State of Hawaii
2022
Air Monitoring Network Plan

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Acronyms and Definitions

AADT	Annual Average Daily Traffic
AQI	Air Quality Index
AQMS	Hawaii Department of Health Air Quality Monitoring Section
AQS	Environmental Protection Agency Air Quality System
BAM	Beta-Attenuation Mass Monitor
CAB	State of Hawaii Department of Health Clean Air Branch
CBSA	Core-Based Statistical Areas
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DOH	Hawaii State Department of Health
DOT	Hawaii State Department of Transportation
DRR	Data Requirements Rule
DWS	Hawaii County Department of Water Supply
ECA	(North American) Emissions Control Area (Maritime)
EPA	United States Environmental Protection Agency
EMD	State of Hawaii Department of Health Environmental Management Division
FEM	Federal Equivalent Method
FRM	Federal Reference Method
H_2S	Hydrogen Sulfide
HECO	Hawaiian Electric Company
IMPROVE	Integrated Monitoring of Protected Visual Environments
LERZ	Kilauea Volcano Lower East Rift Zone
MSA	Metropolitan Statistical Area
MSL	Mean Sea Level
MWC	Municipal Waste Combustor
NAAQS	National Ambient Air Quality Standards
NCore	National Core Multi-Pollutant Monitoring Stations
NEI	National Emissions Inventory
NO_2	Nitrogen Dioxide
O_3	Ozone
PAMS	Photochemical Assessment Monitoring Station
Pb	Lead
PGV	Puna Geothermal Ventures
$PM_{2.5}$	Particulate matter less than or equal to 2.5 microns in aerodynamic diameter
PM_{10}	Particulate matter less than or equal to 10 microns in aerodynamic diameter
$PM_{10-2.5}$	Particulate matter coarse
PQAO	Primary Quality Assurance Organization
PPB	Parts per billion
PPM	Parts per million
PSD	Prevention of Significant Deterioration
PWEI	Population Weighted Emissions Index
QC	Quality Control
SLAMS	State and Local Air Monitoring Stations
SLD	State Laboratories Division
SLDIT	State Laboratories Division Information Technology
SO_2	Sulfur Dioxide
SPM(S)	Special Purpose Monitoring (Stations)
STN	Speciation Trends Network
TPY	Tons per Year
TSA	Technical Systems Audit
TSP	Total suspended particulates
VMAP	Vog Measurement and Prediction Project
VOG	Haze due to volcanic emissions
WD	Wind direction
WS	Wind speed
$\mu g/m^3$	micrograms per cubic meter of air

Introduction

The State of Hawaii Department of Health (DOH), Clean Air Branch (CAB) plans, operates and maintains the statewide ambient air quality monitoring network. Ambient air monitoring data is submitted to the U.S. Environmental Protection Agency's (EPA) AirNow website which reports air quality using the Air Quality Index (AQI). This data is used to determine compliance with National Ambient Air Quality Standards (NAAQS), to track and characterize air quality trends, evaluate emission control strategies, and to support health studies.

The DOH manages the State and Local Air Monitoring Stations (SLAMS), Special Purpose Monitoring Stations (SPMS), and the National Core Multi-Pollutant Monitoring Station (NCore). DOH oversees an ambient air station on the island of Oahu that is operated by Hawaiian Electric Company (HECO) to meet the Data Requirements Rule (DRR). Additionally, Hawaii has two Interagency Monitoring of Protected Visual Environments (IMPROVE) stations located at Haleakala National Park on Maui and Volcanoes National Park on the island of Hawaii. The IMPROVE stations are operated and maintained by the National Park Service through their federal land management agency.

This annual review evaluates the state's existing ambient air monitoring network to determine adequacy in meeting monitoring objectives, optimizes the network by adding new, relocating or discontinuing stations, ensures that air quality issues important to the state are being addressed, and that the quality assured data meets the needs of stakeholders.

This plan encompasses the 18-month period from July 1, 2022 through December 31, 2023. During this period, modifications to this plan may occur due to changes of available resources, staff reductions, funding restrictions, unanticipated community concerns, site issues, or new EPA monitoring requirements. This plan is being submitted to the EPA Region 9 according to the Code of Federal Regulations (CFR), Title 40, Part 58, Section 58.10 Annual monitoring network plan and periodic network assessment.

Notification of the plan availability for public inspection and comment was provided through public notices published on May 24, 2022 in the daily newspapers of all counties. The plan was available for inspection on the Clean Air Branch website at http://health.hawaii.gov/cab, for 30 days from May 24, 2022 to June 22, 2022. Documentation of public notification is provided in **Appendix A**. Comments received will be addressed and included in this plan.

1.0 Network Purpose and Design

1.1 Overview

In 1970, the federal Clean Air Act (CAA) was promulgated as a comprehensive response to address air pollution and created the EPA as the agency responsible for carrying out the law. In 1990, the CAA was amended, Title 40 of the Code of Federal Regulations (CFR) Part 50 required the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. This amendment identified six principal pollutants, which are called criteria air pollutants, they are: particulate matter (PM), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and lead (Pb). Additionally, the CAA NAAQS defined two types of standards:

- *Primary standards* set limits to protect public health including protecting "sensitive" populations such as asthmatics, children, and the elderly.
- *Secondary standards* set limits to protect public welfare, including the protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

These standards are reviewed periodically and are subject to revisions. Additionally, there is a state standard for hydrogen sulfide (H_2S) that was established primarily to monitor the ambient air effects of geothermal energy production activities on the island of Hawaii.

40 CFR Part 58 requires that states establish and operate active ambient air quality surveillance systems in a manner that assures the most applicable data of the highest quality is collected. Appendix A to 40 CFR Part 58 provides the quality assurance requirements that each monitoring organization must implement to ensure that the data produced will be of the type and quality needed and expected by the data user. The data is used, in part, to support regulatory, research and health decisions and to provide air quality information to the general public.

The ambient air monitoring network is designed for the following purposes:

- to determine compliance with the NAAQS.
- to provide the public with timely air quality information.
- to support air pollution research and health studies.
- to track pollution trends throughout the region, including non-urban areas.
- to develop emissions control strategies.
- to prevent or alleviate air pollution episodes by activating emergency control procedures.

The State of Hawaii's monitoring network consists of three major categories of monitoring stations, State and Local Air Monitoring Stations (SLAMS), National Core (NCore), and Special Purpose Monitoring Stations (SPMS).

The annual network review ensures that Hawaii continues to meet monitoring and siting requirements, the three basic monitoring objectives, addresses the six site types in 40

CFR 58 Appendix D, provides information for non-regulatory data goals and complies with requirements of 40 CFR 58 appendices A, C, D, and E as follows:

- *Appendix A: Quality Assurance Requirements for SLAMS, SPMSs and PSD Air Monitoring*
- *Appendix C: Ambient Air Quality Monitoring Methodology*
- *Appendix D: Network Design Criteria for Ambient Air Quality Monitoring*
- *Appendix E: Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring*

1.1.1 SLAMS

The **SLAMS** sites were established primarily to determine compliance with the NAAQS and to meet minimum monitoring requirements set forth in 40 CFR Part 58, Appendix D but may also serve other data purposes such as providing real-time air pollution data for the general public, for regulatory decision making and compliance.

One of the main objectives is to show whether the state is in attainment or non-attainment of the seven criteria pollutants. Non-attainment of any of the NAAQS may have regulatory consequences addressed through the air permitting program. Historically, Hawaii has been in attainment of the NAAQS. Summarized data is available at: https://health.hawaii.gov/cab/hawaii-air-quality-data-books.

All SLAMS must meet quality assurance, methodology, and siting requirements of 40 CFR 58 Appendix A, C and E, respectively. All data is submitted to EPA's Air Quality System (AQS) within 90 days at the end of each calendar quarter, as required in 40 CFR 58.16.

On October 17, 2006, as published in the Federal Register, the EPA provided final rule revisions to ambient monitoring regulations as contained in 40 CFR, Parts 53 and 58. Included in these revised rules are the requirements for establishing NCore sites. NCore stations are established to support the tracking of long-term trends of criteria and non-criteria pollutants, model evaluation, long- term health and ecosystem assessments and other scientific and technological studies.

It was mandated by the EPA that each state is required to operate at least one **NCore** site, to begin January 1, 2011, and measure, at a minimum, $PM_{2.5}$ particle mass (particles with an average aerodynamic diameter of 2.5 micrometers or less) using continuous and integrated/filter-based samplers, speciated $PM_{2.5}$, $PM_{10-2.5}$ particle mass, SO_2, CO, nitrogen oxide (NO), reactive oxides of nitrogen (NO_y), O_3, wind speed, wind direction, relative humidity and ambient temperature. Gas monitors at this site are more sensitive than the standard monitors used at the other sites. Concentrations measured are well below NAAQS but are important in the formation of ozone and particulate matter. Hawaii's SLAMS network includes a NCore site in Kapolei which became fully operational on January 1, 2011.

1.1.2 SPMS

The **SPMS** were established for specific areas of interest to the state and do not count in meeting the minimum monitoring requirements. However, all SPMS utilizes

Federal Reference Method (FRM), Federal Equivalent Methods (FEM), or Approved Regional Methods (ARM) and meets the requirements of 40 CFR Part 58, Appendix E, follow all the quality assurance criteria contained in 40 CFR Part 58, Appendix A as well as the data quality and measurement quality objectives and siting requirements. All data from SPMS which have operated for more than 24 months is eligible for comparison to respective NAAQS.

Areas of Interest for special purpose air monitoring are from sources that are natural and man-made. Hawaii's SPM network is established primarily to monitor air quality impacts of emissions from Kilauea volcano, hydrogen sulfide (H_2S) emissions from geothermal energy production and impacts from cruise ships on the island of Kauai.

1.2 Network Design and Review Process

The network review process is conducted to determine if any changes or modifications to the network are necessary. Changes such as meeting new NAAQS monitoring requirements, utilizing newer and better technology, reducing or eliminating redundancy and low value monitoring, ensuring that enough data is being collected using the best technology, and that all siting and quality assurance requirements are met.

Modification decisions are made using a variety of tools, including but not limited to: data trend analyses; performance and technical systems audits; regular site inspections; cost and value analyses; assessment of unfavorable site changes such as loss of lease or construction that adversely affect data collection; and the need to address special studies or new regulatory as well as non-regulatory monitoring objectives.

1.2.1 Monitoring Objectives and Site Types

Ambient air monitoring networks must be designed to meet three basic objectives as stated in 40 CFR 58 Appendix D:

1) Provide air pollution data to the general public in a timely manner.
2) Support compliance with NAAQS and emissions strategy development.
3) Support air pollution research studies.

The state's ambient air monitoring network achieves all three objectives as follows:

1) Air pollution data from all SLAMS and SPMS are exhibited near real-time on the DOH public website. Additionally, continuous $PM_{2.5}$ and O_3 data is provided to EPA's AIRNow website for use in calculating the AQI, SO_2 data is provided for the Hawaii SO_2 Short Term Advisory, and $PM_{2.5}$ and SO_2 data is provided to the Vog Measurement and Prediction Project (VMAP).
2) Data from SLAMS are used to demonstrate compliance with the NAAQS and in development and tracking of emissions control strategies. Similarly, data from the NCore station is used to demonstrate compliance with the NAAQS and to track long-term trends of criteria and non-criteria pollutants as well as support emissions control strategies.
3) All SLAMS, SPMS, and NCore monitoring provide valuable information in support of air pollution, health and other scientific studies.

In order for the network to support the three basic objectives outlined above, it must be designed with a variety of monitoring site types. The six general site types are:

1) Determine the highest pollutant concentrations expected in the network.
2) Measure typical concentrations in areas of high population density.
3) Determine the impact of significant sources or source categories on air quality.
4) Determine general background concentrations.
5) Determine the extent of regional pollutant transport between populated areas.
6) Measure pollution impacts on visibility, vegetation, crops, animals, and buildings.

The site type for each station in the network is included in its detailed description in Section 3.0 of this document.

1.2.2 $PM_{2.5}$ Network Changes

According to 40 CFR 58.10 (c), this network plan must document how the state will provide for the review of changes to a $PM_{2.5}$ monitoring network that impact the location of a violating $PM_{2.5}$ monitor. The agency must document the process for obtaining public comment and include any comments received through the public notification process within the submitted plan. The state has in place a public notification procedure which includes posting notice in the newspapers of all counties and on the agency web site allowing for public inspection and comments of the changes that are in the annual network plan document. Any comments received are reviewed and if appropriate provided a response.

1.3 Organizational Structure and Responsibilities

The DOH CAB is the state agency responsible for air pollution control in Hawaii and includes planning, management, data collection, quality assurance and regulatory activities. The HDOH serves as the Primary Quality Assurance Organization (PQAO).

Prior to 2022 two separate programs in the DOH were responsible for monitoring ambient air for Hawaii, one in the Environmental Management Division's CAB and the other in the Air Quality Monitoring Section (AQMS) of the State Laboratory Division. CAB is responsible for the overall planning, siting, and quality assurance oversight of the ambient air monitoring program. The AQMS was responsible for all data collection activities including installing, operating, and maintaining ambient air monitoring equipment and stations, in order to provide valid quality assured, defensible data that meet EPA QA requirements. The SLD - IT provides quality assured data to AQS. DOH contracts out laboratory support for co-located $PM_{2.5}$ mass analyses.

During a technical system audit conducted by EPA in 2020 numerous findings confirmed that data collected by AQMS did not meet EPA regulatory requirements and is of questionable quality. High-quality and accurate data used by CAB and EPA for regulatory decisions must be defensible. An administrative organizational change was made as a way of correcting the deficiencies to improve data quality. The CAB is the sole agency responsible for administering Hawaii's ambient air monitoring program. In addition to planning and quality assurance, CAB has acquired data collection and data validation tasks from AQMS.

2.0 Network Evaluation

The criteria ambient air quality network for the state of Hawaii is established according to the requirements of 40 CFR 58 Appendix D. The CAB is responsible for ensuring that the network meets or exceeds the minimum EPA monitoring requirements and locating stations to adequately address the purposes and objectives. The criteria and NCore pollutants covered in this document; CO, NO_2, O_3, SO_2, PM_{10}, and $PM_{2.5}$ are currently monitored at sixteen (16) stations statewide as follows:

- one (1) SLAMS and one (1) NCore CO monitors.
- one (1) SLAMS NO_2 monitor.
- one (1) NCore NO/NO_y monitor.
- one (1) SLAMS and one (1) NCore O_3 monitors.
- four (4) SLAMS, seven (7) SPMS and one (1) NCore SO_2 monitors.
- one (1) SPMS H_2S monitor.
- one (1) SLAMS and one (1) NCore PM_{10} monitors.
- three (3) SLAMS, nine (9) SPMS and one (1) NCore $PM_{2.5}$ monitors.

40 CFR Part 58, Appendix D identifies the minimum monitoring requirements for criteria pollutants in the SLAMS network. The monitoring requirements are based on the latest census population in each Metropolitan Statistical Area (MSA). MSAs are defined by the Federal Office of Management and Budget (OMB) and the U.S. Census Bureau. According to the OMB, there are two MSAs in the state: Urban Honolulu with a 2021 census population of 1,000,890 and Kahului-Wailuku-Lahaina in Maui County with a 2021 census population of 164,221. The 2021 census population was estimated at 1,441,553 for the state, up 2.5% from the 2020 estimate of 1,407,006. There are five counties in the state: Kauai (islands of Niihau and Kauai); City & County of Honolulu (island of Oahu); Maui (islands of Maui, Molokai, Lanai, Kahoolawe, excluding Kalawao County); Kalawao (Kalaupapa Settlement on Molokai) and Hawaii (island of Hawaii). Hawaii's network meets the minimum monitoring requirements.

As the NAAQS are revised, the number of required monitors may also change and some of the tools that may be used to determine network adequacy are:

- historical monitoring data.
- maps of emissions densities.
- dispersion modeling.
- special studies.
- best professional judgment.
- State Implementation Plan requirements.
- monitoring strategies.
- population density changes.
- traffic counts.

The actual geographical location of monitors in the network is reviewed using maps, photographs, and GIS information. Plots of source emissions, historical monitoring data, population density and other special study findings may also be used to evaluate the monitor locations.

The stated objective for each monitoring site is reconfirmed and the location's spatial scale is verified. If the site location does not support the stated objectives or the designated spatial scale, changes will be proposed to the EPA in the annual network plan to rectify the discrepancy.

