

**Pechanga Band of Luiseño Indians
Environmental Department**



2015 Ambient Air Monitoring Network Plan

July 1, 2015

**Pechanga Band of Luiseño Indians
Environmental Department
P.O. Box 1477
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Acronyms, Abbreviations, and Definitions

Air Toxics – suite of parameters that includes VOCs, carbonyls, and metals

AQI – Air Quality Index

AQS – Air Quality System: EPA's repository of ambient air quality data

BAM – Beta Attenuation Mass

CAA – Clean Air Act

CFR – Code of Federal Regulations

CO – carbon monoxide

Criteria Pollutants – the six pollutants regulated by the 1970 Clean Air Act (particulate matter, ozone, nitrogen dioxide, sulfur dioxide, carbon monoxide, and lead)

EPA – Environmental Protection Agency

FEM – Federal Equivalent Method

FRM – Federal Reference Method

HAP – Hazardous Air Pollutant

Hg – mercury

HRV – Health Risk Value

IMPROVE – Interagency Monitoring of Protected Visual Environments

MSA – Metropolitan Statistical Area

NAAQS – National Ambient Air Quality Standard

NCore – National Core Monitoring Network

NO – nitric oxide

NO₂ – nitrogen dioxide

NO_x – oxides of nitrogen

NTN – National Trends Network

O₃ – ozone

PM_{2.5} – particulate matter less than 2.5 microns in diameter (fine particulate matter)

PM₁₀ – particulate matter less than 10 microns in diameter
ppb – parts per billion
ppm – parts per million

PQAO – Primary Quality Assurance Organization

QAPP – Quality Assurance Project Plans

QA/QC – Quality Assurance/Quality Control

QMP – Quality Management Plan

SLAMS – State and Local Air Monitoring Stations

SPM – special purpose monitoring

TSP – total suspended particulate matter

VOC – Volatile Organic Compound

Introduction

The United States Environmental Protection Agency (EPA), through the Code of Federal Regulations (CFR) requires the Pechanga Band of Luiseno Indians (Tribe) to complete the Ambient Air Monitoring Annual Network Plan for the Tribe's ambient air monitoring station. EPA's requirements for the annual plan are listed in 40 CFR § 58.10.

The regulations from Title 40, Part 58, Section 10(a) of the Code of Federal Regulations (40 CFR 58.10, (a)(1)) state that:

“Beginning July 1, 2007, the State, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN stations, State speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA.”

It is the objective of the Tribe to maintain and operate its ambient air monitoring station according to all applicable federal regulations and guideline documents. The purpose of this Ambient Air Monitoring Network Plan (Plan) is to provide evidence that current regulations are being met for the Pechanga air monitoring network, to detail any changes proposed for the 18 months following its publication, and to provide specific information on the existing monitoring site.

The Tribe operates the Air Monitoring Program through the Pechanga Environmental Department (PED). The PED staff performs a complete review of the Pechanga Air Program annually to ensure the program is running effectively and within compliance for valid data submission.

The Pechanga Air Program began in 2008 with the collection of air quality data according to the program Quality Assurance Project Plan (QAPP) which follows the US EPA National Ambient Air Quality Standards (NAAQS). The data collected and monitored at Pechanga Air Station includes ozone (O₃), PM_{2.5}, and oxides of nitrogen (NO_x), which are submitted annually to the EPA.

Public Comment

The annual monitoring network plan must be made available for public inspection for 30 days prior to submission to U.S. EPA. Information on how to comment on the plan and any comments received are listed in Appendix A.

Network Design

The Tribe has been operating its air monitoring station since 2008. The site is located on the Pechanga Indian Reservation (Reservation) on the southeastern boundary of the city of Temecula (Figure 1). The single air monitoring site collects data for multiple pollutants. Table 1 provides a list of monitoring locations, pollutants monitored and the EPA Air Quality System (AQS) site code.

