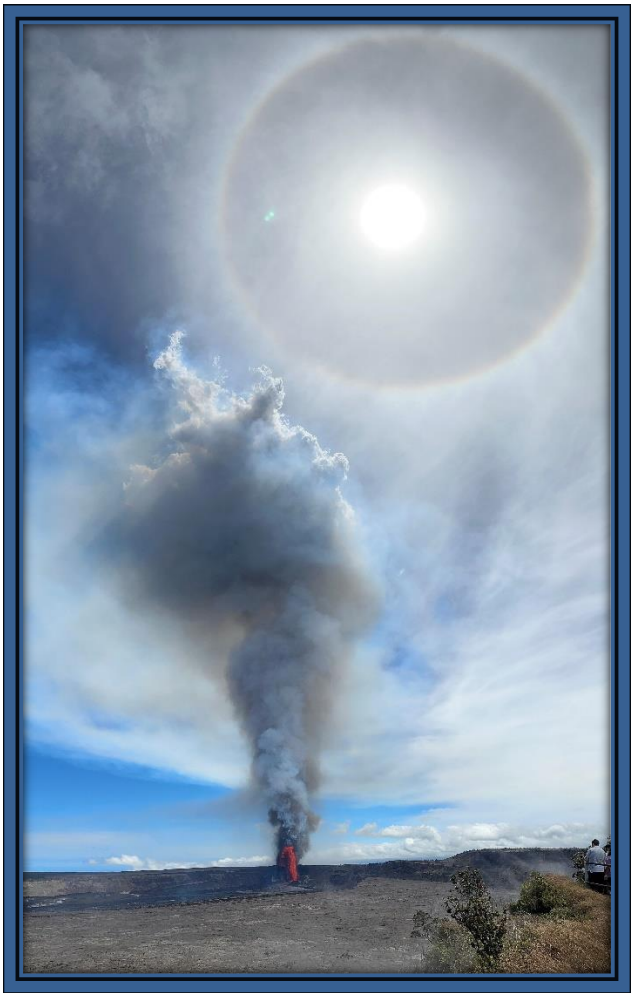
STATE OF HAWAII
ANNUAL SUMMARY
2024
AIR QUALITY DATA



Kilauea Volcano, Hawaii

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STATE OF HAWAII
DEPARTMENT OF HEALTH
KA 'OIHANA OLAKINO

SEPTEMBER 2025

2024
Hawaii Air Quality Data

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Section 1
INTRODUCTION

The Department of Health, Clean Air Branch, monitors the ambient air in the State of Hawaii for various gaseous and particulate air pollutants. The U.S. Environmental Protection Agency (EPA) has set national ambient air quality standards (NAAQS) for six criteria pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, ozone, and particulate matter (PM_{10} and $PM_{2.5}$). Hawaii has also established a state ambient air standard for hydrogen sulfide. The primary purpose of the statewide monitoring network is to measure ambient air concentrations of these pollutants and ensure that these air quality standards are met.

In addition to monitoring the ambient air for criteria pollutants, the State of Hawaii also participates in the NCore multi-pollutant monitoring network; the NCore station in Hawaii is located at the Kapolei monitoring station. The NCore network addresses the following objectives:

- Timely reporting of data to public by supporting AIRNow, air quality forecasting, and other public reporting mechanisms;
- Support for development of emission strategies through air quality model evaluation and other observational methods;
- Accountability of emission strategy progress through tracking long-term trends of criteria and non-criteria pollutants and their precursors;
- Support for long-term health assessments that contribute to ongoing reviews of the NAAQS;
- Compliance through establishing nonattainment/attainment areas through comparison with the NAAQS;
- Support to scientific studies ranging across technological, health, and atmospheric process disciplines;
- Support to ecosystem assessments recognizing that national air quality networks benefit ecosystem assessments and, in turn, benefit from data specifically designed to address ecosystem analyses; and
- $PM_{2.5}$ speciation monitoring that EPA determined to be essential for establishing a relationship between particle concentrations and adverse health effects and would provide valuable information in characterizing aerosols, determining the effectiveness of control strategies, and understanding the effects of particle pollution on atmospheric and regional haze.

Air pollution is caused by different man-made and natural sources, which include industrial, such as power plants and refineries; mobile, such as cars, trucks, and buses; agricultural burning; and naturally occurring, such as wildfires and volcanic activity. In 2024, the state maintained 16 air monitoring stations statewide. On Oahu, four stations measure air emissions from commercial, industrial, and transportation activities. On Maui, two stations measure particulates due to impacts from agricultural burning and wildfires. Kauai's one monitoring station monitors the air quality impacts from cruise

ships. The majority of the state's monitoring stations are located on the island of Hawaii to provide air quality data to communities that may be impacted by emissions from Kilauea volcano and geothermal energy production. Although the state's ambient air monitoring network is reviewed annually, any relocations, additions and/or discontinuations can occur as the need arises.

This report summarizes the validated air pollutant data collected at the 16 monitoring stations during calendar year 2024. Tabular summaries are provided which compare the measured concentrations of criteria pollutants with federal ambient air quality standards and the state's hydrogen sulfide standard. Particulate speciation data and graphical trend summaries are also included in this report.

The Department of Health has a website that displays near real-time air quality data collected from the air monitoring stations. The data has not been reviewed for quality assurance and is subject to change but provides the public with viewing access to current air pollutant and meteorological information. To view this data online, go to https://health.hawaii.gov/cab and link to "Hawaii Ambient Air Quality Data."

Additionally, because sulfur dioxide (SO_2) emissions from Kilauea Volcano may affect communities on the island of Hawaii during an eruption, the Department of Health provides a webpage displaying short term SO_2 data (15-minute averages) from the Hawaii Island stations. The website also provides advisory levels and guidance to help individuals determine what actions need to be taken to protect against possible health effects. This website can be found at https://air.doh.hawaii.gov/home/text/118.

The 2024 "Hawaii Air Quality Data Book", and the Data books from 2016 through 2023 can be found at: https://health.hawaii.gov/cab/hawaii-air-quality-data-books/.

Questions or comments regarding data in this report and other air quality information can be emailed to CAB@doh.hawaii.gov or mailed to:

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Section 2
DEFINITIONS

98th Percentile Value	The $PM_{2.5}$ 24-hour average or the maximum daily 1-hour NO_2 average in the year below which 98% of all values fall.
99th Percentile Value	The maximum daily 1-hour SO_2 value in the year below which 99% of all values fall.
Ambient Air	The general outdoor atmosphere, external to buildings, to which the general public has access.
Ambient Air Quality Standard	A limit in the quantity and exposure to pollutants dispersed or suspended in the ambient air. Primary standards are set to protect public health, including sensitive populations such as people with respiratory conditions, children, and the elderly. Secondary standards are set to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.
Carbon Monoxide	Carbon monoxide (CO) is a colorless, odorless, and tasteless gas under normal atmospheric conditions. It is produced by the incomplete combustion of carbon fuels with the majority of emissions coming from transportation sources.
CFR	Code of Federal Regulations is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government. Title 40 is the Protection of the Environment.
Collocated	This is a procedure required for a certain percentage of PM_{10} and $PM_{2.5}$ samplers in the monitoring network. Collocated samplers determine precision or variation in the PM_{10} or $PM_{2.5}$ concentration measurements of identical samplers run in the same location under the same sampling conditions.
Criteria Pollutants	These are the six pollutants for which the EPA has established national air quality standards. The pollutants are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, lead and particulate matter (PM_{10} and $PM_{2.5}$).
DRR	Data Requirements Rule for 1-hour SO_2 NAAQS.

EPA	The U.S. Environmental Protection Agency; established to protect human health and the natural environment.
Hydrogen Sulfide	Hydrogen sulfide (H_2S) is a toxic, colorless gas with a characteristic "rotten egg" odor detectable at very low levels. It occurs naturally during the decomposition of organic matter, near geothermal sources, and is also produced during certain industrial processes, including wastewater treatment facilities.
Micron	One micron is one millionth of a meter or approximately 1/25,000 of an inch.
$\mu g/m^3$	Micrograms per cubic meter. This is the measurement of air quality expressed as mass per unit volume.
NAAQS	National Ambient Air Quality Standards. These are pollutant standards that the EPA has established to protect public health and welfare. NAAQS have been set for carbon monoxide, nitrogen dioxide, PM_{10}, $PM_{2.5}$, ozone, sulfur dioxide, and lead. These are commonly referred to as criteria pollutants.
NCore	A multi-pollutant network that integrates several advanced measurement systems for particles, pollutant gases, and meteorology. Most NCore stations have been operating since the formal start of the network on January 1, 2011, including Hawaii's.
Nitrogen Dioxide	Nitrogen dioxide (NO_2) is a brownish, highly corrosive gas with a pungent odor. It is formed in the atmosphere from emissions of nitrogen oxides (NO_x). Sources of nitrogen oxides include electric utilities, industrial boilers, motor vehicle exhaust and combustion of fossil fuels. NO_2 is also a component in the atmospheric reaction that produces ground-level ozone.
Ozone	Ozone (O_3) is the main constituent in photochemical air pollution. It is formed in the atmosphere by a chemical reaction of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight. In the upper atmosphere, O_3 shields the earth from harmful ultraviolet radiation; however, at ground level, it can cause harmful effects in humans and plants.

Particulate Matter	This refers to any solid or liquid matter dispersed in the air. Particulate matter (PM) includes dust, soot, smoke, and liquid droplets from sources such as factories, power plants, motor vehicles, construction, agricultural activities, and fires.
PM_{10}	Particulate matter that is 10 microns or less in aerodynamic diameter. These are considered "coarse" particles, generally from sources such as road and windblown dust, and crushing and grinding operations.
$PM_{2.5}$	Particulate matter that is 2.5 microns or less in aerodynamic diameter. Considered "fine" particles, these are generally a result of fuel combustion such as from motor vehicles, utility generation, and industrial facilities. Fine particles can also be formed when gases, such as sulfur dioxide and nitrogen dioxide, are chemically transformed into particles.
ppb	Parts per billion is one particle in 1,000,000,000 other particles.
ppm	Parts per million is one particle in 1,000,000 other particles. It is approximately one drop in 13 gallons.
SLAMS	State and Local Air Monitoring Stations. The Clean Air Act requires that every state establish a network of air monitoring stations for criteria pollutants.
SPM	Special Purpose Monitoring stations. These are stations established to provide data for special studies in support of air program interests and activities. SPM stations supplement the SLAMS network as special circumstances require and adequate resources permit.
Sulfur Dioxide	Sulfur dioxide (SO_2) is a colorless gas that easily combines with water vapor forming sulfuric acid. Emissions of sulfur dioxide are largely from sources that burn fossil fuels such as coal and oil. In Hawaii, another possible major source of sulfur dioxide emissions is from any active eruption of Kilauea Volcano on the Big Island.
Vog	Vog is a term used to express volcanic smog. Vog occurs when volcanic gas and particles combine with air and sunlight to produce atmospheric haze.

Table 2-1 **State and Federal Ambient Air Quality Standards**

Sources: State standards HAR §11-59; Federal standards 40 CFR Part 50

Air Pollutant	Averaging Time	Standards		
		Hawaii State Standard	Federal Primary Standard [a]	Federal Secondary Standard [b]
Carbon Monoxide (CO)	1-hour 8-hour	9 ppm 4.4 ppm	35 ppm 9 ppm	None
Nitrogen Dioxide (NO_2)	1-hour Annual	--- 0.04 ppm	100 ppb 53 ppb	--- 0.053 ppm
PM_{10}	24-hour Annual [c]	150 µg/m^3 50 µg/m^3	150 µg/m^3 ---	--- ---
$PM_{2.5}$	24-hour Annual	---	35 µg/m^3 9 µg/m^3	35 µg/m^3 15 µg/m^3
Ozone (O_3)	8-hour	0.08 ppm	0.070 ppm	0.070 ppm
Sulfur Dioxide (SO_2)	1-hour 3-hour 24-hour Annual	--- 0.5 ppm 0.14 ppm 0.03 ppm	75 ppb --- --- ---	--- ~~0.5 ppm~~ [d] --- 10 ppb [d]
Lead (Pb)	Rolling 3-month	1.5 µg/m^3 [e]	0.15 µg/m^3	0.15 µg/m^3
Hydrogen Sulfide	1-hour	25 ppb	None	None

a ***Primary Standards*** set limits to protect public health, including the health of sensitive populations such as people with respiratory conditions, children and the elderly.

b ***Secondary Standards*** set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

c Because there was insufficient evidence linking long-term exposure to coarse particle pollution with health problems, EPA revoked the annual PM_{10} standard effective December 17, 2006.

d The federal secondary SO_2 standard was revised on December 11, 2024, revoking the previous 3-hour standard of 0.5 ppm not to be exceeded more than once in a year, and revising it to an annual standard of 10 ppb averaged over 3 years..

e The state standard is based on calendar quarter.

Compliance with the National Ambient Air Quality Standards

CO 1-hour: May not be exceeded more than once per year.

CO 8-hour: May not be exceeded more than once per year.

NO_2 1-hour: The 3-year average of the 98th percentile daily maximum 1-hour averages must not exceed the standard.

NO_2 Annual: Average of all 1-hour values in the year may not exceed the level of the standard.