An integral part of the network review is an in-depth determination of whether it meets the needs of specific state objectives as well as budgetary and staff limitations. This includes reviewing for:

- the need for new monitors or monitoring sites.
- the need to relocate existing monitors.
- siting problems and solutions.
- data submittal and completeness problems.
- station maintenance issues.
- quality assurance problems,
- the need for air quality studies and special monitoring programs.
- other issues such as proposed regulations and funding.

The network review is documented in the annual network plan and is made available for public inspection at least thirty (30) days prior to submittal to EPA Region 9 on or before July 1 of each year. The most current network plan is posted on the CAB website at http://health.hawaii.gov/cab under "Reports".

2.1 $PM_{2.5}$ Network

The state must operate a minimum number of required $PM_{2.5}$ monitors based on population and the most recent 3-year design value in each MSA. There are three $PM_{2.5}$ SLAMS in the Honolulu MSA and one SLAMS in the Maui MSA with complete design values. The design value for the annual $PM_{2.5}$ standard is the most current 3-year average annual mean for each site. The design value for the 24-hour $PM_{2.5}$ standard is the most current 3-year average of annual 98^{th} percentile 24-hour values recorded at each monitoring site. Table 2-1 shows the annual and daily design values for complete data years 2019 to 2021.

The most recent 3-year design values in the Honolulu and Maui MSAs were less than 85% of any $PM_{2.5}$ NAAQS. Table 2-2 shows that the state operates more than the minimum monitoring requirements for $PM_{2.5}$ in each MSA. Additionally, in 2021, the state operated one SPMS in the Maui MSA and ten SPMS on the island of Hawaii for volcanic emissions, and one SPMS on the island of Kauai to monitor cruise ship emissions.

To reduce the size of the $PM_{2.5}$ network, some monitors were temporarily discontinued. See Section 2.12 for discussion on site modifications and Section 3.0 for detailed location information.

The IMPROVE monitoring station (HACR1) at Haleakala National Park on Maui, operated by the National Park Service, serves as the background/transport $PM_{2.5}$ site for the state's network. All primary $PM_{2.5}$ monitors operated by the state are continuous FEM. Figure 2-1 shows the map locations of all the $PM_{2.5}$ stations in the state, including the IMPROVE monitor and SPMS.

Table 2-1. $PM_{2.5}$ Network and Concentrations for Each MSA

Site	AQS No.	Sampling Frequency	Annual Design Value (µg/m³) 2019 – 2021	Percent of Annual NAAQS (12µg/m³)	Daily Design Value (µg/m³) 2019-2021	Percent of 24-Hour NAAQS (35 µg/m³)
Honolulu MSA						
Honolulu	150031001	Continuous	3.1	26	6	17
Kapolei	150030010	Continuous	2.8	23	6	17
Pearl City[1]	150032004	Continuous	3.2	27	6	17
Sand Island	150031004	Continuous	**3.7**	31	**7**	20
Maui MSA						
Kihei[2]	150090006	Continuous	**3.2**	27	**10**	29

NOTE: Haleakala IMPROVE (150099001) is the $PM_{2.5}$ background/transport site for Hawaii and is operated and maintained by the NPS
[1] The Pearl City station discontinued operations on April 6, 2022
[2] The Kihei station discontinued operations on March 30, 2022

Table 2-2. $PM_{2.5}$ Minimum Monitoring Requirements for Each MSA

MSA Population Category (2021 Census) (40 CFR 58 Appendix D Table D-5)	Most recent 3-year Design Value ≥85% of any $PM_{2.5}$ NAAQS (≥29.75 µg/m³ for 24-hr standard; ≥10.2 µg/m³ for annual standard)	Most recent 3-year Design Value <85% of any $PM_{2.5}$ NAAQS (<29.75 µg/m³ for 24-hour standard; <10.2 µg/m³ for annual standard)
>1,000,000	3	**2**
500,000-1,000,000	2	1
50,000-<500,000	1	0

MSA	2021 Census Population (estimated)	Highest Annual Design Value 2019 – 2021	Highest Daily Design Value 2019-2021	Required No. of Monitors	Number of Active Monitors in the MSA	Number of Monitors Needed
Honolulu	1,000,890	3.7	7	2	4	0
Maui	164,221	3.2	10	0	1 SPMS	0

Appendix A to 40 CFR 58 requires that 15 percent of each $PM_{2.5}$ monitoring method be co-located. The state currently operates three SLAMS, one NCore and nine SPMS FEM monitors (thirteen total), twelve of which are using Method 209 and one that is using Method 238. Since the state is requesting temporary closures and modifications, the number of co-located monitors will be adjusted accordingly.

One co-located monitor is required for the station using Method 238. One FRM co-located monitor is operating at the Kapolei NCore station to meet this requirement.

Two co-located monitors are currently required for the twelve stations using Method 209, one is the FRM co-located monitor operating at the Kapolei NCore station. There is also a $PM_{2.5}$ FEM co-located at the Kona station. The state will adjust the number of co-located FRM and/or FEM monitors as needed, pending approvals for temporary site closures.

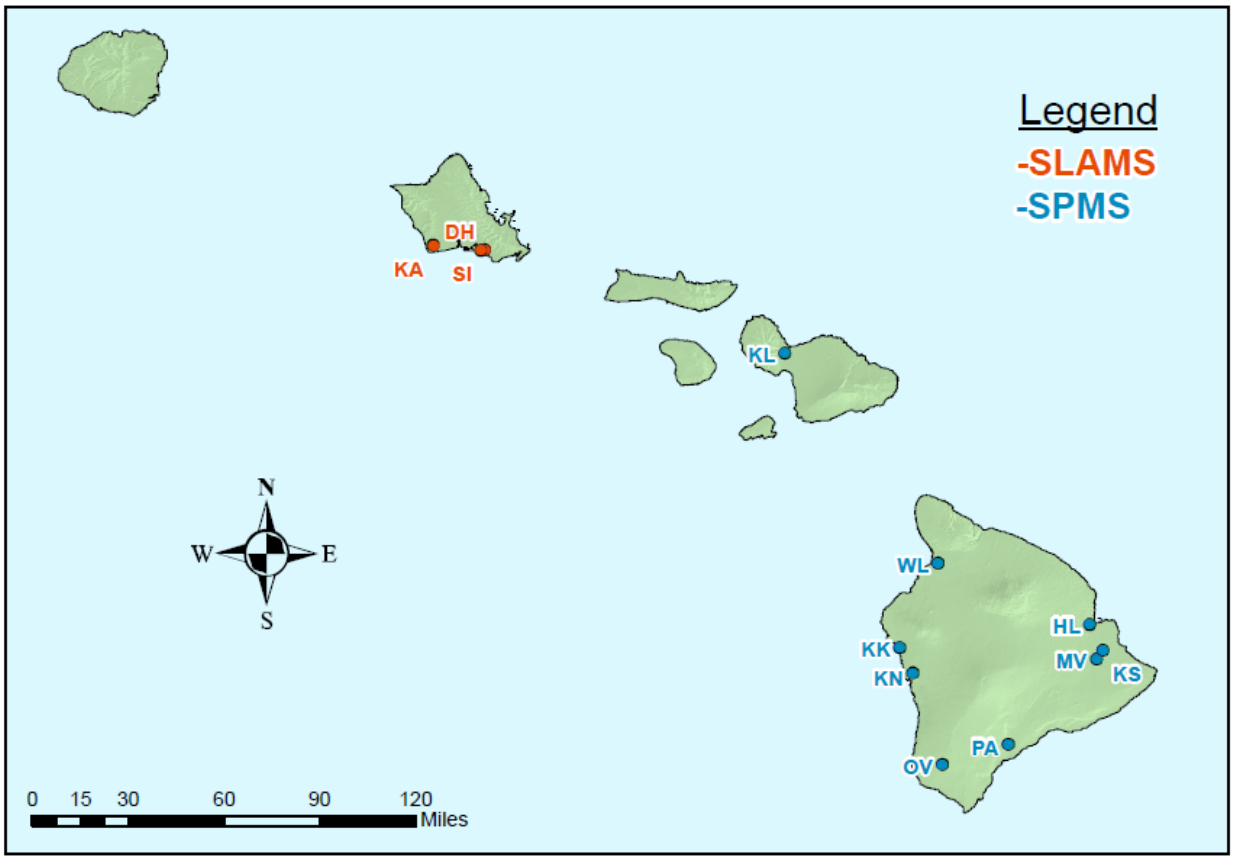
Table 2-3 summarizes the $PM_{2.5}$ co-located network at the time of plan publication.

Table 2-3. $PM_{2.5}$ Co-located Network

Method Code	# Primary Monitors	# Required Co-located	# Active Co-located FRM	# Active Co-located FEM (same method designation as primary)
209	12	2	1[1]	1
238	1	1	1[1]	0

[1] The same co-located FRM sampler is used for both Method 209 and Method 238.

Figure 2-1. $PM_{2.5}$ Network



2.2 PM_{10} Network

The minimum number of required PM_{10} monitoring stations for the MSA is dependent upon population and concentration measurements. High concentration areas are those for which the ambient PM_{10} data show concentrations exceeding the PM_{10} NAAQS by 20 percent or more. Medium and low concentration areas are those for which ambient PM_{10} data show concentrations exceeding 80 percent of the NAAQS, and concentrations less than 80 percent of the NAAQS, respectively.

PM_{10} data for 2021 showed the Honolulu MSA to be a low concentration area (Table 2-4) and, therefore, is required to have two to four PM_{10} monitors (Table 2-5). In the absence of a PM_{10} design value for the Maui MSA and with a population <250,000, no PM_{10} monitoring is required in that MSA. The state meets the minimum PM_{10} monitoring requirements with two PM_{10} stations in the Honolulu MSA.

Table 2-4. PM_{10} Network and Concentrations for the Honolulu MSA[1]

Site Name	AQS No.	2021 Maximum 24-Hr Value ($\mu g/m^3$)	Percent of 24-Hr NAAQS	Sampling Frequency
Honolulu	150031001	26	17	Continuous
Kapolei	150030010	47	31	Continuous
Pearl City[2]	150032004	25	17	Continuous

[1] There is currently no PM_{10} monitor operating in the Maui MSA
[2] The Pearl City station discontinued operations on April 6, 2022

Table 2-5. PM_{10} Minimum Monitoring Requirements for Each MSA

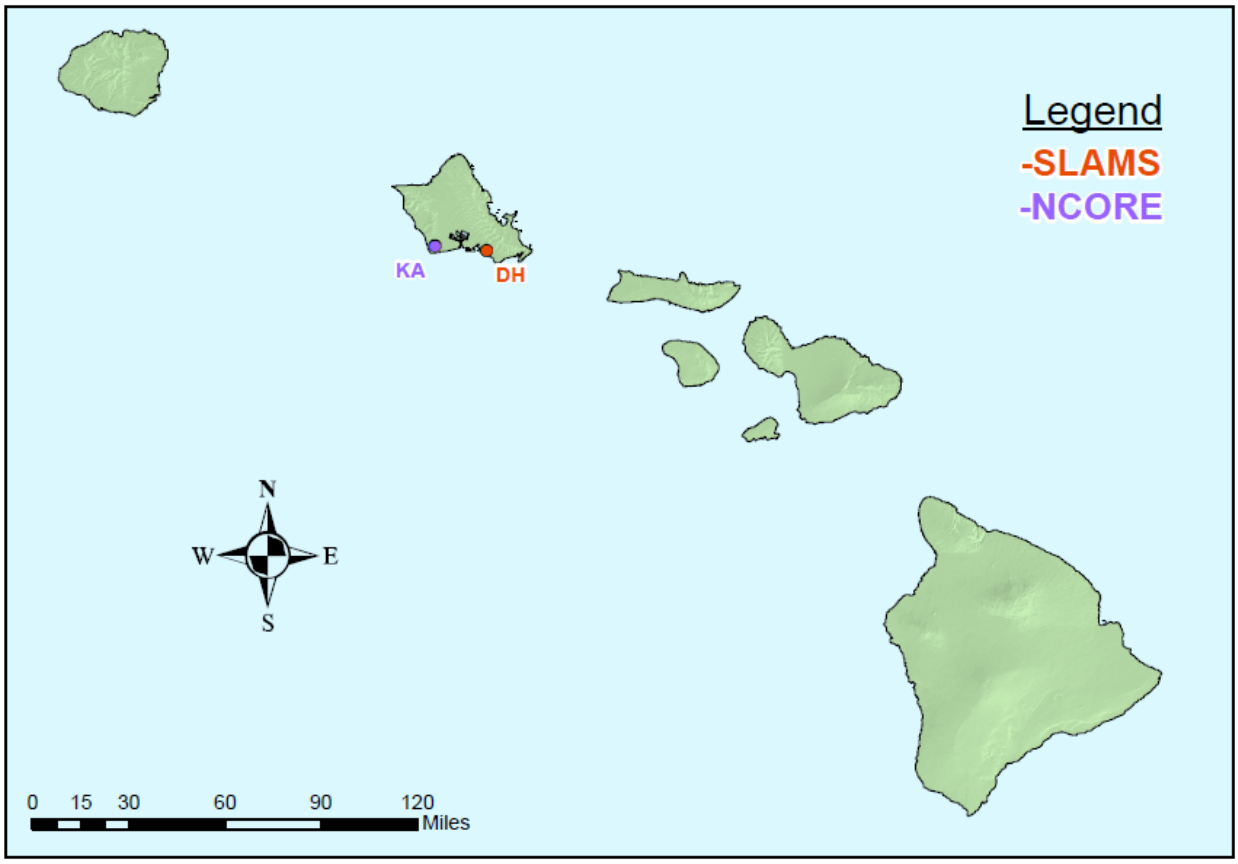
MSA Population Category (2020 Census) (40 CFR 58 Appendix D Table D-4)	High Concentration ≥120% of NAAQS (≥180 $\mu g/m^3$)	Medium Concentration >80% of NAAQS (>120 $\mu g/m^3$)	Low Concentration <80% of NAAQS (<120 $\mu g/m^3$)[1]
>1,000,000	6-10	4-8	2-4
500,000-1,000,000	4-8	2-4	**1-2**
250,000-500,000	3-4	1-2	0-1
100,000-250,000	1-2	0-1	0

MSA	2021 Census Population (estimated)	Highest 24-hr Value (2021)	Required # of Monitors	# of Active Monitors in the MSA	# of Monitors Needed
Honolulu	1,000,890	47 $\mu g/m^3$	2-4	2	0
Maui	164,221	No data available	0[1]	0	0

[1] 40 CFR Part 58 Appendix D Section 4.6 Table D-4 states that in the absence of a design value, these minimum monitoring requirements apply.

Figure 2-2 is a map of the current PM_{10} sites in the state. All the PM_{10} stations are in the Honolulu MSA.

Figure 2-2. PM_{10} Network



2.3 Pb Network

Pb monitoring was conducted since January 1, 2012 until discontinued on December 31, 2018 at the Kapolei/NCore site. Concentrations of Pb measured during this period were approximately one to two percent of the standard. The state has no sources emitting greater than 0.5 tons per year according to the most recent emissions inventory. EPA approved the discontinuation of Pb monitoring per letter dated October 29, 2018.

Table 2-6. Minimum Pb Monitoring Requirement at NCore

NCore	AQS ID	CBSA	2021 Census Population (estimated)	# Required Monitors	# Active Monitors	# Monitors Needed
KA	150030010	Honolulu	1,000,890	*0	*0	0

* Per EPA letter dated October 29, 2018, the Pb monitoring at Kapolei NCore was approved to be discontinued

2.4 O_3 Network

Depending upon MSA population and typical peak concentrations, the state must operate a minimum number of O_3 monitors. NCore sites are intended to complement O_3 data collection and can be used to meet the minimum monitoring requirements.

The O_3 monitoring season for the state of Hawaii is 12-months from January to December. The O_3 design value is the 3-year average of the fourth-highest daily maximum 8-hour concentrations measured at each monitor.

The most recent O_3 design value concentrations at the Sand Island and Kapolei NCore stations in the Honolulu MSA showed less than 85% of the O_3 NAAQS (Table 2-7). The Maui MSA does not have any O_3 monitoring. According to 40 CFR Part 58 Appendix D Table D-2 and, as shown in Table 2-7 below, with a 2021 census population estimated at 164,221 and in the absence of a design value, no O_3 monitor is required in the Maui MSA. The state meets the minimum O_3 network monitoring requirements.

