San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

2006 Area Source Emissions Inventory Methodology
330 - GASOLINE BULK PLANTS/TERMINALS - STORAGE & TRANSFER

I. Purpose

This document describes the Area Source Methodology used to estimate emissions of volatile organic compounds (VOC) from bulk distributors of gasoline (bulk plants) within the San Joaquin Valley Air Basin. An area source is a collection of similar emission units within a geographic area (ie., a County). Area sources collectively represent individual sources that are small and numerous, and that may not have been inventoried as specific point, mobile, or biogenic sources. The California Air Resources Board (CARB) has grouped these individual sources with other like sources into area source categories. These source categories are grouped in such a way that they can be estimated collectively using one methodology.

II. Applicability

The emission calculations from this Area Source Methodology apply to facilities that are identified by the following Category of Emission Source (CES) codes and Reconciliation Emission Inventory Codes (REIC):

Table 1. Emission inventory codes.

CES	REIC	Description
46466	330-382-1100-0000	Bulk plants/terminals – gasoline storage breathing losses
46474	330-384-1100-0000	Bulk plants/terminals – gasoline storage working losses
46482	330-390-1100-0000	Tank cars and trucks – working losses
82248	330-995-1100-0000	Bulk gasoline storage & transfer - unspecified

III. Point Source Reconciliation

Emissions from the area source inventory and point source inventory are reconciled against each other to prevent double counting. This is done using relationships created by the California Air Resources Board (ARB) between the area source REIC and the point sources' Standard Industry Classification (SIC) code and emissions process Source Category Code (SCC) combinations. The area sources in this methodology reconcile against processes in our point source inventory with the SIC/SCC combinations listed in Appendix A.

IV. Methodology Description

This methodology is used to calculate emissions from the storage and transfer of gasoline at bulk plants and terminals. For the purpose of this methodology, bulk plants and terminals include all loading operations, unloading operations and associated storage equipment used to transfer gasoline into delivery vessels (tank trucks, trailers, rail cars, etc.) at wholesale distribution outlets. This methodology does not apply to:

1. Emissions from dispensing motor fuels into vehicles at retail outlets, fleet dispensers, cardlock dispensers, etc.;

2. Emissions from the loading or unloading of marine vessels; or

3. Emissions associated with loading and unloading operations at petroleum refineries or processing plants.

All gasoline bulk plants and terminals in the San Joaquin Valley Air Basin are permitted, and their emissions are reported annually through the District's point source inventory. Therefore, the total unreconciled emissions for this source category is equal to the sum of the emissions reported through the point source inventory, and the area source emissions are set to zero.

V. Activity Data

The activity data for each facility associated with this source category is reported through the District's point sources inventory.

VI. Emission Factors

The emission factors for each process at each facility associated with this source category are reported through the District's point sources inventory.

VII. Emissions Calculations

A. Assumptions

All gasoline bulk plants and terminals within the District are permitted.

B. Sample Calculations

Not applicable.

VIII. Temporal Variation

The temporal data for each facility associated with this source category is reported through the District's point sources inventory.

IX. Spatial Variation

The spatial data for each facility associated with this source category is reported through the District's point sources inventory.

X. Growth Factor

Growth factors are developed by either the District's Planning Department or CARB for each EIC. These factors are used to estimate emissions in future years. The growth factors associated with this emissions category may be obtained from the Air Quality Analysis Section of the District's Planning Department.

XI. Control Level

Control levels are developed by either the District's Planning Department or CARB for each EIC. Control levels are used to estimate emissions reductions in future years due to implementation of District rules. These control levels take into account the effect of control technology, compliance and exemptions at full implementation of the rules.

Emission units within this area source category may be subject to the following District Rules:

Table 2. District rules and control levels applicable to gasoline bulk plants and terminals.

Rule No.	Rule Description
4621	Gasoline Transfer into Stationary Storage Containers, Delivery Vessels and Bulk Plants
4623	Storage of Organic Liquids

Control levels associated with this emissions category may be obtained from the Air Quality Analysis Section of the District's Planning Department.

