99831466
						Total	**5,901.86**

CM3. Rice Cultivation

Season	Acres (U_{AC})	Conversion hectares/acre (C_{11})	Emission Factor (EF_{PS})	Conversion kg/MT (C_3)	MT/year (E_{MRC})
Primary	74,356	0.40	210	1,000	6,319.21
Rattoon	0	0.40	780	1,000	0.00
				Total	**6,319.21**

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CM4. Agricultural Residue Burning

Source	Production - Tons (U_C)	Residue/Crop Ratio (R_{RC})	Fraction Burned (F_{RB})	Fraction Dry (F_{DM})	Burning Efficiency (BE)	Combust. Efficiency (CE)	Carbon Content (CC)	Ratio CH_4-C (R_{CH4-C})	CH_4- to Mol.Wt. (C_{11})	Emissions Tons/year (E_{MARB})
Hay (inc Alfalfa)	36,604.91	0	0.000	0.85	0	0.00	0.00	0.005	1.33	0.00
Barley	5,405.92	1.2	0.030	0.93	0.93	0.88	0.45	0.005	1.33	0.44
Dry Edible Beans	14,493.77	2.1	0.000	0.87	0	0.00	0.00	0.005	1.33	0.00
Corn	63,502.95	1	0.030	0.91	0.93	0.88	0.45	0.005	1.33	4.23
Corn for Grain	7,164.95	1	0.000	0.91	0	0.00	0.00	0.005	1.33	0.00
Oats	1,967.57	1.3	0.000	0.92	0	0.00	0.00	0.005	1.33	0.00
Rice	247,876.59	1.4	0.750	0.91	0.93	0.88	0.38	0.005	1.33	490.59
Sorghum	1,818.91	1.4	0.000	0.91	0	0.00	0.00	0.005	1.33	0.00
All Wheat	40,354.35	1.3	0.030	0.93	0.93	0.88	0.44	0.005	1.33	3.53
Sugar Beet	119,376.47	0	0.000	0.00	0	0.00	0.00	0.005	1.33	0.00
Vegetable Crops & Fruit Trees	645,563.72	0	0.030	0.87	0.93	0.88	0.45	0.005	1.33	0.00
Safflower & Sunflower	10,915.85	2.1	0.000	0.00	0	0.00	0.00	0.005	1.33	0.00
									Total	**498.79**

CN. Nitrous Oxide

CN1. Manure Management

Source	Total Nitrogen Excreted (N_T)	Manure Anaerobic Lagoons ($\%_{AL}$)	Manure Liquid/Slurry ($\%_S$)	Manure Deep Pit ($\%_{DP}$)	Emission Factor for Liquid System (EF_{NML})	N_2O Emissions from Liquid System Mgt.	Manure Solid Storage/ Managed ($\%_{SS}$)	Manure Deep Pit / DryLot ($\%_{DP}$)	Manure Pasture / Poultry ($\%_P$)	Emission Factor for Solid System (EF_{NMS})	N_2O from solid system Mgt.	Total N_2O MT/yr (E_{NMM})
Dairy Cow												
Dairy Cows	3,067,701	1,665,142	691,130	*N/A*	0.001	*3,702.71*	278,706	14,445	*N/A*	0.02	*9,213.34*	12.92
Beef Cow												
Swine												
Market 120-179 lbs	89,293	41,750	7,132	12,277	0.001	*96.11*	2,980	*N/A*	*N/A*	0.02	*93.66*	0.19
Poultry												
Layers												
Hens > 1 yr	117,585	8,231	3,528	*N/A*	0.001	*18.48*	52,913	*N/A*	52,913	0.02	*3,325.98*	3.34
Turkeys	172,974	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	160,866	0.02	*5,055.78*	5.06
Other												
Sheep on Feed	99,194	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	97,453	*N/A*	*N/A*	0.02	*3,062.82*	3.06
											Total	**24.57**

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CN2. Emissions from Animals and Runoff

Indirect emissions from animals

Source	Total Nitrogen Excreted (N_T)	% of Indirect Volitazition ($\%_{VI}$)	conversion from NH_3 to NO_X ($EF_{NH3-NOX}$)	Conversion factor for kg to MT (C_3)	Tons/year (E_{NIA})
Dairy Cow					
Dairy Cows	3,067,701	0.20	0.01	1,000	9.64
Swine					
Market 120-179 lbs	89,293	0.20	0.01	1,000	0.28
Poultry					
Hens > 1 yr	117,585	0.20	0.01	1,000	0.37
Turkeys	172,974	0.20	0.01	1,000	0.54
Other					
Sheep on Feed	99,194	0.20	0.01	1,000	0.31
Goats	989,994	0.20	0.01	1,000	3.11
				Total	**14.26**

Direct emissions from animals

Source	Unmanaged Nitrogen (N_{UM})	Emission Factor for Pastures, Ranges and Paddocks (EF_{PRP})	Conversion factor for kg to MT (C_3)	Manure for Pasture, Range and Paddock (M_{PRP})	Managed Nitrogen (N_M)	Unmanaged Daily Spread (N_{DS})	% of Indirect Volit. ($\%_{VI}$)	Emission Factor for ground App. (EF_{NV})	Manure applied to Soils (M_{AS})	MT/year (E_{NDA})
Dairy Cow										
Dairy Cows	57,904.64	0.02	1,000	1.158	2,649,424	360,373	0.20	0.0125	30.098	50.937
Swine										
Market 120-179 lbs	11,173.60	0.02	1,000	0.223	78,119	*N/A*	0.20	0.0125	0.781	1.930
Poultry										
Hens > 1 yr	*N/A*	0.02	1,000	*0.000*	117,585	*N/A*	0.20	0.0125	1.176	1.848
Turkeys	12,108.18	0.02	1,000	0.242	160,866	*N/A*	0.20	0.0125	1.609	3.289
Other										
Sheep on Feed	97,453.29	0.02	1,000	1.949	1,740	*N/A*	0.20	0.0125	0.017	6.153
Goats	989,993.88	0.02	1,000	19.800	*N/A*	*N/A*	0.20	0.0125	*0.000*	62.228
									Total	**126.384**

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Emissions from Leaching

Source	Unvolatized Synthetic Nitrogen (N_{UVS})	Unvolatized Non-Manure Organic Nitrogen (N_{UVO})	Conversion factor for kg to MT (C_3)	Leaching % of Soil ($\%_{Leach}$)	Leaching Factor - kg N2O-N / kg N (F_{Leach})	Molecular Weight Ratio $N_2O:N_2$ (C_{10})	Total Leaching from non-manure Fertilizer (L_{fert})	Total Nitrogen Excreted (N_T)	% of Volitazation from Manure ($\%_{VM}$)	Total Leaching from Manure (L_{man})	Total from Leaching MT/yr (E_{NL})
Total emissions of N_2O from Leaching	12,407,050	2789.83	1,000	0.3000	0.025	1.57	146.26	4,536,740	0.00	53.47	**199.73**

CN3: Nitrous Oxide from Crop Growth:

Source	Crop Production MTs	Conversion factor for kg to tons (C_3)	Residue/Crop Ratio (R_{RC})	Fraction Dry (F_{DM})	Nitrogen Content of biomass	Nitrogen Fixed by Crops (FN)	Fraction of Residue Applied (F_{RA})	Nitrogen Content of Residue (N_{CR})	Nitrogen Returned to Soil (N_{RS})
Hay (inc Alfalfa)	36,604.91	1,000	0.0	0.8500	0.03	933,425	0.00	*N/A*	*0*
Barley	5,405.92	1,000	1.2	0.9300	*N/A*	*0.00*	0.90	0.01	41,809
Dry Edible Beans	14,493.77	1,000	2.1	0.8700	0.03	1,172,691	1.60	0.02	711,786
Corn	63,502.95	1,000	1.0	0.9100	*N/A*	*0.00*	0.90	0.01	301,652
Corn for Grain	7,164.95	1,000	1.0	0.9100	*N/A*	*0.00*	0.90	0.01	34,035
Oats	1,967.57	1,000	1.3	0.9200	*N/A*	*0.00*	0.90	0.01	14,825
Rice	247,876.59	1,000	1.4	0.9100	*N/A*	*0.00*	1.00	0.01	2,273,722
Sorghum	1,818.91	1,000	1.4	0.9100	*N/A*	*0.00*	0.90	0.01	22,524
All Wheat	40,354.35	1,000	1.3	0.9300	*N/A*	*0.00*	0.90	0.01	272,239
Sugar Beet	119,376.47	1,000	0.0	0.0000	0.03	0.00	0.00	0.00	0
Vegetable Crops & Fruit Trees	645,563.72	1,000	0.0	0.0000	0.03	0.00	0.00	0.00	0
Safflower & Sunflower	10,915.85	1,000	2.1	0.8700	0.03	883,201	0.90	0.02	412,825
Total						2,989,317			4,085,417

Source	Crop Production (Hectares)	Nitrogen Fixed by Crops (FN_T)	Nitrogen Returned to Soil (N_{RST})	Conversion factor for kg to tons (C_3)	factor for soils (kg N2O-N/kgN) (EF_{DIR})	Molecular Weight Ratio $N_2O:N_2$ (C_{10})	Emission factor kg N_2O-N / ha_yr	Emissions in MT (N_{CG})
N2O emissions from Legumes	-	2,989,317	-	1,000	0.0100	1.57	-	46.97
N2O emissions from Residues	-	-	4,085,417	1,000	0.0100	1.57	-	64.20
N_2O from Histols (Temperate Zone)	93,268.31	-	-	1,000	-	1.57	8	1,172.52
							Total	**1,283.69**

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CN4. Emissions from Fertilizers

Source	Target Year Total Fertilizer Use (kg N)	Following Year Total Fertilizer Use (kg N)	Total N in Fertilizers (Calendar Year)	Unvol. N (kg) (NUV)	Volatized N (kg) (NV)	Direct N_2O Emissions (metric tons)	N_2O Emissions (metric tons)	Total Emissions from Fertilizers
Synthetic	14,235,595	12,949,928	13,785,611	12,407,050	1,378,561	195.01	21.67	**216.69**
Organic	84,053	89,459	85,945	2,790	697.46			
Dried Manure	924	824	889					
Activated Sewage Sludge	72,148	72,826	72,385					
Other	10,981	15,808	12,671					
Dried Manure %	1.10%	0.92%	1.03%					
Non-Manure Organics	83,129	88,635	85,056					

CN5. Emissions on N_2O from agricultural residue burning

Source	Production - MTTons (U_C)	Residue/Crop Ratio (R_{RC})	Fraction Burned (F_{RB})	Fraction Dry (F_{DM})	Burning Efficiency (BE)	Combust. Efficiency (CE)	Nitrogen Content (NC)	Ratio N2O-N (R_{N2O-N})	Conv. to Mol.Wt. (C_{10})	Emissions MT/year (E_{NARB})
Hay (inc Alfalfa)	36,604.91	0.0000	0.000	0.85	0.000	0.00	*N/A*	0.007	1.57	*0.00*
Barley	5,405.92	1.2000	0.030	0.93	0.930	0.88	0.008	0.007	1.57	0.01
Dry Edible Beans	14,493.77	2.1000	0.000	0.87	0.000	0.00	0.017	0.007	1.57	0.00
Corn	63,502.95	1.0000	0.030	0.91	0.930	0.88	0.006	0.007	1.57	0.09
Corn for Grain	7,164.95	1.0000	0.000	0.91	0.000	0.00	0.006	0.007	1.57	0.00
Oats	1,967.57	1.3000	0.000	0.92	0.000	0.00	0.007	0.007	1.57	0.00
Rice	247,876.59	1.4000	0.750	0.91	0.930	0.88	0.007	0.007	1.57	15.35
Sorghum	1,818.91	1.4000	0.000	0.91	0.000	0.00	0.011	0.007	1.57	0.00
All Wheat	40,354.35	1.3000	0.030	0.93	0.930	0.88	0.006	0.007	1.57	0.08
Sugar Beet	119,376.47	0.0000	0.000	0.00	0.000	0.00	0.000	0.007	1.57	0.00
Vegetable Crops & Fruit Trees	645,563.72	0.0000	0.000	0.00	0.000	0.00	0.000	0.007	1.57	0.00
Safflower & Sunflower	10,915.85	2.1000	0.030	0.87	0.930	0.88	0.023	0.007	1.57	0.12
									Total	**15.66**

Sutter County
Input data for Green House Gas Emissions
1990
Inventory
Agricultural Emissions

D. Summary Table

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Methane	Enteric Fermentation	5,052.16	106,095.45
	Manure Management	5,901.86	123,939.07
	Rice Cultivation	6,319.21	132,703.34
	Agricultural Residue Burning	498.79	10,474.55
Total Methane		17,772.02	**373,212.42**
Nitrous Oxide	Manure Management	24.57	7,616.35
	Animals and Runoff	340.37	105,514.77
	Crop Growth	1,283.69	397,944.00
	Fertilizer Use	216.69	67,172.61
	Agricultural Residue Burning	15.66	4,854.71
Total Nitrous Oxide		1,880.98	**583,102.45**
	Total emissions from Agriculture		**956,314.87**

Appendix D:2008 URBEMIS Output and GHG Calculations

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Area Source Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2009 - Existing 04-14-2010.urb924

Project Name: Sutter County 2009 Existing

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	CO2
Natural Gas	
Hearth - No Summer Emissions	
Landscape	379.60
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, unmitigated)	379.60

Area Source Changes to Defaults

Percentage of residences with natural gas fireplaces changed from 55% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Winter Area Source Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2009 - Existing 04-14-2010.urb924

Project Name: Sutter County 2009 Existing

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Winter Pounds Per Day, Unmitigated)

Source	CO2
Natural Gas	
Hearth	262,902.94
Landscaping - No Winter Emissions	
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, unmitigated)	262,902.94

Area Source Changes to Defaults

Percentage of residences with natural gas fireplaces changed from 55% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Area Source Unmitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2009 - Existing 04-14-2010.urb924

Project Name: Sutter County 2009 Existing

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	CO2
Natural Gas	
Hearth	10,779.02
Landscape	34.16
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, unmitigated)	10,813.18

Area Source Changes to Defaults

Percentage of residences with natural gas fireplaces changed from 55% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2009 - Existing 04-14-2010.urb924

Project Name: Sutter County 2009 Existing

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	CO2
Single family housing	420,605.71
Apartments low rise	304,568.02
Apartments mid rise	54,101.44
City park	75.46
General office building	396,974.89
General light industry	199,071.36
TOTALS (lbs/day, unmitigated)	1,375,396.88

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2009 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	1,700.00	7.16	dwelling units	5,100.00	36,516.00	402,990.57
Apartments low rise	230.81	7.16	dwelling units	3,693.00	26,441.88	291,812.58
Apartments mid rise	17.26	7.16	dwelling units	656.00	4,696.96	51,835.65
City park		0.01	acres	641.00	6.41	72.98
General office building		24.88	1000 sq ft	1,359.52	33,824.86	382,051.75
General light industry		5.18	1000 sq ft	3,279.68	16,988.74	191,123.34
					118,474.85	1,319,886.87

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.5	2.0	97.5	0.5
Light Truck < 3750 lbs	19.3	4.1	85.5	10.4
Light Truck 3751-5750 lbs	19.7	2.0	97.5	0.5
Med Truck 5751-8500 lbs	9.3	1.1	97.8	1.1
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	64.0	36.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	44.4	55.6
Med-Heavy Truck 14,001-33,000 lbs	1.5	6.7	20.0	73.3
Heavy-Heavy Truck 33,001-60,000 lbs	1.9	0.0	5.3	94.7
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	70.0	30.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	8.3	75.0	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	11.0	11.2	11.0	11.2	11.2	11.4
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 16.8 miles to 11 miles

Home-based shop rural trip length changed from 7.1 miles to 11.2 miles

Home-based other rural trip length changed from 7.9 miles to 11 miles

Commercial-based commute rural trip length changed from 14.7 miles to 11.2 miles

Commercial-based non-work rural trip length changed from 6.6 miles to 11.2 miles

Operational Changes to Defaults

Commercial-based customer rural trip length changed from 6.6 miles to 11.4 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Winter Operational Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2009 - Existing 04-14-2010.urb924

Project Name: Sutter County 2009 Existing

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Winter Pounds Per Day, Unmitigated)

Source	CO2
Single family housing	371,823.35
Apartments low rise	269,243.85
Apartments mid rise	47,826.69
City park	66.63
General office building	350,727.19
General light industry	175,935.71
TOTALS (lbs/day, unmitigated)	1,215,623.42

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2009 Temperature (F): 40 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	1,700.00	7.16	dwelling units	5,100.00	36,516.00	402,990.57
Apartments low rise	230.81	7.16	dwelling units	3,693.00	26,441.88	291,812.58
Apartments mid rise	17.26	7.16	dwelling units	656.00	4,696.96	51,835.65
City park		0.01	acres	641.00	6.41	72.98
General office building		24.88	1000 sq ft	1,359.52	33,824.86	382,051.75
General light industry		5.18	1000 sq ft	3,279.68	16,988.74	191,123.34
					118,474.85	1,319,886.87

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.5	2.0	97.5	0.5
Light Truck < 3750 lbs	19.3	4.1	85.5	10.4
Light Truck 3751-5750 lbs	19.7	2.0	97.5	0.5
Med Truck 5751-8500 lbs	9.3	1.1	97.8	1.1
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	64.0	36.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	44.4	55.6
Med-Heavy Truck 14,001-33,000 lbs	1.5	6.7	20.0	73.3
Heavy-Heavy Truck 33,001-60,000 lbs	1.9	0.0	5.3	94.7
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	70.0	30.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	8.3	75.0	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	11.0	11.2	11.0	11.2	11.2	11.4
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 16.8 miles to 11 miles

Home-based shop rural trip length changed from 7.1 miles to 11.2 miles

Home-based other rural trip length changed from 7.9 miles to 11 miles

Commercial-based commute rural trip length changed from 14.7 miles to 11.2 miles

Commercial-based non-work rural trip length changed from 6.6 miles to 11.2 miles

Operational Changes to Defaults

Commercial-based customer rural trip length changed from 6.6 miles to 11.4 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2009 - Existing 04-14-2010.urb924

Project Name: Sutter County 2009 Existing

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	CO2
Single family housing	73,792.95
Apartments low rise	53,434.78
Apartments mid rise	9,491.80
City park	13.23
General office building	69,634.52
General light industry	34,923.10
TOTALS (tons/year, unmitigated)	241,290.38

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2009 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	1,700.00	7.16	dwelling units	5,100.00	36,516.00	402,990.57
Apartments low rise	230.81	7.16	dwelling units	3,693.00	26,441.88	291,812.58
Apartments mid rise	17.26	7.16	dwelling units	656.00	4,696.96	51,835.65
City park		0.01	acres	641.00	6.41	72.98
General office building		24.88	1000 sq ft	1,359.52	33,824.86	382,051.75
General light industry		5.18	1000 sq ft	3,279.68	16,988.74	191,123.34
					118,474.85	1,319,886.87

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.5	2.0	97.5	0.5
Light Truck < 3750 lbs	19.3	4.1	85.5	10.4
Light Truck 3751-5750 lbs	19.7	2.0	97.5	0.5
Med Truck 5751-8500 lbs	9.3	1.1	97.8	1.1
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	64.0	36.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	44.4	55.6
Med-Heavy Truck 14,001-33,000 lbs	1.5	6.7	20.0	73.3
Heavy-Heavy Truck 33,001-60,000 lbs	1.9	0.0	5.3	94.7
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	70.0	30.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	8.3	75.0	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	11.0	11.2	11.0	11.2	11.2	11.4
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 16.8 miles to 11 miles

Home-based shop rural trip length changed from 7.1 miles to 11.2 miles

Home-based other rural trip length changed from 7.9 miles to 11 miles

Commercial-based commute rural trip length changed from 14.7 miles to 11.2 miles

Commercial-based non-work rural trip length changed from 6.6 miles to 11.2 miles

Operational Changes to Defaults

Commercial-based customer rural trip length changed from 6.6 miles to 11.4 miles

Sutter County Base Year Climate Action Plan
Emissions by Source
2008
Inventory
By Source

Transportation		
Source:		**Metric tons of CO_2e**
1 On-Road Vehicles		254,455
2 Airport Operations		155
	Total	**254,610**

Energy		
Sources:		**Metric tons of CO_2e**
1 Electric		52,186
2 Natural Gas		106,441
	Total	**158,627**

Solid Waste		
Source		**Metric tons of CO_2e**
1 Solid Waste Disposal		2,750
2 Green Waste Recycling		Data Not Available
3 Materials Recycling		Data Not Available
	Total	**2,750**

Landscape Emissions		
Sources:		**Metric tons of CO_2e**
1 Landscape Emissions		32
2 Carbon sink from CO_2 sequestration		Data Not Available
	Total	**32**

Agriculture		
Sources:		**Metric tons of CO_2e**
1 Enteric Fermentation		24,248
2 Manure Management		29,780
3 Rice Cultivation		181,067
4 Agricultural Residue Burning		3,051
5 Crop Growth		386,054
6 Animals and Runoff		78,453
7 Fertilizer Use		102,351
	Total	**805,005**

Net Total Emissions		
Category		**Metric tons of CO_2e**
Energy		158,627
Solid Waste		2,750
Landscape Emissions		32
Agriculture		805,005
Transportation		254,610
	Total	**1,221,024**

Sutter County Base Year Climate Action Plan
Emissions by Land Use
2008
Inventory
By Land Use Category

Source Type		CO_2e MT/yr			
		CO_2	CH_4	N_2O	combined CO_2e
Residential	AG/RAN/ER	164,546	2,943	5,680	173,170
	Low Density Residential	61,120	1,093	2,110	64,323
	Medium Density Residential	11,326	203	389	11,917
	High Density Residential	0	0	0	0
	Total Residential	**236,992**	**4,239**	**8,179**	**249,410**
Commercial	Park	175	1	2	178
	Commercial	47,742	363	647	48,753
	Mixed Use	0	0	0	0
	Total Commercial	**47,917**	**365**	**650**	**48,931**
Industrial	Industrial	115,327	789	1,562	117,678
	Total Industrial	**115,327**	**789**	**1,562**	**117,678**
Agriculture		0	235,461	569,544	805,005
	Total	**400,236**	**240,854**	**579,935**	**1,221,024**

*For consistency with 2008 and 2020 inventories, High Density Residential and Mixed use categories are listed although there is no land designated as such for 1990.

Sutter County Base Year Climate Action Plan
Input data for Green House Gas Emissions
2008 Inventory

Land Use Type (units)	Total Trips	Total VMT	Total Trips	Total VMT	Unit Totals	Unit Type
AG/RAN/ER	47,706.12	526484.73	47706.12	526484.73	5163	du
Low Density Residential	35897.4	396163.7	35897.4	396163.7	3885	du
Medium Density Residential	6652.8	73420.3	6652.8	73420.3	720	du
High Density Residential	0	0	0	0	0	du
Park	6.41	72.98	6.41	72.98	27,921,960.00	Sq/ft
Commercial	30058.99	339516.27	30058.99	339516.27	1,359,520.00	Sq/ft
Mixed Use	0	0	0	0	0.00	Sq/ft
Industrial	11446.08	128768.43	11446.08	128768.43	3,279,680.00	Sq/ft
Total	**131,767.80**	**1,464,426.41**	**131767.8**	**1464426.41**		

Sutter County Base Year Climate Action Plan
Input data for Green House Gas Emissions
2008 Inventory

Land Use Type (units)	Natural gas usage rate (MMBTU/yr)	Kilowatt-hour/ year	Potable Water Usage (gallons/year)	Solid Waste (lbs/year)	% of Total square SFR/MFR/Non-Res
AG/RAN/ER	186,544	58,141,918	29,189,980	22,144,877	100.00%
Low Density Residential	69,289	21,595,856	10,842,137	8,225,502	84.37%
Medium Density Residential	12,840	4,001,962	2,009,173	1,524,554	15.64%
High Density Residential	0	0	0	0	0.00%
Park	1,642	145,060	2,580	8,366	0.11%
Commercial	445,071	39,319,236	699,264	2,324,875	29.27%
Mixed Use	0	0	0	0	0.00%
Industrial	1,073,666	94,851,579	1,686,866	5,609,021	70.62%
Total	**1,789,051**	**218,055,610**	**44,430,000**	**39,837,195**	

Sutter County Base Year Climate Action Plan
Input data for Green House Gas Emissions
2008 Inventory

City Parks

# of City Parks	Estimated SQ / "building"	Estimated Buildings per
10	500	1

Airports

# of planes	Gallons fuel per day	Annual days of operation	Annual Fuel Usage (g/yr)
77	50	365	18,250

Operational(*2a,b) / Area Scenario(*3a,b)	Vehicle			Natural Gas			Total Vehicle +
	Summer (lbs/day)	(lbs/day)	tons/Year	Summer	Winter	Year	
2008	1,526,584.72	1,349,314.62	267,817.78	0.00	0.00	0.00	267,817.78

Area Scenario(*3b,c)	Landscaping			Hearth		
	Summer	Winter	Year	Summer	Winter	Year
2008	384.11	0.00	34.57	0.00	271,778.59	11,142.92

Vehicle Type	Fleet %		Non-Catalyst		Catalyst		Diesel	
Light Auto	39.50	0.3950	2.00	0.0200	97.50	0.9750	0.50	0.0050
Light Truck <3,750 lbs	19.30	0.1930	4.10	0.0410	85.50	0.8550	10.40	0.1040
Light Truck 3,751-5,750 lbs	19.70	0.1970	2.00	0.0200	97.50	0.9750	0.50	0.0050
Med Truck 5,751-8,500 lbs	9.30	0.0930	1.10	0.0110	97.80	0.9780	1.10	0.0110
Lite-Heavy Truck 8,501-10,(	2.50	0.0250	0.00	0.0000	64.00	0.6400	36.00	0.3600
Lite-Heavy Truck 10,001-14	0.90	0.0090	0.00	0.0000	44.40	0.4440	55.60	0.5560
Med-Heavy Truck 14,001 - 1	1.50	0.0150	6.70	0.0670	20.00	0.2000	73.30	0.7330
Heavy-Heavy Truck 33,001-	1.90	0.0190	0.00	0.0000	5.30	0.0530	94.70	0.9470
Other bus	0.10	0.0010	0.00	0.0000	0.00	0.0000	100.00	1.0000
Urban bus	0.00	0.0000	0.00	0.0000	0.00	0.0000	100.00	1.0000
Motorcycle	4.00	0.0400	70.00	0.7000	30.00	0.3000	0.00	0.0000
School Bus	0.10	0.0010	0.00	0.0000	0.00	0.0000	100.00	1.0000
Motor Home	1.20	0.0120	8.30	0.0830	75.00	0.7500	16.70	0.1670
	100.00	1.00						

Disposal Facility	Have Jurisdiction?	No		Type of Facility:	Landfill w/ Flaring		year began:	?
Landfill	**Landfill Total Annual (tons)**	**City's % of Total**	**Daily Hours of Facility Operation**	**Hours attributed to City**	**Days per year of operation**	**% Waste delivered**	**Distance (one way)**	**Round Trip Distance (miles)**
Recology Landfill	19,918.60	1.00	9	9.00	325.00	100	4.81	9.62
		0.00	6	0.00		0		
		0.00		0.00		0		
		0.00		0.00		0		
		0.00		0.00		0		
				9.00	325.00	**Total**		**9.62**

Sutter County Base Year Climate Action Plan
Input data for Green House Gas Emissions
2008 Inventory

Electrical Usage (Provided by PG&E)

83,739,736	Total Residential Electrical Usage
134,315,874	Total Non-Residential Electrical Usage

Residential

37,634	County facilities located in Yuba City
214	County facilities located in Live Oak City
25,475	County facilities located in Unincorporated Sutter
83,676,413	Residential in Unincorporated Sutter County

Non-Residential

6,062,361	County facilities located in Yuba City
88,361	County facilities located in Live Oak City
793,010	County facilities located in Unincorporated Sutter
127,372,142	Commercial in Unincorporated Sutter County

Water Usage (Provided by Department of Water Resources)

42,041,290	42,041,290.32	Residential (gallons per year)
2,388,710	2,388,710	Commercial/Institutional/Industrial (gallons/year)

Solid Waste for Unincorporated Sutter County(Provided by CalRecycle and Yuba Sutter JPA - Reference #3 on Assumptions Page)

39,837,195	39,837,195	lbs/year

Natural Gas Data (Provided by PG&E)

268,672	Total Residential Natural gas usage rate (MMBTU/yr)
1,520,379	Total Non-Residential Natural gas usage rate (MMBTU/yr)

Residential Natural gas usage rate (MMBTU/yr)

MMBTU	Therms	
13	135	County facilities located in Yuba City
0	2	County facilities located in Live Oak City
0	0	County facilities located in Unincorporated Sutter
268,659	2687229	Residential in Unincorporated Sutter County

Commercial Natural gas usage rate (MMBTU/yr)

MMBTU	Therms	
14,853	148564	County facilities located in Yuba City
312	3116	County facilities located in Live Oak City
501	5014	County facilities located in Unincorporated Sutter
1,504,713	15050730	Commercial in Unincorporated Sutter County

Sutter County
Input data for Agriculture
2008

	Enteric Fermentation Emission Factor (EF_{MEF})	Typical Animal Mass - kg- (TAM)	Volatile Solids -kg VS/1000kg mass/day-	Max CH_4 Capacity - m^3CH_4/kg VS- (B_O)	K-Nitrogen - kg/day/1000kg animal mass- (K_N)	Number of Head
	EF used	EF used	EF used	EF used	EF used	
Dairy Cow						
Dairy Cows	123.4	604.0	9.0	0.2	0.4	8,293
Other						
Sheep on Feed	8.0	27.0	9.2	0.4	0.4	16,397

Sutter County
Input data for Agriculture
2008

	Residue/Crop Ratio (R_{RC})	Fraction Residue Burned (F_{RB})	Fraction Dry Matter (F_{DM})	Burning Efficiency (BE)	Combustion Efficiency (CE)	Carbon Content (CC)	Fraction of Residue Applied (F_{RA})	Nitrogen Content of Residue (NC)
	EF used	EF used	EF used	EF used	EF used	EF used	EF used	EF used
Hay (inc Alfalfa)	0.0	0.00	0.85	0.00	0.00	0.00	0.00	N/A
Barley	1.2	0.03	0.93	0.93	0.88	0.45	0.90	0.01
Dry Edible Beans	2.1	0.00	0.87	0.00	0.00	0.00	1.60	0.02
Corn	1.0	0.03	0.91	0.93	0.88	0.45	0.90	0.01
Corn for Grain	1.0	0.00	0.91	0.00	0.00	0.00	0.90	0.01
Oats	1.3	0.00	0.92	0.00	0.00	0.00	0.90	0.01
Rice	1.4	0.10	0.91	0.93	0.88	0.38	1.00	0.01
Sorghum	1.4	0.00	0.91	0.00	0.00	0.00	0.90	0.01
All Wheat	1.3	0.03	0.93	0.93	0.88	0.44	0.90	0.01
Potatoes (inc Sweet)	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cotton	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sugar Beet	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vegetable Crops & Fruit Trees	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Safflower & Sunflower	2.1	0.03	0.87	0.93	0.88	0.45	0.90	0.02

Sutter County
Input data for Agriculture
2008

		Growing Season Emission Factor		
Primary		**EF used**	**Entered**	**Default**
		210		210
Rattoon		780		780
		State	***Project***	***% of State*** ($\%_P$)
Total acres	2008	7,667,570	220,038.00	0.0286972
Total acres	2009	7,667,570	220,918.15	0.028812
Climate Zone	Temperate	Yes	Sub Tropic	No

	2008					2009				
	Primary (Acres Harvested)	**Annual Yield**	**Unit of Yield**	**Annual Yield (MT/yr)**	**State Acres Harvested**	**Primary (Acres Harvested)**	**Annual Yield**	**Unit of Yield**	**Annual Yield (MT/yr)**	**State Acres Harvested**
Hay (inc Alfalfa)	11,138	66,983	tons	60,766	1,610,000	11,183	67,251	tons	61,009	1,610,000
Barley			tons		60,000	0	0	tons		60,000
Dry Edible Beans	8,446	8,459	tons	7,674	51,900	8,480	8,493	tons	7,704	51,900
Corn			tons	0	495,000	0	0	tons	0	495,000
Corn for Grain	7,720	47,941	tons	43,491	170,000	7,751	48,133	tons	43,665	170,000
Oats	2,035	24,223	tons	21,975	25,000	2,043	24,320	tons	22,063	25,000
Rice	101,455	409,137	tons	371,163	517,000	101,861	410,774	tons	372,648	517,000
Sorghum	572	2,168	tons	1,967	9,000	574	2,177	tons	1,975	9,000
All Wheat	7,631	48,493	tons	43,992	545,000	7,662	48,687	tons	44,168	545,000
Potatoes (inc Sweet)			tons	0	53,200	0	0	tons	0	53,200
Cotton			bales		268,000	0	0	bales		268,000
Sugar Beet					25,300	0	0			25,300
Vegetable Crops & Fru	66,815	511,775	tons	464,274	3,734,170	67,082	513,822	tons	466,132	3,734,170
Safflower & Sunflower	14,226	12,673	tons	11,497	104,000	14,283	12,724	tons	11,543	104,000

Sutter County Base Year Climate Action Plan
Input data for Green House Gas Emissions
2008
Inventory
Carbon Dioxide

A. Direct Sources

A1-4. Mobile (Construction Equipment, Motor Vehicles, Landscape Equipment, and Wood Burning Hearth)

Con (MT/yr)	Motor Vehicles (MT/yr)	Landscape (MT/yr) (E_{Cls})	Wood Burning Hearth (MT/yr)	MT/yr
0.00	242,960.27	31.36	10,108.69	**253,100.32**
0.00	0.96	0.00		

Fuel emissions from Airports

Annual Fuel Usage (U_{AAF})	kg/gallon (EF_{CAF})	kg/MT (C_3)	MT/yr (E_{CAF})
18,250.00	8.32	1,000.00	**151.84**

A5. Stationary Sources (Natural Gas)

Unit Type	MMBTU/yr (U_{Ang})	kg/MMBTU (EF_{Cng})	kg/MT (C_3)	MT/yr (E_{Cng})
AG/RAN/ER	186,543.79	53.07	1,000.00	9,899.88
Low Density Residential	69,288.61	53.07	1,000.00	3,677.15
Medium Density Residential	12,839.98	53.07	1,000.00	681.42
High Density Residential	0.00	53.07	1,000.00	0.00
Park	1,641.99	53.07	1,000.00	87.14
Commercial	445,071.28	53.07	1,000.00	23,619.93
Mixed Use	0.00	53.07	1,000.00	0.00
Industrial	1,073,665.67	53.07	1,000.00	56,979.44
			Total (MT/year)	**94,944.95**

B. Indirect Sources

B1. Electricity

Unit Type	kWh/yr	Unit	Unit type	MWh/yr (U_{Ae})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{Cele})
AG/RAN/ER	58141917.52	5,163	du	58,141.92	524.00	2,204.62	13,819.33
Low Density Residential	21595856.47	3,885	du	21,595.86	524.00	2,204.62	5,132.96
Medium Density Residential	4001962.003	720	du	4,001.96	524.00	2,204.62	951.20
High Density Residential	0	0	du	0.00	524.00	2,204.62	0.00
Park	145059.6934	27,921,960	Sq/ft	145.06	524.00	2,204.62	34.48
Commercial	39319235.78	1,359,520	Sq/ft	39,319.24	524.00	2,204.62	9,345.50
Mixed Use	0	0	Sq/ft	0.00	524.00	2,204.62	0.00
Industrial	94851578.58	3,279,680	Sq/ft	94,851.58	524.00	2,204.62	22,544.58
						Total (MT/year)	**51,828.05**

Sutter County Base Year Climate Action Plan
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Inventory
Carbon Dioxide

B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWh/yr (U_{epot})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{Cpot})
AG/RAN/ER	du	5163.00	29.1900	3.50	102.17	524.00	2,204.62	24.28
Low Density Residential	du	3885.00	10.8421	3.50	37.95	524.00	2,204.62	9.02
Medium Density Residential	du	720.00	2.0092	0.01	0.02	804.54	2,000	0.01
High Density Residential	du	0.00	0.0000	0.01	0.00	804.54	2,000	0.00
Park	Sq/ft	27921960.00	0.0026	3.50	0.01	524.00	2,204.62	0.00
Commercial	Sq/ft	1359520.00	0.6993	3.50	2.45	524.00	2,204.62	0.58
Mixed Use	Sq/ft	0.00	0.0000	3.50	0.00	524.00	2,204.62	0.00
Industrial	Sq/ft	3279680.00	1.6869	3.50	5.90	524.00	2,204.62	1.40
							Total (MT/year)	**35.29**

B3. Solid Waste

B3a. Anthropogenic Carbon

CO_2 emissions are considered anthropogenic and are not counted in this inventory.

Source: EPA Solid Waste Management and Greenhouse Gases; A life-cycle assessment of emissions and Sinks, 3rd edition, September 2006.

B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{CWT})	g/MT (C_6)	tons/yr (E_{CWT})
AG/RAN/ER	11,072.44	0.1125	33	9.62	3,464.164	1,000,000	99.39
Low Density Residential	4,112.75	0.1125	33	9.62	3,464.164	1,000,000	36.92
Medium Density Residential	762.28	0.1125	33	9.62	3,464.164	1,000,000	6.84
High Density Residential	0.00	0.1125	33	9.62	3,464.164	1,000,000	0.00
Park	4.18	0.2250	33	9.62	3,464.164	1,000,000	0.02
Commercial	1,162.44	0.2250	33	9.62	3,464.164	1,000,000	5.22
Mixed Use	0.00	0.2250	33	9.62	3,464.164	1,000,000	0.00
Industrial	2,804.51	0.2250	33	9.62	3,464.164	1,000,000	12.59
						Total (MT/year)	**160.98**

B4. Wastewater

Unit Type	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG	MWh/yr (U_{eWW})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{CWW})
AG/RAN/ER	29.1900	0.65	18.9735	1.911	36.25836	524.00	2,205	8.62
Low Density Residential	10.8421	0.82	8.890522	1.911	16.98979	524.00	2,205	4.04
Medium Density Residential	2.0092	0.82	1.647544	1.911	3.148457	524.00	2,205	0.75
High Density Residential	0.0000	0.82	0	1.911	0	524.00	2,205	0.00
Park	0.0026	0.71	0.001846	1.911	0.003528	524.00	2,205	0.00
Commercial	0.6993	0.71	0.496503	1.911	0.948817	524.00	2,205	0.23
Mixed Use	0.0000	0.71	0	1.911	0	524.00	2,205	0.00
Industrial	1.6869	0.8	1.34952	1.911	2.578933	524.00	2,205	0.61
							Total (MT/year)	14.24

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Carbon Dioxide

C. Reserved for AG emissions for CH_4 and N_2O, not applicable for CO_2.

D. Summary Table

Source Type		Emissions, MT /yr	CO_2E metric tons/yr
Direct	Motor vehicles & Aircraft	243112.11	243,112.11
	Landscape equipment	31.36	31.36
	Cooling and heating	105053.64	105,053.64
	Total direct, tons/yr	**348197.12**	**348197.12**
Indirect	Electricity	51828.05	51,828.05
	Potable water	35.29	35.29
	Solid waste	160.98	160.98
	Wastewater	14.24	14.24
	Total indirect, tons/yr	**52,038.56**	**52,038.56**
	Total, tons/yr	**400,235.68**	**400,235.68**
	Global warming potential index	**1**	

Source Type		Emissions, MT/yr	CO_2e metric tons/yr
Residential	AG/RAN/ER	164,546.03	164,546.03
	Low Density Residential	61,119.72	61,119.72
	Medium Density Residential	11,326.27	11,326.27
	High Density Residential	0.00	0.00
	Total Residential	**236,992.02**	**236,992.02**
Commercial	Park	174.79	174.79
	Commercial	47,742.25	47,742.25
	Mixed Use	0.00	0.00
	Total Commercial	**47,917.04**	**47,917.04**
Industrial	Industrial	115,326.63	115,326.63
	Total Industrial	**115,326.63**	**115,326.63**
	Total, tons/yr	**400,235.68**	**400,235.68**
	Global warming potential index	1	

Sutter County Base Year Climate Action Plan
Input data for Green House Gas Emissions
2008
Inventory
Methane

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Unit Type	gallons/yr (U_{AG})	gr/gallon (EF_{MHDV})	gr/MT (C_6)	MT/yr (E_{MCON})
Construction Equipment	0.00	0.0580	1,000,000	**0.00**

A2. Mobile Source (Motor Vehicles)

Unit Type	miles/yr (M)	gr/mile (EF_{MMV})	gr/MT (C_6)	tons/yr (E_{MMV})
Non Cat passenger Car	4222673.56	0.1696	1,000,000	0.72
Cat passenger Car	205855335.86	0.1355	1,000,000	27.89
Diesel Passenger Car	1055668.39	0.0006	1,000,000	0.00
Non cat light-duty truck	4229622.26	0.1908	1,000,000	0.81
Cat light duty truck	88203098.33	0.1516	1,000,000	13.37
Diesel Light duty Truck	10728797.93	0.0011	1,000,000	0.01
Non Cat light-duty truck 2	2105991.62	0.1908	1,000,000	0.40
Cat light duty truck 2	102667091.55	0.1516	1,000,000	15.56
Diesel Light duty truck 2	526497.91	0.0011	1,000,000	0.00
Non Cat Medium duty Truck	546809.50	0.4181	1,000,000	0.23
Cat med duty truck	48616335.52	0.2356	1,000,000	11.45
Diesel Med duty truck	546809.50	0.0051	1,000,000	0.00
Non Cat lite-heavy duty truck	0.00	0.4181	1,000,000	0.00
Cat Light-heavy duty truck	8552250.24	0.2356	1,000,000	2.01
Diesel Lite-heavy duty truck	4810640.76	0.0051	1,000,000	0.02
Non Cat lite-heavy duty truck 2	0.00	0.4181	1,000,000	0.00
Cat Light-heavy duty truck 2	2135924.50	0.2356	1,000,000	0.50
Diesel Lite-heavy duty truck 2	2674716.26	0.0051	1,000,000	0.01
Non Cat med-heavy duty truck	537188.22	0.4181	1,000,000	0.22
Cat med-heavy duty truck	1603546.92	0.2356	1,000,000	0.38
Diesel med-heavy duty truck	5876999.46	0.0051	1,000,000	0.03
Non cat Heavy Duty truck	0.00	0.4181	1,000,000	0.00
Cat heavy duty truck	538257.25	0.2356	1,000,000	0.13
Diesel heavy duty truck	9617539.91	0.0051	1,000,000	0.05
Non Cat Other Bus	0.00	0.4181	1,000,000	0.00
Cat other bus	0.00	0.2356	1,000,000	0.00
Diesel Other Bus	534515.64	0.0051	1,000,000	0.00
Non Cat Urban Bus	0.00	0.4181	1,000,000	0.00
Cat Urban Bus	0.00	0.2356	1,000,000	0.00
Diesel Urban Bus	0.00	0.0051	1,000,000	0.00
Non cat motorcycle	14966437.92	0.0672	1,000,000	1.01
Cat motorcycle	6414187.68	0.0672	1,000,000	0.43
Diesel Motorcycle	0.00	0.0000	1,000,000	0.00
Non Cat School Bus	0.00	0.4181	1,000,000	0.00
Cat School Bus	0.00	0.2356	1,000,000	0.00
Diesel School Bus	534515.64	0.0051	1,000,000	0.00
Non Cat Motor home	532377.58	0.4181	1,000,000	0.22
Cat Motor home	4810640.76	0.2356	1,000,000	1.13
Diesel Motor home	1071169.34	0.0051	1,000,000	0.01
			Total (MT/yr)	**76.59**

Sutter County Base Year Climate Action Plan
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Inventory
Methane

Emissions from Aviation Fuel

Gasoline gallons/ year (U_{AAF})	gr/gallon (EF_{Maf})	gr/MT (C_6)	MT/yr (E_{Maf})
18,250.00	7.04	1,000,000	**0.13**

A3. Mobile Source (Landscape Equipment)

Gasoline gallons/ year (G_F)	gr/gallon (EF_{MF})	gr/MT (C_6)	MT/yr (E_{Mls})
3,563.91	0.50	1,000,000	**0.00**

A4. Wood burning Hearth

MMBtu	kg/MMBtu (EF_{Mwood})	kg/MT (C_3)	MT/yr (E_{Mls})
155,471.65	0.32	1,000	**49.13**

A5. Stationary Source (Cooling and Heating) - Natural Gas

Land Use Type	Unit Type	Units	MMBTUs/yr (U_{Ang})	kg/MMBTU (EF_{Mng})	kg/MT (C_3)	MT/yr (E_{Mng})
AG/RAN/ER	du	5163.00	186,544	0.005	1,000	0.9327
Low Density Residential	du	3885.00	69,289	0.005	1,000	0.3464
Medium Density Residential	du	720.00	12,840	0.005	1,000	0.0642
High Density Residential	du	0.00	0	0.005	1,000	0.0000
Park	Sq/ft	27921960.00	1,642	0.005	1,000	0.0082
Commercial	Sq/ft	1359520.00	445,071	0.005	1,000	2.2254
Mixed Use	Sq/ft	0.00	0	0.005	1,000	0.0000
Industrial	Sq/ft	3279680.00	1,073,666	0.001	1,000	1.0737
					Total (MT/yr)	**4.65**

B. Indirect Sources

B1. Electricity

Land Use Type	Unit Type	Units	kWh/year	MWh/yr (U_{Ae})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	tons/yr (E_{Mele})
AG/RAN/ER	du	5163.00	58141917.5	58,141.92	0.0302	2,205	0.796
Low Density Residential	du	3885.00	21595856.5	21,595.86	0.0302	2,205	0.296
Medium Density Residential	du	720.00	4001962	4,001.96	0.0302	2,205	0.055
High Density Residential	du	0.00	0	0.00	0.0302	2,205	0.000
Park	Sq/ft	27921960.00	145059.693	145.06	0.0302	2,205	0.002
Commercial	Sq/ft	1359520.00	39319235.8	39,319.24	0.0302	2,205	0.539
Mixed Use	Sq/ft	0.00	0	0.00	0.0302	2,205	0.000
Industrial	Sq/ft	3279680.00	94851578.6	94,851.58	0.0302	2,205	1.299
						Total (MT/yr)	**2.987**

Sutter County Base Year Climate Action Plan
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Methane

B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWH/yr (U_{epot})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	tons/yr (E_{Mpot})
AG/RAN/ER	du	5163.00	29.18998	3.50	102.16	0.0302	2,205	0.00140
Low Density Residential	du	3885.00	10.84214	3.50	37.95	0.0302	2,205	0.00052
Medium Density Residential	du	720.00	2.00917	3.50	7.03	0.0302	2,205	0.00010
High Density Residential	du	0.00	0.00000	3.50	0.00	0.0302	2,205	0.00000
Park	Sq/ft	27921960.00	0.00258	3.50	0.01	0.0302	2,205	0.00000
Commercial	Sq/ft	1359520.00	0.69926	3.50	2.45	0.0302	2,205	0.00003
Mixed Use	Sq/ft	0.00	0.00000	3.50	0.00	0.0302	2,205	0.00000
Industrial	Sq/ft	3279680.00	1.68687	3.50	5.90	0.0302	2,205	0.00008
							Total (MT/yr)	**0.00213**

B3. Solid Waste
B3a. Fugitive Emissions

Unit Type	Unit Type	unit	tons/yr (U_{SW})	MT CO_2e/ton (EF_{MWF})	MT CO_2e/yr (E_{MWF})
AG/RAN/ER	du	5163.00	11,072.44	0.130000	1,439.42
Low Density Residential	du	3885.00	4,112.75	0.130000	534.66
Medium Density Residential	du	720.00	762.28	0.130000	99.10
High Density Residential	du	0.00	0.00	0.130000	0.00
Park	Sq/ft	27921960.00	4.18	0.130000	0.54
Commercial	Sq/ft	1359520.00	1,162.44	0.130000	151.12
Mixed Use	Sq/ft	0.00	0.00	0.130000	0.00
Industrial	Sq/ft	3279680.00	2,804.51	0.130000	364.59
				Total (MT/yr)	**2,589.42**

B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{MWT})	gr/MT (C_6)	tons/yr (E_{MWT})
AG/RAN/ER	11,072.4384	0.1125	33	9.62	0.00510	1,000,000	0.000146
Low Density Residential	4,112.7509	0.1125	33	9.62	0.00510	1,000,000	0.000054
Medium Density Residential	762.2771	0.1125	33	9.62	0.00510	1,000,000	0.000010
High Density Residential	0.0000	0.1125	33	9.62	0.00510	1,000,000	0.000000
Park	4.1829	0.2250	33	9.62	0.00510	1,000,000	0.000000
Commercial	1,162.4377	0.2250	33	9.62	0.00510	1,000,000	0.000008
Mixed Use	0.0000	0.2250	33	9.62	0.00510	1,000,000	0.000000
Industrial	2,804.5105	0.2250	33	9.62	0.00510	1,000,000	0.000019
						Total (MT/yr)	**0.000237**

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B3c. Exhaust Emissions (Disposal Equipment)

Vehicle Type	# of equip	lbs/hr (EF_{MWD})	hrs/day (h)	days/yr (n)	lbs/MT (C_1)	MT/yr (E_{MWD})
Excavator	0	0.0164	9.00	325	2,205	0.00
Grader	0	0.0185	9.00	325	2,205	0.00
Off-Highway Tractor	0	0.0243	9.00	325	2,205	0.00
Off-Highway Truck	0	0.0260	9.00	325	2,205	0.00
Off-Highway Heavy Truck	0	0.0342	9.00	325	2,205	0.00
Disposal Facility run by City?					No	0.00
					Total (MT/yr)	**0.00**

B4. Wastewater

Land Use Type	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG (C_5)	MWh/yr (U_{eWW})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	MT/yr (E_{MWW})
AG/RAN/ER	29.18998	65	18.97	1.91	36.26	0.0302	2,205	0.000497
Low Density Residential	10.84214	82	8.89	1.91	16.99	0.0302	2,205	0.000233
Medium Density Residential	2.00917	82	1.65	1.91	3.15	0.0302	2,205	0.000043
High Density Residential	0.00000	82	0.00	1.91	0.00	0.0302	2,205	0.000000
Park	0.00258	71	0.00	1.91	0.00	0.0302	2,205	0.000000
Commercial	0.69926	71	0.50	1.91	0.95	0.0302	2,205	0.000013
Mixed Use	0.00000	71	0.00	1.91	0.00	0.0302	2,205	0.000000
Industrial	1.68687	80	1.35	1.91	2.58	0.0302	2,205	0.000035
							Total (MT/yr)	0.000821

C. See Methane Emissions from AG Formula Spreadsheet (entered into table below under commercial AG)

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D. Summary Table

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Direct	Construction equipment	0.00	0.00
	Motor vehicles & Aviation Fuel	76.72	1,611.09
	Landscape equipment	0.00	0.04
	Cooling and heating	53.78	1,129.37
Total direct, tons/yr		**130.50**	**2,740.50**
Indirect	Electricity	2.99	62.73
	Potable water	0.00	0.04
	Solid waste	2,589.42	2,589.42
	Wastewater	0.00	0.02
Total indirect, tons/yr		**2,592.41**	**2,652.21**
Total from Agriculture		**11,212.42**	**235,460.91**
Total, tons/yr		***13,935.33***	***240,853.62***
Global warming potential index		**21**	

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Residential	AG/RAN/ER	1,511.0352	2,943.38
	Low Density Residential	561.2595	1,093.29
	Medium Density Residential	104.0265	202.64
	High Density Residential	0.0000	0.00
	Total Residential	**2,176.32**	**4,239.31**
Commercial	Park	0.5804	1.31
	Commercial	161.2180	363.24
	Mixed Use	0.0000	0.00
	Total Commercial	**161.80**	**364.55**
Industrial	Industrial	384.7895	788.85
Total Industrial		**384.7895**	**788.85**
Total from Agriculture		**11,212.42**	**235,460.91**
Total, tons/yr		***13,935.33***	***240,853.62***
Global warming potential index		21	

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A. Direct Sources

A1. Mobile Source (Construction Equipment)

Unit Type	gallons/yr (U_{AG})	gr/gallon (EF_{NHDV})	gr/MT (C_6)	MT/yr (E_{NCON})
Non cat heavy-duty truck	0.00	0.0260	1,000,000	**0.00000**

A2. Mobile Source (Motor Vehicles)

Unit Type	miles/yr (M)	gr/mile (EF_{NMV})	gr/MT (C_6)	MT/yr (E_{NMV})
Non Cat passenger Car	4,222,674	0.0197	1,000,000	0.08319
Cat passenger Car	205,855,336	0.0504	1,000,000	10.37511
Diesel Passenger Car	1,055,668	0.0012	1,000,000	0.00127
Non cat light-duty truck	4,229,622	0.0218	1,000,000	0.09221
Cat light duty truck	88,203,098	0.0639	1,000,000	5.63618
Diesel Light duty Truck	10,728,798	0.0017	1,000,000	0.01824
Non Cat light-duty truck 2	2,105,992	0.0218	1,000,000	0.04591
Cat light duty truck 2	102,667,092	0.0639	1,000,000	6.56043
Diesel Light duty truck 2	526,498	0.0017	1,000,000	0.00090
Non Cat Medium duty Truck	546,809	0.0473	1,000,000	0.02586
Cat med duty truck	48,616,336	0.1317	1,000,000	6.40277
Diesel Med duty truck	546,809	0.0048	1,000,000	0.00262
Non Cat lite-heavy duty truck	0	0.0473	1,000,000	0.00000
Cat Light-heavy duty truck	8,552,250	0.1317	1,000,000	1.12633
Diesel Lite-heavy duty truck	4,810,641	0.0048	1,000,000	0.02309
Non Cat lite-heavy duty truck 2	0	0.0473	1,000,000	0.00000
Cat Light-heavy duty truck 2	2,135,924	0.1317	1,000,000	0.28130
Diesel Lite-heavy duty truck 2	2,674,716	0.0048	1,000,000	0.01284
Non Cat med-heavy duty truck	537,188	0.0473	1,000,000	0.02541
Cat med-heavy duty truck	1,603,547	0.1317	1,000,000	0.21119
Diesel med-heavy duty truck	5,876,999	0.0048	1,000,000	0.02821
Non cat Heavy Duty truck	0	0.0473	1,000,000	0.00000
Cat heavy duty truck	538,257	0.1317	1,000,000	0.07089
Diesel heavy duty truck	9,617,540	0.0048	1,000,000	0.04616
Non Cat Other Bus	0	0.0473	1,000,000	0.00000
Cat other bus	0	0.1317	1,000,000	0.00000
Diesel Other Bus	534,516	0.0048	1,000,000	0.00257
Non Cat Urban Bus	0	0.0473	1,000,000	0.00000
Cat Urban Bus	0	0.1317	1,000,000	0.00000
Diesel Urban Bus	0	0.0048	1,000,000	0.00000
Non cat motorcycle	14,966,438	0.0069	1,000,000	0.10327
Cat motorcycle	6,414,188	0.0069	1,000,000	0.04426
Diesel Motorcycle	0	0.0000	1,000,000	0.00000
Non Cat School Bus	0	0.0473	1,000,000	0.00000
Cat School Bus	0	0.1317	1,000,000	0.00000
Diesel School Bus	534,516	0.0048	1,000,000	0.00257
Non Cat Motor home	532,378	0.0473	1,000,000	0.02518
Cat Motor home	4,810,641	0.1317	1,000,000	0.63356
Diesel Motor home	1,071,169	0.0048	1,000,000	0.00514
			Total (MT/yr)	**31.89**

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Emissions from Aviation Fuel

Gasoline gallons/ year (U_{Aaf})	gr/gallon (EF_{Naf})	gr/lbs (C_6)	MT/yr (E_{Nls})
18,250.00	0.11000	1000000	**0.002008**

A3. Mobile Source (Landscape Equipment)

Gasoline gallons/ year	gr/gallon (EF_{Nls})	gr/lbs (C_6)	MT/yr (E_{Nls})
3,563.91	0.22000	1000000	**0.000784**

A4. Wood burning Hearth

MMBtu	kg/MMBtu (EF_{Mwood})	kg/MT (C_3)	MT/yr (E_{Mls})
155,471.65	0.00420	1000	**0.652981**

A5. Stationary Source (Cooling and Heating)

Land Use Type	Unit Type	Units	MMBTUs/yr (U_{Ang})	TU (EF_{Nng})	kg/MT (C_3)	MT/yr (E_{Nng})
AG/RAN/ER	du	5,163	186,544	0.0001	1,000	0.018654
Low Density Residential	du	3,885	69,289	0.0001	1,000	0.006929
Medium Density Residential	du	720	12,840	0.0001	1,000	0.001284
High Density Residential	du	0	0	0.0001	1,000	0.000000
Park	Sq/ft	27,921,960	1,642	0.0001	1,000	0.000164
Commercial	Sq/ft	1,359,520	445,071	0.0001	1,000	0.044507
Mixed Use	Sq/ft	0	0	0.0001	1,000	0.000000
Industrial	Sq/ft	3,279,680	1,073,666	0.0001	1,000	0.107367
					Total (MT/yr)	**0.178905**

