CEQA GHG Guidance
Project Scope Subcommittee

Characterization of Greenhouse Gas Emissions

February 10, 2009

The District has actively sought input from the ad hoc committee and the following document is still under development. The District is still receiving comments from the committee, which will be considered before finalizing this draft document.

Ad Hoc Committee Members:

Daniel Barber, J.P Cativiela, Dennis J. Champion, Casey Creamer, Tin Cheung, Dawn S. Chianese, Kevin Clutter, Jerry Frost, Wendy Garcia, Sarah Jackson, Julia Lester, Arnaud Marjollet, Mark Montelongo, Elena Nuno, Dennis Roberts, Patia Siong, Dennis Tristao, Tom Umenhofer, and Nicole Vermilion.

See appendix A

Introduction

During the Greenhouse Gas (GHG) CEQA Guidance Technical Workgroup meeting an ad hoc committee was formed to evaluate GHG emissions resulting from one industrial and one non-industrial project. Key objectives were to identify and quantify potential direct sources of GHG emissions, to the extend feasible, identify and quantify potential indirect GHG emissions, and to report back to the Technical Workgroup, providing guidance/recommendations regarding the scope of GHG emissions to be considered during the CEQA environmental review process.

Several discussions were coordinated on these key objectives over four conference calls that were held on December 17 and 23, 2008 and on January 6 and 9, 2009. This document summarizes the subcommittee's discussions.

The industrial project selected by the committee consists of adding a 14.6 MMBtu/hr natural gas fired powdered milk spray dryer operation increasing throughput of an existing milk processing facility by 1,200 tons of milk per day. The mixed-use development project consists of 201,000 sq ft commercial, 278,000 sq ft of office space, plus 24 residential units, all situated on 40 acres. Both projects are actual projects submitted to the District. When possible, GHG emissions were calculated using project specific information, otherwise, assumptions were made using best available information.

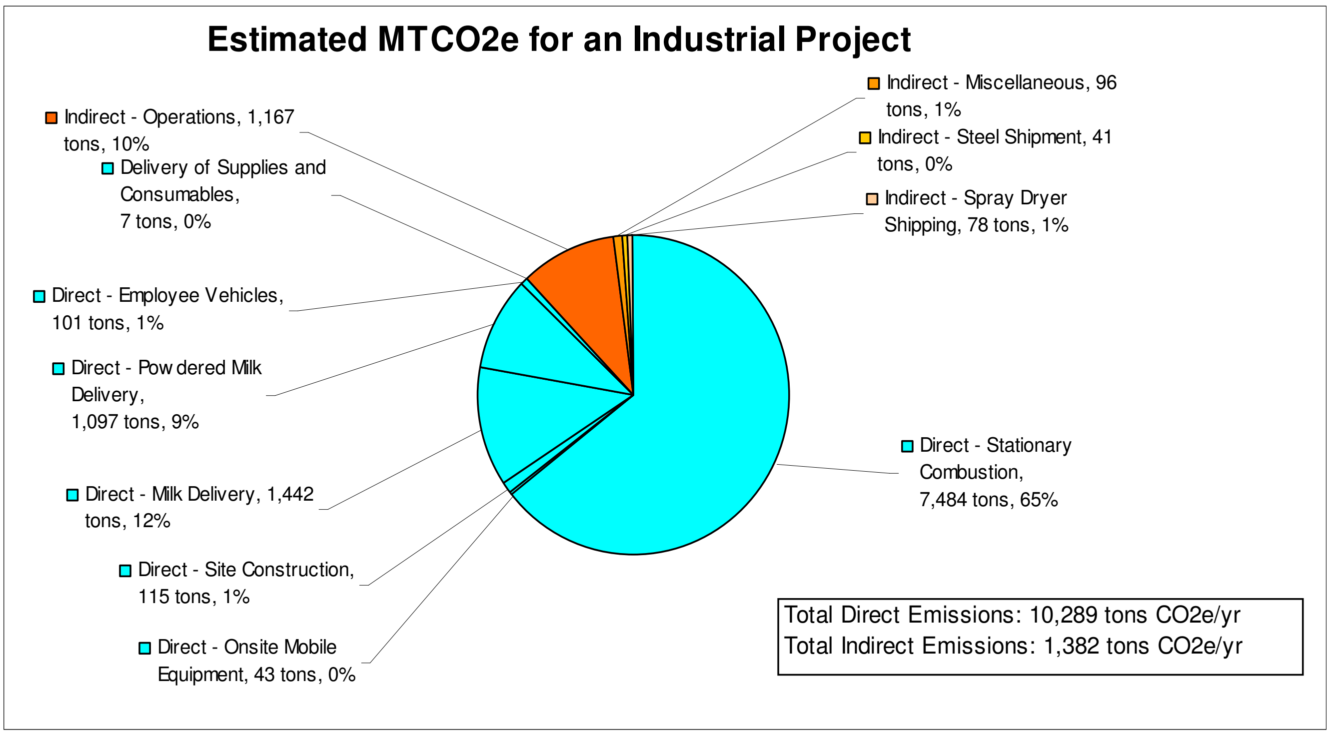
Emission sources were categorized as either Direct, Indirect, or lifecyle. Direct emissions result from a physical change in the environment which is caused by and which is immediately related to the project. Examples of direct emissions are operational emissions (emissions from activities occurring on-site), mobile source emissions (vehicular emissions resulting from delivery of operational materials to the facility, shipment of finished goods, and vehicular emissions resulting from employee, customer, or residential traffic), and emissions from on-site construction activities. Direct emission sources are traditionally considered during the CEQA review process. Indirect emissions result from a physical change in the environment which is not immediately related to the project, but is caused by the project. Examples of indirect emissions include emissions resulting from the generation of electricity to meet project related energy demands. Lifecycle emissions result from a physical change in the environment which is not immediately related to the project, but is caused by a given product or service caused or necessitated by the existence of a project. Examples of lifecycle emissions include emissions from mining, timber harvesting, processing raw materials into intermediate, i.e. converting iron ore into steel, and fabrication of raw materials into finished goods used by a project. Details of emissions sources are presented in attached Table-1 and Table-2.