Table 2-7. O_3 Design Values for the Honolulu MSA

Stations in the MSA	8-Hour Design Value 2019 – 2021	2021 MSA Census Population	Required # of Monitors	# of Active Monitors in the MSA	# of Monitors Needed
Sand Island (150031004)	0.047	1,000,890 (estimated)	1	2	0
Kapolei (150030010)	0.048				
There is no O_3 monitor in the Maui MSA		164,221 (estimated)	0	0	0

Table 2-8. O_3 Minimum Monitoring Requirements for Each MSA

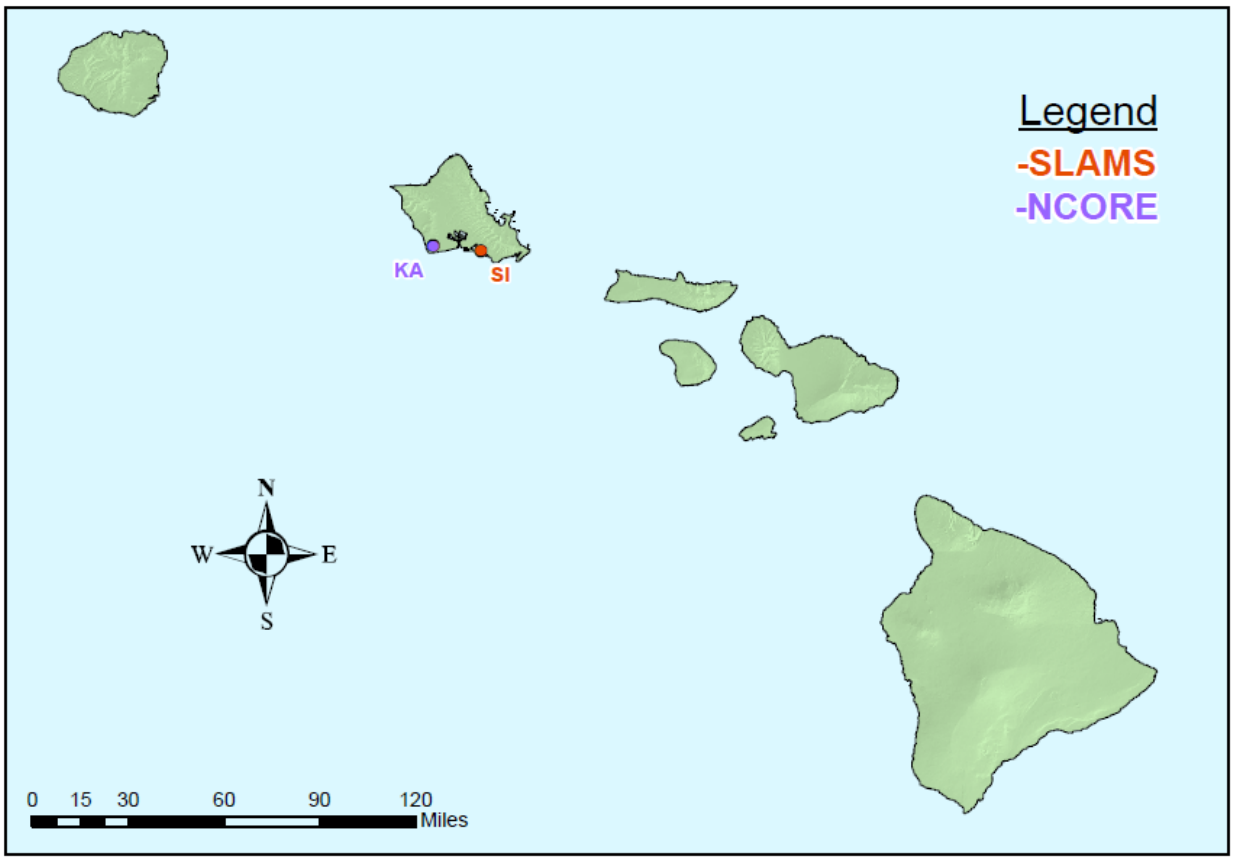
MSA Population Category (40 CFR 58 Appendix D Table D-2)	Most recent 3-year design value ≥85% of any O_3 NAAQS (≥.064 ppm, 8-hr standard)	Most recent 3-year design value <85% of any O_3 NAAQS (<.064 ppm, 8-hr standard)[1]
>10 million	4	2
4-10 million	3	1
350,000-<4 million	2	**1**
50,000-<350,000	1	0

[1] According to 40 CFR part 58 Appendix D, Table D-2, these minimum monitoring requirements apply in the absence of a design value.

Hawaii is in attainment with the 8-hour O_3 standard and is not required to submit an Enhanced Monitoring Plan (EMP). 40 CFR Part 58.10 requires that states with Moderate and above 8-hour O_3 nonattainment areas and states in the Ozone Transport Region as defined in 40 CFR 51.900 shall develop and implement an EMP.

Figure 2-3 shows the map locations of the SLAM and NCore O_3 stations. Both stations are in the Honolulu MSA.

Figure 2-3. O_3 Network



2.5 NO_2 Network

40 CFR Part 58, Appendix D Section 4.3.3 requires area wide NO_2 monitoring in the location of highest expected concentration in a CBSA with a population ≥1,000,000. The Honolulu MSA had a 2021 census population estimated at 1,000,890. The population and Annual Average Daily Traffic (AADT) for the Honolulu CBSA will be monitored, and when thresholds are reached, the near-road monitoring will be established.

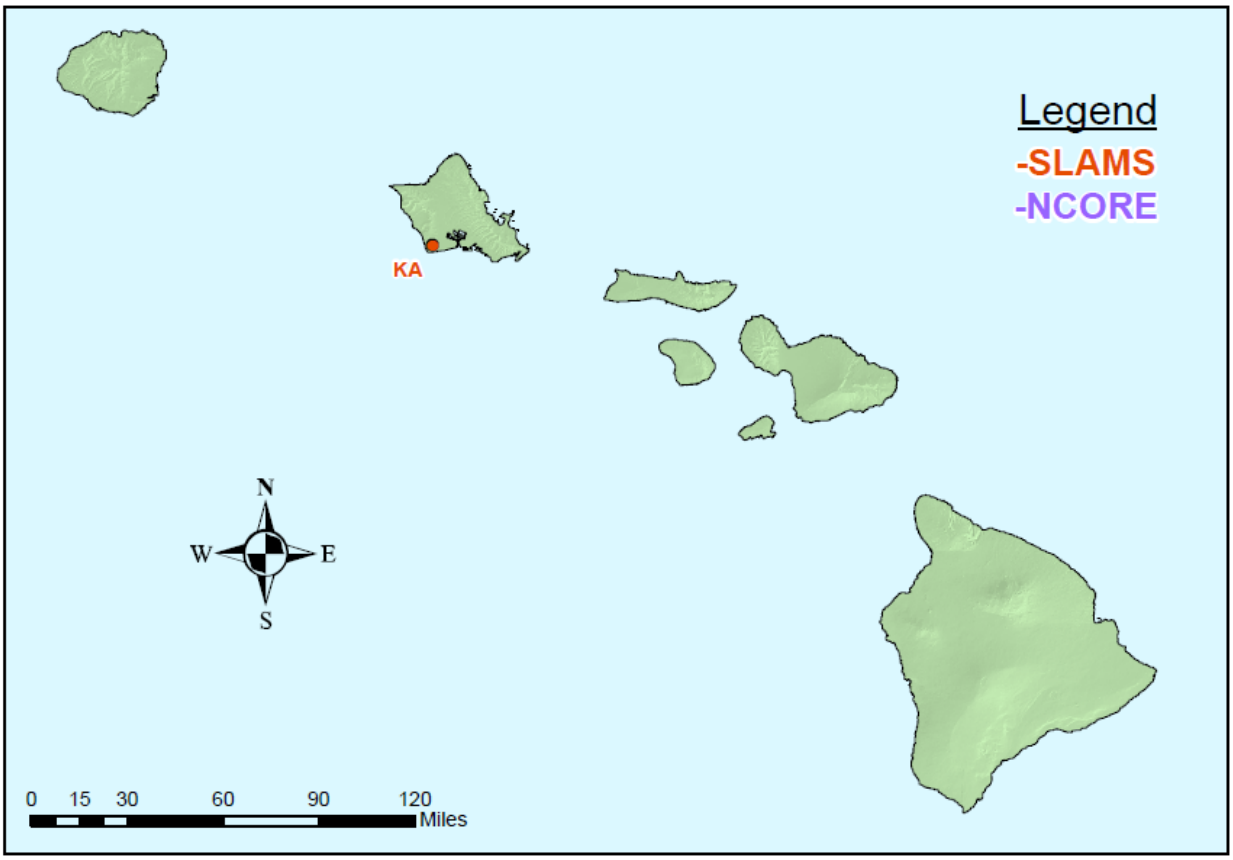
The state currently has one SLAMS NO_2 station in the Honolulu MSA which measures typical concentration in areas of high population density. Additionally, this location would be suitable as the area-wide monitor because it is in the area of highest expected concentration. No NO_2 monitoring is required in the Maui MSA.

Table 2-9. Minimum Near-Road NO_2 Monitoring Requirements for the MSA

CBSA	2021 Census Population (estimated)	Max AADT Counts (2021)[1]	# Required Monitors	# Monitors to be operational by 1/1/2017
Honolulu	100,890	252,626	0	0

[1] 2021 estimated average AADT provided by the State of Hawaii Department of Transportation, calculated from a 4% drop in volume from the 2019 count of 263,152.

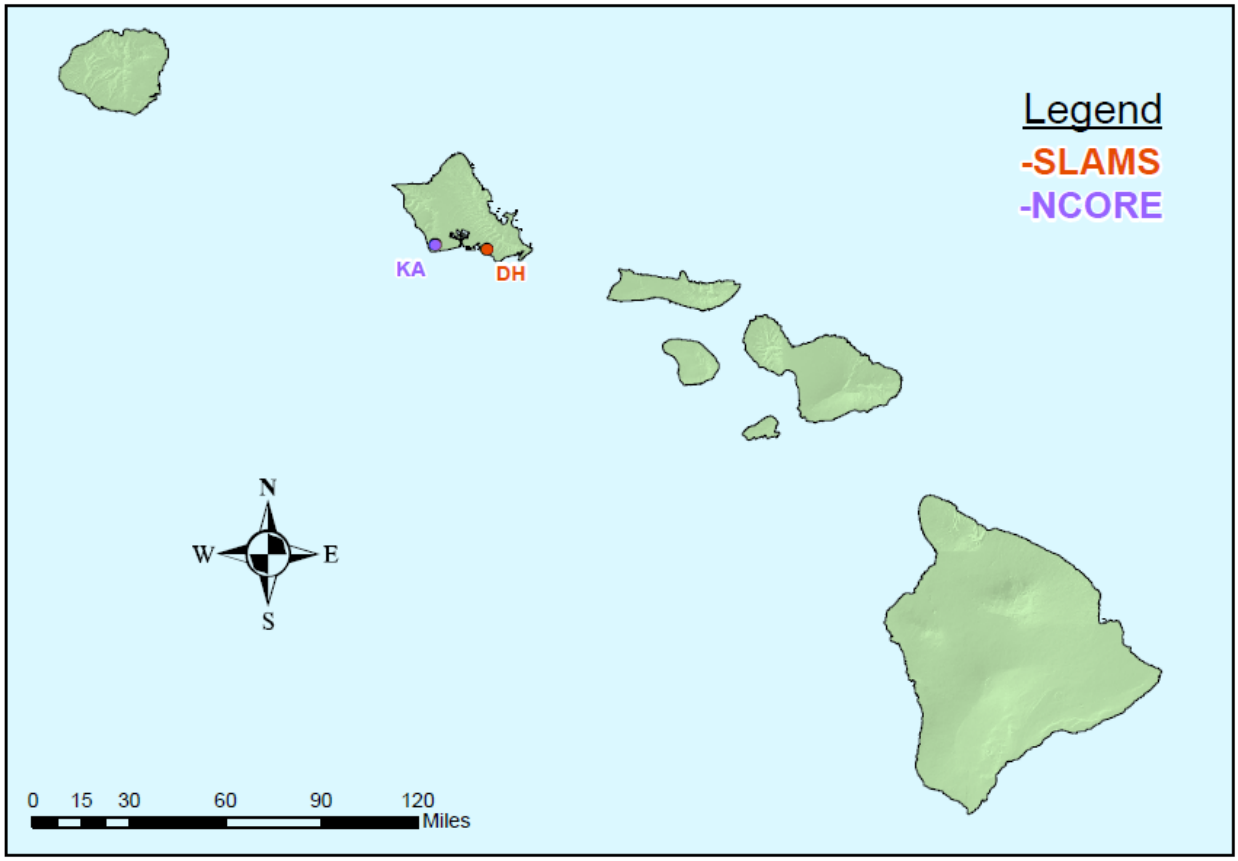
Figure 2-4. NO_2 Network



2.6 CO Network

The state operates two CO monitors, one SLAMS and one SLAMS/NCore, in the Honolulu MSA. Figure 2-5 shows the locations of the CO sites in the state. 40 CFR Part 58, Appendix D Section 4.2.2 requires one co-located CO monitor at near-road NO_2 sites in Core-based Statistical Areas (CBSA) with populations ≥1,000,000. The Honolulu MSA had a 2021 census population estimated at 1,000,890. The population and Annual Average Daily Traffic (AADT) for the Honolulu CBSA will be monitored, and when thresholds are reached, the near-road monitoring and the co-located CO monitor will be established. No CO monitoring is required in the Maui MSA.

Figure 2-5. CO Network



2.7 SO_2 Network

According to the Population Weighted Emissions Index (PWEI) calculation, established the to determine SO_2 monitoring requirements, Hawaii is required to operate one SO_2 monitor in the Honolulu MSA and none in the Maui MSA (Table 2-10). The state currently operates one SLAMS SO_2 monitor in the Honolulu MSA, and one at the NCore station in Kapolei which meets the minimum number of required SO_2 stations. There are no requirements for a SO_2 monitor in the Maui MSA.

The SPM station on Kauai was established to measure SO_2 from cruise ship emissions and will continue. The FEM monitors SO_2, follows all requirements of 40 CFR 58 Appendices A, D, and E, and as of April 2, 2013, has been operating for more than 24 months and is eligible for comparison with the NAAQS.

Elevated levels of SO_2 in communities affected by volcanic emissions continue to be a concern on the island of Hawaii. On December 20, 2020, a new volcanic event started as lava began erupting from inside Halemaumau Crater at the summit of Kilauea volcano. SO_2 emissions from the summit was estimated at approximately 40,000 tons per day for the first three days after the eruption began, cut in half to 20,000 tons per day two days later, and dropped again to 5,000 tons per day the very next day. The emissions continued to gradually decrease and has steadied to a range from 300 to 650 tons measured per day during pauses in eruption and 1,300 to 3,400 tons per day during active eruption.

To provide timely notification of SO_2 levels there are currently eight stations monitoring for SO_2, two are SLAM stations (Hilo and Kona) and six (Mountain View, Pahala, Ocean View, Keeau, Naalehu and Leilani) are SPMS. All stations use FEM monitors and follow the requirements of 40 CFR 58 Appendices A, D, and E. Mountain View, Pahala, Ocean View have been operating for more than 24 months and therefore are subject to NAAQS comparison.

See Section 2.12 for discussion on site modifications and Section 3.0 for detailed location information. Figure 2-6 shows the locations of the SLAMS and SPMS stations discussed.

