

# EMFAC2011-PL

## *User's Guide*



California Environmental Protection Agency

 **Air Resources Board**

December 20, 2012

# EMFAC2011-PL

## 1.0 INTRODUCTION

EMFAC2011-PL (Ver 1.1) is a new simplified tool that reports emission rates for project-level assessments. EMFAC-PL uses emissions and activity data from EMFAC2011-SG module inventory files (which consists of the default inventories of the two EMFAC modules, i.e. EMFAC-LDV and EMFAC-HD) to back-calculate default emission rates. The EMFAC-PL tool also reports effective CO<sub>2</sub> emissions with Pavley-I and Low Carbon Fuel Standard (LCFS) benefits. EMFAC2011-PL is developed on the Microsoft® Access platform, and generates outputs in Microsoft Excel format (\*.xls).

EMFAC2011-PL processes data at a sub-area level (area defined by County-Air Basin-District boundaries [CoABDis] or Geographic Area Index [GAI]). Therefore, in order to process regional scenarios (State, Air Basin, Air District, MPO, County), the tool processes all sub-areas in its domain and aggregate the results. That is, for a single “Statewide” regional modeling scenario, the model will aggregate the emission rates of all 69 sub-areas. Similar to EMFAC2011-SG, the EMFAC2011-PL tool allows users to generate MPO-level outputs in addition to the Statewide, Air Basin, Air District, County, and Sub-Area level outputs common in EMFAC2007.

## 2.0 MODEL OPERATION AND LOGIC

Since the fleet characteristics (vehicle type, technology, and age distributions) and vehicle use patterns (vehicular miles travelled or VMT, and speed) vary by local regulatory and planning agencies, the vehicle usage and speed profiles vary greatly at the sub-area level (GAI or CoABDis). The EMFAC-PL tool processes emission factors at the sub-area level, and then aggregate the data at the desired regional level.

EMFAC-PL uses the combined outputs from the two models (EMFAC-LDV and EMFAC-HD) at the most detailed level (i.e. EMFAC “Burden” output level) disaggregated by Speed (5-MPH increments) as the base inventory. When a user models a scenario, the EMFAC-PL tool imports the data from the corresponding base inventory file, and disaggregates the data into different parameters.

Based on the modeling parameters, the EMFAC-PL tool uses the following equations to calculate the emission rates by Vehicle Category (VC) for the EMFAC2011 vehicle categories:

$$\text{Running Exhaust Emission Rate}_{VC,Speed} \text{ (g/mile)} = \frac{\text{Default Running Exhaust Emissions}_{VC,Speed}}{\text{Default Total VMT}_{VC,Speed}}$$

$$\text{Starting Exhaust Emission Rate}_{VC} \text{ (g/trip)} = \frac{\text{Default Starting Exhaust Emissions}_{VC}}{\text{Default Total Trips}_{VC}}$$

$$\text{Evaporative Emission Rate}_{VC} \text{ (g/veh/day)} = \frac{\text{Default Evaporative Emissions}_{VC}}{\text{Default Total Vehicle Population}_{VC}}$$

$$\text{PM BW/TW Emission Rate}_{VC} \text{ (g/mile)} = \frac{\text{Default PM BW/TW Emissions}_{VC}}{\text{Default Total VMT}_{VC}}$$

$$\text{Idling Exhaust Emission Rate}_{LDV \text{ Vehicles}} \text{ (g/hr)} = \text{Default Running Exhaust Emissions}_{VC@5MPH} \left( \frac{\text{g}}{\text{mile}} \right) \times 5 \left( \frac{\text{mile}}{\text{hour}} \right)$$

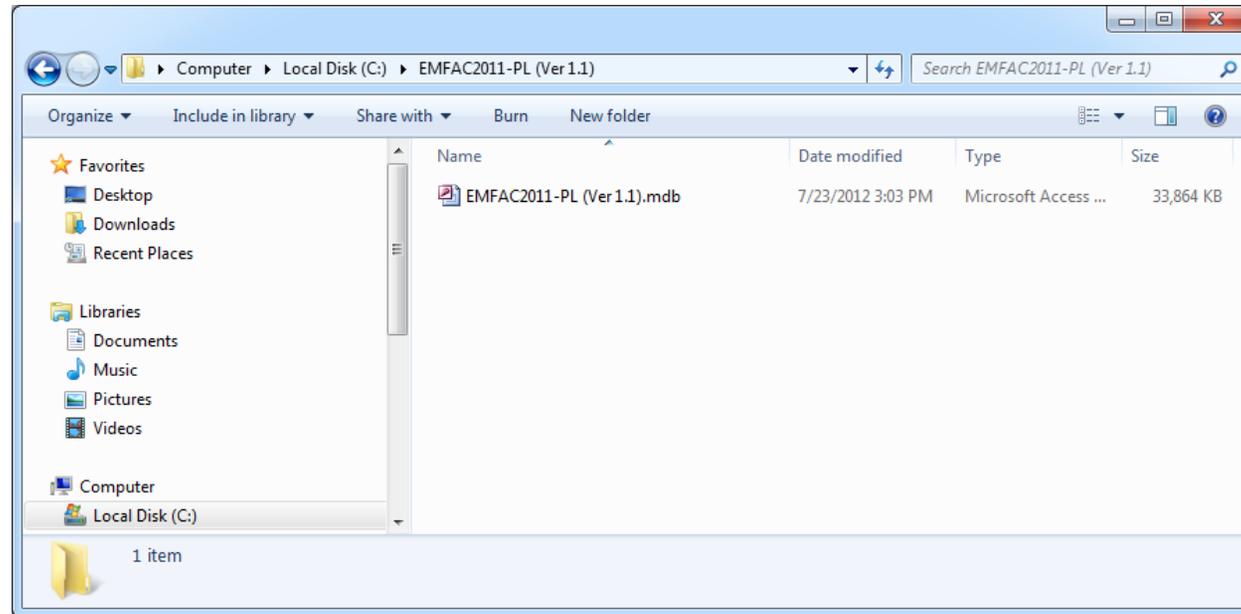
Idling Emission Rates for HD vehicles were obtained from the HD Idling Database at the Sub-Area level ([http://www.arb.ca.gov/msei/emfac2011\\_idling\\_emission\\_rates.xlsx](http://www.arb.ca.gov/msei/emfac2011_idling_emission_rates.xlsx)), and aggregated at the 15 Air Basins and at the statewide total levels using population-weighted aggregation. If the user selects the aggregated “California” option, then the statewide data for the corresponding calendar year and season are looked up. For every other region, an analysis of the Air Basin of largest influence was conducted using the 1990 default populations. Depending on the region selected by the user in EMFAC-PL tool, the tool looks up the Air Basin with the largest influence, and assigns the HD Idling Emission Rates. For example, Los Angeles County lies in two Air Basins: South Coast Air Basin and the Mojave Desert Air Basin. However, since over 97% of the vehicles registered in the LA County were in the South Coast Air Basin, the SCAB HD Idling Emission Rates were assigned to LA County. The HD Idling Lookup Table is presented in Appendix C.

The EMFAC2011 vehicle category scheme is the most detailed scheme used by the model. For other aggregated vehicle category schemes (EMFAC2007, Truck/Non-Truck, ALL vehicles), the tool uses similar weighted-aggregation to calculate the process emission rates, except when calculating running emission factors. When the EMFAC2011 vehicle categories are aggregated up to a higher category scheme for running emission rates, the factors are weighted using the total VMT contribution of the EMFAC2011 vehicle to the newly aggregated category. That is, if the user selects the “Truck/Non-Truck” category scheme for a scenario where ‘LDA-GAS’ has a total VMT contribution of 35% to the ‘Non-Trucks’ category, then all the speed bins for the ‘Non-Trucks’ category will contain 35% of the emission factors from ‘LDA-GAS’. In other words, it assumes that when a standard fleet with a constant fleet composition moves at two different speeds (e.g. 35 MPH in one leg of the project, and 50MPH in the another leg), it should have identical contributions from all the constituents. This way, the EMFAC-PL tool is able to accurately calculate consistent fleet-wide average emission factors at all speeds which are needed for project-level assessments.

Note: The Web Database uses VMT contributions by speed to aggregate the emission rates for Medium-Heavy and Heavy-Heavy Duty Trucks in the EMFAC2007 category scheme (MHDT and HHDT). Since each vehicle class is operated on different road type, speed limits, time of day, day of week, etc., the VMT contribution profiles for vehicles at different speed bins can be different from their total VMT contribution profile. Therefore, for MHDT and HHDT vehicles in EMFAC2007 scheme, the aggregation method in the Web Database may produce different emission factors from the EMFAC2011-PL tool. Although the emission factors from the web database are consistent with the planning inventories, they may not be the most suitable representation of fleet-wide average emission factors at different speeds for project-level analyses for those vehicles (MHDT, HHDT).

### 3.0 MODEL EXTRACTION

1. Extract the “EMFAC2011-PL (Ver 1.1).zip” file to the **root C drive (“C:\”)**
2. The process will create a folder on the root C Drive called “EMFAC2011-PL (Ver 1.1)” and will contain the “EMFAC2011-PL (Ver 1.1).mdb” file



### 4.0 SYSTEM REQUIREMENTS

The EMFAC2011-PL (Ver 1.1) tool requires Microsoft XP or a more recent operating system; and Microsoft Access and Excel 2003 or newer to run the tool.