Industrial Project Emissions – Determinations

The following statistics, also shown in Figure 1, pertain to the industrial project described above:

- Stationary source emissions account for about 70% of direct emissions
- Mobile source emissions account for about 26% of direct emissions
- Construction emissions account for about 1% of direct emissions
- Electrical power consumption account for about 95% of indirect emissions
- Shipment of steel and boiler account for about 5% of indirect emissions
- Total indirect emissions account for about 12% of combined total direct and indirect emissions

Figure 1: Estimated GHG Emissions for an Industrial Project

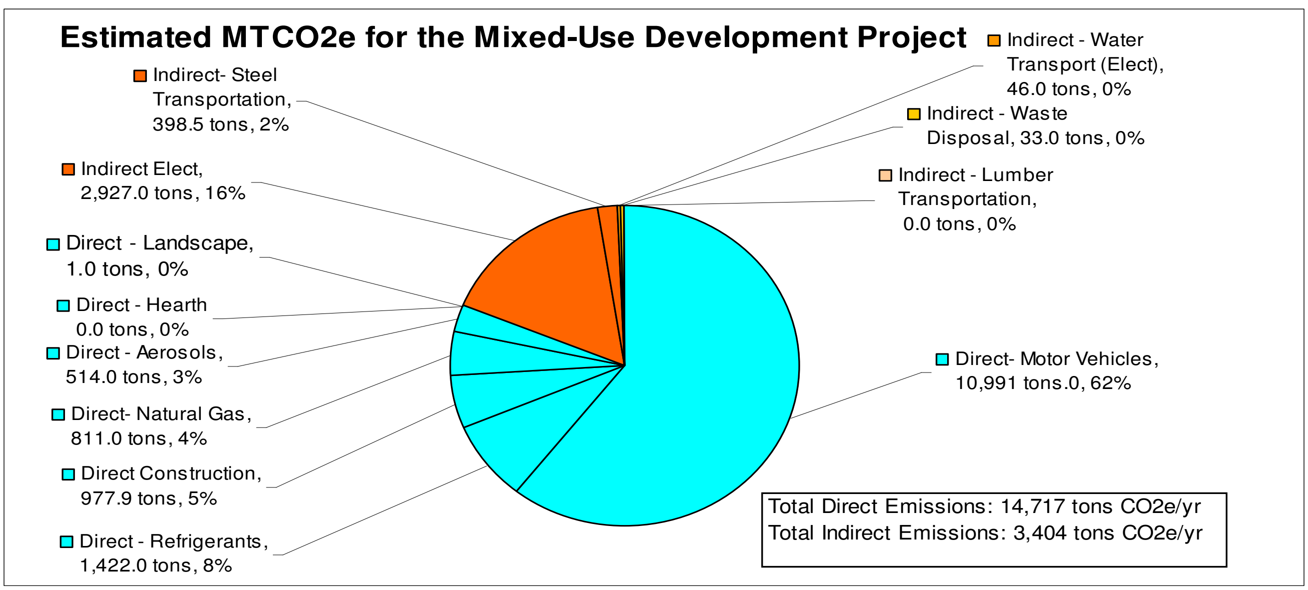


Mixed-Use Project Emissions – Determinations

The following statistics, also shown in Figure 2, pertain to the mixed-use project described above:

- Mobile source emissions account for about 75% of direct emissions
- Refrigerant loss account for about 10% of direct emissions
- Construction emissions account for about 7% of direct emissions
- Natural gas consumption account for about 6% of direct emissions
- Aerosol emissions account for about 4% of direct emissions
- Electrical power consumption account for about 97% of quantifiable indirect emissions
- Total indirect emissions account for about 19% of combined total direct and indirect emissions
- It was not feasible to estimate indirect emissions associated with transportation of raw materials and finished goods

Figure 2: Estimated GHG Emissions for an Mixed- Use Development Project



The assumptions used in the analysis of these two projects can be found in Appendix B and Appendix C.

Indirect Emissions from Electrical Power Consumption - Determinations
The following points represent the committee's majority opinion on this topic:

- For both industrial and non-industrial projects it is feasible to estimate potential electrical consumption and the associated indirect GHG emissions
- Decreasing electrical power consumption would reduce GHG emissions and concomitantly have a positive impact on global climatic change
- Estimating emissions from electrical power consumption is speculative because the actual source of generation (wind, fossil fuel, nuclear, hydroelectric, etc) and location of generation (within or outside California) is unknown
- Traditionally, indirect emissions associated with production of electrical power are not attributed to a development or industrial project
- Emissions resulting from electrical power generation have already been attributed to the power production facility and the power production facility has already been required to mitigate the impacts of its emissions
- Power generating facilities are subject to AB32 emission reduction targets and thus, will be required to mitigate their GHG emissions
- Including indirect emissions associated with electrical power consumption likely double counts GHG emissions associated with electrical power generation. Thus, overstating a project's environmental impacts

Indirect Emissions from Raw Materials and Finished Goods (Lifecycle Emissions) - Determinations
The following points represent the committee's majority opinion on this topic:

- Within limits, it was feasible to estimate potential emissions associated with transportation of raw materials and delivery of finished goods for industrial projects.
- It was not feasible to estimate indirect emissions associated with transportation of raw materials and finished goods for non-industrial projects.
- Estimation of potential emissions associated with transportation of raw materials and delivery of finished goods is highly speculative.
- Knowing emissions resulting from manufacturing and transportation of finished goods could influence decisions on sourcing products and consumer consumption.
- Reducing emissions associated with manufacture and transportation of finished goods would have a positive impact on global climatic change.
- Emissions associated with transportation of raw materials and delivery of finished goods is a minor percentage of direct project emissions.

Greenhouse Gas Reporting Protocols
As a starting point, the committee reviewed two greenhouse gas reporting protocols: (1) the General Reporting Protocol (the Protocol) developed by the California Climate Action Registry, and (2) the Greenhouse Gas Protocol (GHG Protocol) developed by the World Business Council for Sustainable Development and the World Resources Institute.

The Protocol is used primarily by California Registry members in calculating and reporting emissions through the California Action Registry Reporting Online Tool. It provides guidance for businesses, government agencies, and non-profit organizations to participate in the California Climate Action Registry, a voluntary greenhouse gas registry. The Protocol is used to report emissions within California or with the United States.

The GHG Protocol also provides guidance for businesses and other organizations. It consists of two modules: the Corporate Accounting and Reporting Standards and the Project Accounting Protocol Guidelines. The first one contains methodologies for business and others to inventory and report all of the GHG emissions they produce. The latter one is geared toward calculating reductions in GHG emissions from specific GHG-reduction projects. The GHG Protocol states that the GHG assessment boundary is to include all the GHG effect regardless of where they occur and who has control over the sources and sinks associated with them.

The Protocol identifies the operational boundaries through direct emissions and indirect emissions. The GHG Protocol also identifies the emissions as direct or indirect but uses several types of scope of accounting and reporting for indirect emissions.

Methodologies for calculating GHG emission are relevant to calculating project specific GHG emission and were used here. More details on the reporting requirements can be found at http://www.climateregistry.org/tools/protocols/general-reporting-protocol.html for the Protocol, and at http://www.wri.org/project/ghg-protocol for the GHG Protocol.

Discussion:
Pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15064(d), "in evaluating the significance of the environmental effect of a project, the Lead Agency shall consider direct physical changes in the environment which may be caused by the project and reasonably foreseeable indirect physical changes in the environment which may be caused the by project." The CEQA Guidelines clearly states that a physical change that is speculative or unlikely to occur is not reasonably foreseeable (CEQA Guidelines Section 15064[d][3]).