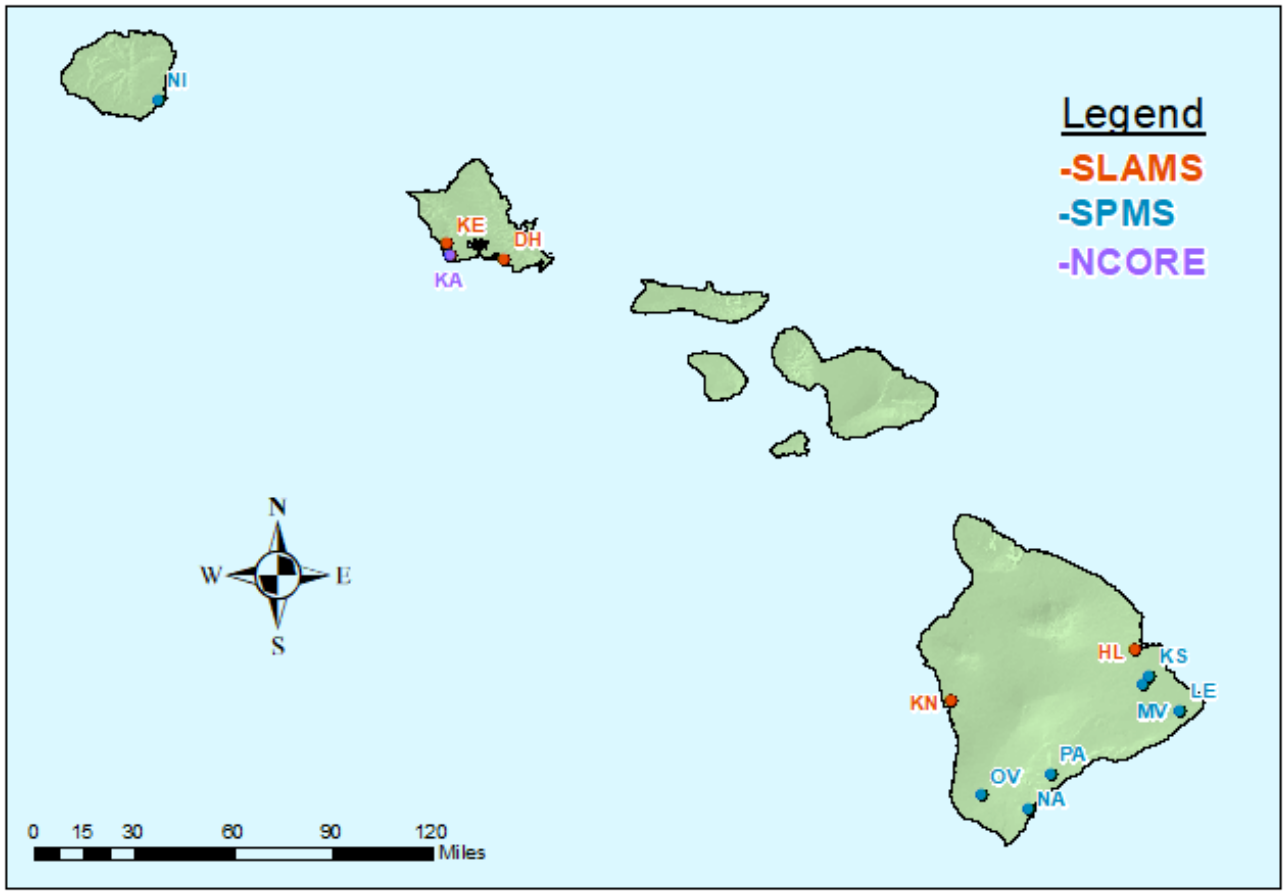
The state is also required by 40 CFR Part 51, Subpart BB, Data Requirements Rule, to characterize maximum 1-hour ambient concentrations of SO_2 through either ambient air quality monitoring or air quality modeling analysis. In 2021 the state had two air stations, Kahe and Waiau, to monitor four sources that have been identified as having SO_2 emissions data of 2,000 tons or more (see detailed site description for more information). After review of the data collected since 2017, it was determined that Waiau met the DRR requirement to shut down; monitoring at Waiau was discontinued on December 31, 2021 with EPA approval. See Appendix B for EPA's approval letter.

Table 2-10. Minimum SO_2 Monitoring Requirements

CBSA	County	2021 Census Population (estimated)	Total SO_2 (tons/year) 2017 NEI	PWEI[1]	DRR[2] Sources Using Monitoring	# Required Monitors	# Active Monitors	# Monitors Needed
Honolulu	City & County of Honolulu	1,000,890	13,159	12,824	4	1	1 SLAMS 1 SLAMS/ NCore	0
Maui	Maui	164,221	2,688	450	0	0	0	0

[1] According to 40 CFR 58 Appendix D, if the PWEI for a CBSA is ≥ 5,000 but < 100,000, a minimum of one SO_2 monitor is required.
[2] Data Requirements Rule for the 2010 1-Hour SO_2 Primary NAAQS.

Figure 2-6. SO_2 Network



2.8 NCore

The Kapolei NCore station is located in the residential, commercial, and industrial community on the southwest side of Oahu. Kapolei is the "second city" next to Honolulu with county, state and federal agencies having established offices in the area. The NCore parameters are: NO/NO_y, trace-level SO_2, trace-level CO, O_3, $PM_{10-2.5}$, $PM_{2.5}$ speciation and the meteorological parameters wind speed, wind direction, temperature and relative humidity.

By correspondence dated October 30, 2009, EPA approved Kapolei as the NCore station and it became fully operational on January 1, 2011.

40 CFR Part 58, Appendix D Section 5 (a) requires the state to collect and report Photochemical Assessment Monitoring Station (PAMS) measurements at each NCore site located in a CBSA with a population ≥1,000,000. The Honolulu MSA had a 2021 census population estimated at 1,000,890 and therefore DOH will continue to work with EPA to determine the appropriate timeline to meet the requirement to operate a PAMS.

2.9 H_2S Network

There is a geothermal facility, Puna Geothermal Ventures (PGV), located on island of Hawaii in the lower east rift zone of the Kilauea volcano. PGV is permitted to operate a 41-megawatt geothermal power plant and to conduct geothermal energy exploration and production. The pollutant of concern emitted from the facility operations is hydrogen sulfide (H2S). The state has a one-hour H_2S standard of 25 parts per billion (ppb).

DOH established and operates a station at the Leilani Community Association Center, downwind of the facility, to monitor ambient levels of H_2S due to activities from PGV. The Leilani station which began sampling on September 18, 2020 is operated and maintained according to EPA monitoring and quality assurance requirements.

2.10 Site Closures

40 CFR part 58, Appendix A, §2.1.3 states: The PQAO/monitoring organization's quality system must have adequate resources both in personnel and funding to plan, implement, assess, and report on the achievement of the requirements of this appendix and its' approved QAPP.

As of 2022, an administrative organization change was made, and the CAB was assigned the responsibility of administering the Hawaii ambient air monitoring program without support from AQMS. This includes planning, installing, operating, maintaining, data collection, validation, AQS reporting and quality assurance. However, the lack of adequate resources in personnel and funding has been a challenge. Hiring additional personnel has begun as well as securing additional funding.

To address the resource challenges, CAB is proposing to reduce the size of the ambient air monitoring network by identifying and temporarily shutting down redundant monitoring stations or parameters and request EPA approvals for permanent station

closures. The monitoring network would still need to meet minimum requirements, fulfill monitoring objectives, and to provide data to the public in a timely manner.

The following monitoring sites have been closed within the past 18 months:

2.10.1 Waiau (150034100) SLAMS/DRR site, Oahu, Hawaii Parameter: SO_2

The Waiau DRR station began collecting data on January 1, 2017, has completed the required 3 years of data collection. DOH received approval from EPA on October 8, 2021 to close this station; a copy of the letter is attached as Appendix B of this document. The site was shut down on December 31, 2021 after five years of operating as a DRR site.

2.10.2 Honaunau (150013032) SPMS Honaunau, Hawaii Parameter: $PM_{2.5}$

This temporary SPMS site began collecting $PM_{2.5}$ data in August 2018. The main purpose was to address air quality on the west side of Hawaii island due to the 2018 LERZ Kilauea volcano eruption. A decision was made to shut down the monitor on January 5, 2022 since there are 4 other $PM_{2.5}$ monitors operating on the west side of Hawaii island. The stand-alone sampler was placed into storage.

2.10.3 Kihei (150090006) SLAMS Kihei, Maui, Hawaii Parameter: $PM_{2.5}$

This SLAMS station was established to monitor the impacts from sugar cane burning and started operating in 1999. The Hawaiian Commercial and Sugar Company shut down its sugar cane growing operations in 2016 after the last harvest. This site was shut down on March 30, 2022. The sampler was removed from the roof of the trailer and placed inside for storage. DOH is requesting approval from EPA to permanently shut down this station.

2.10.4 Pearl City (150032004) SLAMS Pearl City, Oahu, Hawaii Parameters: PM_{10}, $PM_{2.5}$ and $PM_{2.5}$ Co-located

This SLAMS station is located in a commercial and residential area and has been in operation since 1994. PM_{10} data for 2020 showed the Honolulu MSA to be a low concentration area and is required to have one to two PM_{10} monitors. The state currently meets the minimum PM_{10} monitoring requirements with three PM_{10} stations in the Honolulu MSA. With this stations closure, there will be two PM_{10} stations remaining in the Honolulu MSA.

For $PM_{2.5}$ the most recent 3-year design values in the Honolulu MSA were less than 85% of any $PM_{2.5}$ NAAQS and that the state currently operates 4 $PM_{2.5}$ monitors in the MSA, a minimum of 1 monitor is required for the Honolulu MSA. The co-located

$PM_{2.5}$ FRM at Pearl City will possibly be relocated to another Oahu site which has not been determined at this time. This site was shut down on April 6, 2022, and the sampling equipment have been removed from the roof of the building and placed into storage. DOH is requesting approval from EPA to permanently shut down this station.

2.11 Site Additions

There are no plans to add any sites in the next 18 months.

2.12 Site Modifications

2.12.1 Kapolei (150030010) SLAMS/NCore
Kapolei, Oahu, Hawaii
Parameters: PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$, $PM_{2.5}$ Co-located, CO and SO_2

As stated previously in Section 2.10 of this plan, to address resource challenges by decreasing the size of the network, DOH is reducing duplication of monitored parameters. Since trace CO and trace SO_2 are required to be monitored at the NCore station, the CO and SO_2 monitors at the Kapolei SLAMS site were discontinued on March 31, 2022.

The BAM 1020 PM_{10} and BAM 1020 $PM_{2.5}$ samplers were discontinued on December 6, 2021 and replaced with a Teledyne T640X PM sampler on January 7, 2022 to monitor for PM_{10}, $PM_{2.5}$ and $PM_{10-2.5}$. A new BAM 1022 $PM_{2.5}$ sampler was also added on March 2, 2022. If necessary, another $PM_{2.5}$ FRM monitor will be included at this site.

On September 14, 2021, the PQ200 FRM $PM_{2.5}$ co-located sampler was replaced with an E-SEQ-FRM $PM_{2.5}$ sampler that allows for the setup of multiple sampling days instead of just a single day, improving efficiency.

2.12.2 Niumalu (150070007) SPMS
Niumalu, Kauai, Hawaii
Parameters: NO_2 and $PM_{2.5}$

This SPMS station was established to measure the impacts from cruise ship emissions in communities downwind of the harbor. Since the implementation of the new lower ECA fuel sulfur requirements for cruise ships SO_2 values have been well below the NAAQS. However, there is a correlation between increased SO_2 emissions while a cruise ship was in port. With network reduction in mind, and the NO_2 and $PM_{2.5}$ values having been well below the NAAQS, monitoring for NO_2 and $PM_{2.5}$ was discontinued at the site on March 31, 2022, SO_2 monitoring will continue at this station.

2.12.3 Naalehu-TP (150013028) SPMS and Naalehu-TS (150013033) SPMS Naalehu Volunteer Fire Station and Naalehu Elementary School, Naalehu, Hawaii Parameters: $PM_{2.5}$ and SO_2

The temporary SPMS $PM_{2.5}$ monitor at the fire station has been shut down as of January 31, 2022; the stand-alone sampler is currently in storage.

DOH is working with Naalehu School to determine the best location for SO_2 and $PM_{2.5}$ monitoring. The school will decide whether to relocate the monitoring to a new location or to continue at its current site on the school's campus. SO_2 monitoring will continue at this station.

2.12.4 Waikoloa (150012021) SPMS DWS Lalamilo (Parker 610), TMK 3-6-8-002-019, Waikoloa, Hawaii Parameter: $PM_{2.5}$

The temporary site for the Waikoloa $PM_{2.5}$ sampler that was previously located at the Waikoloa Elementary School has been relocated to the permanent site (AQS 150012021), which previously operated from 2012 to 2014. The relocation was completed, and data collection began on July 28, 2021.

2.12.5 Keaau (150013027) SPMS Kamehameha Schools Hawaii, Keaau, Hawaii Parameters: $PM_{2.5}$ and SO_2

This SPMS stations was temporarily installed on the Kamehameha School campus since June 2018 to monitor the volcanic emissions from the LERZ Kilauea eruption. The station will be moved to its permanent site in an open area near the Switch Gear Building on the school campus in June 2022 and operational shortly after.

There are no plans to modify any of the other current sites in the next 18 months.

2.13 Summary of Network and Changes

Table 2-11 summarizes the state's 2022 network monitors and planned changes. Since it has been determined that no criteria monitors are currently required in the Maui MSA, only monitors required for the Honolulu MSA are addressed in the table. Sections 2.10 to 2.12 detail station closures, additions and equipment or network modifications, and is summarized in Table 2-12.

As indicated in table 2-11, the monitors used for all criteria pollutants are FRM or FEM and follow the requirements of 40 CFR 58 and Appendices A, C, D, E and G. Hawaii's air monitoring network meets or exceeds the minimum required monitoring for each parameter.

Table 2-11. Number of Monitors by Pollutant or Program

N/A = Not applicable

Pollutant/ Program	SLAMS Only	SPMS	SLAMS/NCore	No. of Co-located	Total in MSA[1,2]	Total in State[2]	Total Required in MSA[1]	Meets EPA Required Minimum?	Planned Additions	Planned Closures
CO (FRM)	1	0	1	N/A	2	2	N/A	N/A	0	0
NO_2 (FRM)	1	0	---	N/A	1	1	N/A	N/A	0	0
SO_2 (FEM)	4	7	1	N/A	3	12	1	YES	0	0
O_3 (FEM)	1	0	1	N/A	2	2	1	YES	0	0
NO/NO_y	N/A	N/A	1 (NCore)	N/A	1	1	1	YES	0	0
PM_{10} (FEM)	1	0	1	N/A	2	2	1-2	YES	0	0
$PM_{2.5}$ (all are FEM)	3	9	1	1 FRM 1 FEM	4	13[3]	1	YES	1	0
$PM_{2.5}$ Speciation	0	0	1 (NCore/ Supplemental Speciation)	N/A	1	1	1 (NCore)	YES	0	0
$PM_{10-2.5}$	N/A	N/A	1 (NCore)	N/A	1	1	1 (NCore)	YES	0	0
H_2S	N/A	1	N/A	N/A	0	1	N/A	N/A	0	0

[1] As promulgated in 40 CFR 58 Appendix D, the minimum monitoring requirements apply to Metropolitan Statistical Areas (MSA). Currently, only the Honolulu MSA has requirements for minimum criteria pollutant monitoring.
[2] Total refers to the number of primary monitors only and does not count co-located monitors.
[3] Twelve of the thirteen are using Method 209 and one is using Method 238.

Table 2-12. Summary of Network Changes

Site	AQS ID	Site Type	Affected Parameters	Reason for Closure/Addition/Modification
City and County of Honolulu				
Pearl City	150032004	SLAMS	PM_{10}, $PM_{2.5}$, $PM_{2.5\ FRM}$	**Site closure:** To address resource challenges by reducing the size of the ambient air network, this site was shut down on April 6, 2022. As discussed in Section 2.2 of this plan, PM_{10} data for 2021 showed the Honolulu MSA to be a low concentration area and, therefore, is required to have two to four PM_{10} monitors. Even with the closing of the station, the state still meets the minimum PM_{10} monitoring requirements with two remaining PM_{10} stations in the Honolulu MSA. As discussed in Section 2.1 of this plan, the most recent 3-year design values in the Honolulu MSA were less than 85% of any $PM_{2.5}$ NAAQS and that the state currently operates 4 $PM_{2.5}$ monitors in the MSA, more than the minimum 1 monitor required for the MSA. The co-located $PM_{2.5}$ FRM at Pearl City will possibly be relocated to another Oahu site which has not been determined at this time.
Waiau	150034100	DRR/ SLAMS	SO_2	**Site closure:** DOH received EPA approval on October 8, 2021. (Appendix B) This site was closed on December 31, 2021.