PM_{10} 24-hour: Must not be exceeded more than one day per year, after compensating for days when monitoring did not occur (estimated number of exceedances).

$PM_{2.5}$ 24-hour: The 3-year average of the 98th percentile 24-hour concentrations must not exceed the level of the standard.

$PM_{2.5}$ Annual: The 3-year average of 24-hour values must not exceed the level of the standard.

Ozone 8-hour: The 3-year average of the fourth highest daily maximum value must not exceed the level of the standard.

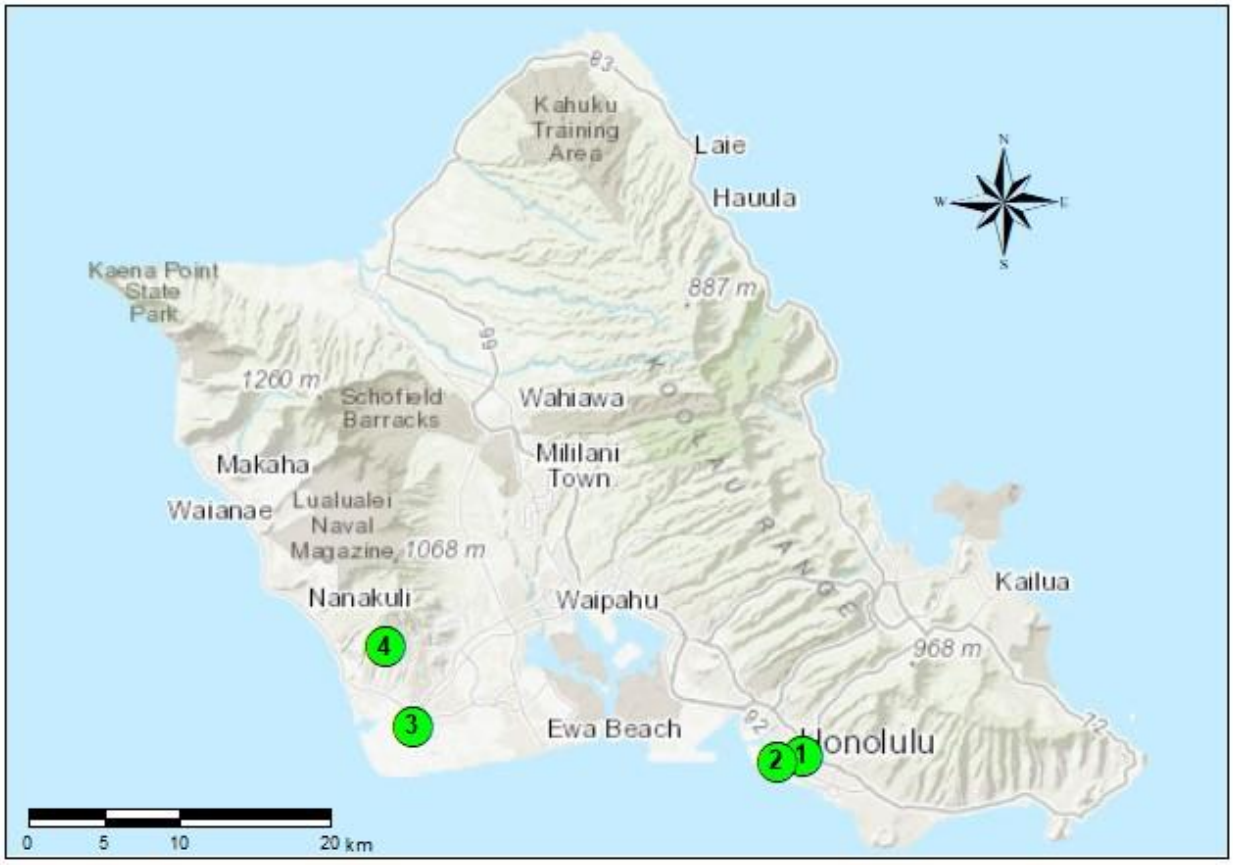
SO_2 1-hour: The 3-year average of the 99th percentile daily maximum 1-hour averages must not exceed the standard.

SO_2 Annual: The 3-year average of the annual concentration must not exceed the level of the standard.

Lead: Average of all 24-hour values in any rolling 3-month period may not exceed the level of the standard.

Section 3
SITE LOCATIONS AND DESCRIPTIONS

Figure 3-1: Island of Oahu – Air Monitoring Stations



Station	Name	Location	Pollutants/Parameters Monitored
1	Honolulu	1250 Punchbowl Street	CO, SO_2, $PM_{2.5}$, PM_{10}
2	Sand Island	1039 Sand Island Parkway	O_3, $PM_{2.5}$, $PM_{2.5}$ Collocated
3	Kapolei / NCore	2052 Lauwiliwili Street	NO_2 / CO trace, SO_2 trace, NO/NO_y, O_3, $PM_{2.5}$, $PM_{2.5}$ speciation, PM_{10}, $PM_{10-2.5}$, WS/WD
4	Kahe	Palehua Road	SO_2

The following station descriptions include latitude and longitude in decimal degrees and altitude in meters above mean sea level.

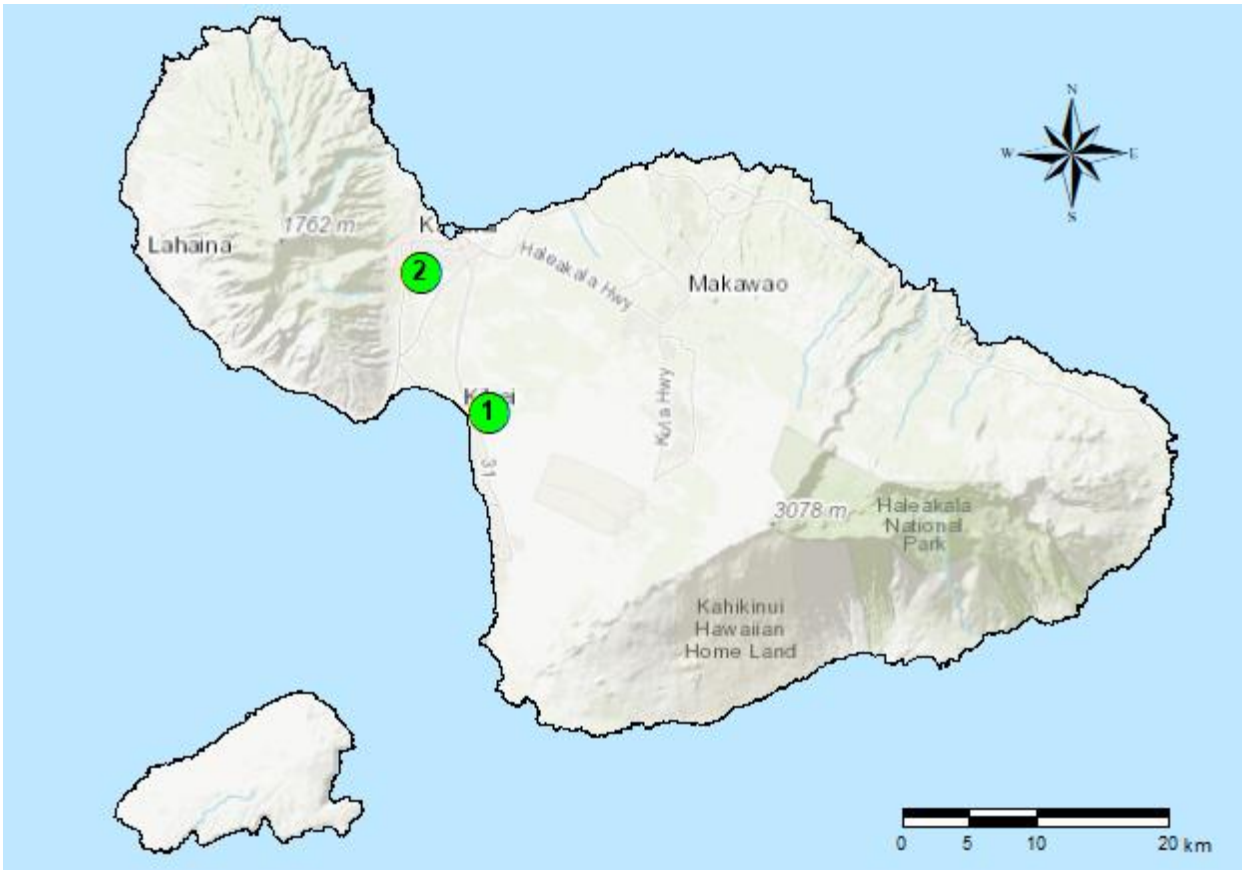
Honolulu (DH)		
	**Location:**	1250 Punchbowl Street, Honolulu
	Latitude:	21.30758
	Longitude:	-157.85542
	Altitude:	20 m
	Parameters:	SO_2, CO, PM_{10}, $PM_{2.5}$
	Established:	April 1971
	Brief Description:	
	Located in downtown Honolulu on the roof of the Department of Health building, across from the Queen's Medical Center, in a busy commercial, business, and government district.	

Kapolei (KA)		
	**Location:**	2052 Lauwiliwili Street, Kapolei
	Latitude:	21.32374
	Longitude:	-158.08861
	Altitude:	17.9 m
	Parameters:	SO_2, CO, NO_2, PM_{10}, $PM_{2.5}$, $PM_{2.5}$ speciation, NCore
	Established:	July 2002
	Brief Description:	
	Located in Kapolei Business Park, southeast of Kapolei Fire Station, next to a drainage canal that separates the park from Barber's Point. Approximately 1.5 miles from Malakole Street in Campbell Industrial Park.	

Sand Island (SI)		
	**Location:**	1039 Sand Island Parkway, Honolulu
	Latitude:	21.30384
	Longitude:	-157.87117
	Altitude:	5.3 m
	Parameters:	O_3, $PM_{2.5}$
	Established:	February 1981
	Brief Description:	
	Located in a light industrial, commercial, and recreational area approximately two miles downwind of downtown Honolulu near the entrance to the Sand Island State Recreation Area.	

Kahe (KE) (Data Requirements Rule)		
	**Location:**	Palehua Road, Makakilo
	Latitude:	21.3678
	Longitude:	-158.103
	Altitude:	388 m
	Parameters:	SO_2
	Established:	January 2017
	Brief Description:	
	Located on the hillside south of Palehua Road, approximately 2.7 kilometers northeast of the Kahe Generating Station. The area around the station is undeveloped and is currently used for cattle grazing. The city of Makakilo is located to the east and southeast.	

Figure 3-2: Island of Maui – Air Monitoring Stations



Station	Name	Location	Pollutant Monitored
1	Kihei	Hale Piilani Park	$PM_{2.5}$
2	Kahului	TMK (2)-3-8-007-153	$PM_{2.5}$

Kihei (KH)

Location:	Hale Piilani Park, Kihei
Latitude:	20.780997
Longitude:	-156.44637
Altitude:	46.5 m
Parameters:	$PM_{2.5}$
Established:	February 1999

Brief Description:

Located in a residential community park, next to a recent residential development on what was once agricultural land.

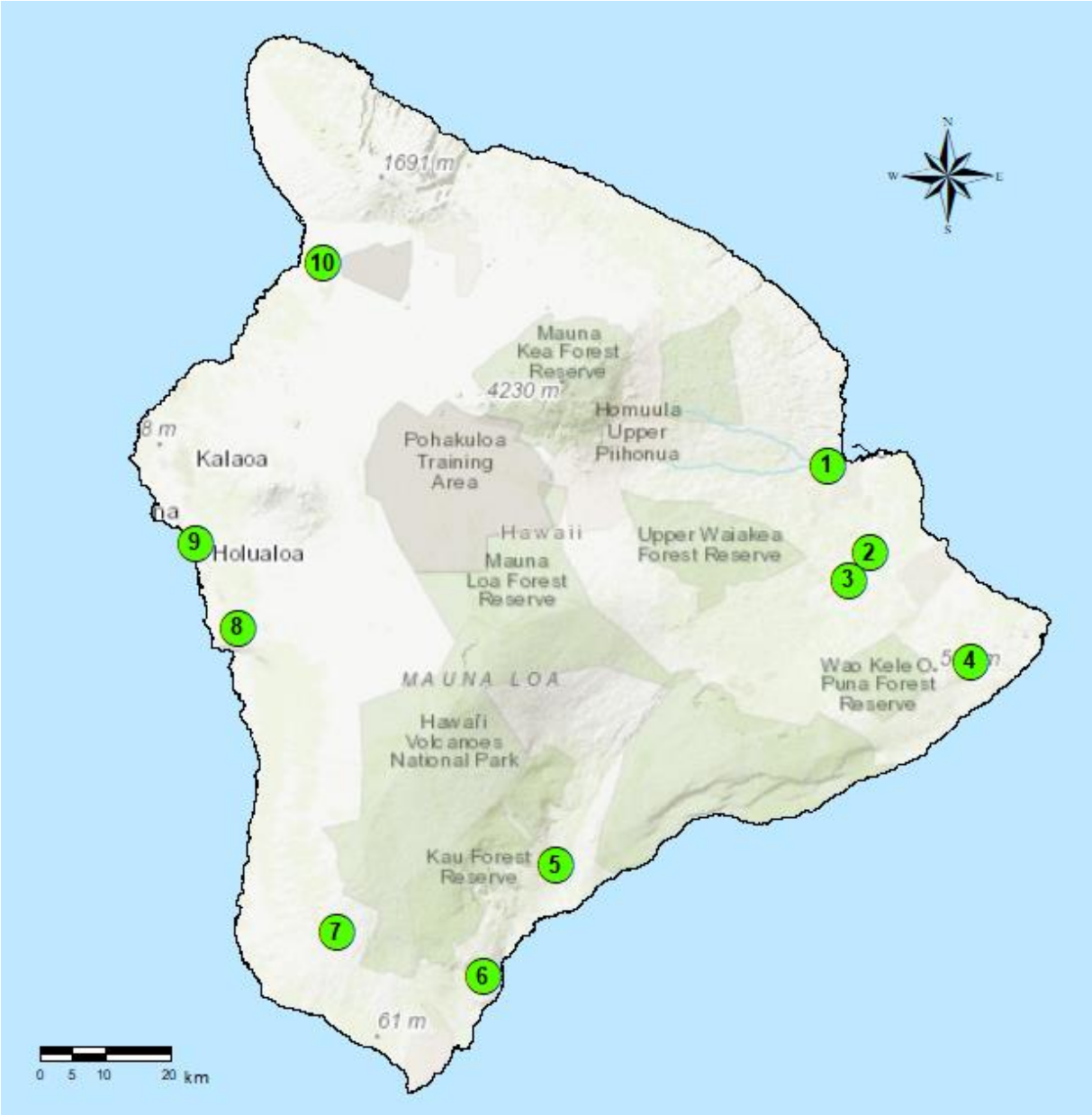
Kahului (KL)