While use of raw materials for construction and operation is an indirect consequence of a project, the emissions and potential environmental impacts associated with the production and transportation of raw materials is unknown and estimation of said emissions is highly speculative. The quantification of emissions associated with raw material usage is likely to be double-counted when developing emission inventories for industrial sources. The source of the raw materials and/or manufacturing processes associated with raw material usage may occur outside the state and is not included in the emissions inventory for the state and therefore should not be included in the emissions inventory for the project for the purposes of CEQA.

Substantial research would be required to minimize the speculative nature of trying to characterize indirect emissions for each project. Project proponents would have to determine the origin of the materials used during the construction and/or operation of the project. Additional research would be necessary to gather emission rates for the international vehicles (ship, aircraft, trains, trucks, etc.), global energy production, global industrial processes, and other GHG emitting processes. Even if this information is compiled, the resulting estimates represent an insignificant percentage, as compared to direct project emission.

While indirect emissions from electrical power consumption can be estimated, the estimate is speculative because actual emissions are determined by the source of power used to generate the electricity (wind, fossil fuel, nuclear, hydroelectric, etc), which is largely unknown for the power being consumed by a specific project. Furthermore, the source of power generation is unknown and may occur outside the boundaries of the air basin or the borders of California. Estimates of indirect emissions from electrical power consumption would be speculative and estimates may not be accurate.

Furthermore, traditionally, indirect emissions associated with production of electrical power are not attributed to a development or industrial project. Emissions of criteria pollutants resulting from electrical power generation have already been attributed to the power production facility and the power production facility has already been required to mitigate the impacts of its criteria pollutants emissions. The same logic applies to GHG emissions. Power generating facilities are subject to AB32 emission reduction targets and thus, will be required to mitigate their GHG emissions. Including indirect emissions associated with electrical power consumption would likely double count GHG emissions associated with electrical power generation and overstate a project's environmental impacts.

Indirect emissions associated with waste disposal can be estimated. However, as with indirect emissions associated with electrical power generation, criteria pollutants emissions resulting from waste disposal have already been attributed to the waste disposal facility. Indeed, the waste disposal facility has already been required to mitigate its operational environmental impacts. As with power generating facilities, waste disposal facilities are subject to AB32 emission reduction targets and thus, will be required to mitigate their GHG emissions. Including indirect emissions associated with waste disposal would likely double count GHG emissions and overstate a project's environmental impacts.

Appendix A

List of Ad Hoc Committee Members

Name	**Affiliation**
Daniel Barber	San Joaquin Valley Air Pollution Control District
J.P Cativiela	Dairy CARES
Dennis J. Champion	Occidental of Elk Hills
Casey Creamer	California Cotton Ginners
Tin Cheung	The Planning Center
Dawn S. Chianese	Environ
Kevin Clutter	Conestoga-Rovers & Associates (CRA)
Jerry Frost	Kern Oil
Wendy Garcia	Constellation Wines
Sarah Jackson	EarthJustice
Julia Lester	Environ
Arnaud Marjollet	San Joaquin Valley Air Pollution Control District
Mark Montelongo	San Joaquin Valley Air Pollution Control District
Elena Nuno	Michael Brandman Associates
Dennis Roberts	San Joaquin Valley Air Pollution Control District
Patia Siong	San Joaquin Valley Air Pollution Control District
Dennis Tristao	J.G. Boswell Company
Tom Umenhofer	Western States Petroleum Association
Nicole Vermilion	The Planning Center