Site	AQS ID	Site Type	Affected Parameters	Reason for Closure/Addition/Modification
Kapolei/ NCore	150030010	SLAMS/ NCore	CO, SO_2, PM_{10}, $PM_{2.5}$, $PM_{10-2.5}$, $PM_{2.5\ FRM}$	**Site modification:** To address resource challenges by reducing the size of the ambient air network, and since trace CO and trace SO_2 are required to be monitored at the NCore station, the CO and SO_2 monitors at the SLAMS site was discontinued with minimal impact on March 31, 2022. The BAM1020 PM_{10} and BAM1020 $PM_{2.5}$ samplers were discontinued on December 6, 2021 and replaced with a Teledyne T640X PM sampler on January 7, 2022 to monitor for PM_{10}, $PM_{2.5}$ and $PM_{10-2.5}$. A new BAM 1022 $PM_{2.5}$ sampler was also added on March 2, 2022. On September 14, 2021, the PQ200 FRM $PM_{2.5}$ co-located sampler was replaced with an E-SEQ-FRM $PM_{2.5}$ sampler that allows for the setup of multiple sampling days instead of just a single day, improving efficiency.
Maui County				
Kihei	150090006	SLAMS	$PM_{2.5}$	**Site closure:** To address resource challenges by reducing the size of the ambient air network, this site was shut down on March 30, 2022. This site was established to monitor the impacts from sugar cane burning and had been operating since 1999. With the last harvest season occurring in 2016, the need no longer exists. As discussed in Section 2.1 of this plan, the most recent 3-year design values in the Maui MSA were less than 85% of any $PM_{2.5}$ NAAQS and with its smaller population, no $PM_{2.5}$ monitor is required for the Maui MSA.
Hawaii County				
Honaunau	150013032	SPMS	$PM_{2.5}$	**Site closure:** To address resource challenges by reducing the size of the ambient air network, this station was shut down on January 5, 2022. The small rural communities served by the station will still be able to access data from the Kona and Ocean View stations. There are still 4 other $PM_{2.5}$ monitors remaining on the west side of Hawaii island.

Site	AQS ID	Site Type	Affected Parameters	Reason for Closure/Addition/Modification
Naalehu-TP & Naalehu-TS	150013028 & 150013033	SPMS	$PM_{2.5}$, SO_2	**Site modification:** The $PM_{2.5}$ monitor at the Naalehu Volunteer Fire Station has been shut down as of January 31, 2022; the stand-alone sampler is currently in storage. DOH is working with Naalehu School to determine the best location for SO_2 and $PM_{2.5}$ monitoring. The school will decide whether to relocate the monitoring to a new location or to continues at its current site on the school's campus. SO_2 monitoring will continue at this station.
Waikoloa	150012021	SPMS	$PM_{2.5}$	**Site modification:** The temporary site for the Waikoloa $PM_{2.5}$ sampler that was previously located at the Waikoloa Elementary School has been relocated to the permanent site, which previously operated from 2012 to 2014. The relocation was completed in one day, on July 28, 2021.
Keeau	150013027	SPMS	$PM_{2.5}$, SO_2	**Site modification:** This SPMS stations was temporarily installed on the Kamehameha School campus since June 2018 to monitor the volcanic emissions from the LERZ Kilauea eruption. The station will be moved to its permanent site in an open area near the Switch Gear Building on the school campus in June 2022 and operational shortly after.
Kauai County				
Niumalu	150070007	SPMS	NO_2, $PM_{2.5}$	**Site modification:** To address resource challenges by reducing the size of the ambient air network, and with the NO_2 and $PM_{2.5}$ values having been well below the NAAQS, the NO_2 and $PM_{2.5}$ monitors at the site was discontinued on March 31, 2022. This site will continue to monitor for SO_2 to monitor the impacts from cruise ship emissions on nearby communities. As discussed in Section 2.1 of this plan, with its smaller population, there are no requirement to have a $PM_{2.5}$ monitor in Kauai.

The operation of each monitor meets the requirements of appendices A, B, C, D, and E of 40 CFR Part 58, where applicable.

3.0 Detailed Site Descriptions

Following are descriptions and photos of each station in the state's current ambient air monitoring network. The descriptions include area location, traffic, probe siting, monitor information and adherence to quality assurance.

DOH Clean Air Branch is the collecting and reporting agency for all stations and monitors operating in the state.

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

ID	AQS No.	Site Name	Basic Monitoring Objective(s)[1]	Parameters
DH	150031001	Honolulu	1,2	$PM_{2.5}$, PM_{10}, SO_2, CO
KA SLAMS/ NCore	150030010	Kapolei	1,2,3	$PM_{2.5}$, $PM_{2.5}$ co-located, PM_{10}, ($PM_{10-2.5}$), trace SO_2, NO_2, NO/NO_y, trace CO, O_3, $PM_{2.5}$ speciation, WS, WD, RH, Ambient Temperature
SI	150031004	Sand Island	1,2	$PM_{2.5}$, O_3
KL	150090025	Kahului	1, 2	$PM_{2.5}$
NI	150070007	Niumalu	1,2,3	SO_2
HL (SLAMS)	150011006	Hilo	1,2,3	SO_2
HL (SPMS)	150011006	Hilo	1,2,3	$PM_{2.5}$
KN SLAMS)	150011012	Kona	1,2,3	SO_2
KN (SPMS)	150011012	Kona	1,2,3	$PM_{2.5}$, $PM_{2.5}$ co-located FEM
MV	150012023	Mt. View	1,2,3	$PM_{2.5}$, SO_2
OV	150012020	Ocean View	1,2,3	$PM_{2.5}$, SO_2
PA	150012016	Pahala	1,2,3	$PM_{2.5}$, SO_2
LE	150012035	Leilani CAC	1,3	H_2S, SO_2
KK	150013028	Kailua-Kona	1,2,3	$PM_{2.5}$
KS	150013027	Keaau	1,2,3	$PM_{2.5}$, SO_2
NA	150013033	Naalehu	1,2,3	SO_2
WL	150012021	Waikoloa	1,2,3	$PM_{2.5}$
KE	150034001	Kahe	1,2,3	SO_2

[1] Basic Monitoring Objectives:

1) Public information
2) NAAQS compliance
3) Support research

(DH) HONOLULU			
AQS: 150031001	Type: SLAMS	County: Honolulu	MSA: Honolulu
Address: 1250 Punchbowl St., Honolulu, HI 96813			
Latitude: 21.30758 Longitude: -157.85542			Elevation: 20 m MSL
Location Description: This station is located on the roof of the state Department of Health building in downtown Honolulu. The surrounding streets are busy thoroughfares serving the downtown area. The area includes a major hospital (Queen's Medical Center), the state capitol, other state, county, commercial and business buildings as well as residential condominiums. This station has been operating since 1972.			

DH TRAFFIC DESCRIPTION			
Type of Roadway	Punchbowl	S. Beretania	Vineyard
Freeway			
Major Street or Highway	X	X	X
Distance from air intake (m)	30	122	610
Direction from air inlet	E	S	N
Composition of roadway	asphalt	asphalt	Asphalt
Number of traffic lanes	5	6	6
Average daily traffic	19,800 [1]	20,100 [1]	34,800 [1]
Average vehicle speed (est. mph)	20	25	25
Traffic one way or two	2	1	2
Street parking?	No	No	No
[1] Source: State of Hawaii Department of Transportation (2016 count)			

For "Site Representativeness" in the following table:

[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(DH) Honolulu continued

DH MONITOR INFORMATION (N/A = Not Applicable)				
	PM_{10}	**$PM_{2.5}$**	**SO_2**	**CO**
POC/FRM or FEM	1/FEM	3/FEM	6/FEM	1/FRM
Type of Monitor	SLAMS	SLAMS	SLAMS	SLAMS
AQS parameter code	81102	88101	42401	42101
Manufacturer	Met One	Met One	TECO	API
Model No.	BAM1020	BAM 1022	43iQ	T300
AQS method code	122	209	060	093
Monitoring start date	7/1/2009	4/9/2018	9/27/2019	10/15/2019
Monitoring frequency	Continuous	Continuous	Continuous	Continuous
Probe material	N/A	N/A	Glass	Glass
Residence time (sec)	N/A	N/A	14.9	8.77
Distance between co-located monitors	N/A	N/A	N/A	N/A
Analytical laboratory	N/A	N/A	N/A	N/A
Location of probe	building roof	building roof	building roof	building roof
Building dimensions (H) (m)	12	12	12	12
Horizontal distance from supporting structure (m)	9	11	9	9
Vertical distance above supporting structure (m)	1.8	2.1	1.2	1.2
Height of probe above ground (m)	13.8	14.1	13.2	13.2
Distance (m) & direction from drip line of tree(s)	24 E	24 E	27 E	27 E
Horizontal distance from edge of nearest traffic lane (m)	27	27	30	30
Horizontal distance from nearest parking lot (m)	24	24	24	24
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	9 ESE, 2.7	12 ESE, 2.7	9 ESE, 2.7	9 ESE 2.7
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	N/A	N/A	N/A	N/A
Distance (m) & direction from furnace or incineration flues	234 S/SW	234 S/SW	238 S/SW	238 S/SW
Unrestricted airflow	360°	360°	360°	360°
Located in paved (P) or vegetative (V) ground?	P	P	P	P
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Middle
Applicable NAAQS averaging time(s)	24-hr	24-hr, annual	1-hr, 3-hr, annual	1-hr, 8-hr
Sampling season	12 months	12 months	12 months	12 months
Site type[1]	2	2	2	1
Purpose of Monitor[2]	1, 2	1, 2	1, 2	1, 2
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	N/A	Yes	N/A	N/A
DATA QUALITY				
Last PEP	N/A	10/24/19	N/A	N/A
Last NPAP (2017 NPAP done for O_3 only in SI site)	N/A	N/A	6/27/18	6/27/18
Date of last annual independent performance audit (CAB)	N/A	N/A	12/8/21	12/8/21
Frequency of flow rate verification (automated PM)	Monthly	Monthly	N/A	N/A
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A	N/A	N/A
Dates of last 2 semi-annual flow rate audits (PM)	6/7/21, 12/8/21	6/4/21, 12/8/21	N/A	N/A
Frequency of 1-point flow rate verification (Pb)	N/A	N/A	N/A	N/A
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A	N/A	N/A
Precision & accuracy submitted to AQS	Quarterly	Quarterly	Quarterly	Quarterly
Frequency of 1-pt. QC check (gases)	N/A	N/A	Weekly	Weekly
Frequency of multi-point gas calibration	N/A	N/A	6 months	6 months
Annual data certification submitted	5/1/22	5/1/22	5/1/22	5/1/22
Changes in the next 18 months?	None	None	None	None

(KA) KAPOLEI SLAMS and NCORE			
AQS: 150030010	Type: SLAMS	County: Honolulu	MSA: Honolulu
Address: 2052 Lauwiliwili St., Kapolei, HI 96707			
Latitude: 21.32374 Longitude: -158.08861			Elevation: 17.9 m MSL

Location Description:
Located in the Kapolei Business Park in the city of Kapolei, the area is a mix of business, commercial, and government activities surrounded by an ever-expanding residential community. The site is also approximately 1.25 km northeast (upwind) of the state's largest industrial park on the southwest coast of Oahu. The station has been operating as a SLAMS station since 2002.
On October 30, 2009, EPA approved the Kapolei station as the state's NCore site and in addition to the SLAMS parameters, the station began collecting the required NCore parameters on January 1, 2011. There are plans to replace the station shelters with new ones.

KA TRAFFIC DESCRIPTION		
Type of Roadway	Kalaeloa Blvd.	Lauwiliwili St.
Freeway		
Major Street or Highway	X	
Local Street or Road		X
Distance from air intake (m)	379	167
Direction from air inlet	NW	W
Composition of roadway	Asphalt	Asphalt
Number of traffic lanes	4	2
Average daily traffic	36,607 [1]	[2] Estimated: <5,000
Average vehicle speed (est. mph)	35	30
Traffic one way or two	2	2
Street parking?	No	Yes

[1] Source: State of Hawaii Department of Transportation (2016 count)
[2] Estimate only, no data available, local road

For "Site Representativeness" in the following table:

[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(KA) Kapolei SLAMS and NCore continued

KA MONITOR INFORMATION (N/A = Not Applicable)				
	PM_{10}	**$PM_{2.5}$ Primary**	**$PM_{2.5}$ Co-loc**	**$PM_{10-2.5}$**
POC/FRM or FEM	3/FEM	1/FEM	2/FRM	7/FEM
Type of Monitor	SLAMS/NCore	SLAMS/NCore	SLAMS/NCore	NCore
AQS parameter code	81102	88101	88101	86101
Manufacturer	TAPI	TAPI	BGI	TAPI
Model No.	T640X	T640X	E-SEQ-FRM	T640X
AQS method code	239	238	142	240
Monitoring start date	1/7/2022	1/7/2022	9/4/21	1/7/2022
Monitoring frequency	Continuous	Continuous	1/3 days	Continuous
Probe material	N/A	N/A	N/A	N/A
Residence time (sec)	N/A	N/A	N/A	N/A
Manual PM instrument flow rate (liters per minute)	N/A	N/A	16.7	N/A
Distance between co-located monitors (m)	N/A	2	2	N/A
Analytical laboratory	N/A	N/A	Pace Analytical	N/A
Location of probe	shelter roof	shelter roof	shelter roof	shelter roof
Shelter dimensions (H x W x D) (m)	4 x 2.4 x 5	4 x 2.4 x 5	4 x 2.4 x 5	4 x 2.4 x 5
Horizontal distance from supporting structure (m)	N/A	N/A	N/A	N/A
Vertical distance above supporting structure (m)	1.7	1.7	1.7 (>2)	1.7
Height of probe above ground (m)	5.7	5.7	5.7	5.7
Distance (m) & direction from drip line of tree(s)	17 NW	17 NW	18 NW	18 NW
Horizontal distance from edge of nearest traffic lane (m)	167	167	169	167
Horizontal distance from nearest parking lot (m)	87	87	87	87
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A	N/A	N/A
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	170 E, 9	170 E, 9	170 E, 9	170 E, 9
Distance (m) & direction from furnace or incineration flues	None	N/A	None	None
Unrestricted airflow	360°	360°	360°	360°
Located in paved (P) or vegetative (V) ground?	gravel	gravel	gravel	gravel
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Applicable NAAQS averaging time(s)	24-hr	24-hr, annual	24-hr, annual	N/A
Sampling season	12 months	12 months	12 months	12 months
Site type[1]	2	2	QC	2
Purpose of Monitor[2]	1, 2	1, 2	QC	4
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	N/A	Yes	Yes	N/A
DATA QUALITY				
Last PEP	N/A	N/A	N/A	N/A
Last NPAP	N/A	N/A	N/A	N/A
Date of last annual independent performance audit (CAB)	N/A	N/A	N/A	N/A
Frequency of flow rate verification (automated PM)	Monthly	Monthly	N/A	Monthly
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A	Monthly	N/A
Dates of last 2 semi-annual flow rate audits (PM)	N/A newly installed	N/A newly installed	12/17/21	N/A newly installed
Frequency of 1-point flow rate verification (Pb)	N/A	N/A	N/A	N/A
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A	N/A	N/A
Precision & accuracy submitted to AQS	Quarterly	Quarterly	Quarterly	Quarterly
Frequency of 1-pt. QC check (gases)	N/A	N/A	N/A	N/A
Frequency of multi-point gas calibration	N/A	N/A	N/A	N/A
Annual data certification submitted	5/1/22	5/1/22	5/1/22	5/1/22
Changes in the next 18 months?	None	None	None	None

(KA) Kapolei SLAMS and NCore continued

KA MONITOR INFORMATION (N/A = Not Applicable)				
	$PM_{2.5}$	**O_3**		
POC/FRM or FEM	7/FEM	1/FRM		
Type of Monitor	SLAMS/NCore	SLAMS/NCore		
AQS parameter code	88101	44201		
Manufacturer	Met One	TECO		
Model No.	BAM 1022	49i		
AQS method code	209	047		
Monitoring start date	3/2/2022	1/9/2014		
Monitoring frequency	Continuous	Continuous		
Probe material	N/A	Glass		
Residence time (sec)	N/A	18.1		
Distance between co-located monitors (m)	2	N/A		
Analytical laboratory	N/A	N/A		
Location of probe	shelter roof	shelter roof		
Shelter dimensions (H x W x D) (m)	4 x 2.4 x 5	4 x 2.4 x 5		
Horizontal distance from supporting structure (m)	N/A	N/A		
Vertical distance above supporting structure (m)	2	1		
Height of probe above ground (m)	5.7	5		
Distance (m) & direction from drip line of tree(s)	17 NW	12 N		
Horizontal distance from edge of nearest traffic lane (m)	167	162		
Horizontal distance from nearest parking lot (m)	87	82		
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A		
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	170 E, 9	165 E, 9		
Distance (m) & direction from furnace or incineration flues	None	None		
Unrestricted airflow	360°	360°		
Located in paved (P) or vegetative (V) ground?	gravel	gravel		
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood		
Applicable NAAQS averaging time(s)	24-hr, annual	8-hr		
Sampling season	12 months	12 months		
Site type[1]	2	2		
Purpose of Monitor[2]	1, 2	1, 2		
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	Yes	N/A		
DATA QUALITY				
Last PEP	N/A	N/A		
Last NPAP	N/A	10/22/19		
Date of last annual independent performance audit (CAB)	newly installed	12/17/21		
Frequency of flow rate verification (automated PM)	Monthly	N/A		
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (PM)	newly installed	N/A		
Frequency of 1-point flow rate verification (Pb)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A		
Precision & accuracy submitted to AQS	Quarterly	Quarterly		
Frequency of 1-pt. QC check (gases)	N/A	14 days		
Frequency of multi-point gas calibration	N/A	6 months		
Annual data certification submitted	5/1/22	5/1/22		
Changes in the next 18 months?	None	None		