Location:	TMK (2)-3—8-007-153, Kahului
Latitude:	20.869444
Longitude:	-156.492417
Altitude:	55.5 m
Parameters:	$PM_{2.5}$
Established:	January 2015

Brief Description:

Located within a fenced area off Maui Lani Parkway, TMK 2-3-8-007-153. The area is surrounded primarily by residential land.

Figure 3-3: Island of Hawaii – Air Monitoring Stations



Station	Name	Location	Pollutants Monitored
1	Hilo	1099 Waianuenue Avenue	SO_2, $PM_{2.5}$
2	Keaau	16-714 Volcano Road	SO_2, $PM_{2.5}$
3	Mountain View	18-1235 Volcano Road	SO_2, $PM_{2.5}$
4	Leilani	13-3441 Moku Street	SO_2, H_2S
5	Pahala	96-3150 Pikake Street	SO_2, $PM_{2.5}$
6	Naalehu	Naalehu Elementary School	SO_2, $PM_{2.5}$
7	Ocean View	92-6091 Orchid Mauka Circle	SO_2, $PM_{2.5}$
8	Kona	81-1043 Konawaena School Road	SO_2, $PM_{2.5}$
9	Kailua-Kona	DWS Puapuaa Reservoir	$PM_{2.5}$
10	Waikoloa	TMK 3-6-8-002-019	SO_2, $PM_{2.5}$

Hilo (HL)

Location:	1099 Waianuenue Avenue, Hilo
Latitude:	19.71756
Longitude:	-155.11053
Altitude:	136.8 m
Parameters:	SO_2, $PM_{2.5}$
Established:	January 1997

Brief Description:

Located near the Hilo Medical Center, this station was established to monitor vog on the east side of the island of Hawaii.

Kona (KN)

Location:	81-1043 Konawaena School Road, Kona
Latitude:	19.50978
Longitude:	-155.91342
Altitude:	517.2 m
Parameters:	SO_2, $PM_{2.5}$
Established:	September 2005

Brief Description:

Located on the upper campus of Konawaena High School, this station monitors for vog on the west side of the island of Hawaii.

Mountain View (MV)

Location:	18-1235 Volcano Road, Mountain View
Latitude:	19.57002
Longitude:	-155.08046
Altitude:	436.5 m
Parameters:	SO_2, $PM_{2.5}$
Established:	December 2010

Brief Description:

Located on the grounds of the Mt. View Elementary School, this station was established to monitor vog during southerly wind conditions.

Ocean View (OV)

Location:	92-6091 Orchid Mauka Circle, Ocean View
Latitude:	19.11756
Longitude:	-155.77814
Altitude:	862.6 m
Parameters:	SO_2, $PM_{2.5}$
Established:	April 2010

Brief Description:

Located at the Ocean View Fire Station in Hawaii Ocean View Estates, this station monitors for volcanic emissions.

Pahala (PA)

Location:	96-3150 Pikake Street, Pahala
Latitude:	19.2039
Longitude:	-155.48018
Altitude:	320 m
Parameters:	SO_2, $PM_{2.5}$
Established:	August 2007
Brief Description:	
Located on the grounds of the Kau High and Pahala Elementary School, this station monitors for volcanic emissions.	

KAILUA-KONA (KK)

Location:	DWS Puapuaa Reservoir, Kailua-Kona
Latitude:	19.61815833
Longitude:	-155. 9711111
Altitude:	92.4 m
Parameters:	$PM_{2.5}$
Established:	November 2018
Brief Description:	
This station is in the middle of Kailua-Kona town within the County of Hawaii's water reservoir and pump house, monitoring for volcanic emissions.	

KEAAU (KS)

Location:	Kamehameha Schools,16-714 Volcano Road, Keaau, HI 96749
Latitude:	19.605424
Longitude:	-155.051379
Altitude:	179.8 m
Parameters:	SO_2, $PM_{2.5}$
Established:	June 2022
Brief Description:	
This station is in the town of Keaau on the Kamehameha Schools Hawaii campus, monitoring for volcanic emissions during southerly wind conditions.	

Leilani (LE)

Location:	13-3441 Moku Street, Pahoa
Latitude:	19.46555556
Longitude:	-154.91583333
Altitude:	229 m
Parameters:	H_2S, SO_2
Established:	June 2021

Brief Description:

Located at the Leilani Community Association Center in a residential subdivision, the station monitors emissions from the nearby geothermal energy facility.

Naalehu (NA)

Location:	Naalehu Elementary School, 95-5547 Mamalahoa Hwy., Naalehu
Latitude:	19.060656
Longitude:	-155.579167
Altitude:	196.3 m
Parameters:	SO_2, $PM_{2.5}$
Established:	September 2018

Brief Description:

This station is located at the USGS Seismograph building on the campus of Naalehu Elementary School, monitoring for volcanic emissions.

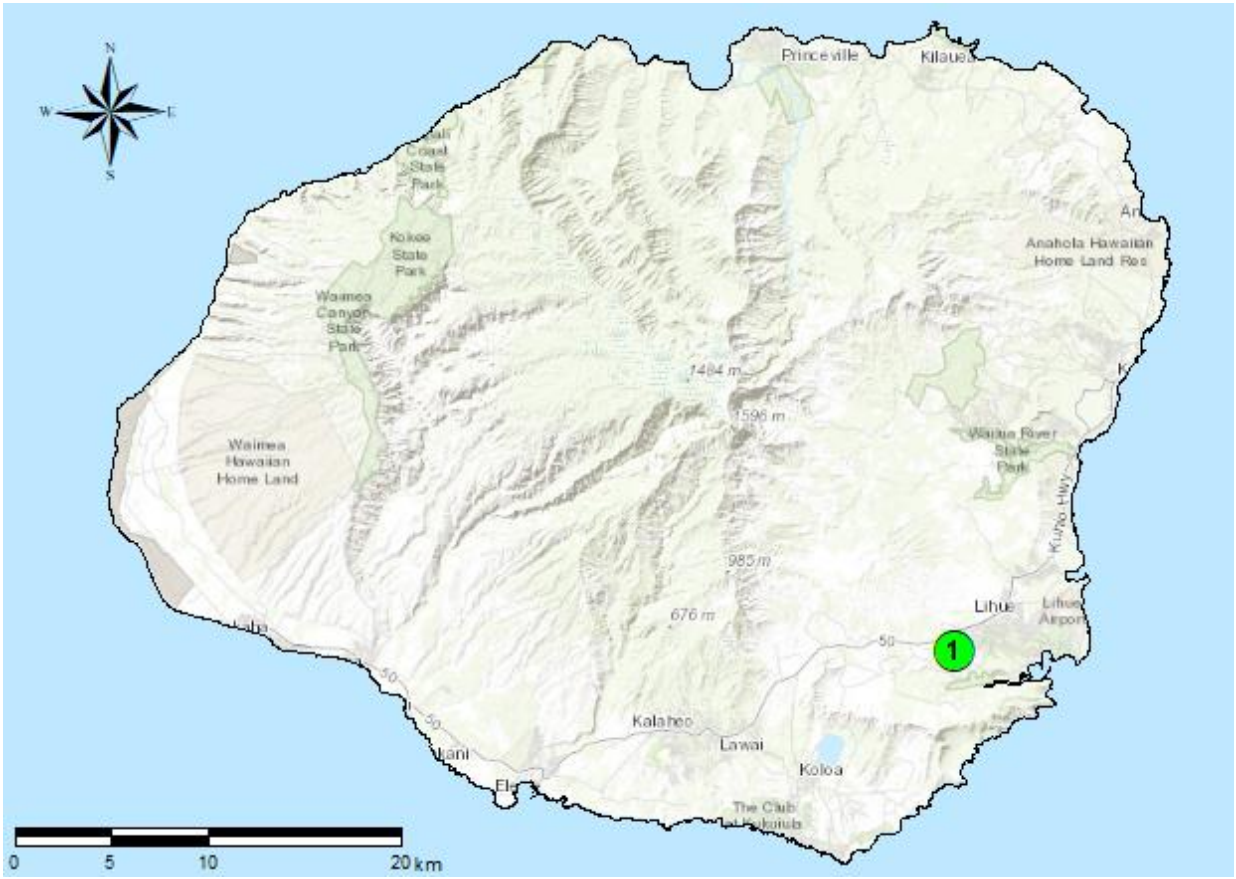
Waikoloa (WL)

Location:	TMK 3-6-8-002-019, Waikoloa
Latitude:	19.977500
Longitude:	-155.798056
Altitude:	182.9 m
Parameters:	SO_2, $PM_{2.5}$
Established:	July 2021

Brief Description:

Located within the County of Hawaii's water tank and pump house, approximately 3 km northeast of Waikoloa, this station monitors for volcanic emissions.

Figure 3-4: Island of Kauai – Air Monitoring Station



Station	Name	Location	Pollutant Monitored
1	Niumalu	2342 Hulemalu Road	SO_2

Niumalu (NI)

Location:	2342 Hulemalu Road, Lihue
Latitude:	21.9495
Longitude:	-159.365
Altitude:	11 m
Parameters:	SO_2
Established:	April 2011
Brief Description:	
Located in the Niumalu residential subdivision, this station monitors for emissions from the cruise ships in Nawiliwili Harbor approximately 1.0 mile upwind.	

Table 3-1 **State of Hawaii Ambient Air Monitoring Network**

	Pollutants Monitored and Station Type								
SITE	**PM_{10}**	**$PM_{2.5}$**	**CO**	**O_3**	**SO_2**	**NO_2**	**H_2S**	**MONITORING OBJECTIVE**	**LOCATION SETTING**
OAHU									
Honolulu	S	S	S	-	S	-	-	Population Exposure	Urban and Center City
Kapolei[1]	S	S,C	S	S	S	S	-	Population Exposure	Suburban
Sand Island	-	S,C	-	S	-	-	-	Maximum Concentration (O_3)/ Transport ($PM_{2.5}$)	Urban and Center City
Kahe[2]	-	-	-	-	S	-	-	Source Impact (DRR)	Neighborhood
MAUI									
Kihei	-	SPM	-	-	-	-	-	Population Exposure	Suburban
Kahului	-	SPM	-	-	-	-	-	Population Exposure	Neighborhood
HAWAII									
Hilo	-	SPM	-	-	S	-	-	Population Exposure	Suburban
Kona	-	SPM	-	-	S	-	-	Population Exposure (SO_2)/ Maximum concentration ($PM_{2.5}$)	Suburban
Mountain View	-	SPM	-	-	SPM	-	-	Source Impact	Suburban
Ocean View	-	SPM	-	-	SPM	-	-	Welfare Impact (SO_2)/ Source Impact ($PM_{2.5}$)	Rural
Pahala	-	SPM	-	-	SPM	-	-	Maximum concentration (SO_2)/ Source Impact ($PM_{2.5}$)	Rural
Kailua-Kona	-	SPM	-	-	-	-	-	Source Impact	Suburban
Keaau	-	SPM	-	-	SPM	-	-	Source Impact	Suburban
Leilani	-	-	-	-	SPM	-	SPM	Source Impact (geothermal)	Rural
Naalehu	-	SPM	-	-	SPM	-	-	Source Impact	Rural
Waikoloa	-	SPM	-	-	SPM	-	-	Source Impact	Rural
KAUAI									
Niumalu	-	-	-	-	SPM	-	-	Source Impact (cruise ships)	Suburban

C = Collocated Site S = (SLAMS) State and Local Air Monitoring Station

SPM = Special Purpose Monitoring Station (for monitoring vog, geothermal energy production and cruise ships)

[1] Includes NCore station.