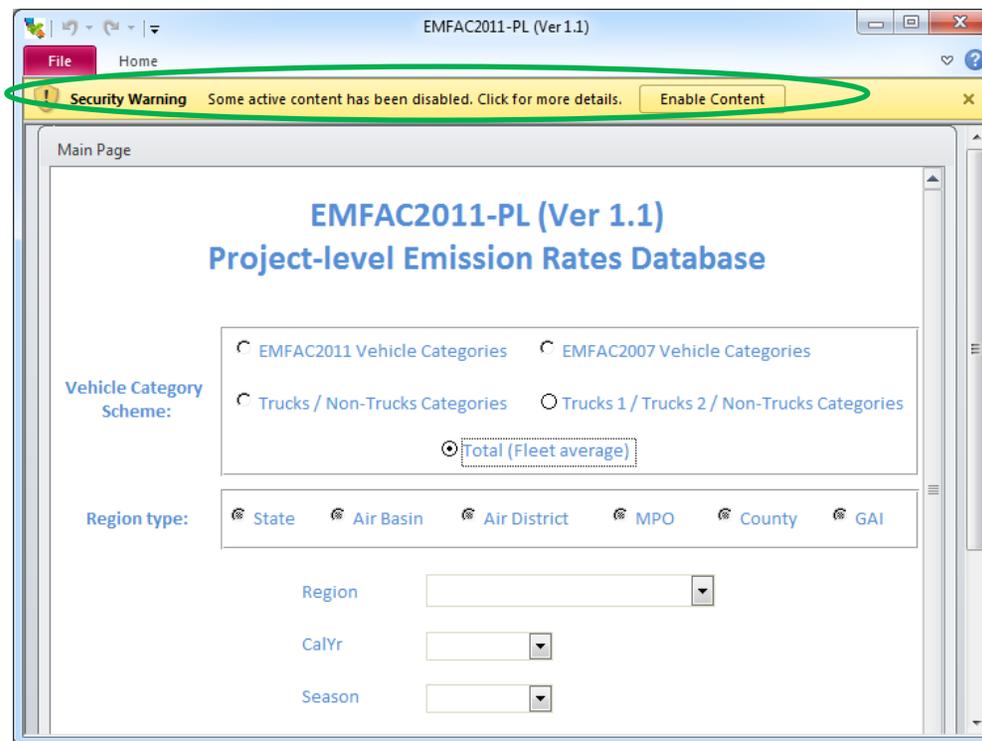
EMFAC2011-PL also requires that EMFAC2011-SG (Ver 1.1) is installed on the user’s computer since the PL tool uses the inventory files from the SG module.

## 5.0 MODEL INSTALLATION (FIRST TIME USER)

EMFAC2011-PL (Ver 1.1) contains Visual Basic for Applications (VBA) code for processing the data. Therefore, first time users may get a “Security Warning” depending on their system’s “*Security Settings*”. If such an error message is received, follow the steps described below to enable the modeling processors.

### 5.1 MICROSOFT® OFFICE 2007/2010 USERS:

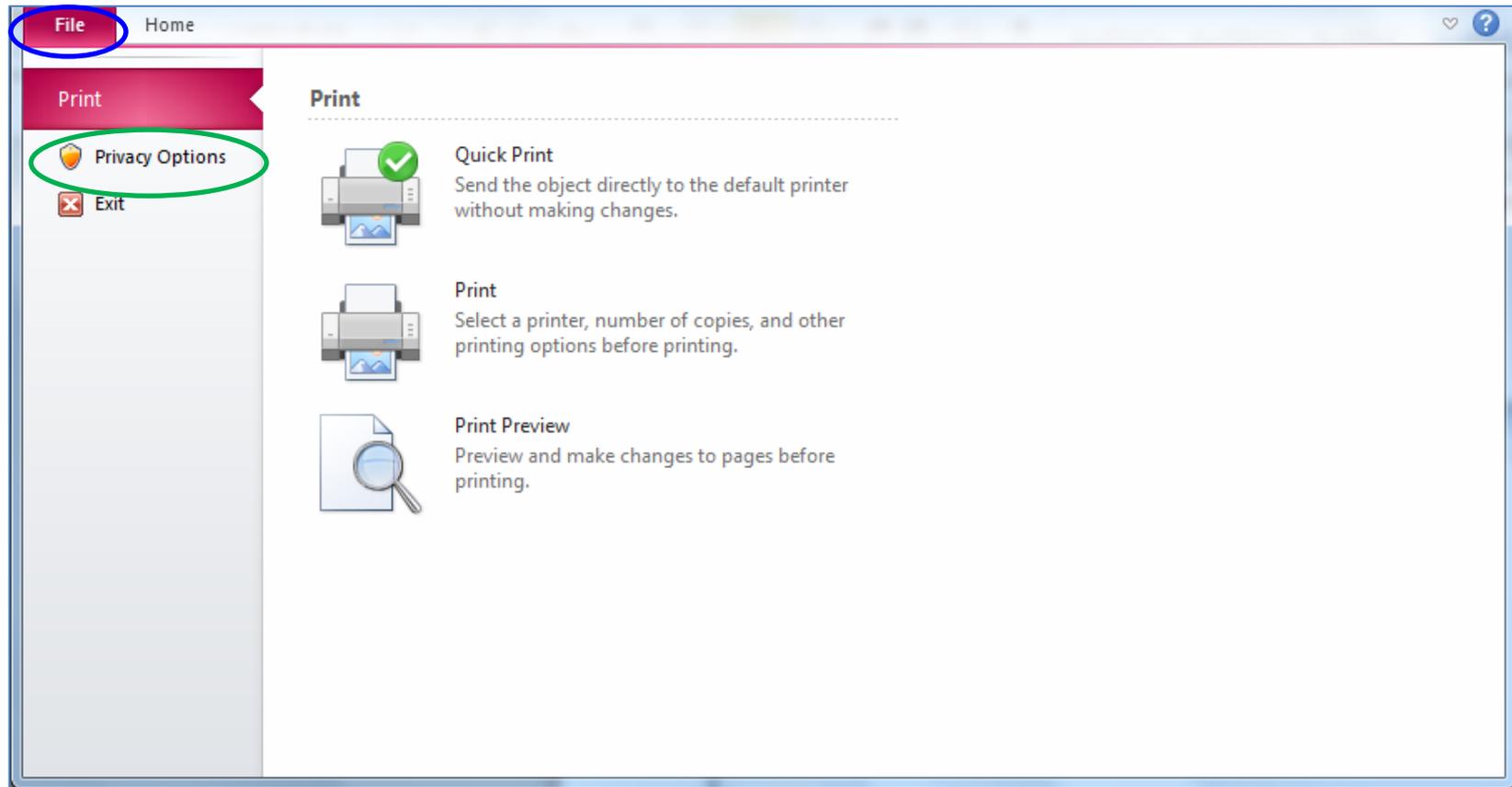
1. Open the file <C:\EMFAC2011-PL (Ver 1.1)\EMFAC2011-PL (Ver 1.1).mdb>
2. Microsoft® Office 2007/2010 users may receive a yellow notification ribbon at the top: “Security Warning – Some active content has been disabled. Click for more details.”



3. If the “Enable Content” button appears, click ‘Enable Content’ button to complete the installation procedure

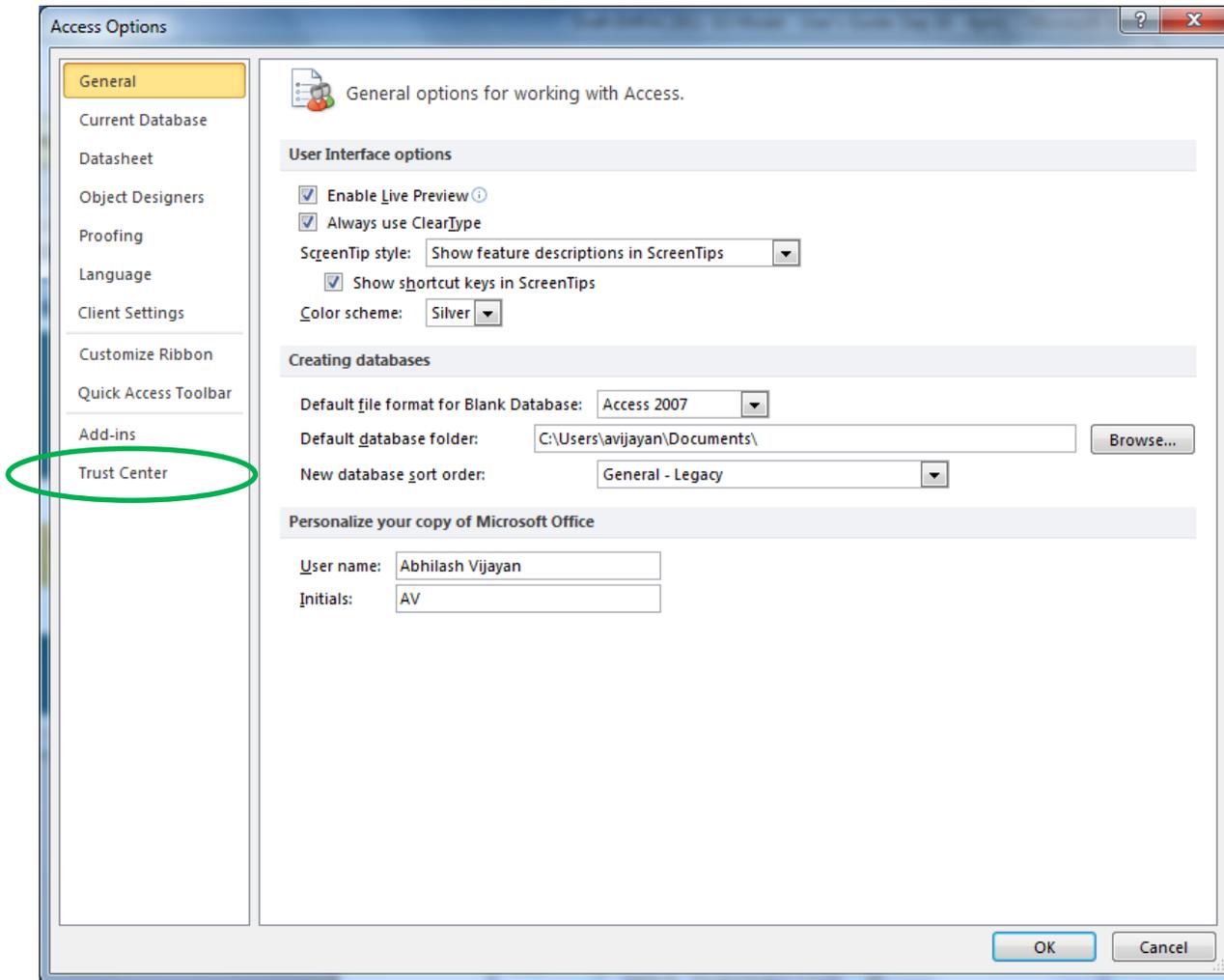
If the ‘Enable Content’ button doesn’t appear, then follow these steps:

- 4. Click ‘File’ to reach Microsoft Access Menu
- 5. Click ‘Privacy Options’ to reach Microsoft Access Options

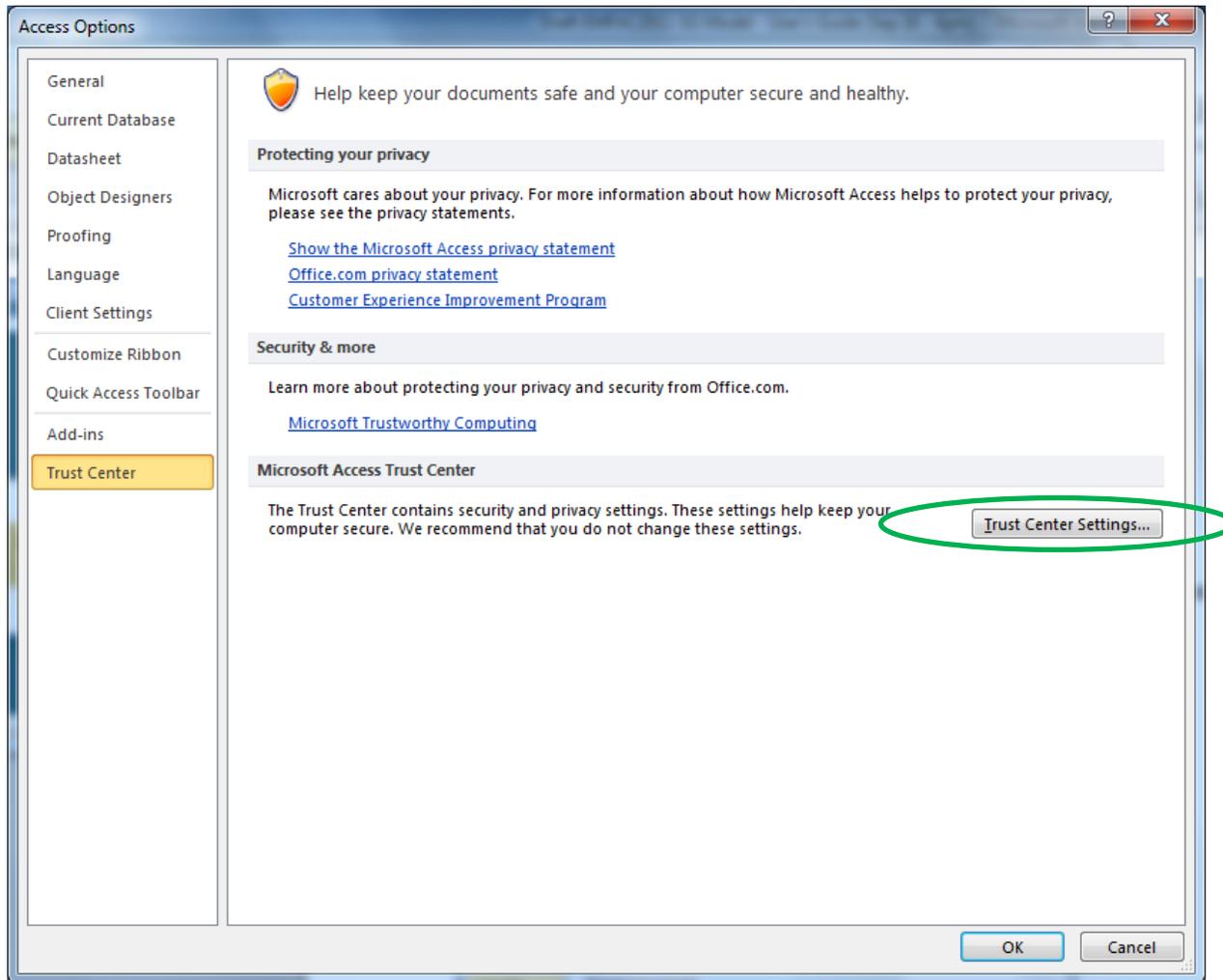


6. Access Options will open up

7. Click on 'Trust Center' button

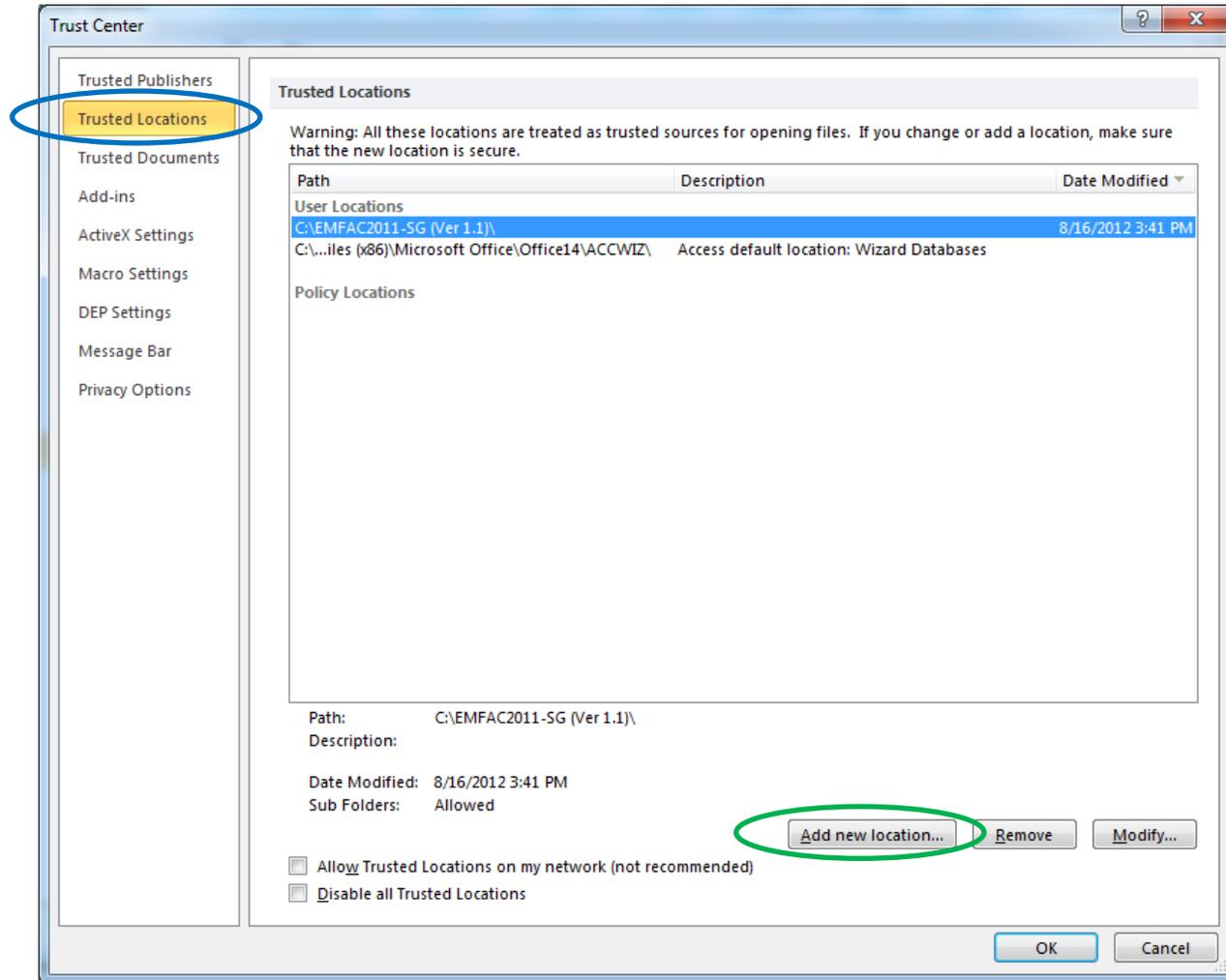


8. Trust Center Options will open up



9. Click on 'Trust Center Settings...' button

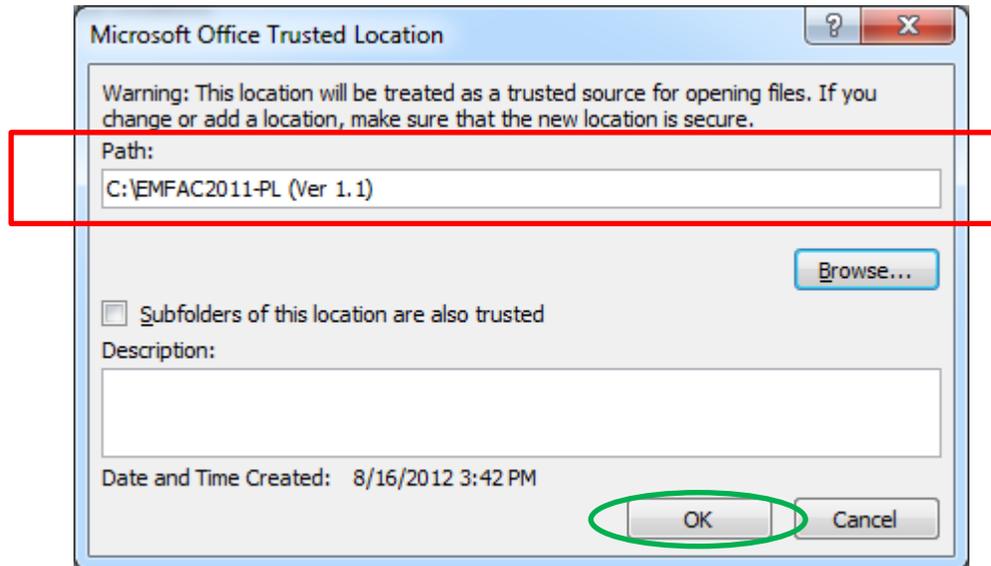
- 10. Click on 'Trusted Locations' option
- 11. Click on 'Add new location' button