Table 1 - Estimated MT CO2e for Industrial Project

Greenhouse Gas Emissions for a Powdered Milk Spray Dryer Operation															
CAT		Emission Source	Process Rate units/year	Units	Emission Factors lb-CO2 (eq) /unit			Annual Emissions ton-CO2 (eq) /year				% Emission Category		% Total Emissions (Direct and Indirect)	
					CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	Total	% of Total	Cum. %	% of Total	Cum. %
DIRECT		**Direct Emissions - Stationary Source**													
	1	Stationary Combustion	127,896	MMBtu	116.7	0.27	0.068	7,463	17	4	**7,484**	72.7%	72.7%	64.1%	64.1%
	2	Onsite Mobil Equipment	6,751	Gallons-LPG	12.7	0.00037	0.005467	43	0	0	**43**	0.4%	73.2%	0.4%	64.5%
		Direct Emissions - Construction													
	3	Site Construction						115	0	0	**115**	1.1%	74.3%	1.0%	65.5%
		Direct Emissions - Offsite Vehicle Travel													
	4	Milk Delivery	774,551	Heavy Truck Miles	3.72	0.000236	0.00328	1,441	0	1	**1,442**	14.0%	88.3%	12.4%	77.8%
	5	Powdered Milk Delivery	589,011	Heavy Truck Miles	3.72	0.000236	0.00328	1,096	0	1	**1,097**	10.7%	99.0%	9.4%	87.2%
	6	Employee Vehicles	182,910	Vehicle Miles	1.08	0.0012	0.0219	99	0	2	**101**	1.0%	99.9%	0.9%	88.1%
	7	Delivery of Supplies and Consumables	3,704	Heavy Truck Miles	3.72	0.000236	0.00328	7	0	0	**7**	0.1%	100.0%	0.1%	88.2%
		Total Direct Emissions						**10,264**	**17**	**8**	**10,289**	**100.0%**			
INDIRECT		**Indirect Emissions - Electric Power**													
	8	Operations	2,653	MWh	878.71	0.15	1.1	1,166	0	1	**1,167**	84.4%	84.4%	10.0%	98.2%
	9	Miscellaneous	219	MWh	878.71	0.15	1.1	96	0	0	**96**	6.9%	91.4%	0.8%	99.0%
		Indirect Emissions - Miscellaneous													
	10	Steel Shipment	1,151,100	ton-miles	0.071	7.37E-05	1.50E-05	41	0	0	**41**	3.0%	94.4%	0.4%	99.3%
	11	Spray Dryer Shipping	2,190,000	ton-miles	0.071	7.37E-05	1.50E-05	78	0	0	**78**	5.6%	100.0%	0.7%	100.0%
		Total Indirect Emissions						**1,381**	**0**	**1**	**1,382**	**100.0%**			
		Total Emissions						**11,645**	**17**	**9**	**11,671**			**100.0%**	

Table 2 - Estimated MTCO2e for the Mixed-Use Development

CATEGORY	Source	Annual Emissions	% Emission Category		% Total Emissions (Direct and Indirect)	
		Metric tons CO2e	% of Total	Cum. %	% of Total	Cum. %
DIRECT	Motor Vehicles	10,991.0	74.7%	74.7%	60.7%	60.7%
	Refrigerants	1,422.0	9.7%	84.3%	7.8%	68.5%
	Construction	977.9	6.6%	91.0%	5.4%	73.9%
	Natural Gas	811.0	5.5%	96.5%	4.5%	78.4%
	Aerosols	514.0	3.5%	100.0%	2.8%	81.2%
	Landscape	1.0	0.0%	100.0%	0.0%	81.2%
	Hearth	0.0	0.0%	100.0%	0.0%	81.2%
		14,717	**100.0%**			
INDIRECT	Indirect Elect	2,927.0	86.0%	86.0%	16.2%	97.4%
	Steel Transportation	398.5	11.7%	97.7%	2.2%	99.6%
	Water Transport (Elect)	46.0	1.4%	99.0%	0.3%	99.8%
	Waste Disposal	33.0	1.0%	100.0%	0.2%	100.0%
	Lumber Transportation	0.0	0.0%	100.0%	0.0%	100.0%
		3,404	**100.0%**			
	TOTAL	**18,121**			100.0%	

The project consists of:

40 acres	
201,000 sqft	commercial
278,000 sqft	office
24 units	residential

NOTES:

(1) The sources and emissions are based on project specific data already available.

(2) Emissions for waste disposal were obtained using EPA's Waste Reduction Model (WARM).
http://epa.gov/climatechange/wycd/waste/calculators/Warm_home.html

(3) Data for residential and businesse waste disposal rate was obtained from the California Integrated Waste Management Board
http://www.ciwmb.ca.gov/Profiles/

(4) URBEMIS 2007 was used to estimate emissions from construction.

Appendix B

Basis for Greenhouse Gas Estimate for Powdered Milk Spray Dryer Operation

Direct Emissions – Stationary Source

- Maximum Firing Capacity for spray dryer is 14.6 MMBtu/hr natural gas
- Facility will operate 8760 hr/yr
- Burner Utilization is 100%
- Emission factors (with Global Warming Potential) for natural gas combustion are from CCAR, V.3, April, 2008:

	kg/MMBtu	lb/MMBtu	GWP	lb-$CO2_{eq}$/scf
CO2:	53.06	116.7	1	116.7
Methane:	0.0059	0.013	21	0.27
N2O	0.0001	0.00022	310	0.068