[2] As required by the Data Requirements Rule, this station was discontinued with EPA approval on September 30, 2024.

Table 3-2 **Sampling Equipment at Each Monitoring Station**

Monitoring Station	PM_{10} Continuous Ambient Particulate Monitor	$PM_{2.5}$ Manual Particulate Monitor	$PM_{2.5}$ Continuous Monitor	CO Continuous Gas Filter Correlation Analyzer	SO_2 Continuous Pulsed Fluorescence Ambient Air Analyzer	O_3 Continuous UV Photometric Analyzer	NO_2 Continuous Chemiluminescence Analyzer	H_2S Continuous Pulsed Fluorescence Ambient Air Analyzer
OAHU								
Honolulu	■		■	■	■			
Kapolei	■	■	■	■	■	■	■	
Sand Island		■	■			■		
MAUI								
Kihei			■					
Kahului			■					
HAWAII								
Hilo			■		■			
Kona			■		■			
Mountain View			■		■			
Ocean View			■		■			
Pahala			■		■			
Kailua-Kona			■					
Keaau			■		■			
Leilani					■			■
Naalaehu			■		■			
Waikoloa			■		■			
KAUAI								
Niumalu					■			

Section 4
AIR QUALITY DATA

To protect the state's air quality from degradation, the Department of Health's Clean Air Branch is responsible for regulating and monitoring pollution sources to ensure that the levels of criteria pollutants remain well below the state and federal ambient air quality standards. Data collected from the ambient air network is validated and audited to ensure that the reported data is of good quality and meets all quality control and assurance requirements.

In 2024 the State of Hawaii was in attainment of all NAAQS.

Description of Summary Tables 4-1 through 4-17:

- Summaries are by pollutant and averaging period, with the number of occurrences exceeding the NAAQS;
- Table 4-11, provides the number of exceedances of the state's H_2S standard (there is no federal H_2S standard);
- The "Maximum" is the highest and second highest valid values recorded in the year for the averaging period;
- For $PM_{2.5}$, the maximum and 98^{th} percentile concentrations are provided;
- For O_3, the 4^{th} highest daily maximum value is also displayed;
- The "Annual Mean" is the arithmetic mean of all valid values recorded in the year;
- "Possible Periods" is the total number of possible sampling periods in the year for the averaging period;
- "Valid Periods" is the total number of acceptable sampling periods after data validation;
- "Percent Recovery" represents the amount of quality data reported;
- Attainment with the NAAQS is determined according to 40 CFR 50.

Description of Tables 4-18 through 4-27:

- For each pollutant and averaging period, the highest concentration for each month is presented;
- The month with the highest value recorded in the year for each site is highlighted.

Table 4-1. 2024 Summary of the 24-Hour PM_{10} Averages

	Maximum		Annual Mean	No. of 24-Hour Averages Greater than 150 µg/m³														
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods	Percent Recovery
OAHU																		
Honolulu	41	30	11.9	0	0	0	0	0	0	0	0	0	0	0	0	366	366	100.0%
Kapolei	36	34	15.1	0	0	0	0	0	0	0	0	0	0	0	0	366	360	98.4%

Table 4-2. Attainment Determination of the 24-Hour PM_{10} NAAQS

Station	Exceedances in 2022	Exceedances in 2023	Exceedances in 2024	Sites in Violation of the NAAQS
Honolulu	0	0	0	0
Kapolei	0	0	0	0
Attainment: The standard not to be exceeded more than once per year on average over 3 years. **In 2024, Hawaii was in attainment with the 24-hour PM_{10} NAAQS.**				

Table 4-3. 2024 Summary of the 24-Hour $PM_{2.5}$ Averages: SLAMS Stations

	Maximum		Annual Mean	No. of 24-Hour Averages Greater than 35 µg/m³														
	1st High	98th %	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods	Percent Recovery
OAHU																		
Honolulu	27.4	7.6	4.1	0	0	0	0	0	0	0	0	0	0	0	0	366	366	100%
Kapolei	11.5	8.9	4.6	0	0	0	0	0	0	0	0	0	0	0	0	366	360	98.4%
Sand Island	19.8	7.6	4.0	0	0	0	0	0	0	0	0	0	0	0	0	366	357	97.5%

Table 4-4. Attainment Determination of the 24-Hour $PM_{2.5}$ NAAQS: SLAMS Stations

Station	2022 98th Value	2023 98th Value	2024 98th Value	3-Year Average	Attainment of the NAAQS
Honolulu	7.2	8.3	7.6	8	Y
Kapolei	8.1	10.0	8.9	9	Y
Sand Island	8.2	10.0	7.6	9	Y
Attainment: The 3-year average of the 98th percentile values must be less than or equal to 35 µg/m³; design values are calculated to the nearest µg/m³. **In 2024, Hawaii was in attainment with the 24-hour $PM_{2.5}$ NAAQS.**					

Table 4-5. Attainment Determination of the Annual $PM_{2.5}$ NAAQS: SLAMS Stations

Station	2022 Annual Wtd. Mean	2023 Annual Wtd. Mean	2024 Annual Wtd. Mean	3-Year Design Value	Attainment of the NAAQS
Honolulu	3.3	4.1	4.1	3.8	Y
Kapolei	3.8	4.5	4.6	4.3	Y
Sand Island	3.7	3.9	4.0	3.8	Y

Attainment: The 3-year average of annual mean values must be less than 9 µg/m^3; design values are calculated to the nearest 0.1 µg/m^3.
In 2024, Hawaii was in attainment with the annual $PM_{2.5}$ NAAQS.

Table 4-6. 2024 Summary of the 24-Hour $PM_{2.5}$ Averages: SPM Stations

	Maximum		Annual Mean	No. of 24-Hour Averages Greater than 35 µg/m^3														
	1st High	98th %	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods	Percent Recovery
HAWAII																		
Hilo	6.8	5.1	2.6	0	0	0	0	0	0	0	0	0	0	0	0	366	352	96.2%
Kona	20.3	10.0	2.5	0	0	0	0	0	0	0	0	0	0	0	0	366	361	98.6%
Mt. View	9.6	4.7	2.1	0	0	0	0	0	0	0	0	0	0	0	0	366	360	98.4%
Ocean View	19.2	12.2	2.0	0	0	0	0	0	0	0	0	0	0	0	0	366	353	96.4%
Pahala	8.9	6.7	3.1	0	0	0	0	0	0	0	0	0	0	0	0	366	360	98.4%
Kailua-Kona	20.5	10.0	2.9	0	0	0	0	0	0	0	0	0	0	0	0	366	360	98.4%
Keaau	8.7	5.3	2.8	0	0	0	0	0	0	0	0	0	0	0	0	366	360	98.4%
Naalehu	8.0	6.2	2.9	0	0	0	0	0	0	0	0	0	0	0	0	366	357	97.5%
Waikoloa	22.2	7.1	2.4	0	0	0	0	0	0	0	0	0	0	0	0	366	359	98.1%
MAUI																		
Kahului	35.7[1]	8.0	3.9	1	0	0	0	0	0	0	0	0	0	0	0	366	346	94.5%
Kihei	8.8	6.0	2.8	0	0	0	0	0	0	0	0	0	0	0	0	366	350	95.6%

The special purpose stations on Hawaii Island were established to monitor ambient air concentrations of $PM_{2.5}$ from volcanic emissions. The special purpose stations on Maui were established to monitor air quality impacts from agricultural burning activities and wildfires.

[1] Due to New Year's fireworks celebration.

Table 4-7. 2024 Summary of the 8-Hour O_3 Averages

	Maximum			Annual Mean	No. of Daily Maximum 8-Hour Averages Greater than 0.070 ppm														
	1st High	2nd High	4th High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods	Percent Recovery
OAHU																			
Sand Island	0.046	0.045	0.044	0.026	0	0	0	0	0	0	0	0	0	0	0	0	356	366	97.3%
Kapolei	0.045	0.045	0.045	0.029	0	0	0	0	0	0	0	0	0	0	0	0	362	366	98.9%

Table 4-8. Attainment Determination of the 8-Hour O_3 NAAQS

Station	2022 4th Highest	2023 4th Highest	2024 4th Highest	3-Year Average	Attainment of the NAAQS
Sand Island	0.044	0.046	0.044	0.044	Y
Kapolei	0.041	0.043	0.045	0.043	Y

Attainment: The 3-year average of the annual 4th highest daily maximum 8-hour average must be less than or equal to 0.070 ppm.
In 2024, Hawaii was in attainment with the 8-hour O_3 NAAQS.

Table 4-9. 2024 Summary of the 1-Hour and Annual NO_2 Averages

	Maximum		Annual Mean	No. of Daily Maximum 1-Hour Averages Greater than 100 ppb														
	1st High	98th%	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods	Percent Recovery
OAHU	**SLAMS Station**																	
Kapolei	30.8	19.6	2.6	0	0	0	0	0	0	0	0	0	0	0	0	8784	8518	97.0%

Attainment of the annual NO_2 NAAQS: The annual mean shall not exceed 53 ppb.
In 2024, Hawaii was in attainment with the annual NO_2 NAAQS.

Table 4-10. Attainment Determination of the 1-Hour NO_2 NAAQS

Station	2022 98th Value	2023 98th Value	2024 98th Value	3-Year Average	Attainment of the NAAQS
OAHU	**SLAMS Station**				
Kapolei	23.1	23.2	19.6	22	Y
Attainment: The 3-year average of the 98th percentile values must be less than or equal to 100 ppb; design values are rounded to the nearest ppb. **In 2024, Hawaii was in attainment with the 1-hour NO_2 NAAQS.**					

Table 4-11. 2024 Summary of the 1-Hour H_2S Averages (State Standard)

	Maximum		Annual Mean	No. of 1-Hour Averages Greater than 25 ppb														
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods	Percent Recovery
HAWAII																		
Leilani	1.6	1.6	0.5	0	0	0	0	0	0	0	0	0	0	0	0	8784	7917	90.1%
State standard: 1-hour values not to exceed 25 ppb. **In 2024, Hawaii did not exceed the state 1-hour H_2S standard.**																		

Table 4-12. 2024 Summary of the 1-Hour SO_2 Averages

	Maximum		Annual Mean	No. of 1-Hour Averages Greater than 75 ppb														
	1st High	99th%	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods	Percent Recovery
OAHU	**SLAMS Stations**																	
Honolulu	3.7	2.6	1.7	0	0	0	0	0	0	0	0	0	0	0	0	8784	8693	99.0%
Kaplolei/NCore	13.4	6.3	0.0	0	0	0	0	0	0	0	0	0	0	0	0	8784	8660	98.6%
Kahe[1]	99.5	46.2	0.7	0	1	0	0	0	0	0	0	0	0	0	0	6576	6423	98.2%
HAWAII	**SLAMS Stations (see NOTE)**																	
Hilo	7.2	5.5	1.6	0	0	0	0	0	0	0	0	0	0	0	0	8784	8662	98.6%
Kona[2]	48.6	29.0	1.6	0	0	0	0	0	0	0	0	0	0	0	0	8784	8654	98.5%
HAWAII	**SPM Stations (see NOTE)**																	
Mt. View	14.5	7.8	0.9	0	0	0	0	0	0	0	0	0	0	0	0	8784	8608	98.0%
Ocean View[2]	173.1	92.8	1.9	0	0	0	0	0	0	0	0	0	0	0	4	8784	8365	95.2%
Pahala[2]	174.8	93.0	2.4	0	0	0	0	0	1	0	0	3	0	0	1	8784	8440	96.1%
Keaau	5.9	4.2	0.2	0	0	0	0	0	0	0	0	0	0	0	0	8784	8441	96.1%
Leilani	2.6	1.8	0.7	0	0	0	0	0	0	0	0	0	0	0	0	8784	8090	92.1%
Naalehu[2]	272.8	73.0	1.2	4	1	0	0	0	1	0	0	1	0	0	0	8784	8541	97.2%
Waikoloa	37.5	7.7	0.8	0	0	0	0	0	0	0	0	0	0	0	0	8784	8668	98.7%
KAUAI	**SPM Station (see NOTE)**																	
Niumalu[3]	2.1	1.1	0.7	0	0	0	0	0	0	0	0	0	0	0	0	8784	5510	62.7%

Attainment: The 3-year average of the 99th percentile values must be less than or equal to 75 ppb.
In 2024, Hawaii was in attainment with the 1-hour SO_2 NAAQS (SLAMS stations only).
NOTE: The SPM stations on Hawaii Island were established to monitor ambient air concentrations of SO_2 from volcanic emissions. Although Hilo and Kona stations are designated SLAMS, high levels of SO_2 attributed to to volcanic emissions is comparable to the NAAQS. Volcanic eruptions are considered natural events, EPA concurrence of an exceptional event demonstration allows the exclusion of data for attainment determinations.
The SPM station on Kauai was established to monitor emissions from cruise ships.

[1] With EPA's approval, the Kahe station was shut down on September 30, 2024.
[2] Elevated values due to emissions from eruptions at the summit of Kilauea Volcano.
[3] Data recovery was <50% in 4th quarter, substitution test not allowed.

