



Five Year Ambient Air Monitoring Network Assessment

Pechanga Ambient Air Monitoring Station

Criteria Pollutants: O₃, NO₂, PM_{2.5}

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1.0 Introduction

The Pechanga Band of Luiseño Indians (Tribe), located on the Pechanga Indian Reservation (Reservation), has completed this assessment of the air quality surveillance system. This assessment is required every five years according to the 40 Code of Federal Regulations (CFR) Part 58.

The EPA's final regulation, found in 40 CFR Part 58.10, requires: (d) The state, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in appendix D to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma), and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby states and tribes or health effects studies. The state, or where applicable local, agency must submit a copy of this 5-year assessment, along with a revised annual network plan, to the Regional Administrator. The assessments are due every five years beginning July 1, 2010.

The requirement for the assessment is to determine if the network is effective and efficient in meeting monitoring objectives. This includes whether new sites are needed or existing sites or monitors can be terminated and whether there are new technologies that can be incorporated. This assessment is conducted once every five years, this is the first report for Pechanga, the assessment provides a comprehensive conceptualization of the current and future needs of the tribe's air surveillance network.

2.0 Background

The Pechanga Ambient Air Monitoring Program has been in operation since 2008 and is managed and maintained by the Pechanga Environmental Department (Department). The primary objective of the monitoring project is to determine whether or not the National Ambient Air Quality Standards (NAAQS) for nitrogen dioxide (NO₂) particulate matter (PM_{2.5}), and ozone (O₃) are exceeded within the Reservation. The data gathered are also utilized to understand the impact pollutants have on the air quality of the Pechanga community. The Department maintains and operates its ambient air monitoring station according to all applicable federal regulations and guideline documents.

The station also monitors for the following meteorological parameters: wind speed, wind direction, temperature, relative humidity, precipitation, solar radiation, and barometric pressure. The purpose of the meteorological measurements at the station is 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.

