

VII. AIR QUALITY

Level of Severity Criteria

Level of Severity	Air Quality Criteria
I	Air monitoring shows periodic but infrequent violations of a State air quality standard, with no area of the county designated by the State as a non-attainment area.
II	Air monitoring shows one or more violations per year of a State air quality standard and the county, or a portion of it, has been designated by the State as a non-attainment area.
III	Air monitoring at any county monitoring station shows a violation of a Federal air quality standard on one or more days per year, and the county or a portion of the county qualifies for designation as a Federal non-attainment area.

The Level of Severity Criteria are based on air quality standards, which are discussed in detail below.

Relationship to the County General Plan and RMS System

The County of San Luis Obispo has the authority to protect the health, safety, and welfare of citizens from such environmental hazards as air pollution. The County General Plan acknowledges the relationship between the San Luis Obispo County Air Pollution Control District (APCD) air quality goals and policies and County General Plan policies. For example, the Conservation and Open Space Element states that the County should amend the General Plan to avoid General Plan Amendments and land use designation changes that are not consistent with the APCD’s approved plans (i.e., Clean Air Plan, California Environmental Quality Act (CEQA) Handbook, and Particulate Matter Reduction Plan). The General Plan and regulatory ordinances could be amended where necessary to respond to air quality concerns that may be raised by the RMS procedures. For example, General Plan Amendments should encourage land use patterns that enable efficient development focused in urban areas that reduces vehicle miles traveled and air pollution.

Air Quality Standards and Attainment Status For Criteria Pollutants

California and the US EPA have adopted ambient air quality standards for six common air pollutants of primary public health concern: ozone, particulate matter (PM₁₀ and PM_{2.5}), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), and lead. These are called “criteria pollutants” because the standards establish permissible airborne pollutant levels based on criteria developed after careful review of all medical and scientific studies of the effects of each pollutant on public health and welfare. Air Quality Standards are used to designate a region as either “attainment” or “non-attainment” for each criteria pollutant. A non-attainment designation can

trigger additional regulations for that region aimed at curbing pollution levels and bringing the region into attainment.

The National Ambient Air Quality Standards (NAAQS or Federal Standards) are generally less restrictive than California Ambient Air Quality Standards (CAAQS or California Standards). However, the Federal Standards come with regulatory penalties that the California Standards do not have. For example, Federal transportation funds can be withheld as a punitive measure. For most pollutants, the NAAQS allow a standard to be exceeded a certain number of times each calendar year without resulting in a non-attainment designation. The current SLO County attainment status is provided in the following table.

Table VII-1 – Criteria Pollutants and Attainment Status			
Criteria Pollutant	Standards Exceeded 2012-14?	Attainment Status California CAAQS	Attainment Status Federal/US NAAQS
Ozone	Yes	Non-Attainment	Non-Attainment East County Attainment West County
PM2.5	Yes	Pending Non-Attainment	Unclassified/Attainment
PM10	Yes	Non-Attainment	Unclassified/Attainment
SO₂	Yes	Attainment	Unclassified
NO₂	No	Attainment	Unclassified
CO	No	Attainment	Unclassified
Lead	No	Attainment	No Attainment Information

Source: SLO APCD

Recommended Levels of Severity

Each criteria pollutant and recommended level of severity is summarized on the following table and discussed in detail below.