Table 4-13. Attainment Determination of the 1-Hour SO_2 NAAQS: SLAMS Stations

	2022 99th Value	2023 99th Value	2024 99th Value	3-Year Average	Attainment of the NAAQS
OAHU SLAMS Stations					N= NO Y= YES
Honolulu	1.6	2.9	2.6	2	Y
Kapolei/NCore	1.9	11.4	6.3	7	Y
Kahe[1]	63.1	60.3	46.2	57	Y
HAWAII SLAMS Stations (see NOTE)					
Hilo[2]	25.3	92.1	5.5	41	Y
Kona[2]	8.2	18.0	29.0	18	Y
HAWAII SPM Stations (see NOTE)					
Mt. View[2]	55.6	42.9	7.8	35	Y
Ocean View[2]	107.3	213.0	92.8	138	N
Pahala[2]	229.2	236.1	93.0	186	N
Keaau[2]	36.1	27.2	4.2	23	Y
Leilani	2.2	2.6	1.8	2	Y
Naalehu[2]	39.0	94.8	73.0	69	Y
Waikoloa	1.5	6.2	7.7	4	Y
KAUAI SPM Station (see NOTE)					
Niumalu[3]	1.8	1.9	1.1	2	Y

Attainment: The 3-year average of the 99th percentile values must be less than or equal to 75 ppb; design values are rounded to the nearest ppb.
In 2024, Hawaii was in attainment with the 1-hour SO_2 NAAQS (SLAMS stations only).
NOTE: The SPM stations on Hawaii Island were established to monitor ambient air concentrations of SO_2 from volcanic emissions. Although Hilo and Kona stations are designated SLAMS, high levels of SO_2 attributed to to volcanic emissions is comparable to the NAAQS. Volcanic eruptions are considered natural events, EPA concurrence of an exceptional event demonstration allows the exclusion of data for attainment determinations.
The SPM station on Kauai was established to monitor emissions from cruise ships.

[1] With EPA's approval, the Kahe station was shut down on September 30, 2024.
[2] Elevated values due to emissions from eruptions at the summit of Kilauea Volcano.
[3] Data recovery was <50% in 4th quarter, substitution test not allowed.

Table 4-14. 2024 Summary of the 3-Hour SO_2 Averages

	Maximum		Annual Mean	No. of 3-Hour Averages Greater than 0.5 ppm														
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods	Percent Recovery
OAHU	**SLAMS Stations**																	
Honolulu	0.003	0.003	0.002	0	0	0	0	0	0	0	0	0	0	0	0	2928	2851	97.4%
Kaplolei/NCore	0.005	0.005	0.000	0	0	0	0	0	0	0	0	0	0	0	0	2928	2819	96.3%
Kahe[1]	0.045	0.038	0.001	0	0	0	0	0	0	0	0	0	0	0	0	2192	2118	96.6%
HAWAII	**SLAMS Stations (see NOTE)**																	
Hilo	0.006	0.005	0.002	0	0	0	0	0	0	0	0	0	0	0	0	2928	2866	97.9%
Kona[2]	0.040	0.039	0.002	0	0	0	0	0	0	0	0	0	0	0	0	2928	2862	97.7%
HAWAII	**SPM Stations (see NOTE)**																	
Mt. View	0.011	0.008	0.001	0	0	0	0	0	0	0	0	0	0	0	0	2928	2798	95.6%
Ocean View[2]	0.136	0.123	0.002	0	0	0	0	0	0	0	0	0	0	0	0	2928	2732	93.3%
Pahala[2]	0.119	0.070	0.002	0	0	0	0	0	0	0	0	0	0	0	0	2928	2762	94.3%
Keaau	0.005	0.004	0.000	0	0	0	0	0	0	0	0	0	0	0	0	2928	2794	95.4%
Leilani	0.002	0.002	0.001	0	0	0	0	0	0	0	0	0	0	0	0	2928	2655	90.7%
Naalehu[2]	0.166	0.139	0.001	0	0	0	0	0	0	0	0	0	0	0	0	2928	2826	96.5%
Waikoloa[2]	0.034	0.025	0.001	0	0	0	0	0	0	0	0	0	0	0	0	2928	2848	97.3%
KAUAI	**SPM Station (see NOTE)**																	
Niumalu[3]	0.001	0.001	0.001	0	0	0	0	0	0	0	0	0	0	0	0	2928	2506	85.8%

Attainment: On December 11, 2024, the National secondary standard was changed from 3-hour values not to exceed 0.5 ppm more than once per year, to a 3-year average of the annual SO_2 concentration ≤10 ppb. The state standard of 3-hour values not to exceed 0.5 ppm remains.
In 2024, Hawaii was in attainment with the state 3-hour SO_2 standard.
NOTE: The SPM stations on Hawaii Island were established to monitor ambient air concentrations of SO_2 from volcanic emissions. Although Hilo and Kona stations are designated SLAMS, high levels of SO_2 attributed to to volcanic emissions is comparable to the NAAQS. Volcanic eruptions are considered natural events, EPA concurrence of an exceptional event demonstration allows the exclusion of data for attainment determinations.
The SPM station on Kauai was established to monitor emissions from cruise ships.

[1] With EPA's approval, the Kahe station was shut down on September 30, 2024.
[2] Elevated values due to emissions from eruptions at the summit of Kilauea Volcano.
[3] Data recovery was <50% in 4th quarter, substitution test not allowed.

Table 4-15. 2024 Summary of the 24-Hour and Annual SO_2 Averages

	Maximum		Annual Mean	No. of 24-Hour Averages Greater than 0.14 ppm														
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods	Percent Recovery
OAHU	**SLAMS Stations**																	
Honolulu	0.002	0.002	0.002	0	0	0	0	0	0	0	0	0	0	0	0	366	365	99.7%
Kaplolei/NCore	0.001	0.001	0.000	0	0	0	0	0	0	0	0	0	0	0	0	366	364	99.5%
Kahe[1]	0.009	0.009	0.001	0	0	0	0	0	0	0	0	0	0	0	0	274	271	98.9%
HAWAII	**SLAMS Stations (see NOTE)**																	
Hilo	0.002	0.002	0.002	0	0	0	0	0	0	0	0	0	0	0	0	366	360	96.2%
Kona[2]	0.024	0.016	0.002	0	0	0	0	0	0	0	0	0	0	0	0	366	366	100%
HAWAII	**SPM Stations (see NOTE)**																	
Mt. View	0.003	0.003	0.001	0	0	0	0	0	0	0	0	0	0	0	0	366	362	98.9%
Ocean View[2]	0.038	0.037	0.002	0	0	0	0	0	0	0	0	0	0	0	0	366	342	93.4%
Pahala[2]	0.033	0.022	0.002	0	0	0	0	0	0	0	0	0	0	0	0	366	357	97.5%
Keaau	0.002	0.002	0.000	0	0	0	0	0	0	0	0	0	0	0	0	366	355	97.0%
Leilani	0.001	0.001	0.001	0	0	0	0	0	0	0	0	0	0	0	0	366	341	93.2%
Naalehu[2]	0.050	0.044	0.001	0	0	0	0	0	0	0	0	0	0	0	0	366	360	98.4%
Waikoloa[2]	0.016	0.016	0.001	0	0	0	0	0	0	0	0	0	0	0	0	366	362	98.9%
KAUAI	**SPM Station (see NOTE)**																	
Niumalu[3]	0.001	0.001	0.001	0	0	0	0	0	0	0	0	0	0	0	0	366	234	63.9%

Attainment: 24-hour values not to exceed 0.14 ppm.
In 2024, Hawaii was in attainment of the state 24-hour SO_2 standard.
Attainment: Annual average (from SLAMS stations only) not to exceed 0.03 ppm.
In 2024, Hawaii was in attainment of the state annual SO_2 standard.
NOTE: The SPM stations on Hawaii Island were established to monitor ambient air concentrations of SO_2 from volcanic emissions. Hilo and Kona stations are designated as SLAMS, high levels of SO_2 attributed to volcanic emissions is comparable to the NAAQS. Volcanic eruptions are considered a natural event, EPA concurrence of an exceptional event demonstration allows the exclusion of data for attainment determinations.
The SPM station on Kauai was established to monitor emissions from cruise ships.

[1] With EPA's approval, the Kahe station was shut down on September 30, 2024.
[2] Elevated values due to emissions from eruptions at the summit of Kilauea Volcano.
[3] Data recovery was <50% in 4th quarter, substitution test not allowed.

Table 4-16. 2024 Summary of the 1-Hour CO Averages

	Maximum		Annual Mean	No. of 1-Hour Averages Greater than 35 ppm														
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods	Percent Recovery
OAHU	**SLAMS Stations**																	
Honolulu	6.8	0.7	0.1	0	0	0	0	0	0	0	0	0	0	0	0	8784	8680	98.8%
Kapolei/NCore[1]	0.5	0.5	0.1	0	0	0	0	0	0	0	0	0	0	0	0	8784	6696	76.2%
Attainment: 1-hour values not to exceed 35 ppm more than once per year. **In 2024, Hawaii was in attainment with the 1-hour CO NAAQS.**																		

[1] Data recovery was <75% in 1st and 3rd quarters.

Table 4-17. 2024 Summary of the 8-Hour CO Averages

	Maximum		Annual Mean	No. of 8-Hour Averages Greater than 9 ppm														
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods	Percent Recovery
OAHU	**SLAMS Stations**																	
Honolulu	1.0	0.4	0.1	0	0	0	0	0	0	0	0	0	0	0	0	8779	8718	99.3%
Kapolei/NCore[1]	0.2	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0	0	8779	6721	76.6%
Attainment: 8-hour values not to exceed 9 ppm more than once per year. **In 2024, Hawaii was in attainment with the 8-hour CO NAAQS.**																		

[1] Data recovery was <75% in 1st and 3rd quarters.

Table 4-18. 2024 Monthly Maximum of 24-Hour PM_{10} Values ($\mu g/m^3$)

The month with the highest value in the year is highlighted *The state and federal 24-hr PM_{10} standard is 150 $\mu g/m^3$*

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Honolulu	41	21	29	23	19	17	15	17	15	18	23	21
Kapolei	36	22	34	33	25	22	18	22	22	24	26	29

Table 4-19. 2024 Monthly Maximum of 24-Hour $PM_{2.5}$ Values ($\mu g/m^3$)

The month with the highest value in the year is highlighted *The federal 24-hr $PM_{2.5}$ standard is 35 $\mu g/m^3$*

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SLAMS Stations												
Honolulu	27.4	7.1	10.2	7.8	7.0	6.9	5.3	7.1	5.4	6.6	7.5	8.6
Kapolei	11.5	7.4	10.7	8.5	6.8	9.0	6.3	9.7	6.8	8.9	8.6	9.2
Sand Island	19.8	7.4	9.8	7.8	5.8	6.8	5.1	7.2	4.6	6.5	6.6	8.3
SPM Stations												
Kahului	35.7[1]	7.7	7.7	8.7	7.7	8.5	6.9	5.9	5.5	8.8	7.8	8.4
Kihei	4.0	6.0	8.2	8.6	5.0	5.5	4.5	4.6	4.6	6.0	5.9	8.8
Hilo (volcano)	5.8	4.4	6.7	5.1	6.0	6.8	4.4	4.5	5.0	4.6	3.9	4.6
Kona (volcano)	3.3	3.2	5.7	3.9	3.3	10.0	4.0	4.0	11.3	3.8	3.2	20.3
Mt. View (volcano)	9.6	3.2	5.7	3.3	4.5	5.3	5.4	3.5	4.1	4.7	3.3	3.8
Ocean View (volcano)	7.1	2.9	3.2	3.2	2.3	12.4	3.1	3.4	15.0	2.4	3.5	19.2
Pahala (volcano)	6.0	4.3	7.6	6.6	6.3	8.9	7.0	4.3	4.5	8.0	3.0	5.0
Kailua-Kona (volcano)	3.9	3.4	6.1	4.3	4.2	10.5	4.1	3.7	10.8	3.8	3.8	20.5
Keaau (volcano)	5.6	4.2	6.8	4.9	5.3	6.0	5.8	5.3	8.7	5.1	3.7	4.9
Naalehu (volcano)	4.7	4.9	7.5	5.2	6.2	8.0	7.6	4.1	5.6	5.3	4.6	5.9
Waikoloa (volcano)	4.0	3.8	7.1	5.0	3.9	9.2	4.5	4.0	3.7	4.0	3.1	22.2

[1] Exceedance was due to New Year's fireworks celebration.

Table 4-20. 2024 Monthly Maximum of 1-Hour NO_2 Values (ppb)

The month with the highest value in the year is highlighted *The federal 1-hour standard for NO_2 is 100 ppb*

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Kapolei	30.8	19.6	21.8	17.7	23.0	13.9	9.0	16.1	14.1	14.5	18.8	21.3

Table 4-21. 2024 Monthly Maximum of 1-Hour H_2S Values (ppb)

The month with the highest value in the year is highlighted *The state 1-hour standard for H_2S is 25 ppb*

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Leilani	1.6	0.9	0.8	0.8	0.5	0.5	0.5	0.5	0.7	1.5	0.4	0.5

Table 4-22. 2024 Monthly Maximum of 1-Hour CO Values (ppm)

The month with the highest value in the year is highlighted *The federal 1-hr CO standard is 35 ppm, the state standard is 9 ppm*

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Honolulu	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.3	6.8	.04	.05	0.6
Kapolei/NCore[1]	0.5	0.2	0.1	0.4	0.3	0.3	0.2	0..2	0.5	0.3	0.4	0.4

[1] Data recovery was <75% in 1st and 3rd quarters.