12. Microsoft Office Trusted Location window will open up

13. Type “C:\EMFAC2011-PL (Ver 1.1)” in the ‘Path’ field

- o Click ‘OK’



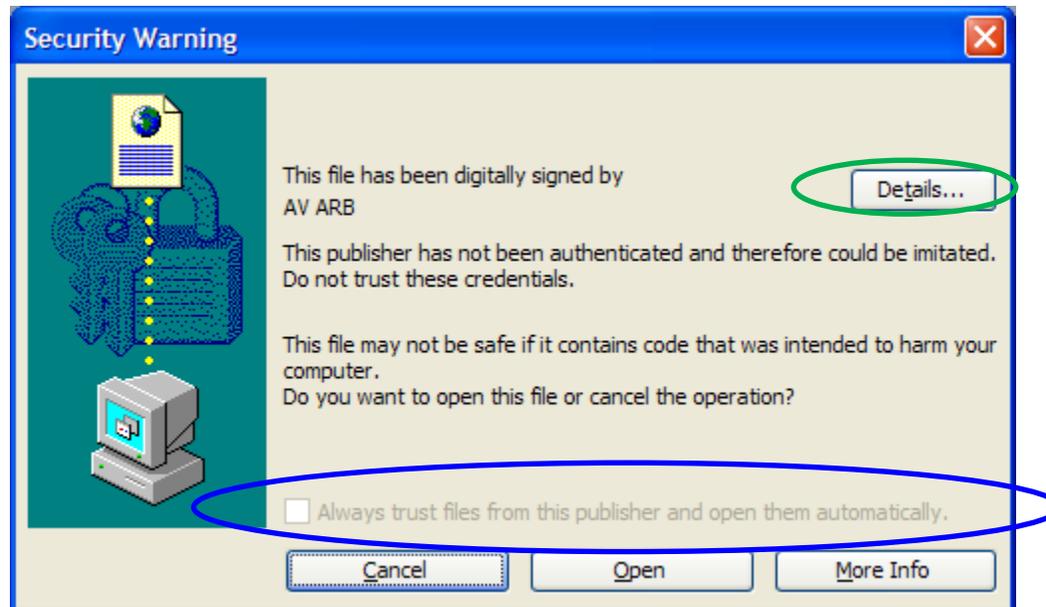
14. Click ‘OK’ on all previous messages boxes, and continue

15. Access will require closing and re-opening the EMFAC2011-PL database for options to take effect

16. Close the PL Tool to complete the installation procedure

## 5.2 MICROSOFT® OFFICE 2003 USERS:

1. Double Click on the <EMFAC2011-PL (Ver 1.1).mdb> file to open it
2. First time users using Microsoft® Office 2003 may get a Security Warning for authorizing the digital signature “AV ARB”:

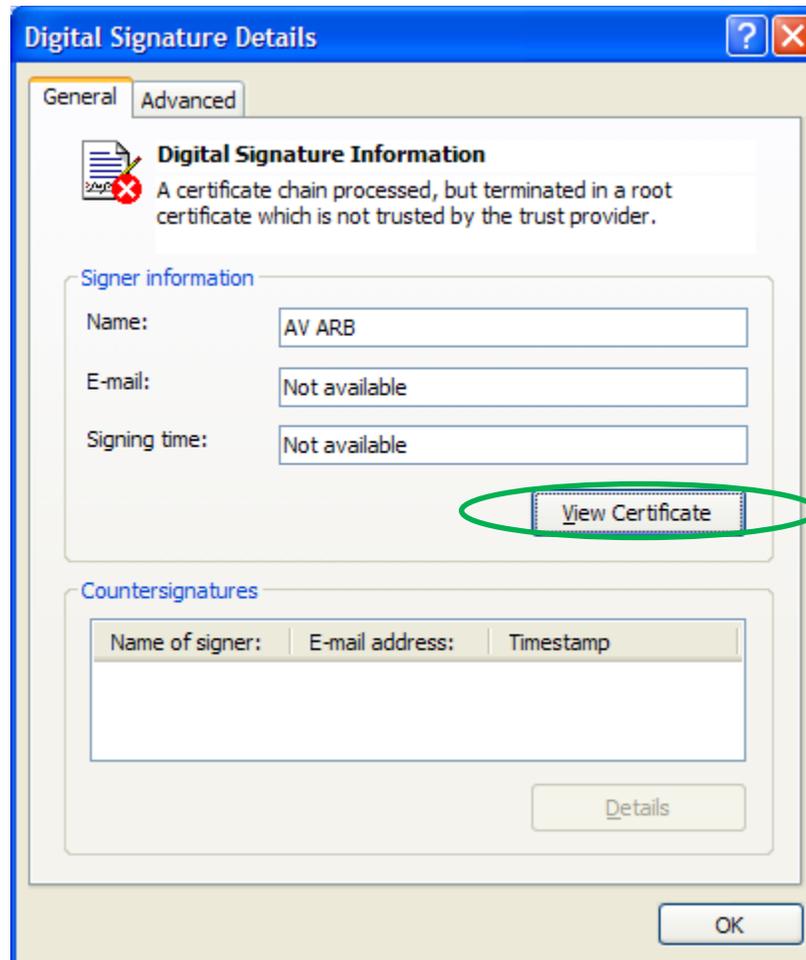


*If the 'Always trust files from this publisher and open the automatically' option is available, check the option and click 'Open'*