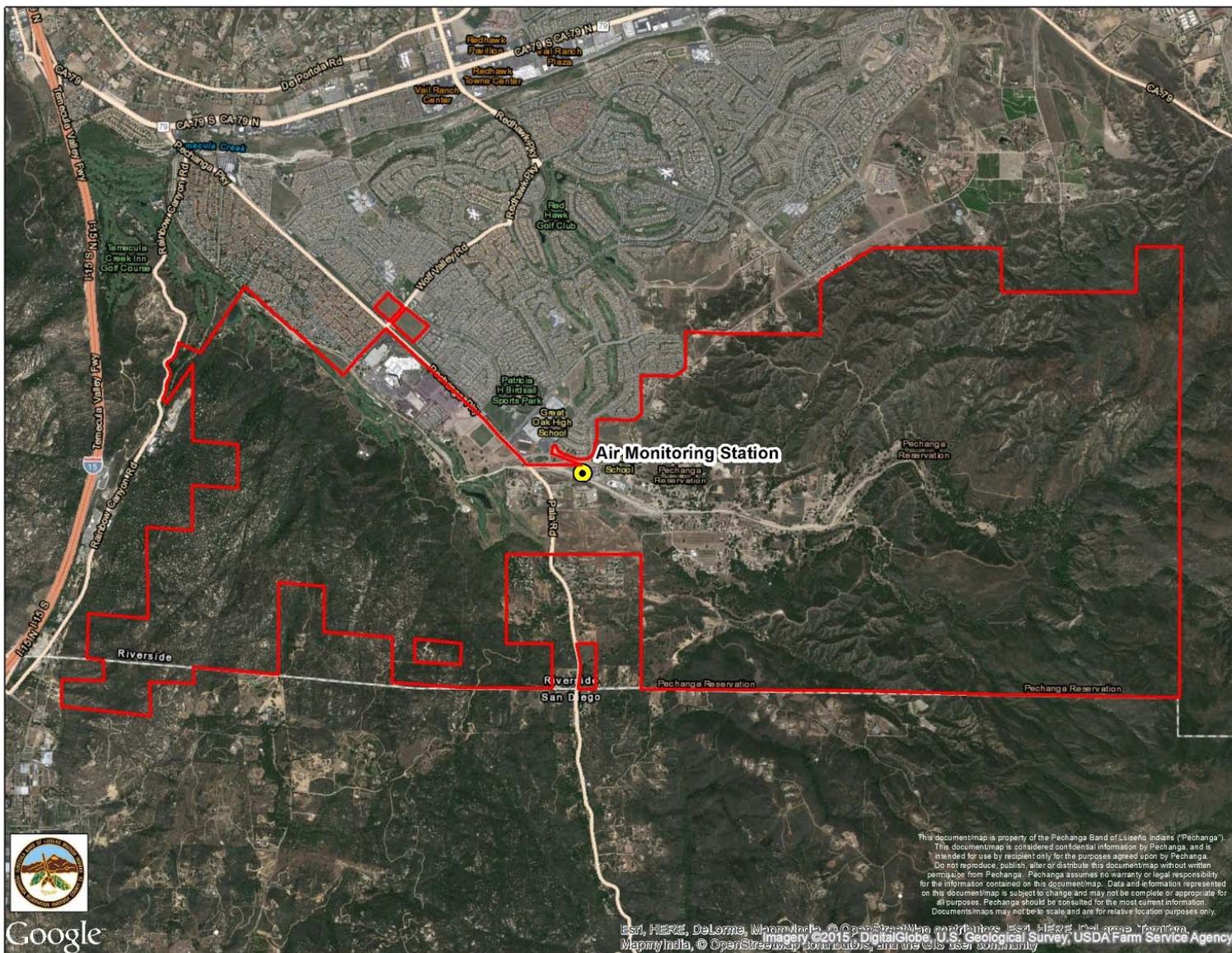


Figure 1: Location of Air Station on the Pechanga Reservation

2.1 Topography

The Reservation is comprised of mountains and plateaus, with elevation that range from 335 meters to 793 meters.

2.2 Location

The Reservation is located in Southwestern Riverside County near the city of Temecula to the northwest, the town of Rainbow to the southwest, and the Cleveland National Forest Agua Tibia Wilderness to the southeast. The Pechanga Reservation is located on a total land base of approximately 2711.4 hectares.

Interstate 15, a major transportation route for the inland counties in southern California, is located approximately 0.3 kilometers west of the Reservation; the City of Temecula is located approximately six kilometers to the northwest, with State Route (SR) 79 as the main transportation corridor providing access to the Reservation.

Riparian scrub and woodland vegetation occur predominately along Pechanga Creek and tributaries with oak woodland found in the upper reaches. North of the residential areas on the main Reservation a mix of chaparral and coastal sage-scrub are present. Chaparral is the predominate vegetation on the remainder of the Reservation.

2.3 Traffic

Road conditions on the Reservation vary from highly developed paved roads and parking lots to unpaved dirt roads in the residential areas. Conditions for the unpaved and unimproved roads vary from good to poor. Unpaved reservation roads leading along steep hillsides have the potential for erosion, due in part to erodible soil conditions. The following near roadways are paved. The nearest freeway is Interstate 15 located 4.6 kilometers from the Reservation. Pechanga Parkway, a main street in Temecula is located 1,075 meters from the main Reservation road. Pala Road, a main road that runs from Pechanga Parkway in Riverside County to Highway 76 in San Diego County is 608 meters from the Reservation.

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 (2013 data)
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Table 1: Traffic Data

2.4 Climate

The region experiences year-round Mediterranean climate conditions which are characterized by warm summers, mild winters, infrequent rainfall, frequent morning coastal fog, and moderate on-shore breezes. Summer temperatures average in the mid-80 to mid-90 degrees Fahrenheit which are cooled in the evening by mild cyclic breezes. During the peak summer months, temperature inversions and the Santa Rosa mountain ranges create a barrier, preventing the cooler coastal temperatures from reaching the inland

valleys during the day, allowing for higher temperatures in contrast to typical temperatures found in the coastal areas.

The regional climate is greatly influenced by the semi-permanent high pressure area of the eastern Pacific Ocean. Precipitation is usually limited to the winter season between November and April, with an average rainfall of approximately 13 inches per year¹. During the summer months, the pressure center moves northward, keeping storm cells from moving in the southern portions of California. In winter, the Pacific high moves south, this allows storm cells to move over California, some of which reach beyond the borders of Mexico. Changes in the circulation pattern allow storm cells to move in from a southwesterly direction, which can allow heavy rains and flooding to occur during the winter months.