(KA) Kapolei SLAMS and NCore continued

KA MONITOR INFORMATION (N/A = Not Applicable)				
	Trace CO	**Trace SO_2**	**NO/NOy**	**$PM_{2.5}$ Spec.**
POC/FRM or FEM	2/FRM	2/FEM	1/FRM	N/A
Type of Monitor	SLAMS/NCore	SLAMS/NCore	NCore	NCore/Supp. Speciation
AQS parameter code	42101	42401	42601/42600	Various
Manufacturer	API	API	API	Met-One/URG
Model No.	M300EU	M100EU	T200U	SASS/300N
AQS method code	093	600	099	810/136
Monitoring start date	9/30/2014	1/1/2011	1/14/2016	7/24/2019
Monitoring frequency	Continuous	Continuous	Continuous	1/3 days
Probe material	Glass	Glass	Glass	N/A
Residence time (sec)	14.7	16.1	13.2	N/A
Distance between co-located monitors	N/A	N/A	N/A	N/A
Analytical laboratory	N/A	N/A	N/A	EPA contract
Location of probe	shelter roof	shelter roof	shelter roof	shelter roof
Shelter dimensions (H x W x D) (m)	4 x 2.4 x 5	4 x 2.4 x 5	4 x 2.4 x 5	4 x 2.4 x 5
Horizontal distance from supporting structure (m)	N/A	N/A	N/A	N/A
Vertical distance above supporting structure (m)	1	1	1	1.7/1.6
Height of probe above ground (m)	5	5	5	5.7/5.6
Distance (m) & direction from drip line of tree(s)	12 N	12 N	12 N	13N/11N
Horizontal distance from edge of nearest traffic lane (m)	162	162	162	165
Horizontal distance from nearest parking lot (m)	82	82	82	85
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A	N/A	N/A
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	165 E, 9	165 E, 9	165 E, 9	168 E, 9
Distance (m) & direction from furnace or incineration flues	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°
Located in paved (P) or vegetative (V) ground?	gravel	gravel	gravel	gravel
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Applicable NAAQS averaging time(s)	1-hr; 8-hr	1-hr; 3-hr; annual	N/A	N/A
Sampling season	12 months	12 months	12 months	12 months
Site type[1]	2	2	2	2
Purpose of Monitor[2]	1,2,4	1,2,4	4	4
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	N/A	N/A	N/A	N/A
DATA QUALITY				
Last PEP	N/A	N/A	N/A	N/A
Last NPAP	12/5/12	12/5/12	12/5/12	N/A
Date of last annual independent performance audit (CAB)	11/23/20	11/23/20	Not conducted	N/A
Frequency of flow rate verification (automated PM)	N/A	N/A	N/A	N/A
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A	N/A	Monthly
Dates of last 2 semi-annual flow rate audits (manual $PM_{2.5}$)	N/A	N/A	N/A	6/16/20, 12/17/21
Frequency of 1-point flow rate verification (Pb)	N/A	N/A	N/A	N/A
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A	N/A	N/A
Precision & accuracy submitted to AQS	Quarterly	Quarterly	Quarterly	Quarterly
Frequency of 1-pt. QC check (gases)	14 days	14 days	14 days	N/A
Frequency of multi-point gas calibration	6 months	6 months	6 months	N/A
Annual data certification submitted	5/1/22	5/1/22	5/1/22	5/1/22
Changes in the next 18 months?	None	None	None	None

(KA) Kapolei SLAMS and NCore continued

KA MONITOR INFORMATION (N/A = Not Applicable)				
	RH	**WS**	**WD**	**AT**
POC/FRM or FEM	POC 1	POC 1	POC 1	POC 1
Type of Monitor	NCore	NCore	NCore	NCore
AQS parameter code	62201	61103	61104	62101
Manufacturer	RM Young	RM Young	RM Young	RM Young
Model No.	05103VP	05103VP	05103VP	05103VP
AQS method code	014	020	020	020
Monitoring start date	1/1/2011	1/1/2011	1/1/2011	1/1/2011
Monitoring frequency	Continuous	Continuous	Continuous	Continuous
Probe material	N/A	N/A	N/A	N/A
Residence time (sec)	N/A	N/A	N/A	N/A
Distance between co-located monitors	N/A	N/A	N/A	N/A
Analytical laboratory	N/A	N/A	N/A	N/A
Location of probe	10m tower	10m tower	10m tower	10m tower
Shelter dimensions (H x W x D) (m)	4 x 2.4 x 5	4 x 2.4 x 5	4 x 2.4 x 5	4 x 2.4 x 5
Horizontal distance from supporting structure (m)	N/A	N/A	N/A	N/A
Vertical distance above supporting structure (m)	N/A	N/A	N/A	N/A
Height of probe above ground (m)	N/A	N/A	N/A	N/A
Distance (m) & direction from drip line of tree(s)	N/A	N/A	N/A	N/A
Horizontal distance from edge of nearest traffic lane (m)	N/A	N/A	N/A	N/A
Horizontal distance from nearest parking lot (m)	N/A	N/A	N/A	N/A
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A	N/A	N/A
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	N/A	N/A	N/A	N/A
Distance (m) & direction from furnace or incineration flues	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°
Located in paved (P) or vegetative (V) ground?	gravel	gravel	gravel	gravel
SITE REPRESENTATIVENESS				
Spatial scale	N/A	N/A	N/A	N/A
Applicable NAAQS averaging time(s)	N/A	N/A	N/A	N/A
Sampling season	12 months	12 months	12 months	12 months
Site type[1]	N/A	N/A	N/A	N/A
Purpose of Monitor[2]	N/A	N/A	N/A	N/A
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	N/A	N/A	N/A	N/A
DATA QUALITY				
Last PEP	N/A	N/A	N/A	N/A
Last NPAP	N/A	N/A	N/A	N/A
Date of last annual independent performance audit (CAB)	11/23/20	11/23/20	11/23/20	11/23/20
Frequency of flow rate verification (automated PM)	N/A	N/A	N/A	N/A
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A	N/A	N/A
Dates of last 2 semi-annual flow rate audits (manual $PM_{2.5}$)	N/A	N/A	N/A	N/A
Frequency of 1-point flow rate verification (Pb)	N/A	N/A	N/A	N/A
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A	N/A	N/A
Precision & accuracy submitted to AQS	N/A	N/A	N/A	N/A
Frequency of 1-pt. QC check (gases)	N/A	N/A	N/A	N/A
Frequency of multi-point gas calibration	N/A	N/A	N/A	N/A
Annual data certification submitted	5/1/22	5/1/22	5/1/22	5/1/22
Changes in the next 18 months?	None	None	None	None

(SI) SAND ISLAND			
AQS: 150031004	Type: SLAMS	County: Honolulu	MSA: Honolulu
Address: 1039 Sand Island Parkway, Honolulu, HI 96819			
Latitude: 21.30384 Longitude: -157.87117			Elevation: 5.3 m MSL
Location Description: Station is located in the University of Hawaii's Anuenue Fisheries near the entrance to the Sand Island Recreational Area. Sand Island is downwind of downtown Honolulu, across from Honolulu Harbor. This station has been operating since 1980.			

SI TRAFFIC DESCRIPTION	
Type of Roadway	Sand Island Parkway
Freeway	
Major Street or Highway	X
Local Street or Road	
Distance from air intake (m)	37
Direction from air inlet	W
Composition of roadway	asphalt
Number of traffic lanes	2
Average daily traffic	14,000 [1]
Average vehicle speed (est. mph)	30
Traffic one way or two	2
Street parking?	No
[1] Source: State of Hawaii Department of Transportation (2016 count)	

For "Site Representativeness" in the following table:

[1]Site Types: 1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes: 1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(SI) Sand Island continued

SI MONITOR INFORMATION (N/A = Not Applicable)				
	$PM_{2.5}$	**O_3**		
POC/FRM or FEM	2/FEM	2/FRM		
Type of Monitor	SLAMS	SLAMS		
AQS parameter code	88101	44201		
Manufacturer	Met One	TECO		
Model No.	BAM1022	49iQ		
AQS method code	209	047		
Monitoring start date	2/13/2019	1/1/1980		
Monitoring frequency	Continuous	Continuous		
Probe material	N/A	Glass		
Residence time (sec)	N/A	14.9		
Distance between co-located monitors	N/A	N/A		
Analytical laboratory	N/A	N/A		
Location of probe	shelter roof	shelter roof		
Shelter dimensions (H x W x D) (m)	3x2x5	3x2x5		
Horizontal distance from supporting structure (m)	N/A	N/A		
Vertical distance above supporting structure (m)	1.1	2.1		
Height of probe above ground (m)	4.1	5.1		
Distance (m) & direction from drip line of tree(s)	15 E	15 E		
Horizontal distance from edge of nearest traffic lane (m)	37	37		
Horizontal distance from nearest parking lot (m)	40	40		
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A		
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	14 N, 5.5	14 N, 5.5		
Distance (m) & direction from furnace or incineration flues	N/A	N/A		
Unrestricted airflow	360°	360°		
Located in paved (P) or vegetative (V) ground?	gravel	gravel		
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood		
Applicable NAAQS averaging time(s)	24-hr, annual	8-hr		
Sampling season	12 months	12 months		
Site type[1]	5	1		
Purpose of Monitor[2]	1, 2	1, 2, 3		
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	Y	N/A		
DATA QUALITY				
Last PEP	6/22/18	N/A		
Last NPAP	N/A	6/14/17		
Date of last annual independent performance audit (CAB)	N/A	12/9/21		
Frequency of flow rate verification (automated PM)	Monthly	N/A		
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (PM)	6/7/21, 12/9/21	N/A		
Frequency of 1-point flow rate verification (Pb)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A		
Precision & accuracy submitted to AQS	Quarterly	Quarterly		
Frequency of 1-pt. QC check (gases)	N/A	Weekly		
Frequency of multi-point gas calibration	N/A	6 months		
Annual data certification submitted	5/1/22	5/1/22		
Changes in the next 18 months?	None	None		

(KL) KAHULUI			
AQS: 150090025	Type: SPMS	County: Maui	MSA: Maui
Address: TMK 2-3-8-007-153 Mauilani Parkway, Kahului, HI 96732			
Latitude: 20.869444	Longitude: -156.492417		Elevation: 55.5 m MSL
Location Description: This station is located off of Mauilani Parkway in Kahului and surrounded primarily by residential land. The station was established to measure typical concentrations of air pollutants in areas of high population density. This station began monitoring for $PM_{2.5}$ on January 13, 2015.			

KL TRAFFIC DESCRIPTION	
Type of Roadway	Mauilani Parkway
Freeway	
Major Street or Highway	
Local Street or Road	X
Distance from air intake (m)	80
Direction from air inlet	S
Composition of roadway	asphalt
Number of traffic lanes	2
Average daily traffic	<1500[1]
Average vehicle speed (est. mph)	30
Traffic one way or two	2
Street parking?	No
[1] Estimate only, no data available, local road	

For "Site Representativeness" in the following table:

[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(KL) Kahului continued

KL MONITOR INFORMATION (N/A = Not Applicable)				
	$PM_{2.5}$			
POC/FRM or FEM	1/FEM			
Type of Monitor	SPMS			
AQS parameter code	88101			
Manufacturer	Met One			
Model No.	BAM 1022			
AQS method code	209			
Monitoring start date	2/11/2019			
Monitoring frequency	Continuous			
Probe material	N/A			
Residence time (sec)	N/A			
Distance between co-located monitors	N/A			
Analytical laboratory	N/A			
Location of probe	stand-alone shelter on ground			
Shelter dimensions (H x W x D) (m)	N/A			
Horizontal distance from supporting structure (m)	N/A			
Vertical distance above supporting structure (m)	N/A			
Height of probe above ground (m)	2.7			
Distance (m) & direction from drip line of tree(s)	15.2 NE			
Horizontal distance from edge of nearest traffic lane (m)	70			
Horizontal distance from nearest parking lot (m)	N/A			
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A			
Distance (m) & direction from possible obstructions not on roof, vertical height above probe (m)	15.2 NE, 6.1			
Distance (m) & direction from furnace or incineration flues	N/A			
Unrestricted airflow	360°			
Located in paved (P) or vegetative (V) ground?	P			
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood			
Applicable NAAQS averaging time(s)	24-hr, annual			
Sampling season	12 months			
Site type[1]	2, 3			
Purpose of Monitor[2]	1, 2, 4			
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	Yes			
DATA QUALITY				
Last PEP	10/23/19			
Last NPAP	N/A			
Date of last annual independent performance audit (CAB)	N/A			
Frequency of flow rate verification (automated PM)	Monthly			
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A			
Dates of last 2 semi-annual flow rate audits (PM)	11/23/21, 3/30/22			
Frequency of 1-point flow rate verification (Pb)	N/A			
Dates of last 2 semi-annual flow rate audits (Pb)	N/A			
Precision & accuracy submitted to AQS	Quarterly			
Frequency of 1-pt. QC check (gases)	N/A			
Frequency of multi-point gas calibration	N/A			
Annual data certification submitted	5/1/22			
Changes in the next 18 months?	None			

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(NI) NIUMALU			
AQS: 150070007	Type: SPMS	County: Kauai	MSA: Not in an MSA
Address: 2342 Hulemalu Rd., Lihue, HI 96766			
Latitude: 21.9495 Longitude: -159.365			Elevation: 11 m MSL
Location Description: Located on a private residential property approximately 1 mile downwind of Nawiliwili Harbor, this station was established to monitor the impact of cruise ship emissions on nearby communities. With the lower ECA fuel sulfur requirements for cruise ships, this station provides information on the effects of lowered fuel sulfur on ambient SO_2. This station began operating in April 2011.			

NI TRAFFIC DESCRIPTION		
Type of Roadway	Hulemalu Rd.	Niumalu Rd.
Freeway		
Major Street or Highway		
Local Street or Road	X	X
Distance from air intake (m)	44.4	309.7
Direction from air inlet	NW	NE
Composition of roadway	asphalt	Asphalt
Number of traffic lanes	2	1
Average daily traffic	100 [1]	30 [1]
Average vehicle speed (est. mph)	15	20
Traffic one way or two	2	2
Street parking?	No	No
[1] Estimated only, no data available, roads are for local residential access		

For "Site Representativeness" in the following table:

[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(NI) Niumalu continued

NI MONITOR INFORMATION (N/A = Not Applicable)				
	SO_2			
POC/FRM or FEM	1/FEM			
Type of Monitor	SPMS			
AQS parameter code	42401			
Manufacturer	TECO			
Model No.	43iQ			
AQS method code	060			
Monitoring start date	8/29/2019			
Monitoring frequency	Continuous			
Probe material	Glass			
Residence time (sec)	13.2			
Distance between co-located monitors	N/A			
Analytical laboratory	N/A			
Location of probe	shelter roof			
Shelter dimensions (H x W x D) (m)	3x5x2.4			
Horizontal distance from supporting structure (m)	N/A			
Vertical distance above supporting structure (m)	1			
Height of probe above ground (m)	4			
Distance (m) & direction from drip line of tree(s)	17.8 ESE			
Horizontal distance from edge of nearest traffic lane (m)	44.4			
Horizontal distance from nearest parking lot (m)	N/A			
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A			
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	14.6 W, 7.2			
Distance (m) & direction from furnace or incineration flues	N/A			
Unrestricted airflow	360°			
Located in paved (P) or vegetative (V) ground?	V			
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood			
Applicable NAAQS averaging time(s)	1-hr, 3-hr, annual			
Sampling season	12 months			
Site type[1]	3			
Purpose of Monitor[2]	1, 2, 4			
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	N/A			
DATA QUALITY				
Last PEP	N/A			
Last NPAP	6/19/18			
Date of last annual independent performance audit (CAB)	12/22/21, 3/23/22			
Frequency of flow rate verification (automated PM)	N/A			
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A			
Dates of last 2 semi-annual flow rate audits (PM)	N/A			
Frequency of 1-point flow rate verification (Pb)	N/A			
Dates of last 2 semi-annual flow rate audits (Pb)	N/A			
Precision & accuracy submitted to AQS	Quarterly			
Frequency of 1-pt. QC check (gases)	Weekly			
Frequency of multi-point gas calibration	6 months			
Annual data certification submitted	5/1/22			
Changes in the next 18 months?	None			

(HL) HILO			
AQS: 150011006	Type: SLAMS (SO_2); SPMS ($PM_{2.5}$)	County: Hawaii	MSA: Not in an MSA
Address: 1099 Waianuenue Ave., Hilo, HI 96720			
Latitude: 19.71756 Longitude: -155.11053			Elevation: 136.8 m MSL
Location Description: Located on the grounds of the Adult Rehabilitation Center of Hilo, near the Hilo Medical Center, this site was originally established to monitor volcanic emissions during non-prevalent wind conditions. This station has been operating since 1997. The shelter is scheduled to be replaced; the date is to be determined.			