*(If the check box is checked, the following steps need not be completed)*

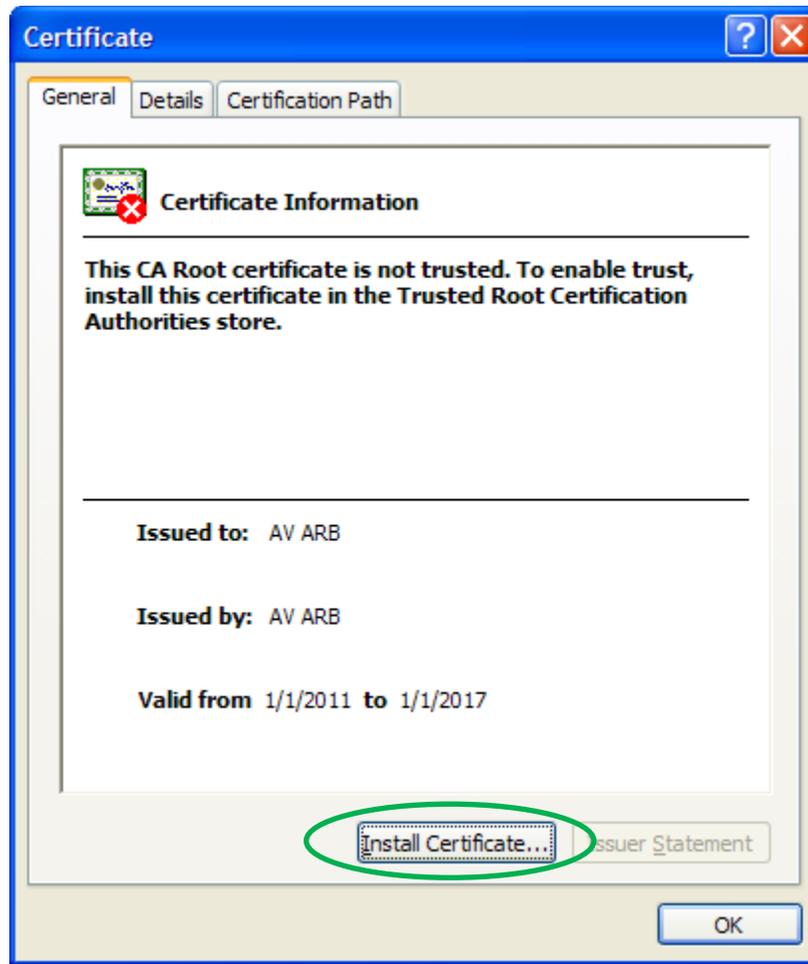
3. Click on the 'Details' button

4. The 'Digital Signature Details' for the digital signature "AV ARB" will open up



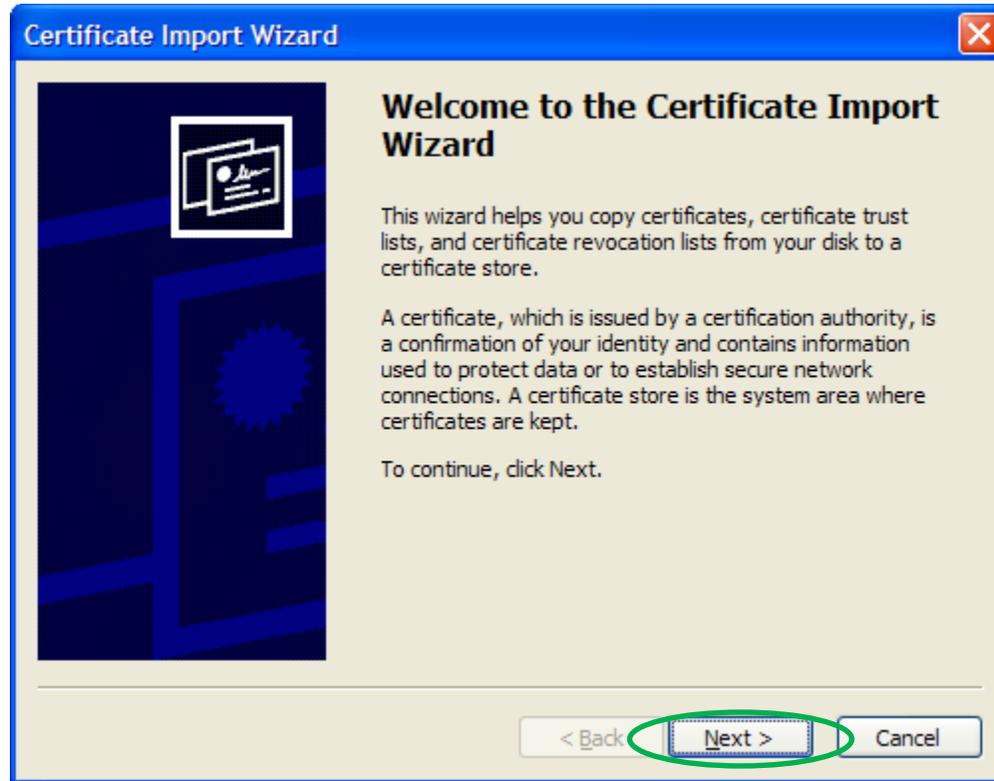
5. Click the 'View Certificate' button

6. The 'Certificate Information' will open up for the digital signature "AV ARB"



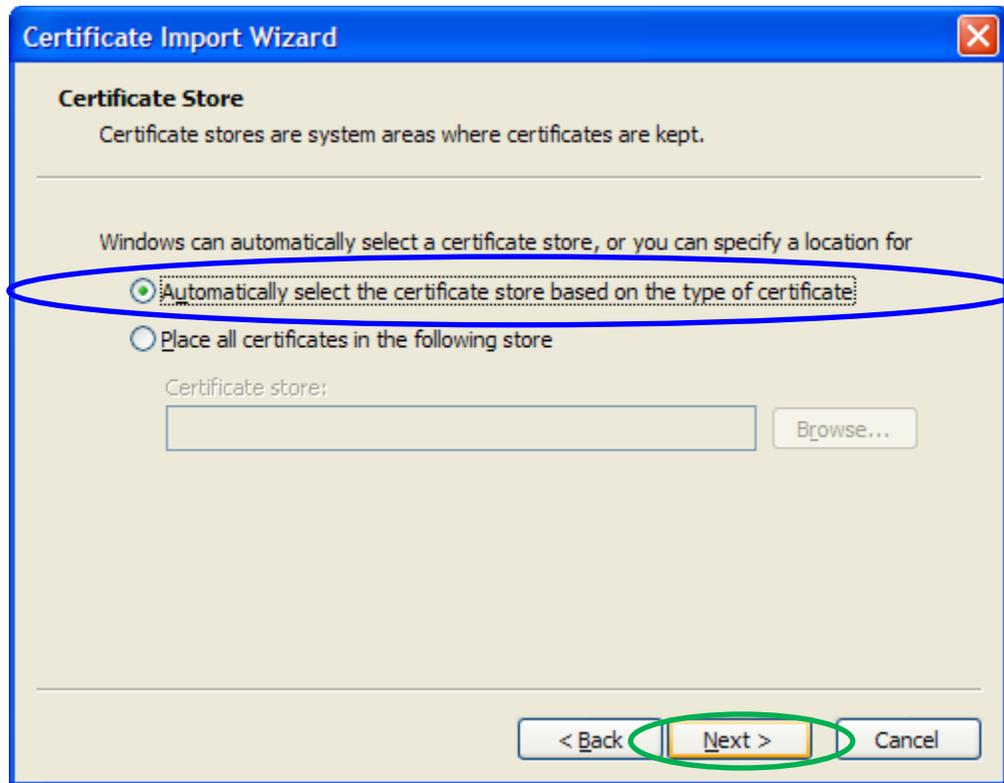
7. Click 'Install Certificate' button to install the digital signature "AV ARB"

8. The 'Certificate Import Wizard' will open

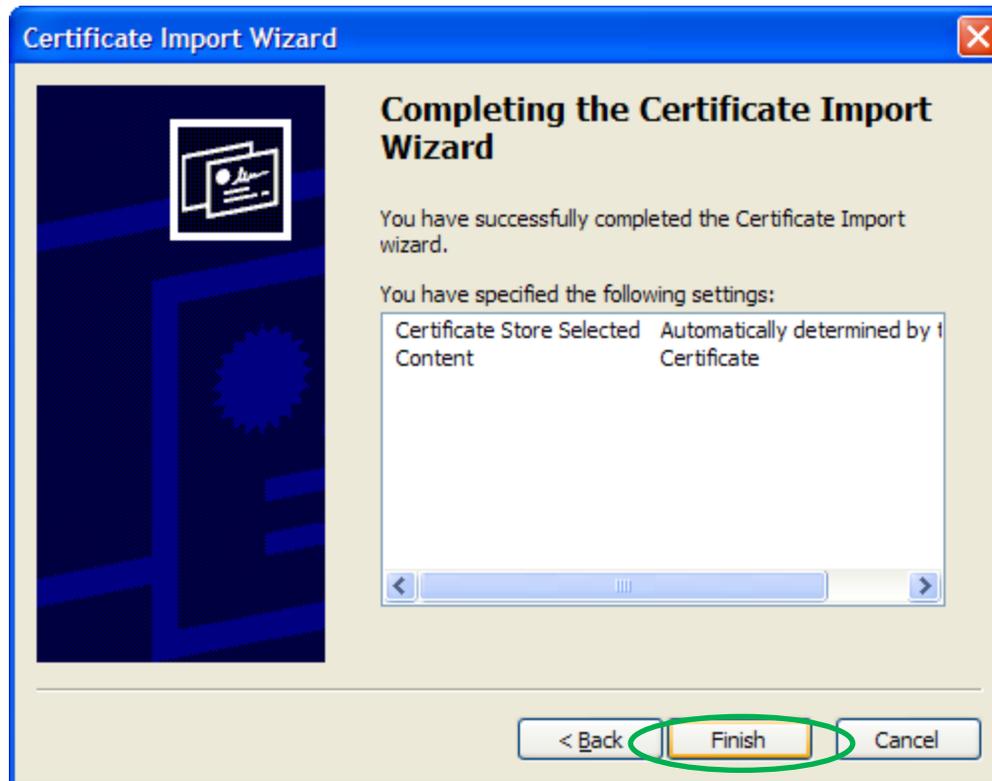


9. Click 'Next'

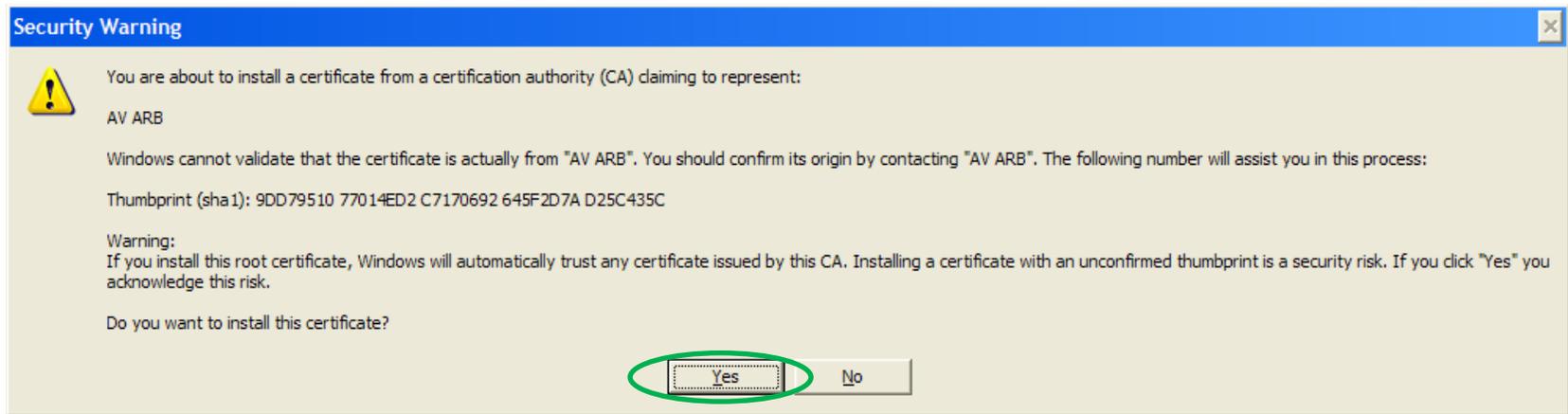
10. Select 'Automatically select the certificate store based on the type of certificate', and click 'Next'