2.5 Population

Land uses on the Reservation include 81 hectares of commercial/recreational development, 121.4 hectares of rural residential /industry, with approximately 486 hectares of allotted land. The main Reservation hosts approximately 180 homes and 12 government buildings with an estimated 540 full-time residents. Most of the current land use on the main Reservation is rural residential, with homes generally located near the creek channel.

Commercial activities include a resort, hotel, casino and convention center, associated parking structures, a gas station/convenience store, a golf course, a 200 space RV Park and car wash.

2.6 Demographics

Almost all of the Pechanga Reservation is located in Riverside County. A small portion of the Reservation is located in San Diego County, approximately 33.2 hectares out of the total 2711.4 hectares of the Reservation. The 33.2 hectares are located in a remote and uninhabited area that is undeveloped.

¹ Temecula Weather, *Temecula, California Precipitation Summary*, 2015

Item	Unit	Value
Population	Capita	~540
Area	Hectares	2,711.4
Reservation Border Miles	Kilometers	~39.386

Table 2: Pechanga Reservation Population²

2.7 Air Monitoring and Health Effects

According to the American Lung Association, deaths from chronic lung disease are on the rise surpassing stroke as the third leading cause of death in the US. In 2010, Chronic Lower Respiratory Disease (CLRD) contributed to the death of nearly seven percent of Riverside County residents. CLRD is the third leading cause of death for Riverside County and the fourth leading cause for California³.

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 outdoors⁴.

Fine particulate matter with a diameter of 2.5 microns or less (PM_{2.5}) 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 disease⁵.

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. These pollutants are linked to respiratory issues including asthma, inflammation in the lungs and CLRD.⁶

Asthma is a chronic condition that affects the lungs. It is characterized by inflammation and constriction of the airways, causing wheezing, coughing, and chest tightness. Although the cause is unknown, specific exposures such as tobacco smoke, allergens, and respiratory infections can trigger and exacerbate symptoms.

² Pechanga Band of Luiseno Indians Environmental Department, *2012 Emissions Inventory*, March 2013

³ County of Riverside-Department of Health, *Community Health Profile*, 2013

⁴ U.S. EPA. 2015. Ozone and Your Patients' Health Training for Health Care Providers.

(<http://www.epa.gov/apti/ozonehealth/population.html>)

⁵ AirNow. 2015. Particle Pollution (PM). (<http://www.airnow.gov/index.cfm?action=aqibasics.particle>)

⁶ County Profile – Riverside Fiscal Year 2013/2014

2010 County Population by Race/Ethnicity
Source: United States Census Bureau, 2010 Census

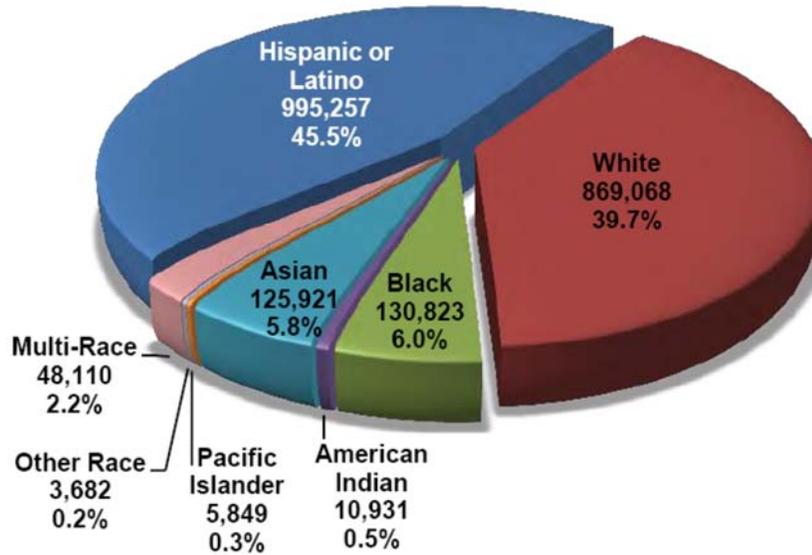


Figure 2: 2010 Riverside County Population by Race/Ethnicity ⁷

According to the health statistics, asthma prevalence is higher in Riverside County compared to the State of California average (14.5% and 13.6%, respectively).

Figures 2 and 3 show the demographics in Riverside County and the Chronic Lung Disease Mortality Rate. These numbers reflect the importance of air monitoring in the community and for trending, research and data submission to the United States Environmental Protection Agency (EPA).