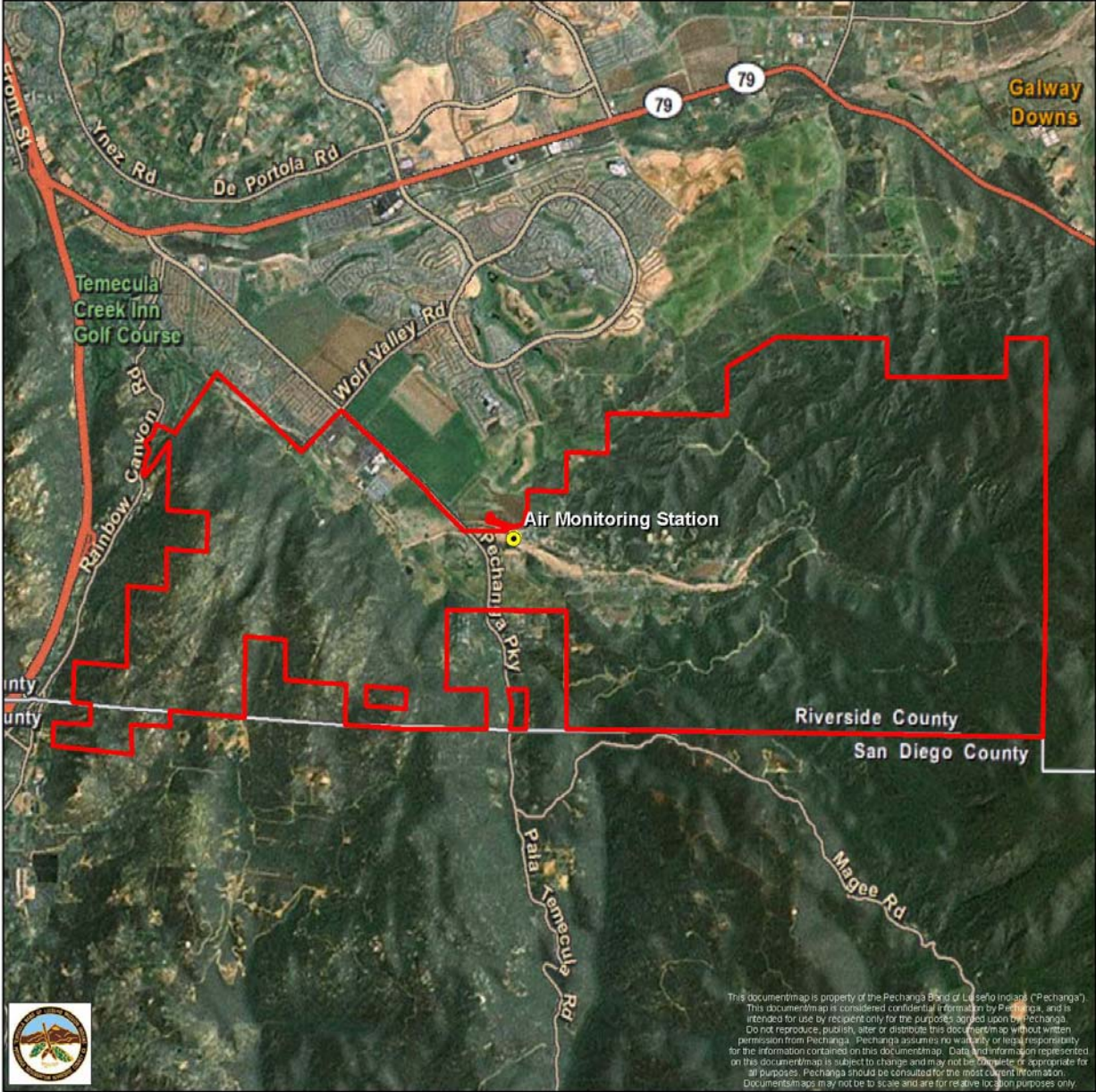


Figure 1 – Pechanga Air Station Location

Site Name	AQS Code	Pollutants Monitored
Pechanga Air Station	TT-586-0009	NO ₂ O ₃ PM _{2.5}

Table 1 – Pechanga Air Station Pollutants Monitored

Site Selection and Purpose

The selection of the air monitoring site was based on the basic monitoring objectives listed below:

- determine representative concentrations and exposure in areas of population density;
- determine the highest concentrations of pollutants in an area based on topography and/or wind patterns;
- judge compliance with and/or progress made towards meeting the NAAQS;
- track pollution trends;
- determine general background concentration levels (The exact location of a site is most often dependent on the logistics of the area chosen for monitoring, such as site access, security and power availability); and,
- determine the welfare-related impacts in more rural and remote areas such as visibility impairment and effects on vegetation.

NAAQS Comparable

40 CFR Part 58 Appendix B requires the identification of any sites that are suitable or not suitable for comparison against the 24-hour PM_{2.5} NAAQS as described in Section §58.30. Pechanga air station meets this NAAQS requirement.

