

Siting of Monitoring Stations Representative ? Compliant ?

Mathew Plate



Siting and Design of Stations

- Primarily defined by 40 CFR Part 58 Appendices D & E
- Information on collocation distances in Appendix A
- Additional information in QA Handbook Volume II
- Information on Meteorology in QA Handbook Volume IV, Modeling Guidance, National Weather Service Guidance, and International Guidance

Objectives

- Provide air pollution data to the public
 - Supporting forecasts and advisories
- Support compliance with ambient air standards
 - Primarily the NAAQS
- Support research studies

Representativeness

- Not a specific criterion
- but the goal of monitoring
- The site should represent the area at the appropriate scale
- This is a subjective evaluation



Representativeness

- If exceptions are made based on representativeness ask for an expert review
 - Sites that meet siting criteria but do not appear to be representative
 - Sites that do not meet siting criteria but appear to be representative

Obstructions

- Probes (sampling inlets) should have 270° unrestricted air flow
 - An obstruction = anything that is higher than ½ the distance from the probe
 - The 270° arc should include predominant wind directions
 - For some pollutants, scales and site types as low as 180° of unobstructed arc is OK

Obstructions

- Monitors must be at least 2m from walls, parapets and other significant structures
- Obstructions change over time and need to be re-evaluated periodically

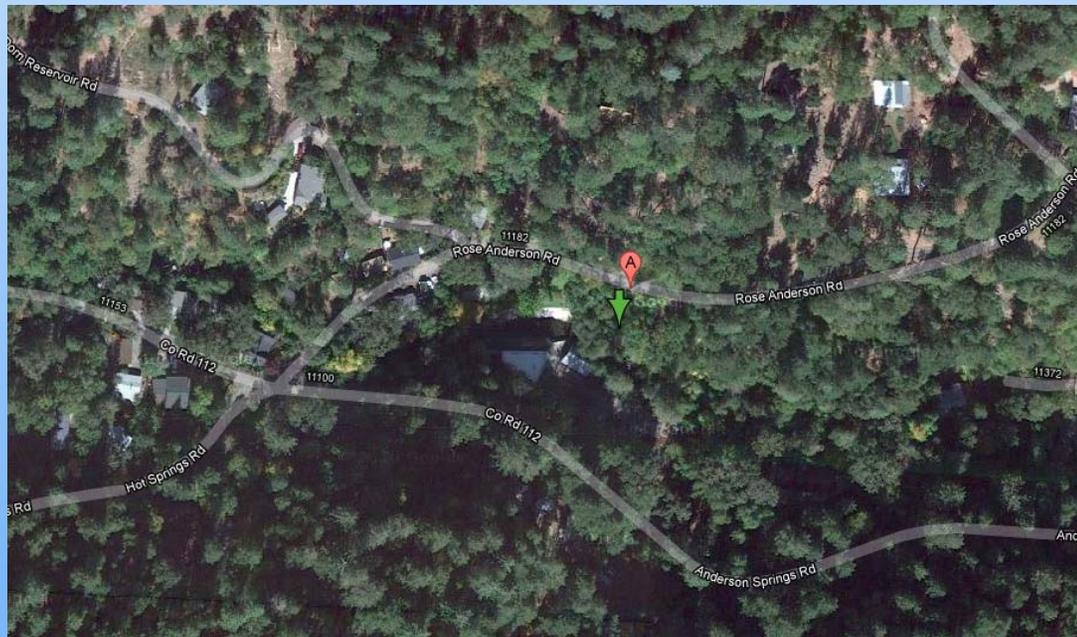
Trees

- ▣ Trees can scavenge pollutants and can be a source of particulates
- ▣ Any tree higher than the inlet should be more than 10m, preferably 20m, away



Trees

- In some communities trees can't be managed, only avoided



Trees

- Consider the surface area of the tree
- Consider summer vs winter
- Trees grow, and some grow rapidly
- Agencies should have a plan to trim trees that interfere with data collection

One Site – Three Years

**Site photos from
2007 and 2008**



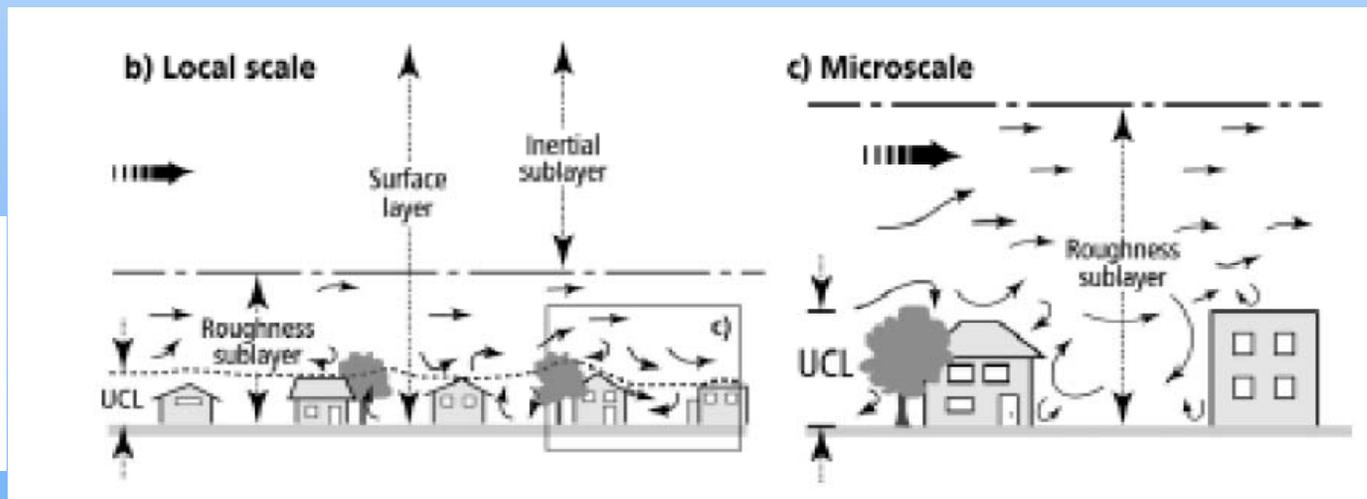
**2009 – two years - from no tree
observed to an obstruction**



Las figuras que se encuentran arriba muestran el cambio en un árbol en el sitio Rosarito entre el 2007 (superior) y el 2009 (inferior).