⁷County Profile – Riverside Fiscal Year 2013/2014

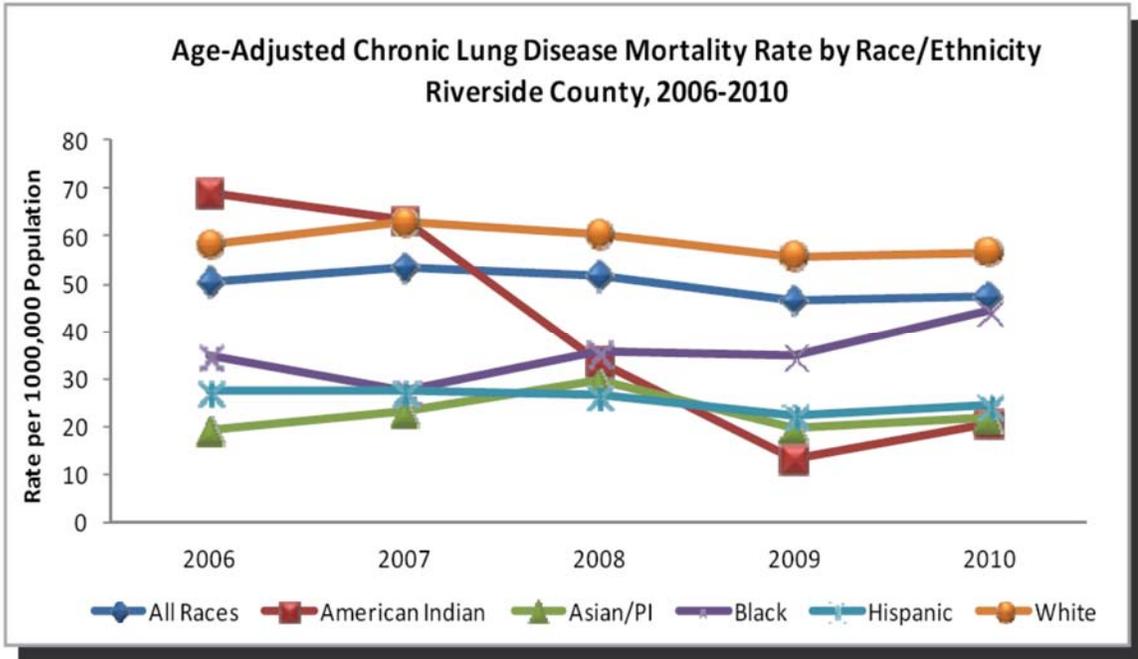


Figure 3: Chronic Lung Disease Mortality Rate Riverside County⁸

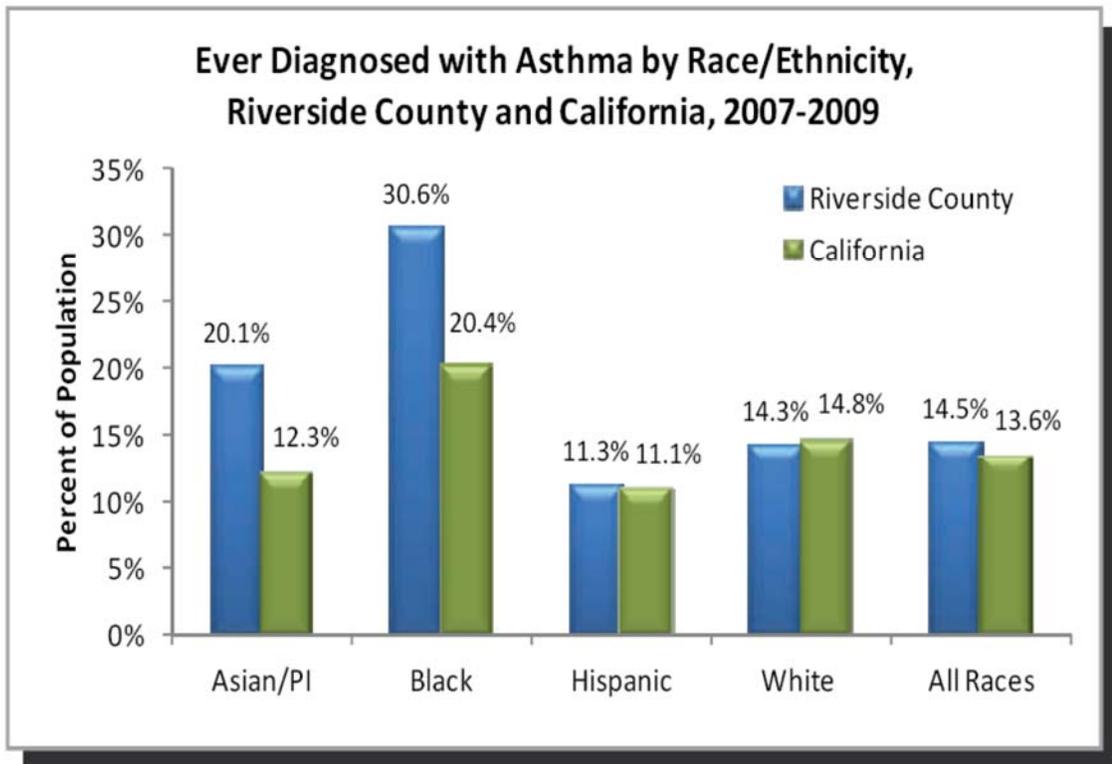


Figure 4: Patients Diagnosed with Asthma, Riverside County⁹

⁸County Profile – Riverside Fiscal Year 2013/2014

⁹County Profile – Riverside Fiscal Year 2013/2014

3.0 Air Monitoring and Emissions

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 EPA's NAAQS. The data collected and monitored at Pechanga Air Station include ozone (O₃), PM_{2.5}, and oxides of nitrogen (NO_x); the data are submitted to EPA annually.

In April of 2015, the EPA took final action to revise the boundaries of the Southern California air quality planning areas to designate the Reservation as a separate air quality planning area for the 1997 8-hour ozone NAAQS.

3.1 Monitoring Objectives

The Pechanga Air Station monitoring network has been designed to meet three basic monitoring objectives. The appearance of any one objective in the order of the proceeding list is not based upon a prioritized scheme. Each objective is equally 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 the Air Quality System (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.

3.2 Reservation Sources

An emissions inventory was completed in 2013 for the Tribe. The emissions accounts for three general source categories: Area Sources, Mobile Sources, and Natural Sources. Following EPA guidelines, Pechanga Reservation does not have qualifying point sources under Federal General Conformity thresholds. The Federal General Conformity thresholds are as follows: 50 metric tons per year for NO_x, 100 metric tons per year for CO, 50 metric tons per year for Volatile Organic Compounds (VOCs), 100 metric tons per year for PM, and 100 tons per year for SO₂.¹⁰