B. Indirect Sources

B1. Electricity

Land Use Type	Unit Type	Units	kWh/yr	MWh/yr (U_{Ae})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{Nele})
AG/RAN/ER	du	5,163	58141918	58,142	0.0081	2,205	0.21362
Low Density Residential	du	3,885	21595856	21,596	0.0081	2,205	0.07935
Medium Density Residential	du	720	4001962	4,002	0.0037	2,205	0.00672
High Density Residential	du	0	0	0	0.0037	2,205	0.00000
Park	Sq/ft	27,921,960	145059.69	145	0.0081	2,205	0.00053
Commercial	Sq/ft	1,359,520	39319236	39,319	0.0081	2,205	0.14446
Mixed Use	Sq/ft	0	0	0	0.0081	2,205	0.00000
Industrial	Sq/ft	3,279,680	94851579	94,852	0.0081	2,205	0.34849
						Total (MT/yr)	**0.79317**

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B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWH/yr (U_{epot})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{Npot})
AG/RAN/ER	du	5,163	29.1899802	3.50	102.16	0.0081	2,205	0.000
Low Density Residential	du	3,885	10.8421368	3.50	37.95	0.0081	2,205	0.000
Medium Density Residential	du	720	2.0091734	3.50	7.03	0.0081	2,205	0.000
High Density Residential	du	0	0.0000000	3.50	0.00	0.0081	2,205	0.000
Park	Sq/ft	27,921,960	0.0025798	3.50	0.01	0.0081	2,205	0.000
Commercial	Sq/ft	1,359,520	0.6992639	3.50	2.45	0.0081	2,205	0.000
Mixed Use	Sq/ft	0	0.0000000	3.50	0.00	0.0081	2,205	0.000
Industrial	Sq/ft	3,279,680	1.6868660	3.50	5.90	0.0081	2,205	0.000
							Total (MT/yr)	**0.001**

B3. Solid Waste

B3a. Fugitive Emissions No Fugitive Nitrous Oxide Emissions

B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{NWT})	gr/MT (C_6)	MT/yr (E_{NWT})
AG/RAN/ER	11,072.44	0.1125	33	9.62	0.0048	1,000,000	0.00013772
Low Density Residential	4,112.75	0.1125	33	9.62	0.0048	1,000,000	0.00005115
Medium Density Residential	762.28	0.1125	33	9.62	0.0048	1,000,000	0.00000948
High Density Residential	0.00	0.1125	33	9.62	0.0048	1,000,000	0.00000000
Park	4.18	0.2250	33	9.62	0.0048	1,000,000	0.00000003
Commercial	1,162.44	0.2250	33	9.62	0.0048	1,000,000	0.00000723
Mixed Use	0.00	0.2250	33	9.62	0.0048	1,000,000	0.00000000
Industrial	2,804.51	0.2250	33	9.62	0.0048	1,000,000	0.00001744
						Total (MT/yr)	**0.000223**

B3c. Exhaust Emissions (Disposal Equipment)

Vehicle Type	# of equip.	lbs/hr (EF_{NWD})	hrs/day (h)	days/yr (n)	lbs/MT (C_1)	tons/yr (E_{NWD})
Excavator	0	0.0074	9.00	325	2,205	0.00
Grader	0	0.0083	9.00	325	2,205	0.00
Off-Highway Tractor	0	0.0109	9.00	325	2,205	0.00
Off-Highway Truck	0	0.0117	9.00	325	2,205	0.00
Rubber Tired Dozer	0	0.0153	9.00	325	2,205	0.00
Disposal Facility run by City?					No	0.00
					Total, tons/yr	**0.00**

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B4. Wastewater

AG/RAN/ER	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG (C_5)	MWh/yr (U_{eWW})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{NWW})
AG/RAN/ER	29.19	65	18.97	1.91	36.2583	0.0081	2204.62	0.00013322
Low Density Residential	10.84	82	8.89	1.91	16.9898	0.0081	2204.62	0.00006242
Medium Density Residential	2.01	82	1.65	1.91	3.1484	0.0037	2204.62	0.00000528
High Density Residential	0.00	82	0.00	1.91	0.0000	0.0037	2204.62	0.00000000
Park	0.00	71	0.00	1.91	0.0035	0.0081	2204.62	0.00000001
Commercial	0.70	71	0.50	1.91	0.9488	0.0081	2204.62	0.00000349
Mixed Use	0.00	71	0.00	1.91	0.0000	0.0081	2204.62	0.00000000
Industrial	1.69	80	1.35	1.91	2.5789	0.0081	2204.62	0.00000948
							Total (MT/yr)	**0.00021390**

C. See Nitrous Emissions from AG Formula Spreadsheet (entered into table below under commercial AG)
D. Summary Table

Source Type		Emissions, tons/yr	CO_2e metric tons/yr
Direct	Construction equipment	0.00000	0.00
	Motor vehicles + aviation fuel	31.8920	9,886.52
	Landscape equipment	0.0008	0.24
	Cooling and heating	0.8319	257.88
	Industrial		
Total direct, tons/yr		**32.7247**	**10,144.65**
Indirect	Electricity	0.7932	245.88
	Potable water	0.0006	0.18
	Solid waste	0.0002	0.07
	Wastewater	0.0002	0.07
	Industrial		
Total indirect, tons/yr		**0.7942**	**246.20**
Total From Agriculture		**1,837.24**	**569,543.93**
Total, tons/yr		***1,870.76***	***579,934.77***
Global warming potential index		**310**	

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Residential	AG/RAN/ER	18.3237	5,680.28
	Low Density Residential	6.8062	2,109.89
	Medium Density Residential	1.2535	388.58
	High Density Residential	0.0000	0.00
	Total Residential	**26.3833**	**8,178.75**
Commercial	Park	0.0075	2.33
	Commercial	2.0882	647.35
	Mixed Use	0.0000	0.00
	Total Commercial	**2.0958**	**649.68**
Industrial	Industrial	5.0401	1,562.41
	Total Industrial	**5.0401**	**1,562.41**
Total from Agriculture		**1,837.24**	**569,543.93**
Total, tons/yr		**1,870.76**	**579,934.77**
Global warming potential index		310	

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CM. Methane

CM1. Enteric Fermentation

Source	Number - Head/year (U_{Aani})	Emission Factor kg CH_4/head (EF_{MEF})	Conversion factor kg to MT (C_3)	MT CH_4/year (E_{MEF})
Dairy Cow				
Dairy Cows	8,293.00	123.42	1000.0	1,023.51
Others				
Sheep	16,397.00	8.00	1000.0	131.18
			Total	**1,154.68**

CM2. Manure Management

Source	Number - 1000s Head/year (U_{Aani})	Typical Animal Mass kg/head (TAM)	Volatile Solids Produced kgVS/1000kg /year (VS)	Max CH_4 capacity m^3CH_4/kgVS (B_O)	Extent Capacity Realized (MCF)	Density of Methane (C_8)	MT CH_4/year (E_{MMM})
Dairy Cow							
Dairy Cows	8.293	604.0	3278.5	0.24	0.499	0.678	1,332.76
Other							
Sheep on Feed	16.397	27.0	3361.7	0.36	0.012	0.678	4.36
						Total	**1,337.11**

CM3. Rice Cultivation

Season	Acres (U_{AC})	Conversion hectares/acre (C_{11})	Emission Factor (EF_{PS})	Conversion kg/MT (C_3)	MT/year (E_{MRC})
Primary	101,455	0.40	210	1,000	8,622.24
Rattoon	0	0.40	780	1,000	0.00
				Total	**8,622.24**

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CM4. Agricultural Residue Burning

Source	Production - Tons (U_C)	Residue/Crop Ratio (R_{RC})	Fraction Burned (F_{RB})	Fraction Dry (F_{DM})	Burning Efficiency (BE)	Combustion Efficiency (CE)	Carbon Content (CC)	Ratio CH_4-C (R_{CH4-C})	Conversion CH_4- to Mol.Wt. (C_{11})	Tons/year (E_{MARB})
Hay (inc Alfalfa)	60,765.97	0	0.000	0.85	0	0.00	0.00	0.005	1.33	0.00
Dry Edible Beans	7,673.75	2.1	0.000	0.87	0	0.00	0.00	0.005	1.33	0.00
Corn for Grain	43,491.36	1	0.000	0.91	0	0.00	0.00	0.005	1.33	0.00
Oats	21,974.74	1.3	0.000	0.92	0	0.00	0.00	0.005	1.33	0.00
Rice	371,163.14	1.4	0.097	0.91	0.93	0.88	0.38	0.005	1.33	94.54
Sorghum	1,966.78	1.4	0.000	0.91	0	0.00	0.00	0.005	1.33	0.00
All Wheat	43,991.75	1.3	0.030	0.93	0.93	0.88	0.44	0.005	1.33	3.85
Vegetable Crops & Fruit Trees	464,274.43	0	0.030	0.87	0.93	0.88	0.45	0.005	1.33	0.00
Safflower & Sunflower	11,496.73	2.1	0.000	0.00	0	0.00	0.00	0.005	1.33	0.00
									Total	**98.39**

CN. Nitrous Oxide

CN1. Manure Management

Source	Total Nitrogen Excreted (N_T)	Manure Anaerobic Lagoons ($\%_{AL}$)	Manure Liquid/Slurry ($\%_S$)	Manure Deep Pit ($\%_{DP}$)	Emission Factor for Liquid System (EF_{NML})	N_2O Emissions from Liquid System Mgt.	Manure Solid Storage/ Managed ($\%_{SS}$)	Manure Deep Pit / DryLot ($\%_{DP}$)	Manure Pasture / Poultry ($\%_P$)	Emission Factor for Solid System (EF_{NMS})	N_2O from solid system Mgt.	Total N_2O MT/yr (E_{NMM})
Dairy Cow												
Dairy Cows	804,440.90	467,234	166,683	*N/A*	0.001	*996.16*	74,355	1,830	*N/A*	0.02	*2,394.41*	3.39
Other												
Sheep on Feed	67,868.82	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	66,678	*N/A*	*N/A*	0.02	*2,095.60*	2.10
											Total	**5.49**

CN2. Emissions from Animals and Runoff

Indirect emissions from animals

Source	Total Nitrogen Excreted (N_T)	% of Indirect Volitazition ($\%_{VI}$)	Rate of conversion from NH_3 to NO_X ($EF_{NH3-NOX}$)	Conversion factor for kg to MT (C_3)	Tons/year (E_{NIA})
Dairy Cow					
Dairy Cows	804,440.90	0.20	0.01	1,000	2.53
Other					
Sheep on Feed	67,868.82	0.20	0.01	1,000	0.21
				Total	**2.74**

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Direct emissions from animals

Source	Unmanaged Nitrogen (N_{UM})	Emission Factor for Pastures, Ranges and Paddocks (EF_{PRP})	Conversion factor for kg to MT (C_3)	Manure for Pasture, Range and Paddock (M_{PRP})	Managed Nitrogen (N_M)	Unmanaged Daily Spread (N_{DS})	% of Indirect Vol. ($\%_{VI}$)	Emission Factor for ground Applications (EF_{NV})	Manure applied to Soils (M_{AS})	MT/year (E_{NDA})
Dairy Cow										
Dairy Cows	7,442.98	0.02	1,000	0.149	710,102.83	86,895.10	0.20	0.0125	7.970	12.992
Other										
Sheep on Feed	66,678.14	0.02	1,000	1.334	1,190.68	*N/A*	0.20	0.0125	0.012	4.210
									Total	**17.202**

Emissions from Leaching

Source	Unvolatized Synthetic Nitrogen (N_{UVS})	Unvolatized Non-Manure Organic Nitrogen (N_{UVO})	Conversion factor for kg to MT (C_3)	Leaching % of Soil ($\%_{Leach}$)	Leaching Factor - kg N2O-N / kg N (F_{Leach})	Molecular Weight Ratio N_2O:N_2 (C_{10})	Total Leaching from non-manure Fertilizer (L_{fert})	Total Nitrogen Excreted (N_T)	% of Volitazation from Manure ($\%_{VM}$)	Total Leaching from Manure (L_{man})	Total from Leaching MT/yr (E_{NL})
Total emissions of N_2O from Leaching	18,900,484	7927.61	1,000	0.3000	0.025	1.57	222.85	872,310	0.00	10.28	**233.13**

CN3: Nitrous Oxide from Crop Growth:

Source	Crop Production MTs	Conversion factor for kg to tons (C_3)	Residue/Crop Ratio (R_{RC})	Fraction Dry (F_{DM})	Nitrogen Content of biomass	Nitrogen Fixed by Crops (FN)	Fraction of Residue Applied (F_{RA})	Nitrogen Content of Residue (N_{CR})	Nitrogen Returned to Soil (N_{RS})
Hay (inc Alfalfa)	60,765.97	1,000	0.0	0.8500	0.03	1,549,532	0.00	*N/A*	*0*
Dry Edible Beans	7,673.75	1,000	2.1	0.8700	0.03	620,883	1.60	0.02	376,856
Corn for Grain	43,491.36	1,000	1.0	0.9100	*N/A*	*0*	0.90	0.01	206,593
Oats	21,974.74	1,000	1.3	0.9200	*N/A*	*0*	0.90	0.01	165,575
Rice	371,163.14	1,000	1.4	0.9100	*N/A*	*0*	1.00	0.01	3,404,605
Sorghum	1,966.78	1,000	1.4	0.9100	*N/A*	*0*	0.90	0.01	24,355
All Wheat	43,991.75	1,000	1.3	0.9300	*N/A*	*0*	0.90	0.01	296,778
Vegetable Crops & Fruit Trees	464,274.43	1,000	0.0	0.0000	0.03	0	0.00	0.00	0
Safflower & Sunflower	11,496.73	1,000	2.1	0.8700	0.03	930,201	0.90	0.02	434,794
Total						3,100,616			4,909,556

Sutter County Base Year Climate Action Plan
Input data for Green House Gas Emissions
2008
Inventory
Agricultural Emissions

Source	Crop Production (Hectares)	Nitrogen Fixed by Crops (FN_T)	Nitrogen Returned to Soil (N_{RST})	Conversion factor for kg to tons (C_3)	Emission factor for soils (kg N2O-N/kgN) (EF_{DIR})	Molecular Weight Ratio N_2O:N_2 (C_{10})	Emission factor kg N_2O-N / ha_yr	Emissions in MT (N_{CG})
N2O emissions from Legumes	-	3,100,616.40	-	1,000	0.0100	1.57	-	48.72
N2O emissions from Residues	-	-	4,909,556	1,000	0.0100	1.57	-	77.15
N_2O from Histols (Temperate Zone)	89,048.16	-	-	1,000	-	1.57	8	1,119.46
N_2O from Histols (Sub tropic Zone)	0.00	-	-	1,000	-	1.57	12	0.00
							Total	**1,245.34**

CN4. Emissions from Fertilizers

Source	Target Year Total Fertilizer Use (kg N)	Following Year Total Fertilizer Use (kg N)	Total N in Fertilizers (Calendar Year)	Unvolatized N (kg) (NUV)	Volatized N (kg) (NV)	Direct N_2O Emissions (metric tons)	N_2O Emissions (metric tons)	Total Emissions from Fertilizers
Synthetic	20,971,178	21,055,063	21,000,538	18,900,484	2,100,054	297.13	33.03	**330.16**
Organic	242,587	243,558	242,927	7,928	1,982			
Dried Manure	1,230	1,234	1,231					
Activated Sewage Sludge	209,887	210,727	210,181					
Other	31,471	31,597	31,515					
Dried Manure %	0.51%	0.51%	0.51%					
Non-Manure Organics	241,358	242,323	241,696					

CN5. Emissions on N_2O from agricultural residue burning

Source	Production - MTTons (U_C)	Residue/Crop Ratio (R_{RC})	Fraction Burned (F_{RB})	Fraction Dry (F_{DM})	Burning Efficiency (BE)	Combust.. Efficiency (CE)	Nitrogen Content (NC)	Ratio N2O-N (R_{N2O-N})	Conversion to Mol.Wt. (C_{10})	Emissions MT/year (E_{NARB})
Hay (inc Alfalfa)	60,765.97	0.0000	0.000	0.85	0.000	0.00	*N/A*	0.007	1.57	*0.00*
Dry Edible Beans	7,673.75	2.1000	0.000	0.87	0.000	0.00	0.017	0.007	1.57	0.00
Corn for Grain	43,491.36	1.0000	0.000	0.91	0.000	0.00	0.006	0.007	1.57	0.00
Oats	21,974.74	1.3000	0.000	0.92	0.000	0.00	0.007	0.007	1.57	0.00
Rice	371,163.14	1.4000	0.097	0.91	0.930	0.88	0.007	0.007	1.57	2.96
Sorghum	1,966.78	1.4000	0.000	0.91	0.000	0.00	0.011	0.007	1.57	0.00
All Wheat	43,991.75	1.3000	0.030	0.93	0.930	0.88	0.006	0.007	1.57	0.09
Vegetable Crops & Fruit Trees	464,274.43	0.0000	0.000	0.00	0.000	0.00	0.000	0.007	1.57	0.00
Safflower & Sunflower	11,496.73	2.1000	0.030	0.87	0.930	0.88	0.023	0.007	1.57	0.13
									Total	**3.18**

Sutter County Base Year Climate Action Plan
Input data for Green House Gas Emissions
2008
Inventory
Agricultural Emissions

D. Summary Table

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Methane	Enteric Fermentation	1,154.68	24,248.37
	Manure Management	1,337.11	28,079.41
	Rice Cultivation	8,622.24	181,067.00
	Agricultural Residue Burning	98.39	2,066.13
Total Methane		11,212.42	**235,460.91**
Nitrous Oxide	Manure Management	5.49	1,700.71
	Animals and Runoff	253.07	78,452.78
	Crop Growth	1,245.34	386,054.38
	Fertilizer Use	330.16	102,350.89
	Agricultural Residue Burning	3.18	985.17
Total Nitrous Oxide		1,837.24	**569,543.93**
	Total emissions from Agriculture		**805,004.84**

Appendix E: 2020 BAU URBEMIS Output and GHG Calculations

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Area Source Mitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2020 - Projected 6-23-2010.urb924

Project Name: Sutter County 2020 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Summer Pounds Per Day, Mitigated)

Source	CO2
Natural Gas	
Hearth - No Summer Emissions	
Landscape	435.67
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, mitigated)	435.67

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction
For Residential Interior Use Low VOC Coating	10.00
For Residential Exterior Use Low VOC Coating	10.00
For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

Percentage of residences with natural gas fireplaces changed from 55% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Winter Area Source Mitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2020 - Projected 6-23-2010.urb924

Project Name: Sutter County 2020 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Winter Pounds Per Day, Mitigated)

Source	CO2
Natural Gas	
Hearth	422,386.44
Landscaping - No Winter Emissions	
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, Mitigated)	422,386.44

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction
For Residential Interior Use Low VOC Coating	10.00
For Residential Exterior Use Low VOC Coating	10.00
For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

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Percentage of residences with natural gas fireplaces changed from 55% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Area Source Mitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2020 - Projected 6-23-2010.urb924

Project Name: Sutter County 2020 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

Source	CO2
Natural Gas	
Hearth	17,317.84
Landscape	39.21
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, mitigated)	17,357.05

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction
For Residential Interior Use Low VOC Coating	10.00
For Residential Exterior Use Low VOC Coating	10.00
For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

Percentage of residences with natural gas fireplaces changed from 55% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2020 - Projected 6-23-2010.urb924

Project Name: Sutter County 2020 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	CO2
Single family housing	614,717.26
Apartments low rise	661,424.76
Apartments mid rise	235,973.48
Apartments high rise	95,745.07
City park	72.82
General office building	827,526.76
Office park	129,583.22
General light industry	317,548.57
TOTALS (lbs/day, unmitigated)	2,882,591.94

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2020 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	1,934.67	9.24	dwelling units	5,804.00	53,628.96	584,555.63
Apartments low rise	390.31	9.24	dwelling units	6,245.00	57,703.80	628,971.38
Apartments mid rise	58.63	9.24	dwelling units	2,228.00	20,586.72	224,395.23
Apartments high rise	14.58	9.24	dwelling units	904.00	8,352.96	91,047.26
City park		0.01	acres	641.00	6.41	69.87
General office building		22.11	1000 sq ft	3,278.68	72,491.62	790,158.58
Office park		22.11	1000 sq ft	512.33	11,327.62	123,471.02
General light industry		3.49	1000 sq ft	7,951.22	27,749.76	302,472.36
					251,847.85	2,745,141.33

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.6	0.0	100.0	0.0
Light Truck < 3750 lbs	19.3	0.0	95.9	4.1
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	72.0	28.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	40.0	60.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	10.9	10.9	10.9	10.9	10.9	10.9
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
General light industry				50.0	25.0	25.0

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 16.8 miles to 10.9 miles

Home-based shop rural trip length changed from 7.1 miles to 10.9 miles

Operational Changes to Defaults

Home-based other rural trip length changed from 7.9 miles to 10.9 miles

Commercial-based commute rural trip length changed from 14.7 miles to 10.9 miles

Commercial-based non-work rural trip length changed from 6.6 miles to 10.9 miles

Commercial-based customer rural trip length changed from 6.6 miles to 10.9 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Winter Operational Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2020 - Projected 6-23-2010.urb924

Project Name: Sutter County 2020 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Winter Pounds Per Day, Unmitigated)

Source	CO2
Single family housing	537,445.95
Apartments low rise	578,282.21
Apartments mid rise	206,311.09
Apartments high rise	83,709.71
City park	63.58
General office building	723,077.18
Office park	113,261.81
General light industry	277,565.31
TOTALS (lbs/day, unmitigated)	2,519,716.84

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2020 Temperature (F): 40 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	1,934.67	9.24	dwelling units	5,804.00	53,628.96	584,555.63
Apartments low rise	390.31	9.24	dwelling units	6,245.00	57,703.80	628,971.38
Apartments mid rise	58.63	9.24	dwelling units	2,228.00	20,586.72	224,395.23
Apartments high rise	14.58	9.24	dwelling units	904.00	8,352.96	91,047.26
City park		0.01	acres	641.00	6.41	69.87
General office building		22.11	1000 sq ft	3,278.68	72,491.62	790,158.58
Office park		22.11	1000 sq ft	512.33	11,327.62	123,471.02
General light industry		3.49	1000 sq ft	7,951.22	27,749.76	302,472.36
					251,847.85	2,745,141.33

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.6	0.0	100.0	0.0
Light Truck < 3750 lbs	19.3	0.0	95.9	4.1
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	72.0	28.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	40.0	60.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	10.9	10.9	10.9	10.9	10.9	10.9
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
General light industry				50.0	25.0	25.0

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 16.8 miles to 10.9 miles

Home-based shop rural trip length changed from 7.1 miles to 10.9 miles

Operational Changes to Defaults

Home-based other rural trip length changed from 7.9 miles to 10.9 miles

Commercial-based commute rural trip length changed from 14.7 miles to 10.9 miles

Commercial-based non-work rural trip length changed from 6.6 miles to 10.9 miles

Commercial-based customer rural trip length changed from 6.6 miles to 10.9 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\Sutter County 2020 - Projected 6-23-2010.urb924

Project Name: Sutter County 2020 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	CO2
Single family housing	107,485.23
Apartments low rise	115,652.18
Apartments mid rise	41,260.70
Apartments high rise	16,741.32
City park	12.73
General office building	144,669.62
Office park	22,656.05
General light industry	55,520.30
TOTALS (tons/year, unmitigated)	503,998.13

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2020 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	1,934.67	9.24	dwelling units	5,804.00	53,628.96	584,555.63
Apartments low rise	390.31	9.24	dwelling units	6,245.00	57,703.80	628,971.38
Apartments mid rise	58.63	9.24	dwelling units	2,228.00	20,586.72	224,395.23
Apartments high rise	14.58	9.24	dwelling units	904.00	8,352.96	91,047.26
City park		0.01	acres	641.00	6.41	69.87
General office building		22.11	1000 sq ft	3,278.68	72,491.62	790,158.58
Office park		22.11	1000 sq ft	512.33	11,327.62	123,471.02
General light industry		3.49	1000 sq ft	7,951.22	27,749.76	302,472.36
					251,847.85	2,745,141.33

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.6	0.0	100.0	0.0
Light Truck < 3750 lbs	19.3	0.0	95.9	4.1
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	72.0	28.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	40.0	60.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	10.9	10.9	10.9	10.9	10.9	10.9
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
General light industry				50.0	25.0	25.0

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 16.8 miles to 10.9 miles

Home-based shop rural trip length changed from 7.1 miles to 10.9 miles

Operational Changes to Defaults

Home-based other rural trip length changed from 7.9 miles to 10.9 miles

Commercial-based commute rural trip length changed from 14.7 miles to 10.9 miles

Commercial-based non-work rural trip length changed from 6.6 miles to 10.9 miles

Commercial-based customer rural trip length changed from 6.6 miles to 10.9 miles

Sutter County
Emissions by Source
2020
Business As Usual (BAU) Inventory
By Source

Transportation		
	Source:	**Metric tons of CO_2e**
1	On-Road Vehicles	479,486
2	Airport Operations	155
	Total	**479,641**

Energy		
	Sources:	**Metric tons of CO_2e**
1	Electric	83,234
2	Natural Gas	150,392
	Total	**233,626**

Solid Waste		
	Source	**Metric tons of CO_2e**
1	Solid Waste Disposal	12,006
2	Green Waste Recycling	Data Not Available
3	Materials Recycling	Data Not Available
	Total	**12,006**

Landscape Emissions		
	Sources:	**Metric tons of CO_2e**
1	Landscape Emissions	36
2	Carbon sink from CO_2 sequestration	Data Not Available
	Total	**36**

Agriculture		
	Sources:	**Metric tons of CO_2e**
1	Enteric Fermentation	24,248
2	Manure Management	29,780
3	Rice Cultivation	177,933
4	Agricultural Residue Burning	3,011
5	Crop Growth	378,097
6	Animals and Runoff	77,806
7	Fertilizer Use	101,392
	Total	**792,267**

Net Total Emissions	
Category	**Metric tons of CO_2e**
Energy	233,626
Solid Waste	12,006
Landscape Emissions	36
Agriculture	792,267
Transportation	479,641
Total	**1,517,575**

Sutter County
Emissions by Land Use
2020
Business As Usual (BAU) Inventory
By Land Use Category

Source Type		CO_2e MT/yr			
		CO_2	CH_4	N_2O	combined CO_2e
Residential	AG/RAN/ER	219,378.12	6,099.99	7,589.19	233,067
	Low Density Residential	116,520.47	3,239.93	4,030.90	123,791
	Medium Density Residential	41,563.80	1,155.81	1,430.05	44,150
	High Density Residential	16,865.03	469.00	580.28	17,914
	Total Residential	**394,327.41**	**10,964.73**	**13,630.43**	**418,923**
Commercial	Park	125.32	2.15	2.67	130
	Commercial	82,333.87	1,430.43	1,776.54	85,541
	Mixed Use	12,863.58	223.46	277.54	13,365
	Total Commercial	**95,322.76**	**1,656.04**	**2,056.75**	**99,036**
Industrial	Industrial	199,673.58	3,367.89	4,308.44	207,350
	Total Industrial	**199,673.58**	**3,367.89**	**4,308.44**	**207,350**
Agriculture		0.00	232,326.97	559,940.39	792,267
	Total	**689,323.76**	**248,315.64**	**579,936.01**	**1,517,575**

Sutter County
Input data for Green House Gas Emissions
2020 Inventory

Land Use Type (units)	Total Trips	Total VMT	Total Trips	Total VMT	2020 Unit Totals	Unit Type
AG/RAN/ER	**53,628.96**	**584555.63**	**53628.96**	**584555.63**	**5804**	**du**
Low Density Residential	**57703.8**	**628971.38**	**57703.8**	**628971.38**	**6245**	**du**
Medium Density Residential	**20586.72**	**224395.23**	**20586.72**	**224395.23**	**2228**	**du**
High Density Residential	**8352.96**	**91047.26**	**8352.96**	**91047.26**	**904**	**du**
Park	**6.41**	**69.87**	**6.41**	**69.87**	**27,921,960.00**	**Sq/ft**
Commercial	**72491.62**	**790158.58**	**72491.62**	**790158.58**	**3,278,683.00**	**Sq/ft**
Mixed Use	**11327.62**	**123471.02**	**11327.62**	**123471.02**	**512,333.00**	**Sq/ft**
Industrial	**27749.76**	**302472.36**	**27749.76**	**302472.36**	**7,951,216.00**	**Sq/ft**
Total	251847.85	2745141.33	251847.85	2745141.33		

Sutter County
Input data for Green House Gas Emissions
2020 Inventory

Land Use Type (units)	Natural gas usage rate (MMBTU/yr)	Electricity (kWh/yr)	Potable Water Usage (gallons/year)	Solid Waste (lbs/year)	% Total Square Foot - SFR/MFR/Non-Res	% Total Square Foot - Res/Non-Res	% Total Square Foot
AG/RAN/ER	399,431	67,615,633	28,235,012	94,469,228	100.00%	55.63%	38.40%
Low Density Residential	212,147	35,912,260	14,996,281	50,176,090	66.60%	29.55%	20.39%
Medium Density Residential	75,689	12,812,611	5,350,305	17,899,821	23.76%	10.54%	7.28%
High Density Residential	30,708	5,198,211	2,170,675	7,263,268	9.64%	4.28%	2.95%
Park	765	97,340	1,240	31,986	0.04%	0.04%	0.01%
Commercial	496,573	63,180,195	804,827	21,278,028	27.91%	27.91%	8.65%
Mixed Use	77,591	9,872,047	125,756	3,324,077	4.36%	4.36%	1.35%
Industrial	1,204,266	153,221,593	1,951,829	51,603,155	67.69%	67.69%	20.97%
Total	2,497,170	347,909,889	53,635,924	246,045,652			

Sutter County
Input data for Green House Gas Emissions
2020 Inventory

City Parks

Year	# of City Parks	Estimated SQ / "building"	Estimated Buildings per
2020	10	500	1
2009	10	500	1

Airport

Year	# of planes	Gallons fuel per day	Annual days of operation	Annual Fuel Usage (g/yr)
2020	77	50.00	365	18,250
2009	77	50	365	18,250

Operational(*2a,b) / Area Scenario(*3a,b)	Vehicle			Natural Gas			Total Vehicle + Natural Gas
	Summer	Winter	tons/Year	Summer	Winter	Year	
2020	2,882,591.94	2,519,716.84	503,998.13	0.00	0.00	0.00	503,998.13
2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Area Scenario(*3b,c)	Landscaping			Hearth		
	Summer	Winter	Year	Summer	Winter	Year
2020	435.67	422,386.44	39.21	0.00	0.00	17,317.84
2009	0.00	0.00	0.00	0.00	0.00	0.00

Vehicle Type	Fleet %		Non-Catalyst		Catalyst		Diesel	
Light Auto	39.60	0.3960	0.00	0.0000	100.00	1.0000	0.00	0.0000
Light Truck <3,750 lbs	19.30	0.1930	0.00	0.0000	95.90	0.9590	4.10	0.0410
Light Truck 3,751-5,750 lbs	19.70	0.1970	0.00	0.0000	100.00	1.0000	0.00	0.0000
Med Truck 5,751-8,500 lbs	9.30	0.0930	0.00	0.0000	100.00	1.0000	0.00	0.0000
Lite-Heavy Truck 8,501-10,000 lbs	2.50	0.0250	0.00	0.0000	72.00	0.7200	28.00	0.2800
Lite-Heavy Truck 10,001-14,000 lbs	0.90	0.0090	0.00	0.0000	55.60	0.5560	44.40	0.4440
Med-Heavy Truck 14,001 - 33,000 lbs	1.60	0.0160	0.00	0.0000	18.80	0.1880	81.20	0.8120
Heavy-Heavy Truck 33,001-60,000 lbs	1.70	0.0170	0.00	0.0000	0.00	0.0000	100.00	1.0000
Other bus	0.10	0.0010	0.00	0.0000	0.00	0.0000	100.00	1.0000
Urban bus	0.00	0.0000	0.00	0.0000	0.00	0.0000	100.00	1.0000
Motorcycle	4.00	0.0400	40.00	0.4000	60.00	0.6000	0.00	0.0000
School Bus	0.10	0.0010	0.00	0.0000	0.00	0.0000	100.00	1.0000
Motor Home	1.20	0.0120	0.00	0.0000	83.30	0.8330	16.70	0.1670

Disposal Facility	Jurisdiction?	No		Type of Facility:	Landfill w/ Combination		year began:	2009
Landfill	Landfill Total	City's % of	Daily Hours of	Hours	Days per year	% Waste	Distance (one	Round Trip
Recology Landfill	123,022.83	30.06%	9	2.71	313.00	100	4.81	9.62
		0.00%		0.00		0		
		0.00%		0.00		0		
		0.00%		0.00		0		
				2.71	313.00	**Total**		**9.62**

Sutter County
Input data for Green House Gas Emissions
2020 Inventory

Electrical Usage

121,538,715 Total 2020 Residential Electrical Usage
226,371,174 Total 2020 Non-Residential Electrical Usage

total 2020	2020 total growth	% total growth	GP area 2030	2008	
				37,634	County facilities located in Yuba City
				214	County facilities located in Live Oak City
				25,475	County facilities located in Unincorporated Sutte
				83,676,413	Residential in Unincorporated Sutter County
121,538,715	**37,798,979**	**40.35%**	**93,676,945**	**83,739,736**	**Total Residential**
				6,062,361	County facilities located in Yuba City
				88,361	County facilities located in Live Oak City
				793,010	County facilities located in Unincorporated Sutte
				38,211,643	Commercial in Unincorporated Sutter County
				89,160,499	Industrial in Unincorporated Sutter County
226,371,174	**92,055,300**	**40.12%**	**229,436,077**	**134,315,874**	**Total commercial/industrail**

Water Usage

	total 2020	2020 total growth	% total growth	GP area 2030	2008	gallons/year
50,752,272	50,752,272	8,710,982			42,041,290	Residential (gallons per year)
2,883,652	2,883,652	494,942			2,388,710	Commercial/Institutional/Industrial (gallons/year)
		9,205,924	**40.24%**	**22,879,600**	**44,430,000**	total water usage

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Solid Waste for Unincorporated Sutter County

	total 2020	2020 total growth	% total growth	2030 County	2008	
246,045,652					**39,837,195**	**lbs/year**
	49,932,599	41,566,788	40.35%	103,014,680	8,365,811	Residential in Unincorporated Sutter County
	196,113,053	164,641,669	40.12%	410,348,330	31,471,384	Non-Residential in Unincorporated Sutter Count

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Natural Gas Data

717,975 Total Residential Natural gas usage rate (MMBTU/yr)
1,779,195 Total Non-Residential Natural gas usage rate (MMBTU/yr)

total 2020	2020 total growth	% total growth	2030 GP area	2008	MMBTU
				13.50	County facilities located in Yuba City
				0.20	County facilities located in Live Oak City
				0.00	County facilities located in Unincorporated Sutte
				268,658.68	Residential in Unincorporated Sutter County
717,975	**449,302**	**40.35%**	**1,113,502**	**268,672**	**Total Residential**
				14,853	County facilities located in Yuba City
				312	County facilities located in Live Oak City
				501	County facilities located in Unincorporated Sutte
				1,504,713	Commercial in Unincorporated Sutter County
1,779,195	**258,817**	**40.12%**	**645,067**	**1,520,379**	**Total Commercial**

Sutter County
Input data for Agriculture
2020

	Enteric Fermentation Emission Factor (EF_{MEF})	Typical Animal Mass - kg- (TAM)	Volatile Solids -kg VS/1000kg mass/day-	Max CH_4 Capacity - m^3CH_4/kg VS- (B_O)	K-Nitrogen - kg/day/1000kg animal mass- (K_N)	Number of Head
	EF used	EF used	EF used	EF used	EF used	
Dairy Cow						
Dairy Cows	123.4	604.0	9.0	0.2	0.4	**8,293**
Other						
Sheep on Feed	8.0	27.0	9.2	0.4	0.4	16,397

Sutter County
Input data for Agriculture
2020

	Residue/Crop Ratio (R_{RC})	Fraction Residue Burned (F_{RB})	Fraction Dry Matter (F_{DM})	Burning Efficiency (BE)	Combustion Efficiency (CE)	Carbon Content (CC)	Fraction of Residue Applied (F_{RA})	Nitrogen Content of Residue (NC)
	EF used	EF used	EF used	EF used	EF used	EF used	EF used	EF used
Hay (inc Alfalfa)	0.0	0.00	0.85	0.00	0.00	0.00	0.00	N/A
Barley	1.2	0.03	0.93	0.93	0.88	0.45	0.90	0.01
Dry Edible Beans	2.1	0.00	0.87	0.00	0.00	0.00	1.60	0.02
Corn	1.0	0.03	0.91	0.93	0.88	0.45	0.90	0.01
Corn for Grain	1.0	0.00	0.91	0.00	0.00	0.00	0.90	0.01
Oats	1.3	0.00	0.92	0.00	0.00	0.00	0.90	0.01
Rice	1.4	0.10	0.91	0.93	0.88	0.38	1.00	0.01
Sorghum	1.4	0.00	0.91	0.00	0.00	0.00	0.90	0.01
All Wheat	1.3	0.03	0.93	0.93	0.88	0.44	0.90	0.01
Potatoes (inc Sweet)	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cotton	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sugar Beet	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vegetable Crops & Fruit Trees	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Safflower & Sunflower	0.0	0.03	0.87	0.93	0.88	0.45	0.90	0.02

Sutter County
Input data for Agriculture
2020

		Growing Season Emission Factor		
Primary		EF used	Entered	Default
		210		210
Rattoon		780		780
		State	*Project*	*% of State ($\%_P$)*
Total acres	2020	7,667,570	218,282.00	0.0284682
Total acres	2021	7,667,570	218,282.00	0.0284682
Climate Zone	Temperate	Yes	Sub Tropic	No

	2020					2021				
	Primary (Acres Harvested)	Annual Yield	Unit of Yield	Annual Yield (MT/yr)	State Acres Harvested	Primary (Acres Harvested)	Annual Yield	Unit of Yield	Annual Yield (MT/yr)	State Acres Harvested
Hay (inc Alfalfa)	11,138	66,983	tons	60,766	1,610,000	11,138	66,983	tons	60,766	1,610,000
Barley			tons		60,000	0	0	tons		60,000
Dry Edible Beans	8,446	8,459	tons	7,674	51,900	8,446	8,459	tons	7,674	51,900
Corn			tons	0	495,000	0	0	tons	0	495,000
Corn for Grain	7,720	47,941	tons	43,491	170,000	7,720	47,941	tons	43,491	170,000
Oats	2,035	24,223	tons	21,975	25,000	2,035	24,223	tons	21,975	25,000
Rice	99,699	409,137	tons	371,163	517,000	99,699	409,137	tons	371,163	517,000
Sorghum	572	2,168	tons	1,967	9,000	572	2,168	tons	1,967	9,000
All Wheat	7,631	48,493	tons	43,992	545,000	7,631	48,493	tons	43,992	545,000
Potatoes (inc Sweet)			tons	0	53,200	0	0	tons	0	53,200
Cotton			bales		268,000	0	0	bales		268,000
Sugar Beet					25,300	0	0			25,300
Vegetable Crops & Fruit T	66,815	511,775	tons	464,274	3,734,170	66,815	511,775	tons	464,274	3,734,170
Safflower & Sunflower	14,226	12,673	tons	11,497	104,000	14,226	12,673	tons	11,497	104,000

Sutter County
Input data for Green House Gas Emissions
2020
Business As Usual (BAU) Inventory
Carbon Dioxide

A. Direct Sources

A1-3. Mobile (Construction Equipment, Motor Vehicles, and Landscape Equipment)

Con (MT/yr)	Motor Vehicles (MT/yr)	Landscape (MT/yr) (E_{Cls})	Hearth (MT/yr) (E_{Cwood})	MT/yr
0.00	457,219.54	35.57	15,710.48	**472,965.60**
0.00	0.97	0.00		

Fuel emissions from Airports

Annual Fuel Usage (U_{AAF})	kg/gallon (EF_{CAF})	kg/MT (C_3)	MT/yr (E_{CAF})
18,250.00	8.32	1,000.00	**151.84**

A4. Stationary Sources (Natural Gas)

Unit Type	MMBTU/yr (U_{Ang})	kg/MMBTU (EF_{Cng})	kg/MT (C_3)	MT/yr (E_{Cng})
AG/RAN/ER	399,431	53.07	1,000.00	21,197.8
Low Density Residential	212,147	53.07	1,000.00	11,258.6
Medium Density Residential	75,689	53.07	1,000.00	4,016.8
High Density Residential	30,708	53.07	1,000.00	1,629.7
Park	765	53.07	1,000.00	40.6
Commercial	496,573	53.07	1,000.00	26,353.2
Mixed Use	77,591	53.07	1,000.00	4,117.7
Industrial	1,204,266	53.07	1,000.00	63,910.4
			Total (MT/year)	**132,524.8**

B. Indirect Sources

B1. Electricity

Unit Type	kWh/yr	Unit	Unit type	MWh/yr (U_{Ae})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{Cele})
AG/RAN/ER	67615633	5,804	du	67,616	524.00	2,204.62	16,071.06
Low Density Residential	35912260	6,245	du	35,912	524.00	2,204.62	8,535.72
Medium Density Residential	12812611	2,228	du	12,813	524.00	2,204.62	3,045.34
High Density Residential	5198210.8	904	du	5,198	524.00	2,204.62	1,235.52
Park	97339.605	27,921,960	Sq/ft	97	524.00	2,204.62	23.14
Commercial	63180195	3,278,683	Sq/ft	63,180	524.00	2,204.62	15,016.84
Mixed Use	9872046.9	512,333	Sq/ft	9,872	524.00	2,204.62	2,346.42
Industrial	153221593	7,951,216	Sq/ft	153,222	524.00	2,204.62	36,418.12
						Total (MT/year)	**82,692.16**

Sutter County
Input data for Green House Gas Emissions
2020
Business As Usual (BAU) Inventory
Carbon Dioxide

B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWh/yr (U_{epot})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{Cpot})
AG/RAN/ER	du	5,804	28.2350	3.50	98.82	524.00	2,204.62	23.49
Low Density Residential	du	6,245	14.9963	3.50	52.49	524.00	2,204.62	12.48
Medium Density Residential	du	2,228	5.3503	0.01	0.05	804.54	2,000	0.02
High Density Residential	du	904	2.1707	0.01	0.02	804.54	2,000	0.01
Park	Sq/ft	27,921,960	0.0012	3.50	0.00	524.00	2,204.62	0.00
Commercial	Sq/ft	3,278,683	0.8048	3.50	2.82	524.00	2,204.62	0.67
Mixed Use	Sq/ft	512,333	0.1258	3.50	0.44	524.00	2,204.62	0.10
Industrial	Sq/ft	7,951,216	1.9518	3.50	6.83	524.00	2,204.62	1.62
							Total (MT/year)	**38.39**

B3. Solid Waste

B3a. Anthropogenic Carbon
CO_2 emissions are considered anthropogenic and are not counted in this inventory.
B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{CWT})	g/MT (C_6)	tons/yr (E_{CWT})
AG/RAN/ER	47,234.61	0.1125	33	9.62	3,464.164	1,000,000	424.00
Low Density Residential	25,088.04	0.1125	33	9.62	3,464.164	1,000,000	225.20
Medium Density Residential	8,949.91	0.1125	33	9.62	3,464.164	1,000,000	80.34
High Density Residential	3,631.63	0.1125	33	9.62	3,464.164	1,000,000	32.60
Park	15.99	0.2250	33	9.62	3,464.164	1,000,000	0.07
Commercial	10,639.01	0.2250	33	9.62	3,464.164	1,000,000	47.75
Mixed Use	1,662.04	0.2250	33	9.62	3,464.164	1,000,000	7.46
Industrial	25,801.58	0.2250	33	9.62	3,464.164	1,000,000	115.80
						Total (MT/year)	**933.22**

B3c. Exhaust Emissions (Disposal Equipment)

Vehicle Type	# of equip	lbs/hr (EF_{CWD})	hrs/day (h)	days/yr (n)	lbs/MT (C_1)	MT/yr (E_{CWD})
Excavator	0	119.60	2.71	313	2,205	0.00
Grader	0	132.70	2.71	313	2,205	0.00
Off-Highway Tractor	0	151.50	2.71	313	2,205	0.00
Off-Highway Truck	0	260.10	2.71	313	2,205	0.00
Rubber Tired Dozer	0	239.00	2.71	313	2,205	0.00
Disposal Facility run by City?					No	0.00
					Total (MT/year)	**0.00**

Sutter County
Input data for Green House Gas Emissions
2020
Business As Usual (BAU) Inventory
Carbon Dioxide

B4. Wastewater

Unit Type	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG	MWh/yr (U_{eWW})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{CWW})
AG/RAN/ER	28.2350	0.65	18.35275	1.911	35.072105	524.00	2,205	8.34
Low Density Residential	14.9963	0.82	12.296966	1.911	23.499502	524.00	2,205	5.59
Medium Density Residential	5.3503	0.82	4.387246	1.911	8.3840271	524.00	2,205	1.99
High Density Residential	2.1707	0.82	1.779974	1.911	3.4015303	524.00	2,205	0.81
Park	0.0012	0.71	0.000852	1.911	0.0016282	524.00	2,205	0.00
Commercial	0.8048	0.71	0.571408	1.911	1.0919607	524.00	2,205	0.26
Mixed Use	0.1258	0.71	0.089318	1.911	0.1706867	524.00	2,205	0.04
Industrial	1.9518	0.8	1.56144	1.911	2.9839118	524.00	2,205	0.71
							Total (MT/year)	17.73

C. Reserved for AG emissions for CH_4 and N_2O, not applicable for CO_2.

D. Summary Table

Source Type		Emissions, MT /yr	CO_2E metric tons/yr
Direct	Construction equipment	0.00	0.00
	Motor vehicles & Aircraft	457371.38	457,371.38
	Landscape equipment	35.57	35.57
	Cooling and heating	148235.30	148,235.30
Total direct, tons/yr		**605642.25**	**605642.25**
Indirect	Electricity	82692.16	82,692.16
	Potable water	38.39	38.39
	Solid waste	933.22	933.22
	Wastewater	17.73	17.73
Total indirect, tons/yr		**83,681.50**	**83,681.50**
Total, tons/yr		**689,323.76**	**689,323.76**
Global warming potential index		**1**	

Source Type		Emissions, MT/yr	CO_2e metric tons/yr
Residential	AG/RAN/ER	219,378.12	219,378.12
	Low Density Residential	116,520.47	116,520.47
	Medium Density Residential	41,563.80	41,563.80
	High Density Residential	16,865.03	16,865.03
	Total Residential	**394,327.41**	**394,327.41**
Commercial	Park	125.32	125.32
	Commercial	82,333.87	82,333.87
	Mixed Use	12,863.58	12,863.58
	Total Commercial	**95,322.76**	**95,322.76**
Industrial	Industrial	199,673.58	199,673.58
	Total Industrial	**199,673.58**	**199,673.58**
Total, tons/yr		**689,323.76**	**689,323.76**
Global warming potential index		1	

Sutter County
Input data for Green House Gas Emissions
2020
Business As Usual (BAU) Inventory
Methane

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Unit Type	gallons/yr (U_{AG})	gr/gallon (EF_{MHDV})	gr/MT (C_6)	MT/yr (E_{MCON})
Construction Equipment	0.00	0.0580	1,000,000	**0.00**

A2. Mobile Source (Motor Vehicles)

Unit Type	miles/yr (M)	gr/mile (EF_{MMV})	gr/MT (C_6)	tons/yr (E_{MMV})
Non Cat passenger Car	0.00	0.1696	1,000,000	0.00
Cat passenger Car	396782727.66	0.1355	1,000,000	53.76
Diesel Passenger Car	0.00	0.0006	1,000,000	0.00
Non cat light-duty truck	0.00	0.1908	1,000,000	0.00
Cat light duty truck	185452840.19	0.1516	1,000,000	28.11
Diesel Light duty Truck	7928640.72	0.0011	1,000,000	0.01
Non Cat light-duty truck 2	0.00	0.1908	1,000,000	0.00
Cat light duty truck 2	197389387.25	0.1516	1,000,000	29.92
Diesel Light duty truck 2	0.00	0.0011	1,000,000	0.00
Non Cat Medium duty Truck	0.00	0.4181	1,000,000	0.00
Cat med duty truck	93183822.41	0.2356	1,000,000	21.95
Diesel Med duty truck	0.00	0.0051	1,000,000	0.00
Non Cat lite-heavy duty truck	0.00	0.4181	1,000,000	0.00
Cat Light-heavy duty truck	18035578.53	0.2356	1,000,000	4.25
Diesel Lite-heavy duty truck	7013836.10	0.0051	1,000,000	0.04
Non Cat lite-heavy duty truck 2	0.00	0.4181	1,000,000	0.00
Cat Light-heavy duty truck 2	5013890.83	0.2356	1,000,000	1.18
Diesel Lite-heavy duty truck 2	4003898.43	0.0051	1,000,000	0.02
Non Cat med-heavy duty truck	0.00	0.4181	1,000,000	0.00
Cat med-heavy duty truck	3013945.57	0.2356	1,000,000	0.71
Diesel med-heavy duty truck	13017679.79	0.0051	1,000,000	0.07
Non cat Heavy Duty truck	0.00	0.4181	1,000,000	0.00
Cat heavy duty truck	0.00	0.2356	1,000,000	0.00
Diesel heavy duty truck	17033601.95	0.0051	1,000,000	0.09
Non Cat Other Bus	0.00	0.4181	1,000,000	0.00
Cat other bus	0.00	0.2356	1,000,000	0.00
Diesel Other Bus	1001976.59	0.0051	1,000,000	0.01
Non Cat Urban Bus	0.00	0.4181	1,000,000	0.00
Cat Urban Bus	0.00	0.2356	1,000,000	0.00
Diesel Urban Bus	0.00	0.0051	1,000,000	0.00
Non cat motorcycle	16031625.36	0.0672	1,000,000	1.08
Cat motorcycle	24047438.04	0.0672	1,000,000	1.62
Diesel Motorcycle	0.00	0.0000	1,000,000	0.00
Non Cat School Bus	0.00	0.4181	1,000,000	0.00
Cat School Bus	0.00	0.2356	1,000,000	0.00
Diesel School Bus	1001976.59	0.0051	1,000,000	0.01
Non Cat Motor home	0.00	0.4181	1,000,000	0.00
Cat Motor home	10015757.94	0.2356	1,000,000	2.36
Diesel Motor home	2007961.08	0.0051	1,000,000	0.01
			Total (MT/yr)	**145.20**

Emissions from Aviation Fuel

Gasoline gallons/ year (U_{AAF})	gr/gallon (EF_{Maf})	gr/MT (C_6)	MT/yr (E_{Maf})
18,250.00	7.04	1,000,000	**0.13**

Sutter County
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A3. Mobile Source (Landscape Equipment)

Gasoline gallons/ year (G_F)	gr/gallon (EF_{MF})	gr/MT (C_6)	MT/yr (E_{MIs})
4,042.26	0.50	1,000,000	**0.00**

A4. Wood burning Hearth

MMBtu	kg/MMBtu (EF_{Mwood})	kg/MT (C_3)	MT/yr (E_{MIs})
241,627.25	0.32	1,000	**76.35**

A5. Stationary Source (Cooling and Heating) - Natural Gas

Land Use Type	Unit Type	Units	MMBTUs/yr (U_{Ang})	kg/MMBTU (EF_{Mng})	kg/MT (C_3)	MT/yr (E_{Mng})
AG/RAN/ER	du	5,804	399,431	0.005	1,000	1.9972
Low Density Residential	du	6,245	212,147	0.005	1,000	1.0607
Medium Density Residential	du	2,228	75,689	0.005	1,000	0.3784
High Density Residential	du	904	30,708	0.005	1,000	0.1535
Park	Sq/ft	27,921,960	765	0.005	1,000	0.0038
Commercial	Sq/ft	3,278,683	496,573	0.005	1,000	2.4829
Mixed Use	Sq/ft	512,333	77,591	0.005	1,000	0.3880
Industrial	Sq/ft	7,951,216	1,204,266	0.001	1,000	1.2043
					Total (MT/yr)	**7.67**

B. Indirect Sources

B1. Electricity

Land Use Type	Unit Type	Units	kWh/year	MWh/yr (U_{Ae})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	tons/yr (E_{Mele})
AG/RAN/ER	du	5,804	67,615,633	67,616	0.0302	2,205	0.926
Low Density Residential	du	6,245	35,912,260	35,912	0.0302	2,205	0.492
Medium Density Residential	du	2,228	12,812,611	12,813	0.0302	2,205	0.176
High Density Residential	du	904	5,198,211	5,198	0.0302	2,205	0.071
Park	Sq/ft	27,921,960	97,340	97	0.0302	2,205	0.001
Commercial	Sq/ft	3,278,683	63,180,195	63,180	0.0302	2,205	0.865
Mixed Use	Sq/ft	512,333	9,872,047	9,872	0.0302	2,205	0.135
Industrial	Sq/ft	7,951,216	153,221,593	153,222	0.0302	2,205	2.099
						Total (MT/yr)	**4.766**

B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWH/yr (U_{epot})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	tons/yr (E_{Mpot})
AG/RAN/ER	du	5,804	28.23501	3.50	98.82	0.0302	2,205	0.00135
Low Density Residential	du	6,245	14.99628	3.50	52.49	0.0302	2,205	0.00072
Medium Density Residential	du	2,228	5.35030	3.50	18.73	0.0302	2,205	0.00026
High Density Residential	du	904	2.17067	3.50	7.60	0.0302	2,205	0.00010
Park	Sq/ft	27,921,960	0.00124	3.50	0.00	0.0302	2,205	0.00000
Commercial	Sq/ft	3,278,683	0.80483	3.50	2.82	0.0302	2,205	0.00004
Mixed Use	Sq/ft	512,333	0.12576	3.50	0.44	0.0302	2,205	0.00001
Industrial	Sq/ft	7,951,216	1.95183	3.50	6.83	0.0302	2,205	0.00009
							Total (MT/yr)	**0.00257**

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B3. Solid Waste

B3a. Fugitive Emissions

Unit Type	Unit Type	unit	tons/yr (U_{SW})	MT CO_2e/ton (EF_{MWF})	MT CO_2e/yr (E_{MWF})
AG/RAN/ER	du	5,804	47,235	0.09	4,251.12
Low Density Residential	du	6,245	25,088	0.09	2,257.92
Medium Density Residential	du	2,228	8,950	0.09	805.49
High Density Residential	du	904	3,632	0.09	326.85
Park	Sq/ft	27,921,960	16	0.09	1.44
Commercial	Sq/ft	3,278,683	10,639	0.09	957.51
Mixed Use	Sq/ft	512,333	1,662	0.09	149.58
Industrial	Sq/ft	7,951,216	25,802	0.09	2,322.14
				Total (MT/yr)	**11,072.05**

B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{MWT})	gr/MT (C_6)	tons/yr (E_{MWT})
AG/RAN/ER	47,234.6140	0.1125	33	9.62	0.00510	1,000,000	0.000624
Low Density Residential	25,088.0449	0.1125	33	9.62	0.00510	1,000,000	0.000332
Medium Density Residential	8,949.9106	0.1125	33	9.62	0.00510	1,000,000	0.000118
High Density Residential	3,631.6338	0.1125	33	9.62	0.00510	1,000,000	0.000048
Park	15.9930	0.2250	33	9.62	0.00510	1,000,000	0.000000
Commercial	10,639.0140	0.2250	33	9.62	0.00510	1,000,000	0.000070
Mixed Use	1,662.0384	0.2250	33	9.62	0.00510	1,000,000	0.000011
Industrial	25,801.5773	0.2250	33	9.62	0.00510	1,000,000	0.000170
						Total (MT/yr)	**0.001373**

B3c. Exhaust Emissions (Disposal Equipment)

Vehicle Type	# of equip	lbs/hr (EF_{MWD})	hrs/day (h)	days/yr (n)	lbs/MT (C_1)	MT/yr (E_{MWD})
Excavator	0	0.0164	2.71	313	2,205	0.00
Grader	0	0.0185	2.71	313	2,205	0.00
Off-Highway Tractor	0	0.0243	2.71	313	2,205	0.00
Off-Highway Truck	0	0.0260	2.71	313	2,205	0.00
Rubber Tired Dozer	0	0.0342	2.71	313	2,205	0.00
Disposal Facility run by City?					No	0.00
					Total (MT/yr)	**0.00**