Table 4-23. 2024 Monthly Maximum of 8-Hour CO Values (ppm)

The month with the highest value in the year is highlighted *The federal 8-hr CO standard is 9 ppm, the state standard is 4.4 ppm*

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Honolulu	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	1.0	0.2	0.3	0.2
Kapolei/NCore[1]	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2

[1] Data recovery was <75% in 1st and 3rd quarters.

Table 4-24. 2024 Monthly Maximum of 8-Hour O_3 Values (ppm)

The month with the highest value in the year is highlighted *The federal 8-hr O_3 standard is 0.070 ppm*

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sand Island	0.040	0.045	0.045	0.043	0.046	0.035	0.031	0.024	0.028	0.036	0.041	0.032
Kapolei/NCore	0.043	0.045	0.045	0.043	0.045	0.036	0.036	0.028	0.032	0.036	0.041	0.037

Table 4-25. 2024 Monthly Maximum of 1-Hour SO_2 Values (ppb)

The month with the highest value in the year is highlighted *The federal 1-hr SO_2 standard is 75 ppb*

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SLAMS Stations												
Honolulu	3.7	2.1	1.9	2.2	1.8	1.8	1.9	1.8	2.1	2.3	2.6	2.4
Kapolei/NCore	2.6	5.6	7.2	2.7	1.9	1.4	1.2	3.4	3.6	1.9	13.4	6.3
Kahe[1]	43.0	99.5	25.1	32.7	50.5	18.1	2.0	9.4	32.5	No data	No data	No data
Hilo	7.2	4.2	4.7	3.4	3.9	5.5	3.9	2.9	5.2	3.3	3.2	4.6
Kona[2]	1.8	1.7	1.8	1.4	1.7	7.6	2.4	1.6	9.1	1.8	1.8	48.6
SPM Stations (see NOTE)												
Niumalu[3] (cruise ships)	2.1	1.0	1.1	1.1	1.0	1.1	1.2	1.1	No data	No data	No data	No data
Mt. View (volcano)	13.4	4.9	3.5	3.8	7.8	1.3	1.3	4.7	1.9	2.0	2.2	14.5
Ocean View[2] (volcano)	3.7	7.5	4.4	4.9	3.9	33.3	1.7	3.2	21.2	2.1	1.7	173.1
Pahala[2] (volcano)	8.2	7.9	6.7	6.2	8.7	93.0	5.5	7.0	174.8	7.8	4.5	144.8
Keaau (volcano)	5.9	3.9	2.4	1.0	1.9	1.7	1.3	1.2	1.8	2.2	2.1	2.2
Leilani (volcano)	1.6	1.6	1.0	1.4	1.3	1.7	2.6	1.8	1.6	1.9	1.0	1.4
Naalehu[2] (volcano)	4.3	5.0	4.4	3.4	2.4	3.3	3.5	3.8	272.8	3.4	1.7	17.0
Waikoloa[2] (volcano)	0.6	0.9	0.9	0.8	0.9	2.2	1.0	1.2	1.9	1.5	1.6	37.5

NOTE: The SPM stations on Hawaii Island were established to monitor ambient air concentrations of SO_2 from volcanic emissions. Hilo and Kona stations are designated as SLAMS, high levels of SO_2 attributed to volcanic emissions is comparable to the NAAQS. Volcanic eruptions are considered a natural event, EPA concurrence of an exceptional event demonstration allows the exclusion of data for attainment determinations.

[1] With EPA's approval, the Kahe station was shut down on September 30, 2024.

[2] Elevated values due to emissions from eruptions at the summit of Kilauea Volcano.

[3] Data recovery was <50% in 4th quarter, substitution test not allowed.

Table 4-26. 2024 Monthly Maximum of 3-Hour SO_2 Values (ppm)

The month with the highest value in the year is highlighted *The state 3-hr SO_2 standard is 0.5 ppm*

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SLAMS Stations												
Honolulu	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Kapolei/NCore	0.002	0.003	0.003	0.001	0.001	0.001	0.001	0.003	0.001	0.001	0.005	0.005
Kahe[1]	0.022	0.045	0.013	0.015	0.038	0.010	0.001	0.005	0.023	No data	No data	No data
Hilo	0.006	0.003	0.004	0.002	0.003	0.003	0.002	0.003	0.004	0.003	0.002	0.004
Kona[2]	0.002	0.002	0.002	0.001	0.001	0.005	0.002	0.002	0.008	0.002	0.002	0.040
SPM Stations (see NOTE)												
Niumalu[3] (cruise ships)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	No data	No data	No data	No data
Mt. View (volcano)	0.008	0.002	0.002	0.002	0.004	0.001	0.001	0.003	0.002	0.002	0.002	0.011
Ocean View[2] (volcano)	0.003	0.006	0.004	0.004	0.004	0.022	0.001	0.002	0.017	0.002	0.001	0.136
Pahala[2] (volcano)	0.007	0.005	0.005	0.005	0.005	0.042	0.004	0.005	0.119	0.005	0.003	0.070
Keaau (volcano)	0.005	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001
Leilani (volcano)	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.002	0.001	0.001
Naalehu[2] (volcano)	0.003	0.004	0.003	0.003	0.002	0.002	0.002	0.003	0.168	0.003	0.002	0.009
Waikoloa[2] (volcano)	0.000	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.002	0.001	0.001	0.034

NOTE: The SPM stations on Hawaii Island were established to monitor ambient air concentrations of SO_2 from volcanic emissions. Volcanic eruptions are considered natural events.

[1] With EPA's approval, the Kahe station was shut down on September 30, 2024.

[2] Elevated values due to emissions from eruptions at the summit of Kilauea Volcano.

[3] Data recovery was <50% in 4th quarter, substitution test not allowed.

Table 4-27. 2024 Monthly Maximum of 24-Hour SO_2 Values (ppm)

The month with the highest value in the year is highlighted *The state 24-hr SO_2 standard is 0.14 ppm*

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SLAMS Stations												
Honolulu	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Kapolei/NCore	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001
Kahe[1]	0.007	0.009	0.003	0.003	0.007	0.003	0.000	0.001	0.005	No data	No data	No data
Hilo	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Kona[2]	0.001	0.002	0.002	0.001	0.001	0.003	0.002	0.002	0.004	0.002	0.002	0.024
SPM Stations (see NOTE)												
Niumalu[3] (cruise ships)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	No data	No data	No data	No data
Mt. View (volcano)	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.003
Ocean View[2] (volcano)	0.003	0.004	0.003	0.004	0.004	0.004	0.001	0.001	0.008	0.001	0.001	0.038
Pahala[2] (volcano)	0.003	0.003	0.003	0.003	0.003	0.013	0.002	0.003	0.033	0.003	0.002	0.019
Keaau (volcano)	0.002	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001
Leilani (volcano)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Naalehu[2] (volcano)	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.050	0.001	0.001	0.003
Waikoloa[2] (volcano)	0.000	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.016

NOTE: The SPM stations on Hawaii Island were established to monitor ambient air concentrations of SO_2 from volcanic emissions. Volcanic eruptions are considered natural events.

[1] With EPA's approval, the Kahe station was shut down on September 30, 2024.

[2] Elevated values due to emissions from eruptions at the summit of Kilauea Volcano.

[3] Data recovery was <50% in 4th quarter, substitution test not allowed.

Section 5
$PM_{2.5}$ SPECIATION DATA

Atmospheric aerosols are solid or liquid particles suspended in air that come directly from a variety of sources (primary) or are formed by chemical reactions (secondary). Primary and secondary particles tend to have long lifetimes in the atmosphere and can travel long distances, up to hundreds or perhaps thousands of miles. Sources include dust from roads, construction, and agriculture; combustion particles from motor vehicles, electric utilities and agricultural burning; and particles from natural sources such as the ocean or volcano.

Most of the $PM_{2.5}$ is a combination of the following components: sulfates, nitrates, ammonium, elemental carbon, organic compounds, water and metals. The EPA selected target particulates of interest based on data use objectives, primary constituents of $PM_{2.5}$, and the capability and availability of current analytical methods.

The filter-based speciation sampler collects samples once every 3 days for analyses performed by an EPA contract laboratory. The speciation sampler is located at the Kapolei NCore monitoring station.

Table 5-1 lists the parameters measured, highest and second highest values recorded in the year, the annual arithmetic mean of all valid samples, and the total number of samples collected in the year. Table 5-2 lists the analysis methods for each parameter.

Except for lead, there are no ambient air quality standards for the individual components of speciated $PM_{2.5}$.

For more information on EPA's speciation program, go to: https://epa.gov/amtic/chemical-speciation-network-csn

Table 5-1. Annual Summary of $PM_{2.5}$ Speciation Data

Parameter	1st High (µg/m³)	2nd High (µg/m³)	Annual Mean (µg/m³)	No. of Samples	Percent Recovery
CARBON					
Organic Carbon	0.904	0.797	0.2282	121	98%
Elemental Carbon	0.254	0.231	0.0715	121	98%
METALS					
Aluminum	0.169	0.150	0.0146	121	99%
Antimony	0.033	0.024	0.0013	121	99%
Arsenic	0.000	0.000	0.0000	121	99%
Barium	0.046	0.045	0.0056	121	99%
Bromine	0.006	0.004	0.0002	120	98%
Cadmium	0.025	0.020	0.0021	121	99%
Calcium	0.493	0.187	0.0485	121	99%
Cerium	0.071	0.058	-0.0007	121	99%
Cesium	0.045	0.039	0.0008	121	99%
Chlorine	1.315	1.310	0.5669	120	98%
Chromium	0.012	0.011	0.0012	112	92%
Cobalt	0.003	0.002	0.0001	112	92%
Copper	0.026	0.004	-0.0004	112	92%
Indium	0.025	0.023	0.0020	121	99%
Iron	0.166	0.088	0.0251	112	92%
Lead	0.010	0.010	0.0011	121	99%
Magnesium	0.177	0.173	0.0474	121	99%
Manganese	0.011	0.009	0.0005	121	99%
Nickel	0.017	0.008	0.0017	112	92%
Phosphorus	0.003	0.003	0.0002	121	99%
Potassium	0.982	0.275	0.0356	121	99%
Rubidium	0.005	0.004	0.0002	121	99%
Selenium	0.005	0.003	0.0003	121	99%
Silicon	0.176	0.167	0.0268	121	99%
Silver	0.027	0.025	0.0016	121	99%
Sodium	1.045	1.035	0.3464	121	99%
Strontium	0.022	0.005	0.0010	121	99%
Sulfur	1.127	0.512	0.1760	121	99%
Tin	0.028	0.025	0.0023	121	99%
Titanium	0.021	0.016	0.0023	121	99%
Vanadium	0.011	0.004	0.0006	121	99%
Zinc	0.008	0.007	0.0017	121	99%
Zirconium	0.023	0.020	0.0004	121	99%

Table 5-1 Continued

Parameter	1st High (µg/m3)	2nd High (µg/m3)	Annual Mean (µg/m3)	No. of Samples	Percent Recovery
IONS					
Ammonium Ion	0.58	0.15	0.012	120	98%
Potassium Ion	0.92	0.05	0.023	120	98%
Sodium Ion	1.19	0.96	0.430	120	98%
Total Nitrate	0.49	0.42	0.159	120	98%
Sulfate	3.37	1.65	0.581	120	98%

Table 5-2. Speciation Collection and Analysis Methods

Parameter	Collection Method	Analysis Method
Carbon	URG 300N Quartz Filter	Thermal Optical Transmittance
Metals	Met-One SASS Teflon Filter	Energy Dispersive X-Ray Fluorescence
Ions	Met-One SASS Nylon Filter	Ion Chromatography

Section 6
AMBIENT AIR QUALITY TRENDS

The following graphs illustrate 5-year trends for CO, O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$, from 2020 to 2024 at the stations monitoring for those pollutants as compared to their respective federal NAAQS.

Figures 6-1 and 6-2 represent the maximum 1-hour average and 8-hour average CO values recorded over the 5-year period at the Honolulu and Kapolei stations.

Attainment of the 8-hour ozone standard is achieved by averaging 3 years of the fourth highest daily maximum 8-hour average concentrations, which must not exceed 0.070 ppm. Figure 6-3 is a graph of the fourth highest daily maximum values recorded at the Sand Island and Kapolei ozone monitoring stations in the past five years.

Figure 6-4 is a graph of the maximum 24-hour averages of PM_{10} values recorded at the Honolulu and Kapolei stations for each year over the 5-year period. PM_{10} monitoring at the Pearl City station was discontinued on April 6, 2022.

Figures 6-5 and 6-6 shows the annual average and 98th percentile 1-hour average of NO_2 values recorded at the Kapolei station. The Niumalu NO_2 station was discontinued on March 31, 2022.

Attainment of the SO_2 1-hour standard is based on the 99th percentile value at each station, which is depicted in Figures 6-7 and 6-8 for the SLAMS and SPMS stations, respectively. Elevated values due to emissions from eruptions at the Halemaumau crater on the summit of Kilauea volcano have impacted two of the downwind SPMS stations, Ocean View and Pahala. Volcanic eruptions are considered a natural event, EPA concurrence of an exceptional event demonstration allows the exclusion of data for attainment determinations.