3.3 Area Sources

¹⁰ Pechanga Band of Luiseno Indians Environmental Department, *2012 Emissions Inventory*, March 2013

A total of seven (7) area sources have been identified on the Reservation. Typically, area sources are inventoried collectively due to number of sources or geographical separation:

Pechanga Resort & Casino (PRC)	Tribal Government Building	Recreation Center
Gas Station	Residences	Unpaved Roads
Emergency Generators		

Table 3: Sources of Emission on the Reservation

The Pechanga Resort and Casino (PRC) emissions are covered under a CAA Title V permit. Because emissions for all NAAQS are reported yearly under the Title V permit, , emissions information was not included in the emissions inventory.

3.4 Mobile Sources

Mobile sources include emissions from on-road and off-road vehicles and equipment that directly impact the Reservation. On-road sources include passenger cars, trucks, buses and motorcycles. Off-road vehicles include construction and farm equipment. Other off-road vehicles; such as aircraft, trains and boats, are not operated within the boundaries of the Reservation and are not included in the calculations.

3.5 Natural Sources

Emissions from Natural Sources on Pechanga Reservation include wildfires, vegetation, and dust from undisturbed surfaces.

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.

The percent emissions reductions achieved between the 2000 base year and the 2012 attainment year from permanent and enforceable emissions control programs were calculated following EPA guidance¹¹, and the results are presented in Table 4.

¹¹ Calcagni, Procedures for Processing Requests to Redesignate Areas to Attainment, September 4, 1992.