11. Click 'Finish'



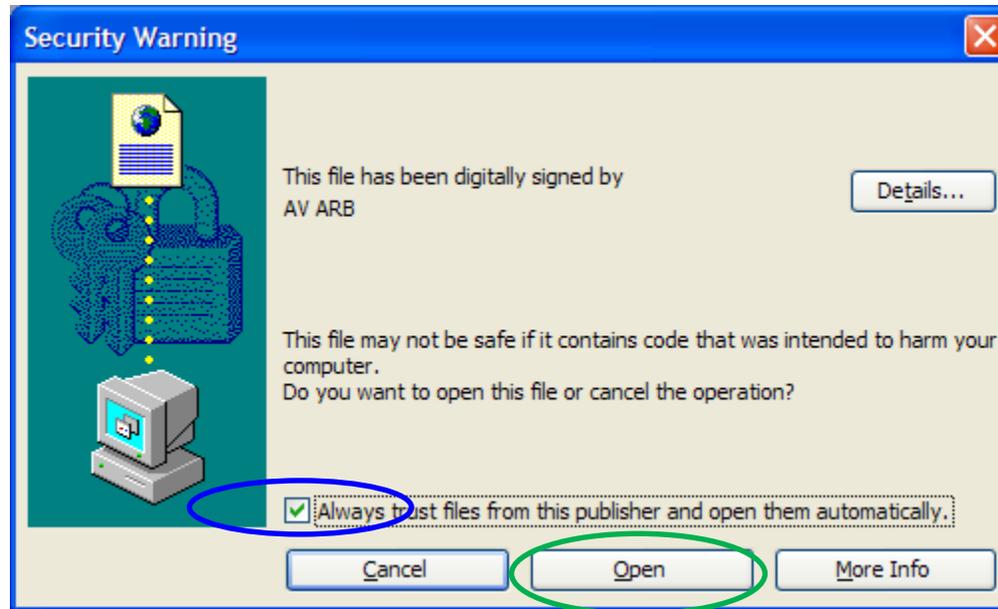
12. A final security warning will be displayed. Click 'Yes'



13. Click 'OK'



14. The Security Warning will show again, and the 'Always trust files from this publisher and open the automatically' option will be available. Check the option (to authorize MS Access documents with the digital signature "AV ARB") and click 'Open'



## 6.0 TOOL OPERATION

Open the file < C:\EMFAC2011-PL (Ver 1.1)\EMFAC2011-PL (Ver 1.1).mdb>

### EMFAC2011-PL (Ver 1.1) Project-level Emission Rates Database

Vehicle Category Scheme:

EMFAC2011 Vehicle Categories     EMFAC2007 Vehicle Categories

Trucks / Non-Trucks Categories     Trucks 1 / Trucks 2 / Non-Trucks Categories

Total (Fleet average)

Region type:

State     Air Basin     Air District     MPO     County     GAI

Region

CalYr

Season

Vehicle Category

Fuel Type

Speed

Reset

Download

Exit

## 6.1 INPUT DATA ELEMENTS

EMFAC2011-PL has eight main inputs:

- Vehicle Category Scheme:
  - EMFAC2011 Scheme
  - EMFAC 2007 Scheme
  - Truck / Non-Truck Scheme
  - Truck 1 / Truck 2 / Non-Truck Scheme
  - ALL Combined
- Region type
  - Statewide Average
  - Air Basin
  - Air District
  - MPO
  - County
  - Sub-Area (CoABDis or GAI)
- Region
- Calendar year
  - Any calendar year between 1990 and 2035
- Season
  - Annual
  - Summer
  - Winter
- Vehicle (based on the Vehicle Category Scheme selected)
- Fuel Technology (GAS, DSL, TOT, or ALL)
- Speed
  - Speeds from 5 - 70 MPH at 5 MPH increments

## 7.0 MODEL OUTPUTS

The model outputs are denoted by “EMFAC2011-PL Output” and contain the region, calendar year, and season title identifiers in the filename. The output files are created in Microsoft® Excel format (.xls), and contain the following worksheets:

- Running Exhaust Emissions Rates [RUNEX] in g/mile/veh
- Idling Exhaust Emissions Rates [IDLEX] in g/hr/veh
- Starting Exhaust Emissions Rates [STREX] in g/trip/veh
- PM Brake Wear [PMBW] and PM Tire Wear [PMTW] in g/mile/veh
- Evaporative Emission Rates in g/veh/day
  - Diurnal Emissions [DIURN]
  - Hot Soak Emissions [HTSK]
  - Running Loss Emissions [RUNLS]
  - Resting Loss Emissions [RESTL]
- Readme file

The following data are generated in each table:

- TOG Emissions
- ROG Emissions
- CO Emissions
- NO<sub>x</sub> Emissions
- CO<sub>2</sub> Emissions
- CO<sub>2</sub> Emissions (including Pavley I and LCFS adjustments)
- PM<sub>10</sub> Emissions
- PM<sub>2.5</sub> Emissions
- SO<sub>x</sub> Emissions

The following process emissions are generated for each pollutant:

- All Pollutants - Running Exhaust, Idling Exhaust, Starting Exhaust
- ROG and TOG - Diurnal Losses, Hot-Soak Losses, Running Losses, Resting Losses
- PM10 and PM2.5 - Brake wear, Tire wear

**Appendix A – Sub-Area Classification**

<b>Sub-Area</b>	<b>County</b>	<b>Air Basin</b>	<b>Air District</b>	<b>MPO</b>
Alameda (SF)	Alameda	San Francisco Bay Area	Bay Area AQMD	MTC
Alpine (GBV)	Alpine	Great Basin Valley	Great Basin Unified APCD	
Amador (MC)	Amador	Mountain Counties	Amador County APCD	
Butte (SV)	Butte	Sacramento Valley	Butte County AQMD	BCAG
Calaveras (MC)	Calaveras	Mountain Counties	Calaveras County APCD	
Colusa (SV)	Colusa	Sacramento Valley	Colusa County APCD	
Contra Costa (SF)	Contra Costa	San Francisco Bay Area	Bay Area AQMD	MTC
Del Norte (NC)	Del Norte	North Coast	North Coast Unified AQMD	
El Dorado (LT)	El Dorado	Lake Tahoe	El Dorado County APCD	TMPO
El Dorado (MC)	El Dorado	Mountain Counties	El Dorado County APCD	SACOG
Fresno (SV)	Fresno	San Joaquin Valley	San Joaquin Valley Unified APCD	COFCG
Glenn (SV)	Glenn	Sacramento Valley	Glenn County APCD	
Humboldt (NC)	Humboldt	North Coast	North Coast Unified AQMD	
Imperial (SS)	Imperial	Salton Sea	Imperial County APCD	SCAG
Inyo (GBV)	Inyo	Great Basin Valley	Great Basin Unified APCD	
Kern (MD)	Kern	Mojave Desert	Kern County APCD	KCOG
Kern (SV)	Kern	San Joaquin Valley	San Joaquin Valley Unified APCD	KCOG
Kings (SV)	Kings	San Joaquin Valley	San Joaquin Valley Unified APCD	KCAG
Lake (LC)	Lake	Lake County	Lake County APCD	
Lassen (NEP)	Lassen	Northeast Plateau	Lassen County APCD	
Los Angeles (MD)	Los Angeles	Mojave Desert	Antelope Valley APCD	SCAG
Los Angeles (SC)	Los Angeles	South Coast	South Coast AQMD	SCAG
Madera (SV)	Madera	San Joaquin Valley	San Joaquin Valley Unified APCD	MCTC
Marin (SF)	Marin	San Francisco Bay Area	Bay Area AQMD	MTC
Mariposa (MC)	Mariposa	Mountain Counties	Mariposa County APCD	
Mendocino (NC)	Mendocino	North Coast	Mendocino County APCD	
Merced (SV)	Merced	San Joaquin Valley	San Joaquin Valley Unified APCD	MCAG
Modoc (NEP)	Modoc	Northeast Plateau	Modoc County APCD	
Mono (GBV)	Mono	Great Basin Valley	Great Basin Unified APCD	
Monterey (NCC)	Monterey	North Central Coast	Monterey Bay Unified APCD	AMBAG
Napa (SF)	Napa	San Francisco Bay Area	Bay Area AQMD	MTC
Nevada (MC)	Nevada	Mountain Counties	Northern Sierra AQMD	
Orange (SC)	Orange	South Coast	South Coast AQMD	SCAG
Placer (LT)	Placer	Lake Tahoe	Placer County APCD	TMPO
Placer (MC)	Placer	Mountain Counties	Placer County APCD	SACOG
Placer (SV)	Placer	Sacramento Valley	Placer County APCD	SACOG
Plumas (MC)	Plumas	Mountain Counties	Northern Sierra AQMD	
Riverside (MD/MDAQMD)	Riverside	Mojave Desert	Mojave Desert AQMD	SCAG
Riverside (MD/SCAQMD)	Riverside	Mojave Desert	South Coast AQMD	SCAG
Riverside (SC)	Riverside	South Coast	South Coast AQMD	SCAG
Riverside (SS)	Riverside	Salton Sea	South Coast AQMD	SCAG
Sacramento (SV)	Sacramento	Sacramento Valley	Sacramento Metropolitan AQMD	SACOG
San Benito (NCC)	San Benito	North Central Coast	Monterey Bay Unified APCD	AMBAG
San Bernardino (MD)	San Bernardino	Mojave Desert	Mojave Desert AQMD	SCAG
San Bernardino (SC)	San Bernardino	South Coast	South Coast AQMD	SCAG
San Diego (SD)	San Diego	San Diego	San Diego County APCD	SANDAG
San Francisco (SF)	San Francisco	San Francisco Bay Area	Bay Area AQMD	MTC
San Joaquin (SV)	San Joaquin	San Joaquin Valley	San Joaquin Valley Unified APCD	SJCOG
San Luis Obispo (SCC)	San Luis Obispo	South Central Coast	San Luis Obispo County APCD	SLOCOG
San Mateo (SF)	San Mateo	San Francisco Bay Area	Bay Area AQMD	MTC
Santa Barbara (SCC)	Santa Barbara	South Central Coast	Santa Barbara County APCD	SBCAG
Santa Clara (SF)	Santa Clara	San Francisco Bay Area	Bay Area AQMD	MTC
Santa Cruz (NCC)	Santa Cruz	North Central Coast	Monterey Bay Unified APCD	AMBAG
Shasta (SV)	Shasta	Sacramento Valley	Shasta County AQMD	SCRTPA
Sierra (MC)	Sierra	Mountain Counties	Northern Sierra AQMD	
Siskiyou (NEP)	Siskiyou	Northeast Plateau	Siskiyou County APCD	
Solano (SF)	Solano	San Francisco Bay Area	Bay Area AQMD	MTC
Solano (SV)	Solano	Sacramento Valley	Yolo/Solano AQMD	MTC
Sonoma (NC)	Sonoma	North Coast	Northern Sonoma County APCD	MTC
Sonoma (SF)	Sonoma	San Francisco Bay Area	Bay Area AQMD	MTC
Stanislaus (SV)	Stanislaus	San Joaquin Valley	San Joaquin Valley Unified APCD	StanCOG
Sutter (SV)	Sutter	Sacramento Valley	Feather River AQMD	SACOG
Tehama (SV)	Tehama	Sacramento Valley	Tehama County APCD	
Trinity (NC)	Trinity	North Coast	North Coast Unified AQMD	
Tulare (SV)	Tulare	San Joaquin Valley	San Joaquin Valley Unified APCD	TCAG
Tuolumne (MC)	Tuolumne	Mountain Counties	Tuolumne County APCD	
Ventura (SCC)	Ventura	South Central Coast	Ventura County APCD	SCAG
Yolo (SV)	Yolo	Sacramento Valley	Yolo/Solano AQMD	SACOG
Yuba (SV)	Yuba	Sacramento Valley	Feather River AQMD	SACOG