Attainment of the $PM_{2.5}$ 24-hour standard is based on the 98th percentile value at each station, which is depicted in Figures 6-9 and 6-11 for the SLAMS and SPMS stations, respectively. Figures 6-10 and 6-12 show the $PM_{2.5}$ annual averages recorded at the SLAMS and SPMS stations. $PM_{2.5}$ monitoring at the Pearl City station was discontinued on March 31, 2022. $PM_{2.5}$ monitoring was discontinued at the Kihei station on March 30, 2022 but restarted on August 22, 2023 with the purpose of monitoring impacts from agricultural activities and wildfires.

Criteria pollutant levels remain below state and federal ambient air quality standards at all SLAMS stations in the state.

Figure 6-1. CO Maximum 1-Hour Average (ppm): 2020-2024

	Kapolei 150030010	Honolulu 150031001
2020	1.2	0.9
2021	0.7	0.9
2022	9.5	1.1
2023	0.6	0.7
2024	0.5	6.8
Average	2.5	2.1

Kapolei CO discontinued 3/31/2022; Kapolei/NCore trace CO used starting 4/1/2022; high value due to brush fire.

NAAQS = 35 ppm

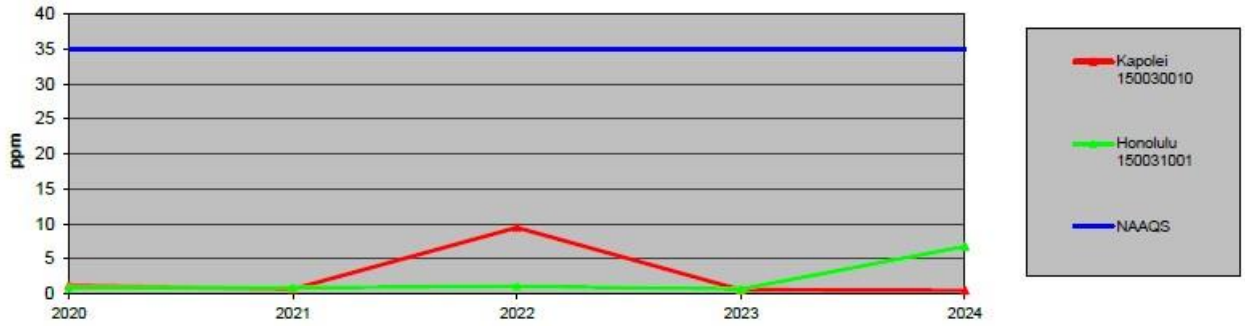


Figure 6-2. CO Maximum 8-Hour Average (ppm): 2020-2024

	Kapolei 150030010	Honolulu 150031001
2020	0.4	0.6
2021	0.3	0.7
2022	1.3	0.7
2023	0.3	0.4
2024	0.2	1.0
Average	0.5	0.7

Kapolei CO discontinued 3/31/2022; Kapolei/NCore trace CO used starting 4/1/2022; high value due to brush fire.

NAAQS = 9 ppm

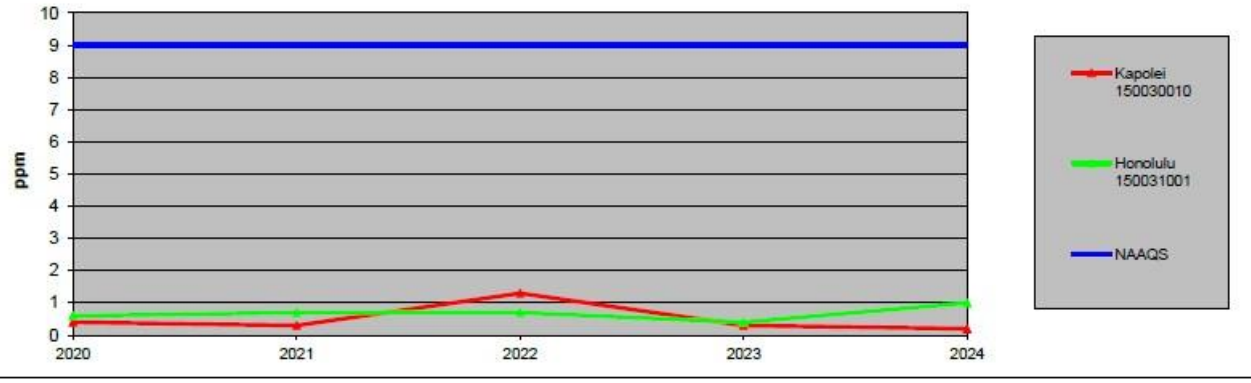


Figure 6-3. O_3 Fourth Highest Daily 8-Hour Average (ppm): 2020-2024

	Sand Island 150031004	*Kapolei NCore 150030010*
2020	0.044	0.045
2021	0.045	0.047
2022	0.044	0.041
2023	0.046	0.043
2024	0.044	0.045
Average	0.045	0.044

NAAQS = 0.070 ppm

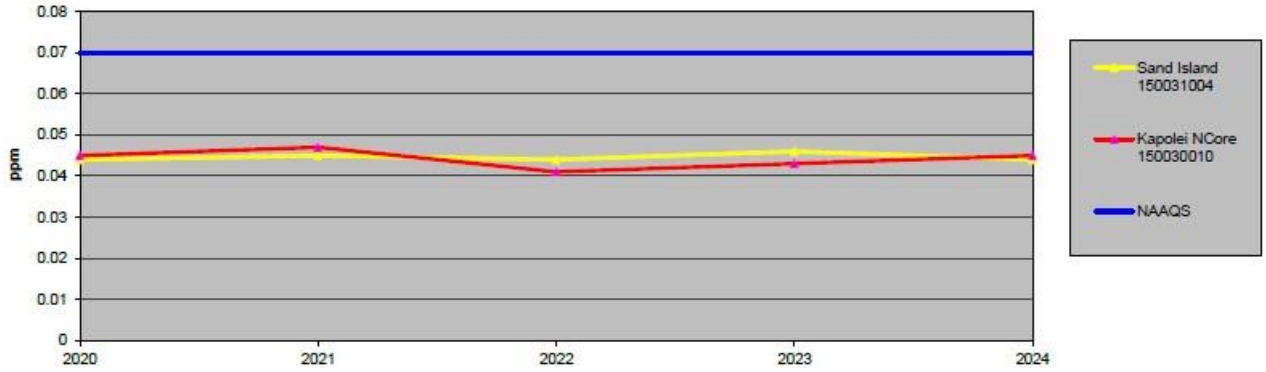


Figure 6-4. PM_{10} Maximum 24-hour Average ($\mu g/m^3$): 2020-2024

	Kapolei 150030010	Honolulu 150031001	Pearl City 150032004	
2020	43	22	26	
2021	46	26	25	
2022	48	25	24	<75% completeness in a quarter(s). Pearl City discontinued on 4/6/2022.
2023	76	33		<75% completeness in a quarter(s).
2024	36	41		
Average	50	29	25	NAAQS = 150 $\mu g/m^3$

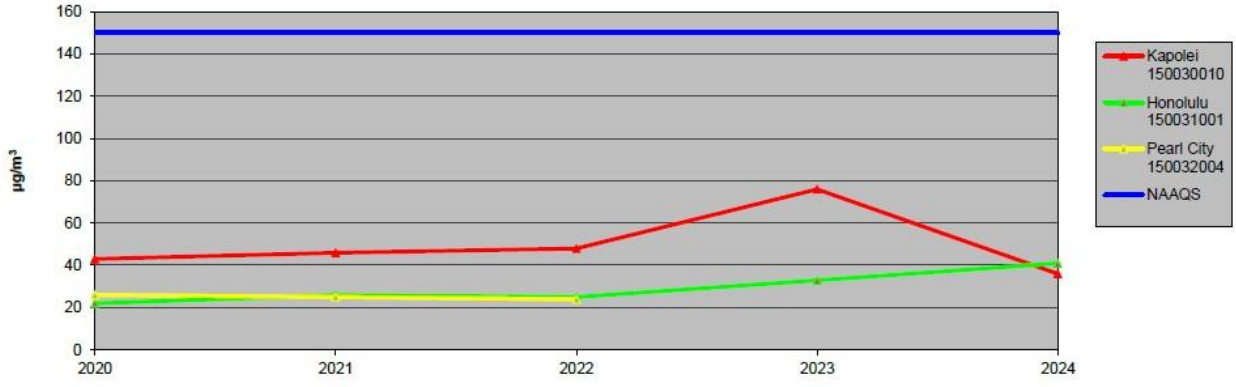


Figure 6-5. NO_2 Annual Average (ppb): 2020-2024

	Kapolei 150030010	Niumalu-SPM 150070007	
2020	3.4	3.1	
2021	3	2	
2022	6.0	2.0	<75% completeness in a quarter(s) and for the year. Niumalu discontinued on 3/31/2022.
2023	3.3		
2024	2.6		
Average	4	2	NAAQS = 53 ppb

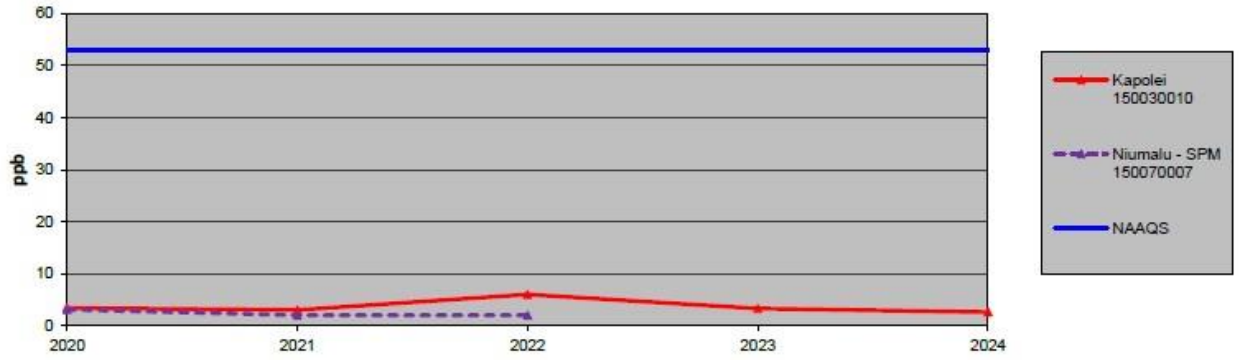


Figure 6-6. NO_2 98th Percentile 1-Hour Average (ppb): 2020-2024

	Kapolei 150030010	Niumalu-SPM 150070007	
2020	26	34	
2021	22	14	
2022	23	29	<75% completeness in a quarter(s) and for the year. Niumalu discontinued on 3/31/2022.
2023	23		
2024	20		
Average	23	26	NAAQS = 100 ppb

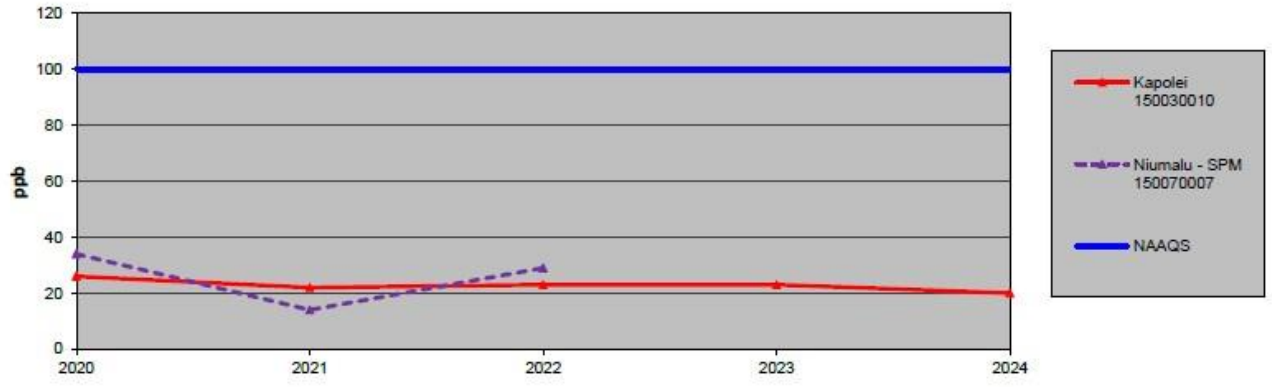


Figure 6-7. SO_2 99th Percentile 1-Hour Average (ppb): SLAMS 2020-2024

	Kapolei 150030010	Honolulu 150031001	Hilo 150011006	Kona 150011012
2020	6	1	12	12
2021	3	2	27	10
2022	2	2	25	8
2023	11	3	92	18
2024	6	3	6	29
Average	6	2	32	15

Although Hilo and Kona are SLAMS for SO_2, the data is flagged due to volcanic emissions and is awaiting EPA concurrence for exclusion.

<75% completion in a quarter(s).

Kapolei SO_2 discontinued 2/28/2022; Kapolei/NCore trace SO_2 used starting 3/1/2022.

