

# Update on Proposed Analysis of Organic Tracers

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**MATES-III Technical Advisory Group Meeting  
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## Overview

- Last MATES-III Technical Advisory Committee meeting it was recommended that organic tracer analysis be considered on PM<sub>2.5</sub> samples
- Informal meeting with professors at the USC Particle Center and Supersite on May, 5<sup>th</sup> regarding:
  - Benefits to using organic tracers
  - Methodology

## Possible Approach

- Compile monthly 1 in 3 day PM<sub>2.5</sub> samples from each of the ten fixed sites
  - 120 total samples
  - 500 µg of material
- Analyze for 30-50 organic compounds
  - Source specific organic compounds
  - Secondary organic compounds
- Compile data (Organic Tracers, EC/OC, Metals)
- Apply Chemical Mass Balance model to obtain source apportionment

## Chemical Mass Balance Model

- Used to estimate source contributions to ambient samples collected at monitoring sites using source profiles.
- Establishes a mass balance from measured constituents in an ambient sample as coming from a linear combination of the chemical compositions from contributing sources

## Examples of Compounds and Sources

Hopanes, Steranes EC	→	Gasoline + Diesel Combustion	→	EC (small amount) Benzo[gh]perylene  EC Methylated PAH's?
Cholesterol, Oleic Acid, EC (small amount)	→	Meat Charbroiling		
Levoglucosan EC (small amount)	→	Biomass Burning		
Odd numbered Alkanes	→	Vegetative Detritus		
Aluminum and Silicon	→	Road and Soil Dust		
Phthalic acid, alkanoic diacids	→	Secondary Organics		

## Studies Measuring Diesel in So. Cal.

### Manchester-Neesvig *et al* Source Contributions

	PM <sub>10</sub> (µg/m <sup>3</sup> ) 1995 Average		
	Upland	Riverside	Long Beach
<b>Diesel</b>	<b>3.25</b>	<b>2.39</b>	<b>3.57</b>
Gasoline	0.39	0.34	0.60
Wood Smoke	0.91	0.61	0.48
Vegetative Detritus	0.46	0.52	0.34
Natural Gas Comb.	0.01	0	0.0
Tire Debris	0.68	0.95	1.18

### MATES-II

#### April 1998 - March 1999 Average PM<sub>10</sub> (µg/m<sup>3</sup>)

	Fontana	Rubidoux	Long Beach
<b>Diesel</b>	<b>3.51</b>	<b>3.52</b>	<b>2.64</b>

## Issues:

- Analytical and Model Uncertainty
- All Sources Accounted For
- Accuracy of Source Profiles

Next Steps?