Table 4							
2000-2012 Reductions in Summer Season Precursor Emissions (Tons Per Day)							
South Coast Air Basin							
Source Category	Jurisdiction	VOCs 2000	VOCs 2012	% VOCs Reduction	NO _x 2000	NO _x 2012	% NO _x Reduction
Consumer Solvent Products	ARB	106.2	85.2	20%	--	--	--
On-Road Motor Vehicles	ARB	381.7	136.4	64%	645.9	283.2	56%
Non-Road Mobile Sources	ARB & EPA	207.1	136.0	34%	235.7	139.5	41%
Stationary & Area Sources	SCAQMD	298.9	138.9	54%	159.9	65.2	59%
Total		993.9	496.5	50%	1,041.5	487.9	53%
Riverside County (portion within SoCAB)							
Source Category	Jurisdiction	VOCs 2000	VOCs 2012	% VOCs Reduction	NO _x 2000	NO _x 2012	% NO _x Reduction
Consumer Solvent Products	ARB	8.6	8.5	1%	--	--	--
On-Road Motor Vehicles	ARB	32.0	17.6	45%	65.9	38.6	41%
Non-Road Mobile Sources	ARB & EPA	17.5	13.5	23%	20.8	14.6	30%
Stationary & Area Sources	SCAQMD	26.0	15.6	40%	8.4	4.6	45%
Total		84.1	55.2	34%	95.1	57.8	39%
San Diego County							
Source Category	Jurisdiction	VOCs 2000	VOCs 2012	% VOCs Reduction	NO _x 2000	NO _x 2012	% NO _x Reduction
Consumer Solvent Products	ARB	21.8	17.5	20%	--	--	--
On-Road Motor Vehicles	ARB	80.4	29.9	63%	133.3	63.9	52%
Non-Road Mobile Sources	ARB & EPA	56.4	40.6	28%	43.6	32.1	26%
Stationary & Area Sources	SCAQMD	49.1	47.5	3%	15.6	6.6	58%
Total		207.7	135.5	35%	192.5	102.6	47%
Pechanga Nonattainment Area							
Source Category	Jurisdiction	VOCs 2006	VOCs 2012	% VOCs Reduction	NO _x 2006	NO _x 2012	% NO _x Reduction
Consumer Solvent Products	ARB	0.0032 ^e	0.0025 ^e	22%-	--	--	--
On-Road Motor Vehicles	ARB	0.0113 ^e	0.0040 ^e	64%	0.0192 ^e	0.0084 ^e	56%
Non-Road Mobile Sources	ARB & EPA	0.0061 ^e	0.0040 ^e	34%	0.0070 ^e	0.0041 ^e	41%

Table 4							
2000-2012 Reductions in Summer Season Precursor Emissions (Tons Per Day)							
Stationary & Area Sources	Pechanga Tribe	0.0049	0.0022	55%	0.012	0.016	-33%
Total		0.0255	0.0128	50%	0.0382	0.0285	25%
Regional Totals (Riverside + San Diego + Pechanga)							
Source Category	Jurisdiction	VOCs 2006	VOCs 2012	% VOCs Reduction	NO _x 2006	NO _x 2012	% NO _x Reduction
Consumer Solvent Products	ARB	30.4	26.0	14%	--	--	--
On-Road Motor Vehicles	ARB	112.4	47.5	58%	199.2	102.5	49%
Non-Road Mobile Sources	ARB & EPA	73.9	54.1	27%	64.4	46.7	27%
Stationary & Area Sources	Local Agency	75.1	63.1	16%	24.0	11.2	53%
Total		291.8	190.7	35%	287.6	160.4	44%

- . Inventory data from CARB's CEPA: 2013 Almanac –Standard Emissions Tool.
- . South Coast Air Basin totals include Riverside County.
- . Inventory data from CARB's CEPA: 2013 Almanac –Standard Emissions Tool.
- . Pechanga emission inventory for on-reservation sources only (by Sierra Research).
- . Scaled from South Coast emissions based on relative population (467/15,735,186).

3.6 Air Monitoring Equipment

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.

Site Name	AQS Code	Pollutants Monitored
Pechanga Air Station Latitude 33.447867 N Longitude -117.088649 W	TT-586-0009	NO ₂ O ₃ PM _{2.5}

Table 5: Pechanga Air Station

Pollutant	Analyzer Make and Model	Range, ppm
NO, NO _x , NO ₂	Ecotech EC9841	0-0.500
O ₃	Thermo Scientific 49i	0-0.500
PM _{2.5}	Met One BAM 1020	2 to 1,000 µg/m ³

Table 6: Pechanga Continuous Analyzers

3.6 Site Selection and Purpose

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

- 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.