**Appendix B – EMFAC2011 Vehicle Category Classification**

Index	EMFAC2011 Veh & Tech	EMFAC2011 Vehicle	Description	Source	EMFAC2007 Vehicle	Truck / Non-Truck Category	Truck 1 / Truck 2 / Non-Truck Category	
1	LDA - DSL	LDA	Passenger Cars	EMFAC-LDV	LDA	Non-Trucks	Non-Trucks	
2	LDA - GAS			EMFAC-LDV		Non-Trucks	Non-Trucks	
3	LDT1 - DSL	LDT1	Light-Duty Trucks (0-3750 lbs)	EMFAC-LDV	LDT1	Non-Trucks	Non-Trucks	
4	LDT1 - GAS			EMFAC-LDV		Non-Trucks	Non-Trucks	
5	LDT2 - DSL	LDT2	Light-Duty Trucks (3751-5750 lbs)	EMFAC-LDV	LDT2	Non-Trucks	Non-Trucks	
6	LDT2 - GAS			EMFAC-LDV		Non-Trucks	Non-Trucks	
7	LHD1 - DSL	LHD1	Light-Heavy-Duty Trucks (8501-10000 lbs)	EMFAC-LDV	LHDT1	Trucks	Truck 1	
8	LHD1 - GAS			EMFAC-LDV		Trucks	Truck 1	
9	LHD2 - DSL	LHD2	Light-Heavy-Duty Trucks (10001-14000 lbs)	EMFAC-LDV	LHDT2	Trucks	Truck 1	
10	LHD2 - GAS			EMFAC-LDV		Trucks	Truck 1	
11	MCY - GAS	MCY	Motorcycles	EMFAC-LDV	MCY	Non-Trucks	Non-Trucks	
12	MDV - DSL	MDV	Medium-Duty Trucks (5751-8500 lbs)	EMFAC-LDV	MDV	Non-Trucks	Non-Trucks	
13	MDV - GAS			EMFAC-LDV		Non-Trucks	Non-Trucks	
14	MH - DSL	MH	Motor Homes	EMFAC-LDV	MH	Non-Trucks	Non-Trucks	
15	MH - GAS			EMFAC-LDV		Non-Trucks	Non-Trucks	
16	T6 Ag - DSL	T6 Ag	Medium-Heavy Duty Diesel Agriculture Truck	EMFAC-HD	MHDT	Trucks	Truck 2	
17	T6 CAIRP heavy - DSL	T6 CAIRP heavy	Medium-Heavy Duty Diesel CA International Registration Plan Truck with GVWR>26000 lbs	EMFAC-HD		Trucks	Truck 2	
18	T6 CAIRP small - DSL	T6 CAIRP small	Medium-Heavy Duty Diesel CA International Registration Plan Truck with GVWR<=26000 lbs	EMFAC-HD		Trucks	Truck 2	
19	T6 instate construction heavy - DSL	T6 instate construction heavy	Medium-Heavy Duty Diesel instate construction Truck with GVWR>26000 lbs	EMFAC-HD		Trucks	Truck 2	
20	T6 instate construction small - DSL	T6 instate construction small	Medium-Heavy Duty Diesel instate construction Truck with GVWR<=26000 lbs	EMFAC-HD		Trucks	Truck 2	
21	T6 instate heavy - DSL	T6 instate heavy	Medium-Heavy Duty Diesel instate Truck with GVWR>26000 lbs	EMFAC-HD		Trucks	Truck 2	
22	T6 instate small - DSL	T6 instate small	Medium-Heavy Duty Diesel instate Truck with GVWR<=26000 lbs	EMFAC-HD		Trucks	Truck 2	
23	T6 OOS heavy - DSL	T6 OOS heavy	Medium-Heavy Duty Diesel Out-of-state Truck with GVWR>26000 lbs	EMFAC-HD		Trucks	Truck 2	
24	T6 OOS small - DSL	T6 OOS small	Medium-Heavy Duty Diesel Out-of-state Truck with GVWR<=26000 lbs	EMFAC-HD		Trucks	Truck 2	
25	T6 Public - DSL	T6 Public	Medium-Heavy Duty Diesel Public Fleet Truck	EMFAC-HD		Trucks	Truck 2	
26	T6 utility - DSL	T6 utility	Medium-Heavy Duty Diesel Utility Fleet Truck	EMFAC-HD		Trucks	Truck 2	
27	T6TS - GAS	T6TS	Medium-Heavy Duty Gasoline Truck	EMFAC-LDV		Trucks	Truck 2	
28	T7 Ag - DSL	T7 Ag	Heavy-Heavy Duty Diesel Agriculture Truck	EMFAC-HD		HHDT	Trucks	Truck 2
29	T7 CAIRP - DSL	T7 CAIRP	Heavy-Heavy Duty Diesel CA International Registration Plan Truck	EMFAC-HD			Trucks	Truck 2
30	T7 CAIRP construction - DSL	T7 CAIRP construction	Heavy-Heavy Duty Diesel CA International Registration Plan Construction Truck	EMFAC-HD	Trucks		Truck 2	
31	T7 NNOOS - DSL	T7 NNOOS	Heavy-Heavy Duty Diesel Non-Neighboring Out-of-state Truck	EMFAC-HD	Trucks		Truck 2	
32	T7 NOOS - DSL	T7 NOOS	Heavy-Heavy Duty Diesel Neighboring Out-of-state Truck	EMFAC-HD	Trucks		Truck 2	
33	T7 other port - DSL	T7 other port	Heavy-Heavy Duty Diesel Drayage Truck at Other Facilities	EMFAC-HD	Trucks		Truck 2	
34	T7 POAK - DSL	T7 POAK	Heavy-Heavy Duty Diesel Drayage Truck in Bay Area	EMFAC-HD	Trucks		Truck 2	
35	T7 POLA - DSL	T7 POLA	Heavy-Heavy Duty Diesel Drayage Truck near South Coast	EMFAC-HD	Trucks		Truck 2	
36	T7 Public - DSL	T7 Public	Heavy-Heavy Duty Diesel Public Fleet Truck	EMFAC-HD	Trucks		Truck 2	
37	T7 Single - DSL	T7 Single	Heavy-Heavy Duty Diesel Single Unit Truck	EMFAC-HD	Trucks		Truck 2	
38	T7 single construction - DSL	T7 single construction	Heavy-Heavy Duty Diesel Single Unit Construction Truck	EMFAC-HD	Trucks		Truck 2	
39	T7 SWCV - DSL	T7 SWCV	Heavy-Heavy Duty Diesel Solid Waste Collection Truck	EMFAC-HD	Trucks		Truck 2	
40	T7 tractor - DSL	T7 tractor	Heavy-Heavy Duty Diesel Tractor Truck	EMFAC-HD	Trucks		Truck 2	
41	T7 tractor construction - DSL	T7 tractor construction	Heavy-Heavy Duty Diesel Tractor Construction Truck	EMFAC-HD	Trucks		Truck 2	
42	T7 utility - DSL	T7 utility	Heavy-Heavy Duty Diesel Utility Fleet Truck	EMFAC-HD	Trucks	Truck 2		
43	T7IS - GAS	T7IS	Heavy-Heavy Duty Gasoline Truck	EMFAC-LDV	Trucks	Truck 2		
44	PTO - DSL	PTO	Power Take Off	EMFAC-HD	Trucks	Truck 2		
45	SBUS - DSL	SBUS	School Buses	EMFAC-HD	SBUS	Non-Trucks	Non-Trucks	
46	SBUS - GAS		School Buses	EMFAC-LDV		Non-Trucks	Non-Trucks	
47	UBUS - DSL	UBUS	Urban Buses	EMFAC-LDV	UBUS	Non-Trucks	Non-Trucks	
48	UBUS - GAS			EMFAC-LDV		Non-Trucks	Non-Trucks	
49	Motor Coach - DSL	Motor Coach	Motor Coach	EMFAC-HD	OBUS	Non-Trucks	Non-Trucks	
50	OBUS - GAS	OBUS	Other Buses	EMFAC-LDV		Non-Trucks	Non-Trucks	
51	All Other Buses - DSL	All Other Buses	All Other Buses	EMFAC-HD		Non-Trucks	Non-Trucks	