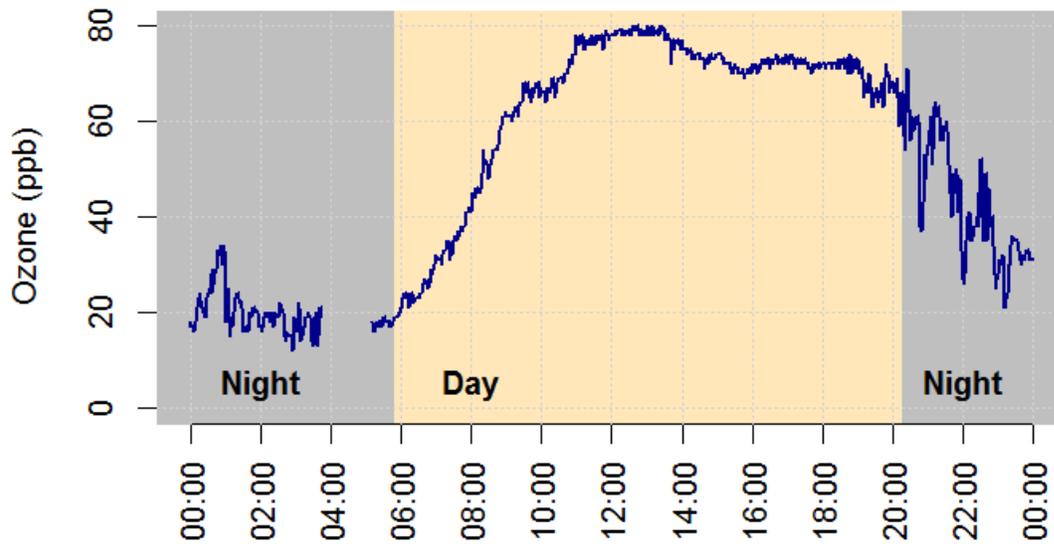
Table VII-2 -- Recommended Levels of Severity for Air Quality		
Criteria Pollutant	Area of County	Recommended Levels of Severity
Ozone	East County	III
	West County	II
Particulate Matter – PM _{2.5}	Nipomo Mesa	III
	All Other Areas	II
Particulate Matter – PM ₁₀	Nipomo Mesa	III
	All Other Areas	II
Sulfur Dioxide	Nipomo Mesa	I
Nitrogen Dioxide, Carbon Monoxide, Lead	All Areas	None
Toxic Air Contaminants	All Areas	None. LOS for Toxics not evaluated because toxics are not criteria pollutants and strategies are in place to mitigate impacts.

Ozone

Ozone is formed in the atmosphere as a byproduct of photochemical reactions between various reactive organic compounds (ROG), oxides of nitrogen (NO_x) and sunlight. The exhaust systems of cars and trucks produce about 50 percent of the county's ROG and NO_x emissions. Other sources include solvent use, petroleum processing, utility and industrial fuel combustion, pesticides and waste burning.

The chemical processes that impact the concentrations of atmospheric ozone have a distinct diurnal pattern. Ozone concentrations typically increase as sunlight intensity increases, peaking midday or in the afternoon, and approaching the lowest daily concentration in the early morning hours and just before sunrise, as shown in the plot below. In the absence of sunlight, ozone can be destroyed or 'scavenged' by reaction with NO_x molecules. The degree of scavenging depends on the amount of available NO_x. In a polluted environment, with lots of NO_x from vehicles operated during the morning commute, this scavenging can be significant and ozone concentrations can approach zero just before sunrise. After sunrise, ozone concentrations typically increase as sunlight intensity increases and the cycle repeats.