HL TRAFFIC DESCRIPTION	
Type of Roadway	Waianuenue Ave.
Freeway	
Major Street or Highway	X
Local Street or Road	
Distance from air intake (m)	20
Direction from air inlet	N
Composition of roadway	Asphalt
Number of traffic lanes	2
Average daily traffic	8,400[1]
Average vehicle speed (est. mph)	35
Traffic one way or two	2
Street parking?	No
[1] Source: State of Hawaii Department of Transportation (2016 count)	

For "Site Representativeness" in the following table:

[1]Site Types:1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes: 1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(HL) Hilo continued

HL MONITOR INFORMATION (N/A = Not Applicable)				
	$PM_{2.5}$	**SO_2**		
POC/FRM or FEM	1/FEM	1/FEM		
Type of Monitor	SPMS	SLAMS		
AQS parameter code	88101	42401		
Manufacturer	Met-One	TECO		
Model No.	BAM 1022	43iQ		
AQS method code	209	060		
Monitoring start date	1/1/2018	1/1/2007		
Monitoring frequency	Continuous	Continuous		
Probe material	N/A	Glass		
Residence time (sec)	N/A	15.5		
Distance between co-located monitors	N/A	N/A		
Analytical laboratory	N/A	N/A		
Location of probe	shelter roof	shelter roof		
Shelter dimensions (H x W x D) (m)	3x4.9x2.4	3x4.9x2.4		
Horizontal distance from supporting structure (m)	N/A	N/A		
Vertical distance above supporting structure (m)	2.2	1.2		
Height of probe above ground (m)	5.5	4.8		
Distance (m) & direction from drip line of tree(s)	40 E	42.5 E		
Horizontal distance from edge of nearest traffic lane (m)	20	20		
Horizontal distance from nearest parking lot (m)	25	25		
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A		
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	N/A	N/A		
Distance (m) & direction from furnace or incineration flues	29 NNW (10m stack height)	29 NNW (10m stack height)		
Unrestricted airflow	360°	360°		
Located in paved (P) or vegetative (V) ground?	V	V		
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood		
Applicable NAAQS averaging time(s)	24-hr, annual	1-hr, 3-hr, annual		
Sampling season	12 months	12 months		
Site type[1]	3	3		
Purpose of Monitor[2]	1, 2, 4	1, 2, 4		
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	Y	N/A		
DATA QUALITY				
Last PEP	6/9/19	N/A		
Last NPAP	N/A	6/10/19		
Date of last annual independent performance audit (CAB)	N/A	5/19/21,12/29/21		
Frequency of flow rate verification (automated PM)	Monthly	N/A		
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (PM)	5/19/21,12/29/21	N/A		
Frequency of 1-point flow rate verification (Pb)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A		
Precision & accuracy submitted to AQS	Quarterly	Quarterly		
Frequency of 1-pt. QC check (gases)	N/A	Weekly		
Frequency of multi-point gas calibration	N/A	6 months		
Annual data certification submitted	5/1/22	5/1/22		
Changes in the next 18 months?	None	None		

(KN) KONA			
AQS: 150011012	Type: SLAMS (SO_2) SPMS ($PM_{2.5}$)	County: Hawaii	MSA: Not in an MSA
Address: 81-1043 Konawaena School Rd., Kona, HI 96750			
Latitude: 19.50978 Longitude: -155.91342			Elevation: 517.2 m MSL
Location Description: This station is located on the upper campus of Konawaena High School. It was established to measure impacts from volcanic emissions. The station has been operating at this site since 2005. The shelter is scheduled to be replaced; the date is to be determined.			

KN TRAFFIC DESCRIPTION		
Type of Roadway	Konawaena School Rd.	Mamalahoa Hwy.
Freeway		
Major Street or Highway		X
Local Street or Road	X	
Distance from air intake (m)	17	702
Direction from air inlet	N	W
Composition of roadway	asphalt	Asphalt
Number of traffic lanes	1	2
Average daily traffic	500 [2]	16,300 [1]
Average vehicle speed (est. mph)	10	55
Traffic one way or two	2	2
Street parking?	No	No

[1] Source: State of Hawaii Department of Transportation (2016 count)
[2] Estimated only, no data available. This is a road used for school access only and station is at the top of the road where there would be less ingress/egress.

For "Site Representativeness" in the following table:

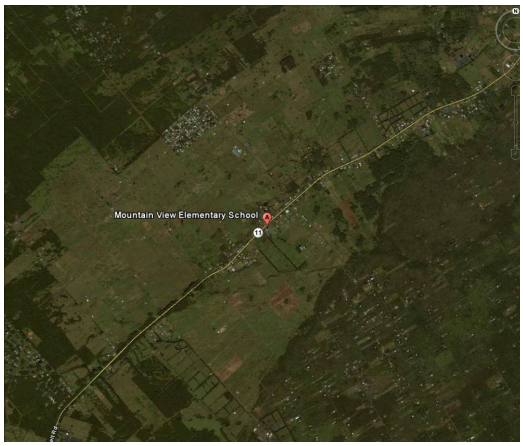
[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(KN) Kona continued

KN MONITOR INFORMATION (N/A = Not Applicable)				
	$PM_{2.5}$ Primary	**$PM_{2.5}$ Co-Lo**	**SO_2**	
POC/FRM or FEM	1/FEM	2/FEM	1/FEM	
Type of Monitor	SPMS	SPMS	SLAMS	
AQS parameter code	88101	88101	42401	
Manufacturer	Met-One	Met-One	TECO	
Model No.	BAM 1022	BAM 1022	43iQ	
AQS method code	209	209	060	
Monitoring start date	3/5/2019	3/5/2019	9/13/2005	
Monitoring frequency	Continuous	Continuous	Continuous	
Probe material	N/A	N/A	Glass	
Residence time (sec)	N/A	N/A	16.7	
Distance between co-located monitors (m)	2.5	2.5	N/A	
Analytical laboratory	N/A	N/A	N/A	
Location of probe	stand-alone shelter on ground	stand-alone shelter on ground	shelter roof	
Shelter dimensions (H x W x D) (m)	N/A	N/A	3x2.4x5	
Horizontal distance from supporting structure (m)	N/A	N/A	N/A	
Vertical distance above supporting structure (m)	N/A	N/A	1.1	
Height of probe above ground (m)	2.1	2.1	4.1	
Distance (m) & direction from drip line of tree(s)	15.2 W	15.2 W	38 NE	
Horizontal distance from edge of nearest traffic lane (m)	30	30	30	
Horizontal distance from nearest parking lot (m)	N/A	N/A	N/A	
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A	N/A	
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	3.4 S, 3	3.4 S, 3	21 SSW, 9	
Distance (m) & direction from furnace or incineration flues	N/A	N/A	N/A	
Unrestricted airflow	270°	270°	360°	
Located in paved (P) or vegetative (V) ground?	V	V	V	
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood	Neighborhood	
Applicable NAAQS averaging time(s)	24-hr, annual	24-hr, annual	1-hr, 3-hr; annual	
Sampling season	12 months	12 months	12 months	
Site type[1]	3	QC	3	
Purpose of Monitor[2]	1, 2, 4	1, 2, 4	1, 2, 4	
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	Y	Y	N/A	
DATA QUALITY				
Last PEP	6/4/19	N/A	N/A	
Last NPAP	N/A	N/A	6/4/19	
Date of last annual independent performance audit (CAB)	N/A	N/A	5/14/21	
Frequency of flow rate verification (automated PM)	Monthly	Monthly	N/A	
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A	N/A	
Dates of last 2 semi-annual flow rate audits (PM)	5/14/21, 12/29/21	6/30/21, 12/29/21	N/A	
Frequency of 1-point flow rate verification (Pb)	N/A	N/A	N/A	
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A	N/A	
Precision & accuracy submitted to AQS	Quarterly	Quarterly	Quarterly	
Frequency of 1-pt. QC check (gases)	N/A	N/A	Weekly	
Frequency of multi-point gas calibration	N/A	N/A	6 months	
Annual data certification submitted	5/1/22	5/1/22	5/1/22	
Changes in the next 18 months?	None	None	Replace shelter	

(MV) MOUNTAIN VIEW			
AQS: 150012023	Type: SPMS	County: Hawaii	MSA: Not in an MSA
Address: 18-1235 Volcano Rd., Mt. View, HI 96771			
Latitude: 19.57002 Longitude: -155.08046			Elevation: 436.5 m MSL
Location Description: This station is located on the grounds of the Mountain View Elementary School. The original Mountain View station, which began in December 2007, was moved at the ending of 2010 approximately 1.8 miles southwest to this current location. Due to the proximity of this community to the Kilauea volcano, it was established to monitor volcanic emissions during non-trade wind days.			



	MV TRAFFIC DESCRIPTION
Type of Roadway	Volcano Rd.
Freeway	
Major Street or Highway	X
Local Street or Road	
Distance from air intake (m)	21
Direction from air inlet	N
Composition of roadway	asphalt
Number of traffic lanes	2
Average daily traffic	13,400 [1]
Average vehicle speed (est. mph)	40
Traffic one way or two	2
Street parking?	No
[1] Source: State of Hawaii Department of Transportation (2016 count)	

For "Site Representativeness" in the following table:

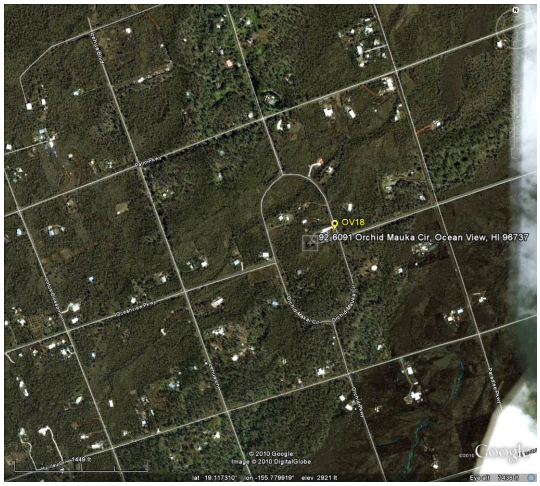
[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(MV) Mt. View continued

MV MONITOR INFORMATION (N/A = Not Applicable)				
	$PM_{2.5}$	**SO_2**		
POC/FRM or FEM	1/FEM	1/FEM		
Type of Monitor	SPMS	SPMS		
AQS parameter code	88101	42401		
Manufacturer	Met-One	TECO		
Model No.	BAM 1022	43iQ		
AQS method code	209	060		
Monitoring start date	5/29/2019	12/8/2010		
Monitoring frequency	Continuous	Continuous		
Probe material	N/A	Glass		
Residence time (sec)	N/A	17.8		
Distance between co-located monitors	N/A	N/A		
Analytical laboratory	N/A	N/A		
Location of probe	stand-alone shelter on ground	shelter roof		
Shelter dimensions (H x W x D) (m)	N/A	3x2.4x5		
Horizontal distance from supporting structure (m)	N/A	N/A		
Vertical distance above supporting structure (m)	N/A	1		
Height of probe above ground (m)	2.2	4		
Distance (m) & direction from drip line of tree(s)	4 SW	2 SW		
Horizontal distance from edge of nearest traffic lane (m)	21	23		
Horizontal distance from nearest parking lot (m)	46.5	46.5		
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A		
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	N/A	N/A		
Distance (m) & direction from furnace or incineration flues	N/A	N/A		
Unrestricted airflow	360°	360°		
Located in paved (P) or vegetative (V) ground?	V	V		
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood		
Applicable NAAQS averaging time(s)	24-hr, annual	1-hr, 3-hr; annual		
Sampling season	12 months	12 months		
Site type[1]	3	3		
Purpose of Monitor[2]	1, 2, 4	1, 2, 4		
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	Y	N/A		
DATA QUALITY				
Last PEP	6/6/19	N/A		
Last NPAP	N/A	6/6/19		
Date of last annual independent performance audit (CAB)	N/A	5/19/21, 12/29/21		
Frequency of flow rate verification (automated PM)	Monthly	N/A		
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (PM)	5/19/21, 12/29/21	N/A		
Frequency of 1-point flow rate verification (Pb)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A		
Precision & accuracy submitted to AQS	Quarterly	Quarterly		
Frequency of 1-pt. QC check (gases)	N/A	Weekly		
Frequency of multi-point gas calibration	N/A	60 days		
Annual data certification submitted	5/1/22	5/1/22		
Changes in the next 18 months?	None	Replace shelter		

(OV) OCEAN VIEW			
AQS: 150012020	Type: SPMS	County: Hawaii	MSA: Not in an MSA
Address: 92-6091 Orchid Mauka Circle, Ocean View, HI 96737			
Latitude: 19.11756 Longitude: -155.77814			Elevation: 862.6 m MSL
Location Description: This station established in 2010 is located on the grounds of the Ocean View Fire Station. During normal trade-winds, volcanic emissions are carried into this residential/agricultural community. This shelter is scheduled to be replaced; the date is to be determined.			



OV TRAFFIC DESCRIPTION	
Type of Roadway	Orchid Mauka Circ.
Freeway	
Major Street or Highway	
Local Street or Road	X
Distance from air intake (m)	13.6
Direction from air inlet	ENE
Composition of roadway	asphalt
Number of traffic lanes	2
Average daily traffic	< 3,000 [1]
Average vehicle speed (est. mph)	25
Traffic one way or two	2
Street parking?	No
[1] Estimated only, local residential street, no data available	

For “Site Representativeness” in the following table:

[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(OV) Ocean View continued

OV MONITOR INFORMATION (N/A = Not Applicable)				
	$PM_{2.5}$	**SO_2**		
POC/FRM or FEM	1/FEM	1/FEM		
Type of Monitor	SPMS	SPMS		
AQS parameter code	88101	42401		
Manufacturer	Met-One	TECO		
Model No.	BAM 1022	43iQ		
AQS method code	209	060		
Monitoring start date	5/1/2019	4/1/2010		
Monitoring frequency	Continuous	Continuous		
Probe material	N/A	Glass		
Residence time (sec)	N/A	15.3		
Distance between co-located monitors	N/A	N/A		
Analytical laboratory	N/A	N/A		
Location of probe	Stand-alone PM shelter on station stairs platform	shelter roof		
Shelter dimensions (H x W x D) (m)	N/A	3x2.4x5		
Horizontal distance from supporting structure (m)	N/A	N/A		
Vertical distance above supporting structure (m)	2.1	1.1		
Height of probe above ground (m)	3.1	4.1		
Distance (m) & direction from drip line of tree(s)	3.7 N	5.5 NE		
Horizontal distance from edge of nearest traffic lane (m)	13.6	13.6		
Horizontal distance from nearest parking lot (m)	6.4	6.4		
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A		
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	1.1 W/ 3.4 (station shelter)	N/A		
Distance (m) & direction from furnace or incineration flues	N/A	N/A		
Unrestricted airflow	270°	360°		
Located in paved (P) or vegetative (V) ground?	gravel	gravel		
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood		
Applicable NAAQS averaging time(s)	24-hr, annual	1-hr, 3-hr; annual		
Sampling season	12 months	12 months		
Site type[1]	3, 6	3, 6		
Purpose of Monitor[2]	1, 2, 4	1, 2, 4		
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	Y	N/A		
DATA QUALITY				
Last PEP	6/4/19	N/A		
Last NPAP	N/A	6/21/16		
Date of last annual independent performance audit (CAB)	N/A	5/7/21		
Frequency of flow rate verification (automated PM)	Monthly	N/A		
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (PM)	5/17/21, 12/9/21	N/A		
Frequency of 1-point flow rate verification (Pb)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A		
Precision & accuracy submitted to AQS	Quarterly	Quarterly		
Frequency of 1-pt. QC check (gases)	N/A	Weekly		
Frequency of multi-point gas calibration	N/A	6 months		
Annual data certification submitted	5/1/22	5/1/22		
Changes in the next 18 months?	None	Replace shelter		

(PA) PAHALA			
AQS: 150012016	Type: SPMS	County: Hawaii	MSA: Not in an MSA
Address: 96-3150 Pikake St., Pahala, HI 96777			
Latitude: 19.2039 Longitude: -155.48018			Elevation: 320 m MSL
Location Description: This station is located on the grounds of the Ka'u High/Pahala Elementary School. During normal trade-winds, volcanic emissions are carried into this rural community. The station began operating in 2007. The shelter is scheduled to be replaced; the date is to be determined.			