**Appendix C – HD Idling Emission Rate Region Lookup Table**

<b>Region Type</b>	<b>Region</b>	<b>HD Idle ER Lookup Region</b>
<b>State</b>	<b>California</b>	<b>California</b>
Air Basin	Great Basin Valley	Great Basin Valley
Air Basin	Lake County	Lake County
Air Basin	Lake Tahoe	Lake Tahoe
Air Basin	Mojave Desert	Mojave Desert
Air Basin	Mountain Counties	Mountain Counties
Air Basin	North Central Coast	North Central Coast
Air Basin	North Coast	North Coast
Air Basin	Northeast Plateau	Northeast Plateau
Air Basin	Sacramento Valley	Sacramento Valley
Air Basin	Salton Sea	Salton Sea
Air Basin	San Diego	San Diego
Air Basin	San Francisco Bay Area	San Francisco Bay Area
Air Basin	San Joaquin Valley	San Joaquin Valley
Air Basin	South Central Coast	South Central Coast
Air Basin	South Coast	South Coast
Air District	Amador County APCD	Mountain Counties
Air District	Antelope Valley APCD	Mojave Desert
Air District	Bay Area AQMD	San Francisco Bay Area
Air District	Butte County AQMD	Sacramento Valley
Air District	Calaveras County APCD	Mountain Counties
Air District	Colusa County APCD	Sacramento Valley
Air District	El Dorado County APCD	Mountain Counties
Air District	Feather River AQMD	Sacramento Valley
Air District	Glenn County APCD	Sacramento Valley
Air District	Great Basin Unified APCD	Great Basin Valley
Air District	Imperial County APCD	Salton Sea
Air District	Kern County APCD	Mojave Desert
Air District	Lake County APCD	Lake County
Air District	Lassen County APCD	Northeast Plateau
Air District	Mariposa County APCD	Mountain Counties
Air District	Mendocino County APCD	North Coast
Air District	Modoc County APCD	Northeast Plateau
Air District	Mojave Desert AQMD	Mojave Desert
Air District	Monterey Bay Unified APCD	North Central Coast
Air District	North Coast Unified AQMD	North Coast
Air District	Northern Sierra AQMD	Mountain Counties
Air District	Northern Sonoma County APCD	North Coast
Air District	Placer County APCD	Sacramento Valley
Air District	Sacramento Metropolitan AQMD	Sacramento Valley
Air District	San Diego County APCD	San Diego
Air District	San Joaquin Valley Unified APCD	San Joaquin Valley
Air District	San Luis Obispo County APCD	South Central Coast
Air District	Santa Barbara County APCD	South Central Coast
Air District	Shasta County AQMD	Sacramento Valley
Air District	Siskiyou County APCD	Northeast Plateau
Air District	South Coast AQMD	South Coast
Air District	Tehama County APCD	Sacramento Valley
Air District	Tuolumne County APCD	Mountain Counties
Air District	Ventura County APCD	South Central Coast
Air District	Yolo/Solano AQMD	Sacramento Valley
County	Alameda	San Francisco Bay Area
County	Alpine	Great Basin Valley
County	Amador	Mountain Counties
County	Butte	Sacramento Valley
County	Calaveras	Mountain Counties
County	Colusa	Sacramento Valley
County	Contra Costa	San Francisco Bay Area
County	Del Norte	North Coast
County	El Dorado	Mountain Counties
County	Fresno	San Joaquin Valley
County	Glenn	Sacramento Valley
County	Humboldt	North Coast
County	Imperial	Salton Sea
County	Inyo	Great Basin Valley
County	Kern	San Joaquin Valley
County	Kings	San Joaquin Valley
County	Lake	Lake County
County	Lassen	Northeast Plateau

Region Type	Region	HD Idle ER Lookup Region
County	Los Angeles	South Coast
County	Madera	San Joaquin Valley
County	Marin	San Francisco Bay Area
County	Mariposa	Mountain Counties
County	Mendocino	North Coast
County	Merced	San Joaquin Valley
County	Modoc	Northeast Plateau
County	Mono	Great Basin Valley
County	Monterey	North Central Coast
County	Napa	San Francisco Bay Area
County	Nevada	Mountain Counties
County	Orange	South Coast
County	Placer	Sacramento Valley
County	Plumas	Mountain Counties
County	Riverside	South Coast
County	Sacramento	Sacramento Valley
County	San Benito	North Central Coast
County	San Bernardino	South Coast
County	San Diego	San Diego
County	San Francisco	San Francisco Bay Area
County	San Joaquin	San Joaquin Valley
County	San Luis Obispo	South Central Coast
County	San Mateo	San Francisco Bay Area
County	Santa Barbara	South Central Coast
County	Santa Clara	San Francisco Bay Area
County	Santa Cruz	North Central Coast
County	Shasta	Sacramento Valley
County	Sierra	Mountain Counties
County	Siskiyou	Northeast Plateau
County	Solano	San Francisco Bay Area
County	Sonoma	San Francisco Bay Area
County	Stanislaus	San Joaquin Valley
County	Sutter	Sacramento Valley
County	Tehama	Sacramento Valley
County	Trinity	North Coast
County	Tulare	San Joaquin Valley
County	Tuolumne	Mountain Counties
County	Ventura	South Central Coast
County	Yolo	Sacramento Valley
County	Yuba	Sacramento Valley
MPO	AMBAG	North Central Coast
MPO	BCAG	Sacramento Valley
MPO	COFCG	San Joaquin Valley
MPO	KCAG	San Joaquin Valley
MPO	KCOG	San Joaquin Valley
MPO	MCAG	San Joaquin Valley
MPO	MCTC	San Joaquin Valley
MPO	MTC	San Francisco Bay Area
MPO	SACOG	Sacramento Valley
MPO	SANDAG	San Diego
MPO	SBCAG	South Central Coast
MPO	SCAG	South Coast
MPO	SCRTPA	Sacramento Valley
MPO	SJCOG	San Joaquin Valley
MPO	SLOCOG	South Central Coast
MPO	StanCOG	San Joaquin Valley
MPO	TCAG	San Joaquin Valley
MPO	TMPO	Lake Tahoe
GAI	Alameda (SF)	San Francisco Bay Area
GAI	Alpine (GBV)	Great Basin Valley
GAI	Amador (MC)	Mountain Counties
GAI	Butte (SV)	Sacramento Valley
GAI	Calaveras (MC)	Mountain Counties
GAI	Colusa (SV)	Sacramento Valley
GAI	Contra Costa (SF)	San Francisco Bay Area
GAI	Del Norte (NC)	North Coast
GAI	El Dorado (LT)	Lake Tahoe
GAI	El Dorado (MC)	Mountain Counties
GAI	Fresno (SV)	San Joaquin Valley
GAI	Glenn (SV)	Sacramento Valley
GAI	Humboldt (NC)	North Coast

Region Type	Region	HD Idle ER Lookup Region
GAI	Imperial (SS)	Salton Sea
GAI	Inyo (GBV)	Great Basin Valley
GAI	Kern (MD)	Mojave Desert
GAI	Kern (SJV)	San Joaquin Valley
GAI	Kings (SJV)	San Joaquin Valley
GAI	Lake (LC)	Lake County
GAI	Lassen (NEP)	Northeast Plateau
GAI	Los Angeles (MD)	Mojave Desert
GAI	Los Angeles (SC)	South Coast
GAI	Madera (SJV)	San Joaquin Valley
GAI	Marin (SF)	San Francisco Bay Area
GAI	Mariposa (MC)	Mountain Counties
GAI	Mendocino (NC)	North Coast
GAI	Merced (SJV)	San Joaquin Valley
GAI	Modoc (NEP)	Northeast Plateau
GAI	Mono (GBV)	Great Basin Valley
GAI	Monterey (NCC)	North Central Coast
GAI	Napa (SF)	San Francisco Bay Area
GAI	Nevada (MC)	Mountain Counties
GAI	Orange (SC)	South Coast
GAI	Placer (LT)	Lake Tahoe
GAI	Placer (MC)	Mountain Counties
GAI	Placer (SV)	Sacramento Valley
GAI	Plumas (MC)	Mountain Counties
GAI	Riverside (MD/MDAQMD)	Mojave Desert
GAI	Riverside (MD/SCAQMD)	Mojave Desert
GAI	Riverside (SC)	South Coast
GAI	Riverside (SS)	Salton Sea
GAI	Sacramento (SV)	Sacramento Valley
GAI	San Benito (NCC)	North Central Coast
GAI	San Bernardino (MD)	Mojave Desert
GAI	San Bernardino (SC)	South Coast
GAI	San Diego (SD)	San Diego
GAI	San Francisco (SF)	San Francisco Bay Area
GAI	San Joaquin (SJV)	San Joaquin Valley
GAI	San Luis Obispo (SCC)	South Central Coast
GAI	San Mateo (SF)	San Francisco Bay Area
GAI	Santa Barbara (SCC)	South Central Coast
GAI	Santa Clara (SF)	San Francisco Bay Area
GAI	Santa Cruz (NCC)	North Central Coast
GAI	Shasta (SV)	Sacramento Valley
GAI	Sierra (MC)	Mountain Counties
GAI	Siskiyou (NEP)	Northeast Plateau
GAI	Solano (SF)	San Francisco Bay Area
GAI	Solano (SV)	Sacramento Valley
GAI	Sonoma (NC)	North Coast
GAI	Sonoma (SF)	San Francisco Bay Area
GAI	Stanislaus (SJV)	San Joaquin Valley
GAI	Sutter (SV)	Sacramento Valley
GAI	Tehama (SV)	Sacramento Valley
GAI	Trinity (NC)	North Coast
GAI	Tulare (SJV)	San Joaquin Valley
GAI	Tuolumne (MC)	Mountain Counties
GAI	Ventura (SCC)	South Central Coast
GAI	Yolo (SV)	Sacramento Valley
GAI	Yuba (SV)	Sacramento Valley