XII. ARB Chemical Speciation

CARB has developed organic gas profiles in order to calculate reactive organic gasses (ROG), volatile organic compounds (VOC) or total organic gas (TOG) given any one of the three values. For each speciation profile, the fraction of TOG that is ROG and VOC is given. The organic gas profile codes can also be used to lookup associated toxics. CARB's speciation profiles for gasoline bulk plant and terminal processes are presented in Table 3.

Table 3. CARB chemical speciation profiles for gasoline dispensing processes.

Profile Description	ARB Organic Gas Profile#	Fractions	
		ROG	VOC
Headspace vapors 1996 SSD EtOH 2.0% (MTBE phaseout)	661	0.996266	0.996266

XIII. Assessment Of Methodology

Since all gasoline bulk plant and terminal facilities in the San Joaquin Valley Air Basin are permitted, there are no area source emissions in this category. All gasoline bulk plant and terminal facility emissions are reported through the District's point source inventory.

XIV. Emissions

Following is the 2006 point source emissions inventory for gasoline bulk plant and terminal storage breathing losses (330-382-1100-0000), storage working losses (330-384-1100-0000), tank car and truck working losses (330-390-1100-0000), and unspecified bulk storage and transfer (330-995-1100-0000). Since all gasoline bulk plants and terminals within the District are permitted, the area source emissions are set to zero and the total unreconciled emissions for this source category is equal to the point source inventory.

Table 4. Point source emissions for gasoline bulk plants and terminals (2006).

County	Emissions (tons/year)					
	NOx	CO	SOx	VOC[1]	PM_{10}	$PM_{2.5}$
Bulk Plants/Terminals – Gasoline Storage Breathing Losses						
Fresno	0.00	0.00	0.00	22.83	0.00	N/A
Kern	0.00	0.00	0.00	0.02	0.00	N/A
Kings	0.00	0.00	0.00	0.00	0.00	N/A
Madera	0.00	0.00	0.00	0.00	0.00	N/A
Merced	0.00	0.00	0.00	0.79	0.00	N/A
San Joaquin	0.00	0.00	0.00	27.82	0.00	N/A
Stanislaus	0.00	0.00	0.00	0.66	0.00	N/A
Tulare	0.00	0.00	0.00	0.00	0.00	N/A
TOTAL	0.00	0.00	0.00	52.12	0.00	N/A
Bulk Plants/Terminals – Gasoline Storage Working Losses						
Fresno	0.00	0.00	0.00	3.71	0.00	N/A
Kern	0.00	0.00	0.00	2.23	0.00	N/A
Kings	0.00	0.00	0.00	0.53	0.00	N/A
Madera	0.00	0.00	0.00	0.24	0.00	N/A
Merced	0.00	0.00	0.00	1.25	0.00	N/A
San Joaquin	0.00	0.00	0.00	7.24	0.00	N/A
Stanislaus	0.00	0.00	0.00	5.06	0.00	N/A
Tulare	0.00	0.00	0.00	1.48	0.00	N/A
TOTAL	0.00	0.00	0.00	18.03	0.00	N/A
Tank Cars and Trucks – Working Losses						
Fresno	0.00	0.00	0.00	0.51	0.00	N/A
Kern	0.00	0.00	0.00	1.37	0.00	N/A
Kings	0.00	0.00	0.00	0.72	0.00	N/A
Madera	0.00	0.00	0.00	0.22	0.00	N/A
Merced	0.00	0.00	0.00	1.97	0.00	N/A
San Joaquin	0.00	0.00	0.00	6.01	0.00	N/A
Stanislaus	0.00	0.00	0.00	1.94	0.00	N/A
Tulare	0.00	0.00	0.00	2.01	0.00	N/A
TOTAL	0.00	0.00	0.00	14.74	0.00	N/A
Bulk Gasoline Storage & Transfer- Unspecified						
Fresno	0.00	0.00	0.00	9.01	0.00	N/A
Kern	0.00	0.00	0.00	1.18	0.00	N/A
Kings	0.00	0.00	0.00	0.00	0.00	N/A
Madera	0.00	0.00	0.00	0.00	0.00	N/A
Merced	0.00	0.00	0.00	0.79	0.00	N/A
San Joaquin	0.00	0.00	0.00	0.00	0.00	N/A
Stanislaus	0.00	0.00	0.00	0.47	0.00	N/A
Tulare	0.00	0.00	0.00	0.00	0.00	N/A
TOTAL	0.00	0.00	0.00	11.45	0.00	N/A

(1) The District only reports ROG to ARB. As noted in Section XII, ROG is the same as VOC.