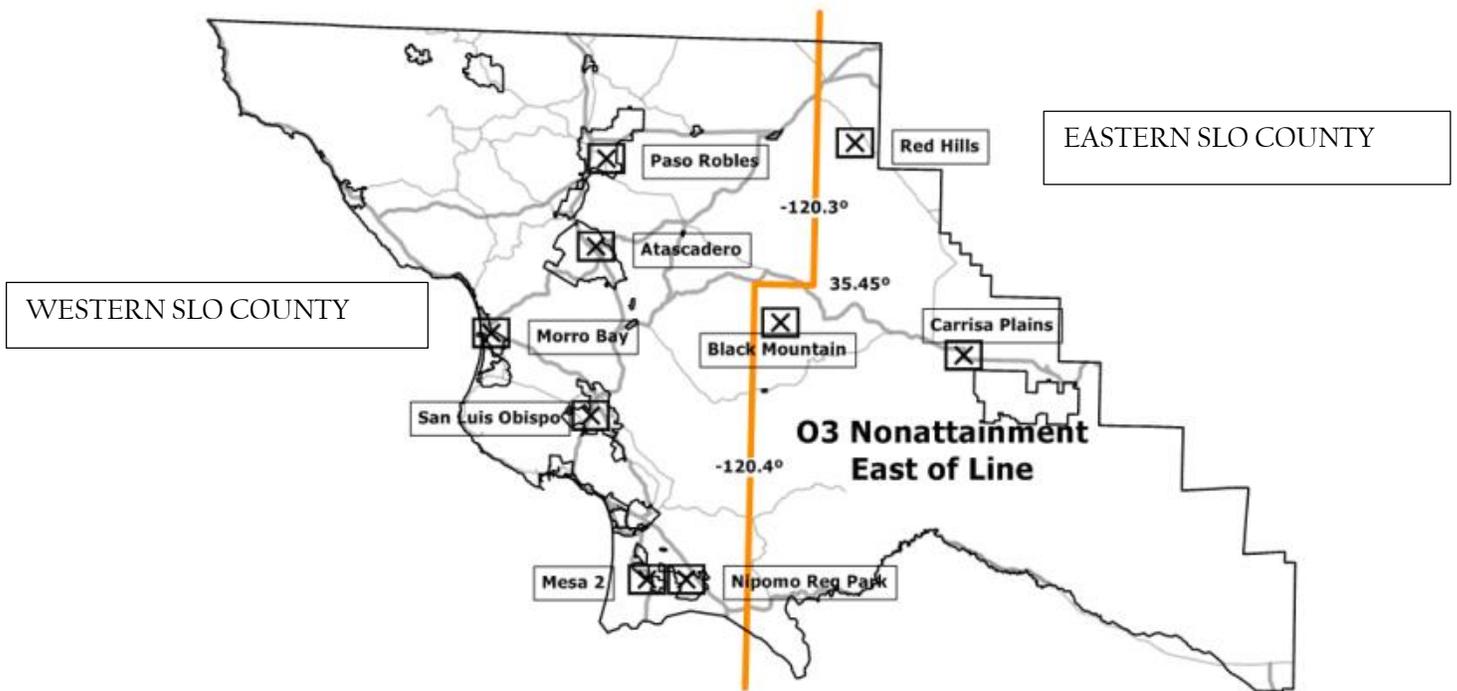
Hourly Ozone at Carrizo Plains, June 7, 2013



Example of Diurnal Ozone Pattern

Ozone is a strong oxidant gas that attacks plant and animal tissues. It can cause impaired breathing and reduced lung capacity, especially among children, athletes, and persons with compromised respiratory systems. It can also cause significant crop and forest damage.

In May 2012, the EPA designated the eastern portion of SLO County as non-attainment for the 8-hour ozone standard. The western portion of the county retained its attainment status. The map that follows identifies the boundary between the attainment and non-attainment areas, which is defined by the latitude and longitude lines shown on the map (Long. -120.3 deg., north of Lat. 35.45 deg. and Long. -120.4 deg., south of Lat. 35.45 deg.).



Exceedances of the 8-hour ozone standard for the past ten years are summarized in the following tables:

East County Ozone Non-Attainment Area Ozone Standard Exceedances (above Federal 8-hour standard, 75 ppb)										
Location	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Carrizo Plains	NA	35	9	22	3	4	5	3	0	0 ⁽²⁾
Red Hills	27	44	16	39	7	16	3	10	3	0 ⁽²⁾

Source: San Luis Obispo APCD

Notes:

1. NA – Not operational
2. January – Sept preliminary data
3. Data are based on calendar year, not fiscal year.

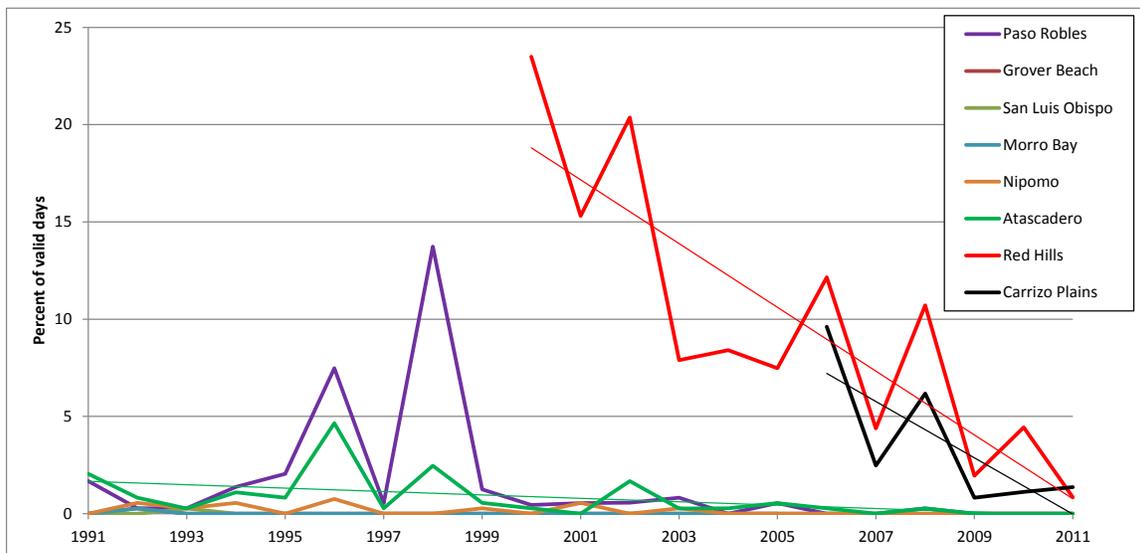
West County Ozone Attainment Area Ozone Standard Exceedances (above Federal 8-hour standard, 75 ppb)										
Location	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Paso Robles	2	0	0	0	0	0	0	0	0	0 ⁽²⁾
Atascadero	2	1	0	1	0	0	0	0	0	0 ⁽²⁾
Morro Bay	0	0	0	1	0	0	0	0	0	0 ⁽²⁾
San Luis Obispo	0	0	0	1	0	0	0	0	0	0 ⁽²⁾
Nipomo - NRP	0	0	0	0	0	0	0	0	0	1 ⁽²⁾

Source: San Luis Obispo APCD

Notes:

1. NA – Not operational
2. January – Sept preliminary data
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20 Year Trend – Exceedances of Federal 8HR Ozone Standard



Recommended Level of Severity for Ozone, East County -- Level of Severity III

The recommended level of severity for ozone in East SLO County is LOS III because this area is currently designated as non-attainment of the Federal 8-hour ozone standard. The APCD is currently working with the California Air Resources Board to develop the State Implementation Plan (SIP) that describes the proposed methods for attaining this standard. In addition, the current

APCD Clean Air Plan addresses ozone control measures. The 20 year trend plot above shows a significant improvement in air quality in the non-attainment area (East SLO County, Red Hills and Carrizo Plains). The improvement is demonstrated as a decrease in ozone standard exceedances.

Recommended Level of Severity for Ozone, West County -- Level of Severity II

The recommended level of severity for ozone in West SLO County is considered LOS II because this area is currently designated non-attainment of the State 8-hour ozone standard and exceeds the Federal and State standards at times. West SLO County is currently designated attainment of the Federal 8-hour ozone standard.

Particulate Matter

Ambient air quality standards have been established for two classes of particulate matter: PM₁₀ (respirable particulate matter less than 10 microns in aerodynamic diameter), and PM_{2.5} (fine particulate matter 2.5 microns or less in aerodynamic diameter). Both consist of many different types of particles that vary in their chemical activity and toxicity. PM_{2.5} tends to be a greater health risk because the particles are smaller and can travel deeper into the lungs. Sources of particulate pollution include diesel exhaust; mineral extraction and production; combustion products from industry and motor vehicles; smoke from open burning; paved and unpaved roads; condensation of gaseous pollutants into liquid or solid particles; and wind-blown dust from soils disturbed by demolition and construction, agricultural operations, off-road vehicle recreation, and other activities.