Metropolitan Statistical Areas

Metropolitan Statistical Areas (MSAs) are defined by the U.S Office of Management and Budget as geographical areas having a large population nucleus and a high degree of economic and social integration with the nucleus. Pechanga Reservation is classified as an MSA according to its population; it does not meet the definition of CBSA or CSA according to 40 CFR Part 58 Appendix D 2e. Pechanga Reservation is a part of the Riverside-San Bernardino-Ontario MSA which is sometimes referred to as the “Inland Empire” and encompasses Riverside County, San Bernardino County, and Eastern Los Angeles County¹.

Minimum Monitoring Requirements

The Pechanga monitoring station meets the minimum monitoring requirements for all criteria pollutants O₃, PM_{2.5}, NO₂ (Tables 2, 3, and 4).

¹ U.S. Department of Commerce Economics and Statistics Administration U.S. Census Bureau. 2013. (http://www2.census.gov/geo/maps/metroarea/stcbsa_pg/Feb2013/cbsa2013_CA.pdf)

Ozone

Ground-level O₃, or photochemical smog, is not emitted into the atmosphere as ozone, but rather is formed by the reactions of other pollutants. The primary pollutants entering into this reaction, Volatile Organic Compounds (VOCs) and oxides of nitrogen (NO_x), create ozone in the presence of sunlight (ultraviolet radiation).

Ozone exposure has been associated with increased susceptibility to respiratory infections, medication use, doctor and emergency department visits and hospital admissions for individuals with lung disease. Ozone exposure also increases the risk of premature death from heart and lung disease. Children are at increased risk from ozone because their lungs are still developing and they are more likely to have increased exposure since they are often active outdoors².

In addition, cumulative ozone exposure can lead to reduced tree growth; visibly injured leaves and increased susceptibility to disease, damage from insects and harsh weather. These effects can have adverse impacts on ecosystems, including loss of species and changes to habitat quality, and water and nutrient cycles³.

Table 2 Minimum Monitoring Requirements for O₃

MSA	County	County Population in Year 2000	Annual Design Value (ppm)	Monitors Required	Active Monitors	Monitors Needed
Pechanga Indian Reservation	Riverside/ San Diego	2,329,271 3,263,431	34.12	1	1	0

The Ecotech EC 9810 ozone analyzer is used to measure continuous ambient concentrations of ozone (O₃). This analyzer was designated by the EPA as an equivalent method for the monitoring of O₃, (EQOA-0193-091, February 3, 1993). The WinCollect software provides the O₃ data in 5-minute, hourly, 8-hourly, and daily averages. The statistics that are calculated and presented in the O₃ data reports include: 1) maximum 1-hour average for the month; and, 2) maximum running 8-hour average for each day. Both are calculated per the method described in 40 CFR 50 Appendix I.

PM_{2.5}

Fine particulate matter with a diameter of 2.5 microns or less is created primarily from industrial processes and fuel combustion. These particles are breathed deeply into the lungs. Exposure to particle pollution is linked to a variety of significant health problems ranging from aggravated asthma to premature death in people with heart and lung disease⁴.

² U.S. EPA. 2015. Ozone and Your Patients’ Health Training for Health Care Providers. (<http://www.epa.gov/apti/ozonehealth/population.html>)

³ U.S. EPA. 2015. Ground-level Ozone Ecosystem Effects. (<http://www.epa.gov/groundlevelozone/ecosystem.html>)

⁴ AirNow. 2015. Particle Pollution (PM). (<http://www.airnow.gov/index.cfm?action=aqibasics.particle>)

Table 3 Minimum Monitoring Requirements for PM_{2.5}

MSA	County	County Population in Year 2000	Annual Design Value $\mu\text{g}/\text{m}^3$	Daily Design Value $\mu\text{g}/\text{m}^3$	Monitors Required	Active Monitors	Monitors Needed
Pechanga Indian Reservation	Riverside/ San Diego	2,329,271 3,263,431	21.35	-	0	2	0

The method used for the Beta Attenuation Monitor Model 1020 configured for PM_{2.5} Federal Equivalent Method (FEM) monitoring includes sampling of ambient air through a standard EPA PM₁₀ inlet head and a Very Sharp Cut Cyclone (VSCC) at a volumetric flow rate of 16.7l per minute. A Smart Heater attached to the inlet system, and controlled by relative humidity (RH) measured at the filter tape, minimizes positive artifact from water sorption in humid environments. Particles in the air stream are collected and measured on quartz fiber filter tape. PM_{2.5} concentrations and sampling attribute data are reported hourly for a 24-hour period, from midnight to midnight.