B4. Wastewater

Land Use Type	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG (C_5)	MWh/yr (U_{eWW})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	MT/yr (E_{MWW})
AG/RAN/ER	28.23501	65	18.35	1.91	35.07	0.0302	2,205	0.000480
Low Density Residential	14.99628	82	12.30	1.91	23.50	0.0302	2,205	0.000322
Medium Density Residential	5.35030	82	4.39	1.91	8.38	0.0302	2,205	0.000115
High Density Residential	2.17067	82	1.78	1.91	3.40	0.0302	2,205	0.000047
Park	0.00124	71	0.00	1.91	0.00	0.0302	2,205	0.000000
Commercial	0.80483	71	0.57	1.91	1.09	0.0302	2,205	0.000015
Mixed Use	0.12576	71	0.09	1.91	0.17	0.0302	2,205	0.000002
Industrial	1.95183	80	1.56	1.91	2.98	0.0302	2,205	0.000041
							Total (MT/yr)	**0.001022**

Sutter County
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Methane

C. See Methane Emissions from AG Formula Spreadsheet (entered into table below under commercial AG)
D. Summary Table

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Direct	Construction equipment	0.00	0.00
	Motor vehicles & Aviation Fuel	145.33	3,051.90
	Landscape equipment	0.00	0.04
	Cooling and heating	84.02	1,764.48
	Total direct, tons/yr	**229.35**	**4,816.42**
Indirect	Electricity	4.77	100.08
	Potable water	0.00	0.05
	Solid waste	11,072.06	11,072.08
	Wastewater	0.00	0.02
	Total indirect, tons/yr	**11,076.83**	**11,172.24**
	Total from Agriculture	**11,063.19**	**232,326.97**
	Total, tons/yr	***22,369.37***	***248,315.64***
	Global warming potential index	**21**	

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Residential	AG/RAN/ER	4,339.1076	6,099.99
	Low Density Residential	2,304.6601	3,239.93
	Medium Density Residential	822.1646	1,155.81
	High Density Residential	333.6123	469.00
	Total Residential	**7,799.54**	**10,964.73**
Commercial	Park	1.4733	2.15
	Commercial	980.0199	1,430.43
	Mixed Use	153.0999	223.46
	Total Commercial	**1,134.59**	**1,656.04**
Industrial	Industrial	2,371.9124	3,367.89
	Total Industrial	**2,371.9124**	**3,367.89**
	Total from Agriculture	**11,063.19**	**232,326.97**
	Total, tons/yr	***22,369.24***	***248,315.64***
	Global warming potential index	21	

Sutter County
Input data for Green House Gas Emissions
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Business As Usual (BAU) Inventory
Nitrous Oxide

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Unit Type	gallons/yr (U_{AG})	gr/gallon (EF_{NHDV})	gr/MT (C_6)	MT/yr (E_{NCON})
Non cat heavy-duty truck	0.00	0.0260	1,000,000	**0.00000**

A2. Mobile Source (Motor Vehicles)

Unit Type	miles/yr (M)	gr/mile (EF_{NMV})	gr/MT (C_6)	MT/yr (E_{NMV})
Non Cat passenger Car	0	0.0197	1,000,000	0.00000
Cat passenger Car	396,782,728	0.0504	1,000,000	19.99785
Diesel Passenger Car	0	0.0012	1,000,000	0.00000
Non cat light-duty truck	0	0.0218	1,000,000	0.00000
Cat light duty truck	185,452,840	0.0639	1,000,000	11.85044
Diesel Light duty Truck	7,928,641	0.0017	1,000,000	0.01348
Non Cat light-duty truck 2	0	0.0218	1,000,000	0.00000
Cat light duty truck 2	197,389,387	0.0639	1,000,000	12.61318
Diesel Light duty truck 2	0	0.0017	1,000,000	0.00000
Non Cat Medium duty Truck	0	0.0473	1,000,000	0.00000
Cat med duty truck	93,183,822	0.1317	1,000,000	12.27231
Diesel Med duty truck	0	0.0048	1,000,000	0.00000
Non Cat lite-heavy duty truck	0	0.0473	1,000,000	0.00000
Cat Light-heavy duty truck	18,035,579	0.1317	1,000,000	2.37529
Diesel Lite-heavy duty truck	7,013,836	0.0048	1,000,000	0.03367
Non Cat lite-heavy duty truck 2	0	0.0473	1,000,000	0.00000
Cat Light-heavy duty truck 2	5,013,891	0.1317	1,000,000	0.66033
Diesel Lite-heavy duty truck 2	4,003,898	0.0048	1,000,000	0.01922
Non Cat med-heavy duty truck	0	0.0473	1,000,000	0.00000
Cat med-heavy duty truck	3,013,946	0.1317	1,000,000	0.39694
Diesel med-heavy duty truck	13,017,680	0.0048	1,000,000	0.06248
Non cat Heavy Duty truck	0	0.0473	1,000,000	0.00000
Cat heavy duty truck	0	0.1317	1,000,000	0.00000
Diesel heavy duty truck	17,033,602	0.0048	1,000,000	0.08176
Non Cat Other Bus	0	0.0473	1,000,000	0.00000
Cat other bus	0	0.1317	1,000,000	0.00000
Diesel Other Bus	1,001,977	0.0048	1,000,000	0.00481
Non Cat Urban Bus	0	0.0473	1,000,000	0.00000
Cat Urban Bus	0	0.1317	1,000,000	0.00000
Diesel Urban Bus	0	0.0048	1,000,000	0.00000
Non cat motorcycle	16,031,625	0.0069	1,000,000	0.11062
Cat motorcycle	24,047,438	0.0069	1,000,000	0.16593
Diesel Motorcycle	0	0.0000	1,000,000	0.00000
Non Cat School Bus	0	0.0473	1,000,000	0.00000
Cat School Bus	0	0.1317	1,000,000	0.00000
Diesel School Bus	1,001,977	0.0048	1,000,000	0.00481
Non Cat Motor home	0	0.0473	1,000,000	0.00000
Cat Motor home	10,015,758	0.1317	1,000,000	1.31908
Diesel Motor home	2,007,961	0.0048	1,000,000	0.00964
			Total (MT/yr)	**61.99**

Emissions from Aviation Fuel

Gasoline gallons/ year (U_{Aaf})	gr/gallon (EF_{Naf})	gr/lbs (C_6)	MT/yr (E_{NIs})
18,250.00	0.11000	1000000	**0.002008**

Sutter County
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Nitrous Oxide

A3. Mobile Source (Landscape Equipment)

Gasoline gallons/ year	gr/gallon (EF_{Nls})	gr/lbs (C_6)	MT/yr (E_{Nls})
4,042.26	0.22000	1000000	**0.000889**

A4. Wood burning Hearth

MMBtu	kg/MMBtu (EF_{Mwood})	kg/MT (C_3)	MT/yr (E_{Mls})
241,627.25	0.00420	1000	**1.014834**

A5. Stationary Source (Cooling and Heating)

Land Use Type	Unit Type	Units	MMBTUs/yr (U_{Ang})	kg/MMBTU (EF_{Nng})	kg/MT (C_3)	MT/yr (E_{Nng})
AG/RAN/ER	du	5,804	399,431	0.0001	1,000	0.039943
Low Density Residential	du	6,245	212,147	0.0001	1,000	0.021215
Medium Density Residential	du	2,228	75,689	0.0001	1,000	0.007569
High Density Residential	du	904	30,708	0.0001	1,000	0.003071
Park	Sq/ft	27,921,960	765	0.0001	1,000	0.000077
Commercial	Sq/ft	3,278,683	496,573	0.0001	1,000	0.049657
Mixed Use	Sq/ft	512,333	77,591	0.0001	1,000	0.007759
Industrial	Sq/ft	7,951,216	1,204,266	0.0001	1,000	0.120427
					Total (MT/yr)	**0.249718**

B. Indirect Sources

B1. Electricity

Land Use Type	Unit Type	Units	kWh/yr	MWh/yr (U_{Ae})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{Nele})
AG/RAN/ER	du	5,804	67,615,633	67,616	0.0081	2,205	0.24843
Low Density Residential	du	6,245	35,912,260	35,912	0.0081	2,205	0.13195
Medium Density Residential	du	2,228	12,812,611	12,813	0.0037	2,205	0.02150
High Density Residential	du	904	5,198,211	5,198	0.0037	2,205	0.00872
Park	Sq/ft	27,921,960	97,340	97	0.0081	2,205	0.00036
Commercial	Sq/ft	3,278,683	63,180,195	63,180	0.0081	2,205	0.23213
Mixed Use	Sq/ft	512,333	9,872,047	9,872	0.0081	2,205	0.03627
Industrial	Sq/ft	7,951,216	153,221,593	153,222	0.0081	2,205	0.56295
						Total (MT/yr)	**1.24231**

B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWH/yr (U_{epot})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{Npot})
AG/RAN/ER	du	5,804	28.2350117	3.50	98.82	0.0081	2,205	0.000363
Low Density Residential	du	6,245	14.9962814	3.50	52.49	0.0081	2,205	0.000193
Medium Density Residential	du	2,228	5.3503046	3.50	18.73	0.0081	2,205	0.000069
High Density Residential	du	904	2.1706747	3.50	7.60	0.0081	2,205	0.000028
Park	Sq/ft	27,921,960	0.0012400	3.50	0.00	0.0081	2,205	0.000000
Commercial	Sq/ft	3,278,683	0.8048272	3.50	2.82	0.0081	2,205	0.000010
Mixed Use	Sq/ft	512,333	0.1257561	3.50	0.44	0.0081	2,205	0.000002
Industrial	Sq/ft	7,951,216	1.9518286	3.50	6.83	0.0081	2,205	0.000025
							Total (MT/yr)	**0.000690**

Sutter County
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Business As Usual (BAU) Inventory
Nitrous Oxide

B3. Solid Waste

B3a. Fugitive Emissions No Fugitive Nitrous Oxide Emissions

B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{NWT})	gr/MT (C_6)	MT/yr (E_{NWT})
AG/RAN/ER	47,234.61	0.1125	33	9.62	0.0048	1,000,000	0.00058750
Low Density Residential	25,088.04	0.1125	33	9.62	0.0048	1,000,000	0.00031204
Medium Density Residential	8,949.91	0.1125	33	9.62	0.0048	1,000,000	0.00011132
High Density Residential	3,631.63	0.1125	33	9.62	0.0048	1,000,000	0.00004517
Park	15.99	0.2250	33	9.62	0.0048	1,000,000	0.00000010
Commercial	10,639.01	0.2250	33	9.62	0.0048	1,000,000	0.00006616
Mixed Use	1,662.04	0.2250	33	9.62	0.0048	1,000,000	0.00001034
Industrial	25,801.58	0.2250	33	9.62	0.0048	1,000,000	0.00016046
						Total (MT/yr)	**0.001293**

B3c. Exhaust Emissions (Disposal Equipment)

Vehicle Type	# of equip.	lbs/hr (EF_{NWD})	hrs/day (h)	days/yr (n)	lbs/MT (C_1)	tons/yr (E_{NWD})
Excavator	0	0.0074	2.71	313	2,205	0.00
Grader	0	0.0083	2.71	313	2,205	0.00
Off-Highway Tractor	0	0.0109	2.71	313	2,205	0.00
Off-Highway Truck	0	0.0117	2.71	313	2,205	0.00
Rubber Tired Dozer	0	0.0153	2.71	313	2,205	0.00
Disposal Facility run by City?					No	0.00
					Total, tons/yr	**0.00**

B4. Wastewater

AG/RAN/ER	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG (C_5)	MWh/yr (U_{eWW})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{NWW})
AG/RAN/ER	28.24	65	18.35	1.91	35.0721	0.0081	2204.62	0.00012886
Low Density Residential	15.00	82	12.30	1.91	23.4995	0.0081	2204.62	0.00008634
Medium Density Residential	5.35	82	4.39	1.91	8.3840	0.0037	2204.62	0.00001407
High Density Residential	2.17	82	1.78	1.91	3.4015	0.0037	2204.62	0.00000571
Park	0.00	71	0.00	1.91	0.0017	0.0081	2204.62	0.00000001
Commercial	0.80	71	0.57	1.91	1.0920	0.0081	2204.62	0.00000401
Mixed Use	0.13	71	0.09	1.91	0.1706	0.0081	2204.62	0.00000063
Industrial	1.95	80	1.56	1.91	2.9840	0.0081	2204.62	0.00001096
							Total (MT/yr)	**0.00025059**

Sutter County
Input data for Green House Gas Emissions
2020
Business As Usual (BAU) Inventory
Nitrous Oxide

C. See Nitrous Emissions from AG Formula Spreadsheet (entered into table below under commercial AG)
D. Summary Table

Source Type		Emissions, tons/yr	CO_2e metric tons/yr
Direct	Construction equipment	0.00000	0.00
	Motor vehicles + aviation fuel	61.9920	19,217.52
	Landscape equipment	0.0009	0.28
	Cooling and heating	1.2646	392.01
Total direct, tons/yr		**63.2574**	**19,609.81**
Indirect	Electricity	1.2423	385.12
	Potable water	0.0007	0.21
	Solid waste	0.0013	0.40
	Wastewater	0.0003	0.08
Total indirect, tons/yr		**1.2445**	**385.81**
Total From Agriculture		**1,806.26**	**559,940.39**
Total, tons/yr		***1,870.76***	***579,936.01***
Global warming potential index		**310**	

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Residential	AG/RAN/ER	24.4805	7,589.19
	Low Density Residential	13.0025	4,030.90
	Medium Density Residential	4.6129	1,430.05
	High Density Residential	1.8718	580.28
	Total Residential	**43.9677**	**13,630.43**
Commercial	Park	0.0086	2.67
	Commercial	5.7306	1,776.54
	Mixed Use	0.8952	277.54
	Total Commercial	**6.6345**	**2,056.75**
Industrial	Industrial	13.8978	4,308.44
	Total Industrial	**13.8978**	**4,308.44**
Total from Agriculture		**1,806.26**	**559,940.39**
Total, tons/yr		**1,870.76**	**579,936.01**
Global warming potential index		310	

Sutter County
Input data for Green House Gas Emissions
2020
Business As Usual (BAU) Inventory
Agricultural Emissions

CM. Methane

CM1. Enteric Fermentation

Source	Number - Head/year (U_{Aani})	Emission Factor kg CH_4/head (EF_{MEF})	Conversion factor kg to MT (C_3)	MT CH_4/year (E_{MEF})
Dairy Cow				
Dairy Cows	8,293.00	123.42	1000.0	1,023.51
Others				
Sheep	16,397.00	8.00	1000.0	131.18
			Total	**1,154.68**

CM2. Manure Management

Source	Number - 1000s Head/year (U_{Aani})	Typical Animal Mass kg/head (TAM)	Volatile Solids Produced kgVS/1000kg/year (VS)	Max CH_4 capacity m^3CH_4/kgVS (B_O)	Extent Capacity Realized (MCF)	Density of Methane (C_8)	MT CH_4/year (E_{MMM})
Dairy Cow							
Dairy Cows	8.293	604.0	3278.5	0.24	0.499	0.678	1,332.76
Other							
Sheep on Feed	16.397	27.0	3361.7	0.36	0.012	0.678	4.359072539
						Total	**1,337.11**

CM3. Rice Cultivation

Season	Acres (U_{AC})	Conversion hectares/acre (C_{11})	Emission Factor (EF_{PS})	Conversion kg/MT (C_3)	MT/year (E_{MRC})
Primary	99,699	0.40	210	1,000	8,473.00
Rattoon	0	0.40	780	1,000	0.00
				Total	**8,473.00**

Sutter County
Input data for Green House Gas Emissions
2020
Business As Usual (BAU) Inventory
Agricultural Emissions

CM4. Agricultural Residue Burning

Source	Production - Tons (U_C)	Residue/Crop Ratio (R_{RC})	Fraction Burned (F_{RB})	Fraction Dry (F_{DM})	Burning Efficiency (BE)	Combustion Efficiency (CE)	Carbon Content (CC)	Ratio CH_4-C (R_{CH4-C})	Conversion CH_4- to Mol.Wt. (C_{11})	Emissions Tons/year (E_{MARB})
Hay (inc Alfalfa)	60,765.97	0	0.000	0.85	0	0.00	0.00	0.005	1.33	0.00
Dry Edible Beans	7,673.75	2.1	0.000	0.87	0	0.00	0.00	0.005	1.33	0.00
Corn for Grain	43,491.36	1	0.000	0.91	0	0.00	0.00	0.005	1.33	0.00
Oats	21,974.74	1.3	0.000	0.92	0	0.00	0.00	0.005	1.33	0.00
Rice	371,163.14	1.4	0.097	0.91	0.93	0.88	0.38	0.005	1.33	94.54
Sorghum	1,966.78	1.4	0.000	0.91	0	0.00	0.00	0.005	1.33	0.00
All Wheat	43,991.75	1.3	0.030	0.93	0.93	0.88	0.44	0.005	1.33	3.85
Vegetable Crops & Fruit Trees	464,274.43	0	0.030	0.87	0.93	0.88	0.45	0.005	1.33	0.00
Safflower & Sunflower	11,496.73	0	0.000	0.00	0	0.00	0.00	0.005	1.33	0.00
									Total	**98.39**

CN. Nitrous Oxide

CN1. Manure Management

Source	Total Nitrogen Excreted (N_T)	Manure Anaerobic Lagoons ($\%_{AL}$)	Manure Liquid/Slurry ($\%_S$)	Manure Deep Pit ($\%_{DP}$)	Emission Factor for Liquid System (EF_{NML})	N_2O Emissions from Liquid System Mgt.	Manure Solid Storage/ Managed ($\%_{SS}$)	Manure Deep Pit / DryLot ($\%_{DP}$)	Manure Pasture / Poultry ($\%_P$)	Emission Factor for Solid System (EF_{NMS})	N_2O Emissions from solid system Mgt.	Total N_2OMT/yr (E_{NMM})
Dairy Cow												
Dairy Cows	804,440.90	467,234	166,683	*N/A*	0.001	*996.16*	74,355	1,830	*N/A*	0.02	*2,394.41*	3.39
Other												
Sheep on Feed	67,868.82	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	66,678	*N/A*	*N/A*	0.02	*2,095.60*	2.10
											Total	**5.49**

Sutter County
Input data for Green House Gas Emissions
2020
Business As Usual (BAU) Inventory
Agricultural Emissions

CN2. Emissions from Animals and Runoff

Indirect emissions from animals

Source	Total Nitrogen Excreted (N_T)	% of Indirect Volitazition ($\%_{VI}$)	Rate of conversion from NH_3 to NO_X ($EF_{NH3-NOX}$)	Conversion factor for kg to MT (C_3)	Tons/year (E_{NIA})
Dairy Cow					
Dairy Cows	804,440.90	0.20	0.01	1,000	2.53
Other					
Sheep on Feed	67,868.82	0.20	0.01	1,000	0.21
				Total	**2.74**

Direct emissions from animals

Source	Unmanaged Nitrogen (N_{UM})	Emission Factor for Pastures, Ranges and Paddocks (EF_{PRP})	Conversion factor for kg to MT (C_3)	Manure for Pasture, Range and Paddock (M_{PRP})	Managed Nitrogen (N_M)	Unmanaged Daily Spread (N_{DS})	% of Indirect Volitazition ($\%_{VI}$)	Emission Factor for ground Applications (EF_{NV})	Manure applied to Soils (M_{AS})	MT/year (E_{NDA})
Dairy Cow										
Dairy Cows	7,442.98	0.02	1,000	0.149	710,103	86,895.10	0.20	0.0125	7.970	12.992
Other										
Sheep on Feed	66,678.14	0.02	1,000	1.334	1,191	*N/A*	0.20	0.0125	0.012	4.210
									Total	**17.202**

Emissions from Leaching

Source	Unvolatized Synthetic Nitrogen (N_{UVS})	Unvolatized Non-Manure Organic Nitrogen (N_{UVO})	Conversion factor for kg to MT (C_3)	Leaching % of Soil ($\%_{Leach}$)	Leaching Factor - kg N2O-N / kg N (F_{Leach})	Molecular Weight Ratio N_2O:N_2 (C_{10})	Total Leaching from non-manure Fertilizer (L_{fert})	Total Nitrogen Excreted (N_T)	% of Volitazation from Manure ($\%_{VM}$)	Total Leaching from Manure (L_{man})	Total Emissions from Leaching MT/yr (E_{NL})
Total emissions of N_2O from Leaching	18,723,437	7853.35	1,000	0.3000	0.025	1.57	220.76	872,310	0.00	10.28	**231.04**

Sutter County
Input data for Green House Gas Emissions
2020
Business As Usual (BAU) Inventory
Agricultural Emissions

CN3: Nitrous Oxide from Crop Growth:

Source	Crop Production MTs	Conversion factor for kg to tons (C_3)	Residue/Crop Ratio (R_{RC})	Fraction Dry (F_{DM})	Nitrogen Content of Aboveground biomass	Nitrogen Fixed by Crops (FN)	Fraction of Residue Applied (F_{RA})	Nitrogen Content of Residue (N_{CR})	Nitrogen Returned to Soil (N_{RS})
Hay (inc Alfalfa)	60,765.97	1,000	0.0	0.8500	0.03	1,549,532	0.00	*N/A*	*0*
Dry Edible Beans	7,673.75	1,000	2.1	0.8700	0.03	620,883	1.60	0.02	376,856
Corn for Grain	43,491.36	1,000	1.0	0.9100	*N/A*	*0*	0.90	0.01	206,593
Oats	21,974.74	1,000	1.3	0.9200	*N/A*	*0*	0.90	0.01	165,575
Rice	371,163.14	1,000	1.4	0.9100	*N/A*	*0*	1.00	0.01	3,404,605
Sorghum	1,966.78	1,000	1.4	0.9100	*N/A*	*0*	0.90	0.01	24,355
All Wheat	43,991.75	1,000	1.3	0.9300	*N/A*	*0*	0.90	0.01	296,778
Vegetable Crops & Fruit Trees	464,274.43	1,000	0.0	0.0000	0.03	0	0.00	0.00	0
Safflower & Sunflower	11,496.73	1,000	0.0	0.8700	0.03	300,065	0.90	0.02	0
Total						2,470,480			4,474,762

Source	Crop Production (Hectares)	Nitrogen Fixed by Crops (FN_T)	Nitrogen Returned to Soil (N_{RST})	Conversion factor for kg to tons (C_3)	Emission factor for soils (kg N2O-N/kgN) (EF_{DIR})	Molecular Weight Ratio $N_2O:N_2$ (C_{10})	Emission factor kg N_2O-N / ha_yr	Emissions in MT (N_{CG})
N2O emissions from Legumes	-	2,470,480.38	-	1,000	0.0100	1.57	-	38.82
N2O emissions from Residues	-	-	4,474,762	1,000	0.0100	1.57	-	70.32
N_2O from Histols (Temperate Zone)	88,337.52	-	-	1,000	-	1.57	8	1,110.53
N_2O from Histols (Sub tropic Zone)	0.00	-	-	1,000	-	1.57	12	0.00
							Total	**1,219.67**

Sutter County
Input data for Green House Gas Emissions
2020
Business As Usual (BAU) Inventory
Agricultural Emissions

CN4. Emissions from Fertilizers

Source	Total Fertilizer Use (kg N)	Year Total Fertilizer Use (kg N)	Fertilizers (Calendar Year)	Unvolatized N (kg) (NUV)	Volatized N (kg) (NV)	Emissions (metric tons)	N_2O Emissions (metric	Total Emissions from
Synthetic	20,803,819	20,803,819	20,803,819	18,723,437	2,080,382	294.35	32.72	**327.07**
Organic	240,651	240,651	240,651	7,853	1,963.34			
Dried Manure	1,220	1,220	1,220					
Activated Sewage Sludge	208,212	208,212	208,212					
Other	31,219	31,219	31,219					
Dried Manure %	1%	1%	1%					
Non-Manure Organics	239,432	239,432	239,432					

CN5. Emissions on N_2O from agricultural residue burning

Source	Production - MTTons (U_C)	Residue/Crop Ratio (R_{RC})	Fraction Burned (F_{RB})	Fraction Dry (F_{DM})	Burning Efficiency (BE)	Combustion Efficiency (CE)	Nitrogen Content (NC)	Ratio N2O-N (R_{N2O-N})	Conversion to Mol.Wt. (C_{10})	Emissions MT/year (E_{NARB})
Hay (inc Alfalfa)	60,765.97	0.0000	0.000	0.85	0.000	0.00	*N/A*	0.007	1.57	*0.00*
Dry Edible Beans	7,673.75	2.1000	0.000	0.87	0.000	0.00	0.017	0.007	1.57	0.00
Corn for Grain	43,491.36	1.0000	0.000	0.91	0.000	0.00	0.006	0.007	1.57	0.00
Oats	21,974.74	1.3000	0.000	0.92	0.000	0.00	0.007	0.007	1.57	0.00
Rice	371,163.14	1.4000	0.097	0.91	0.930	0.88	0.007	0.007	1.57	2.96
Sorghum	1,966.78	1.4000	0.000	0.91	0.000	0.00	0.011	0.007	1.57	0.00
All Wheat	43,991.75	1.3000	0.030	0.93	0.930	0.88	0.006	0.007	1.57	0.09
Vegetable Crops & Fruit Trees	464,274.43	0.0000	0.000	0.00	0.000	0.00	0.000	0.007	1.57	0.00
Safflower & Sunflower	11,496.73	0.0000	0.030	0.87	0.930	0.88	0.023	0.007	1.57	0.00
									Total	**3.05**

Sutter County
Input data for Green House Gas Emissions
2020
Business As Usual (BAU) Inventory
Agricultural Emissions

D. Summary Table

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Methane	Enteric Fermentation	1,154.68	24,248.37
	Manure Management	1,337.11	28,079.41
	Rice Cultivation	8,473.00	177,933.06
	Agricultural Residue Burning	98.39	2,066.13
Total Methane		11,063.19	**232,326.97**
Nitrous Oxide	Manure Management	5.49	1,700.71
	Animals and Runoff	250.99	77,805.65
	Crop Growth	1,219.67	378,097.17
	Fertilizer Use	327.07	101,392.14
	Agricultural Residue Burning	3.05	944.72
Total Nitrous Oxide		1,806.26	**559,940.39**
Total emissions from Agriculture			**792,267.36**

Appendix F: 2030 BAU URBEMIS Output and GHG Calculations

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Area Source Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\2030 GP Buildout\2030 GP Build out 6-23-2010-2.urb924

Project Name: Sutter County 2030 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	CO2
Natural Gas	
Hearth - No Summer Emissions	
Landscape	481.62
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, unmitigated)	481.62

Area Source Changes to Defaults

Percentage of residences with natural gas fireplaces changed from 55% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Winter Area Source Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\2030 GP Buildout\2030 GP Build out 6-23-2010-2.urb924

Project Name: Sutter County 2030 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Winter Pounds Per Day, Unmitigated)

Source	CO2
Natural Gas	
Hearth	645,028.98
Landscaping - No Winter Emissions	
Consumer Products	
Architectural Coatings	
TOTALS (lbs/day, unmitigated)	645,028.98

Area Source Changes to Defaults

Percentage of residences with natural gas fireplaces changed from 55% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Area Source Unmitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\2030 GP Buildout\2030 GP Build out 6-23-2010-2.urb924

Project Name: Sutter County 2030 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	CO2
Natural Gas	
Hearth	26,446.19
Landscape	43.35
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, unmitigated)	26,489.54

Area Source Changes to Defaults

Percentage of residences with natural gas fireplaces changed from 55% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\2030 GP Buildout\2030 GP Build out 6-23-2010-2.urb924

Project Name: Sutter County 2030 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	CO2
Single family housing	579,625.04
Apartments low rise	784,135.11
Apartments mid rise	497,605.18
Apartments high rise	223,576.08
City park	11,284.10
General office building	1,227,102.21
Office park	332,390.48
General light industry	515,842.50
TOTALS (lbs/day, unmitigated)	4,171,560.70

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	2,148.33	9.24	dwelling units	6,445.00	59,551.80	550,907.73
Apartments low rise	544.94	9.24	dwelling units	8,719.00	80,563.56	745,285.42
Apartments mid rise	145.61	9.24	dwelling units	5,533.00	51,124.92	472,951.51
Apartments high rise	40.10	9.24	dwelling units	2,486.00	22,970.64	212,499.09
City park		1.59	acres	740.00	1,176.60	10,839.43
General office building		22.11	1000 sq ft	5,707.85	126,200.57	1,172,087.78
Office park		22.11	1000 sq ft	1,537.00	33,983.07	316,722.22
General light industry		3.49	1000 sq ft	15,097.75	52,691.15	491,344.95
					428,262.31	3,972,638.13

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.9	0.0	100.0	0.0
Light Truck < 3750 lbs	19.1	0.0	99.0	1.0
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	32.5	67.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	91.7	8.3

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	9.3	9.3	9.2	9.3	9.5	9.2
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
General light industry				50.0	25.0	25.0

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 16.8 miles to 9.3 miles

Home-based shop rural trip length changed from 7.1 miles to 9.3 miles

Operational Changes to Defaults

Home-based other rural trip length changed from 7.9 miles to 9.2 miles

Commercial-based commute rural trip length changed from 14.7 miles to 9.3 miles

Commercial-based non-work rural trip length changed from 6.6 miles to 9.5 miles

Commercial-based customer rural trip length changed from 6.6 miles to 9.2 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Winter Operational Unmitigated Emissions (Pounds/Day)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\2030 GP Buildout\2030 GP Build out 6-23-2010-2.urb924

Project Name: Sutter County 2030 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Winter Pounds Per Day, Unmitigated)

Source	CO2
Single family housing	505,511.73
Apartments low rise	683,872.27
Apartments mid rise	433,979.27
Apartments high rise	194,988.70
City park	9,825.88
General office building	1,069,421.88
Office park	289,782.01
General light industry	449,742.13
TOTALS (lbs/day, unmitigated)	3,637,123.87

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Temperature (F): 40 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	2,148.33	9.24	dwelling units	6,445.00	59,551.80	550,907.73
Apartments low rise	544.94	9.24	dwelling units	8,719.00	80,563.56	745,285.42
Apartments mid rise	145.61	9.24	dwelling units	5,533.00	51,124.92	472,951.51
Apartments high rise	40.10	9.24	dwelling units	2,486.00	22,970.64	212,499.09
City park		1.59	acres	740.00	1,176.60	10,839.43
General office building		22.11	1000 sq ft	5,707.85	126,200.57	1,172,087.78
Office park		22.11	1000 sq ft	1,537.00	33,983.07	316,722.22
General light industry		3.49	1000 sq ft	15,097.75	52,691.15	491,344.95
					428,262.31	3,972,638.13

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.9	0.0	100.0	0.0
Light Truck < 3750 lbs	19.1	0.0	99.0	1.0
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	32.5	67.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	91.7	8.3

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	9.3	9.3	9.2	9.3	9.5	9.2
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
General light industry				50.0	25.0	25.0

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 16.8 miles to 9.3 miles

Home-based shop rural trip length changed from 7.1 miles to 9.3 miles

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Operational Changes to Defaults

Home-based other rural trip length changed from 7.9 miles to 9.2 miles

Commercial-based commute rural trip length changed from 14.7 miles to 9.3 miles

Commercial-based non-work rural trip length changed from 6.6 miles to 9.5 miles

Commercial-based customer rural trip length changed from 6.6 miles to 9.2 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D5136300 - Sutter County CAP\Modeling\GHG\2030 GP Buildout\2030 GP Build out 6-23-2010-2.urb924

Project Name: Sutter County 2030 General Plan Build out

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	CO2
Single family housing	101,273.01
Apartments low rise	137,005.33
Apartments mid rise	86,942.37
Apartments high rise	39,063.57
City park	1,970.64
General office building	214,353.93
Office park	58,069.25
General light industry	90,120.15
TOTALS (tons/year, unmitigated)	728,798.25

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	2,148.33	9.24	dwelling units	6,445.00	59,551.80	550,907.73
Apartments low rise	544.94	9.24	dwelling units	8,719.00	80,563.56	745,285.42
Apartments mid rise	145.61	9.24	dwelling units	5,533.00	51,124.92	472,951.51
Apartments high rise	40.10	9.24	dwelling units	2,486.00	22,970.64	212,499.09
City park		1.59	acres	740.00	1,176.60	10,839.43
General office building		22.11	1000 sq ft	5,707.85	126,200.57	1,172,087.78
Office park		22.11	1000 sq ft	1,537.00	33,983.07	316,722.22
General light industry		3.49	1000 sq ft	15,097.75	52,691.15	491,344.95
					428,262.31	3,972,638.13

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.9	0.0	100.0	0.0
Light Truck < 3750 lbs	19.1	0.0	99.0	1.0
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	32.5	67.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	91.7	8.3

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	9.3	9.3	9.2	9.3	9.5	9.2
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
City park				5.0	2.5	92.5
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
General light industry				50.0	25.0	25.0

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 16.8 miles to 9.3 miles

Home-based shop rural trip length changed from 7.1 miles to 9.3 miles

Operational Changes to Defaults

Home-based other rural trip length changed from 7.9 miles to 9.2 miles

Commercial-based commute rural trip length changed from 14.7 miles to 9.3 miles

Commercial-based non-work rural trip length changed from 6.6 miles to 9.5 miles

Commercial-based customer rural trip length changed from 6.6 miles to 9.2 miles

Sutter County
Emissions by Source
2030
Business As Usual (BAU) Inventory
By Source

Transportation		
	Source:	**Metric tons of CO_2e**
1	On-Road Vehicles	693,377
2	Airport Operations	155
	Total	**693,532**

Energy		
	Sources:	**Metric tons of CO_2e**
1	Electric	129,434
2	Natural Gas	215,552
	Total	**344,986**

Solid Waste		
	Source	**Metric tons of CO_2e**
1	Solid Waste Disposal	21,899
2	Green Waste Recycling	Data Not Available
3	Materials Recycling	Data Not Available
	Total	**21,899**

Landscape Design		
	Sources:	**Metric tons of CO_2e**
1	Landscape Maintenance Emissions	40
2	Carbon sink from CO_2 sequestration	Data Not Available
	Total	**40**

Agriculture		
	Sources:	**Metric tons of CO_2e**
1	Enteric Fermentation	24,248
2	Manure Management	29,780
3	Rice Cultivation	171,663
4	Agricultural Residue Burning	3,011
5	Crop Growth	372,557
6	Animals and Runoff	76,704
7	Fertilizer Use	99,760
	Total	**777,724**

Net Total Emissions	
Category	**Metric tons of CO_2e**
Energy	344,986
Solid Waste	21,899
Landscape Design	40
Agriculture	777,724
Transportation	693,532
Total	**1,838,181**

Sutter County
Emissions by Land Use
2030
Business As Usual (BAU) Inventory
By Land Use Category

Source Type		CO_2e MT/yr			
		CO_2	CH_4	N_2O	combined CO_2e
Residential	AG/RAN/ER	238,228.19	7,487.35	7,828.17	253,544
	Low Density Residential	159,085.76	4,999.89	5,227.49	169,313
	Medium Density Residential	100,942.78	3,172.84	3,296.88	107,413
	High Density Residential	45,356.19	1,425.64	1,481.37	48,263
	Total Residential	**543,612.92**	**17,085.72**	**17,833.91**	**578,533**
Commercial	Park	99.21	2.24	2.37	104
	Commercial	117,571.44	2,698.28	2,849.17	123,119
	Mixed Use	31,661.78	726.65	767.29	33,156
	Total Commercial	**149,332.44**	**3,427.18**	**3,618.83**	**156,378**
Industrial	Industrial	310,994.93	7,014.56	7,536.58	325,546
	Total Industrial	**310,994.93**	**7,014.56**	**7,536.58**	**325,546**
Agriculture		0.00	226,057.31	551,666.67	777,724
	Total	**1,003,940.29**	**253,584.77**	**580,655.99**	**1,838,181**

Sutter County
Input data for Green House Gas Emissions
2030 Inventory

Land Use Type (units)	Total Trips	Total VMT	Total Trips	Total VMT	2020 Unit Totals	Unit Type
AG/RAN/ER	59,551.80	550907.73	59551.8	550907.73	6445	du
Low Density Residential	80563.56	745285.42	80563.56	745285.42	8719	du
Medium Density Residential	51124.92	472951.51	51124.92	472951.51	5533	du
High Density Residential	22970.64	212499.09	22970.64	212499.09	2486	du
Park	1176.6	10839.43	1176.6	10839.43	32,234,400.00	Sq/ft
Commercial	126200.57	1172087.78	126200.57	1172087.78	5,707,850.00	Sq/ft
Mixed Use	33983.07	316722.22	33983.07	316722.22	1,537,000.00	Sq/ft
Industrial	52691.15	491344.95	52691.15	491344.95	15,097,750.00	Sq/ft
Total	**428262.31**	**3972638.13**	**428262.31**	**3972638.13**		

Sutter County
Input data for Green House Gas Emissions
2030 Inventory

Land Use Type (units)	Natural gas usage rate (MMBTU/yr)	Electricity (kWh/yr)	Potable Water Usage (gallons/year)	Solid Waste (lbs/year)	% Total Square Foot - SFR/MFR/Non-Res	% Total Square Foot - Res/Non-Res	% Total Square Foot
AG/RAN/ER	605,697	77,747,538	27,910,584	122,851,128	100.00%	43.82%	27.29%
Low Density Residential	404,480	51,919,218	18,638,477	82,037,308	52.09%	29.26%	18.22%
Medium Density Residential	256,670	32,946,278	11,827,382	52,059,454	33.06%	18.57%	11.56%
High Density Residential	115,329	14,803,648	5,314,361	23,391,640	14.85%	8.34%	5.20%
Park	476	80,025	796	36,015	0.02%	0.02%	0.01%
Commercial	553,077	92,905,886	924,277	43,379,877	25.54%	25.54%	9.64%
Mixed Use	148,939	25,018,859	248,901	11,682,314	6.88%	6.88%	2.60%
Industrial	1,462,954	245,747,181	2,444,822	114,747,788	67.56%	67.56%	25.49%
Total	**3,547,621**	**541,168,632**	**67,309,600**	**450,185,525**			

Sutter County
Input data for Green House Gas Emissions
2030 Inventory

City Parks

Year	# of City Parks	Estimated SQ / "building"	Estimated Buildings per
2030	10	500	1
2008	10	500	1

Airport

Year	# of planes	Gallons fuel per day	Annual days of operation	Annual Fuel Usage (g/yr)
2030	77	50.00	365	18,250
2008	77	50	365	18,250

Operational(*2a,b) / Area Scenario(*3a,b)	Vehicle			Natural Gas			Total Vehicle + Natural Gas
	Summer	Winter	tons/Year	Summer	Winter	Year	
2030	4,171,560.70	3,637,123.87	728,798.25	0.00	0.00	0.00	728,798.25
2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Area Scenario(*3b,c)	Landscaping			Hearth		
	Summer	Winter	Year	Summer	Winter	Year
2030	481.62	0.00	43.35	0.00	645,028.98	26,446.19
2008	0.00	0.00	0.00	0.00	0.00	0.00

Vehicle Type	Fleet %		Non-Catalyst		Catalyst		Diesel	
Light Auto	39.60	0.3960	0.00	0.0000	100.00	1.0000	0.00	0.0000
Light Truck <3,750 lbs	19.30	0.1930	0.00	0.0000	95.90	0.9590	4.10	0.0410
Light Truck 3,751-5,750 lbs	19.70	0.1970	0.00	0.0000	100.00	1.0000	0.00	0.0000
Med Truck 5,751-8,500 lbs	9.30	0.0930	0.00	0.0000	100.00	1.0000	0.00	0.0000
Lite-Heavy Truck 8,501-10,000 lbs	2.50	0.0250	0.00	0.0000	72.00	0.7200	28.00	0.2800
Lite-Heavy Truck 10,001-14,000 lbs	0.90	0.0090	0.00	0.0000	55.60	0.5560	44.40	0.4440
Med-Heavy Truck 14,001 - 33,000 lbs	1.60	0.0160	0.00	0.0000	18.80	0.1880	81.20	0.8120
Heavy-Heavy Truck 33,001-60,000 lbs	1.70	0.0170	0.00	0.0000	0.00	0.0000	100.00	1.0000
Other bus	0.10	0.0010	0.00	0.0000	0.00	0.0000	100.00	1.0000
Urban bus	0.00	0.0000	0.00	0.0000	0.00	0.0000	100.00	1.0000
Motorcycle	4.00	0.0400	40.00	0.4000	60.00	0.6000	0.00	0.0000
School Bus	0.10	0.0010	0.00	0.0000	0.00	0.0000	100.00	1.0000
Motor Home	1.20	0.0120	0.00	0.0000	83.30	0.8330	16.70	0.1670

Disposal Facility	Jurisdiction?	No		Type of Facility:	Landfill w/ Combination		year began:	2009
Landfill	Annual (tons)	Total	Facility	attributed to	of operation	delivered	way)	Distance (miles)
Recology Landfill	225,092.76	29.14%	9	2.62	313.00	100	4.81	9.62
		0.00%		0.00		0		
		0.00%		0.00		0		
		0.00%		0.00		0		
		0.00%		0.00		0		
				2.62	313.00	**Total**		**9.62**

Sutter County
Input data for Green House Gas Emissions
2030 Inventory

Electrical Usage

177,416,681 Total 2030 Residential Electrical Usage
363,751,951 Total 2030 Non-Residential Electrical Usage

Total 2030	GP Area Growth	2008	kWh/yr
		37,634	County facilities located in Yuba City
		214	County facilities located in Live Oak City
		25,475	County facilities located in Unincorporated Sutter
		83,676,413	Residential in Unincorporated Sutter County
177,416,681	**93,676,945**	**83,739,736**	**Total Residnential**
		6,062,361	County facilities located in Yuba City
		88,361	County facilities located in Live Oak City
		793,010	County facilities located in Unincorporated Sutter
		38,211,643	Commercial in Unincorporated Sutter County
		89,160,499	Industrial in Unincorporated Sutter County
363,751,951	**229,436,077**	**134,315,874**	**Total Commercial**

Water Usage

	Total 2030	GP Area Growth	2008	
63,690,805	63,690,805	21,649,514	42,041,290	Residential (gallons per year)
3,618,796	3,618,796	1,230,086	2,388,710	Commercial/Institutional/Industrial (gallons/year)
		22,879,600	**44,430,000**	Total

Solid Waste for Unincorporated Sutter County

	Total 2030	GP Area Growth	2008	
450,185,525	**450,185,525**	**410,348,330**	**39,837,195**	**lbs/year**
			24,807,418	Residential in Unincorporated Sutter County
			15,029,777	Non-Residential in Unincorporated Sutter County

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Natural Gas Data

1,382,175 Total Residential Natural gas usage rate (MMBTU/yr)
2,165,446 Total Non-Residential Natural gas usage rate (MMBTU/yr)

Total 2030	GP Area Growth	2008	MMBTU/year
		13.50	County facilities located in Yuba City
		0.20	County facilities located in Live Oak City
		0.00	County facilities located in Unincorporated Sutter
		268,658.68	Residential in Unincorporated Sutter County
1,382,175	**1,113,502**	**268,672.37**	**Total Residential**
		14,853	County facilities located in Yuba City
		312	County facilities located in Live Oak City
		501	County facilities located in Unincorporated Sutter
		1,504,713	Commercial in Unincorporated Sutter County
2,165,446	**645,067**	**1,520,379**	**Total Commercial**

Sutter County
Input data for Agriculture
2030

	Enteric Fermentation Emission Factor (EF_{MEF})	Typical Animal Mass -kg- (TAM)	Volatile Solids -kg VS/1000kg mass/day-	Max CH_4 Capacity - m^3CH_4/kg VS- (B_O)	K-Nitrogen - kg/day/1000kg animal mass- (K_N)	Number of Head
	EF used	EF used	EF used	EF used	EF used	
Dairy Cow						
Dairy Cows	123.4	604.0	9.0	0.2	0.4	**8,293**
Other						
Sheep on Feed	8.0	27.0	9.2	0.4	0.4	16,397

Sutter County
Input data for Agriculture
2030

	Residue/Crop Ratio (R_{RC})	Fraction Residue Burned (F_{RB})	Fraction Dry Matter (F_{DM})	Burning Efficiency (BE)	Combustion Efficiency (CE)	Carbon Content (CC)	Fraction of Residue Applied (F_{RA})	Nitrogen Content of Residue (NC)
	EF used	EF used	EF used	EF used	EF used	EF used	EF used	EF used
Hay (inc Alfalfa)	0.0	0.00	0.85	0.00	0.00	0.00	0.00	N/A
Barley	1.2	0.03	0.93	0.93	0.88	0.45	0.90	0.01
Dry Edible Beans	2.1	0.00	0.87	0.00	0.00	0.00	1.60	0.02
Corn	1.0	0.03	0.91	0.93	0.88	0.45	0.90	0.01
Corn for Grain	1.0	0.00	0.91	0.00	0.00	0.00	0.90	0.01
Oats	1.3	0.00	0.92	0.00	0.00	0.00	0.90	0.01
Rice	1.4	0.10	0.91	0.93	0.88	0.38	1.00	0.01
Sorghum	1.4	0.00	0.91	0.00	0.00	0.00	0.90	0.01
All Wheat	1.3	0.03	0.93	0.93	0.88	0.44	0.90	0.01
Potatoes (inc Sweet)	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cotton	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sugar Beet	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vegetable Crops & Fruit Trees	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Safflower & Sunflower	0.0	0.03	0.87	0.93	0.88	0.45	0.90	0.02

Sutter County
Input data for Agriculture
2030

		Growing Season Emission Factor		
Primary		EF used	Entered	Default
		210		210
Rattoon		780		780
		State	***Project***	***% of State ($\%_P$)***
Total acres	2030	7,667,570	214,769.00	0.02801
Total acres	2031	7,667,570	214,769.00	0.02801
Climate Zone	Temperate	Yes	Sub Tropic	No

	2030					2031				
	Primary (Acres Harvested)	**Annual Yield**	**Unit of Yield**	**Annual Yield (MT/yr)**	**State Acres Harvested**	**Primary (Acres Harvested)**	**Annual Yield**	**Unit of Yield**	**Annual Yield (MT/yr)**	**State Acres Harvested**
Hay (inc Alfalfa)	11,138	66,983	tons	60,766	1,610,000	11,138	66,983	tons	60,766	1,610,000
Barley			tons		60,000	0	0	tons		60,000
Dry Edible Beans	8,446	8,459	tons	7,674	51,900	8,446	8,459	tons	7,674	51,900
Corn			tons	0	495,000	0	0	tons	0	495,000
Corn for Grain	7,720	47,941	tons	43,491	170,000	7,720	47,941	tons	43,491	170,000
Oats	2,035	24,223	tons	21,975	25,000	2,035	24,223	tons	21,975	25,000
Rice	96,186	409,137	tons	371,163	517,000	96,186	409,137	tons	371,163	517,000
Sorghum	572	2,168	tons	1,967	9,000	572	2,168	tons	1,967	9,000
All Wheat	7,631	48,493	tons	43,992	545,000	7,631	48,493	tons	43,992	545,000
Potatoes (inc Sweet)			tons	0	53,200	0	0	tons	0	53,200
Cotton			bales		268,000	0	0	bales		268,000
Sugar Beet					25,300	0	0			25,300
Vegetable Crops & Fru	66,815	511,775	tons	464,274	3,734,170	66,815	511,775	tons	464,274	3,734,170
Safflower & Sunflower	14,226	12,673	tons	11,497	104,000	14,226	12,673	tons	11,497	104,000

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Carbon Dioxide

A. Direct Sources

A1-3. Mobile (Construction Equipment, Motor Vehicles, and Landscape Equipment)

Con (MT/yr)	Motor Vehicles (MT/yr)	Landscape (MT/yr) (E_{Cls})	Hearth (MT/yr) (E_{Cwood})	MT/yr
0.00	661,154.84	39.33	23,991.59	**685,185.75**
0.00	0.96	0.00		

Fuel emissions from Airports

Annual Fuel Usage (U_{AAF})	kg/gallon (EF_{CAF})	kg/MT (C_3)	MT/yr (E_{CAF})
18,250.00	8.32	1,000.00	**151.84**

A4. Stationary Sources (Natural Gas)

Unit Type	MMBTU/yr (U_{Ang})	kg/MMBTU (EF_{Cng})	kg/MT (C_3)	MT/yr (E_{Cng})
AG/RAN/ER	605,697	53.07	1,000.00	32,144.3
Low Density Residential	404,480	53.07	1,000.00	21,465.7
Medium Density Residential	256,670	53.07	1,000.00	13,621.5
High Density Residential	115,329	53.07	1,000.00	6,120.5
Park	476	53.07	1,000.00	25.3
Commercial	553,077	53.07	1,000.00	29,351.8
Mixed Use	148,939	53.07	1,000.00	7,904.2
Industrial	1,462,954	53.07	1,000.00	77,639.0
			Total (MT/year)	**188,272.2**

B. Indirect Sources

B1. Electricity

Unit Type	kWh/yr	Unit	Unit type	MWh/yr (U_{Ae})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{Cele})
AG/RAN/ER	77747538	6,445	du	77,748	524.00	2,204.62	18,479.24
Low Density Residential	51919218	8,719	du	51,919	524.00	2,204.62	12,340.30
Medium Density Residential	32946278	5,533	du	32,946	524.00	2,204.62	7,830.76
High Density Residential	14803648	2,486	du	14,804	524.00	2,204.62	3,518.57
Park	80025.429	32,234,400	Sq/ft	80	524.00	2,204.62	19.02
Commercial	92905886	5,707,850	Sq/ft	92,906	524.00	2,204.62	22,082.12
Mixed Use	25018859	1,537,000	Sq/ft	25,019	524.00	2,204.62	5,946.55
Industrial	245747181	15,097,750	Sq/ft	245,747	524.00	2,204.62	58,409.85
						Total (MT/year)	**128,626.41**

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Carbon Dioxide

B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWh/yr (U_{epot})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{Cpot})
AG/RAN/ER	du	6,445	27.9106	3.50	97.69	524.00	2,204.62	23.22
Low Density Residential	du	8,719	18.6385	3.50	65.23	524.00	2,204.62	15.51
Medium Density Residential	du	5,533	11.8274	0.01	0.12	804.54	2,000	0.05
High Density Residential	du	2,486	5.3144	0.01	0.05	804.54	2,000	0.02
Park	Sq/ft	32,234,400	0.0008	3.50	0.00	524.00	2,204.62	0.00
Commercial	Sq/ft	5,707,850	0.9243	3.50	3.24	524.00	2,204.62	0.77
Mixed Use	Sq/ft	1,537,000	0.2489	3.50	0.87	524.00	2,204.62	0.21
Industrial	Sq/ft	15,097,750	2.4448	3.50	8.56	524.00	2,204.62	2.03
							Total (MT/year)	**41.81**

B3. Solid Waste

B3a. Anthropogenic Carbon
CO_2 emissions are considered anthropogenic and are not counted in this inventory.
B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{CWT})	g/MT (C_6)	tons/yr (E_{CWT})
AG/RAN/ER	61,425.56	0.1125	33	9.62	3,464.164	1,000,000	551.39
Low Density Residential	41,018.65	0.1125	33	9.62	3,464.164	1,000,000	368.20
Medium Density Residential	26,029.73	0.1125	33	9.62	3,464.164	1,000,000	233.66
High Density Residential	11,695.82	0.1125	33	9.62	3,464.164	1,000,000	104.99
Park	18.01	0.2250	33	9.62	3,464.164	1,000,000	0.08
Commercial	21,689.94	0.2250	33	9.62	3,464.164	1,000,000	97.35
Mixed Use	5,841.16	0.2250	33	9.62	3,464.164	1,000,000	26.22
Industrial	57,373.89	0.2250	33	9.62	3,464.164	1,000,000	257.51
						Total (MT/year)	**1,639.40**

B3c. Exhaust Emissions (Disposal Equipment)

Vehicle Type	# of equip	lbs/hr (EF_{CWD})	hrs/day (h)	days/yr (n)	lbs/MT (C_1)	MT/yr (E_{CWD})
Excavator	0	119.60	2.62	313	2,205	0.00
Grader	0	132.70	2.62	313	2,205	0.00
Off-Highway Tractor	0	151.50	2.62	313	2,205	0.00
Off-Highway Truck	0	260.10	2.62	313	2,205	0.00
Rubber Tired Dozer	0	239.00	2.62	313	2,205	0.00
Disposal Facility run by City?					No	0.00
					Total (MT/year)	**0.00**

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Carbon Dioxide

B4. Wastewater

Unit Type	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG	MWh/yr (U_{eWW})	lbs/MWh (EF_{Cele})	lbs/MT (C_1)	MT/yr (E_{CWW})
AG/RAN/ER	27.9106	0.65	18.14189	1.911	34.669152	524.00	2,205	8.24
Low Density Residential	18.6385	0.82	15.28357	1.911	29.206902	524.00	2,205	6.94
Medium Density Residential	11.8274	0.82	9.698468	1.911	18.533772	524.00	2,205	4.41
High Density Residential	5.3144	0.82	4.357808	1.911	8.3277711	524.00	2,205	1.98
Park	0.0008	0.71	0.000568	1.911	0.0010854	524.00	2,205	0.00
Commercial	0.9243	0.71	0.656253	1.911	1.2540995	524.00	2,205	0.30
Mixed Use	0.2489	0.71	0.176719	1.911	0.33771	524.00	2,205	0.08
Industrial	2.4448	0.8	1.95584	1.911	3.7376102	524.00	2,205	0.89
							Total (MT/year)	22.83

C. Reserved for AG emissions for CH_4 and N_2O, not applicable for CO_2.

D. Summary Table

Source Type		Emissions, MT /yr	CO_2E metric tons/yr
Direct	Construction equipment	0.00	0.00
	Motor vehicles & Aircraft	661306.68	661,306.68
	Landscape equipment	39.33	39.33
	Cooling and heating	212263.83	212,263.83
Total direct, tons/yr		**873609.84**	**873609.84**
Indirect	Electricity	128626.41	128,626.41
	Potable water	41.81	41.81
	Solid waste	1639.40	1,639.40
	Wastewater	22.83	22.83
Total indirect, tons/yr		**130,330.45**	**130,330.45**
Total, tons/yr		**1,003,940**	**1,003,940**
Global warming potential index		**1**	

Source Type		Emissions, MT/yr	CO_2e metric tons/yr
Residential	AG/RAN/ER	238,228.19	238,228.19
	Low Density Residential	159,085.76	159,085.76
	Medium Density Residential	100,942.78	100,942.78
	High Density Residential	45,356.19	45,356.19
	Total Residential	**543,612.92**	**543,612.92**
Commercial	Park	99.21	99.21
	Commercial	117,571.44	117,571.44
	Mixed Use	31,661.78	31,661.78
	Total Commercial	**149,332.44**	**149,332.44**
Industrial	Industrial	310,994.93	310,994.93
	Total Industrial	**310,994.93**	**310,994.93**
Total, tons/yr		**1,003,940**	**1,003,940**
Global warming potential index		1	

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Methane

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Unit Type	gallons/yr (U_{AG})	gr/gallon (EF_{MHDV})	gr/MT (C_6)	MT/yr (E_{MCON})
Construction Equipment	0.00	0.0580	1,000,000	**0.00**

A2. Mobile Source (Motor Vehicles)

Unit Type	miles/yr (M)	gr/mile (EF_{MMV})	gr/MT (C_6)	tons/yr (E_{MMV})
Non Cat passenger Car	0.00	0.1696	1,000,000	0.00
Cat passenger Car	574205115.13	0.1355	1,000,000	77.80
Diesel Passenger Car	0.00	0.0006	1,000,000	0.00
Non cat light-duty truck	0.00	0.1908	1,000,000	0.00
Cat light duty truck	268378540.77	0.1516	1,000,000	40.69
Diesel Light duty Truck	11473952.21	0.0011	1,000,000	0.01
Non Cat light-duty truck 2	0.00	0.1908	1,000,000	0.00
Cat light duty truck 2	285652544.65	0.1516	1,000,000	43.30
Diesel Light duty truck 2	0.00	0.0011	1,000,000	0.00
Non Cat Medium duty Truck	0.00	0.4181	1,000,000	0.00
Cat med duty truck	134851201.28	0.2356	1,000,000	31.77
Diesel Med duty truck	0.00	0.0051	1,000,000	0.00
Non Cat lite-heavy duty truck	0.00	0.4181	1,000,000	0.00
Cat Light-heavy duty truck	26100232.51	0.2356	1,000,000	6.15
Diesel Lite-heavy duty truck	10150090.42	0.0051	1,000,000	0.05
Non Cat lite-heavy duty truck 2	0.00	0.4181	1,000,000	0.00
Cat Light-heavy duty truck 2	7255864.64	0.2356	1,000,000	1.71
Diesel Lite-heavy duty truck 2	5794251.62	0.0051	1,000,000	0.03
Non Cat med-heavy duty truck	0.00	0.4181	1,000,000	0.00
Cat med-heavy duty truck	4361638.85	0.2356	1,000,000	1.03
Diesel med-heavy duty truck	18838567.82	0.0051	1,000,000	0.10
Non cat Heavy Duty truck	0.00	0.4181	1,000,000	0.00
Cat heavy duty truck	0.00	0.2356	1,000,000	0.00
Diesel heavy duty truck	24650219.59	0.0051	1,000,000	0.13
Non Cat Other Bus	0.00	0.4181	1,000,000	0.00
Cat other bus	0.00	0.2356	1,000,000	0.00
Diesel Other Bus	1450012.92	0.0051	1,000,000	0.01
Non Cat Urban Bus	0.00	0.4181	1,000,000	0.00
Cat Urban Bus	0.00	0.2356	1,000,000	0.00
Diesel Urban Bus	0.00	0.0051	1,000,000	0.00
Non cat motorcycle	23200206.67	0.0672	1,000,000	1.56
Cat motorcycle	34800310.01	0.0672	1,000,000	2.34
Diesel Motorcycle	0.00	0.0000	1,000,000	0.00
Non Cat School Bus	0.00	0.4181	1,000,000	0.00
Cat School Bus	0.00	0.2356	1,000,000	0.00
Diesel School Bus	1450012.92	0.0051	1,000,000	0.01
Non Cat Motor home	0.00	0.4181	1,000,000	0.00
Cat Motor home	14494329.12	0.2356	1,000,000	3.41
Diesel Motor home	2905825.89	0.0051	1,000,000	0.01
			Total (MT/yr)	**210.11**