4.0 Site Analysis

The Tribe operates a single ambient monitoring station, continuously monitoring ambient ozone levels in compliance with federal requirements.¹² The data generated at this monitor are used to define the nature and severity of air pollution on the Reservation, identify nitrogen dioxide (NO₂) particulate matter (PM_{2.5}), and ozone (O₃) pollution trends, and determine compliance with the NAAQS.

4.1 Nearby Air Monitors

Air quality control in California is a shared responsibility among Tribal, local, State, and federal agencies. Local air districts regulate emissions from non-mobile (stationary) sources, such as stationary industrial and commercial sources, and some area-wide sources such as coatings and industrial solvents. At the State level, California Air Resources Board (CARB) adopts measures to reduce emissions from on-road motor vehicles, off-road vehicles and equipment, fuels, and some consumer products. At the federal level, EPA regulates off-road equipment and mobile sources such as ships, trains, aircraft, and out-of-state vehicles, as well as some consumer products.

Ozone levels are continuously monitored at a number of other monitors near Pechanga. These monitors are operated by two air districts and one tribe with jurisdiction over the area where they are located:

- Lake Elsinore, South Coast Air Quality Management District (AQMD);
- Temecula (Winchester/Lake Skinner), South Coast AQMD;
- Oceanside (Camp Pendleton), San Diego County Air Pollution Control District (APCD); and
- Pala, Pala Band of Mission Indians.

A map indicating the location of the ozone monitors operated in the area near the Reservation is presented in Figure 5.

¹² 40 CFR Part 58, "Ambient Air Quality Surveillance."

Pursuant to federal requirements, the Pechanga Tribe ensures the quality of the ambient ozone concentration data collected at its monitoring sites through analysis of precision and accuracy data. These ambient concentration data and quality assurance data are submitted to the EPA's ambient air quality database, AQS.