- Emissions for milk evaporation (from delivered milk to 50% concentrate fed to the dryer) are attributed to the existing milk evaporation system (3 boilers) and not included with the dryer.
- 50 hp forklift used to handle bagged product. Operates 8 hours per day with 50% utilization of horsepower and 30% thermal efficiency.
- Emission factors (with Global Warming Potential) for LPG-powered vehicles are from CCAR, V.3, April, 2008 for California:

	g/mile	lb/mile	GWP	lb-$CO2_{eq}$/gal
CO2:	-	-	1	12.7*
Methane:	0.04	8.81×10^{-5}	21	0.00037**
N2O	0.04	8.81×10^{-5}	310	0.00547**

* CO2 is based on 5.79 kg/gal for diesel (per CCAR) and an annual fuel consumption of 6,751 gal LPG
** Methane and N2O are based on hypothetical fuel economy of 5 mpg

Direct Emissions - Construction

- Construction emissions include direct emissions from construction sources at the plant site plus emissions associated with shipping of the spray dryer
- Construction site CO2 emissions were estimated using URBEMIS and assume a 2 acre site with 10,400 square feet of combined industrial building and office space.
- Methane and N2O emissions for construction were approximated by factoring from the CO2 emissions based on the heavy truck emission factors presented above.

Direct Emissions - Offsite Vehicle Travel

- Maximum Milk Solids processing is 84.6 tpd dry product
- Powdered milk product trucks carry 25 tons per round trip and travel 478 miles per round trip at 6 mpg.
- Delivered raw milk quantity is estimated based on 7 wt% milk solids in raw milk.
- Milk delivery trucks travel 44 miles round trip at 6 mpg and carry 6000 gal per round trip.
- Emission factors (with Global Warming Potential) for Heavy Trucks are from CCAR, V.3, April, 2008 for California:

	g/mile	lb/mile	GWP	lb-$CO2_{eq}$/mi
CO2:	-	3.72*	1	3.72
Methane:	0.0051	$1.12x10^{-5}$	21	0.00024
N2O	0.0048	$1.06x10^{-5}$	310	0.00328

* CO2 is based on 10.15 kg/gal for diesel (per CCAR) and a fuel efficiency of 6 mpg

- Average employee travel is 35 mi round trip with average fuel economy of 18 mpg
- Plant staff:

Administrative Staff:	10 per shift, 5 shifts per week (shared with evaporator)
Operations Supervisor:	1 per shift, 3 shifts per day (shared with evaporator)
Dryer Operators:	2 per shift, 3 shifts per day
Maintenance	5 per shift, 5 shifts per week (shared with evaporator)
Security	1 per shift, 3 shifts per day (shared with evaporator)

- Emission factors (with Global Warming Potential) for Passenger Cars are from CCAR, V.3, April, 2008 for California:

	g/mile	lb/mile	GWP	lb-$CO2_{eq}$/mi
CO2:	-	1.08*	1	1.08
Methane:	0.026	$5.73x10^{-5}$	21	0.0012
N2O	0.032	$7.05x10^{-5}$	310	0.0219

* CO2 is based on 8.81 kg/gal for diesel (per CCAR) and a fuel efficiency of 18 mpg

Mobile Source Emissions Associated with Shipment of Plant Operating Supplies and Consumables:

- Total installed cost for the dryer system was $20,000,000 (assumed)
- Annual expense for plant consumables and operating supplies is 2% of TIC = $400,000/year(2 x typical per Peters and Timmerhaus, Plant Design and Economics for Chemical Engineers, 2nd ed, McGraw-Hill, 1958.)
- Shipping cost for plant consumables and operating supplies is 5% of value or 0.05 x 200,000 = $20,000/year (assumed)
- Shipping rate is $5.40/mi (a shipping expenditure of $5.40 generates one vehicle mile for a heavy diesel truck – rough estimate based on published UPS shipping rates)

Indirect Emissions - Electric Power

- Operating electrical loads consist of:
  Main Blower Motor @ 250 hp (per applicant)
  Rotary atomizer for dryer @ 75 kw power input (basis GEA Niro literature)
  Pumps for handling milk are 10 bhp (assumed)
  Product conveying and bagging requires 15 bhp (assumed)
- Electric Motor Efficiency is 90%
- Emission factors (with Global Warming Potential) for electricity usage are from CCAR, V.3, April, 2008 for California:

	lb/MWh	GWP	lb-$CO2_{eq}$/MWh
CO2:	878.71	1	878.71
Methane:	0.0067	21	0.15
N2O	0.0037	310	1.1

- Miscellaneous electrical loads:
  Instrumentation and anciliary loads = 2 kw
  Dryer is housed in a 100' x 100' expanded manufacturing area (indoors) which requires 24 hour lighting at 2.2 W/ft2
  400 ft2 incremental office space associated with the milk drying operation requiring 2.5 W/ft2
  Plant outdoor lighting assumed to be existing.