A collocated PM_{2.5} sampler at the air station is a Thermo Scientific Partisol Model 2000 Federal Reference Method (FRM) sampler. It is located 1.5 meters from the primary sampler, at a right angle to the prevailing southwest wind direction. Its sample inlet is nine meters above the ground, at the same height as the primary sampler. The Model 2000 has been designated by the EPA as a reference method for the monitoring of PM_{2.5} according to the criteria specified in 40 CFR 53, Subparts A-C. The sampler is operated for a 24-hour period, from midnight to midnight, once every 6 days, according to the national schedule⁵.

NO₂

NO₂ is a highly toxic, reddish brown gas that is created primarily from fuel combustion in industrial sources and vehicles. It creates an odorous haze that causes eye and sinus irritation, blocks natural sunlight, and reduces visibility.

Table 4 Minimum Monitoring Requirements for NO₂

MSA	County	County Population in Year 2000	Annual Design Value 2009 (ppm)	Monitors Required	Active Monitors	Monitors Needed
Pechanga Indian Reservation	Riverside/ San Diego	2,329,271 3,263,431	5.10	0	1	0

The Ecotech EC 9841B ozone analyzer is used to measure continuous ambient concentrations of oxides of nitrogen (NO, NO₂, NO_x). This analyzer was designated by the EPA as an FEM for the monitoring of NO₂, as method RFNA-1292-090. The WinCollect software provides the NO_x data in 5-minute, hourly, 8-hourly, and daily averages. The data are then processed and averaged for comparisons to federal ambient air quality standards. The statistics that are calculated and

⁵ U.S. EPA. 2015. Nitrogen Dioxide Health. (<http://www.epa.gov/airquality/nitrogenoxides/health.html>)

presented in the NO_x data reports are: 1) maximum 1-hour average for each day; 2) maximum 1-hour average for the month; and, 3) the annual mean.

Meteorological Instruments

The purposes of the meteorological measurements at the Pechanga air station are to provide local information to the Tribe and to assist in providing characterizations of regional-scale meteorological patterns in conjunction with the air quality measurements.

Data Availability

Data is submitted to EPA through the AQS and the data can be accessed through the system. The Pechanga Environmental Department has the data accessible to Pechanga Tribal members upon request.

Monitoring Objectives.

The ambient air monitoring networks must be designed to meet three basic monitoring objectives. These basic objectives are listed below. The appearance of any one objective in the order of this list is not based upon a prioritized scheme. Each objective is important and must be considered individually:

- (a) Provide air pollution data to the general public in a timely manner. The Pechanga Air program makes their data available through AQS. The data are uploaded into the AQS quarterly.
- (b) The Pechanga air program will work to capture data to meet compliance with NAAQS standards and emissions strategy development. Data from monitors of various types can be used in the development of attainment and maintenance plans.
- (c) The Pechanga Air Program submits information to AQS which can be accessed for the purpose of support for air pollution research studies.

Detailed Site Information

Site Name: Pechanga

The Pechanga ambient air monitoring station was established in the spring of 2008 in order to represent neighborhood scale air quality. It is located at the Pechanga Government Center.

Recent or Proposed Changes

The Pechanga Air Program anticipates continuing the current program that is in place. The program proposed to make the following changes to the equipment and software. The operating procedures for the data management and validation will remain the same.

Table 5 Proposed Changes

Current Operation	Proposed Change
Wincollect telemetry software	Agilaire 8872 data logger system
Ecotech EC9810 Ozone Analyzer	Thermo Scientific 49i Ozone Analyzer
Ecotech Model 1100 GasCal	Teledyne Model T700U

The Pechanga air program will be evaluated annually to comply with federal regulations and other regulations that may apply.