Emissions from Aviation Fuel

Gasoline gallons/ year (U_{AAF})	gr/gallon (EF_{Maf})	gr/MT (C_6)	MT/yr (E_{Maf})
18,250.00	7.04	1,000,000	**0.13**

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Methane

A3. Mobile Source (Landscape Equipment)

Gasoline gallons/ year (G_F)	gr/gallon (EF_{MF})	gr/MT (C_6)	MT/yr (E_{Mls})
4,469.07	0.50	1,000,000	**0.00**

A4. Wood burning Hearth

MMBtu	kg/MMBtu (EF_{Mwood})	kg/MT (C_3)	MT/yr (E_{Mls})
368,990.61	0.32	1,000	**116.60**

A5. Stationary Source (Cooling and Heating) - Natural Gas

Land Use Type	Unit Type	Units	MMBTUs/yr (U_{Ang})	kg/MMBTU (EF_{Mng})	kg/MT (C_3)	MT/yr (E_{Mng})
AG/RAN/ER	du	6,445	605,697	0.005	1,000	3.0285
Low Density Residential	du	8,719	404,480	0.005	1,000	2.0224
Medium Density Residential	du	5,533	256,670	0.005	1,000	1.2833
High Density Residential	du	2,486	115,329	0.005	1,000	0.5766
Park	Sq/ft	32,234,400	476	0.005	1,000	0.0024
Commercial	Sq/ft	5,707,850	553,077	0.005	1,000	2.7654
Mixed Use	Sq/ft	1,537,000	148,939	0.005	1,000	0.7447
Industrial	Sq/ft	15,097,750	1,462,954	0.001	1,000	1.4630
					Total (MT/yr)	**11.89**

B. Indirect Sources

B1. Electricity

Land Use Type	Unit Type	Units	kWh/year	MWh/yr (U_{Ae})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	tons/yr (E_{Mele})
AG/RAN/ER	du	6445.00	77747537.9	77,747.54	0.0302	2,205	1.065
Low Density Residential	du	8719.00	51919217.5	51,919.22	0.0302	2,205	0.711
Medium Density Residential	du	5533.00	32946277.7	32,946.28	0.0302	2,205	0.451
High Density Residential	du	2486.00	14803647.9	14,803.65	0.0302	2,205	0.203
Park	Sq/ft	32234400.00	80025.4292	80.03	0.0302	2,205	0.001
Commercial	Sq/ft	5707850.00	92905885.8	92,905.89	0.0302	2,205	1.273
Mixed Use	Sq/ft	1537000.00	25018859.2	25,018.86	0.0302	2,205	0.343
Industrial	Sq/ft	15097750.00	245747181	245,747.18	0.0302	2,205	3.366
						Total (MT/yr)	**7.413**

B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWH/yr (U_{epot})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	tons/yr (E_{Mpot})
AG/RAN/ER	du	6445.00	27.91058	3.50	97.69	0.0302	2,205	0.00134
Low Density Residential	du	8719.00	18.63848	3.50	65.23	0.0302	2,205	0.00089
Medium Density Residential	du	5533.00	11.82738	3.50	41.40	0.0302	2,205	0.00057
High Density Residential	du	2486.00	5.31436	3.50	18.60	0.0302	2,205	0.00025
Park	Sq/ft	32234400.00	0.00080	3.50	0.00	0.0302	2,205	0.00000
Commercial	Sq/ft	5707850.00	0.92428	3.50	3.23	0.0302	2,205	0.00004
Mixed Use	Sq/ft	1537000.00	0.24890	3.50	0.87	0.0302	2,205	0.00001
Industrial	Sq/ft	15097750.00	2.44482	3.50	8.56	0.0302	2,205	0.00012
							Total (MT/yr)	**0.00323**

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Methane

B3. Solid Waste

B3a. Fugitive Emissions

Unit Type	Unit Type	unit	tons/yr (U_{SW})	MT CO_2e/ton (EF_{MWF})	MT CO_2e/yr (E_{MWF})
AG/RAN/ER	du	6,445	61,426	0.09	5,528.30
Low Density Residential	du	8,719	41,019	0.09	3,691.68
Medium Density Residential	du	5,533	26,030	0.09	2,342.68
High Density Residential	du	2,486	11,696	0.09	1,052.62
Park	Sq/ft	32,234,400	18	0.09	1.62
Commercial	Sq/ft	5,707,850	21,690	0.09	1,952.09
Mixed Use	Sq/ft	1,537,000	5,841	0.09	525.70
Industrial	Sq/ft	15,097,750	57,374	0.09	5,163.65
				Total (MT/yr)	**20,258.35**

B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{MWT})	gr/MT (C_6)	tons/yr (E_{MWT})
AG/RAN/ER	61,425.5640	0.1125	33	9.62	0.00510	1,000,000	0.000812
Low Density Residential	41,018.6541	0.1125	33	9.62	0.00510	1,000,000	0.000542
Medium Density Residential	26,029.7271	0.1125	33	9.62	0.00510	1,000,000	0.000344
High Density Residential	11,695.8199	0.1125	33	9.62	0.00510	1,000,000	0.000155
Park	18.0074	0.2250	33	9.62	0.00510	1,000,000	0.000000
Commercial	21,689.9386	0.2250	33	9.62	0.00510	1,000,000	0.000143
Mixed Use	5,841.1572	0.2250	33	9.62	0.00510	1,000,000	0.000039
Industrial	57,373.8942	0.2250	33	9.62	0.00510	1,000,000	0.000379
						Total (MT/yr)	**0.002414**

B3c. Exhaust Emissions (Disposal Equipment)

Vehicle Type	# of equip	lbs/hr (EF_{MWD})	hrs/day (h)	days/yr (n)	lbs/MT (C_1)	MT/yr (E_{MWD})
Excavator	0	0.0164	2.62	313	2,205	0.00
Grader	0	0.0185	2.62	313	2,205	0.00
Off-Highway Tractor	0	0.0243	2.62	313	2,205	0.00
Off-Highway Truck	0	0.0260	2.62	313	2,205	0.00
Rubber Tired Dozer	0	0.0342	2.62	313	2,205	0.00
Disposal Facility run by City?					No	0.00
					Total (MT/yr)	**0.00**

B4. Wastewater

Land Use Type	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG (C_5)	MWh/yr (U_{eWW})	lbs/MWh (EF_{Mele})	lbs/MT (C_1)	MT/yr (E_{MWW})
AG/RAN/ER	27.91058	65	18.14	1.91	34.67	0.0302	2,205	0.000475
Low Density Residential	18.63848	82	15.28	1.91	29.21	0.0302	2,205	0.000400
Medium Density Residential	11.82738	82	9.70	1.91	18.53	0.0302	2,205	0.000254
High Density Residential	5.31436	82	4.36	1.91	8.33	0.0302	2,205	0.000114
Park	0.00080	71	0.00	1.91	0.00	0.0302	2,205	0.000000
Commercial	0.92428	71	0.66	1.91	1.25	0.0302	2,205	0.000017
Mixed Use	0.24890	71	0.18	1.91	0.34	0.0302	2,205	0.000005
Industrial	2.44482	80	1.96	1.91	3.74	0.0302	2,205	0.000051
							Total (MT/yr)	**0.001316**

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Methane

C. See Methane Emissions from AG Formula Spreadsheet (entered into table below under commercial AG)
D. Summary Table

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Direct	Construction equipment	0.00	0.00
	Motor vehicles & Aviation Fuel	210.24	4,415.01
	Landscape equipment	0.00	0.05
	Cooling and heating	128.49	2,698.23
	Total direct, tons/yr	**338.73**	**7,113.29**
Indirect	Electricity	7.41	155.68
	Potable water	0.00	0.07
	Solid waste	20,258.35	20,258.40
	Wastewater	0.00	0.03
	Total indirect, tons/yr	**20,265.77**	**20,414.17**
	Total from Agriculture	**10,764.63**	**226,057.31**
	Total, tons/yr	***31,369.13***	***253,584.77***
	Global warming potential index	**21**	

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Residential	AG/RAN/ER	5,621.5537	7,487.35
	Low Density Residential	3,753.9513	4,999.89
	Medium Density Residential	2,382.1924	3,172.84
	High Density Residential	1,070.3798	1,425.64
	Total Residential	**12,828.08**	**17,085.72**
Commercial	Park	1.6503	2.24
	Commercial	1,987.6148	2,698.28
	Mixed Use	535.2698	726.65
	Total Commercial	**2,524.53**	**3,427.18**
Industrial	Industrial	5,251.7563	7,014.56
	Total Industrial	**5,251.7563**	**7,014.56**
	Total from Agriculture	**10,764.63**	**226,057.31**
	Total, tons/yr	***31,369.00***	***253,584.77***
	Global warming potential index	21	

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Nitrous Oxide

A. Direct Sources

A1. Mobile Source (Construction Equipment)

Unit Type	gallons/yr (U_{AG})	gr/gallon (EF_{NHDV})	gr/MT (C_6)	MT/yr (E_{NCON})
Non cat heavy-duty truck	0.00	0.0260	1,000,000	**0.00000**

A2. Mobile Source (Motor Vehicles)

Unit Type	miles/yr (M)	gr/mile (EF_{NMV})	gr/MT (C_6)	MT/yr (E_{NMV})
Non Cat passenger Car	0	0.0197	1,000,000	0.00000
Cat passenger Car	574,205,115	0.0504	1,000,000	28.93994
Diesel Passenger Car	0	0.0012	1,000,000	0.00000
Non cat light-duty truck	0	0.0218	1,000,000	0.00000
Cat light duty truck	268,378,541	0.0639	1,000,000	17.14939
Diesel Light duty Truck	11,473,952	0.0017	1,000,000	0.01951
Non Cat light-duty truck 2	0	0.0218	1,000,000	0.00000
Cat light duty truck 2	285,652,545	0.0639	1,000,000	18.25320
Diesel Light duty truck 2	0	0.0017	1,000,000	0.00000
Non Cat Medium duty Truck	0	0.0473	1,000,000	0.00000
Cat med duty truck	134,851,201	0.1317	1,000,000	17.75990
Diesel Med duty truck	0	0.0048	1,000,000	0.00000
Non Cat lite-heavy duty truck	0	0.0473	1,000,000	0.00000
Cat Light-heavy duty truck	26,100,233	0.1317	1,000,000	3.43740
Diesel Lite-heavy duty truck	10,150,090	0.0048	1,000,000	0.04872
Non Cat lite-heavy duty truck 2	0	0.0473	1,000,000	0.00000
Cat Light-heavy duty truck 2	7,255,865	0.1317	1,000,000	0.95560
Diesel Lite-heavy duty truck 2	5,794,252	0.0048	1,000,000	0.02781
Non Cat med-heavy duty truck	0	0.0473	1,000,000	0.00000
Cat med-heavy duty truck	4,361,639	0.1317	1,000,000	0.57443
Diesel med-heavy duty truck	18,838,568	0.0048	1,000,000	0.09043
Non cat Heavy Duty truck	0	0.0473	1,000,000	0.00000
Cat heavy duty truck	0	0.1317	1,000,000	0.00000
Diesel heavy duty truck	24,650,220	0.0048	1,000,000	0.11832
Non Cat Other Bus	0	0.0473	1,000,000	0.00000
Cat other bus	0	0.1317	1,000,000	0.00000
Diesel Other Bus	1,450,013	0.0048	1,000,000	0.00696
Non Cat Urban Bus	0	0.0473	1,000,000	0.00000
Cat Urban Bus	0	0.1317	1,000,000	0.00000
Diesel Urban Bus	0	0.0048	1,000,000	0.00000
Non cat motorcycle	23,200,207	0.0069	1,000,000	0.16008
Cat motorcycle	34,800,310	0.0069	1,000,000	0.24012
Diesel Motorcycle	0	0.0000	1,000,000	0.00000
Non Cat School Bus	0	0.0473	1,000,000	0.00000
Cat School Bus	0	0.1317	1,000,000	0.00000
Diesel School Bus	1,450,013	0.0048	1,000,000	0.00696
Non Cat Motor home	0	0.0473	1,000,000	0.00000
Cat Motor home	14,494,329	0.1317	1,000,000	1.90890
Diesel Motor home	2,905,826	0.0048	1,000,000	0.01395
			Total (MT/yr)	**89.71**

Emissions from Aviation Fuel

Gasoline gallons/ year (U_{Aaf})	gr/gallon (EF_{Naf})	gr/lbs (C_6)	MT/yr (E_{Nls})
18,250.00	0.11000	1000000	**0.002008**

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Nitrous Oxide

A3. Mobile Source (Landscape Equipment)

Gasoline gallons/ year	gr/gallon (EF_{Nls})	gr/lbs (C_6)	MT/yr (E_{Nls})
4,469.07	0.22000	1000000	**0.000983**

A4. Wood burning Hearth

MMBtu	kg/MMBtu (EF_{Mwood})	kg/MT (C_3)	MT/yr (E_{Mls})
368,990.61	0.00420	1000	**1.549761**

A5. Stationary Source (Cooling and Heating)

Land Use Type	Unit Type	Units	MMBTUs/yr (U_{Ang})	kg/MMBTU (EF_{Nng})	kg/MT (C_3)	MT/yr (E_{Nng})
AG/RAN/ER	du	6445	605,697	0.0001	1,000	0.060570
Low Density Residential	du	8719	404,480	0.0001	1,000	0.040448
Medium Density Residential	du	5533	256,670	0.0001	1,000	0.025667
High Density Residential	du	2486	115,329	0.0001	1,000	0.011533
Park	Sq/ft	32234400	476	0.0001	1,000	0.000048
Commercial	Sq/ft	5707850	553,077	0.0001	1,000	0.055308
Mixed Use	Sq/ft	1537000	148,939	0.0001	1,000	0.014894
Industrial	Sq/ft	15097750	1,462,954	0.0001	1,000	0.146295
					Total (MT/yr)	**0.354763**

B. Indirect Sources

B1. Electricity

Land Use Type	Unit Type	Units	kWh/yr	MWh/yr (U_{Ae})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{Nele})
AG/RAN/ER	du	6445	77747537.9	77,748	0.0081	2,205	0.28565
Low Density Residential	du	8719	51919217.5	51,919	0.0081	2,205	0.19076
Medium Density Residential	du	5533	32946277.7	32,946	0.0037	2,205	0.05529
High Density Residential	du	2486	14803647.9	14,804	0.0037	2,205	0.02484
Park	Sq/ft	32234400	80025.4292	80	0.0081	2,205	0.00029
Commercial	Sq/ft	5707850	92905885.8	92,906	0.0081	2,205	0.34135
Mixed Use	Sq/ft	1537000	25018859.2	25,019	0.0081	2,205	0.09192
Industrial	Sq/ft	15097750	245747181	245,747	0.0081	2,205	0.90290
						Total (MT/yr)	**1.89301**

B2. Potable Water

Unit Type	unit type	unit number	MG/yr (U_{Apot})	MWh/MG (C_4)	MWH/yr (U_{epot})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{Npot})
AG/RAN/ER	du	6445	27.9105844	3.50	97.69	0.0081	2,205	0.000359
Low Density Residential	du	8719	18.6384771	3.50	65.23	0.0081	2,205	0.000240
Medium Density Residential	du	5533	11.8273824	3.50	41.40	0.0081	2,205	0.000152
High Density Residential	du	2486	5.3143607	3.50	18.60	0.0081	2,205	0.000068
Park	Sq/ft	32234400	0.0007961	3.50	0.00	0.0081	2,205	0.000000
Commercial	Sq/ft	5707850	0.9242766	3.50	3.23	0.0081	2,205	0.000012
Mixed Use	Sq/ft	1537000	0.2489008	3.50	0.87	0.0081	2,205	0.000003
Industrial	Sq/ft	15097750	2.4448222	3.50	8.56	0.0081	2,205	0.000031
							Total (MT/yr)	**0.000866**

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Nitrous Oxide

B3. Solid Waste

B3a. Fugitive Emissions No Fugitive Nitrous Oxide Emissions

B3b. Exhaust Emissions (Hauling Trucks)

Unit Type	tons/yr (U_{SW})	tons/cuyd (d)	cuyd/trip (C_T)	miles/trip (M)	gr/mile (EF_{NWT})	gr/MT (C_6)	MT/yr (E_{NWT})
AG/RAN/ER	61,425.56	0.1125	33	9.62	0.0048	1,000,000	0.00076401
Low Density Residential	41,018.65	0.1125	33	9.62	0.0048	1,000,000	0.00051019
Medium Density Residential	26,029.73	0.1125	33	9.62	0.0048	1,000,000	0.00032376
High Density Residential	11,695.82	0.1125	33	9.62	0.0048	1,000,000	0.00014547
Park	18.01	0.2250	33	9.62	0.0048	1,000,000	0.00000011
Commercial	21,689.94	0.2250	33	9.62	0.0048	1,000,000	0.00013489
Mixed Use	5,841.16	0.2250	33	9.62	0.0048	1,000,000	0.00003633
Industrial	57,373.89	0.2250	33	9.62	0.0048	1,000,000	0.00035681
						Total (MT/yr)	**0.002272**

B3c. Exhaust Emissions (Disposal Equipment)

Vehicle Type	# of equip.	lbs/hr (EF_{NWD})	hrs/day (h)	days/yr (n)	lbs/MT (C_1)	tons/yr (E_{NWD})
Excavator	0	0.0074	2.62	313	2,205	0.00
Grader	0	0.0083	2.62	313	2,205	0.00
Off-Highway Tractor	0	0.0109	2.62	313	2,205	0.00
Off-Highway Truck	0	0.0117	2.62	313	2,205	0.00
Rubber Tired Dozer	0	0.0153	2.62	313	2,205	0.00
Disposal Facility run by City?					No	0.00
					Total, tons/yr	**0.00**

B4. Wastewater

AG/RAN/ER	MG/yr Potable (U_{Apot})	% used indoors ($\%_{in}$)	MG/yr ww generated (U_{AWW})	MWh/MG (C_5)	MWh/yr (U_{eWW})	lbs/MWh (EF_{Nele})	lbs/MT (C_1)	MT/yr (E_{NWW})
AG/RAN/ER	27.91	65	18.14	1.91	34.6691	0.0081	2204.62	0.00012738
Low Density Residential	18.64	82	15.28	1.91	29.2069	0.0081	2204.62	0.00010731
Medium Density Residential	11.83	82	9.70	1.91	18.5337	0.0037	2204.62	0.00003111
High Density Residential	5.31	82	4.36	1.91	8.3277	0.0037	2204.62	0.00001398
Park	0.00	71	0.00	1.91	0.0011	0.0081	2204.62	0.00000000
Commercial	0.92	71	0.66	1.91	1.2541	0.0081	2204.62	0.00000461
Mixed Use	0.25	71	0.18	1.91	0.3377	0.0081	2204.62	0.00000124
Industrial	2.44	80	1.96	1.91	3.7376	0.0081	2204.62	0.00001373
							Total (MT/yr)	**0.00029935**

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Nitrous Oxide

C. See Nitrous Emissions from AG Formula Spreadsheet (entered into table below under commercial AG)
D. Summary Table

Source Type		Emissions, tons/yr	CO_2e metric tons/yr
Direct	Construction equipment	0.00000	0.00
	Motor vehicles + aviation fuel	89.7120	27,810.72
	Landscape equipment	0.0010	0.30
	Cooling and heating	1.9045	590.40
Total direct, tons/yr		**91.6175**	**28,401.43**
Indirect	Electricity	1.8930	586.83
	Potable water	0.0009	0.27
	Solid waste	0.0023	0.70
	Wastewater	0.0003	0.09
Total indirect, tons/yr		**1.8964**	**587.90**
Total From Agriculture		**1,779.57**	**551,666.67**
Total, tons/yr		***1,873.08***	***580,655.99***
Global warming potential index		**310**	

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Residential	AG/RAN/ER	25.2516	7,828.17
	Low Density Residential	16.8625	5,227.49
	Medium Density Residential	10.6349	3,296.88
	High Density Residential	4.7785	1,481.37
	Total Residential	**57.5275**	**17,833.91**
Commercial	Park	0.0076	2.37
	Commercial	9.1907	2,849.17
	Mixed Use	2.4751	767.29
	Total Commercial	**11.6734**	**3,618.83**
Industrial	Industrial	24.3110	7,536.58
	Total Industrial	**24.3110**	**7,536.58**
Total from Agriculture		**1,779.57**	**551,666.67**
Total, tons/yr		**1,873.08**	**580,655.99**
Global warming potential index		310	

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Agricultural Emissions

CM. Methane

CM1. Enteric Fermentation

Source	Number - Head/year (U_{Aani})	Emission Factor kg CH_4/head (EF_{MEF})	Conversion factor kg to MT (C_3)	MT CH_4/year (E_{MEF})
Dairy Cow				
Dairy Cows	8,293.00	123.42	1000.0	1,023.51
Others				
Sheep	16,397.00	8.00	1000.0	131.18
			Total	**1,154.68**

CM2. Manure Management

Source	Number - 1000s Head/year (U_{Aani})	Typical Animal Mass kg/head (TAM)	Volatile Solids Produced kgVS/1000kg/year (VS)	Max CH_4 capacity m^3CH_4/kgVS (B_O)	Extent Capacity Realized (MCF)	Density of Methane (C_8)	MT CH_4/year (E_{MMM})
Dairy Cow							
Dairy Cows	8.293	604.0	3278.5	0.24	0.499	0.678	1,332.76
Other							
Sheep on Feed	16.397	27.0	3361.7	0.36	0.012	0.678	4.36
						Total	**1,337.11**

CM3. Rice Cultivation

Season	Acres (U_{AC})	Conversion hectares/acre (C_{11})	Emission Factor (EF_{PS})	Conversion kg/MT (C_3)	MT/year (E_{MRC})
Primary	96,186	0.40	210	1,000	8,174.45
				Total	**8,174.45**

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Agricultural Emissions

CM4. Agricultural Residue Burning

Source	Production - Tons (U_C)	Residue/Crop Ratio (R_{RC})	Fraction Burned (F_{RB})	Fraction Dry (F_{DM})	Burning Efficiency (BE)	Combustion Efficiency (CE)	Carbon Content (CC)	Ratio CH_4-C (R_{CH4-C})	Conversion CH_4- to Mol.Wt. (C_{11})	Emissions Tons/year (E_{MARB})
Hay (inc Alfalfa)	60,765.97	0	0.000	0.85	0	0.00	0.00	0.005	1.33	0.00
Dry Edible Beans	7,673.75	2.1	0.000	0.87	0	0.00	0.00	0.005	1.33	0.00
Corn for Grain	43,491.36	1	0.000	0.91	0	0.00	0.00	0.005	1.33	0.00
Oats	21,974.74	1.3	0.000	0.92	0	0.00	0.00	0.005	1.33	0.00
Rice	371,163.14	1.4	0.097	0.91	0.93	0.88	0.38	0.005	1.33	94.54
Sorghum	1,966.78	1.4	0.000	0.91	0	0.00	0.00	0.005	1.33	0.00
All Wheat	43,991.75	1.3	0.030	0.93	0.93	0.88	0.44	0.005	1.33	3.85
Vegetable Crops & Fruit Trees	464,274.43	0	0.030	0.87	0.93	0.88	0.45	0.005	1.33	0.00
Safflower & Sunflower	11,496.73	0	0.000	0.00	0	0.00	0.00	0.005	1.33	0.00
									Total	**98.39**

CN. Nitrous Oxide

CN1. Manure Management

Source	Total Nitrogen Excreted (N_T)	Manure Anaerobic Lagoons ($\%_{AL}$)	Manure Liquid/Slurry ($\%_S$)	Manure Deep Pit ($\%_{DP}$)	Emission Factor for Liquid System (EF_{NML})	N_2O Emissions from Liquid System Mgt.	Manure Solid Storage/ Managed ($\%_{SS}$)	Manure Deep Pit / DryLot ($\%_{DP}$)	Manure Pasture / Poultry ($\%_P$)	Emission Factor for Solid System (EF_{NMS})	N_2O Emissions from solid system Mgt.	Total N_2OMT/yr (E_{NMM})
Dairy Cow												
Dairy Cows	804,440.90	467,234	166,683	*N/A*	0.001	*996.16*	74,355	1,830	*N/A*	0.02	*2,394.41*	3.39
Other												
Sheep on Feed	67,868.82	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	66,678	*N/A*	*N/A*	0.02	*2,095.60*	2.10
											Total	**5.49**

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Agricultural Emissions

CN2. Emissions from Animals and Runoff

Indirect emissions from animals

Source	Total Nitrogen Excreted (N_T)	% of Indirect Volitazition ($\%_{VI}$)	Rate of conversion from NH_3 to NO_X ($EF_{NH3-NOX}$)	Conversion factor for kg to MT (C_3)	Tons/year (E_{NIA})
Dairy Cow					
Dairy Cows	804,440.90	0.20	0.01	1,000	2.53
Other					
Sheep on Feed	67,868.82	0.20	0.01	1,000	0.21
				Total	**2.74**

Direct emissions from animals

Source	Unmanaged Nitrogen (N_{UM})	Emission Factor for Pastures, Ranges and Paddocks (EF_{PRP})	Conversion factor for kg to MT (C_3)	Manure for Pasture, Range and Paddock (M_{PRP})	Managed Nitrogen (N_M)	Unmanaged Daily Spread (N_{DS})	% of Indirect Volitazition ($\%_{VI}$)	Emission Factor for ground Applications (EF_{NV})	Manure applied to Soils (M_{AS})	MT/year (E_{NDA})
Dairy Cow										
Dairy Cows	7,442.98	0.02	1,000	0.149	710,103	86,895.10	0.20	0.0125	7.970	12.992
Other										
Sheep on Feed	66,678.14	0.02	1,000	1.334	1,191	*N/A*	0.20	0.0125	0.012	4.210
									Total	**17.202**

Emissions from Leaching

Source	Unvolatized Synthetic Nitrogen (N_{UVS})	Unvolatized Non-Manure Organic Nitrogen (N_{UVO})	Conversion factor for kg to MT (C_3)	Leaching % of Soil ($\%_{Leach}$)	Leaching Factor - kg N2O-N / kg N (F_{Leach})	Molecular Weight Ratio $N_2O:N_2$ (C_{10})	Total Leaching from non-manure Fertilizer (L_{fert})	Total Nitrogen Excreted (N_T)	% of Volitazation from Manure ($\%_{VM}$)	Total Leaching from Manure (L_{man})	Total Emissions from Leaching MT/yr (E_{NL})
Total emissions of N_2O from Leaching	18,422,105	7726.96	1,000	0.3000	0.025	1.57	217.21	872,310	0.00	10.28	**227.49**

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Agricultural Emissions

CN3: Nitrous Oxide from Crop Growth:

Source	Crop Production MTs	Conversion factor for kg to tons (C_3)	Residue/Crop Ratio (R_{RC})	Fraction Dry (F_{DM})	Nitrogen Content of Aboveground biomass	Nitrogen Fixed by Crops (FN)	Fraction of Residue Applied (F_{RA})	Nitrogen Content of Residue (N_{CR})	Nitrogen Returned to Soil (N_{RS})
Hay (inc Alfalfa)	60,765.97	1,000	0.0	0.8500	0.03	1,549,532	0.00	*N/A*	*0*
Dry Edible Beans	7,673.75	1,000	2.1	0.8700	0.03	620,883	1.60	0.02	376,856
Corn for Grain	43,491.36	1,000	1.0	0.9100	*N/A*	*0*	0.90	0.01	206,593
Oats	21,974.74	1,000	1.3	0.9200	*N/A*	*0*	0.90	0.01	165,575
Rice	371,163.14	1,000	1.4	0.9100	*N/A*	*0*	1.00	0.01	3,404,605
Sorghum	1,966.78	1,000	1.4	0.9100	*N/A*	*0*	0.90	0.01	24,355
All Wheat	43,991.75	1,000	1.3	0.9300	*N/A*	*0*	0.90	0.01	296,778
Vegetable Crops & Fruit Trees	464,274.43	1,000	0.0	0.0000	0.03	0	0.00	0.00	0
Safflower & Sunflower	11,496.73	1,000	0.0	0.8700	0.03	300,065	0.90	0.02	0
Total						2,470,480			4,474,762

Source	Crop Production (Hectares)	Nitrogen Fixed by Crops (FN_T)	Nitrogen Returned to Soil (N_{RST})	Conversion factor for kg to tons (C_3)	Emission factor for soils (kg N2O-N/kgN) (EF_{DIR})	Molecular Weight Ratio $N_2O:N_2$ (C_{10})	Emission factor kg N_2O-N / ha_yr	Emissions in MT (N_{CG})
N2O emissions from Legumes	-	2,470,480.38	-	1,000	0.0100	1.57	-	38.82
N2O emissions from Residues	-	-	4,474,762	1,000	0.0100	1.57	-	70.32
N_2O from Histols (Temperate Zone)	86,915.82	-	-	1,000	-	1.57	8	1,092.66
N_2O from Histols (Sub tropic Zone)	0.00	-	-	1,000	-	1.57	12	0.00
							Total	**1,201.80**

CN4. Emissions from Fertilizers

Source	Total Fertilizer Use (kg N)	Year Total Fertilizer Use (kg N)	Fertilizers (Calendar Year)	Unvolatized N (kg) (NUV)	Volatized N (kg) (NV)	Emissions (metric tons)	N_2O Emissions (metric	Total Emissions from
Synthetic	20,469,005	20,469,005	20,469,005	18,422,105	2,046,901	289.61	32.20	**321.81**
Organic	236,778	236,778	236,778	7,727	1,931.74			
Dried Manure	1,200	1,200	1,200					
Activated Sewage Sludge	204,861	204,861	204,861					
Other	30,717	30,717	30,717					
Dried Manure %	1%	1%	1%					
Non-Manure Organics	235,578	235,578	235,578					

Sutter County
Input data for Green House Gas Emissions
2030
Business As Usual (BAU) Inventory
Agricultural Emissions

CN5. Emissions on N_2O from agricultural residue burning

Source	Production - MTTons (U_C)	Residue/Crop Ratio (R_{RC})	Fraction Burned (F_{RB})	Fraction Dry (F_{DM})	Burning Efficiency (BE)	Combustion Efficiency (CE)	Nitrogen Content (NC)	Ratio N2O-N (R_{N2O-N})	Conversion to Mol.Wt. (C_{10})	Emissions MT/year (E_{NARB})
Hay (inc Alfalfa)	60,765.97	0.0000	0.000	0.85	0.000	0.00	*N/A*	0.007	1.57	*0.00*
Dry Edible Beans	7,673.75	2.1000	0.000	0.87	0.000	0.00	0.017	0.007	1.57	0.00
Corn for Grain	43,491.36	1.0000	0.000	0.91	0.000	0.00	0.006	0.007	1.57	0.00
Oats	21,974.74	1.3000	0.000	0.92	0.000	0.00	0.007	0.007	1.57	0.00
Rice	371,163.14	1.4000	0.097	0.91	0.930	0.88	0.007	0.007	1.57	2.96
Sorghum	1,966.78	1.4000	0.000	0.91	0.000	0.00	0.011	0.007	1.57	0.00
All Wheat	43,991.75	1.3000	0.030	0.93	0.930	0.88	0.006	0.007	1.57	0.09
Vegetable Crops & Fruit Trees	464,274.43	0.0000	0.000	0.00	0.000	0.00	0.000	0.007	1.57	0.00
Safflower & Sunflower	11,496.73	0.0000	0.030	0.87	0.930	0.88	0.023	0.007	1.57	0.00
									Total	**3.05**

D. Summary Table

Source Type		Emissions, tons/yr	CO_2E metric tons/yr
Methane	Enteric Fermentation	1,154.68	24,248.37
	Manure Management	1,337.11	28,079.41
	Rice Cultivation	8,174.45	171,663.40
	Agricultural Residue Burning	98.39	2,066.13
Total Methane		10,764.63	**226,057.31**
Nitrous Oxide	Manure Management	5.49	1,700.71
	Animals and Runoff	247.43	76,704.25
	Crop Growth	1,201.80	372,556.64
	Fertilizer Use	321.81	99,760.35
	Agricultural Residue Burning	3.05	944.72
Total Nitrous Oxide		1,779.57	**551,666.67**
	Total emissions from Agriculture		**777,723.98**

Appendix G: Reduction Measures, Assumptions and Attributed Reductions

Sutter County
Reduction Measures

R1 Reductions
In order to provide credit to the County for regulatory actions already taken or planned by the State of California, The Climate Action Plan first evaluates the greenhouse gas reductions that will occur within the County as a result of these actions. These will be identified in the CAP as R1 reduction measures.

R2 Reductions
R2 and R3 reduction measures are measures that can be incorporated at the County level to provide reductions in greenhouse gas emissions. R2 measures are those measures that can be quantified to show the value of the reduction from the incorporation of those measures.

R3 Reductions
R3 measures are those measures that, although they provide a vehicle through which reductions in emissions will occur, cannot be quantified at this time. The R3 measures can be viewed as supportive measures or methods of implementation for the R2 measures.

Transportation Reduction Measures

R1-T 1 Assembly Bill 1493: Pavley I

Assembly Bill (AB) 1493 (Pavley) required the California Air Resources Board (CARB) to adopt regulations that will reduce GHG from automobiles and light-duty trucks by 30 percent below 2002 levels by the year 2016, effective with 2009 models. By 2020, this requirement will reduce emissions in California by approximately 16.4 million metric tons of carbon dioxide equivalent ($MMTCO_2e$), representing 17.3 percent of emissions from passenger/light-duty vehicles in the State. By 2030 this requirement will reduce emissions in California by 19.70 percent from passenger/light-duty vehicles in the State.

		2020	2030
Pavley Afforded Reduction to automobiles & light duty Trucks	=	17.30%	19.70%

R1-T 2 Assembly Bill 1493: Pavley II

California committed to further strengthening the AB1493 standards beginning in 2017 to obtain a 45 percent GHG reduction from 2020 model year vehicles. By 2020, this requirement will reduce emissions in California by approximately 4.0 $MMTCO_2e$, representing 2.5 percent of emissions from passenger/light-duty vehicles in the State. By 2030 reductions from increased energy efficiency for passenger and light duty vehicles would increase by 55% (from combined Pavley I and II 2020 reductions of 22.2% to 34.25%) and will provide reductions from heavy duty vehicles by at least 25%. Airplane fuel economy will increase reductions by at least 25% by 2030 (PEW, 2003).

		2020	2030
Pavley Afforded Reduction to automobiles & light duty Trucks	=	2.50%	14.55%
Pavley Afforded Reductions to Heavy Duty Trucks	=	N/A	25.00%
Reduction afforded to airplane fuel	=	N/A	25.00%

R1-T 3 Executive Order S-1-07 (Low Carbon Fuel Standard)

The Low Carbon Fuel Standard (LCFS) will require a reduction of at least ten (10) percent in the carbon intensity of California's transportation fuels by 2020. This requirement will reduce emissions in California by approximately 15 $MMTCO_2e$, representing 6.9 percent of emissions from passenger/light-duty vehicles in the State. This requirement will reduce emissions in California by 7.2 percent from passenger/light-duty vehicles in the State by 2030.

		2020	2030
Reduction to automobiles & light duty Trucks	=	6.90%	7.20%

R1-T 4 Tire Pressure Program

The AB32 early action measure involves actions to ensure that vehicle tire pressure is maintained to manufacturer specifications. By 2020, this requirement will reduce emissions in California by approximately 0.55 $MMTCO_2e$, representing 0.3 percent of emissions from passenger/light-duty vehicles in the State.

		2020	2030
Reduction to automobiles & light duty Trucks	=	0.30%	0.30%

R1-T 5 Low Rolling Resistance Tires

This AB32 early action measure would increase vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.3 $MMTCO_2e$, representing 0.2 percent of emissions from passenger/light-duty vehicles in the State.

		2020	2030
Reduction to automobiles & light duty Trucks	=	0.30%	0.30%

R1-T 6 Low Friction Engine Oils

This AB32 early action measure would increase vehicle efficiency by mandating the use of engine oils that meet certain low friction specifications. By 2020, this requirement will reduce emissions in California by approximately 2.8 $MMTCO_2e$, representing 1.7 percent of emissions from passenger light-duty vehicles in the State.

		2020	2030
Reduction to automobiles & light duty Trucks	=	1.70%	1.70%

R1-T 7 Cool Paints and Reflective Glazing

This AB32 early action measure is based on measures to reduce the solar heat gain in a vehicle parked in the sun. By 2020, this requirement will reduce emissions in California by approximately 0.89 $MMTCO_2e$, representing 0.6 percent of emissions from passenger/light-duty vehicles in the State.

		2020	2030
Reduction to automobiles & light duty Trucks	=	0.60%	0.60%

R1-T 8 Goods Movement Efficiency Measures

This AB32 early action measure targets system wide efficiency improvements in goods movement to achieve GHG reductions from reduced diesel combustion. By 2020, this requirement will reduce emissions in California by approximately 3.5 $MMTCO_2e$, representing 1.6 Percent of emissions from all mobile sources (on-road and off-road) in the State.

		2020	2030
Reduction afforded to Medium and Heavy Duty Vehicle emissions	=	1.60%	1.60%

R1-T 9 Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)

This AB32 early action measure would increase heavy-duty vehicle (long-haul trucks) efficiency by requiring installation of best available technology and/or CARB approved technology to reduce aerodynamic drag and rolling resistance. By 2020, this requirement will reduce emissions in California by approximately 0.93 $MMTCO_2e$, representing 1.9 percent of emissions from heavy-duty vehicles in the State.

Reduction afforded to Heavy Duty Vehicles emissions		2020	2030
	=	1.90%	1.90%

R1-T 10 Medium and Heavy Duty Vehicle Hybridization

The implementation approach for this AB 32 measure is to adopt a regulation and/or incentive program that reduce the GHG emissions of new trucks (parcel delivery trucks and vans, utility trucks, garbage trucks, transit buses, and other vocational work trucks) sold in California by replacing them with hybrids. By 2020, this requirement will reduce emissions in California by approximately 0.5 $MMTCO_2e$, representing 0.2 percent of emissions from all on-road mobile sources in the State. This reduction is also equivalent to a 1.0 percent reduction of emissions from all heavy-duty trucks in the State.

Reduction afforded to all on-road mobile sources		2020	2030
	=	0.20%	0.20%

R2-T 1 Employment Based Trip and VMT Reduction

Implementation of this measure would require adopting a voluntary trip reduction ordinance that promotes commuter-choice programs, employer transportation management, guaranteed ride home programs and commuter assistance and outreach type programs intended to reduce commuter vehicle miles traveled. A guaranteed ride home program is a program that ensures employees that take advantage of carpooling opportunities are guaranteed a safe ride home should the employee miss the carpool pick-up time due to work related activities. This could be as simple as the employer paying for taxi service for the employee. This measure would require employers with more than 100 employees within the unincorporated County to establish a trip reduction plan that would incorporate annual employee commute surveys, marketing of commute alternatives, ride matching assistance, and transit information at a minimum. This reduction measure adds to and enhances Mobility Policies 2.G-2 and 2.G-3.

The Sutter Pointe development, in addition to the above ordinance, and in accordance with its Master Air Quality Mitigation Plan (MAQMP), will provide the following services and programs that will enhance the reduction of VMT within this Specific Plan Area. The following elements of the Sutter Pointe MAQMP are included within R2-T1 because they will reduce GHG emissions and further the County's goal of achieving the reduction target:

- Sutter Pointe will create a Transportation Management Association (TMA) with the primary goal of providing alternative mode use programs and services to the residents, employers, and employees, as
- Employment of a Transportation Coordinator (TC) will be required for all commercial/industrial development with 500 or more employees. The primary role of the TC will be to act as a liaison between the TMA and their employer and employees to disseminate information and facilitate trip

Assumptions:

* By 2020, this measure results in a 0.2% reduction in passenger/light-duty VMT in the County.
* By 2030, this measure results in a 4% reduction in passenger/light-duty VMT in the County.
* The percentage reduction reflects a growing decentralized and geographically extensive transportation network in the County.
* Measures R1-T1 through R1-T7 are implemented

Reductions:

Reduction afforded to passenger/light duty VMT in county		2020	2030
	=	0.20%	4.00%

R2-T 2 Land Use Based trips and VMT Reduction Policies

The demand for transportation is influenced by the density and geographic distribution of people and places. Whether neighborhoods have sidewalks or bike paths, whether homes are within walking distance of shops or transit stops will influence the type and amount of transportation that is utilized. By changing the focus of land use from automobile centered transportation, a reduction in vehicle miles traveled will occur. Implementation of Policies LU1.2 (Balanced Land Use Pattern), LU1.3 (Adequate Land Use Supply), LU 3.5 (Infill Development), LU 3.9 (Rural Hubs), LU 3.12 (Mixed Use); Mobility Policies M 3.1 (Transit Service for Residents), M 3.2 (Transit in New Development), M 3.3 (Transit Integration); and Agricultural Policies AG 4.4 (Farm worker Housing), AG 4.6 (Local Processing), AG 4.7 (Local Purchasing), and AG 4.12 (Support Uses) will all work together to provide a reduction in VMT for the County, by changing the focus of land use away from vehicle centered transportation to the increased densities and lay-outs that foster the implementation and use of alternate modes of transportation.

Assumptions:

* General Plan Policies: Land Use LU 1.2, 1.3, 3.5, 3,.9, 3.12, Mobility 2.C-1, 2.C-2, 2.C-3, and Agricultural policies AG4.4, AG 4.6, AG 4.7, and AG 4.12; are implemented and enforced with the planning of new development.
* In 2020, reduction in VMT is approximately 4% per year.
* In 2030, reduction in VMT is approximately 6% per year.
* Measures R2-T2, R2-T3, R2-T5, R2-T6, R2-T8, and R3-T1 are implemented.

Reductions:

Reduction afforded to passenger/light duty		2020	2030
VMT in county	=	4.00%	6.00%

R2-T 3 Preferential Parking

Implementation of this reduction measure would encourage the County to adopt a comprehensive parking program for public and private parking lots that facilitate carpooling and alternate transportation. Incentives to encourage carpooling and the use of alternate transportation methods could include:

- Providing reserved preferential parking spaces for car-share, carpool, and ultra-low or zero emission vehicles;
- Provide larger parking spaces that can accommodate vans used for ride-sharing programs and reserve them for vanpools; and include adequate passenger waiting/loading areas;
- Consider restricting the number of parking spaces within the County by sharing parking among different land uses where feasible. For example in areas where there are multiple land uses provide resident restricted parking during nighttime hours (7pm to 7am) and open the parking lot
- Provide convenient pedestrian pathways through parking areas.

The development within the Sutter Pointe Specific Plan area requires, as part of the MAQMP, that developments with 100 or more employees provide the minimum required parking and develop the sites to facilitate alternate modes of transportation.

Assumptions:

* The percentage reduction reflects a growing decentralized and geographically extensive transportation network in the County.
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T2 are implemented
* In 2020, reduction is equal to 0.1% from all vehicle miles traveled by passenger and light duty vehicles in the County.
* In 2030. reduction is equal to 0.88% from all vehicle miles traveled by passenger and light duty vehicles in the County.

Reductions:

Reduction afforded to passenger/light duty		2020	2030
VMT in county	=	0.10%	0.88%

R2-T 4

Roadway Improvements Including Signal Synchronization and Transportation Flow Management

This reduction builds on Mobility Goals M 1 and M 2, and Agricultural Policy AG 4.1 and supports (through the policies associated with those goals) modification of arterial roadways to promote and support multimodal transportation options for automobiles, transit, trucks,. In addition, this measure results in the maintenance of existing regional transportation systems to support the local, national, and global movement of agricultural products. These modifications include, but are not limited to, synchronization of signals, improvement of traffic flow, the development of parallel roadways, and support for the extension of freight rail into Sutter County's industrial areas.

Assumptions:

* In 2020, results in a 1% reduction in fuel consumption.
* In 2030, results in a 1.5% reduction in fuel consumption.
* A 1% reduction in fuel consumption is equal to a 1% reduction in VMT.
* A 1.5% reduction in fuel consumption is equal to a 1.5% reduction in VMT.
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T3 are implemented

Reductions:

Reduction afforded to passenger/light duty VMT in county		2020	2030
	=	1.00%	1.50%

R2-T 5 Increase the Use of Ridesharing as an Alternative to Single Occupancy Vehicle Use

Mobility Implementation Programs M 3-A, M 3-B, and M 3-C promote the use of ridesharing throughout the County by strengthening the transportation network within the Unincorporated County as well as between the Unincorporated County and the Cities within the County. Encouraging community car-sharing through employers will further enhance the use of these services and support the underlying goal of reducing congestion and providing viable alternatives to automobile use. Further reductions in VMT could be obtained through assistance provided by a Transportation Management Agency (TMA). A TMA could oversee or provide assistance with the creation of rideshare incentives for employees such as gas cards, carpool awards, educational seminars, commuter-choice programs, commuter-tax benefits, guaranteed ride-home programs, commuter assistance and outreach, parking incentives, and the encouragement of telecommuting and compressed work weeks. This reduction measure will also be enhanced by the requirements of the MAQMP as discussed in R2-T1 above.

Assumptions:

* The percentage reduction reflects a growing decentralized and geographically extensive transportation network in the County.
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T4 are implemented are implemented
* Results in a 0.1% reduction in vehicle miles traveled by passenger cars and light duty trucks in 2020.
* Results in a 3% reduction in vehicle miles traveled by passenger cars and light duty trucks in 2030.

Reductions:

Reduction afforded to passenger/light duty VMT in county		2020	2030
	=	0.10%	3.00%

R2-T 6 Provide a Comprehensive System of Facilities for Non-motorized Transportation

Mobility Goal M 5, and land use policies LU 1.10 (Efficient Land Use Patterns) and LU 4.8 (Quality New Development) require the County to address bicycle and pedestrian facilities. These goals and policies should: encourage the creation of bike lanes and walking paths directed to the location of schools, provide adequate bicycle parking; and encourage the development of bicycle stations, attended parking, and other attended bicycle support facilities at intermodal hubs. Bicycle stations are full-service bicycle facilities that in addition to providing secure, guarded bicycle parking could include other amenities such as "valet" bicycle service, showers, bicycle rentals, or repair services. These types of requirements are intended for large residential and non-residential development as well as large employers (500 or more employees). In addition, the establishment of multi-use trails that promote off-street bicycle and pedestrian travel as well as secure bicycle racks along these pathways will encourage their use.

The development within the Sutter Pointe Specific Plan area requires, as part of the MAQMP, bicycle and pedestrian connectivity where projects will be required to support bicycling and walking through providing amenities or incorporating convenient access to/within the project sites. Amenities and site design for these developments may include:

- Proximity to bike lanes;
- Elimination of impediments to bicycle and pedestrian circulation;
- Secure bicycle storage;
- Bicycle and pedestrian incentive programs; and
- Showers and lockers.

Assumptions:

* The percentage reduction reflects a growing decentralized and geographically extensive transportation network in the County.
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T5 are implemented are implemented
* Results in a 0.02% reduction in 2020, and 0.07% reduction in 2030, in vehicle miles traveled by passenger cars and light duty trucks from the development of Sutter Pointe only. - Assumes that large residential, commercial, and industrial development will occur only in Sutter Pointe.

Reductions:

		2020	2030
Afforded Reduction	=	0.20%	0.20%
% passenger/light duty from Sutter Pointe	=	18.48%	34.47%
Reduction afforded to passenger/light duty VMT County	=	0.02%	0.07%

R2-T 7 Expand Renewable Fuel/Low-Emission Vehicle Use

Implementation of the following would promote the expanded use of renewable fuel and low-emission vehicles:

- Collaboration between local and regional governments and business to foster the increased use of renewable fuels. This can be accomplished by coordinating the siting of new alternative fueling/recharging locations for example.
- Providing preferential parking for ultra low-, zero- emission, and alternative fuel vehicles;
- Collaboration with energy providers to ensure the availability of necessary facilities and infrastructure to encourage the use of privately owned zero emission vehicles. This can be accomplished by having conveniently located charging and fueling stations for these vehicles.
- Provide incentives for taxicabs to use gas-electric hybrid vehicles or, at a minimum, smaller more fuel-efficient vehicles.

New developments within the Sutter Pointe Specific Plan area (as provided in the EIR for the area) will be required to provide the necessary facilities and infrastructure in all land use types to encourage the use of low or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations). In addition industrial and commercial land uses will require all forklifts, yard trucks, or vehicles that are predominantly used onsite at non-residential land uses to be electric-powered or powered by biofuels that are produced from waste products, or shall use other technologies that do not rely on direct fossil fuel consumption.

Assumptions:

* Results in a 2% increase in 2020, and a 3% increase in 2030, in average miles per gallon for passenger vehicles and light duty trucks.
* A 2 % increase in average miles per gallon is equal to a 2% reduction in VMT.
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T6 are implemented are implemented

Reductions:

		2020	2030
Reduction afforded to passenger/light duty VMT County	=	2.00%	3.00%
Reduction from increase in alternative fuel use	=	N/A	4.00%
Reduction afforded to passenger/light duty VMT County	=	N/A	7.00%

R2-T 8 Transit Infrastructure Development within the Sutter Pointe Specific Plan

The Sutter Pointe Specific Plan EIR has included the following requirements regarding transportation. The inclusion of these requirements will facilitate the reduction of vehicle miles traveled and help to reduce greenhouse gas emissions throughout the County. A Conceptual Transit Plan has been developed for Sutter Pointe that includes plans for phased transit service which will begin as soon as 50 interested riders have been identified. There are four phases of transportation improvement within the Sutter Pointe development as follows:

- Phase 1 will extend past 2020 based on anticipated residential development. The primary focus of this phase is for the TMA to facilitate or develop and market rideshare initiatives including car and vanpool programs, commuter bus services, incorporation of transit stops for the Yuba-Sutter Transit system, and Airporter services to and from Sacramento International Airport.
- Phase 2 of the Sutter Pointe Transit Plan would incorporate an expansion of Sutter Pointe Transit Commuter Express Service.
- Phase 3 would increase Sacramento commuter service capacity, expand commuter service to Placer County, establish midday service to Sacramento and provide commute services to the Sutter Pointe Business Park from adjacent communities. With warranted demand, dedicated peak hour trips serving the Sutter Pointe business and industrial parks could be added from the Yuba City/Marysville area.
- Phase 4 would incorporate further expansion of the Sutter Pointe commuter bus services to Sacramento and Placer County, develop local transit services, and expand neighboring regional transit services.

Assumptions:

* Results in a 2.00% reduction in worker trips in 2020, and 5% reduction in 2030, from the Sutter Pointe development.
* Assumes ~32% of workers in 2020, and ~48% of workers in 2030, will be from the Sutter Pointe development.
* Assumes that ~34% of Conseptual Transit Plan Phase 1 is implemented by 2020, and 100% is built out by 2030.
* Measures R1-T1 through R1-T7 and R2-T1 - R2-T7 are implemented are implemented

Reductions:

		2020	2030
Afforded Reduction	=	2.00%	5.00%
% workers from Sutter Pointe		32.15%	48.20%
% of Phase 1 implemented	=	34.34%	100.00%
Reduction afforded to passenger/light duty VMT County	=	0.22%	2.41%

Energy Reduction Measures

R1-E 1 Renewable Portfolio Standard for Building Energy Use

Senate Bills (SBs) 1075 (2002) and 107 (2006) created the State's Renewable Portfolio Standard (RPS), with an initial goal of 20 percent renewable energy production by 2010. Executive Order (EO) S-14-08 establishes a RPS target of 33 percent by the year 2020 and requires State agencies to take all appropriate actions to ensure the target is met. The 33 percent RPS by 2020 goal is supported by the California Air Resources Board (CARB), though its feasibility is not certain due to current limitations in production and transmission of renewable energy.

Assumptions:

* PG&E reaches it 33% goal for 2020.
* Assumes that in 2008 PG&E's renewable portfolio was at 12% with respect to California's RPS.
* Assumes a 21% reduction in emissions from existing kWHs used.
* Assumes R1-E2 through R1-E6 have been implemented.

Reductions:

		2020	2030
% Reduction Afforded	=	21.00%	21.00%

R1-E 2 & 3 AB1109 Energy Efficiency Standard for Lighting

Assembly Bill (AB1109) mandated that the California Energy Commission (CEC) on or before December 31, 2008, adopt energy efficiency standards for general purpose lighting. These regulations, combined with other State efforts, shall be structured to reduce State-wide electricity consumption in the following ways:

- R1-E2: At least 50 percent reduction from 2007 levels for indoor residential lighting by 2018; and
- R1-E3: At least 25 percent reduction from 2007 levels for indoor commercial and outdoor lighting by 2018.

Assumptions:

* Assumes 20% of residential electrical use is from lighting.
* Assumes 37.14% of commercial/industrial electrical usage is from lighting.
* No data was available to determine outdoor lighting use, therefore no reduction was taken.

Reductions:

		2020	2030
% reduction from residential electrical use	=	10.00%	10.00%
% reduction from commercial/industrial electrical use	=	9.29%	9.29%

R1-E 4 Electrical Energy Efficiency

This measure captures the emission reductions associated with electricity energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2 reductions, as described in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"), the County's adopted Green Building ordinance (effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 21.3 $MMTCO_2e$, representing 17.5 percent of emissions from all electricity in the State. This measure includes the following strategies:

- "Zero Net Energy" buildings (buildings that combine energy efficiency and renewable generation so that they, based on an annual average, extract no energy from the grid);

- Broader standards for new types of appliances and for water efficiency;
- Improved compliance and enforcement of existing standards;
- Voluntary efficiency and green building targets beyond mandatory codes;
- Voluntary and mandatory whole-building retrofits for existing buildings;
- Innovative financing to overcome first-cost and split incentives for energy efficiency, on-site renewables, and high efficiency distributed generation;
- More aggressive utility programs to achieve long-term savings;
- Water system and water use efficiency and conservation measures;
- Additional industrial and agricultural efficiency initiatives; and
- Providing real time energy information technologies to help consumers conserve and optimize energy performance.

Assumptions:

* The percent reduction from California's emissions from various energy efficiency measures is equal to the County's emissions from this measures or 17.5%.
* Assumes application only to New development

Reductions:

		2020	2030
% reduction afforded	=	17.50%	17.50%
% of 2020 from growth	=	38.56%	38.56%
% reduction applied	=	6.75%	6.75%
% reduction afforded in 2030	=	N/A	11.31%
% of 2030 growth from 2020	=	N/A	35.99%
% reduction from 2030 growth	=	N/A	4.07%
% reduction applied	=	N/A	10.82%

R1-E 5 Natural Gas Energy Efficiency

This measure captures the emission reductions associated with natural gas energy efficiency activities included in CARB's AB32 Scoping Plan that are not attributed to other R1 or R2 reductions, as described in this report. This measure includes energy efficiency measures that CARB views as crucial to meeting the State-wide 2020 target, and will result in additional emissions reductions beyond those already accounted for in California's Energy Efficiency Standards for Residential and Non-Residential Buildings (Title 24, Part 6 of the California Code of Regulations; hereinafter referred to as, "Title 24 Energy Efficiency Standards"), the County's adopted Green Building ordinance(effective January 1, 2011), etc. By 2020, this requirement will reduce emissions in California by approximately 4.3 $MMTCO_2e$, representing 6.2 percent of emissions from all natural gas combustion in the State. This measure includes the following strategies:

- "Zero Net Energy" buildings (buildings that combine energy efficiency and renewable generation so that they, based on an annual average, extract no energy from the grid);
- Broader standards for new types of appliances and for water efficiency;
- Improved compliance and enforcement of existing standards;
- Voluntary efficiency and green building targets beyond mandatory codes;
- Voluntary and mandatory whole-building retrofits for existing buildings;
- Innovative financing to overcome first-cost and split incentives for energy efficiency, on-site renewables, and high efficiency distributed generation;
- More aggressive utility programs to achieve long-term savings;
- Water system and water use efficiency and conservation measures;
- Additional industrial and agricultural efficiency initiatives; and
- Providing real time energy information technologies to help consumers conserve and optimize energy performance.