Indirect Emissions - Miscellaneous

- Specific power consumption for ocean shipping (main engine output) is 0.04735 kwh per ton-milebased on data for the "Emma Maersk" (freight capacity of 61,213 tons requiring 80,000 kw to maintain a speed of 24 knots).
- Ship fuel consumption is 203 g/kwh (residual fuel oil) per: Cooper, David, "Representative Emission Factors for use in Quantification of Emissions from Ship Movements Between Port in the European Community", Swedish Environmental Research Institute, 2002.
- Ship transit CO2 emission factor is 677 g-CO2/kw per ARB's "Emission Inventory for Ship Main Engines and Boilers"
- Ship methane and N2O emission factors are based on CCAR factors for combustion of residual fuel oil at a stationary source and on the calculated fuel consumption.
- Due to length of shipment, emissions due to anchorage and hoteling were assumed to be negligible.
- The dryer is assumed to be procured and shipped from China (Hong Kong to Los Angeles - one-way shipping distance of 7,300 miles) and only cargo ship emissions are considered.
- Dryer is assumed to weigh 300 tons.
- Steel (300 tons) is assumed to be shipped from India to China (Mumbai to Hong Kong – one way shipping distance of 3,837 miles)

Appendix C

Basis for Greenhouse Gas Estimate for a Mixed-Use Development Project

Direct Emissions

Motor Vehicles

- The vehicle percentages are based on default values in URBEMIS 2002.
- The build-out for this project is year 2010.
- The vehicle miles traveled is estimated at 61,000 with 12,200 trips.
- The emission factors for the running emissions are based on the U.S. Environmental Protection Agency and Climate Leaders Greenhouse Gas Inventory Protocol – Core Module Guidance, for direct emissions from mobile combustion sources.
- The emission factors for the starting emissions are based on the U.S. Environmental Protection Agency EPA420-P-04-016 (Update of Methane and Nitrous Oxide Emission Factors for On-highway Vehicles).

Refrigerant

- It is assumed that there are 24 domestic refrigeration units, about 490 units of Residential/office/commercial A/C ranging in capacity.
- An annual leak rate in percent of capacity is included.

Construction

- URBEMIS 2007 was used to obtain emissions from construction.
- The analysis evaluates the project consisting of 40 acres, 201,000 square feet of commercial land use, 278,000 square feet of office land use, and 24 multi-dwelling residential units in Fresno County.
- The construction timeline was one year.

Natural Gas

- A natural gas usage factor based on default value in URBEMIS 2002 for methane and nitrous oxide was assigned to the type of land (e.g.: office, retail/shopping, residential, etc.) and its associated square footage or units.

Aerosols

- MOBILE6 and URBEMIS 2007 were used to estimate the carbon emissions for this arena.

Landscape

- URBEMIS 2007 was used to obtain landscape emissions.

Hearth

- No hearth emissions were included as there were no wood-burning fireplaces in the development per City of Fresno code, however if hearths were allowed URBEMIS 2007 would have been used to provide the hearth emissions.

Indirect Emissions

Electricity

- The emission factor was obtained from the General Reporting Protocol – Reporting Entity-wide Greenhouse Gas Emissions, Version 2.2, March 2007 by the California Climate Action Registry.
- The residential electricity usage rate was assumed to be 5626.50 kwh/unit/yr based on South Coast Air Quality Management 1993 CEQA Handbook, Table 9-11-A.
- The electricity use was based on Table E-1 from the California Energy Commission - California Commercial End-Use Survey March 2006.
- The analysis evaluates the project consisting of 201,000 square feet of commercial land use, 278,000 square feet of office land use, and 24 multi-dwelling residential units.
- The total electricity use is about 8,000 MWh/year.

Steel Transportation

- Specific power consumption for ocean shipping (main engine output) is 0.04735 kwh per ton-milebased on data for the "Emma Maersk" (freight capacity of 61,213 tons requiring 80,000 kw to maintain a speed of 24 knots).
- Ship fuel consumption is 203 g/kwh (residual fuel oil) per: Cooper, David, "Representative Emission Factors for use in Quantification of Emissions from Ship Movements Between Port in the European Community", Swedish Environmental Research Institute, 2002.
- Ship transit CO2 emission factor is 677 g-CO2/kw per ARB's "Emission Inventory for Ship Main Engines and Boilers"
- Ship methane and N2O emission factors are based on CCAR factors for combustion of residual fuel oil at a stationary source and on the calculated fuel consumption.
- Due to length of shipment, emissions due to anchorage and hoteling were assumed to be negligible.
- The steel is assumed to be shipped from India to Los Angeles – (one-way shipping distance of 10,500 miles) and only cargo ship emissions are considered.
-