Air Flow

- Perform a general evaluation of obstructions and trees
- Look for sufficient ambient air flow
- In the end, it is a subjective review



WMO/TD-No. 1250
2006

Air Flow



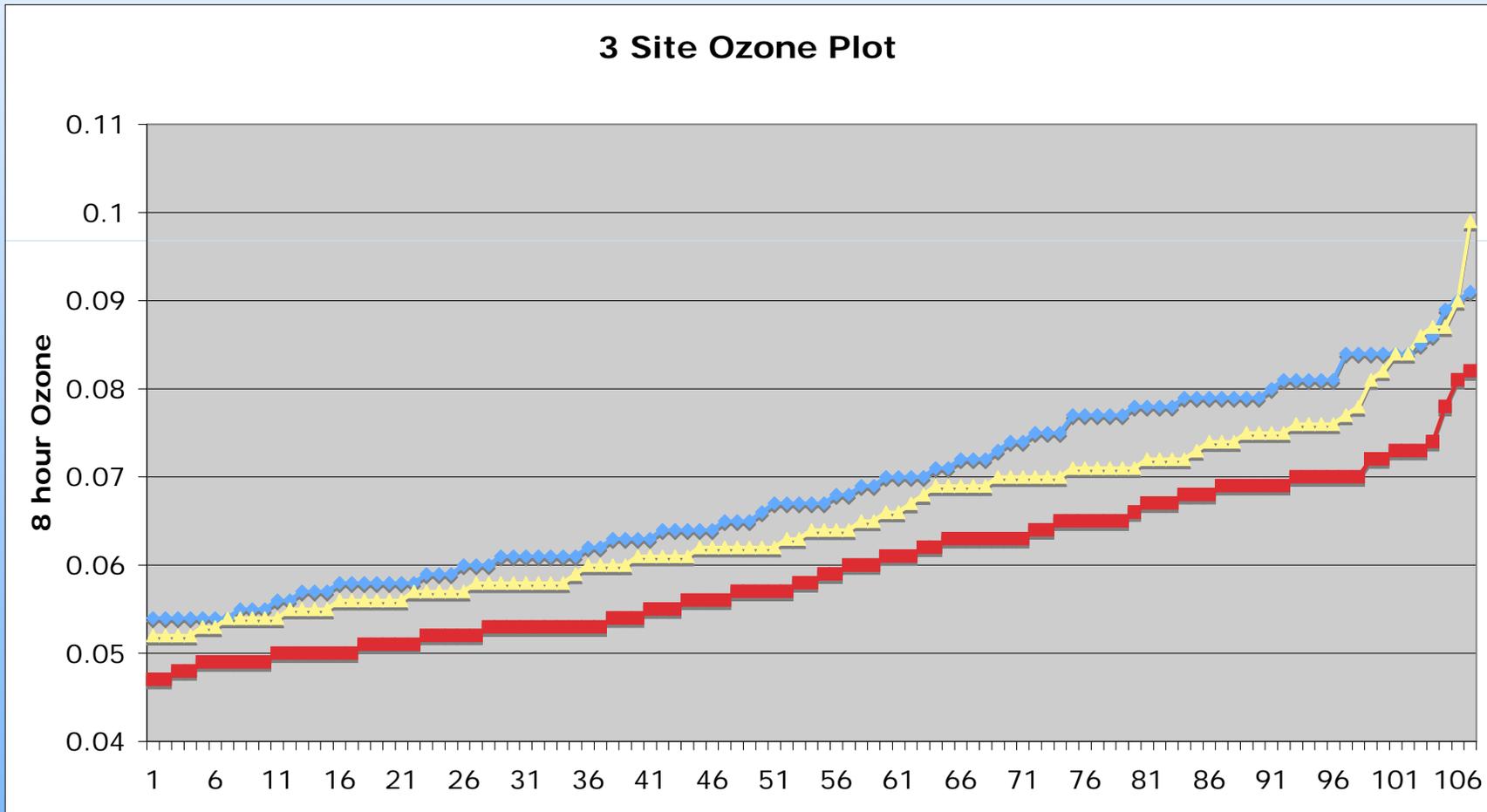
Roadways

- ▣ Required distance depends on site type and scale
- ▣ Because O₃ is not a primary pollutant, roadway distance is critical

Roadway Site



Near vs Adjacent Sites



Maximum 8-hour Ozone – Near Road vs. Adjacent Sites

Dust and PM10

- To represent conditions in dry areas it may not be possible to avoid adjacent dust sources



Meteorology

- Meteorology for most sites is not optimal
- Findings can be significant
- Document these in site report

Meteorology

**Site with
acceptable Met**



Typical Site



Thoughts on EPA Requirements

- Exceptions are included for high density urban area - “street canyons”
- This is applicable to other types of urban/populated areas (i.e., forests and deserts)
- When siting in these areas, the key is representativeness

Conclusion

- ▣ Let representativeness and data use guide siting decisions
- ▣ Data will be compromised if siting requirements are not met
- ▣ Actual conditions will require that adjustments be made