NAAQS = 75 ppb

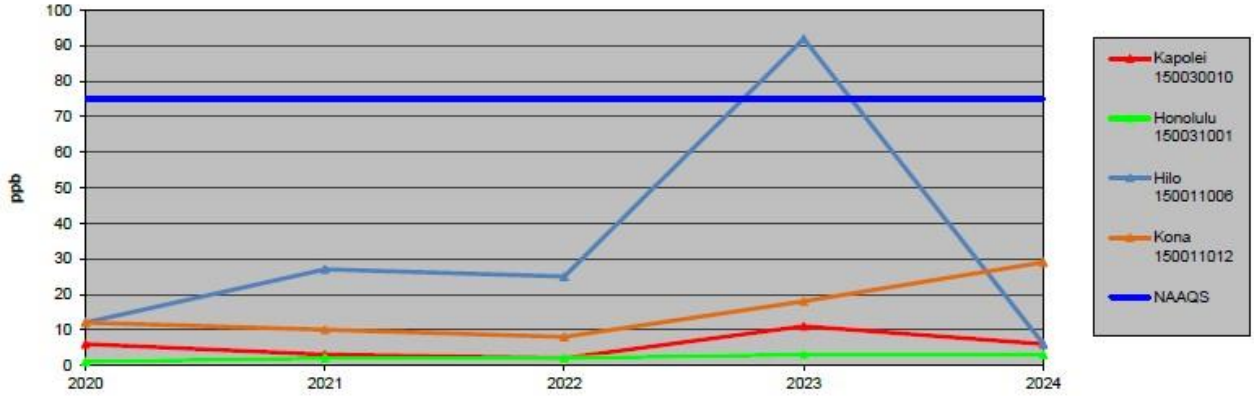


Figure 6-8. SO_2 99th Percentile 1-Hour Average (ppb): SPMS 2020-2024

	Mt. View 150012023	Pahala 150012016	Leilani 150012035	Ocean View 150012020	Keaau 150013027	Naalehu 150013033	Waikoloa 150012021	Niumalu 150070007
2020	8	274	0	205				4
2021	61	420	3	141	26	67		3
2022	56	229	2	107	36	39		2
2023	43	236	3	213	27	95	6	2
2024	8	93	2	93	4	73	8	1
Average	35	250	2	152	23	69	7	2

Aqua: monitors volcanic emissions. Exceedances flagged for exclusion.* Purple: monitors cruise ship emissions

<75% completion in a quarter(s).

<75% completion in a quarter(s).

<75% completion in a quarter(s).

<75% completion in a quarter(s).

NAAQS = 75 ppb *Due to exceptional event

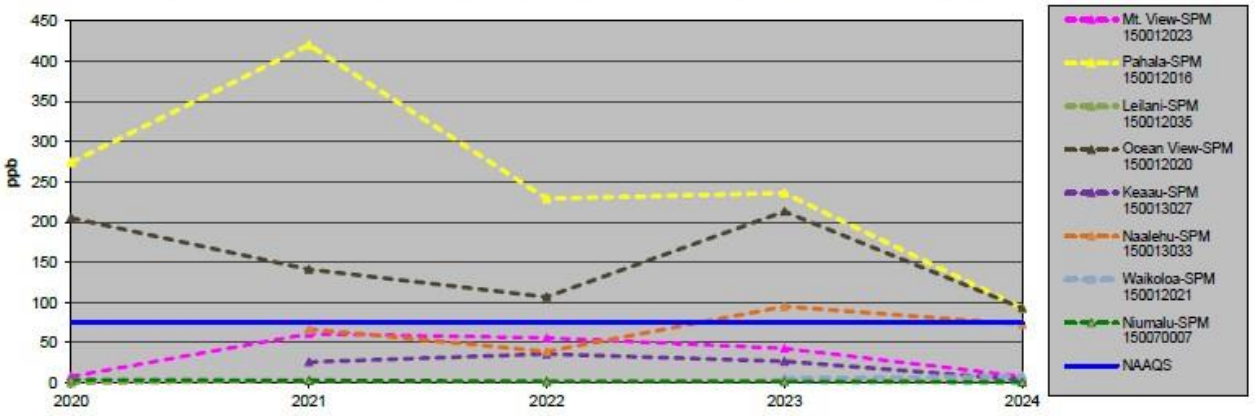


Figure 6-9. $PM_{2.5}$ 98th Percentile 24-Hour Average (µg/m³): SLAMS 2020-2024

	Honolulu 150031001	Pearl City 150032004	Kapolei 150030010	Sand Island 150031004	
2020	6.2	6.2	6.9	7.2	<75% completeness in a quarter(s); Kapolei 2020, 2022 and 2023.
2021	6.0	6.1	6.7	6.2	
2022	7.2	6.3	8.1	8.2	Pearl City discontinued 3/31/2022.
2023	8.3		10.0	10.0	
2024	7.6		8.9	7.6	
Average	7.1	6.2	8.1	7.8	NAAQS = 35 µg/m³

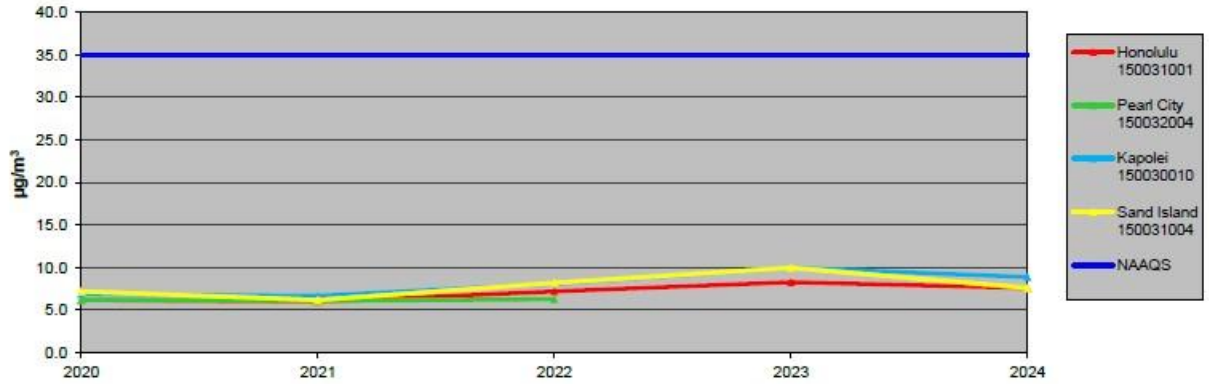


Figure 6-10. $PM_{2.5}$ Annual Average (µg/m³): SLAMS 2020-2024

	Honolulu 150031001	Pearl City 150032004	Kapolei 150030010	Sand Island 150031004	
2020	3.0	3.2	3.4	3.9	<75% completeness in a quarter(s); Kapolei 2020, 2022 and 2023.
2021	3.0	3.2	2.9	3.3	
2022	3.3	3.4	3.8	3.7	Pearl City discontinued 3/31/2022.
2023	4.1		4.5	3.9	
2024	4.1		4.6	4.0	
Average	3.5	3.3	3.8	3.8	NAAQS = 12 µg/m³, 9 µg/m³ as of March 6, 2024.

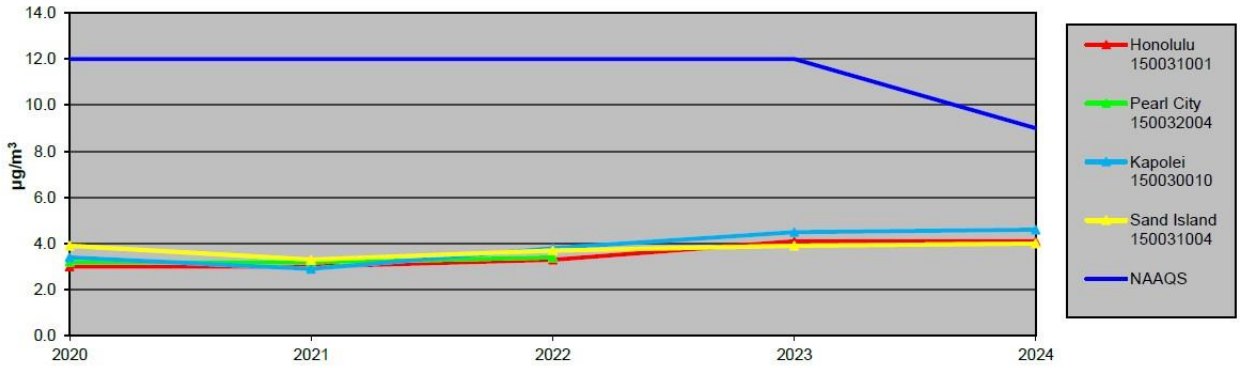


Figure 6-11. $PM_{2.5}$ 98th Percentile 24-Hour Average (µg/m³): SPMS 2020-2024

	Hilo 150011006	Kona 150011012	Mt. View 150012023	Pahala 150012016	Ocean View 150012020	Kailua-Kona 150013034	Keeau 150013027	Naalehu 150013033	Waikoloa 150012021	Niumalu 150070007	Kahului 150090025	Kihei 150090006
2020	5.8	10.2	4.5	6.7	11.4					8.3	7.1	7.2
2021	6.5	10.0	4.6	6.7	9.6	11.2	5.6		8.4	7.2	7.3	5.7
2022	7.0	9.1	6.8	7.0	9.3	10.2	6.6		6.4	5.2	7.7	6.9
2023	6.2	11.5	5.3	7.0	10.2	11.2	5.3	6.7	9.9		8.3	5.3
2024	5.1	10.0	4.7	6.7	12.2	10.0	5.3	6.2	7.1		8.0	6.0
Average	6.1	10.2	5.2	6.8	10.5	10.7	5.7	6.5	8.0	6.9	7.7	6.2

Aqua: monitors volcanic emissions. Purple: monitored cruise ship emissions until 3/31/2022. Green: monitors agricultural burn/wildfires.
<75% completeness in a quarter(s). Various stations in 2020 & 202 Kihei discontinued 3/30/2022, restarted 8/22/2023 as SPM due to Maui wildfires. (Preliminary data only)
NAAQS = 35 µg/m³.

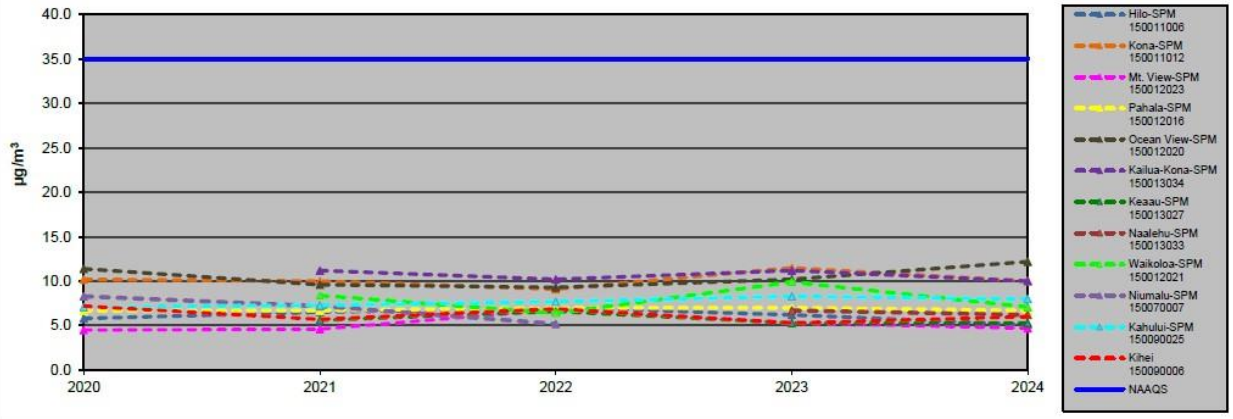


Figure 6-12. $PM_{2.5}$ Annual Average (µg/m³): SPMS 2020-2024

	Hilo 150011006	Kona 150011012	Mt. View 150012023	Pahala 150012016	Ocean View 150012020	Kailua-Kona 150013034	Keeau 150013027	Naalehu 150013033	Waikoloa 150012021	Niumalu 150070007	Kahului 150090025	Kihei 150090006
2020	3.5	2.0	2.0	2.2	2.0					3.0	3.9	2.9
2021	3.7	3.6	1.7	2.5	3.5	4.7	2.7		1.8	3.2	3.9	2.5
2022	3.4	4.7	2.4	3.6	4.6	5.3	2.7		2.3	2.3	4.0	2.3
2023	2.9	3.2	2.1	3.6	2.6	3.4	2.5	3.0	2.8		4.0	2.3
2024	2.6	2.5	2.1	3.1	2.0	2.9	2.8	2.9	2.4		3.9	2.8
Average	3.2	3.2	2.1	3.0	2.9	4.1	2.7	3.0	2.3	2.8	3.9	2.6

Aqua: monitors volcanic emissions. Purple: monitored cruise ship emissions until 3/31/2022. Green: monitors agricultural burn/wildfires.
<75% completeness in a quarter(s). Various stations in 2020 & 202 Kihei discontinued 3/30/2022, restarted 8/22/2023 as SPM due to Maui wildfires. (Preliminary data only)
NAAQS = 12 µg/m3, 9 µg/m3 as of 3/6/2024.