PM_{2.5}

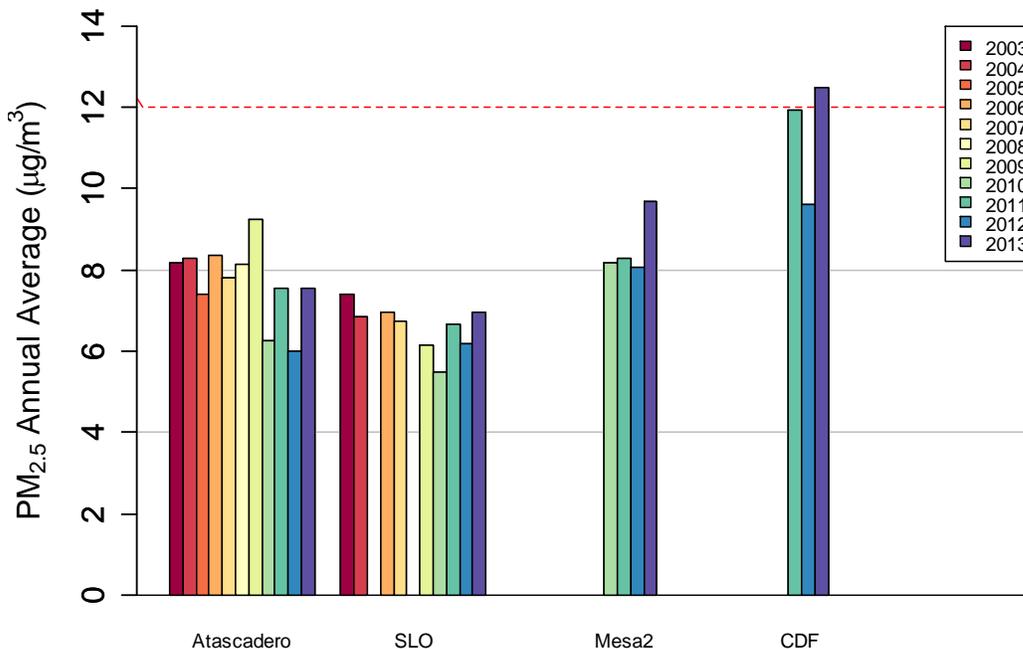
PM _{2.5} Exceedances (above Federal 24-hour standard)										
Location	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Atascadero	0 ⁽³⁾	0 ⁽³⁾	0 ⁽³⁾	0 ⁽³⁾	2 ⁽³⁾	0	0	0	0	0 ⁽²⁾
San Luis Obispo	0 ⁽³⁾	0	0	0 ⁽²⁾						
Nipomo/AG – CDF ⁽⁴⁾	NA	NA	NA	NA	NA	NA	0	3	2	2 ⁽²⁾
Nipomo Mesa 2	0 ⁽³⁾	0	0	1	0	0 ⁽²⁾				

Source: San Luis Obispo APCD

Notes:

1. NA – Not operational
2. January – Sept preliminary data
3. 1 in 6 day sampling for all or part of year, one 24-hour filter sample was obtained every 6 days. Sampling during 2012-2014 was made hourly on all days. Data are based on calendar year, not fiscal year.
4. 2391 Willow Road, Arroyo Grande NA – Not operational

Trends in PM_{2.5} Annual Average



Note: PM_{2.5} Federal and State Annual Standard is 12 µg/m³

PM₁₀

PM ₁₀ Exceedances (above Federal 24-hour standard, 150 µg/m ³)										
Location	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Atascadero	0 ⁽³⁾	0	0	0	0 ⁽²⁾					
Paso Robles	0 ⁽³⁾	0	0	0	0	0 ⁽²⁾				
San Luis Obispo	0 ⁽³⁾	0	0	0 ⁽²⁾						
Nipomo/AG - CDF	NA	NA	NA	NA	NA	1	0	3	2	2 ⁽²⁾
Nipomo - Mesa 2	0 ⁽³⁾	0	0	0	0	0 ⁽²⁾				
Nipomo - NRP	0 ⁽³⁾	0	0	0	0 ⁽²⁾					

Source: San Luis Obispo APCD

Notes:

1. NA – Not operational
2. January – Sept preliminary data
3. 1 in 6 day sampling for all or part of year, one 24-hour filter sample was obtained every 6 days. Sampling during 2012-2014 was made hourly on all days. Data are based on calendar year, not fiscal year.
4. 2391 Willow Road, Arroyo Grande NA – Not operational