Following is the net change in total unreconciled emissions between this update (2006 inventory year) and the previous update (2005 inventory year) for gasoline bulk plant and terminal storage breathing losses (330-382-1100-0000), storage working losses (330-384-1100-0000), tank car and truck working losses (330-390-1100-0000), and unspecified bulk storage and transfer (330-995-1100-0000). The change in emissions are reported for each county in the District.

Table 5. Net emissions change for gasoline bulk plants and terminals (2005-2006).

County	Emissions (tons/year)					
	NOx	CO	SOx	VOC[1]	PM_{10}	$PM_{2.5}$
Bulk Plants/Terminals – Gasoline Storage Breathing Losses						
Fresno	0.00	0.00	0.00	-0.25	0.00	N/A
Kern	0.00	0.00	0.00	0.02	0.00	N/A
Kings	0.00	0.00	0.00	0.00	0.00	N/A
Madera	0.00	0.00	0.00	0.00	0.00	N/A
Merced	0.00	0.00	0.00	0.79	0.00	N/A
San Joaquin	0.00	0.00	0.00	12.65	0.00	N/A
Stanislaus	0.00	0.00	0.00	0.00	0.00	N/A
Tulare	0.00	0.00	0.00	-0.31	0.00	N/A
TOTAL	0.00	0.00	0.00	12.91	0.00	N/A
Bulk Plants/Terminals – Gasoline Storage Working Losses						
Fresno	0.00	0.00	0.00	1.40	0.00	N/A
Kern	0.00	0.00	0.00	-0.19	0.00	N/A
Kings	0.00	0.00	0.00	-0.17	0.00	N/A
Madera	0.00	0.00	0.00	0.20	0.00	N/A
Merced	0.00	0.00	0.00	0.84	0.00	N/A
San Joaquin	0.00	0.00	0.00	3.66	0.00	N/A
Stanislaus	0.00	0.00	0.00	0.47	0.00	N/A
Tulare	0.00	0.00	0.00	0.57	0.00	N/A
TOTAL	0.00	0.00	0.00	6.79	0.00	N/A
Tank Cars and Trucks – Working Losses						
Fresno	0.00	0.00	0.00	-0.37	0.00	N/A
Kern	0.00	0.00	0.00	0.34	0.00	N/A
Kings	0.00	0.00	0.00	-0.07	0.00	N/A
Madera	0.00	0.00	0.00	0.22	0.00	N/A
Merced	0.00	0.00	0.00	0.71	0.00	N/A
San Joaquin	0.00	0.00	0.00	-1.14	0.00	N/A
Stanislaus	0.00	0.00	0.00	0.77	0.00	N/A
Tulare	0.00	0.00	0.00	0.86	0.00	N/A
TOTAL	0.00	0.00	0.00	1.33	0.00	N/A
Bulk Gasoline Storage & Transfer- Unspecified						
Fresno	0.00	0.00	0.00	9.01	0.00	N/A
Kern	0.00	0.00	0.00	1.18	0.00	N/A
Kings	0.00	0.00	0.00	-0.07	0.00	N/A
Madera	0.00	0.00	0.00	0.00	0.00	N/A
Merced	0.00	0.00	0.00	0.79	0.00	N/A
San Joaquin	0.00	0.00	0.00	0.00	0.00	N/A
Stanislaus	0.00	0.00	0.00	0.47	0.00	N/A
Tulare	0.00	0.00	0.00	0.00	0.00	N/A
TOTAL	0.00	0.00	0.00	11.38	0.00	N/A

(1) The District only reports ROG to ARB. As noted in Section XII, ROG is the same as VOC.

XV. Revision History

2006. The methodology was reformatted to the new District standard. Process rates were updated.

XVI. Update Schedule

In an effort to provide inventory information to ARB and other District programs and maximize limited resources, the District has developed an update cycle based on emissions within the source category as shown in Table 6.