Assumptions:

* The percent reduction from California's emissions from various energy efficiency measures is equal to the County's emissions from this measures or 6.2%.
* Assumes application only to New development

Reductions:

		2020	2030
% reduction afforded	=	6.20%	
% of 2020 from growth	=	38.56%	
% reduction applied	=	2.39%	
% reduction afforded in 2030	=	N/A	2.20%
% of 2030 growth from 2020	=	N/A	35.99%
% reduction from 2030 growth	=	N/A	0.79%
% reduction applied	=	N/A	3.18%

R1-E 6 Increased Combined Heat and Power

This measure captures the reduction in building electricity emissions associated with the increase of combined heat and power activities, as outlined in CARB's AB32 Scoping Plan. The Scoping Plan suggests that increased combined heat and power systems, which capture "waste heat" produced during power generation for local use, will offset 30,000 GWh State-wide in 2020. Approaches to lowering market barriers include utility-provided incentive payments, a possible CHP portfolio standard, transmission and distribution support systems, or the use of feed-in tariffs. By 2020, this requirement will reduce emissions in California by approximately 6.7 $MMTCO_2e$, representing 7.6 percent of emissions from all electricity in the State.

Assumptions:

* The percent reduction from California's emissions is equal to the County's emissions from this measures or 7.6%.

Reductions:

		2020	2030
% reduction afforded	=	7.60%	7.60%

R1-E 7 Industrial Efficiency Measures

This measure captures the reduction in industrial building energy emissions associated with the energy efficiency measures for industrial sources included in CARB's AB32 Scoping Plan. By 2020, this requirement will reduce emissions in California by approximately 1.0 $MMTCO_2e$, representing 3.9 percent of emissions from all industrial natural gas combustion in the State. CARB proposes the following possible State-wide measures:

- Oil and gas extraction;
- GHG leak reduction from oil and gas transmission;
- Refinery flare recovery process improvements; and
- Removal of methane exemption from existing refinery regulations.

Assumptions:

* The percent reduction from California's emissions is equal to the County's emissions from this measures or 3.9%.
* Assumes applies to all residential, commercial, and industrial land uses.

Reductions:

		2020	2030
% reduction afforded	=	3.90%	3.90%

R1-E 8 Renewable Portfolio Standard (33% by 2020) Related to Water Supply and Conveyance

This measure would increase electricity production from eligible renewable power sources to 33 percent by 2020. A reduction in GHG emissions results from replacing natural gas-fired electricity production with zero GHG-emitting renewable sources of power. By 2020, this requirement will reduce emissions from electricity used for water supply and conveyance in California by approximately 21.3 $MMTCO_2e$, representing 15.2 percent of emissions from electricity generation (in-State and imports).

Assumptions:

* The percent reduction from California's emissions is equal to the County's emissions from electricity used for water supply and conveyance or 21%.
* Assumes applies to all residential, commercial, and industrial land uses.

Reductions:

		2020	2030
% reduction afforded	=	21.00%	21.00%

R2-E 1 Residential Energy Efficiency Program

This measure involves the adoption of a program that facilitates energy efficient design for all new residential buildings within the Sutter Pointe Specific Plan to be 20% beyond the current Title 24 Standards which will implement the new development requirements set forth in the Sutter Pointe Specific Plan EIR. This energy efficiency requirement for the Sutter Pointe Specific Plan is equal to that of the LEED for Homes and ENERGY STAR programs.

The 2008 Title 24 Energy Standards were adopted by the Energy Commission on April 23, 2008, with the 2008 Residential Compliance Manual adopted by the Commission on December 17, 2008. Compliance with the 2008 standards went into effect January 1, 2010. In an effort to meet the overall goal of the California Energy Efficiency Strategic Plan of reaching zero net energy for residential buildings by 2020, the stringency of the Title 24 Energy Standards as regulated and required by the State will continue to increase every three years. As energy efficiency standards increase the County may want to periodically re-evaluate their percentage beyond Title 24 goal to ensure it is still a feasibly achievable goal.

As described in the Sutter Pointe Specific Plan DEIR and to facilitate the implementation of this program, the County could provide all developers with a list of potentially feasible GHG reduction measures that reflect the current state of the regulatory environment prior to design development. The developer will then submit to the County a mitigation report demonstrating which of the proposed reduction measures are feasible as well as why the unselected measures are infeasible. The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (100 points) the developer will meet the requirements of this measure. This system will assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Install energy efficient appliances, including air conditioning and heating units, dishwashers, water heaters, etc.;
- Install solar water heaters;
- Install top quality windows and insulation;
- Install energy efficient lighting;
- Optimize conditions for natural heating, cooling and lighting by building siting and orientation.
- Use features that incorporate natural ventilation;
- Install light-colored "cool" pavements, and strategically located shade trees along all bicycle and pedestrian routes; and
- Incorporate skylights; reflective surfaces, and natural shading in buildings design and layouts.

Sutter Pointe is implementing a pilot solar program which will offer solar as a standard feature on a percentage of homes in the Phase 1 development stage and as an upgrade for all homes. Given the success of the program it will be continued through the additional phases of the specific plan development.

Residential developments within the unincorporated portions of Sutter County that are not within the Sutter Pointe Specific Plan are encouraged to participate in the volunteer Residential Energy Efficiency Program. This volunteer program would set a minimum goal of achieving energy efficiency of 5% greater than current Title 24 Standards. Incentives to participate in this volunteer program include prioritization and streamlining of the application process for residential projects that achieve the minimum goal. The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (33 points) the developer will meet the requirements of this measure. This system will assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the strategies outlined in the bullet points above.

Assumptions:

- Applies to new development only.
- Assumes new development within Sutter Pointe to be 20% beyond current Title 24.
- Assumes new development within the remainder of Unincorporated County to be 10% beyond current Title 24.

Reductions:		2020	2030
% 2020 residential growth	=	35.66%	52.71%
% of new residential development from Sutter Pointe	=	47.85%	33.60%
% new development from Sutter Pointe	=	17.06%	34.47%
% Development from Unincorporated County	=	18.60%	18.24%
% reduction afforded to Sutter Pointe	=	20.00%	20.00%
% reduction afforded to Unincorporated County	=	5.00%	10.00%
% reduction from Sutter Pointe	=	3.41%	6.89%
% reduction from Unincorporated County	=	0.93%	1.82%
Reduction from growth between 2008 and 2020	=	N/A	4.34%
Total % reduction	=	4.34%	13.06%

R2-E 2 Residential Renewable Energy Program

This measure facilitates the voluntary incorporation of renewable energy (such as photovoltaic panels) into new residential developments. For participating developments, renewable energy application should be such that the new home's projected energy use from the grid is reduced by 50%. The California Energy Commissions' New Solar Homes Partnership is a component of the California Solar Initiative and provides rebates to developers of 6 or more units where 50% of the units include solar power. In addition this measure would encourage that all residents be equipped with "solar ready" features where feasible, to encourage future installation of solar energy systems. These features should include the proper solar orientation (south facing roof sloped at 20^{O} to 55^{O} from the horizontal), clear access on south sloped roofs, electrical conduit installed for solar electric system wiring, plumbing installed for solar hot water systems, and space provided for a solar hot water tank. The incentive program should provide enough funding and other incentives as shown in the R3 measures to result in approximately fifty percent of new residential development participation in this program, thereby resulting in a 25% reduction in electrical consumption from new residential developments.

As an alternative to, or in support of, providing onsite renewable energy, the project proponent can buy into a purchased energy offset program that will allow for the purchase of electricity generated from renewable energy resources offsite. Purchased energy offsets (or a combination of incorporated renewables and purchased offsets) must be equal to 25% of the total projected energy consumption for the development. See R3-E3 for further details on the financing program.

Assumptions:

* Applies to new development only.
* Assumes that 50% of new development will participate.
* Assumes that those developments participating will reduce electrical use by 50%.

Reductions:		2020	2030
% 2020 residential growth	=	35.66%	52.71%
% reduction from energy use	=	25.00%	25.00%
Total % reduction	=	8.91%	13.18%

R2-E 3 Residential Retrofit Implementation Program

This measure would initiate a County program that facilitates the incorporation of energy reduction measures for residential buildings undergoing major renovations. AB 811 is a potential funding source to the County for implementing incentive programs to encourage residences within the County to undertake energy efficiency retrofitting and reducing energy consumption in retrofitted homes by a minimum of 15%. As with the new development, the County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (100 points) the developer will meet the requirements of this measure. This system will be provided to assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Replace inefficient air conditioning and heating units with new energy efficient models;
- Replace older, inefficient appliances with new energy efficient models;
- Replace old windows and insulation with top-quality windows and insulation;
- Install solar water heaters;
- Replace inefficient and incandescent lighting with energy efficient lighting; and
- Weatherize the existing building to increase energy efficiency.

Assumptions:

* Applies to existing development only.
* Assumes that 25% of existing development will participate.
* Assumes that those developments participating will increase efficiency by 15%.
* Assumes reduction from electrical and natural gas.

Reductions:		2020	2030
% of 2020 that is existing residential development	=	64.34%	47.29%
% reduction applied	=	15.00%	15.00%
% existing homes participating	=	5.00%	25.00%
Total % reduction	=	0.48%	1.77%

R2-E 4 Residential Renewable Retrofit Program

This measure will initiate an incentive program that encourages residents to retrofit their homes with photovoltaic panels such that 50% of all of the home's electrical usage is offset. The California Energy Commission's Solar Initiative has incentives available to home owners.

Assumptions:

* Applies to existing development only.
* Assumes that 25% of existing development will participate.
* Assumes that those developments participating will reduce emissions from electricity by 50%.
* Assumes reduction from electricity.

Reductions:		2020	2030
% of 2020 that is existing residential development	=	64.34%	47.29%
% reduction applied	=	50.00%	50.00%
% existing homes participating	=	5.00%	25.00%
Total % reduction	=	1.61%	5.91%

R2-E 5 Commercial Energy Efficiency Program

This measure involves the adoption of a County Program that facilitates the energy efficient design for all new commercial buildings within Sutter Pointe to be 20% beyond the current Title 24 Standards which expands the new development requirements set forth in the Sutter Pointe Specific Plan EIR. This voluntary energy efficiency requirement is 10% greater than the minimum requirements of the LEED and ENERGY STAR programs. As energy efficiency standards increase the County may want to periodically re-evaluate their percentage beyond Title 24 goal to ensure it is still a feasibly achievable goal.

As described in R2-E1 above, the County could provide all developers with a list of potentially feasible GHG reduction measures that reflect the current state of the regulatory environment. The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (100 points) the developer will meet the requirements of this measure. This system will provide flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Install energy efficient appliances, including air conditioning and heating units, dishwashers, water heaters, etc.;
- Install solar water heaters;
- Install top quality windows and insulation;
- Install energy efficient lighting;
- Optimize conditions for natural heating, cooling and lighting by building siting and orientation.
- Use features that incorporate natural ventilation;
- Install light-colored "cool" pavements, and strategically located shade trees along all bicycle and pedestrian routes; and
- Incorporate skylights; reflective surfaces, and natural shading in buildings design and layouts.

The Sutter Pointe Specific Plan requires all non-residential buildings (25,000 sq feet or more) to install Energy Star (or equivalent) cool roofing systems and energy efficient furnaces. These features are intended to reduce energy consumption for non-residential projects.

Commercial developments within the unincorporated portions of Sutter County that are not within the Sutter Pointe Specific Plan are encouraged to participate in the volunteer Commercial Energy Efficiency Program. This volunteer program would set a minimum goal of achieving energy efficiency of 5% greater than current Title 24 Standards. Incentives to participate in this volunteer program include prioritization and streamlining of the application process for commercial projects that achieve the minimum goal. The County will develop a menu of options with points assigned to them. As long as a developer meets the required point allotment (33 points) the developer will meet the requirements of this program. This system will assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the strategies outlined in the bullet points above.

Assumptions:

- Applies to new development only.
- Assumes new development within Sutter Pointe to be 20% beyond current Title 24.
- Assumes new development within the remainder of Unincorporated County to be 10% beyond current Title 24.

Reductions:		2020	2030
% new com/ind development that is commercial	=	16.63%	32.58%
% of new commercial development from Sutter Pointe	=	28.13%	42.93%
% new development from Sutter Pointe	=	4.68%	62.88%
% Development from Unincorporated County	=	11.95%	37.12%
% reduction afforded to Sutter Pointe	=	20.00%	20.00%
% reduction afforded to Unincorporated County	=	5.00%	10.00%
% reduction from Sutter Pointe	=	0.94%	12.58%
% reduction from Unincorporated County	=	0.60%	3.71%
Reduction from growth between 2008 and 2020	=	N/A	1.53%
Total % reduction	=	1.53%	17.82%

R2-E 6 Commercial/Industrial Renewable Energy Program

This measure would facilitate the voluntary incorporation of renewable (solar or other renewable) energy generation into the design and construction of new commercial, office, and industrial developments. Renewable energy generation shall be incorporated such that a minimum of 20% of the project's total energy needs are offset. In addition this measure would encourage all facilities be equipped with "solar ready" features where feasible, to facilitate future installation of solar energy systems. These features should include the proper solar orientation (south facing roof sloped at 20^{O} to 55^{O} from the horizontal), clear access on south sloped roofs, electrical conduit installed for solar electric system wiring, plumbing installed for solar hot water systems, and space provided for a solar hot water tank.

As an alternative to, or in support of, providing onsite renewable energy, the project proponent can buy into an offset program that will allow for the purchase of renewable energy resources offsite. Purchased energy offsets (or a combination of incorporated renewables and purchased offsets) must be equal 20% of the total projected energy consumption for the development. See R3-E3 for further details on the financing program.

Assumptions:

* Applies to new development only.
* Assumes that 25% of new development will participate in 2020, and 35% in 2030.
* Assumes that those developments participating will reduce electrical use by 20%.

Reductions:

		2020	2030
% of com/ind development from growth	=	60.47%	47.43%
% reduction from program	=	20.00%	20.00%
% of participation	=	5.00%	35.00%
Total % reduction	=	0.60%	3.32%

R2-E 7 Commercial/Industrial Retrofit Program

This measure encourages all commercial or industrial buildings undergoing major renovations to reduce their energy consumption by a minimum of 20%. As with the new development, a menu of options will be provided to assure flexibility in the implementation of this reduction measure. Although not limited to these actions, this reduction goal can be achieved through the incorporation of the following:

- Replace inefficient air conditioning and heating units with new energy efficient models;
- Replace older, inefficient appliances with new energy efficient models;
- Replace old windows and insulation with top-quality windows and insulation;
- Install solar water heaters;
- Replace inefficient and incandescent lighting with energy efficient lighting; and
- Weatherize the existing building to increase energy efficiency.

Assumptions:

* Applies to existing development only.
* Assumes that 25% of existing development will participate in 2020, and 35% in 2030.
* Assumes that those developments participating will increase efficiency by 20%.
* Assumes reduction from electrical and natural gas.

Reductions:

		2020	2030
% from existing com/ind development	=	39.53%	39.33%
% reduction applied	=	20.00%	20.00%
% of participation	=	5.00%	35.00%
Total % reduction	=	0.40%	2.75%

R2-E 8 Agricultural Alternative Energy Programs

This program combines Agricultural Draft Policies AG 3.7 (Alternative Energy), and AG 4.3 (New Technologies) to support the incorporation and expansion of existing and new technologies to increase the energy efficiency and profitability of agricultural processes throughout Sutter County.

Assumptions:

* Applies to agricultural development only.
* Program furthers success of commercial/industrial energy efficiency measures.
* Assumes no reduction specific to this program. Reduction included in Electrical and natural gas usage from commercial and industrial usage.
* Utilities classify agricultural usage with the non-residential or commercial/industrial uses. Therefore this measure is quantified by applying the reduction to the fraction of the non-residential consumption that is associated with agricultural use.

R2-E 9 Water Use Reduction Initiative

This initiative would reduce emissions associated with electricity consumption for water treatment and reduction and therefore are included with the energy reductions. This measure encourages the County to adopt a per capita water use reduction goal in support of the Governors Executive Order S-14-08 which mandates the reduction of water use of 20 percent per capita. The County's adoption of a water use reduction goal would introduce requirements for new development and would provide cooperative support for water purveyors that are required to implement these reductions for existing developments. The County would also provide internal reduction measures such that County facilities will support this reduction requirement. The following represent potential programs that can be implemented to attain this reduction goal.

Water Conservation Program:

Under this program the excessive watering of landscaping, excessive fountain operation, watering during peak daylight hours, water of non-permeable surfaces, excessive water use for noncommercial washing, and water use resulting in flooding or runoff would be prohibited. In addition the program would encourage efficient water use for construction activities, the installation of low-flow toilets and showerheads for all new developments, use of drought-tolerant plants with efficient landscape watering systems for all new developments, recycling of water used for cooling systems, use of pool covers, and the posting of water conservation signage at all hotels.

Sutter Pointe Water Conservation and Efficiency Requirement

Under the provisions in the Sutter Pointe Specific Plan EIR, new developments within the Sutter Pointe Specific Plan area are required to adhere to the following water conservation and efficiency measures:

- With the exception of ornamental shade trees, use water-efficient landscapes with native, drought resistant species in all public areas and commercial landscaping. Use water-efficient turf in parks and other turf-dependant spaces;
- Install the infrastructure to use reclaimed water for landscape irrigation and/or washing cars;
- Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls;
- Design buildings and lots to be water efficient. Only install water-efficient fixtures and appliances;
- Restrict water methods (prohibit systems that apply water to non-vegetated surfaces) and control runoff. Prohibit businesses from using pressure washers for cleaning driveways, parking lots, sidewalks, and street surfaces;
- Provide education about water conservation and available programs and incentives; and
- Construct driveways to single family detached residences, multi-family residences and parking lots with pervious surfaces.

New Development Incentives:

Provide incentives for developers to comply with the California Green Building Standards Code as requirements for all new development. Under this Code new developments are required to reduce indoor potable water use by 20% beyond the Energy Policy Act of 1992 fixture performance requirements, and to reduce outdoor potable water use by 50% from a mid-summer baseline average consumption through irrigation efficiency, native plant selection, the use of recycled water and/or captured rainwater for example.

Water Meter Program:

Encourage water providers to install water meters for all County homes not using wells. This would provide for a better accounting of County water usage and provide potential costing per usage to help offset costs of the implementation of water conservation programs.

Water Efficiency Pricing Program

Under this program, the County would encourage water suppliers to adopt a water conservation pricing schedule (i.e. tiered rate) to encourage efficient water use. Notices could be provided in each billing showing water use budgets and the relationship between the budget and the actual usage.

Water Efficiency Retrofit Program:

This program would encourage upgrades in water efficiency for renovations or additions of residential, commercial, office, and industrial properties equivalent to that of new developments. The County would work with local water purveyors to achieve consistent standards, and to develop, approve, and review procedures for implementation.

Water Efficiency Training and Education:

Under this measure the County, in coordination with local water purveyors would implement a public information and education program that promotes water conservation. The program could include certification programs for irrigation designers, installers, and managers, as well as classes to promote the use of drought tolerant, native species and xeriscaping.

Increased Recycled Water Use:

Promote the use of municipal wastewater and graywater for agricultural, industrial and irrigation purposes. This measure would be subject to approval of the State Health Department and compliance with Title 22 provisions. This measure would facilitate the following:

- Inventory of non-potable water uses that could be substituted with recycled or graywater;
- Determination of the feasibility of producing and distributing recycled water for groundwater replenishment;
- Determine the associated energy/GHG tradeoffs for treatment/use vs. out of basin water supply usage; and
- Cooperation and coordination with responsible agencies to encourage the use of recycled water where energy tradeoffs are favorable.

Assumptions:

- Applies to all land uses (existing and new development)
- Assumes emission reduction of 20% in 2020, and 30% in 2030.
- Assumes reduction to electricity used to treat and convey water and wastewater.
- Assumes that approximately 14% of the electricity usage is used to pump water from wells in 2020, and 10% in 2030.

Reductions:

		2020	2030
% reduction applied to water usage directly	=	20.00%	30.00%
% of electricity from water pumps	=	15.26%	10.61%
% reduction applied to electricity:	=	3.05%	3.18%

Solid Waste Reduction Measures

R1-W 1 Waste Measures

The CARB AB32 Scoping Plan recommends three measures for reducing emissions from Municipal Solid Waste at the State level, including: 1) landfill methane control; 2) increase the efficiency of landfill methane capture; and 3) high recycling/zero waste. CARB is in the process of developing a discrete early action program for methane recovery (1), likely to be adopted in early 2010. This measure is expected to result in a 1.0 $MMTCO_2e$ reduction by 2020. Other measures proposed by CARB include increasing efficiency of landfill methane capture (2) and instituting high recycling/zero waste policies (3). Potential reductions associated with these measures are still to be determined. CARB estimates a preliminary one-time cost for adoption of these measures to be approximately $70 per ton of CO_2 reduced. Capital cost is estimated to be approximately $3,440,000 and annual operation cost is estimated to be approximately $706,400 per landfill. Total industry cost estimates will be evaluated further in the staff report for the landfill methane control measure.

Assumptions:

* Currently Not Quantified because complete life cycle emissions vs. reductions are unknown.

R2-W 1 County Diversion Program

This measure would implement a County wide waste diversion plan to further the goal of diverting 75% of all waste from landfills by 2020. The following is a potential list of waste reduction measures that will further strengthen existing waste reduction/diversion programs.

- Provide outreach and education programs for residential, commercial, and industrial land uses in order to further promote existing County diversion programs;
- Increase disposal fees and/or reduce residential pick-up frequency;
- Encourage businesses to adopt a voluntary procurement standard and prioritize those products that have less packaging, are reusable, recyclable, or compostable;
- Support State level policies that provide incentives for efficient and reduced packaging waste for commercial products;
- Expand list of recyclable materials;
- Work with Recology to develop and provide waste audits;
- Make recycling and composting opportunities mandatory at all public events;
- Establish an appliance end-of-life requirement;
- For new developments, require the use of recycled-content materials, or recycled materials;
- Require a minimum of 15% of materials used in construction be sourced locally, as feasible; and
- Encourage the use of recycled building materials and cement substitutes for new developments.

Assumptions:

* Applies to existing and future development not associated with Sutter Pointe.
* Assumes an existing diversion rate of 50%
* Assumes 2020 goal of 75% diversion rate and 80% in 2030.
* Does not apply to construction activities

Reductions:		2020	2030
% of development in 2020 that existed in 2008	=	61.44%	39.33%
% waste from non-Sutter Pointe uses	=	20.88%	26.72%
% reduction applied	=	25.00%	30.00%
% not from construction activities	=	71.00%	71.00%
% reduction applied to Existing	=	10.91%	8.38%
% reduction applied to non-Sutter Pointe new	=	3.71%	5.69%
% reduction applied	=	14.61%	14.07%

R2-W 2 County Diversion Program

This reduction measure would encourage a diversion of 60% of construction waste by 2020. This provides a 10% increase in diversion beyond AB2176, § 42911, that requires development projects to provide adequate areas for collecting and loading recyclable materials and ensures a 50% diversion rate prior to being issued a building permit.

Assumptions:

* Applies to new development
* Assumes an existing diversion rate of 50%
* Assumes 2020 goal of 60% diversion rate, and 70% in 2030.
* Only applies to construction activities

Reductions:

	2020	2030
% waste from Construction Activities	29.00%	29.00%
% reduction	10.00%	20.00%
% reduction applied	2.90%	5.80%

R2-W 3 Sutter Pointe Solid Waste Reduction Measures

All development within the Sutter Pointe Specific Plan area would be required to abide by the following solid waste reduction measures:

- Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard);
- Provide interior and exterior storage areas for recyclables and green waste at all buildings;
- Provide adequate recycling containers in public areas, including parks, school grounds, golf courses, and pedestrian zones in areas of mixed-use development; and
- Provide education and publicity about reducing waste and available recycling services.

Assumptions:

* Applies to Sutter Pointe only.
* Assumes all development meets the existing 50% diversion rate.
* Assumes 2020 goal of 75% diversion rate, and 80% in 2030.
* Assumes reduction from construction activities accounted for in R2-W2.
* Assumes R2-W1 is implemented.

Reductions:

	2020	2030
% waste from Sutter Pointe	17.68%	33.95%
% reduction	25.00%	30.00%
% reduction applied	4.42%	10.19%

Industrial Reduction Measures

R1-I 1 Oil and Gas Extraction Combustion Related GHG Emission Reduction

This AB 32 measure would reduce combustion emissions from oil and gas extraction. By 2020, this requirement will reduce emissions in California by approximately 1.8 MMTCO2e, representing 13 percent of combustion emissions from oil and gas extraction in the State.

Reductions:

	2020	2030
% reduction applied	13.00%	13.00%

R1-I 2 Stationary Internal Combustion Engine Electrification

This AB 32 measure would affect owners and operators of industrial and commercial engines over 50 horsepower used as primary power sources by replacing internal combustion engines with electric motors. By 2020, this requirement will reduce emissions in California by approximately 0.3 $MMTCO_2e$, representing 0.5 Percent of combustion emissions from industrial sources (non-coal) in the State.

Reductions:	2020	2030
% reduction applied	0.50%	0.50%

Agricultural Reduction Measures

R1-A 1 Methane Capture at Large Dairies

This is an AB 32 voluntary measure to encourage the installation of methane digesters to capture methane emissions at large dairies. By 2020, this requirement will reduce emissions in California by approximately one (1) $MMTCO_2$ representing 7.8 percent of CH_4 and N_2O emissions from manure management and enteric fermentation at dairies in the State.

Assumptions:

* All cows reported are from large dairies.
* Assumes no methane capture systems were in place in 2008
* Assumes reductions are to methane and nitrous oxide emissions.

Reductions:	2020	2030
% reduction applied	7.80%	7.80%

R2-A 2 Agricultural Water Management

Encourage the agricultural community to be cognizant of the necessity of water conservation and to provide access to information on technologies to reduce potable water usage where feasible. This would encourage the County in conjunction with the local water purveyors to explore the feasibility of and promote using recycled water while maintaining water quality and quantity necessary for agriculture purposes. Further, this would encourage the County to explore the feasibility of and promote water management. This measure enhances the Agricultural policies AG 3.1 (Efficient Water Management), 3.2 (Water Conservation and Recycling), 3.3 (Water Quality and Quantity), and 3.5 (Groundwater Resources).

Assumptions:

* Agricultural Water Use is included in the water use for the County under commercial/industrial uses.
* Assumes this measure fosters and improves the success of water reduction measure R2-E9.
* Assumes reductions are accounted for in reduction taken from R2-E9. No additional reduction applied.

Appendix H:2020 Reduced URBEMIS Output and GHG Calculations

Sutter County
Emissions by Land Use
2020
Reduced Inventory
By Land Use Category

Source Type		CO_2e MT/yr			
		CO_2	CH_4	N_2O	combined CO_2e
Residential	AG/RAN/ER	160,827.23	4,882.60	5,533.60	171,243
	Low Density Residential	85,421.84	2,593.33	2,939.10	90,954
	Medium Density Residential	30,471.10	925.15	1,044.35	32,441
	High Density Residential	12,364.03	375.40	423.77	13,163
	Total Residential	289,084.20	8,776.48	9,940.82	**307,801**
Commercial	Park	95.99	1.73	1.94	100
	Commercial	63,031.78	1,147.84	1,291.92	65,472
	Mixed Use	9,847.92	179.32	201.83	10,229
	Total Commercial	73,127.52	1,331.58	1,496.31	**75,955**
Industrial	Industrial	146,254.57	2,688.46	3,131.45	152,074
	Total Industrial	146,254.57	2,688.46	3,131.45	**152,074**
Agriculture		0.00	192,880.80	559,858.41	752,739
	Total	**508,466.29**	**205,677.32**	**574,426.99**	**1,288,571**

Sutter County
Emissions by Source
2020
Reduced Inventory
By Source

Transportation		
	Source:	**Metric tons of CO_2e**
1	On-Road Vehicles	348,058
2	Airport Operations	155
	Total	**348,213**

Energy		
	Sources:	**Metric tons of CO_2e**
1	Electric	46,600
2	Natural Gas	131,623
	Total	**178,223**

Solid Waste		
	Source	**Metric tons of CO_2e**
1	Solid Waste Disposal	9,359
2	Green Waste Recycling	Data Not Available
3	Materials Recycling	Data Not Available
	Total	**9,359**

Landscape Emissions		
	Sources:	**Metric tons of CO_2e**
1	Landscape Emissions	36
2	Carbon sink from CO_2 sequestration	Data Not Available
	Total	**36**

Agriculture		
	Sources:	**Metric tons of CO_2e**
1	Enteric Fermentation	22,572
2	Manure Management	27,515
3	Rice Cultivation	142,346
4	Agricultural Residue Burning	3,011
5	Crop Growth	378,097
6	Animals and Runoff	77,806
7	Fertilizer Use	101,392
	Total	**752,739**

Net Total Emissions	
Category	**Metric tons of CO_2e**
Energy	178,223
Solid Waste	9,359
Landscape Emissions	36
Agriculture	752,739
Transportation	348,213
Total	**1,288,571**

Sutter County
Input data for Green House Gas Emissions
2020
Reduced Inventory
Carbon Dioxide

A. Direct Sources

A1-3. Mobile (Construction Equipment, Motor Vehicles, and Landscape Equipment) Unreduced Emissions

Con (MT/yr)	Motor Vehicles (MT/yr)	Landscape (MT/yr) (E_{Cls})	Hearth (MT/yr) (E_{Cwood})
	457,219.54	35.57	15,710.48

Transportation Emission Reductions

		R1-T 1	R1-T 2	R1-T 3	R1-T 4	R1-T 5	R1-T 6
Passenger & Light Duty Vehicles		17.30%	2.50%	6.90%	0.30%	0.30%	1.70%
Medium Duty Vehicles	**Unmitigated**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Heavy Duty Vehicles	**MT/yr**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Passenger & Light Duty Vehicles	377,663.34	312,327.58	304,519.40	283,507.56	282,657.03	281,809.06	277,018.31
Medium Duty Vehicles	48,922.49	48,922.49	48,922.49	48,922.49	48,922.49	48,922.49	48,922.49
Heavy Duty Vehicles	30,633.71	30,633.71	30,633.71	30,633.71	30,633.71	30,633.71	30,633.71

		R1-T 7	R1-T 8	R1-T 9	R1-T 10		R2-T 1
Passenger & Light Duty Vehicles		0.60%	0.00%	0.00%	0.20%		0.20%
Medium Duty Vehicles		0.00%	1.60%	0.00%	0.20%		0.00%
Heavy Duty Vehicles	**MT/yr**	0.00%	1.60%	1.90%	0.20%		0.00%
Passenger & Light Duty Vehicles	277,018.31	275,356.20	275,356.20	275,356.20	274,805.49		274,255.88
Medium Duty Vehicles	48,922.49	48,922.49	48,139.73	48,139.73	48,043.45		48,043.45
Heavy Duty Vehicles	30,633.71	30,633.71	30,143.57	29,570.84	29,511.70		29,511.70

		R2-T 2	R2-T 3	R2-T 4	R2-T 5	R2-T 6	R2-T 7
Passenger & Light Duty Vehicles		4.00%	0.10%	1.00%	0.10%	0.02%	2.00%
Medium Duty Vehicles		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Heavy Duty Vehicles	**MT/yr**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Passenger & Light Duty Vehicles	274,255.88	263,286.74	263,023.45	260,393.22	260,132.82	260,080.80	254,879.18
Medium Duty Vehicles	48,043.45	48,043.45	48,043.45	48,043.45	48,043.45	48,043.45	48,043.45
Heavy Duty Vehicles	29,511.70	29,511.70	29,511.70	29,511.70	29,511.70	29,511.70	29,511.70

		R2-T 8						
Passenger & Light Duty Vehicles		0.22%					**Reduced**	
Medium Duty Vehicles		0.00%					**MT/yr**	**%**
Heavy Duty Vehicles	**MT/yr**	0.00%					**(ECele)**	**Reduction**
Passenger & Light Duty Vehicles	254,879.18	254,316.39					254,316	**32.66%**
Medium Duty Vehicles	48,043.45	48,043.45					48,043	**1.80%**
Heavy Duty Vehicles	29,511.70	29,511.70					29,512	**3.66%**
Reduced Total (MT/yr)							**331,872**	**27.42%**
Unmitigated Total (MT/yr)							**457,220**	

Sutter County
Input data for Green House Gas Emissions
2020
Reduced Inventory
Carbon Dioxide

Airport Fuel Emission Reductions

(U_{AAF})	Unmitigated MT/yr (E_{CWD})						Reduced MT/yr (ECele)	% Reduction
Reductions								
Annual Fuel Usage	151.84						151.84	0.00%

A4. Stationary Sources (Natural Gas) Emission Reductions

Unit Type		R1-E 5	R1-E 7	R2-E 1	R2-E 3	R2-E 5	R2-E 7
Single Family Residential Reduction		2.39%	3.90%	4.34%	0.48%	0.00%	0.00%
Multi Family Residential Reduction		2.39%	3.90%	4.34%	0.48%	0.00%	0.00%
Commercial Reduction	Unmitigated	2.39%	3.90%	0.00%	0.00%	1.53%	0.40%
Industrial Reduction	MT/yr	2.39%	3.90%	0.00%	0.00%	0.00%	0.40%
AG/RAN/ER	21,197.79	20,691.03	19,884.08	19,020.73	18,928.94	18,928.94	18,928.94
Low Density Residential	11,258.65	10,989.50	10,560.91	10,102.36	10,053.61	10,053.61	10,053.61
Medium Density Residential	4,016.81	3,920.78	3,767.87	3,604.27	3,586.88	3,586.88	3,586.88
High Density Residential	1,629.66	1,590.70	1,528.67	1,462.29	1,455.23	1,455.23	1,455.23
Park	40.60	39.63	38.09	38.09	38.09	37.50	37.35
Commercial	26,353.15	25,723.15	24,719.95	24,719.95	24,719.95	24,340.85	24,244.62
Mixed Use	4,117.74	4,019.30	3,862.55	3,862.55	3,862.55	3,803.31	3,788.28
Industrial	63,910.41	62,382.56	59,949.64	59,949.64	59,949.64	59,949.64	59,712.63

Unit Type		R1-I 1	R1-I 2				Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		0.00%	0.00%					
Multi Family Residential Reduction		0.00%	0.00%					
Commercial Reduction		0.00%	0.00%					
Industrial Reduction	MT/yr (E_{Cng})	13.00%	0.50%					
AG/RAN/ER	18,928.94	18,928.94	18,928.94				18,929	10.70%
Low Density Residential	10,053.61	10,053.61	10,053.61				10,054	10.70%
Medium Density Residential	3,586.88	3,586.88	3,586.88				3,587	10.70%
High Density Residential	1,455.23	1,455.23	1,455.23				1,455	10.70%
Park	37.35	37.35	37.35				37	8.00%
Commercial	24,244.62	24,244.62	24,244.62				24,245	8.00%
Mixed Use	3,788.28	3,788.28	3,788.28				3,788	8.00%
Industrial	59,712.63	51,949.99	51,690.24				51,690	19.12%
Total Reduced (MT/yr)							**113,785**	**14.14%**
Total Unmitigated (MT/yr)	**132,524.81**							

Sutter County
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B. Indirect Sources

B1. Electricity Emission Reductions

Unit Type		R1-E 1	R1-E 2 & 3	R1-E 4	R1-E 6	R2-E 1	R2-E 2
Single Family Residential Reduction		21.00%	10.00%	6.75%	7.60%	4.34%	8.91%
Multi Family Residential Reduction		21.00%	10.00%	6.75%	7.60%	4.34%	8.91%
Commercial Reduction	Unmitigated	21.00%	9.29%	6.75%	7.60%	0.00%	0.00%
Industrial Reduction	MT/yr (E_{Cele})	21.00%	9.29%	6.75%	7.60%	0.00%	0.00%
AG/RAN/ER	16,071.06	12,696.14	11,426.52	10,655.49	9,845.68	9,418.18	8,578.64
Low Density Residential	8,535.72	6,743.22	6,068.90	5,659.39	5,229.27	5,002.22	4,556.32
Medium Density Residential	3,045.34	2,405.82	2,165.24	2,019.13	1,865.68	1,784.67	1,625.58
High Density Residential	1,235.52	976.06	878.45	819.18	756.92	724.06	659.51
Park	23.14	18.28	16.45	15.34	14.18	14.18	14.18
Commercial	15,016.84	11,863.30	10,676.97	9,956.52	9,199.83	9,199.83	9,199.83
Mixed Use	2,346.42	1,853.67	1,668.30	1,555.73	1,437.50	1,437.50	1,437.50
Industrial	36,418.12	28,770.31	26,098.99	24,337.91	22,488.23	22,488.23	22,488.23

Unit Type		R2-E 3	R2-E 4	R2-E 5	R2-E 6	R2-E 7	
Single Family Residential Reduction		0.48%	1.61%	0.00%	0.00%	0.00%	
Multi Family Residential Reduction		0.48%	1.61%	0.00%	0.00%	0.00%	
Commercial Reduction		0.00%	0.00%	1.53%	0.60%	0.40%	
Industrial Reduction	MT/yr (E_{Cele})	0.00%	0.00%	0.00%	0.60%	0.40%	
AG/RAN/ER	8,578.64	8,537.24	8,399.91	8,399.91	8,399.91	8,399.91	
Low Density Residential	4,556.32	4,534.33	4,461.39	4,461.39	4,461.39	4,461.39	
Medium Density Residential	1,625.58	1,617.74	1,591.72	1,591.72	1,591.72	1,591.72	
High Density Residential	659.51	656.33	645.77	645.77	645.77	645.77	
Park	14.18	14.18	14.18	13.96	13.87	13.82	
Commercial	9,199.83	9,199.83	9,199.83	9,058.74	9,003.97	8,968.37	
Mixed Use	1,437.50	1,437.50	1,437.50	1,415.45	1,406.89	1,401.33	
Industrial	22,488.23	22,488.23	22,488.23	22,488.23	22,352.25	22,263.88	

Unit Type		R2-E 9					Reduced MT/yr (E_{Cele})	% reduction
Single Family Residential Reduction		3.05%						
Multi Family Residential Reduction		3.05%						
Commercial Reduction		3.05%						
Industrial Reduction	MT/yr (ECele)	3.05%						
AG/RAN/ER	8,399.91	8,143.55					8,144	49.33%
Low Density Residential	4,461.39	4,325.23					4,325	49.33%
Medium Density Residential	1,591.72	1,543.14					1,543	49.33%
High Density Residential	645.77	626.06					626	49.33%
Park	13.82	13.40					13	42.10%
Commercial	8,968.37	8,694.66					8,695	42.10%
Mixed Use	1,401.33	1,358.56					1,359	42.10%
Industrial	22,263.88	21,584.40					21,584	40.73%
Reduced total (MT/year)							**46,289**	**44.02%**
Unmitigated total (MT/year)							**82,692**	

Sutter County
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B2. Potable Water Emission Reductions

Unit Type	Unmitigated MT/yr	R1-E 8	R2-E 9				Reduced MT/yr (E_{Cele})	% reduction
Single Family Residential Reduction		21.00%	20.00%					
Multi Family Residential Reduction		21.00%	20.00%					
Commercial Reduction		21.00%	20.00%					
Industrial Reduction		21.00%	20.00%					
AG/RAN/ER	23.49	18.56	14.85				14.85	36.80%
Low Density Residential	12.48	9.86	7.89				7.89	36.80%
Medium Density Residential	0.02	0.02	0.01				0.01	36.80%
High Density Residential	0.01	0.01	0.01				0.01	36.80%
Park	0.00	0.00	0.00				0.00	0.00%
Commercial	0.67	0.53	0.42				0.42	36.80%
Mixed Use	0.10	0.08	0.06				0.06	36.80%
Industrial	1.62	1.28	1.02				1.02	36.80%
Reduced total (MT/year)							**24**	**36.80%**
Unmitigated total (MT/year)							**38**	

B3. Solid Waste

Combined: B3a. Anthropogenic Carbon and B3b. Exhaust Emissions Reductions

Unit Type	Unmitigated MT/yr	R1-E 1	R2-W 1	R2-W 2	R2-W 3		Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		21.00%	14.61%	2.90%	4.42%			
Multi Family Residential Reduction		21.00%	14.61%	2.90%	4.42%			
Commercial Reduction		21.00%	14.61%	2.90%	4.42%			
Industrial Reduction		21.00%	14.61%	2.90%	4.42%			
AG/RAN/ER	424.00	334.96	286.02	277.72	265.45		265.45	37.39%
Low Density Residential	225.20	177.91	151.91	147.51	140.99		140.99	37.39%
Medium Density Residential	80.34	63.47	54.19	52.62	50.30		50.30	37.39%
High Density Residential	32.60	25.75	21.99	21.35	20.41		20.41	37.39%
Park	0.07	0.06	0.05	0.05	0.04		0.04	37.39%
Commercial	47.75	37.72	32.21	31.28	29.89		29.89	37.39%
Mixed Use	7.46	5.89	5.03	4.89	4.67		4.67	37.39%
Industrial	115.80	91.48	78.12	75.85	72.50		72.50	37.39%
Total Reduced (MT/year)							**584**	**37.39%**
Total Unmitigated (MT/yr)							**933.22**	

Sutter County
Input data for Green House Gas Emissions
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B3c. Exhaust Emissions (Disposal Equipment) Emission Reductions

Vehicle Type	Unmitigated MT/yr						Reduced MT/yr (ECele)	% Reduction
Reduction								
Excavator	0.00	0.00					0.00	0.00%
Grader	0.00	0.00					0.00	0.00%
Off-Highway Tractor	0.00	0.00					0.00	0.00%
Off-Highway Truck	0.00	0.00					0.00	0.00%
Rubber Tired Dozer	0.00	0.00					0.00	0.00%
Disposal Facility run by City?							No	
Total Reduced (MT/year)							**0.00**	**0.00%**
Total Unmitigated (MT/yr)							**0.00**	

B4. Wastewater Emission Reductions

Unit Type	Unmitigated MT/yr	R2-E 9					Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		20.00%						
Multi Family Residential Reduction		20.00%						
Commercial Reduction		20.00%						
Industrial Reduction		20.00%						
AG/RAN/ER	8.34	6.67					6.67	20.00%
Low Density Residential	5.59	4.47					4.47	20.00%
Medium Density Residential	1.99	1.59					1.59	20.00%
High Density Residential	0.81	0.65					0.65	20.00%
Park	0.00	0.00					0.00	20.00%
Commercial	0.26	0.21					0.21	20.00%
Mixed Use	0.04	0.03					0.03	20.00%
Industrial	0.71	0.57					0.57	20.00%
Total Reduced (MT/year)							**14**	**20.00%**
Total Unmitigated (MT/yr)							**17.73**	

Sutter County
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C. AG emissions for CH_4 and N_2O, not applicable for CO_2.

D. Summary Table

Source Type		Emissions, MT /yr	CO_2e metric tons/yr
Direct	Motor vehicles & Aircraft	332,023.38	332,023.38
	Landscape equipment	35.57	35.57
	Cooling and heating	129,495.63	129,495.63
	Total direct, tons/yr	**461,554.58**	**461,554.58**
Indirect	Electricity	46,289.02	46,289.02
	Potable water	24.26	24.26
	Solid waste	584.24	584.24
	Wastewater	14.19	14.19
	Total indirect, tons/yr	**46,911.71**	**46,911.71**
Agriculture		0.00	0.00
	Total, tons/yr	**508,466.29**	**508,466.29**
	Global warming potential index	**1**	

Source Type		Emissions, MT/yr	CO_2e metric tons/yr
Residential	AG/RAN/ER	160,827.23	160,827.23
	Low Density Residential	85,421.84	85,421.84
	Medium Density Residential	30,471.10	30,471.10
	High Density Residential	12,364.03	12,364.03
	Total Residential	**289,084.20**	**289,084.20**
Commercial	Park	95.99	95.99
	Commercial	63,031.78	63,031.78
	Mixed Use	9,847.92	9,847.92
	Total Commercial	**73,127.52**	**73,127.52**
Industrial	Industrial	146,254.57	146,254.57
	Total Industrial	**146,254.57**	**146,254.57**
Agricultural		**0.00**	**0.00**
	Total, tons/yr	**508,466.29**	**508,466.29**
	Global warming potential index	1	

Sutter County
Input data for Green House Gas Emissions
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Methane

A. Direct Sources

A1-3. Mobile (Construction Equipment, Motor Vehicles, and Landscape Equipment) Unreduced Emissions

Con (MT/yr)	Motor Vehicles (MT/yr)	Landscape (MT/yr) (E_{Cls})	Hearth (MT/yr) (E_{Cwood})
	145.20	0.0020	76.35

Transportation Emission Reductions

		R1-T 1	R1-T 2	R1-T 3	R1-T 4	R1-T 5	R1-T 6
Passenger & Light Duty Vehicles		17.30%	2.50%	6.90%	0.30%	0.30%	1.70%
Medium Duty Vehicles		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Heavy Duty Vehicles	MT/yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Passenger & Light Duty Vehicles	119.94	99.19	96.71	90.03	89.76	89.49	87.97
Medium Duty Vehicles	15.54	15.54	15.54	15.54	15.54	15.54	15.54
Heavy Duty Vehicles	9.73	9.73	9.73	9.73	9.73	9.73	9.73

		R1-T 7	R1-T 8	R1-T 9	R1-T 10		R2-T 1
Passenger & Light Duty Vehicles		0.60%	0.00%	0.00%	0.00%		0.20%
Medium Duty Vehicles		0.00%	1.60%	0.00%	0.20%		0.00%
Heavy Duty Vehicles	MT/yr	0.00%	1.60%	1.90%	0.20%		0.00%
Passenger & Light Duty Vehicles	87.97	87.45	87.45	87.45	87.45		87.27
Medium Duty Vehicles	15.54	15.54	15.29	15.29	15.26		15.26
Heavy Duty Vehicles	9.73	9.73	9.57	9.39	9.37		9.37

		R2-T 2	R2-T 3	R2-T 4	R2-T 5	R2-T 6	R2-T 7
Passenger & Light Duty Vehicles		4.00%	0.10%	1.00%	0.10%	0.02%	2.00%
Medium Duty Vehicles		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Heavy Duty Vehicles	MT/yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Passenger & Light Duty Vehicles	87.27	83.78	83.70	82.86	82.78	82.76	81.10
Medium Duty Vehicles	15.26	15.26	15.26	15.26	15.26	15.26	15.26
Heavy Duty Vehicles	9.37	9.37	9.37	9.37	9.37	9.37	9.37

		R2-T 8					Reduced MT/yr (ECele)	% Reduction
Passenger & Light Duty Vehicles		0.22%						
Medium Duty Vehicles		0.00%						
Heavy Duty Vehicles	MT/yr	0.00%						
Passenger & Light Duty Vehicles	81.10	80.93					81	**32.53%**
Medium Duty Vehicles	15.26	15.26					15	**1.80%**
Heavy Duty Vehicles	9.37	9.37					9	**3.66%**
Reduced Total (MT/yr)							**106**	**27.30%**
Unmitigated Total (MT/yr)	145.20							

Sutter County
Input data for Green House Gas Emissions
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Methane

Airport Fuel Emissions Reductions

(U_{AAF})	MT/yr (E_{CWD})						Reduced MT/yr (ECele)	% Reduction
Reductions								
Annual Fuel Usage	0.13						0.13	0.00%

A4. Stationary Sources (Natural Gas) Emission Reductions

Unit Type		R1-E 5	R1-E 7	R2-E 1	R2-E 3	R2-E 5	R2-E 7
Single Family Residential Reduction		2.39%	3.90%	4.34%	0.48%	0.00%	0.00%
Multi Family Residential Reduction		2.39%	3.90%	4.34%	0.48%	0.00%	0.00%
Commercial Reduction		2.39%	3.90%	0.00%	0.00%	1.53%	0.40%
Industrial Reduction	MT/yr (E_{Cng})	2.39%	3.90%	0.00%	0.00%	0.00%	0.40%
AG/RAN/ER	2.00	1.95	1.87	1.79	1.78	1.78	1.78
Low Density Residential	1.06	1.04	0.99	0.95	0.95	0.95	0.95
Medium Density Residential	0.38	0.37	0.35	0.34	0.34	0.34	0.34
High Density Residential	0.15	0.15	0.14	0.14	0.14	0.14	0.14
Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	2.48	2.42	2.33	2.33	2.33	2.29	2.28
Mixed Use	0.39	0.38	0.36	0.36	0.36	0.36	0.36
Industrial	1.20	1.18	1.13	1.13	1.13	1.13	1.13

Unit Type		R1-I 1	R1-I 2				Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		0.00%	0.00%					
Multi Family Residential Reduction		0.00%	0.00%					
Commercial Reduction		0.00%	0.00%					
Industrial Reduction	MT/yr (E_{Cng})	13.00%	0.50%					
AG/RAN/ER	1.78	1.78	1.78				2	10.70%
Low Density Residential	0.95	0.95	0.95				1	10.70%
Medium Density Residential	0.34	0.34	0.34				0	10.70%
High Density Residential	0.14	0.14	0.14				0	10.70%
Park	0.00	0.00	0.00				0	8.00%
Commercial	2.28	2.28	2.28				2	8.00%
Mixed Use	0.36	0.36	0.36				0	8.00%
Industrial	1.13	0.98	0.97				1	19.12%
Total Reduced (MT/yr)							**7**	**11.01%**
Total Unmitigated (MT/yr)							**7.67**	

Sutter County
Input data for Green House Gas Emissions
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Methane

B. Indirect Sources

B1. Electricity Emission Reductions

Unit Type		R1-E 1	R1-E 2 & 3	R1-E 4	R1-E 6	R2-E 1	R2-E 2
Single Family Residential Reduction		21.00%	10.00%	6.75%	7.60%	4.34%	8.91%
Multi Family Residential Reduction		21.00%	10.00%	6.75%	7.60%	4.34%	8.91%
Commercial Reduction	Unmitigated MT/yr (E_{Cele})	21.00%	9.29%	6.75%	7.60%	0.00%	0.00%
Industrial Reduction		21.00%	9.29%	6.75%	7.60%	0.00%	0.00%
AG/RAN/ER	0.93	0.73	0.66	0.61	0.57	0.54	0.49
Low Density Residential	0.49	0.39	0.35	0.33	0.30	0.29	0.26
Medium Density Residential	0.18	0.14	0.12	0.12	0.11	0.10	0.09
High Density Residential	0.07	0.06	0.05	0.05	0.04	0.04	0.04
Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	0.87	0.68	0.62	0.57	0.53	0.53	0.53
Mixed Use	0.14	0.11	0.10	0.09	0.08	0.08	0.08
Industrial	2.10	1.66	1.50	1.40	1.30	1.30	1.30

Unit Type		R2-E 3	R2-E 4	R2-E 5	R2-E 6	R2-E 7	Reduced MT/yr (E_{Cele})	% reduction
Single Family Residential Reduction		0.48%	1.61%	0.00%	0.00%	0.00%		
Multi Family Residential Reduction		0.48%	1.61%	0.00%	0.00%	0.00%		
Commercial Reduction		0.00%	0.00%	1.53%	0.60%	0.40%		
Industrial Reduction	MT/yr (E_{Cele})	0.00%	0.00%	0.00%	0.60%	0.40%		
AG/RAN/ER	0.49	0.49	0.48	0.48	0.48	0.48	0.4841	47.73%
Low Density Residential	0.26	0.26	0.26	0.26	0.26	0.26	0.2571	47.73%
Medium Density Residential	0.09	0.09	0.09	0.09	0.09	0.09	0.0917	47.73%
High Density Residential	0.04	0.04	0.04	0.04	0.04	0.04	0.0372	47.73%
Park	0.00	0.00	0.00	0.00	0.00	0.00	0.0008	40.28%
Commercial	0.53	0.53	0.53	0.52	0.52	0.52	0.5169	40.28%
Mixed Use	0.08	0.08	0.08	0.08	0.08	0.08	0.0808	40.28%
Industrial	1.30	1.30	1.30	1.30	1.29	1.28	1.2831	38.87%

Unit Type	MT/yr (ECele)	R2-E 9					Reduced MT/yr (ECele)	% reduction
Single Family Residential Reduction		3.05%						
Multi Family Residential Reduction		3.05%						
Commercial Reduction		3.05%						
Industrial Reduction		3.05%						
AG/RAN/ER	0.48	0.46934					0.4693	49.33%
Low Density Residential	0.257123761	0.24928					0.2493	49.33%
Medium Density Residential	0.09173434	0.08893					0.0889	49.33%
High Density Residential	0.037219545	0.03608					0.0361	49.33%
Park	0.000794304	0.00077					0.0008	42.10%
Commercial	0.516876723	0.5011					0.5011	42.10%
Mixed Use	0.080762175	0.0783					0.0783	42.10%
Industrial	1.283149197	1.24399					1.2440	40.73%
Reduced total (MT/year)							**2.67**	**44.02%**
Unmitigated total (MT/year)							**4.77**	

Sutter County
Input data for Green House Gas Emissions
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Methane

B2. Potable Water Emission Reductions

Unit Type	MT/yr (E_{Cpot})	R1-E 8	R2-E 9				Reduced MT/yr (E_{Cele})	% reduction
Single Family Residential Reduction		21.00%	20.00%					
Multi Family Residential Reduction		21.00%	20.00%					
Commercial Reduction		21.00%	20.00%					
Industrial Reduction		21.00%	20.00%					
AG/RAN/ER	0.00135	0.001069	0.000856				0.00086	36.80%
Low Density Residential	0.00072	0.000568	0.000454				0.00045	36.80%
Medium Density Residential	0.00026	0.000203	0.000162				0.00016	36.80%
High Density Residential	0.00010	0.000082	0.000066				0.00007	36.80%
Park	0.00000	0.000000	0.000000				0.00000	36.80%
Commercial	0.00004	0.000030	0.000024				0.00002	36.80%
Mixed Use	0.00001	0.000005	0.000004				0.00000	36.80%
Industrial	0.00009	0.000074	0.000059				0.00006	36.80%
Reduced total (MT/year)							**0.00163**	**36.80%**
Unmitigated total (MT/year)							**0.00257**	

B3. Solid Waste

Combined: B3a. Anthropogenic Carbon and B3b. Exhaust Emissions Reductions

Unit Type	MT/yr (E_{CWF})	R2-W 1	R2-W 2	R2-W 3			Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		14.61%	2.90%	4.42%				
Multi Family Residential Reduction		14.61%	2.90%	4.42%				
Commercial Reduction		14.61%	2.90%	4.42%				
Industrial Reduction		14.61%	2.90%	4.42%				
AG/RAN/ER	202.43	172.86	167.84	160.42			160.42	20.75%
Low Density Residential	107.52	91.81	89.15	85.21			85.21	20.75%
Medium Density Residential	38.36	32.75	31.80	30.40			30.40	20.75%
High Density Residential	15.56	13.29	12.90	12.33			12.33	20.75%
Park	0.07	0.06	0.06	0.05			0.05	20.75%
Commercial	45.60	38.93	37.80	36.13			36.13	20.75%
Mixed Use	7.12	6.08	5.91	5.64			5.64	20.75%
Industrial	110.58	94.42	91.68	87.63			87.63	20.75%
Total Reduced (MT/year)							**418**	**20.75%**
Total Unmitigated (MT/yr)							**527.24**	

Sutter County
Input data for Green House Gas Emissions
2020
Reduced Inventory
Methane

B3c. Exhaust Emissions (Disposal Equipment) Reductions

Vehicle Type							Reduced MT/yr	%
Reductions	MT/yr (E_{CWD})						(ECele)	Reduction
Excavator	0.00	0.00					0.00	0.00%
Grader	0.00	0.00					0.00	0.00%
Off-Highway Tractor	0.00	0.00					0.00	0.00%
Off-Highway Truck	0.00	0.00					0.00	0.00%
Rubber Tired Dozer	0.00	0.00					0.00	0.00%
Disposal Facility run by City?							No	
Total Reduced (MT/year)							**0.00**	**0.00%**
Total Unmitigated (MT/yr)							**0.00**	