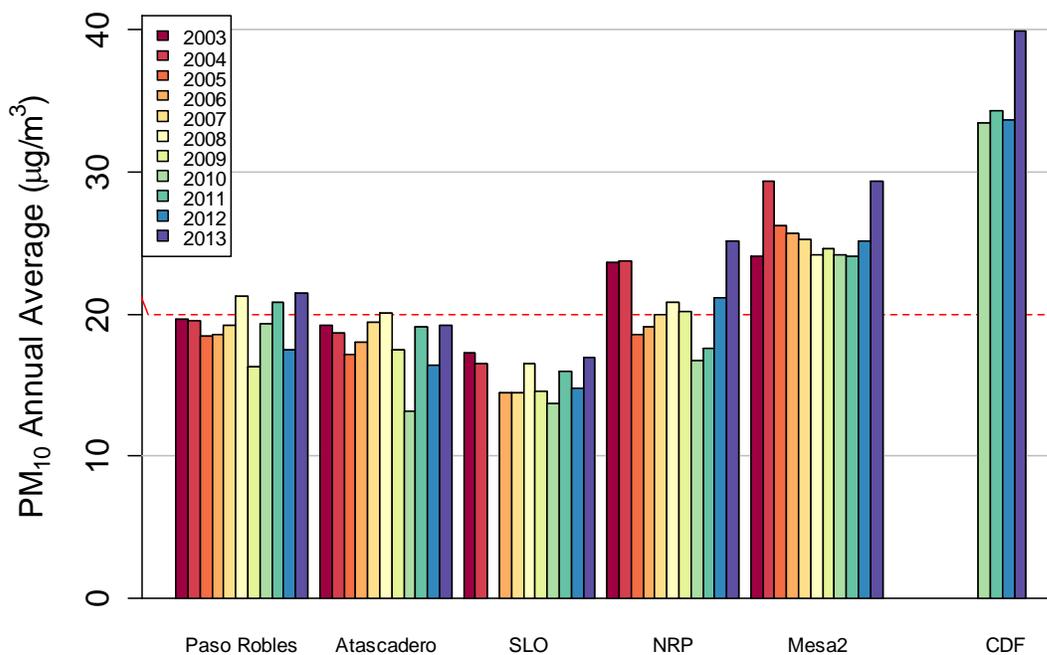
PM ₁₀ Exceedances (above CA 24-hour standard, 50 ug/m ³)										
Location	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Atascadero	0 ⁽³⁾	1 ⁽³⁾	0 ⁽³⁾	0 ⁽³⁾	0 ⁽³⁾	0 ⁽³⁾	2	2	2	5 ⁽²⁾
Paso Robles	0 ⁽³⁾	2 ⁽³⁾	0 ⁽³⁾	1 ⁽³⁾	2 ⁽³⁾	0	2	2	2	12 ⁽²⁾
San Luis Obispo	0 ⁽³⁾	1 ⁽³⁾	0 ⁽³⁾	0 ⁽³⁾	0 ⁽³⁾	0 ⁽³⁾	2 ⁽³⁾	1	1	0 ⁽²⁾
Nipomo/AG - CDF*	NA	NA	NA	NA	NA	53	63	70	93	68 ⁽²⁾
Nipomo - Mesa 2	1 ⁽³⁾	5 ⁽³⁾	7 ⁽³⁾	5 ⁽³⁾	17 ⁽³⁾	40	32	36	55	35 ⁽²⁾
Nipomo - NRP	0 ⁽³⁾	1 ⁽³⁾	2 ⁽³⁾	1 ⁽³⁾	2 ⁽³⁾	0 ⁽³⁾	3	9	20	9 ⁽²⁾

Source: San Luis Obispo APCD

Notes:

1. NA – Not operational
2. January – Sept preliminary data
3. 1 in 6 day sampling for all or part of year, one 24 hour filter sample was obtained every 6 days Sampling during 2012-2014 is made hourly on all days Data are based on calendar year, not fiscal year.
4. 2391 Willow Road, Arroyo Grande NA – Not operational

Trends in PM₁₀ Annual Average



Note: PM₁₀ State Annual Standard is 20 ug/m³ (there is no Federal Annual Standard for PM₁₀)

Particulate Matter Studies

Historical ambient air monitoring on the Nipomo Mesa has documented atypical concentrations of airborne particulate matter compared to other areas of San Luis Obispo County and other coastal areas of California. To better understand the extent and sources of these unusually high concentrations of particulate pollution on the Nipomo Mesa, the APCD conducted several comprehensive air monitoring studies. The studies concluded that Off Highway Vehicle activity in the Oceano Dunes State Recreational Vehicle Area (SVRA) is a major contributing factor to the high PM concentrations observed on the Nipomo Mesa.