Table 6: Pechanga Air Network Site Information

Site Name	Pechanga			
AQS ID	TT-586-0009			
GPS coordinates	33.44788 N -117.08953 W			
Location	Pechanga Government Center, Pechanga Reservation			
Address	12705 Pechanga Road, Temecula, CA 92593			
Counties	Riverside and San Diego			
Distances to roads	Pechanga Road: 57meters Pechanga Parkway: 1,075 meters Pala Road: 608 meters I-15: 4.6 kilometers			
Traffic counts	Pechanga Road: no data (road is within Reservation) Pechanga Parkway: 13,230 ADT (2014 data) Pala Road: 8,500 ADT (2014 data) I-15: 133,000 ADT (20013 data)			
Groundcover	Paved from east to north; vegetated from south to west			
Representative Area	Pechanga Band of Luiseño Indians Reservation- Riverside and San Diego County, Temecula, CA Suburban/Rural.			
Pollutant, Parameter Occurrence Code (POC)	Ozone 1	PM_{2.5} 1	PM_{2.5} FRM 2	NO₂ 1
Primary / QA Collocated / Other	Primary	Primary	Collocated	Primary
Parameter Code	44201	88101	88101	42602
Site Type	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor Type	SLAMS	SLAMS	QA Col	SLAMS
Network Affiliation	Pechanga	Pechanga	Pechanga	Pechanga
Method Code	091	170	116	090
FRM / FEM / ARM / Other	N/A	N/A	FRM	N/A
Collecting Agency	Pechanga Band	Pechanga Band	Pechanga Band	Pechanga Band
Analytical Lab	NA	N/A	RTI International (RTI) 3040 East Cornwallis Road P. O. Box 12194 Research Triangle Park, NC 27709	NA
Reporting Agency	US EPA	US EPA	US EPA	US EPA
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Start Date	2008	2008	2008	2008
Current Sampling Frequency	Hourly	Hourly	1 in 6	Hourly
Sampling method	Photometric EQOA-0193-091	Beta Attenuation EQPM-0308-170	Beta Attenuation EQPM-0308-170	Chemiluminescent RFNA-1292-090
Analysis method	N/A	N/A	N/A	N/A
Start date	June 9, 2008	August 12, 2008	August 12, 2008	July 25, 2008
Operation schedule	Continuous	Continuous	1 in 6 coll	Continuous
Sampling season	Year round	Year round	Year round	Year round
Probe height	9 meters	9 meters	9 meters	9 meters
Distance from supporting structure	1.3 meters	1.3 meters	1.3 meters	1.3 meters
Distance from obstructions on roof	16 meters	16 meters	16 meters	16 meters
Distance from obstructions not on roof	50 meters	50 meters	50 meters	50 meters
Distance from trees	50 meters	50 meters	50 meters	50 meters

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Distance to furnace or incinerator flue	N/A	N/A	N/A	N/A
Distance between collocated monitors	N/A	N/A	1 meter	N/A
Unrestricted airflow	360°	360°	360°	360°
Probe material	Teflon	Teflon	N/A	Teflon
Will there be changes within the next 18 months?	No	No	No	No
Is it suitable for comparison against the annual PM _{2.5} ?	N/A	Yes	No	N/A
Frequency of flow rate verification for manual PM samplers audit	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers audit	N/A	Monthly	Monthly	N/A
Frequency of one-point QC check (gaseous)	bi-weekly	N/A	N/A	bi-weekly
Last Annual Performance Evaluation (gaseous)	12/18/2014	N/A	N/A	12/18/2014
Last two semi-annual flow rate audits for PM monitors	N/A	6/12/2014 12/01/2014	N/A	N/A

Site Name	Pechanga			
Meteorological	Wind Speed	Wind Direction	Ambient Temp	Rel. Humidity
Manufacturer	Met One	Met One	Vaisala	Vaisala
Model	034B	034B	HMP45A	HMP45A
Range	0.4 to 50.0 m/s	000 to 360°	-10.0 to 50.0°C	0-100% RH
Analysis method	Cup anemometer	Potentiometer	RTD	Capacitive thin film polymer
Start date	March 15, 2008	March 15, 2008	March 15, 2008	March 15, 2008
Height above ground	11 meters	11 meters	9 meters	9 meters
Vertical distance from supporting structure	3.3 meters	3.3 meters	1.5 meters	1.5 meters
Horizontal distance from supporting structure	N/A	N/A	N/A	N/A
Distance from obstructions on roof	16 meters	16 meters	16 meters	16 meters
Distance from obstructions not on roof	50 meters/ SW	50 meters/ SW	50 meters/ SW	50 meters/ SW
Unrestricted airflow	360°	360°	360°	360°

Site Name	Pechanga			
Meteorological	Precipitation	Solar Radiation	Pressure	
Manufacturer	Ecotech	Middleton	Ecotech	
Model	Rainmaster 1000	SK01-D2	BPS 1000	
Range	N/A	0 to 1400 wt/m ²	600 to 800 mm Hg	
Analysis method	Tipping bucket	Differential thermopile	Transducer	
Start date	March 15, 2008	March 15, 2008	March 15, 2008	
Height above ground	8 meters	8 meters	5 meters	
Vertical distance from supporting	3.3 meters	3.3 meters	1.5 meters	

structure				
Horizontal distance from supporting structure	N/A	N/A	N/A	
Distance from obstructions on roof	16 meters	16 meters	16 meters	
Distance from obstructions not on roof	16 meters	16 meters	16 meters	
Unrestricted airflow	360°	360°	360°	

Appendix A – Public Comment