B4. Wastewater Emission Reductions

Unit Type		R2-E 9					Reduced MT/yr (E_{Cele})	%
Single Family Residential Reduction		20.00%						
Multi Family Residential Reduction		20.00%						
Commercial Reduction		20.00%						
Industrial Reduction	MT/yr	20.00%						Reduction
AG/RAN/ER	0.0004804	0.000384					0.000384	20.00%
Low Density Residential	0.0003219	0.000258					0.000258	20.00%
Medium Density Residential	0.0001148	0.000092					0.000092	20.00%
High Density Residential	0.0000466	0.000037					0.000037	20.00%
Park	0.0000000	0.000000					0.000000	20.00%
Commercial	0.0000150	0.000012					0.000012	20.00%
Mixed Use	0.0000023	0.000002					0.000002	20.00%
Industrial	0.0000409	0.000033					0.000033	20.00%
Total Reduced (MT/year)							**0.000818**	**20.00%**
Total Unmitigated (MT/yr)							**0.0010220**	

C. AG emissions Reductions for CH_4

		R1-A 1	R2-E 9				Reduced	%
Emissions Source	MT/yr	7.80%	20.00%				MT/yr	Reduction
Enteric Fermentation - Dairy Cows	1,023.51	943.67					943.67	7.80%
Enteric Fermentation - Other Animals	131.18	131.18					131.18	0.00%
Manure Management - Dairy Cows	1,332.76	1,228.80					1,228.80	7.80%
Manure Management - Other Animals	4.36	4.36					4.36	0.00%
Rice Cultivation	8473.00	8,473.00	6,778.40				6,778.40	20.00%
Agricultural Crop Burning	98.39	98.39					98.39	0.00%
Total Reduced (MT/year)							**9,184.80**	**16.98%**
Total Unmitigated (MT/yr)							**11,063.19**	

Sutter County
Input data for Green House Gas Emissions
2020
Reduced Inventory
Methane

D. Summary Table

Source Type		Emissions, MT /yr	CO_2e metric tons/yr
Direct	Motor vehicles & Aircraft	105.68	2,219.35
	Landscape equipment	0.00	0.04
	Cooling and heating	83.18	1,746.75
	Total direct, tons/yr	**188.86**	**3,966.14**
Indirect	Electricity	2.67	56.02
	Potable water	0.00	0.03
	Solid waste	417.82	8,774.31
	Wastewater	0.00	0.02
	Total indirect, tons/yr	**420.49**	**8,830.38**
Agriculture		9,184.80	192,880.80
	Total, tons/yr	**9,794.16**	**205,677.33**
	Global warming potential index	**21**	

Source Type		Emissions, MT/yr	CO_2e metric tons/yr
Residential	AG/RAN/ER	232.50	4,882.60
	Low Density Residential	123.49	2,593.33
	Medium Density Residential	44.05	925.15
	High Density Residential	17.88	375.40
	Total Residential	**417.93**	**8,776.48**
Commercia	Park	0.08	1.73
	Commercial	54.66	1,147.84
	Mixed Use	8.54	179.32
	Total Commercial	**63.41**	**1,331.58**
Industrial	Industrial	128.02	2,688.46
	Total Industrial	**128.02**	**2,688.46**
Agricultural		**9,184.80**	**192,880.80**
	Total, tons/yr	**9,794.16**	**205,677.32**
	Global warming potential index	21	

Sutter County
Input data for Green House Gas Emissions
2020
Reduced Inventory
Nitrous Oxide

A. Direct Sources

A1-3. Mobile (Construction Equipment, Motor Vehicles, and Landscape Equipment) Unreduced Emissions

Con (MT/yr)	Motor Vehicles (MT/yr)	Landscape (MT/yr) (E_{Cls})	Hearth (MT/yr) (E_{Cwood})
	61.99	0.0008893	1.0148345

Transportation Emissions Reductions

		R1-T 1	R1-T 2	R1-T 3	R1-T 4	R1-T 5	R1-T 6	
Passenger & Light Duty Vehicles		17.30%	2.50%	6.90%	0.30%	0.30%	1.70%	
Medium Duty Vehicles	**Unmitigated**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Heavy Duty Vehicles	**MT/yr**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Passenger & Light Duty Vehicles	51.20	42.35	41.29	38.44	38.32	38.21	37.56	
Medium Duty Vehicles	6.63	6.63	6.63	6.63	6.63	6.63	6.63	
Heavy Duty Vehicles	4.15	4.15	4.15	4.15	4.15	4.15	4.15	

		R1-T 7	R1-T 8	R1-T 9	R1-T 10		R2-T 1	
Passenger & Light Duty Vehicles		0.60%	0.00%	0.00%	0.00%		0.20%	
Medium Duty Vehicles		0.00%	1.60%	0.00%	0.20%		0.00%	
Heavy Duty Vehicles	**MT/yr**	0.00%	1.60%	1.90%	0.20%		0.00%	
Passenger & Light Duty Vehicles	37.56	37.33	37.33	37.33	37.33		37.26	
Medium Duty Vehicles	6.63	6.63	6.53	6.53	6.51		6.51	
Heavy Duty Vehicles	4.15	4.15	4.09	4.01	4.00		4.00	

		R2-T 2	R2-T 3	R2-T 4	R2-T 5	R2-T 6	R2-T 7	
Passenger & Light Duty Vehicles		4.00%	0.10%	1.00%	0.10%	0.02%	2.00%	
Medium Duty Vehicles		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Heavy Duty Vehicles	**MT/yr**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Passenger & Light Duty Vehicles	37.26	35.77	35.73	35.37	35.34	35.33	34.63	
Medium Duty Vehicles	6.51	6.51	6.51	6.51	6.51	6.51	6.51	
Heavy Duty Vehicles	4.00	4.00	4.00	4.00	4.00	4.00	4.00	

		R2-T 8						
Passenger & Light Duty Vehicles		0.22%					**Reduced**	
Medium Duty Vehicles		0.00%					**MT/yr**	**%**
Heavy Duty Vehicles	**MT/yr**	0.00%					**(ECele)**	**Reduction**
Passenger & Light Duty Vehicles	34.63	34.55					35	**32.53%**
Medium Duty Vehicles	6.51	6.51					7	**1.80%**
Heavy Duty Vehicles	4.00	4.00					4	**3.66%**
Reduced Total (MT/yr)							**45**	**27.30%**
Unmitigated Total (MT/yr)							61.99	

Sutter County
Input data for Green House Gas Emissions
2020
Reduced Inventory
Nitrous Oxide

Airport Fuel Emissions Reductions

(U_{AAF})	Unmitigated MT/yr (E_{CWD})						Reduced MT/yr (ECele)	% Reduction
Reductions								
Annual Fuel Usage	0.0020075						0.0020075	0.00%

A4. Stationary Sources (Natural Gas)

Unit Type	Unmitigated MT/yr	R1-E 5	R1-E 7	R2-E 1	R2-E 3	R2-E 5	R2-E 7
Single Family Residential Reduction		2.39%	3.90%	4.34%	0.48%	0.00%	0.00%
Multi Family Residential Reduction		2.39%	3.90%	4.34%	0.48%	0.00%	0.00%
Commercial Reduction		2.39%	3.90%	0.00%	0.00%	1.53%	0.40%
Industrial Reduction		2.39%	3.90%	0.00%	0.00%	0.00%	0.40%
AG/RAN/ER	0.0399430	0.0389881	0.0374676	0.0358408	0.0356678	0.0356678	0.0356678
Low Density Residential	0.0212150	0.0207078	0.0199002	0.0190362	0.0189443	0.0189443	0.0189443
Medium Density Residential	0.0075690	0.0073881	0.0070999	0.0067916	0.0067589	0.0067589	0.0067589
High Density Residential	0.0030710	0.0029976	0.0028807	0.0027556	0.0027423	0.0027423	0.0027423
Park	0.0000770	0.0000752	0.0000722	0.0000722	0.0000722	0.0000711	0.0000708
Commercial	0.0496570	0.0484699	0.0465796	0.0465796	0.0465796	0.0458652	0.0456839
Mixed Use	0.0077590	0.0075735	0.0072781	0.0072781	0.0072781	0.0071665	0.0071382
Industrial	0.1204270	0.1175481	0.1129637	0.1129637	0.1129637	0.1129637	0.1125171

Unit Type	MT/yr (E_{Cng})	R1-I 1	R1-I 2				Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		0.00%	0.00%					
Multi Family Residential Reduction		0.00%	0.00%					
Commercial Reduction		0.00%	0.00%					
Industrial Reduction		13.00%	0.50%					
AG/RAN/ER	0.0356678	0.0356678	0.0356678				0.0356678	10.70%
Low Density Residential	0.0189443	0.0189443	0.0189443				0.0189443	10.70%
Medium Density Residential	0.0067589	0.0067589	0.0067589				0.0067589	10.70%
High Density Residential	0.0027423	0.0027423	0.0027423				0.0027423	10.70%
Park	0.0000708	0.0000708	0.0000708				0.0000708	8.00%
Commercial	0.0456839	0.0456839	0.0456839				0.0456839	8.00%
Mixed Use	0.0071382	0.0071382	0.0071382				0.0071382	8.00%
Industrial	0.1125171	0.0978899	0.0974004				0.0974004	19.12%
Total Reduced (MT/yr)							**0.2144066**	**14.14%**
Total Unmitigated (MT/yr)							**0.2497180**	

Sutter County
Input data for Green House Gas Emissions
2020
Reduced Inventory
Nitrous Oxide

B. Indirect Sources

B1. Electricity Emissions Reductions

Unit Type		R1-E 1	R1-E 2 & 3	R1-E 4	R1-E 6	R2-E 1	R2-E 2
Single Family Residential Reduction		21.00%	10.00%	6.75%	7.60%	4.34%	8.91%
Multi Family Residential Reduction		21.00%	10.00%	6.75%	7.60%	4.34%	8.91%
Commercial Reduction	Unmitigated	21.00%	9.29%	6.75%	7.60%	0.00%	0.00%
Industrial Reduction	MT/yr	21.00%	9.29%	6.75%	7.60%	0.00%	0.00%
AG/RAN/ER	0.2484300	0.1962597	0.1766337	0.1647150	0.1521967	0.1455884	0.1326105
Low Density Residential	0.1319453	0.1042368	0.0938131	0.0874829	0.0808342	0.0773244	0.0704316
Medium Density Residential	0.0215033	0.0169876	0.0152888	0.0142572	0.0131737	0.0126017	0.0114783
High Density Residential	0.0087241	0.0068920	0.0062028	0.0057843	0.0053447	0.0051126	0.0046569
Park	0.0003576	0.0002825	0.0002543	0.0002371	0.0002191	0.0002191	0.0002191
Commercial	0.2321305	0.1833831	0.1650448	0.1539080	0.1422110	0.1422110	0.1422110
Mixed Use	0.0362709	0.0286540	0.0257886	0.0240485	0.0222208	0.0222208	0.0222208
Industrial	0.5629518	0.4447319	0.4034386	0.3762157	0.3476233	0.3476233	0.3476233

Unit Type		R2-E 3	R2-E 4	R2-E 5	R2-E 6	R2-E 7	Reduced MT/yr (E_{Cele})	% reduction
Single Family Residential Reduction		0.48%	1.61%	0.00%	0.00%	0.00%		
Multi Family Residential Reduction		0.48%	1.61%	0.00%	0.00%	0.00%		
Commercial Reduction		0.00%	0.00%	1.53%	0.60%	0.40%		
Industrial Reduction	MT/yr (E_{Cele})	0.00%	0.00%	0.00%	0.60%	0.40%		
AG/RAN/ER	0.1326105	0.1319705	0.1298477	0.1298477	0.1298477	0.1298477	0.1298477	47.73%
Low Density Residential	0.0704316	0.0700917	0.0689642	0.0689642	0.0689642	0.0689642	0.0689642	47.73%
Medium Density Residential	0.0114783	0.0114229	0.0112392	0.0112392	0.0112392	0.0112392	0.0112392	47.73%
High Density Residential	0.0046569	0.0046344	0.0045599	0.0045599	0.0045599	0.0045599	0.0045599	47.73%
Park	0.0002191	0.0002191	0.0002191	0.0002157	0.0002144	0.0002136	0.0002136	40.28%
Commercial	0.1422110	0.1422110	0.1422110	0.1400301	0.1391834	0.1386332	0.1386332	40.28%
Mixed Use	0.0222208	0.0222208	0.0222208	0.0218800	0.0217477	0.0216617	0.0216617	40.28%
Industrial	0.3476233	0.3476233	0.3476233	0.3476233	0.3455214	0.3441554	0.3441554	38.87%

Unit Type		R2-E 9					Reduced MT/yr (ECele)	% reduction
Single Family Residential Reduction		3.05%						
Multi Family Residential Reduction		3.05%						
Commercial Reduction		3.05%						
Industrial Reduction	MT/yr (ECele)	3.05%						
AG/RAN/ER	0.1298477	0.12588					0.1258848	49.33%
Low Density Residential	0.068964247	0.06686					0.0668595	49.33%
Medium Density Residential	0.011239195	0.0109					0.0108962	49.33%
High Density Residential	0.004559852	0.00442					0.0044207	49.33%
Park	0.000213566	0.00021					0.000207	42.10%
Commercial	0.138633173	0.1344					0.1344022	42.10%
Mixed Use	0.021661737	0.021					0.0210006	42.10%
Industrial	0.344155371	0.33365					0.333652	40.73%
Reduced total (MT/year)							**0.70**	**43.87%**
Unmitigated total (MT/year)							**1.24**	

Sutter County
Input data for Green House Gas Emissions
2020
Reduced Inventory
Nitrous Oxide

B2. Potable Water Emissions Reductions

Unit Type	Unmitigated MT/yr	R1-E 8	R2-E 9				Reduced MT/yr (E_{Cele})	% reduction
Single Family Residential Reduction		21.00%	20.00%					
Multi Family Residential Reduction		21.00%	20.00%					
Commercial Reduction		21.00%	20.00%					
Industrial Reduction		21.00%	20.00%					
AG/RAN/ER	0.0003631	0.0002868	0.0002295				0.0002295	36.80%
Low Density Residential	0.0001928	0.0001523	0.0001219				0.0001219	36.80%
Medium Density Residential	0.0000688	0.0000544	0.0000435				0.0000435	36.80%
High Density Residential	0.0000279	0.0000221	0.0000176				0.0000176	36.80%
Park	0.0000000	0.0000000	0.0000000				0.0000000	36.80%
Commercial	0.0000103	0.0000082	0.0000065				0.0000065	36.80%
Mixed Use	0.0000016	0.0000013	0.0000010				0.0000010	36.80%
Industrial	0.0000251	0.0000198	0.0000159				0.0000159	36.80%
Reduced total (MT/year)							**0.0004359**	**36.80%**
Unmitigated total (MT/year)							**0.0006897**	

B3. Solid Waste

Combined: B3a. Anthropogenic Carbon and B3b. Exhaust Emissions Reductions

Unit Type	Unmitigated MT/yr	R2-W 1	R2-W 2	R2-W 3			Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		14.61%	2.90%	4.42%				
Multi Family Residential Reduction		14.61%	2.90%	4.42%				
Commercial Reduction		14.61%	2.90%	4.42%				
Industrial Reduction		14.61%	2.90%	4.42%				
AG/RAN/ER	0.0005875	0.0005017	0.0004871	0.0004656			0.0004656	20.75%
Low Density Residential	0.0003120	0.0002664	0.0002587	0.0002473			0.0002473	20.75%
Medium Density Residential	0.0001113	0.0000951	0.0000923	0.0000882			0.0000882	20.75%
High Density Residential	0.0000452	0.0000386	0.0000375	0.0000358			0.0000358	20.75%
Park	0.0000001	0.0000001	0.0000001	0.0000001			0.0000001	20.75%
Commercial	0.0000662	0.0000565	0.0000549	0.0000524			0.0000524	20.75%
Mixed Use	0.0000103	0.0000088	0.0000086	0.0000082			0.0000082	20.75%
Industrial	0.0001605	0.0001370	0.0001330	0.0001272			0.0001272	20.75%
Total Reduced (MT/year)							**0.0010247**	**20.75%**
Total Unmitigated (MT/yr)							**0.0012931**	

Sutter County
Input data for Green House Gas Emissions
2020
Reduced Inventory
Nitrous Oxide

B3c. Exhaust Emissions (Disposal Equipment) Reductions

Vehicle Type							Reduced MT/yr	%
Reductions	MT/yr (E_{CWD})						(ECele)	Reduction
Excavator	0.0000000	0.0000000					0.0000000	0.00%
Grader	0.0000000	0.0000000					0.0000000	0.00%
Off-Highway Tractor	0.0000000	0.0000000					0.0000000	0.00%
Off-Highway Truck	0.0000000	0.0000000					0.0000000	0.00%
Rubber Tired Dozer	0.0000000	0.0000000					0.0000000	0.00%
Disposal Facility run by City?							No	
Total Reduced (MT/year)							**0.0000000**	**0.00%**
Total Unmitigated (MT/yr)							**0.0000000**	

B4. Wastewater Emissions Reduction

Unit Type		R2-E 9					Reduced MT/yr	%
Single Family Residential Reduction		20.00%						
Multi Family Residential Reduction		20.00%						
Commercial Reduction	Unmitigated	20.00%						
Industrial Reduction	MT/yr	20.00%					(E_{Cele})	Reduction
AG/RAN/ER	0.0001289	0.0001031					0.0001031	20.00%
Low Density Residential	0.0000863	0.0000691					0.0000691	20.00%
Medium Density Residential	0.0000141	0.0000113					0.0000113	20.00%
High Density Residential	0.0000057	0.0000046					0.0000046	20.00%
Park	0.0000000	0.0000000					0.0000000	20.00%
Commercial	0.0000040	0.0000032					0.0000032	20.00%
Mixed Use	0.0000006	0.0000005					0.0000005	20.00%
Industrial	0.0000110	0.0000088					0.0000088	20.00%
Total Reduced (MT/year)							**0.0002005**	**20.00%**
Total Unmitigated (MT/yr)							**0.0002506**	

C. AG Emissions Reductions for N_2O.

Emissions Source	Unmitigated	R1-A 1					Reduced	%
Reductions	MT/yr	7.80%					MT/yr	Reduction
Manure Management - Dairy Cows	3.39	3.13					3.13	7.80%
Manure Management - Other Animals	2.10	2.10					2.10	0.00%
Animals and Runoff	250.99	250.99					250.99	0.00%
Crop Growth	1219.67	1,219.67					1,219.67	0.00%
Fertilizer Use	327.07	327.07					327.07	0.00%
Agricultural Residue Burning	3.05	3.05					3.05	0.00%
Total Reduced (MT/year)							**1,805.99**	**0.01%**
Total Unmitigated (MT/yr)							**1,806.26**	

Sutter County
Input data for Green House Gas Emissions
2020
Reduced Inventory
Nitrous Oxide

D. Summary Table

Source Type		Emissions, MT /yr	CO_2e metric tons/yr
Direct	Motor vehicles & Aircraft	45.07	13,970.58
	Landscape equipment	0.00	0.28
	Cooling and heating	1.23	381.06
	Total direct, tons/yr	**46.30**	**14,351.92**
Indirect	Electricity	0.70	216.17
	Potable water	0.00	0.14
	Solid waste	0.00	0.32
	Wastewater	0.00	0.06
	Total indirect, tons/yr	**0.70**	**216.69**
Agriculture		1,805.99	559,858.41
	Total, tons/yr	**1,852.99**	**574,427.01**
	Global warming potential index	310	

Source Type		Emissions, MT/yr	CO_2e metric tons/yr
Residential	AG/RAN/ER	17.85	5,533.60
	Low Density Residential	9.48	2,939.10
	Medium Density Residential	3.37	1,044.35
	High Density Residential	1.37	423.77
	Total Residential	**32.07**	**9,940.82**
Commercial	Park	0.01	1.94
	Commercial	4.17	1,291.92
	Mixed Use	0.65	201.83
	Total Commercial	**4.83**	**1,496.31**
Industrial	Industrial	10.10	3,131.45
	Total Industrial	**10.10**	**3,131.45**
Agricultural		**1,805.99**	**559,858.41**
	Total, tons/yr	**1,852.99**	**574,426.99**
	Global warming potential index	310	

Appendix I: 2030 Reduced URBEMIS Output and GHG Calculations

Sutter County
Emissions by Source
2030
Reduced Inventory
By Source

Transportation		
	Source:	**Metric tons of CO_2e**
1	On-Road Vehicles	362,245
2	Airport Operations	87
	Total	**362,332**

Energy		
	Sources:	**Metric tons of CO_2e**
1	Electric	60,768
2	Natural Gas	174,018
	Total	**234,786**

Solid Waste		
	Source	**Metric tons of CO_2e**
1	Solid Waste Disposal	15,671
2	Green Waste Recycling	Data Not Available
3	Materials Recycling	Data Not Available
	Total	**15,671**

Landscape Design		
	Sources:	**Metric tons of CO_2e**
1	Landscape Maintenance Emissions	40
2	Carbon sink from CO2 sequestration	Data Not Available
	Total	**40**

Agriculture		
	Sources:	**Metric tons of CO_2e**
1	Enteric Fermentation	22,572
2	Manure Management	27,515
3	Rice Cultivation	120,164
4	Agricultural Residue Burning	3,011
5	Crop Growth	372,557
6	Animals and Runoff	76,704
7	Fertilizer Use	99,760
	Total	**722,283**

Net Total Emissions	
Category	**Metric tons of CO_2e**
Energy	234,786
Solid Waste	15,671
Landscape Design	40
Agriculture	722,283
Transportation	362,332
Total	**1,335,112**

Sutter County
Emissions by Land Use
2030
Reduced Inventory
By Land Use Category

Source Type		CO_2e MT/yr			
		CO_2	CH_4	N_2O	combined CO_2e
Residential	AG/RAN/ER	133,991.87	5,376.46	4,150.61	143,519
	Low Density Residential	89,478.33	3,590.28	2,771.70	95,840
	Medium Density Residential	56,775.66	2,278.33	1,750.53	60,805
	High Density Residential	25,510.77	1,023.71	786.56	27,321
	Total Residential	305,756.64	12,268.78	9,459.40	**327,485**
Commercial	Park	56.73	1.61	1.25	60
	Commercial	67,154.59	1,932.68	1,508.16	70,595
	Mixed Use	18,084.59	520.47	406.15	19,011
	Total Commercial	85,409.80	2,456.78	1,916.03	**89,783**
Industrial	Industrial	186,511.58	5,029.37	4,019.87	195,561
	Total Industrial	186,511.58	5,029.37	4,019.87	**195,561**
Agriculture		0.00	170,698.73	551,584.68	722,283
	Total	**577,678.01**	**190,453.66**	**566,979.98**	**1,335,112**

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Carbon Dioxide

A. Direct Sources

A1-3. Mobile (Construction Equipment, Motor Vehicles, and Landscape Equipment) Unreduced Emissions

Con (MT/yr)	Motor Vehicles (MT/yr)	Landscape (MT/yr) (E_{Cls})	Hearth (MT/yr) (E_{Cwood})
	661,154.84	39.33	23,991.59

Transportation Emission Reductions

		R1-T 1	R1-T 2	R1-T 3	R1-T 4	R1-T 5	R1-T 6
Passenger & Light Duty Vehicles		19.70%	14.55%	7.20%	0.30%	0.30%	1.70%
Medium Duty Vehicles	**Unmitigated**	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%
Heavy Duty Vehicles	**MT/yr**	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%
Passenger & Light Duty Vehicles	546,113.90	438,529.46	374,723.42	347,743.34	346,700.11	345,660.01	339,783.79
Medium Duty Vehicles	70,743.57	70,743.57	53,057.68	53,057.68	53,057.68	53,057.68	53,057.68
Heavy Duty Vehicles	44,297.37	44,297.37	33,223.03	33,223.03	33,223.03	33,223.03	33,223.03

		R1-T 7	R1-T 8	R1-T 9	R1-T 10		R2-T 1
Passenger & Light Duty Vehicles		0.60%	0.00%	0.00%	0.20%		4.00%
Medium Duty Vehicles		0.00%	1.60%	0.00%	0.20%		0.00%
Heavy Duty Vehicles	**MT/yr**	0.00%	1.60%	1.90%	0.20%		0.00%
Passenger & Light Duty Vehicles	339,783.79	337,745.08	337,745.08	337,745.08	337,069.59		323,586.81
Medium Duty Vehicles	53,057.68	53,057.68	52,208.75	52,208.75	52,104.34		52,104.34
Heavy Duty Vehicles	33,223.03	33,223.03	32,691.46	32,070.32	32,006.18		32,006.18

		R2-T 2	R2-T 3	R2-T 4	R2-T 5	R2-T 6	R2-T 7
Passenger & Light Duty Vehicles		6.00%	0.88%	1.50%	3.00%	0.07%	7.00%
Medium Duty Vehicles		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Heavy Duty Vehicles	**MT/yr**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Passenger & Light Duty Vehicles	323,586.81	304,171.60	301,510.10	296,987.45	288,077.83	287,879.25	267,727.70
Medium Duty Vehicles	52,104.34	52,104.34	52,104.34	52,104.34	52,104.34	52,104.34	52,104.34
Heavy Duty Vehicles	32,006.18	32,006.18	32,006.18	32,006.18	32,006.18	32,006.18	32,006.18

		R2-T 8						
Passenger & Light Duty Vehicles		2.41%					**Reduced**	
Medium Duty Vehicles		0.00%					**MT/yr**	**%**
Heavy Duty Vehicles	**MT/yr**	0.00%					**(ECele)**	**Reduction**
Passenger & Light Duty Vehicles	267,727.70	261,275.67					261,276	**52.16%**
Medium Duty Vehicles	52,104.34	52,104.34					52,104	**26.35%**
Heavy Duty Vehicles	32,006.18	32,006.18					32,006	**27.75%**
Reduced Total (MT/yr)							**345,386**	**47.76%**
Unmitigated Total (MT/yr)							**661,155**	

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Carbon Dioxide

Airport Fuel Emission Reductions

(U_{AAF})	Unmitigated MT/yr (E_{CWD})	R1-T 2					Reduced MT/yr (ECele)	% Reduction
Reductions		25.00%						
Annual Fuel Usage	151.84	113.88					113.88	25.00%

A4. Stationary Sources (Natural Gas) Emission Reductions

Unit Type		R1-E 5	R1-E 7	R2-E 1	R2-E 3	R2-E 5	R2-E 7
Single Family Residential Reduction		3.18%	3.90%	13.06%	1.77%	0.00%	0.00%
Multi Family Residential Reduction		3.18%	3.90%	13.06%	1.77%	0.00%	0.00%
Commercial Reduction	Unmitigated	3.18%	3.90%	0.00%	0.00%	17.82%	2.75%
Industrial Reduction	MT/yr	3.18%	3.90%	0.00%	0.00%	0.00%	2.75%
AG/RAN/ER	32,144.32	31,121.69	29,907.95	26,002.67	25,541.55	25,541.55	25,541.55
Low Density Residential	21,465.74	20,782.83	19,972.30	17,364.39	17,056.46	17,056.46	17,056.46
Medium Density Residential	13,621.47	13,188.12	12,673.78	11,018.89	10,823.48	10,823.48	10,823.48
High Density Residential	6,120.49	5,925.78	5,694.67	4,951.08	4,863.28	4,863.28	4,863.28
Park	25.28	24.48	23.52	23.52	23.52	19.33	18.80
Commercial	29,351.77	28,417.99	27,309.68	27,309.68	27,309.68	22,443.53	21,825.70
Mixed Use	7,904.21	7,652.75	7,354.29	7,354.29	7,354.29	6,043.87	5,877.50
Industrial	77,638.95	75,168.97	72,237.38	72,237.38	72,237.38	72,237.38	70,248.82

Unit Type		R1-I 1	R1-I 2				Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		0.00%	0.00%					
Multi Family Residential Reduction		0.00%	0.00%					
Commercial Reduction		0.00%	0.00%					
Industrial Reduction	MT/yr (E_{Cng})	13.00%	0.50%					
AG/RAN/ER	25,541.55	25,541.55	25,541.55				25,542	20.54%
Low Density Residential	17,056.46	17,056.46	17,056.46				17,056	20.54%
Medium Density Residential	10,823.48	10,823.48	10,823.48				10,823	20.54%
High Density Residential	4,863.28	4,863.28	4,863.28				4,863	20.54%
Park	18.80	18.80	18.80				19	25.64%
Commercial	21,825.70	21,825.70	21,825.70				21,826	25.64%
Mixed Use	5,877.50	5,877.50	5,877.50				5,877	25.64%
Industrial	70,248.82	61,116.48	60,810.89				60,811	21.67%
Total Reduced (MT/yr)							**146,818**	**22.02%**
Total Unmitigated (MT/yr)	**188,272.24**							

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Carbon Dioxide

B. Indirect Sources

B1. Electricity Emission Reductions

Unit Type		R1-E 1	R1-E 2 & 3	R1-E 4	R1-E 6	R2-E 1	R2-E 2
Single Family Residential Reduction		21.00%	10.00%	10.82%	7.60%	13.06%	13.18%
Multi Family Residential Reduction		21.00%	10.00%	10.82%	7.60%	13.06%	13.18%
Commercial Reduction	Unmitigated	21.00%	9.29%	10.82%	7.60%	0.00%	0.00%
Industrial Reduction	MT/yr (E_{Cele})	21.00%	9.29%	10.82%	7.60%	0.00%	0.00%
AG/RAN/ER	18,479.24	14,598.60	13,138.74	11,717.13	10,826.63	9,412.92	8,172.52
Low Density Residential	12,340.30	9,748.84	8,773.95	7,824.61	7,229.94	6,285.88	5,457.55
Medium Density Residential	7,830.76	6,186.30	5,567.67	4,965.25	4,587.89	3,988.82	3,463.19
High Density Residential	3,518.57	2,779.67	2,501.70	2,231.02	2,061.46	1,792.28	1,556.10
Park	19.02	15.03	13.52	12.06	11.14	11.14	11.14
Commercial	22,082.12	17,444.87	15,700.39	14,001.61	12,937.48	12,937.48	12,937.48
Mixed Use	5,946.55	4,697.77	4,228.00	3,770.53	3,483.97	3,483.97	3,483.97
Industrial	58,409.85	46,143.78	41,859.33	37,330.15	34,493.06	34,493.06	34,493.06

Unit Type		R2-E 3	R2-E 4	R2-E 5	R2-E 6	R2-E 7	
Single Family Residential Reduction		1.77%	5.91%	0.00%	0.00%	0.00%	
Multi Family Residential Reduction		1.77%	5.91%	0.00%	0.00%	0.00%	
Commercial Reduction		0.00%	0.00%	17.82%	3.32%	2.75%	
Industrial Reduction	MT/yr (E_{Cele})	0.00%	0.00%	0.00%	3.32%	2.75%	
AG/RAN/ER	8,172.52	8,027.59	7,553.07	7,553.07	7,553.07	7,553.07	
Low Density Residential	5,457.55	5,360.77	5,043.88	5,043.88	5,043.88	5,043.88	
Medium Density Residential	3,463.19	3,401.77	3,200.69	3,200.69	3,200.69	3,200.69	
High Density Residential	1,556.10	1,528.51	1,438.15	1,438.15	1,438.15	1,438.15	
Park	11.14	11.14	11.14	9.16	8.85	8.61	
Commercial	12,937.48	12,937.48	12,937.48	10,632.23	10,279.20	9,996.23	
Mixed Use	3,483.97	3,483.97	3,483.97	2,863.18	2,768.11	2,691.91	
Industrial	34,493.06	34,493.06	34,493.06	34,493.06	33,347.76	32,429.76	

Unit Type		R2-E 9					Reduced MT/yr (E_{Cele})	% reduction
Single Family Residential Reduction		3.18%						
Multi Family Residential Reduction		3.18%						
Commercial Reduction		3.18%						
Industrial Reduction	MT/yr (ECele)	3.18%						
AG/RAN/ER	7,553.07	7,312.70					7,313	60.43%
Low Density Residential	5,043.88	4,883.37					4,883	60.43%
Medium Density Residential	3,200.69	3,098.83					3,099	60.43%
High Density Residential	1,438.15	1,392.39					1,392	60.43%
Park	8.61	8.34					8	56.17%
Commercial	9,996.23	9,678.11					9,678	56.17%
Mixed Use	2,691.91	2,606.24					2,606	56.17%
Industrial	32,429.76	31,397.71					31,398	46.25%
Reduced total (MT/year)							**60,378**	**53.06%**
Unmitigated total (MT/year)							**128,626**	

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Carbon Dioxide

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Carbon Dioxide

B2. Potable Water Emission Reductions

Unit Type	Unmitigated MT/yr	R1-E 8	R2-E 9				Reduced MT/yr (E_{Cele})	% reduction
Single Family Residential Reduction		21.00%	30.00%					
Multi Family Residential Reduction		21.00%	30.00%					
Commercial Reduction		21.00%	30.00%					
Industrial Reduction		21.00%	30.00%					
AG/RAN/ER	23.22	18.34	12.84				12.84	44.70%
Low Density Residential	15.51	12.25	8.58				8.58	44.70%
Medium Density Residential	0.05	0.04	0.03				0.03	44.70%
High Density Residential	0.02	0.02	0.01				0.01	44.70%
Park	0.00	0.00	0.00				0.00	0.00%
Commercial	0.77	0.61	0.43				0.43	44.70%
Mixed Use	0.21	0.17	0.12				0.12	44.70%
Industrial	2.03	1.60	1.12				1.12	44.70%
Reduced total (MT/year)							**23**	**44.70%**
Unmitigated total (MT/year)							**42**	

B3. Solid Waste

Combined: B3a. Anthropogenic Carbon and B3b. Exhaust Emissions Reductions

Unit Type	Unmitigated MT/yr	R1-E 1	R2-W 1	R2-W 2	R2-W 3		Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		21.00%	14.07%	5.80%	10.19%			
Multi Family Residential Reduction		21.00%	14.07%	5.80%	10.19%			
Commercial Reduction		21.00%	14.07%	5.80%	10.19%			
Industrial Reduction		21.00%	14.07%	5.80%	10.19%			
AG/RAN/ER	551.39	435.60	374.32	352.61	316.69		316.69	42.56%
Low Density Residential	368.20	290.88	249.96	235.46	211.48		211.48	42.56%
Medium Density Residential	233.66	184.59	158.62	149.42	134.20		134.20	42.56%
High Density Residential	104.99	82.94	71.27	67.14	60.30		60.30	42.56%
Park	0.08	0.06	0.05	0.05	0.05		0.05	42.56%
Commercial	97.35	76.91	66.09	62.25	55.91		55.91	42.56%
Mixed Use	26.22	20.71	17.80	16.77	15.06		15.06	42.56%
Industrial	257.51	203.43	174.81	164.67	147.90		147.90	42.56%
Total Reduced (MT/year)							**942**	**42.56%**
Total Unmitigated (MT/yr)							**1,639.40**	

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Carbon Dioxide

B3c. Exhaust Emissions (Disposal Equipment) Emission Reductions

Vehicle Type	Unmitigated MT/yr						Reduced MT/yr (ECele)	% Reduction
Reduction								
Excavator	0.00	0.00					0.00	0.00%
Grader	0.00	0.00					0.00	0.00%
Off-Highway Tractor	0.00	0.00					0.00	0.00%
Off-Highway Truck	0.00	0.00					0.00	0.00%
Rubber Tired Dozer	0.00	0.00					0.00	0.00%
Disposal Facility run by City?							No	
Total Reduced (MT/year)							**0.00**	**0.00%**
Total Unmitigated (MT/yr)							**0.00**	

B4. Wastewater Emission Reductions

Unit Type	Unmitigated MT/yr	R2-E 9					Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		30.00%						
Multi Family Residential Reduction		30.00%						
Commercial Reduction		30.00%						
Industrial Reduction		30.00%						
AG/RAN/ER	8.24	5.77					5.77	30.00%
Low Density Residential	6.94	4.86					4.86	30.00%
Medium Density Residential	4.41	3.08					3.08	30.00%
High Density Residential	1.98	1.39					1.39	30.00%
Park	0.00	0.00					0.00	30.00%
Commercial	0.30	0.21					0.21	30.00%
Mixed Use	0.08	0.06					0.06	30.00%
Industrial	0.89	0.62					0.62	30.00%
Total Reduced (MT/year)							**16**	**30.00%**
Total Unmitigated (MT/yr)							**22.83**	

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Carbon Dioxide

C. AG emissions for CH_4 and N_2O, not applicable for CO_2.

D. Summary Table

Source Type		Emissions, MT /yr	CO_2e metric tons/yr
Direct	Motor vehicles & Aircraft	345,500.07	345,500.07
	Landscape equipment	39.33	39.33
	Cooling and heating	170,809.26	170,809.26
	Total direct, tons/yr	**516,348.65**	**516,348.65**
Indirect	Electricity	60,377.67	60,377.67
	Potable water	23.12	23.12
	Solid waste	941.59	941.59
	Wastewater	15.98	15.98
	Total indirect, tons/yr	**61,358.37**	**61,358.37**
Agriculture		0.00	0.00
	Total, tons/yr	**577,707.02**	**577,707.02**
	Global warming potential index	**1**	

Source Type		Emissions, MT/yr	CO_2e metric tons/yr
Residential	AG/RAN/ER	133,991.87	133,991.87
	Low Density Residential	89,478.33	89,478.33
	Medium Density Residential	56,775.66	56,775.66
	High Density Residential	25,510.77	25,510.77
	Total Residential	**305,756.64**	**305,756.64**
Commercial	Park	56.73	56.73
	Commercial	67,154.59	67,154.59
	Mixed Use	18,084.59	18,084.59
	Total Commercial	**85,409.80**	**85,409.80**
Industrial	Industrial	186,511.58	186,511.58
	Total Industrial	**186,511.58**	**186,511.58**
Agricultural		**0.00**	**0.00**
	Total, tons/yr	**577,678.01**	**577,678.01**
	Global warming potential index	1	

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Methane

A. Direct Sources

A1-3. Mobile (Construction Equipment, Motor Vehicles, and Landscape Equipment) Unreduced Emissions

Con (MT/yr)	Motor Vehicles (MT/yr)	Landscape (MT/yr) (E_{Cls})	Hearth (MT/yr) (E_{Cwood})
	210.11	0.0022	116.60

Transportation Emission Reductions

		R1-T 1	R1-T 2	R1-T 3	R1-T 4	R1-T 5	R1-T 6
Passenger & Light Duty Vehicles		19.70%	14.55%	7.20%	0.30%	0.30%	1.70%
Medium Duty Vehicles		0.00%	25.00%	0.00%	0.00%	0.00%	0.00%
Heavy Duty Vehicles	MT/yr	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%
Passenger & Light Duty Vehicles	173.55	139.36	119.08	110.51	110.18	109.85	107.98
Medium Duty Vehicles	22.48	22.48	16.86	16.86	16.86	16.86	16.86
Heavy Duty Vehicles	14.08	14.08	10.56	10.56	10.56	10.56	10.56

		R1-T 7	R1-T 8	R1-T 9	R1-T 10		R2-T 1
Passenger & Light Duty Vehicles		0.60%	0.00%	0.00%	0.00%		4.00%
Medium Duty Vehicles		0.00%	1.60%	0.00%	0.20%		0.00%
Heavy Duty Vehicles	MT/yr	0.00%	1.60%	1.90%	0.20%		0.00%
Passenger & Light Duty Vehicles	107.98	107.33	107.33	107.33	107.33		103.04
Medium Duty Vehicles	16.86	16.86	16.59	16.59	16.56		16.56
Heavy Duty Vehicles	10.56	10.56	10.39	10.19	10.17		10.17

		R2-T 2	R2-T 3	R2-T 4	R2-T 5	R2-T 6	R2-T 7
Passenger & Light Duty Vehicles		6.00%	0.88%	1.50%	3.00%	0.07%	7.00%
Medium Duty Vehicles		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Heavy Duty Vehicles	MT/yr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Passenger & Light Duty Vehicles	103.04	96.86	96.01	94.57	91.73	91.67	85.25
Medium Duty Vehicles	16.56	16.56	16.56	16.56	16.56	16.56	16.56
Heavy Duty Vehicles	10.17	10.17	10.17	10.17	10.17	10.17	10.17

		R2-T 8					Reduced MT/yr (ECele)	% Reduction
Passenger & Light Duty Vehicles		2.41%						
Medium Duty Vehicles		0.00%						
Heavy Duty Vehicles	MT/yr	0.00%						
Passenger & Light Duty Vehicles	85.25	83.20					83	**52.06%**
Medium Duty Vehicles	16.56	16.56					17	**26.35%**
Heavy Duty Vehicles	10.17	10.17					10	**27.75%**
Reduced Total (MT/yr)							**110**	**47.68%**
Unmitigated Total (MT/yr)	210.11							

Sutter County
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Airport Fuel Emissions Reductions

(U_{AAF})	Unmitigated MT/yr (E_{CWD})	R1-T 2					Reduced MT/yr (ECele)	% Reduction
Reductions		25.00%						
Annual Fuel Usage	0.13	0.10					0.10	25.00%

A4. Stationary Sources (Natural Gas) Emission Reductions

Unit Type		R1-E 5	R1-E 7	R2-E 1	R2-E 3	R2-E 5	R2-E 7
Single Family Residential Reduction		3.18%	3.90%	13.06%	1.77%	0.00%	0.00%
Multi Family Residential Reduction		3.18%	3.90%	13.06%	1.77%	0.00%	0.00%
Commercial Reduction		3.18%	3.90%	0.00%	0.00%	17.82%	2.75%
Industrial Reduction	MT/yr (E_{Cng})	3.18%	3.90%	0.00%	0.00%	0.00%	2.75%
AG/RAN/ER	3.03	2.93	2.82	2.45	2.41	2.41	2.41
Low Density Residential	2.02	1.96	1.88	1.64	1.61	1.61	1.61
Medium Density Residential	1.28	1.24	1.19	1.04	1.02	1.02	1.02
High Density Residential	0.58	0.56	0.54	0.47	0.46	0.46	0.46
Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	2.77	2.68	2.57	2.57	2.57	2.11	2.06
Mixed Use	0.74	0.72	0.69	0.69	0.69	0.57	0.55
Industrial	1.46	1.42	1.36	1.36	1.36	1.36	1.32

Unit Type		R1-I 1	R1-I 2				Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		0.00%	0.00%					
Multi Family Residential Reduction		0.00%	0.00%					
Commercial Reduction		0.00%	0.00%					
Industrial Reduction	MT/yr (E_{Cng})	13.00%	0.50%					
AG/RAN/ER	2.41	2.41	2.41				2	20.54%
Low Density Residential	1.61	1.61	1.61				2	20.54%
Medium Density Residential	1.02	1.02	1.02				1	20.54%
High Density Residential	0.46	0.46	0.46				0	20.54%
Park	0.00	0.00	0.00				0	25.64%
Commercial	2.06	2.06	2.06				2	25.64%
Mixed Use	0.55	0.55	0.55				1	25.64%
Industrial	1.32	1.15	1.15				1	21.67%
Total Reduced (MT/yr)							**9**	**22.19%**
Total Unmitigated (MT/yr)							**11.89**	

Sutter County
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B. Indirect Sources

B1. Electricity Emission Reductions

Unit Type		R1-E 1	R1-E 2 & 3	R1-E 4	R1-E 6	R2-E 1	R2-E 2
Single Family Residential Reduction		21.00%	10.00%	10.82%	7.60%	13.06%	13.18%
Multi Family Residential Reduction		21.00%	10.00%	10.82%	7.60%	13.06%	13.18%
Commercial Reduction	Unmitigated	21.00%	9.29%	10.82%	7.60%	0.00%	0.00%
Industrial Reduction	MT/yr (E_{Cele})	21.00%	9.29%	10.82%	7.60%	0.00%	0.00%
AG/RAN/ER	1.07	0.84	0.76	0.68	0.62	0.54	0.47
Low Density Residential	0.71	0.56	0.51	0.45	0.42	0.36	0.31
Medium Density Residential	0.45	0.36	0.32	0.29	0.26	0.23	0.20
High Density Residential	0.20	0.16	0.14	0.13	0.12	0.10	0.09
Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	1.27	1.01	0.90	0.81	0.75	0.75	0.75
Mixed Use	0.34	0.27	0.24	0.22	0.20	0.20	0.20
Industrial	3.37	2.66	2.41	2.15	1.99	1.99	1.99

Unit Type		R2-E 3	R2-E 4	R2-E 5	R2-E 6	R2-E 7		
Single Family Residential Reduction		1.77%	5.91%	0.00%	0.00%	0.00%		
Multi Family Residential Reduction		1.77%	5.91%	0.00%	0.00%	0.00%	Reduced	
Commercial Reduction		0.00%	0.00%	17.82%	3.32%	2.75%	MT/yr	%
Industrial Reduction	MT/yr (E_{Cele})	0.00%	0.00%	0.00%	3.32%	2.75%	(E_{Cele})	reduction
AG/RAN/ER	0.47	0.46	0.44	0.44	0.44	0.44	0.4353	59.13%
Low Density Residential	0.31	0.31	0.29	0.29	0.29	0.29	0.2907	59.13%
Medium Density Residential	0.20	0.20	0.18	0.18	0.18	0.18	0.1845	59.13%
High Density Residential	0.09	0.09	0.08	0.08	0.08	0.08	0.0829	59.13%
Park	0.00	0.00	0.00	0.00	0.00	0.00	0.0005	54.73%
Commercial	0.75	0.75	0.75	0.61	0.59	0.58	0.5761	54.73%
Mixed Use	0.20	0.20	0.20	0.17	0.16	0.16	0.1551	54.73%
Industrial	1.99	1.99	1.99	1.99	1.92	1.87	1.8690	44.48%

Unit Type	MT/yr (ECele)	R2-E 9						
Single Family Residential Reduction		3.18%						
Multi Family Residential Reduction		3.18%					Reduced	
Commercial Reduction		3.18%					MT/yr	%
Industrial Reduction		3.18%					(ECele)	reduction
AG/RAN/ER	0.44	0.42146					0.4215	60.43%
Low Density Residential	0.29069885	0.28145					0.2814	60.43%
Medium Density Residential	0.184465142	0.17859					0.1786	60.43%
High Density Residential	0.082886898	0.08025					0.0802	60.43%
Park	0.000497953	0.00048					0.0005	56.17%
Commercial	0.576117772	0.55778					0.5578	56.17%
Mixed Use	0.155143975	0.15021					0.1502	56.17%
Industrial	1.86904378	1.80956					1.8096	46.25%
Reduced total (MT/year)							**3.48**	**53.06%**
Unmitigated total (MT/year)							**7.41**	

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B2. Potable Water Emission Reductions

Unit Type	MT/yr (E_{Cpot})	R1-E 8	R2-E 9				Reduced MT/yr (E_{Cele})	% reduction
Single Family Residential Reduction		21.00%	30.00%					
Multi Family Residential Reduction		21.00%	30.00%					
Commercial Reduction		21.00%	30.00%					
Industrial Reduction		21.00%	30.00%					
AG/RAN/ER	0.00134	0.001057	0.000740				0.00074	44.70%
Low Density Residential	0.00089	0.000706	0.000494				0.00049	44.70%
Medium Density Residential	0.00057	0.000448	0.000314				0.00031	44.70%
High Density Residential	0.00025	0.000201	0.000141				0.00014	44.70%
Park	0.00000	0.000000	0.000000				0.00000	0.00%
Commercial	0.00004	0.000035	0.000024				0.00002	44.70%
Mixed Use	0.00001	0.000009	0.000007				0.00001	44.70%
Industrial	0.00012	0.000093	0.000065				0.00006	44.70%
Reduced total (MT/year)							**0.00178**	**44.70%**
Unmitigated total (MT/year)							**0.00323**	

B3. Solid Waste

Combined: B3a. Anthropogenic Carbon and B3b. Exhaust Emissions Reductions

Unit Type	MT/yr (E_{CWF})	R2-W 1	R2-W 2	R2-W 3			Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		14.07%	5.80%	10.19%				
Multi Family Residential Reduction		14.07%	5.80%	10.19%				
Commercial Reduction		14.07%	5.80%	10.19%				
Industrial Reduction		14.07%	5.80%	10.19%				
AG/RAN/ER	263.25	226.22	213.10	191.39			191.39	27.30%
Low Density Residential	175.79	151.06	142.30	127.81			127.81	27.30%
Medium Density Residential	111.56	95.86	90.30	81.10			81.10	27.30%
High Density Residential	50.13	43.07	40.58	36.44			36.44	27.30%
Park	0.08	0.07	0.06	0.06			0.06	27.30%
Commercial	92.96	79.88	75.25	67.58			67.58	27.30%
Mixed Use	25.03	21.51	20.26	18.20			18.20	27.30%
Industrial	245.89	211.30	199.04	178.77			178.77	27.30%
Total Reduced (MT/year)							**701**	**27.30%**
Total Unmitigated (MT/yr)							**964.69**	

Sutter County
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B3c. Exhaust Emissions (Disposal Equipment) Reductions

Vehicle Type							Reduced MT/yr	%
Reductions	MT/yr (E_{CWD})						(ECele)	Reduction
Excavator	0.00	0.00					0.00	0.00%
Grader	0.00	0.00					0.00	0.00%
Off-Highway Tractor	0.00	0.00					0.00	0.00%
Off-Highway Truck	0.00	0.00					0.00	0.00%
Rubber Tired Dozer	0.00	0.00					0.00	0.00%
Disposal Facility run by City?							No	
Total Reduced (MT/year)							**0.00**	**0.00%**
Total Unmitigated (MT/yr)							**0.00**	

B4. Wastewater Emission Reductions

Unit Type		R2-E 9					Reduced MT/yr	%
Single Family Residential Reduction		30.00%						
Multi Family Residential Reduction		30.00%						
Commercial Reduction		30.00%						
Industrial Reduction	MT/yr	30.00%					(E_{Cele})	Reduction
AG/RAN/ER	0.0004749	0.000332					0.000332	30.00%
Low Density Residential	0.0004001	0.000280					0.000280	30.00%
Medium Density Residential	0.0002539	0.000178					0.000178	30.00%
High Density Residential	0.0001141	0.000080					0.000080	30.00%
Park	0.0000000	0.000000					0.000000	30.00%
Commercial	0.0000172	0.000012					0.000012	30.00%
Mixed Use	0.0000046	0.000003					0.000003	30.00%
Industrial	0.0000512	0.000036					0.000036	30.00%
Total Reduced (MT/year)							**0.000921**	**30.00%**
Total Unmitigated (MT/yr)							**0.0013160**	

C. AG emissions Reductions for CH_4

		R1-A 1	R2-E 9				Reduced	%
Emissions Source	MT/yr	7.80%	30.00%				MT/yr	Reduction
Enteric Fermentation - Dairy Cows	1,023.51	943.67					943.67	7.80%
Enteric Fermentation - Other Animals	131.18	131.18					131.18	0.00%
Manure Management - Dairy Cows	1,332.76	1,228.80					1,228.80	7.80%
Manure Management - Other Animals	4.36	4.36					4.36	0.00%
Rice Cultivation	8174.45	8,174.45	5,722.11				5,722.11	30.00%
Agricultural Crop Burning	98.39	98.39					98.39	0.00%
Total Reduced (MT/year)							**8,128.51**	**24.49%**
Total Unmitigated (MT/yr)							**10,764.63**	

Sutter County
Input data for Green House Gas Emissions
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Methane

D. Summary Table

Source Type		Emissions, MT /yr	CO_2e metric tons/yr
Direct	Motor vehicles & Aircraft	110.02	2,310.50
	Landscape equipment	0.00	0.05
	Cooling and heating	125.85	2,642.85
	Total direct, tons/yr	**235.88**	**4,953.40**
Indirect	Electricity	3.48	73.08
	Potable water	0.00	0.04
	Solid waste	701.35	14,728.40
	Wastewater	0.00	0.02
	Total indirect, tons/yr	**704.83**	**14,801.53**
Agriculture		8,128.51	170,698.73
	Total, tons/yr	**9,069.22**	**190,453.66**
	Global warming potential index	**21**	

Source Type		Emissions, MT/yr	CO_2e metric tons/yr
Residential	AG/RAN/ER	256.02	5,376.46
	Low Density Residential	170.97	3,590.28
	Medium Density Residential	108.49	2,278.33
	High Density Residential	48.75	1,023.71
	Total Residential	**584.23**	**12,268.78**
Commercia	Park	0.08	1.61
	Commercial	92.03	1,932.68
	Mixed Use	24.78	520.47
	Total Commercial	**116.99**	**2,456.78**
Industrial	Industrial	239.49	5,029.37
	Total Industrial	**239.49**	**5,029.37**
Agricultural		**8,128.51**	**170,698.73**
	Total, tons/yr	**9,069.22**	**190,453.66**
	Global warming potential index	21	

Sutter County
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A. Direct Sources

A1-3. Mobile (Construction Equipment, Motor Vehicles, and Landscape Equipment) Unreduced Emissions

Con (MT/yr)	Motor Vehicles (MT/yr)	Landscape (MT/yr) (E_{Cls})	Hearth (MT/yr) (E_{Cwood})
	89.71	0.0009832	1.5497605

Transportation Emissions Reductions

		R1-T 1	R1-T 2	R1-T 3	R1-T 4	R1-T 5	R1-T 6	
Passenger & Light Duty Vehicles		19.70%	14.55%	7.20%	0.30%	0.30%	1.70%	
Medium Duty Vehicles	**Unmitigated**	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	
Heavy Duty Vehicles	**MT/yr**	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	
Passenger & Light Duty Vehicles	74.10	59.50	50.85	47.18	47.04	46.90	46.10	
Medium Duty Vehicles	9.60	9.60	7.20	7.20	7.20	7.20	7.20	
Heavy Duty Vehicles	6.01	6.01	4.51	4.51	4.51	4.51	4.51	

		R1-T 7	R1-T 8	R1-T 9	R1-T 10		R2-T 1	
Passenger & Light Duty Vehicles		0.60%	0.00%	0.00%	0.00%		4.00%	
Medium Duty Vehicles		0.00%	1.60%	0.00%	0.20%		0.00%	
Heavy Duty Vehicles	**MT/yr**	0.00%	1.60%	1.90%	0.20%		0.00%	
Passenger & Light Duty Vehicles	46.10	45.83	45.83	45.83	45.83		43.99	
Medium Duty Vehicles	7.20	7.20	7.08	7.08	7.07		7.07	
Heavy Duty Vehicles	4.51	4.51	4.44	4.35	4.34		4.34	

		R2-T 2	R2-T 3	R2-T 4	R2-T 5	R2-T 6	R2-T 7	
Passenger & Light Duty Vehicles		6.00%	0.88%	1.50%	3.00%	0.07%	7.00%	
Medium Duty Vehicles		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Heavy Duty Vehicles	**MT/yr**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Passenger & Light Duty Vehicles	43.99	41.35	40.99	40.38	39.17	39.14	36.40	
Medium Duty Vehicles	7.07	7.07	7.07	7.07	7.07	7.07	7.07	
Heavy Duty Vehicles	4.34	4.34	4.34	4.34	4.34	4.34	4.34	

		R2-T 8						
Passenger & Light Duty Vehicles		2.41%					**Reduced**	
Medium Duty Vehicles		0.00%					**MT/yr**	**%**
Heavy Duty Vehicles	**MT/yr**	0.00%					**(ECele)**	**Reduction**
Passenger & Light Duty Vehicles	36.40	35.52					36	**52.06%**
Medium Duty Vehicles	7.07	7.07					7	**26.35%**
Heavy Duty Vehicles	4.34	4.34					4	**27.75%**
Reduced Total (MT/yr)							**47**	**47.68%**
Unmitigated Total (MT/yr)							89.71	

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Input data for Green House Gas Emissions
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Nitrous Oxide

Airport Fuel Emissions Reductions

(U_{AAF})	Unmitigated MT/yr (E_{CWD})	R1-T 2					Reduced MT/yr (ECele)	% Reduction
Reductions		25.00%						
Annual Fuel Usage	0.0020075	0.0015056					0.0015056	25.00%

A4. Stationary Sources (Natural Gas)

Unit Type	Unmitigated MT/yr	R1-E 5	R1-E 7	R2-E 1	R2-E 3	R2-E 5	R2-E 7
Single Family Residential Reduction		3.18%	3.90%	13.06%	1.77%	0.00%	0.00%
Multi Family Residential Reduction		3.18%	3.90%	13.06%	1.77%	0.00%	0.00%
Commercial Reduction		3.18%	3.90%	0.00%	0.00%	17.82%	2.75%
Industrial Reduction		3.18%	3.90%	0.00%	0.00%	0.00%	2.75%
AG/RAN/ER	0.0605700	0.0586430	0.0563560	0.0489972	0.0481283	0.0481283	0.0481283
Low Density Residential	0.0404480	0.0391612	0.0376339	0.0327198	0.0321396	0.0321396	0.0321396
Medium Density Residential	0.0256670	0.0248504	0.0238813	0.0207629	0.0203947	0.0203947	0.0203947
High Density Residential	0.0115330	0.0111661	0.0107306	0.0093294	0.0091640	0.0091640	0.0091640
Park	0.0000480	0.0000465	0.0000447	0.0000447	0.0000447	0.0000367	0.0000357
Commercial	0.0553080	0.0535484	0.0514601	0.0514601	0.0514601	0.0422907	0.0411265
Mixed Use	0.0148940	0.0144202	0.0138578	0.0138578	0.0138578	0.0113885	0.0110750
Industrial	0.1462950	0.1416408	0.1361168	0.1361168	0.1361168	0.1361168	0.1323698