The APCD has been working to evaluate and develop potential solutions to the particulate matter emissions from the SVRA that are impacting downwind neighborhoods. On November 16, 2011, the APCD Board approved the Coastal Dunes Dust Control Rule 1001 to require implementation of dust control measures on coastal dunes where vehicle activity occurs. As of October 2014, as shown in the plots and data tables, ambient PM concentrations on the Nipomo Mesa have not been reduced as a result of Rule 1001. Therefore, the Level of Severity will remain at Level III for both PM_{2.5} and PM₁₀ until mitigation measures are implemented that reduce ambient concentration to levels that meet health standards.

Recommended Level of Severity for PM₁₀ and PM_{2.5}, Nipomo Mesa -- Level of Severity III

The level of severity for PM₁₀ and PM_{2.5} in the Nipomo Mesa of SLO County is considered LOS III because SLO County:

- is currently designated as non-attainment of the State PM₁₀ standard;
- is designated attainment of the Federal PM standards, but exceed these standards on a number of days in the last three years; and,
- is scheduled to be designated as non-attainment of the State annual PM_{2.5} standard because the annual standard of 12 ug/m³ was exceeded in 2013. This designation to non-attainment should be finalized by mid-2015.

Mitigation measures to address PM issues on the Nipomo Mesa are outlined in APCD's Particulate Matter Reduction Plan.

Recommended Level of Severity for PM₁₀ and PM_{2.5}, All Areas of the County Outside the Nipomo Mesa -- Level of Severity II

The LOS for PM_{2.5} recommended for areas outside of the Nipomo Mesa of SLO County is LOS II because the Federal PM_{2.5} standard has been exceeded in Atascadero. Federal PM_{2.5} standards can be exceeded during winter stagnant periods and during periods of wildfire smoke impacts.

The LOS for PM₁₀ in areas outside of the Nipomo Mesa of SLO County is considered LOS II because SLO County is currently designated as non-attainment of the State PM₁₀ standard and the standard has been exceeded at all county PM₁₀ monitoring stations.

Sulfur Dioxide

Sulfur dioxide (SO₂) is a colorless gas generated by fossil fuel combustion from mobile sources such as vehicles, ships, and aircraft and at stationary sources such as industry, homes, and businesses. SO₂ may also be emitted by petroleum production and refining operations. The State standard for SO₂ was exceeded periodically on the Nipomo Mesa up until 1993. Equipment and processes at the facilities responsible for the emissions were upgraded as a result.

Exceedances of the Federal SO₂ standard had never been measured in SLO County until the Federal 1-Hour SO₂ standard was exceeded on May 19, 2013.

The exceedance was measured at the Mesa2 monitoring station, located immediately downwind of the Phillips 66 Santa Maria Refinery. The refinery was performing maintenance at the time, and process equipment that would normally control sulfur dioxide emissions was not operating. Releases of this type are unlikely to recur in the future as the refinery is no longer permitted to operate without these emission controls during scheduled maintenance procedures.

Recommended Level of Severity for Sulfur Dioxide, Nipomo Mesa -- Level of Severity I

The LOS for SO₂ in SLO County is considered LOS I for the Nipomo Mesa due to exceedance of the federal SO₂ standard in 2013.

No LOS is recommended for the remainder of SLO County because the state and national standards for SO₂ have never been exceeded.

Nitrogen Dioxide, Carbon Monoxide and Lead

Nitrogen dioxide (NO₂) is a brownish-colored air pollutant that irritates the eyes, nose and throat, and can damage lung tissues.

Carbon monoxide (CO) results from fuel combustion of all types and can cause headaches and fatigue. Motor vehicles are by far the chief contributor of CO in outdoor air.