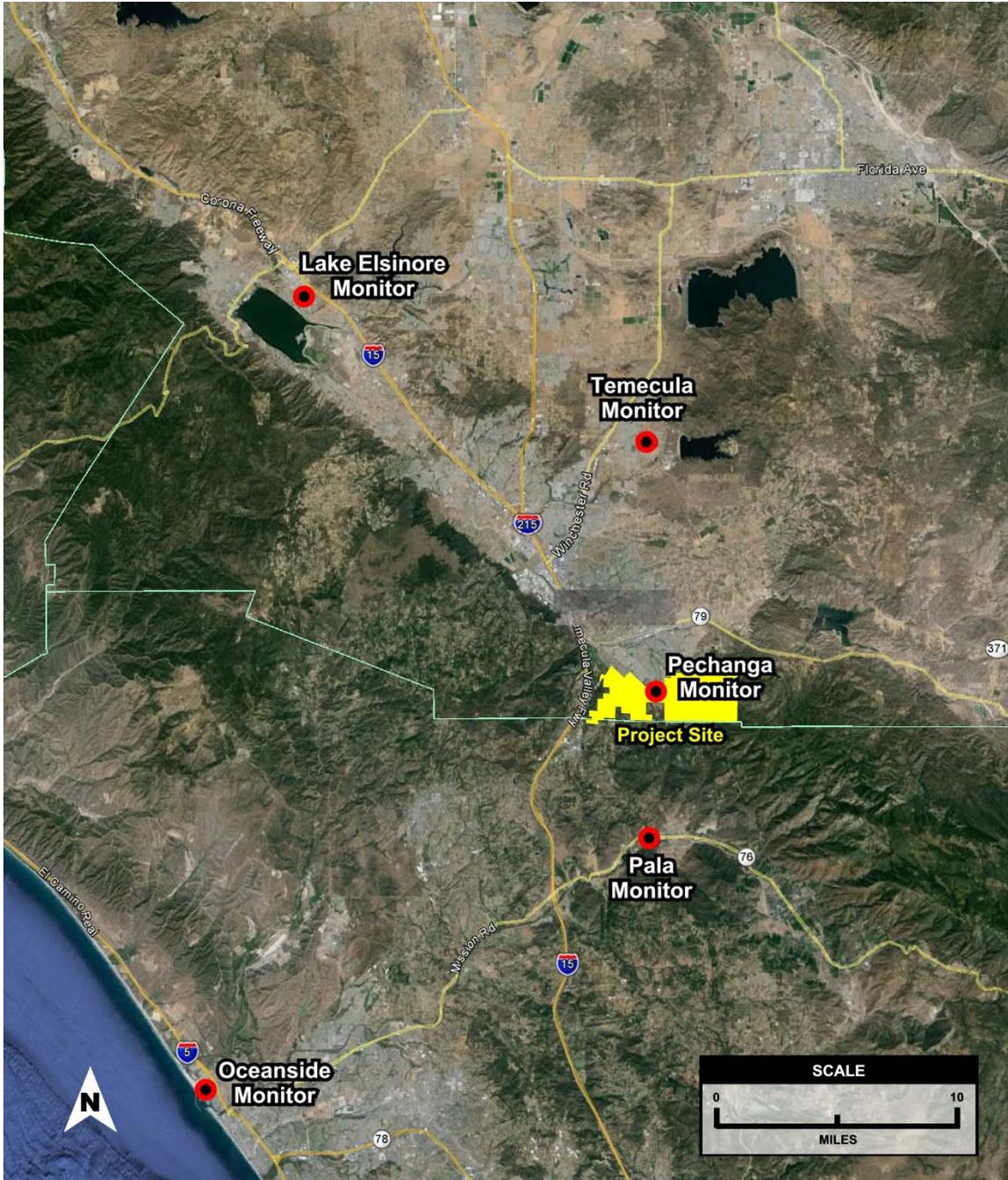


Figure 5
Ozone Monitors in Pechanga Vicinity of Reservation

Because ozone levels in Pechanga are overwhelmingly the result of emissions in the South Coast and San Diego air basins, and because both of these areas are committed to continued reductions in ozone precursor

emissions, it is expected that ozone levels in Pechanga will continue to decline. As shown in Table 7, regional emissions of VOCs and NO_x are expected to decline between now and 2025.

Table 7		
Ozone Attainment Inventory (Summer 2012)		
(Tons per Day)		
Pollutant	VOCs	NO _x
South Coast ^a	496.5	487.9
Riverside County (portion within SoCAB) ^a	55.2	57.8
San Diego ^a	135.5	102.6
Pechanga ^b	0.013	0.029
Regional (Riverside + San Diego + Pechanga)	190.7	160.4

a. Inventory data from California Air Resources Board's (CARB's) California Environmental Protection Agency (CEPA): 2013 Almanac –Standard Emissions Tool.

b. Pechanga emission inventory for on-reservation sources only (by Sierra Research).

Table 8				
Ozone Maintenance Demonstration				
2012-2025 Maintenance Period				
Projected Inventory of Ozone Precursors (Tons per Day)				
Pollutant	Average Total Daily Emissions			
	2012	2015	2020	2025
South Coast Air Basin^a				
VOCs	496.5	456.8	424.1	414.8
NO _x	487.9	430.8	343.4	280.1
Riverside County (portion with SoCAB)^a				
VOCs	55.1	53.2	52.5	53.7
NO _x	57.8	51.5	40.9	31.4
San Diego County^a				
VOCs	135.6	127.7	121.6	118.7
NO _x	104.3	88.8	67.0	54.1

Pechanga ^b				
VOCs	0.013	0.013	0.012	0.011
NO _x	0.029	0.029	0.028	0.028
Regional (Riverside + San Diego + Pechanga)				
VOCs	190.7	180.9	174.1	172.4
NO _x	162.1	140.3	107.9	85.5

5.0 Assessment Results

The Tribe will continue to operate the ambient air quality program. The air monitoring equipment is centrally located on the Reservation and at this time is found sufficient for collecting air data. In the next 10 years the Tribe may establish an additional monitoring station. The location may be further southeast from the existing location on the Reservation. However, in the immediate future there is no plan for expansion of monitors.

The Tribe will continue monitoring for nitrogen dioxide (NO₂) particulate matter (PM_{2.5}), and ozone (O₃) pollutants. There are no future plans at this time to expand the program to collect additional pollutants.

The Tribe will continue to ensure that all necessary air reports, assessments and permit applications are completed and submitted to EPA. The staff will continue to collect, analyze and submit the data to the AQS database.

The Pechanga Environmental Department will continue to track air trends. The Environmental Department is planning to launch a dynamic Air Quality Index program for the community. This program will inform the community about the air quality on the Pechanga Reservation and health effects by displaying real-time air quality data in community areas such as the Government Center and tribal Recreation Center.