Unit Type	MT/yr (E_{Cng})	R1-I 1	R1-I 2				Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		0.00%	0.00%					
Multi Family Residential Reduction		0.00%	0.00%					
Commercial Reduction		0.00%	0.00%					
Industrial Reduction		13.00%	0.50%					
AG/RAN/ER	0.0481283	0.0481283	0.0481283				0.0481283	20.54%
Low Density Residential	0.0321396	0.0321396	0.0321396				0.0321396	20.54%
Medium Density Residential	0.0203947	0.0203947	0.0203947				0.0203947	20.54%
High Density Residential	0.0091640	0.0091640	0.0091640				0.0091640	20.54%
Park	0.0000357	0.0000357	0.0000357				0.0000357	25.64%
Commercial	0.0411265	0.0411265	0.0411265				0.0411265	25.64%
Mixed Use	0.0110750	0.0110750	0.0110750				0.0110750	25.64%
Industrial	0.1323698	0.1151617	0.1145859				0.1145859	21.67%
Total Reduced (MT/yr)							**0.2766498**	**22.02%**
Total Unmitigated (MT/yr)							**0.3547630**	

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Nitrous Oxide

B. Indirect Sources

B1. Electricity Emissions Reductions

Unit Type		R1-E 1	R1-E 2 & 3	R1-E 4	R1-E 6	R2-E 1	R2-E 2
Single Family Residential Reduction		21.00%	10.00%	10.82%	7.60%	13.06%	13.18%
Multi Family Residential Reduction		21.00%	10.00%	10.82%	7.60%	13.06%	13.18%
Commercial Reduction	Unmitigated	21.00%	9.29%	10.82%	7.60%	0.00%	0.00%
Industrial Reduction	MT/yr	21.00%	9.29%	10.82%	7.60%	0.00%	0.00%
AG/RAN/ER	0.2856500	0.2256635	0.2030972	0.1811220	0.1673568	0.1455039	0.1263299
Low Density Residential	0.1907565	0.1506976	0.1356279	0.1209529	0.1117605	0.0971672	0.0843629
Medium Density Residential	0.0552935	0.0436819	0.0393137	0.0350599	0.0323954	0.0281653	0.0244538
High Density Residential	0.0248449	0.0196275	0.0176647	0.0157534	0.0145561	0.0126555	0.0109878
Park	0.0002940	0.0002323	0.0002090	0.0001864	0.0001722	0.0001722	0.0001722
Commercial	0.3413458	0.2696632	0.2426969	0.2164371	0.1999878	0.1999878	0.1999878
Mixed Use	0.0919219	0.0726183	0.0653565	0.0582849	0.0538552	0.0538552	0.0538552
Industrial	0.9029003	0.7132912	0.6470621	0.5770500	0.5331942	0.5331942	0.5331942

Unit Type		R2-E 3	R2-E 4	R2-E 5	R2-E 6	R2-E 7	Reduced MT/yr (E_{Cele})	% reduction
Single Family Residential Reduction		1.77%	5.91%	0.00%	0.00%	0.00%		
Multi Family Residential Reduction		1.77%	5.91%	0.00%	0.00%	0.00%		
Commercial Reduction		0.00%	0.00%	17.82%	3.32%	2.75%		
Industrial Reduction	MT/yr (E_{Cele})	0.00%	0.00%	0.00%	3.32%	2.75%		
AG/RAN/ER	0.1263299	0.1240896	0.1167545	0.1167545	0.1167545	0.1167545	0.1167545	59.13%
Low Density Residential	0.0843629	0.0828668	0.0779684	0.0779684	0.0779684	0.0779684	0.0779684	59.13%
Medium Density Residential	0.0244538	0.0240201	0.0226003	0.0226003	0.0226003	0.0226003	0.0226003	59.13%
High Density Residential	0.0109878	0.0107929	0.0101549	0.0101549	0.0101549	0.0101549	0.0101549	59.13%
Park	0.0001722	0.0001722	0.0001722	0.0001416	0.0001369	0.0001331	0.0001331	54.73%
Commercial	0.1999878	0.1999878	0.1999878	0.1643532	0.1588960	0.1545219	0.1545219	54.73%
Mixed Use	0.0538552	0.0538552	0.0538552	0.0442591	0.0427895	0.0416116	0.0416116	54.73%
Industrial	0.5331942	0.5331942	0.5331942	0.5331942	0.5154901	0.5012997	0.5012997	44.48%

Unit Type		R2-E 9					Reduced MT/yr (ECele)	% reduction
Single Family Residential Reduction		3.18%						
Multi Family Residential Reduction		3.18%						
Commercial Reduction		3.18%						
Industrial Reduction	MT/yr (ECele)	3.18%						
AG/RAN/ER	0.1167545	0.11304					0.1130389	60.43%
Low Density Residential	0.077968414	0.07549					0.0754871	60.43%
Medium Density Residential	0.02260026	0.02188					0.021881	60.43%
High Density Residential	0.010154922	0.00983					0.0098318	60.43%
Park	0.000133089	0.00013					0.0001289	56.17%
Commercial	0.154521896	0.1496					0.1496044	56.17%
Mixed Use	0.041611604	0.04029					0.0402873	56.17%
Industrial	0.501299676	0.48535					0.4853462	46.25%
Reduced total (MT/year)							**0.90**	**52.69%**
Unmitigated total (MT/year)							**1.89**	

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Nitrous Oxide

B2. Potable Water Emissions Reductions

Unit Type	Unmitigated MT/yr	R1-E 8	R2-E 9				Reduced MT/yr (E_{Cele})	% reduction
Single Family Residential Reduction		21.00%	30.00%					
Multi Family Residential Reduction		21.00%	30.00%					
Commercial Reduction		21.00%	30.00%					
Industrial Reduction		21.00%	30.00%					
AG/RAN/ER	0.0003589	0.0002835	0.0001985				0.0001985	44.70%
Low Density Residential	0.0002397	0.0001893	0.0001325				0.0001325	44.70%
Medium Density Residential	0.0001521	0.0001202	0.0000841				0.0000841	44.70%
High Density Residential	0.0000683	0.0000540	0.0000378				0.0000378	44.70%
Park	0.0000000	0.0000000	0.0000000				0.0000000	44.70%
Commercial	0.0000119	0.0000094	0.0000066				0.0000066	44.70%
Mixed Use	0.0000032	0.0000025	0.0000018				0.0000018	44.70%
Industrial	0.0000314	0.0000248	0.0000174				0.0000174	44.70%
Reduced total (MT/year)							**0.0004787**	**44.70%**
Unmitigated total (MT/year)							**0.0008656**	

B3. Solid Waste

Combined: B3a. Anthropogenic Carbon and B3b. Exhaust Emissions Reductions

Unit Type	Unmitigated MT/yr	R2-W 1	R2-W 2	R2-W 3			Reduced MT/yr (E_{Cele})	% Reduction
Single Family Residential Reduction		14.07%	5.80%	10.19%				
Multi Family Residential Reduction		14.07%	5.80%	10.19%				
Commercial Reduction		14.07%	5.80%	10.19%				
Industrial Reduction		14.07%	5.80%	10.19%				
AG/RAN/ER	0.0007640	0.0006565	0.0006184	0.0005555			0.0005555	27.30%
Low Density Residential	0.0005102	0.0004384	0.0004130	0.0003709			0.0003709	27.30%
Medium Density Residential	0.0003238	0.0002782	0.0002621	0.0002354			0.0002354	27.30%
High Density Residential	0.0001455	0.0001250	0.0001178	0.0001058			0.0001058	27.30%
Park	0.0000001	0.0000001	0.0000001	0.0000001			0.0000001	27.30%
Commercial	0.0001349	0.0001159	0.0001092	0.0000981			0.0000981	27.30%
Mixed Use	0.0000363	0.0000312	0.0000294	0.0000264			0.0000264	27.30%
Industrial	0.0003568	0.0003066	0.0002888	0.0002594			0.0002594	27.30%
Total Reduced (MT/year)							**0.0016515**	**27.30%**
Total Unmitigated (MT/yr)							**0.0022716**	

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Nitrous Oxide

B3c. Exhaust Emissions (Disposal Equipment) Reductions

Vehicle Type							Reduced MT/yr	%
Reductions	MT/yr (E_{CWD})						(ECele)	Reduction
Excavator	0.0000000	0.0000000					0.0000000	0.00%
Grader	0.0000000	0.0000000					0.0000000	0.00%
Off-Highway Tractor	0.0000000	0.0000000					0.0000000	0.00%
Off-Highway Truck	0.0000000	0.0000000					0.0000000	0.00%
Rubber Tired Dozer	0.0000000	0.0000000					0.0000000	0.00%
Disposal Facility run by City?							No	
Total Reduced (MT/year)							**0.0000000**	**0.00%**
Total Unmitigated (MT/yr)							**0.0000000**	

B4. Wastewater Emissions Reduction

Unit Type		R2-E 9					Reduced MT/yr	%
Single Family Residential Reduction		30.00%						
Multi Family Residential Reduction		30.00%						
Commercial Reduction	Unmitigated	30.00%						
Industrial Reduction	MT/yr	30.00%					(E_{Cele})	Reduction
AG/RAN/ER	0.0001274	0.0000892					0.0000892	30.00%
Low Density Residential	0.0001073	0.0000751					0.0000751	30.00%
Medium Density Residential	0.0000311	0.0000218					0.0000218	30.00%
High Density Residential	0.0000140	0.0000098					0.0000098	30.00%
Park	0.0000000	0.0000000					0.0000000	30.00%
Commercial	0.0000046	0.0000032					0.0000032	30.00%
Mixed Use	0.0000012	0.0000009					0.0000009	30.00%
Industrial	0.0000137	0.0000096					0.0000096	30.00%
Total Reduced (MT/year)							**0.0002095**	**30.00%**
Total Unmitigated (MT/yr)							**0.0002994**	

C. AG Emissions Reductions for N_2O.

Emissions Source	Unmitigated	R1-A 1					Reduced	%
Reductions	MT/yr	7.80%					MT/yr	Reduction
Manure Management - Dairy Cows	3.39	3.13					3.13	7.80%
Manure Management - Other Animals	2.10	2.10					2.10	0.00%
Animals and Runoff	247.43	247.43					247.43	0.00%
Crop Growth	1201.80	1,201.80					1,201.80	0.00%
Fertilizer Use	321.81	321.81					321.81	0.00%
Agricultural Residue Burning	3.05	3.05					3.05	0.00%
Total Reduced (MT/year)							**1,779.31**	**0.01%**
Total Unmitigated (MT/yr)							**1,779.57**	

Sutter County
Input data for Green House Gas Emissions
2030
Reduced Inventory
Nitrous Oxide

D. Summary Table

Source Type		Emissions, MT /yr	CO_2e metric tons/yr
Direct	Motor vehicles & Aircraft	46.94	14,550.44
	Landscape equipment	0.00	0.30
	Cooling and heating	1.83	566.19
	Total direct, tons/yr	**48.76**	**15,116.93**
Indirect	Electricity	0.90	277.64
	Potable water	0.00	0.15
	Solid waste	0.00	0.51
	Wastewater	0.00	0.06
	Total indirect, tons/yr	**0.90**	**278.36**
Agriculture		1,779.31	551,584.68
	Total, tons/yr	**1,828.97**	**566,979.98**
	Global warming potential index	310	

Source Type		Emissions, MT/yr	CO_2e metric tons/yr
Residential	AG/RAN/ER	13.39	4,150.61
	Low Density Residential	8.94	2,771.70
	Medium Density Residential	5.65	1,750.53
	High Density Residential	2.54	786.56
	Total Residential	**30.51**	**9,459.40**
Commercial	Park	0.00	1.25
	Commercial	4.87	1,508.16
	Mixed Use	1.31	406.15
	Total Commercial	**6.18**	**1,916.03**
Industrial	Industrial	12.97	4,019.87
	Total Industrial	**12.97**	**4,019.87**
Agricultural		**1,779.31**	**551,584.68**
	Total, tons/yr	**1,828.97**	**566,979.98**
	Global warming potential index	310	

APPENDIX F
HAZARDOUS MATERIALS –CVRWQCB SITE CLEANUP LIST, LUST CLEANUP SITES

APPENDIX F – HAZARDOUS MATERIALS LIST

TABLE F-1

CVRWQCB SITE CLEANUP LIST – SUTTER COUNTY

Facility	Address	Status	Constituents
H&B Machinery (Former)**	1781 Colusa Highway, Yuba City	Preliminary Assessment	xylene, toluene, heavy metals
Helena Chemical Company	3056 Colusa Highway, Yuba City	Closed by RB (Remediation Complete)	Nitrate
Puregro (Unocal)/Robbins	4900 Del Monte Ave, Robbins	Remediation Underway	TPH, nitrate, ammonia, pesticides
Costa Property	1716 Elmer Rd, Yuba City	Remedial Investigation	PCE, TCE, DCE
Wellhead Electric Co. (Karnak Facility)	Ensely and Irmour Rds, east of Knights Landing, Knights Landing	Remediation Underway	TPH
Slack's Wheel, Brake & Automotive	236 Garden Highway, Yuba City	Closed	N/A
Custom Chrome & Bumper Comp.	335 Garden Highway , Yuba City	Phase II Remedial Investigation	Metals
John Taylor Fertilizer- Yuba City	300 George Washington Blvd, N Yuba City	IRM	nitrate, ammonia, 1,2-DCP, 1,2,3-TCP
Hydraulic Equipment Specialty**	921 George Washington Blvd, N Yuba City	Closed (Remediation Complete)	TPH, PCE, dichloromethane
Harter Packing / Home Depot	Hooper Rd and Live Oak Blvd, Yuba City	Closed by RB (Remediation Complete)	arsenic
Lomo Airstrip	1111 Koch Ln, Live Oak	Closed (Remediation Complete)	pesticides
Property at Krehe Road	Krehe Road, Live Oak	Preliminary Assessment	TPH-d
Williams Tank Lines Gasoline Spill	Oswald Rd & Highway 99, Yuba City	Closed by RB (Remediation Complete)	TPH - g
HOLT of California (Formerly Tenco Tractor, Inc.)	7310 Pacific Ave, Pleasant Grove	Closed by RB (Remediation Complete)	Benzene
Beneto Tank Lines Tanker Spill	4444, 4454 Sawtelle Rd, Yuba City	Closed by RB (Remediation Complete)	TPH, BTEX
Yuba City Steel Products Company	526 Stevens Ave, Yuba City	Preliminary Assessment	VOCs, TPH, As, Ba, Cd, Cr, Co, Cu, Ni, Pb, Vn, Zn
Pacific Bell Yuba City Site	1301 Tharp Rd, Yuba City	Remediation Underway	TPH, Cd, Pb
H & B Machinery**	1501 Tharp Rd, Yuba City	Preliminary Assessment	N/A
Bowles Flying Service	10600 Township Rd, Live Oak	Phase I Remedial Investigation	pesticides
AAA Salvage Yard**	3094 Township Rd N, Yuba City	Preliminary Assessment	TPH - mo, battery acid, Freon
Wagner Estate	1777 Tudor Rd, Yuba City	Closed by RB (Remediation Complete)	TPH - g, d, benzene

Source: Central Valley Regional Water Quality Control Board, Sacramento Office, Site Cleanup List, April 1, 2005, http://www.waterboards.ca.gov/centralvalley/water_issues/site_cleanup/sllist04-05.pdf, http://www.waterboards.ca.gov/centralvalley/water_issues/site_cleanup/, accessed 03/30/10.

TABLE F-2

LEAKING UNDERGROUND STORAGE TANK CLEANUP SITES LIST – SUTTER COUNTY

Facility	Status	City/Community	Tank Type
BUCKLEY PROPERTY	COMPLETED - CASE CLOSED	KNIGHTS LANDING	GASOLINE
BIDEGAIN FARMSTEAD	COMPLETED - CASE CLOSED	LIVE OAK	Unknown
BIHLMAN PROPERTY	OPEN - SITE ASSESSMENT	LIVE OAK	GASOLINE
BIRLA TIRES (FORMER MINI MART)	OPEN - VERIFICATION MONITORING	LIVE OAK	GASOLINE
BOONE'S MINI MART	OPEN - REMEDIATION	LIVE OAK	GASOLINE
C.J'S SERVICE CENTER	OPEN - SITE ASSESSMENT	LIVE OAK	Unknown
EAST 99 SS (FORMER)	OPEN - REMEDIATION	LIVE OAK	GASOLINE
LIBERTY TRACTOR	COMPLETED - CASE CLOSED	LIVE OAK	DIESEL
LIVE OAK HIGH SCHOOL	COMPLETED - CASE CLOSED	LIVE OAK	GASOLINE
MORE FOR LESS	OPEN - SITE ASSESSMENT	LIVE OAK	GASOLINE
SOUTHERN PACIFIC - LIVE OAK	COMPLETED - CASE CLOSED	LIVE OAK	Unknown
TIFF'S MARKET	OPEN - SITE ASSESSMENT	LIVE OAK	GASOLINE
WILLARD LEE FARM	COMPLETED - CASE CLOSED	LIVE OAK	DIESEL
NEWHALL LAND & FARM	COMPLETED - CASE CLOSED	MERIDIAN	GASOLINE
99 NORTH FOOD & GAS (FORMER)	OPEN - REMEDIATION	NICOLAUS	DIESEL
EAST NICOLAUS MARKET	OPEN - SITE ASSESSMENT	NICOLAUS	GASOLINE
SUTTER DIST 3 SHOP	COMPLETED - CASE CLOSED	NICOLAUS	GASOLINE
VERONA STORE	COMPLETED - CASE CLOSED	NICOLAUS	GASOLINE
FARM AIR FLYING SERVICE	COMPLETED - CASE CLOSED	PLEASANT GROVE	GASOLINE
HOLT OF CALIFORNIA	OPEN - REMEDIATION	PLEASANT GROVE	REGULAR GASOLINE
PLEASANT GROVE FIRE	COMPLETED - CASE CLOSED	PLEASANT GROVE	GASOLINE
SBC	COMPLETED - CASE CLOSED	PLEASANT GROVE	Unknown
VAN DYKE'S RICE DRYER	COMPLETED - CASE CLOSED	PLEASANT GROVE	GASOLINE
BROWN'S ELEM. SCHOOL	COMPLETED - CASE CLOSED	RIO OSO	GASOLINE
PG&E RIO OSO SUBST	COMPLETED - CASE CLOSED	RIO OSO	GASOLINE
GARNER PROPERTY	COMPLETED - CASE CLOSED	ROBBINS	GASOLINE
R.G. TUCKER & SONS	OPEN - SITE ASSESSMENT	ROBBINS	GASOLINE
RECLAIM DISTRICT 1500	COMPLETED - CASE CLOSED	ROBBINS	GASOLINE
ROBBINS MERCHANTILE	OPEN - VERIFICATION MONITORING	ROBBINS	GASOLINE
ROBBINS SERVICE STATION (FORMER MOBIL)	OPEN - REMEDIATION	ROBBINS	GASOLINE
ROY RIEGELS CHEM	COMPLETED - CASE CLOSED	ROBBINS	GASOLINE
STANGHELLINI RANCH	COMPLETED - CASE CLOSED	ROBBINS	GASOLINE
SUTTER MUTUAL WATER CO	COMPLETED - CASE CLOSED	ROBBINS	GASOLINE
WAGNER AIRPORT	COMPLETED - CASE CLOSED	ROBBINS	DIESEL
CA DWR SUTTER MAINTENANCE STN	COMPLETED - CASE CLOSED	SUTTER	GASOLINE
MINTAN MINI MART	COMPLETED - CASE CLOSED	SUTTER	GASOLINE
SUTTER DIST SHOP 3	COMPLETED - CASE CLOSED	SUTTER	GASOLINE
SUTTER FIRE DEPT	COMPLETED - CASE CLOSED	SUTTER	GASOLINE
SUTTER FOOD AND GAS	COMPLETED - CASE CLOSED	SUTTER	Unknown
1ST STOP	OPEN - SITE ASSESSMENT	YUBA CITY	Unknown
ARCO #0489 (CASE # 1)	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
ARCO #0489 (CASE # 2)	OPEN - SITE ASSESSMENT	YUBA CITY	GASOLINE
ARCO #6001	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
ASSOCIATED TRANSPORT	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
B & D MARKET	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
BILL HAMON TOYOTA	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
CHEVRON #9-4712	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
CHEVRON #9-8338	COMPLETED - CASE CLOSED	YUBA CITY	DIESEL

TABLE F-2

LEAKING UNDERGROUND STORAGE TANK CLEANUP SITES LIST – SUTTER COUNTY

Facility	Status	City/Community	Tank Type
CIRCLE K STORE #01156	OPEN - REMEDIATION	YUBA CITY	GASOLINE
CITY CORPORATION YARD	OPEN - SITE ASSESSMENT	YUBA CITY	GASOLINE
CONTINENTAL CABLEVISION	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
CORNELL PROPERTY	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
DEL HEFFLEY CHEVRON	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
DHILLEN FARM	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
EXXON (A&R)	OPEN - SITE ASSESSMENT	YUBA CITY	GASOLINE
FAR WEST HOMES	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
FORMER CHEVRON #9-4859	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
FORMER PALACE MEATS	COMPLETED - CASE CLOSED	YUBA CITY	DIESEL
GASAMAT #952	OPEN - SITE ASSESSMENT	YUBA CITY	GASOLINE
GILL LEWIS	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
HOLLY OAK GROCERY AND GAS	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
HYDRAULIC EQUIPMENT	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
JACK'S TACKS	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
LAKEVIEW PETROLEUM CARDLOCK	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
LAMON CONSTRUCTION	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
MAGGIE'S RESTAURANT	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
MARLENE BROCKER	COMPLETED - CASE CLOSED	YUBA CITY	DIESEL
MARLER'S SERVICE	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
MECHANICS SHOP	OPEN - REMEDIATION	YUBA CITY	DIESEL
MR PAUL'S MARKET	OPEN - SITE ASSESSMENT	YUBA CITY	GASOLINE
MTL TERMINALS	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
ORR PROPERTY	COMPLETED - CASE CLOSED	YUBA CITY	DIESEL
OSWALD MARKET	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
PACIFIC BELL	COMPLETED - CASE CLOSED	YUBA CITY	DIESEL
PAUL YOUNG	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
PEPSI COLA BOTTLING CO	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
POWER THRUST AUTO REPAIR (FORMER)	COMPLETED - CASE CLOSED	YUBA CITY	Unknown
QUESTION MARKET	OPEN - VERIFICATION MONITORING	YUBA CITY	GASOLINE
QUICK-N-SHOP	OPEN - REMEDIATION	YUBA CITY	GASOLINE
RAINBO THRIFT STORE/DEPOT	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
RAMOS OIL	COMPLETED - CASE CLOSED	YUBA CITY	Unknown
RESIDENCE	COMPLETED - CASE CLOSED	YUBA CITY	DIESEL
ROBERT MOHAMMED	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
ROTO ROOTER (FORMER)	OPEN - SITE ASSESSMENT	YUBA CITY	GASOLINE
ROUSE ESTATE	COMPLETED - CASE CLOSED	YUBA CITY	Unknown
ROUSE ESTATE	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
SEARS AUTOMOTIVE CENTER	COMPLETED - CASE CLOSED	YUBA CITY	DIESEL
SHELL SERVICE STATION #204-8670-0113	OPEN - SITE ASSESSMENT	YUBA CITY	GASOLINE
SHELL SERVICE STATION #205-8670-0568	OPEN - REMEDIATION	YUBA CITY	GASOLINE
SIERRA GOLD NURSERY	OPEN - SITE ASSESSMENT	YUBA CITY	DIESEL
SUNSWEET GROWERS	COMPLETED - CASE CLOSED	YUBA CITY	DIESEL
SUTTER COUNTY CORP YARD	OPEN - REMEDIATION	YUBA CITY	GASOLINE
SUTTER COUNTY SHERIFF'S STATION	OPEN - REMEDIATION	YUBA CITY	UNLEADED GASOLINE
SUTTER-YUBA MOSQUITO ABATEMENT	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
TOMS SIERRA BULK PLANT	OPEN - REMEDIATION	YUBA CITY	GASOLINE

TABLE F-2

LEAKING UNDERGROUND STORAGE TANK CLEANUP SITES LIST – SUTTER COUNTY

Facility	Status	City/Community	Tank Type
UNOCAL #3848	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
VACANT (FOMERLY) MEYERS ROOFING SERVICE	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
VACANT COMMERCIAL BUILDING	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
WELLS FARGO BANK	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
YUBA CITY CAR WASH	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE
YUBA CITY CHEVRON-CASE #2	OPEN - VERIFICATION MONITORING	YUBA CITY	DIESEL
YUBA CITY HS	COMPLETED - CASE CLOSED	YUBA CITY	UNLEADED GASOLINE
YUBA CITY TOWN CENTER	OPEN - VERIFICATION MONITORING	YUBA CITY	GASOLINE
YUBA CITY TRUCK STOP	COMPLETED - CASE CLOSED	YUBA CITY	GASOLINE

Source: Central Valley Regional Water Quality Control Board, GeoTracker, Leaking Underground Storage Tank (LUST) Cleanup Sites, http://geotracker.waterboards.ca.gov/search.asp, accessed 03/30/10.

APPENDIX G
NOISE

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: X
Project Name: **Sutter County GPU Existing (2009)**

Background Information

Model Description: **FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.**
Source of Traffic Volumes: **DKS**
Community Noise Descriptor: **L_{dn}: X** **CNEL:**

Assumed 24-Hour Traffic Distribution:	**Day**	**Evening**	**Night**
Total ADT Volumes	**77.7%**	**12.7%**	**9.6%**
Medium-Duty Trucks	**87.4%**	**5.1%**	**7.5%**
Heavy-Duty Trucks	**89.1%**	**2.8%**	**8.1%**

Analysis Condition					Design		Vehicle Mix			Distance from Centerline of Roadway			
			Median	ADT	Speed	Alpha	Medium	Heavy	Ldn at	Distance to Contour			
Roadway, Segment		Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	75 Feet	70 Ldn	65 Ldn	60 Ldn	55 Ldn
Analysis Condition													
State Route 20	Colussa County Line	2	0	7,200	55	0.5	3.3%	1.7%	64.4	-	69	148	319
	Sutter Bypass	2	0	7,200	55	0.5	3.3%	1.7%	64.4	-	69	148	319
	Acacia Avenue	2	0	9,500	55	0.5	3.3%	1.7%	65.6	38	83	178	383
	Humphery Road	4	0	9,500	55	0.5	3.3%	1.7%	65.8	-	85	183	393
	Township Road	4	0	12,200	55	0.5	3.3%	1.7%	66.9	46	100	216	465
	George Washignton Blvd	4	0	17,500	55	0.5	3.3%	1.7%	68.5	59	127	274	591
State Route 70	Junction 99	2	0	18,700	65	0.5	6.7%	3.3%	71.8	99	214	461	994
	Nicolaus Ave	2	0	19,200	65	0.5	6.7%	3.3%	71.9	101	218	470	1,012
State Route 99	Sacramento County Line	4	0	39,500	55	0.5	6.7%	3.3%	73.7	133	287	617	1,330
	Riego Road	4	0	33,500	55	0.5	6.7%	3.3%	73.0	119	257	553	1,192
	Sankey Road	4	0	33,500	55	0.5	6.7%	3.3%	73.0	119	257	553	1,192
	Howsley Road	4	0	33,500	55	0.5	6.7%	3.3%	73.0	119	257	553	1,192
	Junction 70	2	0	16,200	55	0.5	6.7%	3.3%	69.7	71	154	332	715
	Garden Highway	2	0	17,400	55	0.5	6.7%	3.3%	70.0	75	162	348	750
	Sacramento Ave	2	0	17,600	55	0.5	6.7%	3.3%	70.0	76	163	351	756
	Tudor Road	2	0	14,400	55	0.5	6.7%	3.3%	69.2	66	142	307	661
	Junction Route 113	2	0	17,300	55	0.5	6.7%	3.3%	70.0	75	161	347	747
	O'Banion Road	4	0	17,300	55	0.5	6.7%	3.3%	70.1	77	165	356	767
	Oswald Road	4	0	19,600	55	0.5	6.7%	3.3%	70.7	83	180	387	834
	Barry Road	4	0	21,100	55	0.5	6.7%	3.3%	71.0	88	189	406	876
	Bougue Road	4	0	26,500	45	0.5	6.7%	3.3%	70.3	78	169	364	784
	Lincoln Road	4	0	26,500	45	0.5	6.7%	3.3%	70.3	78	169	364	784
	Franklin Road	4	0	36,000	45	0.5	6.7%	3.3%	71.6	96	207	446	962
	Bridge Street	4	0	21,800	45	0.5	6.7%	3.3%	69.4	69	148	320	688

Analysis Condition	Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Ldn at 75 Feet	Distance from Centerline of Roadway to Contour: 70 Ldn	65 Ldn	60 Ldn	55 Ldn
	Junction Route 20	4	0	20,300	45	0.5	6.7%	3.3%	69.1	66	141	305	656
	Queens Ave	4	0	20,300	45	0.5	6.7%	3.3%	69.1	66	141	305	656
	Pease Ave	4	0	20,300	55	0.5	6.7%	3.3%	70.8	85	184	396	853
	Eager Road	4	0	17,800	55	0.5	6.7%	3.3%	70.3	78	168	363	782
	End Freeway	2	0	17,800	55	0.5	6.7%	3.3%	70.1	76	164	353	761
	Encinal Road	2	0	19,900	55	0.5	6.7%	3.3%	70.6	82	177	381	820
	Live Oak Blvd	2	0	15,600	55	0.5	6.7%	3.3%	69.5	70	150	324	697
	Paseo Ave	2	0	15,600	55	0.5	6.7%	3.3%	69.5	70	150	324	697
	Live Oak City Limits	3	0	15,600	40	0.5	6.7%	3.3%	66.9	47	101	218	469
	Pennington Road	3	0	15,600	40	0.5	6.7%	3.3%	66.9	47	101	218	469
	Live Oak City Limits	2	0	15,600	55	0.5	6.7%	3.3%	69.5	70	150	324	697
State Route 113	Yolo County Line	2	0	7,400	55	0.5	6.7%	3.3%	66.3	42	91	197	424
	Knights Road	2	0	7,400	55	0.5	6.7%	3.3%	66.3	42	91	197	424
	Del Monte Avenue	2	0	5,500	55	0.5	6.7%	3.3%	65.0	35	75	161	348
	Sutter Bypass	2	0	5,800	55	0.5	6.7%	3.3%	65.2	36	78	167	360
	George Washington Blvd	2	0	3,850	55	0.5	6.7%	3.3%	63.4	-	59	127	274
Acacia Ave	Butte House Rd	2	0	4,660	45	0.5	1.8%	0.7%	59.2	-	-	66	142
	State Route 20	2	0	1,070	45	0.5	1.8%	0.7%	52.8	-	-	-	53
Bear River Road	Swanson Road	2	0	990	50	0.5	1.8%	0.7%	53.5	-	-	-	60
	Pleasant Grove Road	2	0	1,040	50	0.5	1.8%	0.7%	53.8	-	-	-	62
Bogue Road	Township Road	2	0	934	55	0.5	1.8%	0.7%	54.3	-	-	-	67
	George Washington Blvd	2	0	2,410	55	0.5	1.8%	0.7%	58.4	-	-	59	127
	Walton Avenue	3	0	5,070	55	0.5	1.8%	0.7%	61.7	-	45	98	210
	State Route 99	3	0	0	55	0.5	1.8%	0.7%	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Broadway	Clark Road	2	0	850	55	0.5	1.8%	0.7%	53.9	-	-	-	63
	Encinal Road	2	0	1,610	45	0.5	1.8%	0.7%	54.5	-	-	32	70
Butte House Road	Acacia Ave	2	0	2,450	50	0.5	1.8%	0.7%	57.5	-	-	51	110
	East Butte Road	3	0	4,370	50	0.5	1.8%	0.7%	60.1	-	-	76	163
	Township Road	3	0	4,120	50	0.5	1.8%	0.7%	59.8	-	-	73	157
Catlett Road	Garden Highway	2	0	90	55	0.5	1.8%	0.7%	44.1	-	-	-	-
	State Route 70/99	2	0	620	55	0.5	1.8%	0.7%	52.5	-	-	-	51
	Pleasant Grove Road	2	0	200	55	0.5	1.8%	0.7%	47.6	-	-	-	-
El Margarita Road	State Route 20	2	0	2,320	35	0.5	1.8%	0.7%	53.6	-	-	-	61
Franklin Road	Acacia Avenue	2	0	1,070	55	0.5	1.8%	0.7%	54.9	-	-	34	74
	Township Road	2	0	2,620	55	0.5	1.8%	0.7%	58.8	-	-	62	134
	George Washington Blvd	2	0	5,140	35	0.5	1.8%	0.7%	57.1	-	-	48	103
	El Margarita Road	2	0	8,110	35	0.5	1.8%	0.7%	59.1	-	-	65	140
Garden Highway	Stewart Road	2	0	5,230	55	0.5	1.8%	0.7%	61.8	-	46	99	213
	Messick Road	2	0	4,290	55	0.5	1.8%	0.7%	60.9	-	40	86	186
	O'Banion Road	2	0	4,280	55	0.5	1.8%	0.7%	60.9	-	40	86	186
	State Route 99	2	0	520	55	0.5	1.8%	0.7%	51.8	-	-	-	46
	Catlett Road	2	0	150	55	0.5	1.8%	0.7%	46.4	-	-	-	-

Analysis Condition	Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Vehicle Mix: Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Ldn at 75 Feet	Distance from Centerline of Roadway to Contour: 70 Ldn	65 Ldn	60 Ldn	55 Ldn
	Riego Rd	2	0	200	55	0.5	1.8%	0.7%	47.6	-	-	-	-
George Washington	State Route 20	2	0	7,420	55	0.5	1.8%	0.7%	63.3	-	58	125	268
	Franklin Road	2	0	4,280	55	0.5	1.8%	0.7%	60.9	-	40	86	186
	Lincoln Road	2	0	3,390	55	0.5	1.8%	0.7%	59.9	-	34	74	159
	Bougue Road	2	0	3,940	55	0.5	1.8%	0.7%	60.6	-	38	82	176
	Oswald Road	2	0	3,040	55	0.5	1.8%	0.7%	59.4	-	-	69	148
Howsley Road	State Route 70-99	2	0	2,270	55	0.5	1.8%	0.7%	58.2	-	-	57	122
	Pleasant Grove Road	2	0	1,380	55	0.5	1.8%	0.7%	56.0	-	-	41	87
Humphrey Road	Butte House Rd	2	0	680	55	0.5	1.8%	0.7%	52.9	-	-	-	55
	South Butte Road	2	0	1,910	55	0.5	1.8%	0.7%	57.4	-	-	50	109
	State Route 20	2	0	830	55	0.5	1.8%	0.7%	53.8	-	-	-	62
Larkin Road	Butte County Line	2	0	2,990	55	0.5	1.8%	0.7%	59.4	-	-	68	146
	Live Oak City Limits	2	0	1,500	55	0.5	1.8%	0.7%	56.4	-	-	43	92
	Paseo Ave	2	0	1,500	55	0.5	1.8%	0.7%	56.4	-	-	43	92
	Clark Road	2	0	1,450	55	0.5	1.8%	0.7%	56.2	-	-	42	90
	Encinal Road	2	0	1,390	55	0.5	1.8%	0.7%	56.0	-	-	41	88
Lincoln Road	Clements Road	2	0	560	55	0.5	1.8%	0.7%	52.1	-	-	-	48
	Township Road	2	0	1,040	55	0.5	1.8%	0.7%	54.8	-	-	34	72
	George Washington Blvd	2	0	3,673	40	0.5	1.8%	0.7%	56.9	-	-	47	101
Live Oak Blvd	State Route 99	2	0	6,620	55	0.5	1.8%	0.7%	62.8	-	54	115	249
Moroni - McGrath Rd	Tarke Road	2	0	1,270	55	0.5	1.8%	0.7%	55.6	-	-	38	83
Nicolaus Road	State Route 99	2	0	1,470	55	0.5	1.8%	0.7%	56.3	-	-	42	91
	State Route 70	2	0	1,220	55	0.5	1.8%	0.7%	55.5	-	-	37	81
Oswald Road	Township Road	2	0	590	55	0.5	1.8%	0.7%	52.3	-	-	-	50
	George Washington Blvd	2	0	1,360	55	0.5	1.8%	0.7%	55.9	-	-	40	87
	Walton Avenue	2	0	2,150	55	0.5	1.8%	0.7%	57.9	-	-	55	118
	State Route 99	2	0	200	55	0.5	1.8%	0.7%	47.6	-	-	-	-
Pease Road	Township Road	2	0	810	55	0.5	1.8%	0.7%	53.7	-	-	-	61
	Tierra Buena Road	2	0	1,670	40	0.5	1.8%	0.7%	53.5	-	-	-	60
Pennington Road	North Butte Road	2	0	1,660	55	0.5	1.8%	0.7%	56.8	-	-	46	99
	Township Road	2	0	1,790	55	0.5	1.8%	0.7%	57.1	-	-	48	104
Pleasant Grove Road	Yuba County Line	2	0	3,140	55	0.5	1.8%	0.7%	59.6	-	33	70	151
	Nicolaus Ave	2	0	3,000	55	0.5	1.8%	0.7%	59.4	-	-	68	147
	Catlett Road	2	0	2,330	55	0.5	1.8%	0.7%	58.3	-	-	58	124
	Howsley Road	2	0	1,210	55	0.5	1.8%	0.7%	55.4	-	-	37	80
	Sankey Road	2	0	1,750	55	0.5	1.8%	0.7%	57.0	-	-	48	102
	Riego Road	2	0	1,180	55	0.5	1.8%	0.7%	55.3	-	-	37	79
Power Line Road	Riego Road	2	0	220	55	0.5	1.8%	0.7%	48.0	-	-	-	-
Progress Road	McClatchy Road	2	0	1,010	55	0.5	1.8%	0.7%	54.6	-	-	33	71
	Acme Road	2	0	1,250	55	0.5	1.8%	0.7%	55.6	-	-	38	82
Railroad Avenue	Bogue Road	3	0	2,250	45	0.5	1.8%	0.7%	56.1	-	-	41	88
	Stewart Road	3	0	1,320	45	0.5	1.8%	0.7%	53.8	-	-	-	62

Analysis Condition	Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Ldn at 75 Feet	Distance from Centerline of Roadway to Contour: 70 Ldn	65 Ldn	60 Ldn	55 Ldn
	Berry Road	2	0	1,050	45	0.5	1.8%	0.7%	52.7	-	-	-	53
Reclamation Road	Progress Road	2	0	1,060	55	0.5	1.8%	0.7%	54.9	-	-	34	73
	Pelger Road	2	0	1,890	55	0.5	1.8%	0.7%	57.4	-	-	50	108
Riego Road	Garden Highway	2	0	650	55	0.5	1.8%	0.7%	52.7	-	-	-	53
	Powerline Road	2	0	650	55	0.5	1.8%	0.7%	52.7	-	-	-	53
	State Route 70-99	2	0	9,900	55	0.5	1.8%	0.7%	64.6	33	70	151	325
	Pacific Avenue	2	0	9,900	55	0.5	1.8%	0.7%	64.6	33	70	151	325
Rio Oso Road	State Route 70	2	0	1,060	55	0.5	1.8%	0.7%	54.9	-	-	34	73
Riviera Road	Township Road	2	0	450	55	0.5	1.8%	0.7%	51.1	-	-	-	41
	State Route 99	2	0	460	55	0.5	1.8%	0.7%	51.2	-	-	-	42
Sankey Road	State Route 70-99	2	0	1,180	55	0.5	1.8%	0.7%	55.3	-	-	37	79
	Pacific Avenue	2	0	1,080	55	0.5	1.8%	0.7%	54.9	-	-	34	74
	Pleasant Grove Road	2	0	670	55	0.5	1.8%	0.7%	52.9	-	-	-	54
Stewart Road	Walton Avenue	2	0	400	35	0.5	1.8%	0.7%	46.0	-	-	-	-
	State Route 99	2	0	890	35	0.5	1.8%	0.7%	49.5	-	-	-	32
	Railroad Avenue	2	0	720	35	0.5	1.8%	0.7%	48.5	-	-	-	-
Swanson Road	Rio Oso Road	2	0	980	50	0.5	1.8%	0.7%	53.5	-	-	-	60
Tarke Road	State Route 20	2	0	890	55	0.5	1.8%	0.7%	54.1	-	-	-	65
Tierra Buena Road	Eager Road	2	0	2,180	55	0.5	1.8%	0.7%	58.0	-	-	55	119
	Pease Ave	2	0	2,360	55	0.5	1.8%	0.7%	58.3	-	-	58	125
Township Road	Butte County Line	2	0	1,730	55	0.5	1.8%	0.7%	57.0	-	-	47	102
	Pennington Road	2	0	1,920	55	0.5	1.8%	0.7%	57.4	-	-	51	109
	Paseo Ave	2	0	1,961	55	0.5	1.8%	0.7%	57.5	-	-	51	111
	Nuestro Road	2	0	1,540	55	0.5	1.8%	0.7%	56.5	-	-	44	94
	Pease Ave	2	0	2,349	55	0.5	1.8%	0.7%	58.3	-	-	58	125
	Butte House Rd	3	0	2,470	45	0.5	1.8%	0.7%	56.5	-	-	44	94
	State Route 20	2	0	3,330	45	0.5	1.8%	0.7%	57.7	-	-	53	114
	Franklin Road	2	0	1,530	45	0.5	1.8%	0.7%	54.3	-	-	-	68
	Lincoln Road	2	0	1,906	55	0.5	1.8%	0.7%	57.4	-	-	50	108
	Bogue Road	2	0	750	55	0.5	1.8%	0.7%	53.4	-	-	-	58
	Oswald Road	2	0	380	55	0.5	1.8%	0.7%	50.4	-	-	-	37
	O'Banion Road	2	0	220	55	0.5	1.8%	0.7%	48.0	-	-	-	-
Walton Ave	Bogue Road	2	0	2,690	40	0.5	1.8%	0.7%	55.6	-	-	38	82
	Reed Road	2	0	1,540	40	0.5	1.8%	0.7%	53.2	-	-	-	57
West Catlett Road	Garden Highway	2	0	300	55	0.5	1.8%	0.7%	49.4	-	-	-	-

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: X
Project Name: **Sutter County GPU (2030)**

Background Information

Model Description: **FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.**
Source of Traffic Volumes: **DKS**
Community Noise Descriptor: **L_{dn}: X** **CNEL:**

Assumed 24-Hour Traffic Distribution:	**Day**	**Evening**	**Night**
Total ADT Volumes	**77.7%**	**12.7%**	**9.6%**
Medium-Duty Trucks	**87.4%**	**5.1%**	**7.5%**
Heavy-Duty Trucks	**89.1%**	**2.8%**	**8.1%**

Analysis Condition			Median	ADT	Design Speed	Alpha	Vehicle Mix Medium	Vehicle Mix Heavy	Ldn at	Distance from Centerline of Roadway to Contour			
	Roadway, Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	75 Feet	70 Ldn	65 Ldn	60 Ldn	55 Ldn
Analysis Condition													
State Route 20	Colussa County Line	2	0	11,230	55	0.5	3.3%	1.7%	66.4	43	92	199	428
	Sutter Bypass	2	0	29,240	55	0.5	3.3%	1.7%	70.5	81	175	376	811
	Acacia Avenue	2	0	24,560	55	0.5	3.3%	1.7%	69.8	72	156	335	722
	Humphery Road	4	0	23,340	55	0.5	3.3%	1.7%	69.7	72	154	333	716
	Township Road	4	0	22,760	55	0.5	3.3%	1.7%	69.6	70	152	327	705
	George Washignton Blvd	4	0	27,560	55	0.5	3.3%	1.7%	70.4	80	172	372	800
State Route 70	Junction 99	4	0	34,620	65	0.5	6.7%	3.3%	74.7	154	332	714	1,539
	Nicolaus Ave	2	0	32,900	65	0.5	6.7%	3.3%	74.3	145	312	672	1,448
State Route 99	Sacramento County Line	4	0	129,830	55	0.5	6.7%	3.3%	78.9	294	633	1,365	2,940
	Riego Road	4	0	69,010	55	0.5	6.7%	3.3%	76.2	193	416	895	1,929
	Sankey Road	4	0	59,170	55	0.5	6.7%	3.3%	75.5	174	375	808	1,741
	Howsley Road	4	0	58,300	55	0.5	6.7%	3.3%	75.4	172	371	800	1,724
	Junction 70	4	0	21,250	55	0.5	6.7%	3.3%	71.0	88	190	408	880
	Garden Highway	4	0	23,850	55	0.5	6.7%	3.3%	71.5	95	205	441	950
	Sacramento Ave	4	0	24,050	55	0.5	6.7%	3.3%	71.6	96	206	443	955
	Tudor Road	4	0	8,460	55	0.5	6.7%	3.3%	67.0	48	103	221	476
	Junction Route 113	4	0	6,040	55	0.5	6.7%	3.3%	65.6	-	82	177	380
	O'Banion Road	4	0	23,480	55	0.5	6.7%	3.3%	71.5	94	203	436	940
	Oswald Road	4	0	27,330	55	0.5	6.7%	3.3%	72.1	104	224	483	1,040
	Barry Road	4	0	29,030	55	0.5	6.7%	3.3%	72.4	108	233	503	1,083
	Bougue Road	6	0	41,710	45	0.5	6.7%	3.3%	72.6	112	242	522	1,124
	Lincoln Road	6	0	41,440	45	0.5	6.7%	3.3%	72.6	112	241	519	1,119
	Franklin Road	6	0	53,400	45	0.5	6.7%	3.3%	73.7	133	285	615	1,325
	Bridge Street	6	0	32,560	45	0.5	6.7%	3.3%	71.6	95	205	442	953

Analysis Condition	Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Ldn at 75 Feet	Distance from Centerline of Roadway to Contour: 70 Ldn	65 Ldn	60 Ldn	55 Ldn
	Junction Route 20	4	0	31,190	45	0.5	6.7%	3.3%	71.0	87	188	406	874
	Queens Ave	4	0	31,400	45	0.5	6.7%	3.3%	71.0	88	189	408	878
			0		55	0.5	1.8%	0.7%	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
	Pease Ave	4	0	32,200	55	0.5	6.7%	3.3%	72.8	116	250	539	1,161
			0		55	0.5	1.8%	0.7%	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
	Eager Road	4	0	26,300	55	0.5	6.7%	3.3%	72.0	101	218	471	1,014
			0		55	0.5	1.8%	0.7%	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
	End Freeway	4	0	26,300	55	0.5	6.7%	3.3%	72.0	101	218	471	1,014
	Encinal Road	2	0	25,690	55	0.5	6.7%	3.3%	71.7	97	209	451	972
	Live Oak Blvd	2	0	21,810	55	0.5	6.7%	3.3%	71.0	87	188	405	872
	Paseo Ave	2	0	20,350	55	0.5	6.7%	3.3%	70.7	83	179	386	832
	Live Oak City Limits	3	0	20,800	40	0.5	6.7%	3.3%	68.2	57	122	264	568
	Pennington Road	3	0	20,940	40	0.5	6.7%	3.3%	68.2	57	123	265	570
	Live Oak City Limits	2	0	20,940	55	0.5	6.7%	3.3%	70.8	85	183	394	848
State Route 113	Yolo County Line	2	0	4,460	55	0.5	6.7%	3.3%	64.1	-	65	140	303
	Knights Road	2	0	4,460	55	0.5	6.7%	3.3%	64.1	-	65	140	303
	Del Monte Avenue	2	0	4,280	55	0.5	6.7%	3.3%	63.9	-	63	137	294
	Sutter Bypass	2	0	3,990	55	0.5	6.7%	3.3%	63.6	-	61	130	281
	George Washington Blvd	2	0	3,090	55	0.5	6.7%	3.3%	62.5	-	51	110	237
Acacia Ave	Butte House Rd	2	0	13,180	45	0.5	1.8%	0.7%	63.7	-	61	132	284
	State Route 20	2	0	3,220	45	0.5	1.8%	0.7%	57.6	-	-	52	111
Bear River Road	Swanson Road	2	0	5,200	50	0.5	1.8%	0.7%	60.7	-	39	84	181
	Pleasant Grove Road	2	0	5,020	50	0.5	1.8%	0.7%	60.6	-	38	82	177
Bogue Road	Township Road	4	0	3,880	55	0.5	1.8%	0.7%	60.7	-	-	83	179
	George Washington Blvd	4	0	3,840	55	0.5	1.8%	0.7%	60.6	-	-	82	178
	Walton Avenue	4	0	6,720	55	0.5	1.8%	0.7%	63.1	-	56	120	258
	State Route 99	4	0	1,370	55	0.5	1.8%	0.7%	56.1	-	-	-	89
Broadway	Clark Road	2	0	1,890	55	0.5	1.8%	0.7%	57.4	-	-	50	108
	Encinal Road	2	0	3,350	45	0.5	1.8%	0.7%	57.7	-	-	53	114
Butte House Road	Acacia Ave	2	0	5,260	50	0.5	1.8%	0.7%	60.8	-	39	85	183
	East Butte Road	3	0	12,720	50	0.5	1.8%	0.7%	64.7	-	72	154	332
	Township Road	4	0	10,350	50	0.5	1.8%	0.7%	63.9	-	63	137	294
Catlett Road	Garden Highway	2	0	370	55	0.5	1.8%	0.7%	50.3	-	-	-	36
	State Route 70/99	2	0	4,810	55	0.5	1.8%	0.7%	61.4	-	43	93	201
	Pleasant Grove Road	2	0	4,010	55	0.5	1.8%	0.7%	60.6	-	38	83	178
El Margarita Road	State Route 20	2	0	1,720	35	0.5	1.8%	0.7%	52.3	-	-	-	50
Franklin Road	Acacia Avenue	2	0	1,970	55	0.5	1.8%	0.7%	57.5	-	-	51	111
	Township Road	4	0	1,600	55	0.5	1.8%	0.7%	56.8	-	-	46	99
	George Washington Blvd	4	0	4,510	35	0.5	1.8%	0.7%	56.7	-	-	45	97
	El Margarita Road	4	0	16,420	35	0.5	1.8%	0.7%	62.3	-	50	107	230
Garden Highway	Stewart Road	2	0	9,930	55	0.5	1.8%	0.7%	64.6	33	70	151	326
	Messick Road	2	0	6,970	55	0.5	1.8%	0.7%	63.0	-	55	120	258
	O'Banion Road	2	0	16,670	55	0.5	1.8%	0.7%	66.8	46	99	214	461

Analysis Condition	Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Vehicle Mix: Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Ldn at 75 Feet	Distance from Centerline of Roadway to Contour: 70 Ldn	65 Ldn	60 Ldn	55 Ldn
	State Route 99	2	0	470	55	0.5	1.8%	0.7%	51.3	-	-	-	43
	Catlett Road	2	0	160	55	0.5	1.8%	0.7%	46.6	-	-	-	-
	Riego Rd	2	0	5,250	55	0.5	1.8%	0.7%	61.8	-	46	99	213
George Washington	State Route 20	4	0	4,880	55	0.5	1.8%	0.7%	61.7	-	45	97	209
	Franklin Road	4	0	1,640	55	0.5	1.8%	0.7%	56.9	-	-	47	101
	Lincoln Road	4	0	1,180	55	0.5	1.8%	0.7%	55.5	-	-	-	81
	Bougue Road	2	0	4,790	55	0.5	1.8%	0.7%	61.4	-	43	93	201
	Oswald Road	2	0	1,740	55	0.5	1.8%	0.7%	57.0	-	-	47	102
Howsley Road	State Route 70-99	2	0	4,800	55	0.5	1.8%	0.7%	61.4	-	43	93	201
	Pleasant Grove Road	2	0	6,160	55	0.5	1.8%	0.7%	62.5	-	51	110	237
Humphrey Road	Butte House Rd	2	0	360	55	0.5	1.8%	0.7%	50.2	-	-	-	36
	South Butte Road	2	0	1,330	55	0.5	1.8%	0.7%	55.8	-	-	40	85
	State Route 20	2	0	680	55	0.5	1.8%	0.7%	52.9	-	-	-	55
Larkin Road	Butte County Line	2	0	4,030	55	0.5	1.8%	0.7%	60.7	-	39	83	179
	Live Oak City Limits	2	0	6,850	55	0.5	1.8%	0.7%	63.0	-	55	118	255
	Paseo Ave	2	0	6,980	55	0.5	1.8%	0.7%	63.0	-	56	120	258
	Clark Road	2	0	4,890	55	0.5	1.8%	0.7%	61.5	-	44	94	203
	Encinal Road	2	0	4,160	55	0.5	1.8%	0.7%	60.8	-	39	85	183
Lincoln Road	Clements Road	2	0	1,490	55	0.5	1.8%	0.7%	56.3	-	-	43	92
	Township Road	4	0	2,660	55	0.5	1.8%	0.7%	59.0	-	-	65	139
	George Washington Blvd	4	0	3,670	40	0.5	1.8%	0.7%	57.1	-	-	48	104
Live Oak Blvd	State Route 99	2	0	9,110	55	0.5	1.8%	0.7%	64.2	-	66	143	308
Moroni - McGrath Rd	Tarke Road	2	0	1,480	55	0.5	1.8%	0.7%	56.3	-	-	43	92
Nicolaus Road	State Route 99	2	0	3,510	55	0.5	1.8%	0.7%	60.1	-	35	76	163
	State Route 70	2	0	10,620	55	0.5	1.8%	0.7%	64.9	34	73	158	341
Oswald Road	Township Road	2	0	8,380	55	0.5	1.8%	0.7%	63.8	-	63	135	291
	George Washington Blvd	2	0	6,300	55	0.5	1.8%	0.7%	62.6	-	52	112	241
	Walton Avenue	2	0	5,180	55	0.5	1.8%	0.7%	61.7	-	46	98	211
	State Route 99	2	0	570	55	0.5	1.8%	0.7%	52.2	-	-	-	49
Pease Road	Township Road	4	0	520	55	0.5	1.8%	0.7%	51.9	-	-	-	47
	Tierra Buena Road	4	0	970	40	0.5	1.8%	0.7%	51.3	-	-	-	-
Pennington Road	North Butte Road	2	0	1,680	55	0.5	1.8%	0.7%	56.9	-	-	46	100
	Township Road	4	0	2,550	55	0.5	1.8%	0.7%	58.8	-	-	63	135
Pleasant Grove Road	Yuba County Line	2	0	10,180	55	0.5	1.8%	0.7%	64.7	33	71	154	332
	Nicolaus Ave	2	0	7,470	55	0.5	1.8%	0.7%	63.3	-	58	125	270
	Catlett Road	2	0	5,270	55	0.5	1.8%	0.7%	61.8	-	46	99	214
	Howsley Road	2	0	1,420	55	0.5	1.8%	0.7%	56.1	-	-	41	89
	Sankey Road	2	0	10,760	55	0.5	1.8%	0.7%	64.9	34	74	160	344
	Riego Road	2	0	19,000	55	0.5	1.8%	0.7%	67.4	50	108	233	503
Power Line Road	Riego Road	2	0	11,810	55	0.5	1.8%	0.7%	65.3	37	79	170	366
Progress Road	McClatchy Road	2	0	1,220	55	0.5	1.8%	0.7%	55.5	-	-	37	81
	Acme Road	2	0	920	55	0.5	1.8%	0.7%	54.2	-	-	-	67
Railroad Avenue	Bogue Road	3	0	4,970	45	0.5	1.8%	0.7%	59.5	-	-	70	150