Lead is extremely toxic. Exposure to high concentrations of lead, particularly in young children, can result in damage to the central nervous system, and may be associated with high blood pressure in adults. Human exposure to lead typically occurs via inhalation of air and ingestion of lead in food, soil, water or dust. Lead was last monitored in SLO County in 1987. Concentrations of lead in the ambient air dropped significantly after unleaded fuel use in vehicles became widespread.

No LOS is recommended for NO₂ in SLO County because the State and national standards for NO₂ have never been exceeded in this county.

No LOS is recommended for CO in SLO County because the State CO standards have not been exceeded in San Luis Obispo County since 1975.

No LOS is recommended for lead in SLO County because the county is in attainment of the state standard for lead.

Toxics

A toxic air contaminant (TAC) is defined as “an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health”. Exposure to toxic air contaminants can potentially increase the risk of contracting cancer or result in other adverse health effects (e.g., asthma, birth defects and respiratory disease). TACs can cause health effects through both short-term, high-level or "acute" exposure and long-term, low-level or "chronic" exposure.

TAC's are not considered “criteria pollutants” but are significant in maintaining public health. A characteristic of toxic air pollution, which distinguishes it from criteria pollutants, is that the impact of toxic air contaminants tends to be highest in close proximity to sources and drops off with distance to the affected receptor. The cancer-causing potential of TACs is a particular public health concern because many scientists believe that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen can pose some risk of causing cancer. Furthermore, many compounds have a synergistic effect where different compounds interact and cause effects greater than that of each individual compound.

The APCD has been successful in reducing levels of criteria and toxic air pollutants from existing sources while limiting impacts from new and modified sources within San Luis Obispo County. Current rules and policies continue to control and reduce toxic impacts; however, continued efforts are needed to protect the health and welfare of the public. The Environmental Protection Agency reported recently that levels of benzene and lead, as well as mercury from man-made sources, are each down more than 50% from 1990 levels (nationally, a 66% drop in benzene, 60% drop in mercury and 84% drop in lead). By 2030, EPA expects reductions to be 80% of the 1990 levels.

The APCD developed a Toxic Risk Management Plan (TRMP) to provide an overall guidance and planning document that integrates local, State and Federal efforts to minimize toxic air pollution impacts. The primary goal of the TRMP is to reduce population exposure to toxic air contaminants to ensure healthful air for all. The TRMP identifies suggested air toxic control strategies and options for stationary and mobile sources that may be implemented in the future to provide additional reductions in air toxics exposure and contaminant levels. In addition, toxics are reduced as part of the APCD CEQA review process as defined in the APCD CEQA Handbook.

There are no NAAQS or CAAQS for toxics so no Federal or State standards were exceeded. The TRMP and CEQA Handbook address toxics adequately, so a LOS has not been quantified.

Summary of Recommended Levels of Severity and Recommended Actions for Air Quality

Table VII-3 – Summary of Recommended Levels of Severity and Recommended Actions for Air Quality			
Parameter	Recommended Levels Of Severity	Applicable Documents & Plans	Recommended Actions
Ozone	III, East SLO County II, West SLO County	Clean Air Plan, CEQA Handbook, State Implementation Plan (SIP) documents (Emission Statement Rule, Conformity Documents, Emissions Inventory)	Support APCD's efforts to address East County Non-attainment.
PM2.5	III, Nipomo Mesa II, Elsewhere	CEQA Handbook, Particulate Matter Reduction Plan	Support APCD's Enforcement of Particulate Matter Reduction Plan
PM10	III, Nipomo Mesa II, Elsewhere	CEQA Handbook, Particulate Matter Reduction Plan	Support APCD's Enforcement of Particulate Matter Reduction Plan
SO₂	I, Nipomo Mesa	Federal Consent Decree	Support APCD's Enforcement of the Federal Consent Decree.
NO₂	None Recommended	National and State Ambient Air Quality Standards	No actions needed.
CO	None Recommended	National and State Ambient Air Quality Standards	No actions needed.
Lead	None Recommended	National and State Ambient Air Quality Standards	No actions needed.
Toxics	None Recommended	CEQA Handbook, Toxic Risk Management Plan	No additional actions needed at this time.