Water Transport (Electricity use in typical urban water systems)

- Emission factor was obtained from the General Reporting Protocol – Reporting Entity-wide Greenhouse Gas Emissions, Version 2.2, March 2007 by the California Climate Action Registry.
- Emission factor was also from the California's Energy-Water Relationship Final Staff Report, November 2005 by the California Energy Commission.
- It is assumed that there's about 80,000 gallons per day of water and about 115,000 kWh in energy usage.

Waste Disposal

- Waste disposal data was obtained from the California Integrated Waste Management Board – 1999 estimated materials disposed by residential sector and 1999 estimated business waste amounts for Fresno County.
- It is estimated that 137 tons of waste would be generated.
- Data was entered into US EPA's Waste Reduction Model to obtain greenhouse gas emissions.

Lumber Transportation

- It is assumed that lumber is shipped to Fresno from Springfield, Oregon. The one-way travel distance is 669 miles.
- It is estimated that 16,000 board feet of lumber is needed for a house of 2,000 square feet.
- The number of train hauling cars is 75 cars in which 24 would be used to transport lumber. The hauling capacity is about 100 tons per cars which would equate to about 12,000 board feet of lumber.
- The conversion emission factor for diesel is 0.0287 kg CO_2/mile based on the calculation tool provided by the GHG Protocol – Mobile Guide, Version 1.3, March 2005.

Appendix D

Summary of Written Comments

Written comments pertaining to proposed recommendations for establishing the scope of a project's greenhouse gas impacts are summarized below.

1. Sarah Jackson (Earth Justice)

One of CEQA's main functions is to provide public agencies and the general public "with detailed information about the effects of a proposed project on the environment." *San Franciscans for Reasonable Growth v. City & County of San Francisco*, 151 Cal. App. 3d 61, 72 (1984). Full analysis of all direct and indirect emissions caused by a project, using a lead agency's "best efforts to find out and disclose all that it possibly can," CEQA Guidelines section 15144, will provide maximum opportunities for mitigation and will allow for more environmentally sound decision-making. Furthermore, CEQA requires that indirect or secondary effects "which are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable," CEQA Guidelines section 15358(a), be analyzed. Both the ARB and South Coast have determined that lifecycle analyses of GHGs are appropriate and South Coast recently proposed that lifecycle analyses be prepared for all projects undergoing CEQA analysis in order to "produce a more defensible approach." *See* South Coast Interim GHG Significance Threshold Staff Proposal at 3-7, October 2008. Categorical exclusions of emissions from analysis is contrary to CEQA's purpose and would minimize the true environmental impact of the project.

2. Gordon Nipp (Kern-Kaweah Chapter of Sierra)

- Emissions from project electricity consumption can be estimated by following the Climate Action Registry protocol. The basic methodology uses updated US EPA-developed EGRID emission factors for calculating indirect emissions from electricity use. For California, this factor is 878.71 pounds of CO_2 per MWh of usage, a figure that is lower than for many other regions because it includes renewables production. While anyone can call any such figure "speculative", this protocol is in current usage and is well established. Electricity consumption estimations should not be considered speculative.
- Including indirect emissions associated with a project's electricity consumptions as part of the project's environmental impact and requiring mitigation for this impact would not lead to double counting of these emissions. If, for example, a project were required as mitigation to generate a portion of its electricity with solar PV, the electricity generated by the project's PV would not have to be generated by a power plant. The power plant would not be required to mitigate impacts of electricity generated by project PV, electricity that the power plant doesn't have to generate.
- Indirect GHG emissions from electrical power generation should be included during CEQA review.

3. Wendy Garcia (Constellation Wines)

1) Regarding power consumption: I believe the project scope recommendations would be stronger by removing statements such as:

"Estimating emissions from electrical power consumption is speculative because the actual source of generation (wind, fossil fuel, nuclear, hydroelectric, etc) and location of generation (within or outside California) is unknown."

These emissions can be estimated. Power providers such as PG&E, SCE and others contract with, and purchase power from, specific electical generators. It is not speculative.

2) The de minimus level for reporting of GHG emissions is 3 to 5 percent, depending upon the reporting program. In the scope recommendation document indirect emissions are greater than 5% of total GHG emissions, so they are significant, but for the other reasons cited, indirect emissions should be left out of the scope for quantifying GHGs for CEQA purposes.