Analysis Condition	Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Vehicle Mix: Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Ldn at 75 Feet	Distance from Centerline of Roadway to Contour: 70 Ldn	65 Ldn	60 Ldn	55 Ldn
	Stewart Road	3	0	4,120	45	0.5	1.8%	0.7%	58.7	-	-	61	132
	Berry Road	2	0	1,420	45	0.5	1.8%	0.7%	54.0	-	-	-	64
Reclamation Road	Progress Road	2	0	730	55	0.5	1.8%	0.7%	53.2	-	-	-	57
	Pelger Road	2	0	2,710	55	0.5	1.8%	0.7%	58.9	-	-	64	137
Riego Road	Garden Highway	4	0	5,630	55	0.5	1.8%	0.7%	62.3	-	49	106	229
	Powerline Road	8	0	77,280	55	0.5	1.8%	0.7%	74.7	154	332	715	1,541
	State Route 70-99	8	0	91,400	55	0.5	1.8%	0.7%	75.4	172	371	800	1,723
	Pacific Avenue	6	0	52,520	55	0.5	1.8%	0.7%	72.4	108	232	500	1,077
Rio Oso Road	State Route 70	2	0	5,270	55	0.5	1.8%	0.7%	61.8	-	46	99	214
Riviera Road	Township Road	2	0	1,110	55	0.5	1.8%	0.7%	55.1	-	-	35	76
	State Route 99	2	0	1,260	55	0.5	1.8%	0.7%	55.6	-	-	38	82
Sankey Road	State Route 70-99	4	0	24,750	55	0.5	1.8%	0.7%	68.7	62	133	286	615
	Pacific Avenue	4	0	33,160	55	0.5	1.8%	0.7%	70.0	75	161	347	748
	Pleasant Grove Road	4	0	39,380	55	0.5	1.8%	0.7%	70.7	84	181	389	839
Stewart Road	Walton Avenue	2	0	1,150	35	0.5	1.8%	0.7%	50.6	-	-	-	38
	State Route 99	2	0	660	35	0.5	1.8%	0.7%	48.2	-	-	-	-
	Railroad Avenue	2	0	230	35	0.5	1.8%	0.7%	43.6	-	-	-	-
Swanson Road	Rio Oso Road	2	0	5,190	50	0.5	1.8%	0.7%	60.7	-	39	84	181
Tarke Road	State Route 20	2	0	1,660	55	0.5	1.8%	0.7%	56.8	-	-	46	99
Tierra Buena Road	Eager Road	2	0	5,480	55	0.5	1.8%	0.7%	62.0	-	47	102	219
	Pease Ave	2	0	6,220	55	0.5	1.8%	0.7%	62.5	-	51	111	239
Township Road	Butte County Line	2	0	2,390	55	0.5	1.8%	0.7%	58.4	-	-	59	126
	Pennington Road	2	0	3,320	55	0.5	1.8%	0.7%	59.8	-	34	73	157
	Paseo Ave	#N/A	0	#N/A	55	0.5	1.8%	0.7%	#N/A	#N/A	#N/A	#N/A	#N/A
	Nuestro Road	2	0	3,450	55	0.5	1.8%	0.7%	60.0	-	35	75	161
	Pease Ave	2	0	3,500	55	0.5	1.8%	0.7%	60.0	-	35	76	163
	Butte House Rd	3	0	5,620	45	0.5	1.8%	0.7%	60.0	-	-	75	163
	State Route 20	2	0	4,930	45	0.5	1.8%	0.7%	59.4	-	-	69	148
	Franklin Road	2	0	4,560	45	0.5	1.8%	0.7%	59.1	-	-	65	140
	Lincoln Road	2	0	6,440	55	0.5	1.8%	0.7%	62.7	-	53	113	244
	Bogue Road	2	0	5,510	55	0.5	1.8%	0.7%	62.0	-	47	102	220
	Oswald Road	2	0	1,360	55	0.5	1.8%	0.7%	55.9	-	-	40	87
	O'Banion Road	2	0	-	55	0.5	1.8%	0.7%	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Walton Ave	Bogue Road	2	0	5,950	40	0.5	1.8%	0.7%	59.0	-	-	65	139
	Reed Road	2	0	3,450	40	0.5	1.8%	0.7%	56.7	-	-	45	97
West Catlett Road	Garden Highway	2	0	580	55	0.5	1.8%	0.7%	52.2	-	-	-	49

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: X
Project Name: Sutter County GPU (2030 Old GP)
Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with CALVENO.
Source of Traffic Volumes: DKS
Community Noise Descriptor: Ldn

Assumed 24-Hour Traffic Distributio	Day	Evening	Night
Total ADT Volumes	77.7%	12.7%	9.6%
Medium-Duty Trucks	87.4%	5.1%	7.5%
Heavy-Duty Trucks	89.1%	2.8%	8.1%

			Existing					Old GP					GPU						
			ADT	Ldn at	Distance to Contour			ADT	Ldn at	Distance to Contour			ADT	Ldn at	Distance to Contour			Change	Change
Roadway	From	To	Volume	75 Fee	70 Ldn	65 Ldn	60 Ldn	Volume	75 Fee	70 Ldn	65 Ldn	60 Ldn	Volume	75 Fee	70 Ldn	65 Ldn	60 Ldn	from Exist	from GP
State Route 20	Colussa County Lin	Sutter Bypass	7200	64.4	-	69	148	11740	66.5	44	95	205	11230	66.4	43	92	199	1.9	-0.2
	Sutter Bypass	Acacia Avenue	7200	64.4	-	69	148	22020	69.3	67	145	312	29240	70.5	81	175	376	6.1	1.2
	Acacia Avenue	Humphery Road	9500	65.6	38	83	178	21970	69.3	67	144	311	24560	69.8	72	156	335	4.1	0.5
	Humphery Road	Township Road	9500	65.8	-	85	183	21260	69.3	67	145	312	23340	69.7	72	154	333	3.9	0.4
	Township Road	George Washingtor	12200	66.9	46	100	216	22280	69.5	69	150	322	22760	69.6	70	152	327	2.7	0.1
	George Washingtor	Yuba City Limits	17500	68.5	59	127	274	27880	70.5	81	174	374	27560	70.4	80	172	372	2.0	-0.1
State Route 70	Junction 99	Nicolaus Ave	18700	71.8	99	214	461	39630	75.3	168	363	782	34620	74.7	154	332	714	2.8	-0.6
	Nicolaus Ave	Yuba County Line	19200	71.9	101	218	470	35750	74.6	153	330	711	32900	74.3	145	312	672	2.3	-0.4
State Route 99	Sacramento County	Riego Rd	39500	73.7	133	287	617	130730	78.9	295	636	1371	129830	78.9	294	633	1365	5.2	0.0
	Riego Road	Sankey Road	33500	73.0	119	257	553	77470	76.7	208	449	967	69010	76.2	193	416	895	3.1	-0.5
	Sankey Road	Howsley Road	33500	73.0	119	257	553	69240	76.2	193	417	897	59170	75.5	174	375	808	2.5	-0.7
	Howsley Road	State Route 70	33500	73.0	119	257	553	67620	76.1	190	410	883	58300	75.4	172	371	800	2.4	-0.6
	Junction 70	Garden Highway	16200	69.7	71	154	332	24640	71.7	97	209	451	21250	71.0	88	190	408	1.4	-0.6
	Garden Highway	Sacramento Ave	17400	70.0	75	162	348	25600	71.8	100	215	462	23850	71.5	95	205	441	1.5	-0.3
	Sacramento Ave	Tudor Road	17600	70.0	76	163	351	25800	71.9	100	216	465	24050	71.6	96	206	443	1.5	-0.3
	Tudor Road	Junction Route 113	14400	69.2	66	142	307	10160	67.8	54	116	250	8460	67.0	48	103	221	-2.1	-0.8
	Junction Route 113	O'Banion Road	17300	70.0	75	161	347	11240	68.3	58	124	267	6040	65.6	-	82	177	-4.4	-2.7
	O'Banion Road	Oswald Road	17300	70.1	77	165	356	21420	71.1	88	191	410	23480	71.5	94	203	436	1.3	0.4
	Oswald Road	Barry Road	19600	70.7	83	180	387	23140	71.4	93	201	432	27330	72.1	104	224	483	1.4	0.7
	Barry Road	Bougue Road	21100	71.0	88	189	406	23900	71.5	95	205	442	29030	72.4	108	233	503	1.4	0.8
	Bougue Road	Lincoln Road	26500	70.3	78	169	364	32170	71.5	95	204	439	41710	72.6	112	242	522	2.3	1.1
	Lincoln Road	Franklin Road	26500	70.3	78	169	364	33120	71.6	96	208	447	41440	72.6	112	241	519	2.3	1.0
	Franklin Road	Bridge Street	36000	71.6	96	207	446	46620	73.1	121	261	562	53400	73.7	133	285	615	2.1	0.6
	Bridge Street	Juction Route 20	21800	69.4	69	148	320	30120	71.2	90	195	420	32560	71.6	95	205	442	2.1	0.3
	Junction Route 20	Queens Ave	20300	69.1	66	141	305	28510	70.6	82	177	382	31190	71.0	87	188	406	1.9	0.4
	Queens Ave	Pease Ave	20300	69.1	66	141	305	28940	70.7	83	179	386	31400	71.0	88	189	408	1.9	0.4
	Pease Ave	Eager Road	20300	70.8	85	184	396	29060	72.4	108	234	503	32200	72.8	116	250	539	2.0	0.4
	Eager Road	End Freeway	17800	70.3	78	168	363	25200	71.8	99	212	457	26300	72.0	101	218	471	1.7	0.2
	End Freeway	Encinal Road	17800	70.1	76	164	353	25200	71.8	99	212	457	26300	72.0	101	218	471	1.9	0.2
	Encinal Road	Live Oak Blvd	19900	70.6	82	177	381	25990	71.7	98	211	455	25690	71.7	97	209	451	1.1	-0.1

			Existing					Old GP					GPU						
			ADT	Ldn at	Distance to Contour			ADT	Ldn at	Distance to Contour			ADT	Ldn at	Distance to Contour			Change	Change
Roadway	From	To	Volume	75 Fee	70 Ldn	65 Ldn	60 Ldn	Volume	75 Fee	70 Ldn	65 Ldn	60 Ldn	Volume	75 Fee	70 Ldn	65 Ldn	60 Ldn	from Exist	from GP
	Live Oak Blvd	Paseo Ave	15600	69.5	70	150	324	22020	71.0	88	189	407	21810	71.0	87	188	405	1.5	0.0
	Paseo Ave	Live Oak City Limits	15600	69.5	70	150	324	20740	70.8	84	182	391	20350	70.7	83	179	386	1.2	-0.1
	Live Oak City Limits	Pennington Road	15600	66.9	47	101	218	20540	68.1	56	121	261	20800	68.2	57	122	264	1.2	0.1
	Pennington Road	Live Oak City Limits	15600	66.9	47	101	218	20700	68.2	57	122	263	20940	68.2	57	123	265	1.3	0.1
	Live Oak City Limits	Butte County Line	15600	69.5	70	150	324	20700	70.8	84	181	391	20940	70.8	85	183	394	1.3	0.1
State Route 113	Yolo County Line	Knights Road	7400	66.3	42	91	197	10250	67.7	53	114	245	4460	64.1	-	65	140	-2.2	-3.6
	Knights Road	Del Monte Avenue	7400	66.3	42	91	197	10250	67.7	53	114	245	4460	64.1	-	65	140	-2.2	-3.6
	Del Monte Avenue	Sutter Bypass	5500	65.0	35	75	161	8350	66.8	46	99	213	4280	63.9	-	63	137	-1.1	-2.9
	Sutter Bypass	George Washingtor	5800	65.2	36	78	167	4250	63.9	-	63	136	3990	63.6	-	61	130	-1.6	-0.3
	George Washingtor	Junction Route 99	3850	63.4	-	59	127	3740	63.3	-	58	125	3090	62.5	-	51	110	-1.0	-0.8
Acacia Ave	Butte House Rd	State Route 20	4660	59.2	-	-	66	7690	61.3	-	43	92	13180	63.7	-	61	132	4.5	2.3
	State Route 20	Franklin Road	1070	52.8	-	-	-	1160	53.1	-	-	-	3220	57.6	-	-	52	4.8	4.4
Bear River Road	Swanson Road	Pleasant Grove Roa	990	53.5	-	-	-	6480	61.7	-	45	97	5200	60.7	-	39	84	7.2	-1.0
	Pleasant Grove Roa	Brewer Road	1040	53.8	-	-	-	7210	62.2	-	49	105	5020	60.6	-	38	82	6.8	-1.6
Bogue Road	Township Road	George Washingtor	934	54.3	-	-	-	1820	57.4	-	-	50	3880	60.7	-	-	83	6.4	3.3
	George Washingtor	Sanborn Road	2410	58.4	-	-	59	2970	59.5	-	-	70	3840	60.6	-	-	82	2.2	1.1
	Walton Avenue	State Route 99	5070	61.7	-	45	98	4640	61.4	-	-	94	6720	63.1	-	56	120	1.3	1.6
	State Route 99	Railroad Avenue	0	#####	#####	#####	#####	730	53.4	-	-	-	1370	56.1	-	-	-	#NUM!	2.7
Broadway	Clark Road	Encinal Road	850	53.9	-	-	-	2070	57.8	-	-	53	1890	57.4	-	-	50	3.5	-0.4
	Encinal Road	Nuestro Road	1610	54.5	-	-	32	2600	56.6	-	-	45	3350	57.7	-	-	53	3.2	1.1
Butte House Roa	Acacia Ave	East Butte Road	2450	57.5	-	-	51	6970	62.0	-	47	102	5260	60.8	-	39	85	3.3	-1.2
	East Butte Road	Township Road	4370	60.1	-	-	76	10360	63.8	-	62	134	12720	64.7	-	72	154	4.6	0.9
	Township Road	Madison Road	4120	59.8	-	-	73	8330	63.0	-	55	118	10350	63.9	-	63	137	4.1	0.9
Catlett Road	Garden Highway	State Route 70/99	90	44.1	-	-	-	1020	54.7	-	-	33	370	50.3	-	-	-	6.1	-4.4
	State Route 70/99	Pleasant Grove Roa	620	52.5	-	-	-	4790	61.4	-	43	93	4810	61.4	-	43	93	8.9	0.0
	Pleasant Grove Roa	Brewer Road	200	47.6	-	-	-	3230	59.7	-	33	72	4010	60.6	-	38	83	13.0	0.9
El Margarita Roa	State Route 20	Franklin Road	2320	53.6	-	-	-	1720	52.3	-	-	-	1720	52.3	-	-	-	-1.3	0.0
Franklin Road	Acacia Avenue	Township Road	1070	54.9	-	-	34	1120	55.1	-	-	35	1970	57.5	-	-	51	2.7	2.5
	Township Road	George Washingtor	2620	58.8	-	-	62	1480	56.5	-	-	-	1600	56.8	-	-	46	-2.0	0.3
	George Washingtor	El Margarita Road	5140	57.1	-	-	48	4310	56.5	-	-	-	4510	56.7	-	-	45	-0.4	0.2
	El Margarita Road	Walton Avenue	8110	59.1	-	-	65	14970	61.9	-	47	100	16420	62.3	-	50	107	3.2	0.4
Garden Highway	Stewart Road	Messick Road	5230	61.8	-	46	99	7010	63.1	-	56	120	9930	64.6	33	70	151	2.8	1.5
	Messick Road	O'Banion Road	4290	60.9	-	40	86	7010	63.1	-	56	120	6970	63.0	-	55	120	2.1	0.0
	O'Banion Road	Tudor Road - SR 99	4280	60.9	-	40	86	16720	66.8	46	99	214	16670	66.8	46	99	214	5.9	0.0
	State Route 99	Catlett Road	520	51.8	-	-	-	1020	54.7	-	-	33	470	51.3	-	-	-	-0.4	-3.4
	Catlett Road	Riego Rd	150	46.4	-	-	-	550	52.0	-	-	-	160	46.6	-	-	-	0.3	-5.4
	Riego Rd	Sacramento County	200	47.6	-	-	-	5780	62.2	-	49	106	5250	61.8	-	46	99	14.2	-0.4
George Washing	State Route 20	Franklin Road	7420	63.3	-	58	125	5090	61.8	-	46	100	4880	61.7	-	45	97	-1.6	-0.2
	Franklin Road	Lincoln Road	4280	60.9	-	40	86	1580	56.8	-	-	46	1640	56.9	-	-	47	-4.0	0.2
	Lincoln Road	Bougue Road	3390	59.9	-	34	74	1180	55.5	-	-	-	1180	55.5	-	-	-	-4.4	0.0
	Bougue Road	Oswald Road	3940	60.6	-	38	82	2810	59.1	-	-	65	4790	61.4	-	43	93	0.8	2.3

			Existing						Old GP						GPU							
			ADT	Ldn at	Distance to Contour				ADT	Ldn at	Distance to Contour				ADT	Ldn at	Distance to Contour				Change	Change
Roadway	From	To	Volume	75 Fee	70 Ldn		65 Ldn	60 Ldn	Volume	75 Fee	70 Ldn		65 Ldn	60 Ldn	Volume	75 Fee	70 Ldn		65 Ldn	60 Ldn	from Exist	from GP
	Oswald Road	Tudor Road - SR 11	3040	59.4	-	-		69	2210	58.0	-	-		56	1740	57.0	-	-		47	-2.4	-1.0
Howsley Road	State Route 70-99	Pleasant Grove Roa	2270	58.2	-	-		57	4980	61.6	-		44	96	4800	61.4	-		43	93	3.3	-0.2
	Pleasant Grove Roa	Brewer Road	1380	56.0	-	-		41	5970	62.4	-		50	108	6160	62.5	-		51	110	6.5	0.1
Humphrey Road	Butte House Rd	South Butte Road	680	52.9	-	-	-		330	49.8	-	-	-		360	50.2	-	-	-		-2.8	0.4
	South Butte Road	State Route 20	1910	57.4	-	-		50	1290	55.7	-	-		39	1330	55.8	-	-		40	-1.6	0.1
	State Route 20	Franklin Road	830	53.8	-	-	-		870	54.0	-	-	-		680	52.9	-	-	-		-0.9	-1.1
Larkin Road	Butte County Line	Live Oak City Limits	2990	59.4	-	-		68	4040	60.7	-		39	83	4030	60.7	-		39	83	1.3	0.0
	Live Oak City Limits	Paseo Ave	1500	56.4	-	-		43	5230	61.8	-		46	99	6850	63.0	-		55	118	6.6	1.2
	Paseo Ave	Clark Road	1500	56.4	-	-		43	5910	62.3	-		50	107	6980	63.0	-		56	120	6.7	0.7
	Clark Road	Encinal Road	1450	56.2	-	-		42	4500	61.1	-		41	89	4890	61.5	-		44	94	5.3	0.4
	Encinal Road	Eager Road	1390	56.0	-	-		41	3130	59.6	-		33	70	4160	60.8	-		39	85	4.8	1.2
Lincoln Road	Clements Road	Township Road	560	52.1	-	-	-		570	52.2	-	-	-		1490	56.3	-	-		43	4.2	4.2
	Township Road	George Washingtor	1040	54.8	-	-		34	2230	58.3	-	-		57	2660	59.0	-	-		65	4.3	0.8
	George Washingtor	Sanborn Road	3673	56.9	-	-		47	3150	56.4	-	-	-		3670	57.1	-	-		48	0.2	0.7
Live Oak Blvd	State Route 99	Yuba City Limits	6620	62.8	-		54	115	7020	63.1	-		56	120	9110	64.2	-		66	143	1.4	1.1
Moroni - McGrat	Tarke Road	Progress Road	1270	55.6	-	-		38	2500	58.6	-	-		60	1480	56.3	-	-		43	0.7	-2.3
Nicolaus Road	State Route 99	State Route 70	1470	56.3	-	-		42	2510	58.6	-	-		61	3510	60.1	-		35	76	3.8	1.5
	State Route 70	Pleasant Grove Roa	1220	55.5	-	-		37	7110	63.1	-		56	121	10620	64.9	34		73	158	9.4	1.7
Oswald Road	Township Road	George Washingtor	590	52.3	-	-	-		4530	61.2	-		42	90	8380	63.8	-		63	135	11.5	2.7
	George Washingtor	Walton Avenue	1360	55.9	-	-		40	4220	60.9	-		40	86	6300	62.6	-		52	112	6.7	1.7
	Walton Avenue	State Route 99	2150	57.9	-	-		55	4520	61.2	-		42	90	5180	61.7	-		46	98	3.8	0.6
	State Route 99	Railroad Avenue	200	47.6	-	-	-		160	46.6	-	-	-		570	52.2	-	-	-		4.5	5.5
Pease Road	Township Road	Tierra Buena Road	810	53.7	-	-	-		470	51.5	-	-	-		520	51.9	-	-	-		-1.8	0.4
	Tierra Buena Road	Live Oak Blvd	1670	53.5	-	-	-		960	51.3	-	-	-		970	51.3	-	-	-		-2.2	0.0
Pennington Roac	North Butte Road	Township Road	1660	56.8	-	-		46	2350	58.3	-	-		58	1680	56.9	-	-		46	0.1	-1.5
	Township Road	Live Oak City Limits	1790	57.1	-	-		48	2700	59.1	-	-		65	2550	58.8	-	-		63	1.7	-0.2
Pleasant Grove R	Yuba County Line	Nicolaus Ave	3140	59.6	-		33	70	11270	65.1		35	76	165	10180	64.7		33	71	154	5.1	-0.4
	Nicolaus Ave	Catlett Road	3000	59.4	-	-		68	8010	63.6	-		61	131	7470	63.3	-		58	125	4.0	-0.3
	Catlett Road	Howsley Road	2330	58.3	-	-		58	5750	62.2	-		49	105	5270	61.8	-		46	99	3.5	-0.4
	Howsley Road	Sankey Road	1210	55.4	-	-		37	2730	59.0	-	-		64	1420	56.1	-	-		41	0.7	-2.8
	Sankey Road	Riego Road	1750	57.0	-	-		48	11340	65.2		36	77	165	10760	64.9		34	74	160	7.9	-0.2
	Riego Road	Sacramento County	1180	55.3	-	-		37	19010	67.4		50	108	233	19000	67.4		50	108	233	12.1	0.0
Power Line Road	Riego Road	Sacramento County	220	48.0	-	-	-		12210	65.5		37	81	174	11810	65.3		37	79	170	17.3	-0.1
Progress Road	McClatchy Road	Acme Road	1010	54.6	-	-		33	2240	58.1	-	-		56	1220	55.5	-	-		37	0.8	-2.6
	Acme Road	Reclamation Road	1250	55.6	-	-		38	2380	58.4	-	-		58	920	54.2	-	-	-		-1.3	-4.1
Railroad Avenue	Bogue Road	Stewart Road	2250	56.1	-	-		41	2350	56.3	-	-		42	4970	59.5	-	-		70	3.4	3.3
	Stewart Road	Berry Road	1320	53.8	-	-	-		1210	53.4	-	-	-		4120	58.7	-	-		61	4.9	5.3
	Berry Road	Oswald Road	1050	52.7	-	-	-		860	51.8	-	-	-		1420	54.0	-	-	-		1.3	2.2
Reclamation Roa	Progress Road	Pelger Road	1060	54.9	-	-		34	2190	58.0	-	-		55	730	53.2	-	-	-		-1.6	-4.8
	Pelger Road	State Route 113	1890	57.4	-	-		50	6070	62.4	-		51	109	2710	58.9	-	-		64	1.6	-3.5
Riego Road	Garden Highway	Powerline Road	650	52.7	-	-	-		6140	62.7	-		52	113	5630	62.3	-		49	106	9.5	-0.4

			Existing					Old GP					GPU						
			ADT	Ldn at	Distance to Contour			ADT	Ldn at	Distance to Contour			ADT	Ldn at	Distance to Contour			Change	Change
Roadway	From	To	Volume	75 Fee	70 Ldn	65 Ldn	60 Ldn	Volume	75 Fee	70 Ldn	65 Ldn	60 Ldn	Volume	75 Fee	70 Ldn	65 Ldn	60 Ldn	from Exist	from GP
	Powerline Road	State Route 70-99	650	52.7	-	-	-	77910	74.7	155	334	719	77280	74.7	154	332	715	22.0	0.0
	State Route 70-99	Pacific Avenue	9900	64.6	33	70	151	92500	75.5	174	374	806	91400	75.4	172	371	800	10.9	-0.1
	Pacific Avenue	Pleasant Grove Roa	9900	64.6	33	70	151	52170	72.3	107	231	497	52520	72.4	108	232	500	7.8	0.0
Rio Oso Road	State Route 70	Swanson Road	1060	54.9	-	-	34	5680	62.1	-	48	104	5270	61.8	-	46	99	7.0	-0.3
Riviera Road	Township Road	State Route 99	450	51.1	-	-	-	1380	56.0	-	-	41	1110	55.1	-	-	35	3.9	-0.9
	State Route 99	Larkin Road	460	51.2	-	-	-	1290	55.7	-	-	39	1260	55.6	-	-	38	4.4	-0.1
Sankey Road	State Route 70-99	Pacific Avenue	1180	55.3	-	-	37	24890	68.7	62	133	287	24750	68.7	62	133	286	13.4	0.0
	Pacific Avenue	Pleasant Grove Roa	1080	54.9	-	-	34	32800	69.9	74	160	345	33160	70.0	75	161	347	15.0	0.0
	Pleasant Grove Roa	Locust Road	670	52.9	-	-	-	38400	70.6	82	178	383	39380	70.7	84	181	389	17.9	0.1
Stewart Road	Walton Avenue	State Route 99	400	46.0	-	-	-	180	42.5	-	-	-	1150	50.6	-	-	-	4.6	8.1
	State Route 99	Railroad Avenue	890	49.5	-	-	-	300	44.7	-	-	-	660	48.2	-	-	-	-1.3	3.4
	Railroad Avenue	Garden Highway	720	48.5	-	-	-	90	39.5	-	-	-	230	43.6	-	-	-	-5.0	4.1
Swanson Road	Rio Oso Road	Bear River Road	980	53.5	-	-	-	5600	61.1	-	41	88	5190	60.7	-	39	84	7.2	-0.3
Tarke Road	State Route 20	Moroni Road	890	54.1	-	-	-	3250	59.7	-	33	72	1660	56.8	-	-	46	2.7	-2.9
Tierra Buena Roa	Eager Road	Pease Ave	2,180	58.0	-	-	55	4350	61.0	-	41	87	5480	62.0	-	47	102	4.0	1.0
	Pease Ave	Butte House Road	2,360	58.3	-	-	58	5610	62.1	-	48	103	6220	62.5	-	51	111	4.2	0.4
Township Road	Butte County Line	Pennington Road	1,730	57.0	-	-	47	2660	58.9	-	-	63	2390	58.4	-	-	59	1.4	-0.5
	Pennington Road	Paseo Ave	1,920	57.4	-	-	51	3120	59.5	-	32	70	3320	59.8	-	34	73	2.4	0.3
	Nuestro Road	Pease Ave	1,540	56.5	-	-	44	2430	58.5	-	-	59	3450	60.0	-	35	75	3.5	1.5
	Pease Ave	Butte House Road	2,349	58.3	-	-	58	2320	58.3	-	-	57	3500	60.0	-	35	76	1.7	1.8
	Butte House Rd	State Route 20	2,470	56.5	-	-	44	4340	58.9	-	-	64	5620	60.0	-	-	75	3.6	1.1
	State Route 20	Franklin Road	3,330	57.7	-	-	53	4090	58.6	-	-	60	4930	59.4	-	-	69	1.7	0.8
	Franklin Road	Lincoln Road	1,530	54.3	-	-	-	3400	57.8	-	-	53	4560	59.1	-	-	65	4.7	1.3
	Lincoln Road	Bogue Road	1,906	57.4	-	-	50	4380	61.0	-	41	88	6440	62.7	-	53	113	5.3	1.7
	Bogue Road	Oswald Road	750	53.4	-	-	-	3230	59.7	-	33	72	5510	62.0	-	47	102	8.7	2.3
	Oswald Road	O'Banion Road	380	50.4	-	-	-	920	54.2	-	-	-	1360	55.9	-	-	40	5.5	1.7
Walton Ave	Bogue Road	Reed Road	2690	55.6	-	-	38	3180	56.3	-	-	43	5950	59.0	-	-	65	3.4	2.7
	Reed Road	Oswald Road	1540	53.2	-	-	-	2030	54.4	-	-	-	3450	56.7	-	-	45	3.5	2.3
West Catlett Roa	Garden Highway	State Route 70-99	300	49.4	-	-	-	1230	55.5	-	-	38	580	52.2	-	-	-	2.9	-3.3

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	CNEL at 100 Feet	Distance from Centerline of Roadway to Contour: 70 CNEL	65 CNEL	60 CNEL	55 CNEL
Analysis Condition												
Auburn Blvd., Howe/Fulton	4	0	6,700	40	0.5	1.8%	0.7%	58.4	-	-	78	168
Auburn Blvd., Watt/Winding Way	4	0	28,300	30	0.5	1.8%	0.7%	62.2	-	65	141	303
Auburn Blvd., El Camino/Marconi	2	0	11,900	40	0.5	1.8%	0.7%	60.8	-	52	112	242
Watt Ave., I-80/US-50	6	0	121,300	45	0.5	1.8%	0.7%	72.4	144	310	667	1,438
Watt Ave., Elkhorn/I-80	6	0	86,800	45	0.5	1.8%	0.7%	70.9	115	248	534	1,150
Fruitridge Rd., Land Park/Freeport	4	0	16,900	50	0.5	1.8%	0.7%	64.7	45	96	207	445
Fruitridge Rd., Freeport/Franklin	4	0	27,900	50	0.5	1.8%	0.7%	66.9	62	134	289	622
Fruitridge Rd., Franklin/SR-99	4	0	32,800	50	0.5	1.8%	0.7%	67.6	69	149	322	693
Fruitridge Rd., SR-99/Martin Luther King	4	0	34,700	50	0.5	1.8%	0.7%	67.9	72	155	334	719
Fruitridge Rd., Martin Luther King/Stockton	4	0	35,000	50	0.5	1.8%	0.7%	67.9	72	156	336	724
Fruitridge Rd., Stockton/Wallace	4	0	26,100	50	0.5	1.8%	0.7%	66.6	59	128	276	595
Fruitridge Rd., Wallace/Florin-Perkins	4	0	30,200	50	0.5	1.8%	0.7%	67.3	66	141	304	656
Fruitridge Rd., Florin-Perkins/Elk Grove-Florin	4	0	22,800	50	0.5	1.8%	0.7%	66.0	54	117	252	544
Franklin Blvd., Broadway/Sutterville	4	0	12,600	45	0.5	1.8%	0.7%	62.3	-	66	143	308
Franklin Blvd., Sutterville/Fruitridge	4	0	23,500	45	0.5	1.8%	0.7%	65.0	47	101	217	467
Franklin Blvd., Fruitridge/Martin Luther King	4	0	19,600	45	0.5	1.8%	0.7%	64.2	-	89	192	414
Franklin Blvd., East/Valley High	4	0	NV	45	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Franklin Blvd., Valley Hi/City Limits	4	0	24,300	45	0.5	1.8%	0.7%	65.2	48	103	222	477
Freeport Blvd., Broadway/Fruitridge	4	0	31,200	45	0.5	1.8%	0.7%	66.3	56	121	262	564
Freeport Blvd., Pocket/South	4	0	7,600	45	0.5	1.8%	0.7%	60.1	-	47	102	220
Freeport Blvd., Fruitridge/Pocket	4	0	19,700	45	0.5	1.8%	0.7%	64.3	-	89	193	415
Stockton Blvd., US-50/2nd	4	0	12,800	45	0.5	1.8%	0.7%	62.4	-	67	144	311
Stockton Blvd., 2nd/Fruitridge	4	0	21,500	45	0.5	1.8%	0.7%	64.7	-	95	204	440
Stockton Blvd., Fruitridge/65th	4	0	24,300	45	0.5	1.8%	0.7%	65.2	48	103	222	477
Stockton Blvd., 65th/SR-99	4	0	36,800	45	0.5	1.8%	0.7%	67.0	63	136	292	629
Florin Rd., Franklin/SR-99	4	0	56,100	45	0.5	1.8%	0.7%	68.8	83	180	387	834
Florin Rd., SR-99/65th	4	0	80,200	45	0.5	1.8%	0.7%	70.4	106	228	491	1,058
Florin Rd., 65th/Stockton	4	0	51,200	45	0.5	1.8%	0.7%	68.4	78	169	364	784
Florin Rd., Stockton/Power Inn	4	0	41,200	45	0.5	1.8%	0.7%	67.5	68	146	315	679
Florin Rd., Power Inn/Bradshaw	4	0	27,600	45	0.5	1.8%	0.7%	65.7	52	112	241	520
I-5., Yolo County Line/I-80	6	10	284,000	65	0.5	1.8%	0.7%	80.2	479	1,032	2,224	4,792
I-5., I-80/Garden Hwy.	8	10	297,000	65	0.5	1.8%	0.7%	80.8	524	1,129	2,432	5,240
I-5., Garden Hwy/US-50	8	10	NV	65	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
I-5., US-50/Sutterville	8	10	209,000	65	0.5	1.8%	0.7%	79.3	415	893	1,924	4,146
I-5., Sutterville/Florin	8	10	174,000	65	0.5	1.8%	0.7%	78.5	367	790	1,703	3,669
I-5., Florin/Laguna	8	10	135,000	65	0.5	1.8%	0.7%	77.4	310	667	1,438	3,098
I-80., US-50/I-5	6	10	143,000	65	0.5	1.8%	0.7%	77.2	303	653	1,408	3,033
I-80., I-5/Marysville	6	10	186,000	65	0.5	1.8%	0.7%	78.4	361	779	1,677	3,614
I-80., Marysville/Business 80 Split	6	10	181,000	65	0.5	1.8%	0.7%	78.3	355	765	1,647	3,549
Business 80., I-80 Split/Howe	6	10	154,000	55	0.5	1.8%	0.7%	75.7	239	516	1,111	2,393
Business 80., Howe/SR 160	6	10	213,000	55	0.5	1.8%	0.7%	77.1	297	640	1,379	2,971
Business 80., SR 160/US 50	6	10	181,000	55	0.5	1.8%	0.7%	76.4	267	574	1,237	2,665
Business 80., US-50/I-5	6	10	NV	55	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
State Route 160., Business 80/Richards	4	10	68,600	65	0.5	1.8%	0.7%	73.8	179	385	830	1,789
US-50., Bradshaw/Power Inn	9	10	233,000	65	0.5	1.8%	0.7%	80.0	464	1,000	2,154	4,640

Analysis Condition		Median	ADT	Design Speed	Alpha	Vehicle Mix: Medium	Vehicle Mix: Heavy	CNEL at	Distance from Centerline of Roadway: Distance to Contour			
Roadway, Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
US-50., Power Inn/SR-99	12	10	308,000	65	0.5	1.8%	0.7%	82.4	673	1,450	3,125	6,732
SR-99., US-50/Fruitridge	6	10	267,000	65	0.5	1.8%	0.7%	79.9	460	991	2,135	4,599
SR-99., Fruitridge/Florin	6	10	218,000	65	0.5	1.8%	0.7%	79.1	402	866	1,865	4,017
SR-99., Florin/Bond	6	10	153,000	65	0.5	1.8%	0.7%	77.5	317	684	1,473	3,173
El Centro Rd., I-5/San Juan	4	0	12,800	50	0.5	1.8%	0.7%	63.5	-	80	172	370
El Centro Rd., San Juan/I-80	2	0	20,900	50	0.5	1.8%	0.7%	65.6	51	109	235	506
Elkhorn Blvd., I-5/E. Levee	6	0	56,000	50	0.5	1.8%	0.7%	70.1	102	220	474	1,021
Elkhorn Blvd., E. Levee Rd/Dry Creek	6	0	31,100	50	0.5	1.8%	0.7%	68.4	79	169	365	786
Elkhorn Blvd., Dry Creek/Watt Ave	6	0	31,400	50	0.5	1.8%	0.7%	68.4	79	169	365	786
Del Paso Rd., Power Line/I-5	2	0	14,300	35	0.5	1.8%	0.7%	60.2	-	48	103	223
Del Paso Rd., I-5/Truxel	6	0	58,000	50	0.5	1.8%	0.7%	70.3	104	225	485	1,045
Del Paso Rd., Truxel/Northgate	6	0	41,400	50	0.5	1.8%	0.7%	68.8	83	180	387	834
San Juan., River/I-80	4	0	7,800	50	0.5	1.8%	0.7%	61.4	-	57	123	266
Sorento Rd., N. of Del Paso	6	0	NV	35	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Northgate Blvd., Del Paso/North Market	4	0	39,800	35	0.5	1.8%	0.7%	64.8	45	96	208	447
Northgate Blvd., North Market/I-80	4	0	49,900	35	0.5	1.8%	0.7%	65.7	52	112	241	520
Natomas Blvd., Elkhorn/Del Paso	4	0	44,900	30	0.5	1.8%	0.7%	64.2	-	89	191	412
Truxel Rd., Gateway Park/I-80	8	0	97,500	35	0.5	1.8%	0.7%	69.2	88	190	409	881
Truxel Rd., Gateway Park/Del Paso	8	0	26,400	35	0.5	1.8%	0.7%	63.5	-	79	171	369
North Market Blvd., Northgate/Truxel	4	0	19,900	55	0.5	1.8%	0.7%	66.5	58	125	270	582
Arena Blvd., I-5/Truxel	6	0	27,500	45	0.5	1.8%	0.7%	65.9	-	115	248	535
Arena Blvd., El Centro/I-5	6	0	34,600	45	0.5	1.8%	0.7%	66.9	62	134	289	623
Commerce Parkwy., Elkhorn/Club Center	6	0	22,800	55	0.5	1.8%	0.7%	67.3	66	142	305	658
Commerce Parkwy., Club Center/Del Paso	6	0	53,100	55	0.5	1.8%	0.7%	70.9	116	249	536	1,156
Commerce Parkwy., Del Paso/San Juan	4	0	28,100	55	0.5	1.8%	0.7%	68.0	73	158	340	733
Del Paso Blvd., SR-160/Grove	4	0	16,900	35	0.5	1.8%	0.7%	61.0	-	54	117	253
Del Paso Blvd., Grove/Marysville	4	0	NV	35	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Del Paso Blvd., Marysville/South Ave.	2	0	NV	35	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Rio Linda Blvd., City Limits/I-80	4	0	12,200	30	0.5	1.8%	0.7%	58.6	-	-	80	173
Rio Linda Blvd., I-80/Arcade	4	0	14,600	30	0.5	1.8%	0.7%	59.3	-	-	90	195
Rio Linda Blvd., Arcade/El Camino	4	0	18,200	30	0.5	1.8%	0.7%	60.3	-	49	105	226
Marysville Blvd., Rio Linda/Bell	2	0	6,200	35	0.5	1.8%	0.7%	56.6	-	-	59	128
Marysville Blvd., North/Grand	4	0	29,800	30	0.5	1.8%	0.7%	62.4	-	68	145	313
Marysville Blvd., Grand/Del Paso	4	0	13,300	30	0.5	1.8%	0.7%	58.9	-	-	85	183
Norwood Ave., Main/I-80	4	0	30,000	40	0.5	1.8%	0.7%	64.9	46	98	211	455
Norwood Ave., I-80/Leitch	4	0	15,300	40	0.5	1.8%	0.7%	61.9	-	63	135	291
El Camino Ave., Rio Linda/Norwood	4	0	22,300	45	0.5	1.8%	0.7%	64.8	45	97	209	451
El Camino Ave., UPRR/B-80	4	0	31,100	45	0.5	1.8%	0.7%	66.3	56	121	261	563
Arden Way., Del Paso/Royal Oaks	6	0	32,900	40	0.5	1.8%	0.7%	65.5	-	108	232	499
Arden Way., Royal Oaks/B-80	4	0	42,000	40	0.5	1.8%	0.7%	66.3	57	123	264	570
Grand Ave., Norwood/Marysville	2	0	7,000	35	0.5	1.8%	0.7%	57.1	-	-	64	138
Silver Eagle Rd., Northgate/Norwood	2	0	17,000	30	0.5	1.8%	0.7%	59.9	-	46	99	212
Main Ave., Northgate/Norwood	6	0	24,700	30	0.5	1.8%	0.7%	61.8	-	61	132	285
Main Ave., Norwood/Rio Linda	6	0	23,000	30	0.5	1.8%	0.7%	61.5	-	59	126	272
Main Ave., Dry Creek/McLellan Boundary	6	0	2,200	30	0.5	1.8%	0.7%	51.3	-	-	-	57
Arcade Blvd., Rio Linda/Roseville	4	0	23,700	55	0.5	1.8%	0.7%	67.2	65	141	304	654
Raley Blvd., City Limits/Bell	6	0	29,600	40	0.5	1.8%	0.7%	65.0	-	100	216	465

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix Medium Trucks	 Heavy Trucks	CNEL at 100 Feet	Distance from Centerline of Roadway Distance to Contour 70 CNEL	 65 CNEL	 60 CNEL	 55 CNEL
Bell Ave., Marysville/Raley	4	0	5,100	40	0.5	1.8%	0.7%	57.2	-	-	65	140
Roseville Rd., Marconi/I-80	4	0	33,300	30	0.5	1.8%	0.7%	62.9	-	73	157	338
Winters St., I-80/Bell	4	0	9,600	40	0.5	1.8%	0.7%	59.9	-	46	99	213
Royal Oaks Dr., SR 160/Arden	2	0	16,600	30	0.5	1.8%	0.7%	59.8	-	45	97	209
Dry Creek Rd., Bell/Marysville	2	0	2,700	50	0.5	1.8%	0.7%	56.7	-	-	60	129
Arden Garden Connector	4	0	29,500	50	0.5	1.8%	0.7%	67.1	65	139	300	646
San Juan Rd., Truxel/Northgate	4	0	24,800	50	0.5	1.8%	0.7%	66.4	58	124	267	575
W. El Camino Ave., I-80/I-5	6	0	16,700	30	0.5	1.8%	0.7%	60.1	-	-	102	220
W. El Camino Ave., I-5/Truxel	6	0	34,300	30	0.5	1.8%	0.7%	63.3	-	76	165	355
W. El Camino Ave., Truxel/Northgate	4	0	23,300	30	0.5	1.8%	0.7%	61.4	-	57	123	266
W. El Camino., Northgate/UPRR	2	0	23,600	30	0.5	1.8%	0.7%	61.3	-	57	123	264
Garden Hwy., I-80/Gateway Oaks	2	0	1,600	50	0.5	1.8%	0.7%	54.4	-	-	42	91
Garden Hwy., Gateway Oaks/I-5	4	0	16,900	50	0.5	1.8%	0.7%	64.7	45	96	207	445
Northgate Blvd., I-80/W. El Camino	4	0	43,500	25	0.5	1.8%	0.7%	62.5	-	68	147	317
Northgate Blvd., W. El Camino/SR-160	4	0	32,600	25	0.5	1.8%	0.7%	61.3	-	56	122	262
W. Silver Eagle Rd.	2	0	NV	30	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Truxel Rd., Garden Hwy/Woodland Oaks	4	0	30,100	35	0.5	1.8%	0.7%	63.5	-	80	172	371
Truxel Rd., Woodland Oaks/San Juan	4	0	29,000	35	0.5	1.8%	0.7%	63.4	-	78	168	362
Truxel Rd., I-80/San Juan	6	0	39,500	30	0.5	1.8%	0.7%	63.9	-	84	181	390
I Street., 5th/21st	4	0	38,000	35	0.5	1.8%	0.7%	68.4	79	169	365	786
I Street., 21st/30th	2	0	14,100	35	0.5	1.8%	0.7%	60.2	-	48	102	221
L Street., 5th/16th	3	0	23,400	40	0.5	1.8%	0.7%	63.7	38	82	177	382
L Street., 16th/30th	2	0	9,800	50	0.5	1.8%	0.7%	62.3	-	66	142	305
P Street., 3rd/30th	2	0	10,900	30	0.5	1.8%	0.7%	58.0	-	34	73	158
J Street., 5th/16th	3	0	23,500	30	0.5	1.8%	0.7%	61.4	-	57	123	265
J Street., 16th/30th	3	0	22,700	25	0.5	1.8%	0.7%	59.6	-	44	95	204
J Street., 30th Street/H Street	3	0	16,400	30	0.5	1.8%	0.7%	59.8	-	45	97	209
Q Street, 3rd/16th	4	0	18,600	35	0.5	1.8%	0.7%	61.5	-	58	125	269
7th Street	3	0	10,600	30	0.5	1.8%	0.7%	57.9	-	-	72	156
12th Street., N. B Street/L Street	3	0	30,200	30	0.5	1.8%	0.7%	62.4	-	68	145	313
12th Street., N Street/W Street	2	0	600	25	0.5	1.8%	0.7%	43.8	-	-	-	-
15th Street., L Street/Broadway	3	0	17,700	30	0.5	1.8%	0.7%	60.1	-	47	102	219
15th Street., L Street/J Street	3	0	20,900	30	0.5	1.8%	0.7%	60.8	-	53	114	245
16th Street., E Street/Broadway	3	0	30,700	30	0.5	1.8%	0.7%	62.5	-	68	147	317
29th Street	3	0	28,900	30	0.5	1.8%	0.7%	62.2	-	66	141	304
30th Street	3	0	19,200	30	0.5	1.8%	0.7%	60.5	-	50	108	232
Alhambra Blvd.	2	0	14,300	30	0.5	1.8%	0.7%	59.2	-	41	88	189
Broadway., 3rd/Riverside	4	0	21,600	30	0.5	1.8%	0.7%	61.0	-	54	117	253
Broadway., Riverside/Franklin	4	0	34,500	30	0.5	1.8%	0.7%	63.1	-	74	160	346
Richards Blvd.	8	0	72,600	35	0.5	1.8%	0.7%	67.9	72	156	336	724
Exposition Blvd., SR-160/B-80	4	0	32,900	40	0.5	1.8%	0.7%	65.3	48	104	225	484
Exposition Blvd., B-80/Arden	6	0	46,700	40	0.5	1.8%	0.7%	67.0	63	136	293	630
Arden Way., B-80/Howe	4	0	74,900	40	0.5	1.8%	0.7%	68.8	84	180	389	838
Arden Way., Howe/Watt	4	0	32,800	40	0.5	1.8%	0.7%	65.3	48	104	224	483
Arden Way., Watt/Eastern	4	0	21,600	40	0.5	1.8%	0.7%	63.4	-	79	170	366
El Camino Ave., B-80/Howe	4	0	35,800	45	0.5	1.8%	0.7%	66.9	62	133	287	618
El Camino Ave., Howe/Watt	4	0	29,900	45	0.5	1.8%	0.7%	66.1	55	118	254	548

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	CNEL at 100 Feet	Distance from Centerline of Roadway: Distance to Contour: 70 CNEL	65 CNEL	60 CNEL	55 CNEL
El Camino Ave., Watt/Walnut	4	0	22,000	45	0.5	1.8%	0.7%	64.8	45	96	207	447
El Camino Ave., Walnut/Fair Oaks	4	0	NV	45	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Marconi Ave., Howe Fair Oaks	4	0	29,000	40	0.5	1.8%	0.7%	64.7	44	96	207	445
Marconi Ave., Auburn/Howe	4	0	22,400	40	0.5	1.8%	0.7%	63.6	-	81	174	375
American River Dr., Howe/Watt	2	0	12,500	35	0.5	1.8%	0.7%	59.6	-	44	94	204
Heritage Lane	4	0	21,300	35	0.5	1.8%	0.7%	62.0	-	63	137	295
Howe Ave., Fair Oaks/US-50	4	0	66,500	50	0.5	1.8%	0.7%	70.7	111	239	515	1,110
Howe Ave., Fair Oaks/Hurley	6	0	NV	50	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Howe Ave., Arden/Alta Arden	6	0	36,700	50	0.5	1.8%	0.7%	68.3	77	166	357	770
Howe Ave., El Camino/Marconi	2	0	36,000	50	0.5	1.8%	0.7%	67.9	73	157	337	726
Howe Ave., US-50/Folsom	6	0	56,400	50	0.5	1.8%	0.7%	70.2	103	221	476	1,026
Fulton Ave., Arden/El Camino	4	0	31,800	40	0.5	1.8%	0.7%	65.1	47	102	220	473
Alta Arden Ex., Howe/Fulton	4	0	19,000	40	0.5	1.8%	0.7%	62.9	-	72	156	336
Fair Oaks Blvd., Howe/Munroe	6	0	39,000	45	0.5	1.8%	0.7%	67.4	67	145	313	675
Fair Oaks Blvd., Munroe/Watt	4	0	39,700	45	0.5	1.8%	0.7%	67.3	66	143	307	662
Fair Oaks Blvd., Watt/Eastern	4	0	43,100	45	0.5	1.8%	0.7%	67.7	70	151	325	699
Fair Oaks Blvd., Eastern/Manzanita	4	0	NV	45	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Elvas Ave., C Street/H Street	2	0	8,300	30	0.5	1.8%	0.7%	56.8	-	-	61	132
Elvas Ave., H Street/Folsom	4	0	16,700	50	0.5	1.8%	0.7%	64.7	44	95	205	442
H Street., Alhambra/57th Street	2	0	16,900	30	0.5	1.8%	0.7%	59.9	-	46	98	212
H Street., 57th/Carlson	4	0	17,100	25	0.5	1.8%	0.7%	58.5	-	-	79	170
Folsom Blvd., Alhambra/Folsom	4	0	NV	40	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Folsom Blvd., Hornet/Watt	4	0	56,900	40	0.5	1.8%	0.7%	67.7	70	150	324	697
Stockton Blvd., Alhambra/US-50	4	0	25,700	45	0.5	1.8%	0.7%	65.4	50	107	230	495
Jackson Rd., Folsom Blvd/Florin-Perkins	4	0	30,900	30	0.5	1.8%	0.7%	62.6	-	69	149	321
Hornet Dr.	4	0	28,900	45	0.5	1.8%	0.7%	65.9	54	115	249	536
La Riviera Dr.	2	0	21,000	35	0.5	1.8%	0.7%	61.9	-	62	134	288
Carlson Dr.	2	0	11,900	30	0.5	1.8%	0.7%	58.4	-	36	78	168
College Town Dr.	4	0	25,800	35	0.5	1.8%	0.7%	62.9	-	72	155	335
39th Street, J Street/Folsom Blvd	2	0	5,100	55	0.5	1.8%	0.7%	60.5	-	50	107	232
59th Street, US 50/Folsom Blvd	2	0	8,300	55	0.5	1.8%	0.7%	62.6	32	69	149	320
C Street., Alhambra/Elvas	2	0	5,000	35	0.5	1.8%	0.7%	55.7	-	-	51	111
Sutterville Rd., Riverside/Freeport	2	0	13,500	45	0.5	1.8%	0.7%	62.5	-	68	148	318
Sutterville Rd., Freeport/Franklin	4	0	27,600	45	0.5	1.8%	0.7%	65.7	52	112	241	520
Seams Ave.	4	0	17,100	30	0.5	1.8%	0.7%	60.0	-	47	100	216
Riverside Blvd., Broadway/Sutterville	4	0	14,200	30	0.5	1.8%	0.7%	59.2	-	-	89	191
Riverside Blvd., Sutterville/Seamas	2	0	6,900	30	0.5	1.8%	0.7%	56.0	-	-	54	116
Riverside Blvd., Greenhaven/Pocket	2	0	10,200	30	0.5	1.8%	0.7%	57.7	-	33	70	151
Land Park Dr., Broadway/Sutterville	4	0	14,800	35	0.5	1.8%	0.7%	60.5	-	50	107	231
South Land Park Dr., Sutterville/35th	2	0	5,500	40	0.5	1.8%	0.7%	57.4	-	-	67	145
South Land Park Dr., 35th/Windbridge	2	0	5,100	40	0.5	1.8%	0.7%	57.1	-	-	64	138
24th Street., Sutterville/Fruitridge	4	0	14,000	40	0.5	1.8%	0.7%	61.6	-	59	127	274
24th Street., Fruitridge/Florin	4	0	21,500	40	0.5	1.8%	0.7%	63.4	-	79	169	364
24th Street., Florin/Meadowview	4	0	20,700	40	0.5	1.8%	0.7%	63.3	-	77	165	355
Broadway., Alhambra/Stockton	4	0	17,000	35	0.5	1.8%	0.7%	61.1	-	55	118	254
Broadway., Stockton/65th	2	0	21,000	30	0.5	1.8%	0.7%	60.8	-	53	114	245
65th Street., Elvas/Fruitridge	4	0	38,700	45	0.5	1.8%	0.7%	67.2	65	140	302	651

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix Medium Trucks	 Heavy Trucks	CNEL at 100 Feet	Distance from Centerline of Roadway Distance to Contour 70 CNEL	 65 CNEL	 60 CNEL	 55 CNEL
Power Inn Rd., Jackson/Fruitridge	6	0	40,500	45	0.5	1.8%	0.7%	67.6	69	149	321	692
Power Inn Rd., Fruitridge/53rd	6	0	50,800	45	0.5	1.8%	0.7%	68.6	80	173	374	805
Power Inn Rd., 53rd/Elsie	6	0	37,500	45	0.5	1.8%	0.7%	67.3	66	142	305	657
12th Ave., SR-99/65th Street	4	0	19,300	35	0.5	1.8%	0.7%	61.6	-	59	128	276
14th Ave., 65th/Power Inn	4	0	19,700	40	0.5	1.8%	0.7%	63.0	-	74	160	344
Florin Perkins Rd., Keifer/Fruitridge	4	0	24,800	45	0.5	1.8%	0.7%	65.3	48	104	225	484
Florin Perkins Rd., Fruitridge/Elder Creek	4	0	39,000	45	0.5	1.8%	0.7%	67.2	65	141	304	654
Florin Perkins Rd., Elder Creek/Gerber	4	0	29,300	45	0.5	1.8%	0.7%	66.0	54	116	251	541
MLK Blvd., Broadway/Fruitridge	2	0	10,700	30	0.5	1.8%	0.7%	57.9	-	34	72	156
T Street., Alhambra/64th	2	0	3,400	40	0.5	1.8%	0.7%	55.3	-	-	49	105
33rd Street., US-50/16th Street	2	0	NV	55	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Raley Blvd., Bell/Marysville	6	0	29,600	40	0.5	1.8%	0.7%	65.0	-	100	216	465
South Watt Ave., SR-50/Fruitridge	6	0	72,800	45	0.5	1.8%	0.7%	70.1	102	220	475	1,023
Florin Rd., Riverside/Havenside	4	0	9,200	45	0.5	1.8%	0.7%	61.0	-	54	116	250
Florin Rd., Havenside/I-5	4	0	42,900	45	0.5	1.8%	0.7%	67.7	70	150	324	697
Florin Rd., I-5/Franklin	4	0	48,900	45	0.5	1.8%	0.7%	68.2	76	164	353	761
Pocket Rd., Riverside/Freeport	4	0	13,400	35	0.5	1.8%	0.7%	60.0	-	47	100	216
43rd Ave.	2	0	7,100	40	0.5	1.8%	0.7%	58.5	-	37	80	172
Gloria Drive.	2	0	4,700	45	0.5	1.8%	0.7%	58.0	-	34	73	157
Greenhaven Drive	2	0	7,700	35	0.5	1.8%	0.7%	57.5	-	-	68	147
Meadowview Rd.	4	0	35,200	30	0.5	1.8%	0.7%	63.2	-	75	163	350
Blair Ave.	2	0	8,900	35	0.5	1.8%	0.7%	58.2	-	35	75	162
65th Expressway., Fruitridge/Elder Creek	4	0	NV	45	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
65th Expressway., Elder Creek/53rd	4	0	20,300	45	0.5	1.8%	0.7%	64.4	-	91	197	423
65th Expressway., 53rd/Florin	4	0	19,300	45	0.5	1.8%	0.7%	64.2	-	88	190	409
Elk Grove-Florin., Fruitridge/Elder Creek	6	0	NV	40	0.5	1.8%	0.7%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Elk Grove-Florin., Elder Creek/Sheldon	6	0	36,800	40	0.5	1.8%	0.7%	66.0	-	116	250	538
Elder Creek Rd., Stockton/Elk Grove-Florin	4	0	25,600	50	0.5	1.8%	0.7%	66.5	59	127	273	587
Elder Creek Rd., Elk Grove Florin/Bradshaw	4	0	31,800	50	0.5	1.8%	0.7%	67.5	68	146	315	679
Mack Rd., Meadowview/Franklin	4	0	36,200	40	0.5	1.8%	0.7%	65.7	52	111	239	516
Mack Rd., Franklin/Center Parkway	4	0	46,300	40	0.5	1.8%	0.7%	66.8	61	131	282	608
Mack Rd., Center Parkway/Stockton	4	0	45,800	40	0.5	1.8%	0.7%	66.7	60	130	280	603
Center Parkway., Tangerine/Mack	2	0	8,500	40	0.5	1.8%	0.7%	59.3	-	42	90	193
Center Parkway., Mack/Calvine	4	0	11,100	40	0.5	1.8%	0.7%	60.6	-	51	109	235
Valley Hi Dr., Mack/Center	6	0	26,100	35	0.5	1.8%	0.7%	63.1	-	75	162	348
Valley Hi Dr., Center/Franklin	2	0	7,500	35	0.5	1.8%	0.7%	57.4	-	-	67	145
Bruceville Rd., Mack/City Limits	6	0	14,100	40	0.5	1.8%	0.7%	61.8	-	61	132	284
Bruceville Rd., City Limits/Elk Grove	6	0	42,300	40	0.5	1.8%	0.7%	66.6	59	127	274	590
47th Ave., Franklin/SR-99	6	0	27,900	40	0.5	1.8%	0.7%	64.8	-	96	208	447
47th Ave., SR-99/Stockton	6	0	42,100	40	0.5	1.8%	0.7%	66.5	59	127	273	588