Table 6. Area source update frequency criteria.

Total Emissions (tons/day)	Update Cycle (years)
<=1	4
>1 and <= 2.5	3
>2.5 and <=5	2
>5	1

Since VOC emissions for this source category is less than one ton per day, these area source estimates will be updated every four years.

Table 7. Industrial natural gas combustion methodology update frequency.

EIC	Frequency (In years)	Source of Emissions (Point Source Inventory / Data Gathering)
330-382-1100-0000	4	Point Source Inventory
330-384-1100-0000	4	Point Source Inventory
330-390-1100-0000	4	Point Source Inventory
330-995-1100-0000	4	Point Source Inventory

XVII. Appendices

Appendix A. Emission Inventory Codes

Appendix A. Emission Inventory Codes

Table 8. EIC, SCC and SIC codes in the District's 2006 point source inventory that reconciled to REIC 330-382-1100-0000.

EIC	SCC	Point Source Type	SIC
330-326-1110-0000	40301003	PETROLEUM STORAGE - FIXED ROOF TANKS - GASOLINE-RVP 7 - 67K BBL-BREATHING	5171
330-382-1100-0000	40301141	PETROLEUM STORAGE - FLOAT ROOF TANKS - EXTNL-SECDRY SEAL - GASOLINE	5171
	40400112	BULK TERMINALS - FLOAT ROOF TANKS - GASOLINE-RVP 7 - 67K BBL-STAND LOS	5171
330-382-1120-0000	40400102	BULK TERMINALS - FIXED ROOF TANKS - GASOLINE-RVP 10 - 67K BBL-BREATHING	5171
	40400111	BULK TERMINALS - FLOAT ROOF TANKS - GASOLINE-RVP 10 - 67K BBL-STAND LOS	5171
330-382-1130-0000	40301001	PETROLEUM STORAGE - FIXED ROOF TANKS - GASOLINE-RVP 13 - 67K BBL-BREATHING	5171

Table 9. EIC, SCC and SIC codes in the District's 2006 point source inventory that reconciled to REIC 330-384-1100-0000.

EIC	SCC	Point Source Type	SIC
330-384-1100-0000	40400116	BULK TERMINALS - FLOAT ROOF TANKS - GASLN-RVP 13/10/7 - 67K BBL- WITHDRAW	5171
	40600131	PETROLEUM MARKTNG - TANK CARS/TRUCKS - GASOLINE-SUBMERGE - LOAD-NORMAL SVC	5171
	40301009	PETROLEUM STORAGE - FIXED ROOF TANKS - GASOLINE-RVP 7 - WORKING LOSS	5171
	40400109	BULK TERMINALS - FIXED ROOF TANKS - GASOLINE-RVP 7 - WORKING LOSS	5171
	40400406	PETROLEUM STORAGE - UNDERGROUND TANKS - GASOLINE-RVP 7 - WORKING LOSS	5171
330-384-1120-0000	40301008	PETROLEUM STORAGE - FIXED ROOF TANKS - GASOLINE-RVP 10 - WORKING LOSS	5171
	40400108	BULK TERMINALS - FIXED ROOF TANKS - GASOLINE-RVP 10 - WORKING LOSS	5171
330-384-1130-0000	40301007	PETROLEUM STORAGE - FIXED ROOF TANKS - GASOLINE-RVP 13 - WORKING LOSS	5171

Table 10. EIC, SCC and SIC codes in the District's 2006 point source inventory that reconciled to REIC 330-390-1100-0000.

EIC	SCC	Point Source Type	SIC
330-390-1100-0000	40400154	BULK TERMINALS - MISCELLANEOUS - TANK TRUCK VAPOR - LEAKS	5171
	40400250	BULK PLANTS - MISCELLANEOUS - LOADING RACKS -	5171

Table 11. EIC, SCC and SIC codes in the District's 2006 point source inventory that reconciled to REIC 330-995-1100-0000.

EIC	SCC	Point Source Type	SIC
330-995-1100-0000	40688801	PETROLEUM MARKTNG - FUGITIVE EMISSION - NOT CLASSIFIED - OTHER	4941, 9711