PA TRAFFIC DESCRIPTION		
Type of Roadway	Puahala	Pumeli
Freeway		
Major Street or Highway		
Local Street or Road	X	X
Distance from air intake (m)	226	61
Direction from air inlet	E	N
Composition of roadway	Asphalt	Asphalt
Number of traffic lanes	2	2
Average daily traffic	< 3,000 [1]	< 3,000 [1]
Average vehicle speed (est. mph)	25 mph	25 mph
Traffic one way or two	2	2
Street parking?	No	No
[1] Estimated only, no data available. Local roads for a community with a 2010 population of about 1,400		

For "Site Representativeness" in the following table:

[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(PA) Pahala continued

PA MONITOR INFORMATION (N/A = Not Applicable)				
	$PM_{2.5}$	**SO_2**		
POC/FRM or FEM	1/FEM	1/FEM		
Type of Monitor	SPMS	SPMS		
AQS parameter code	88101	42401		
Manufacturer	Met-One	TECO		
Model No.	BAM 1022	43iQ		
AQS method code	209	060		
Monitoring start date	2/26/2019	8/10/2007		
Monitoring frequency	Continuous	Continuous		
Probe material	N/A	Glass		
Residence time (sec)	N/A	17.9		
Distance between co-located monitors	N/A	N/A		
Analytical laboratory	N/A	N/A		
Location of probe	stand-alone shelter on ground	shelter roof		
Shelter dimensions (H x W x D) (m)	N/A	2.4x2.4x6		
Horizontal distance from supporting structure (m)	N/A	N/A		
Vertical distance above supporting structure (m)	2.1	1.2		
Height of probe above ground (m)	2.1	3.6		
Distance (m) & direction from drip line of tree(s)	11 N	11 N		
Horizontal distance from edge of nearest traffic lane (m)	48	48		
Horizontal distance from nearest parking lot (m)	40	40		
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A		
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	2 W/ 2.7 (building)	N/A		
Distance (m) & direction from furnace or incineration flues	N/A	N/A		
Unrestricted airflow	270°	360°		
Located in paved (P) or vegetative (V) ground?	V	V		
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood		
Applicable NAAQS averaging time(s)	24-hr, annual	1-hr, 3-hr; annual		
Sampling season	12 months	12 months		
Site type[1]	3	3		
Purpose of Monitor[2]	1, 2, 4	1, 2, 4		
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	Y	N/A		
DATA QUALITY				
Last PEP	6/6/19	N/A		
Last NPAP	N/A	6/22/16		
Date of last annual independent performance audit (CAB)	N/A	5/18/21		
Frequency of flow rate verification (automated PM)	Monthly	N/A		
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (PM)	5/18/21, 12/10/21	N/A		
Frequency of 1-point flow rate verification (Pb)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A		
Precision & accuracy submitted to AQS	Quarterly	Quarterly		
Frequency of 1-pt. QC check (gases)	N/A	Weekly		
Frequency of multi-point gas calibration	N/A	6 months		
Annual data certification submitted	5/1/22	5/1/22		
Changes in the next 18 months?	None	Replace shelter		

(KK) KAILUA-KONA			
AQS: 150013028	Type: SPMS	County: Hawaii	MSA: Not in an MSA
Address: Department of Water Supply Puapua'a Reservoir, Kailua-Kona, HI 96740			
Latitude: 19.61815833 Longitude: -155.9711111			Elevation: 92.4 m MSL
Location Description: This station is located in the middle Kailua-Kona town within a fenced area that contains a County of Hawaii water reservoir and pump house. The station was established to monitor the effects of volcanic emissions and has been operating since November 21, 2018 monitoring for $PM_{2.5}$.			

KK TRAFFIC DESCRIPTION			
Type of Roadway	Kuakini Highway	Walua Road	Queen Kaahumanu Hwy
Freeway			
Major Street or Highway	X		X
Local Street or Road		X (no through traffic)	
Distance from air intake (m)	125	42	145
Direction from air inlet	NW	S	E
Composition of roadway	asphalt	asphalt	Asphalt
Number of traffic lanes	2	2	2
Average daily traffic	8,200 [1]	[2] Estimated <50	22,900 [1]
Average vehicle speed (est. mph)	45	25	45
Traffic one way or two	2	2	2
Street parking?	No	No	No
[1] Source: State of Hawaii Department of Transportation (2016 count) [2] Estimated only, no data available, road is for local business access			

For "Site Representativeness" in the following table:

[1]Site Types:1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes: 1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(KK) Kailua-Kona continued

KK MONITOR INFORMATION (N/A = Not Applicable)				
	$PM_{2.5}$			
POC/FRM or FEM	1/FEM			
Type of Monitor	SPMS			
AQS parameter code	88101			
Manufacturer	Met One			
Model No.	BAM1022			
AQS method code	209			
Monitoring start date	11/15/2018			
Monitoring frequency	Continuous			
Probe material	N/A			
Residence time (sec)	N/A			
Distance between co-located monitors	N/A			
Analytical laboratory	N/A			
Location of probe	stand-alone shelter on ground			
Shelter dimensions (H x W x D) (m)	N/A			
Horizontal distance from supporting structure (m)	N/A			
Vertical distance above supporting structure (m)	2.2			
Height of probe above ground (m)	2.2			
Distance (m) & direction from drip line of tree(s)	19.8 SE			
Horizontal distance from edge of nearest traffic lane (m)	42			
Horizontal distance from nearest parking lot (m)	25			
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A			
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	3 NE/3			
Distance (m) & direction from furnace or incineration flues	N/A			
Unrestricted airflow	180°			
Located in paved (P) or vegetative (V) ground?	gravel			
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood			
Applicable NAAQS averaging time(s)	24-hr, annual			
Sampling season	12 months			
Site type[1]	3			
Purpose of Monitor[2]	1, 2, 4			
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	N			
DATA QUALITY				
Last PEP	Not Done			
Last NPAP	N/A			
Date of last annual independent performance audit (CAB)	N/A			
Frequency of flow rate verification (automated PM)	Monthly			
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A			
Dates of last 2 semi-annual flow rate audits (PM)	12/29/21			
Frequency of 1-point flow rate verification (Pb)	N/A			
Dates of last 2 semi-annual flow rate audits (Pb)	N/A			
Precision & accuracy submitted to AQS	Quarterly			
Frequency of 1-pt. QC check (gases)	N/A			
Frequency of multi-point gas calibration	N/A			
Annual data certification submitted	5/1/22			
Changes in the next 18 months?	Secure electrical			

(KS) KEAAU			
AQS: 150013027	Type: SPMS	County: Hawaii	MSA: Not in an MSA
Address: Kamehameha Schools Hawaii Campus, 16-714 Volcano Road, Keaau, HI 96749			
Latitude: 19.60533889 Longitude: -155.05138889			Elevation: 179.8 m MSL
Location Description: This temporary station is located in the town of Keaau on the Kamehameha Schools Hawaii campus. The station began monitoring for $PM_{2.5}$ and SO_2 on June 14, 2018.			

KS TRAFFIC DESCRIPTION	
Type of Roadway	Volcano Road/Mamalahoa Highway
Freeway	
Major Street or Highway	X
Local Street or Road	
Distance from air intake (m)	720
Direction from air inlet	E
Composition of roadway	asphalt
Number of traffic lanes	2
Average daily traffic	13,400 [1]
Average vehicle speed (est. mph)	45
Traffic one way or two	2
Street parking?	No
[1] Source: State of Hawaii Department of Transportation (2016 count)	

For "Site Representativeness" in the following table:

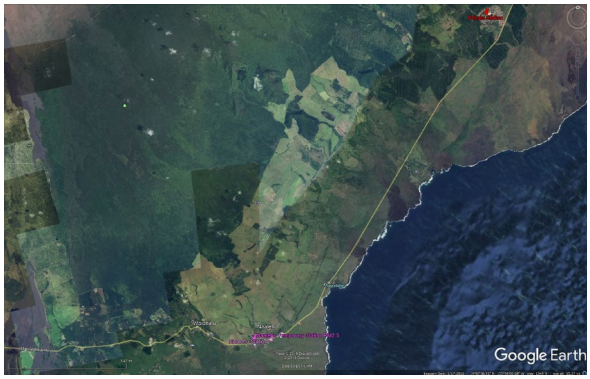
[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(KS) Keaau continued

KS MONITOR INFORMATION (N/A = Not Applicable)				
	$PM_{2.5}$	**SO_2**		
POC/FRM or FEM	1/FEM	1/FEM		
Type of Monitor	SPMS	SPMS		
AQS parameter code	88101	42401		
Manufacturer	Met One	TECO		
Model No.	BAM1022	43iQ		
AQS method code	209	060		
Monitoring start date	6/14/2018	6/14/2018		
Monitoring frequency	Continuous	Continuous		
Probe material	N/A	Teflon		
Residence time (sec)	N/A	10.2		
Distance between co-located monitors	N/A	N/A		
Analytical laboratory	N/A	N/A		
Location of probe	stand-alone shelter on ground	shelter wall		
Shelter dimensions (H x W x D) (m)	N/A	2.4 x 2.0 x 3.7		
Horizontal distance from supporting structure (m)	N/A	1.4		
Vertical distance above supporting structure (m)	N/A	N/A		
Height of probe above ground (m)	2.2	2		
Distance (m) & direction from drip line of tree(s)	24 SE	23 SE		
Horizontal distance from edge of nearest traffic lane (m)	30	30		
Horizontal distance from nearest parking lot (m)	51	51		
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A		
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	N/A	N/A		
Distance (m) & direction from furnace or incineration flues	N/A	N/A		
Unrestricted airflow	360	360		
Located in paved (P) or vegetative (V) ground?	P	P		
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood		
Applicable NAAQS averaging time(s)	24-hr, annual	1-hr, 3-hr; annual		
Sampling season	12 months	12 months		
Site type[1]	3	3		
Purpose of Monitor[2]	1, 2, 4	1, 2, 4		
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	N	N/A		
DATA QUALITY				
Last PEP	Not Done	N/A		
Last NPAP	N/A	Not Done		
Date of last annual independent performance audit (CAB)	N/A	Not Done		
Frequency of flow rate verification (automated PM)	Monthly	N/A		
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (PM)	5/17/21, 12/20/21	N/A		
Frequency of 1-point flow rate verification (Pb)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A		
Precision & accuracy submitted to AQS	Quarterly	Quarterly		
Frequency of 1-pt. QC check (gases)	N/A	Weekly		
Frequency of multi-point gas calibration	N/A	6 months		
Annual data certification submitted	5/1/22	5/1/22		
Changes in the next 18 months?	None	None		

(NA) NAALEHU			
AQS: 150013033	Type: SPMS	County: Hawaii	MSA: Not in an MSA
Address: Naalehu Elementary School, 95-5547 Mamalahoa Hwy., Naalehu, HI 96772			
Latitude: 19.060656	Longitude: -155.579167		Elevation: 196.3 m MSL
Location Description: This station is located inside the USGS Seismograph building on the campus of Naalehu Elementary School. This station has been operating since September 6, 2018 monitoring for SO_2 and will be relocated to another location on the school's campus once an appropriate location is identified.			



NA TRAFFIC DESCRIPTION	
Type of Roadway	Mamalahoa HIghway
Freeway	
Major Street or Highway	X
Local Street or Road	
Distance from air intake (m)	180
Direction from air inlet	N
Composition of roadway	asphalt
Number of traffic lanes	2
Average daily traffic	3,700 [1]
Average vehicle speed (est. mph)	25
Traffic one way or two	2
Street parking?	No
[1] Source: State of Hawaii Department of Transportation (2016 count)	

For "Site Representativeness" in the following table:

[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(NA) Naalehu – SO_2 continued

NA-TS MONITOR INFORMATION (N/A = Not Applicable)				
	SO_2			
POC/FRM or FEM	1/FEM			
Type of Monitor	SPMS			
AQS parameter code	42401			
Manufacturer	TECO			
Model No.	43iQ			
AQS method code	060			
Monitoring start date	9/6/2018			
Monitoring frequency	Continuous			
Probe material	Glass			
Residence time (sec)	9.7			
Distance between co-located monitors	N/A			
Analytical laboratory	N/A			
Location of probe	building wall			
Shelter dimensions (H x W x D) (m)	2.4 x 3.7 x 3.1			
Horizontal distance from supporting structure (m)	1			
Vertical distance above supporting structure (m)	N/A			
Height of probe above ground (m)	1.9			
Distance (m) & direction from drip line of tree(s)	N/A			
Horizontal distance from edge of nearest traffic lane (m)	114			
Horizontal distance from nearest parking lot (m)	114			
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A			
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	N/A			
Distance (m) & direction from furnace or incineration flues	N/A			
Unrestricted airflow	180°			
Located in paved (P) or vegetative (V) ground?	V			
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood			
Applicable NAAQS averaging time(s)	1-hr, 3-hr; annual			
Sampling season	12 months			
Site type[1]	3			
Purpose of Monitor[2]	1, 2, 4			
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	N/A			
DATA QUALITY				
Last PEP	N/A			
Last NPAP	Not Done			
Date of last annual independent performance audit (CAB)	12/31/20, not done in 2021			
Frequency of flow rate verification (automated PM)	N/A			
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A			
Dates of last 2 semi-annual flow rate audits (PM)	N/A			
Frequency of 1-point flow rate verification (Pb)	N/A			
Dates of last 2 semi-annual flow rate audits (Pb)	N/A			
Precision & accuracy submitted to AQS	Quarterly			
Frequency of 1-pt. QC check (gases)	Weekly			
Frequency of multi-point gas calibration	60 days			
Annual data certification submitted	5/1/22			
Changes in the next 18 months?	None			

(WL) WAIKOLOA			
AQS: 150012021	Type: SPMS	County: Hawaii	MSA: Not in an MSA
Address: TMK 3-6-8-002-019, Waikoloa, HI 96738			
Latitude: 19.977500	Longitude: -155.798056		Elevation: 182.9 m MSL
Location Description: This station is located within a fenced area that contains a County of Hawaii water tank and pump house, approximately 3 km northeast of Waikoloa. The $PM_{2.5}$ monitor for this station was relocated from Waikoloa E.S. on July 28, 2021.			

WL TRAFFIC DESCRIPTION		
Type of Roadway	Queen Kaahumanu Hwy.	Waikoloa Road
Freeway		
Major Street or Highway	X	
Local Street or Road		X
Distance from air intake (m)	2,143	4,580
Direction from air inlet	W	N
Composition of roadway	asphalt	asphalt
Number of traffic lanes	2	2
Average daily traffic	11,900 [1]	8,200 [1]
Average vehicle speed (est. mph)	55	55
Traffic one way or two	2	2
Street parking?	No	No
[1] Source: State of Hawaii Department of Transportation (2016 count)		

For "Site Representativeness" in the following table:

[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(WL) Waikoloa continued

WL MONITOR INFORMATION (N/A = Not Applicable)				
	$PM_{2.5}$			
POC/FRM or FEM	1/FEM			
Type of Monitor	SPMS			
AQS parameter code	88101			
Manufacturer	Met One			
Model No.	BAM1022			
AQS method code	209			
Monitoring start date	7/28/2021			
Monitoring frequency	Continuous			
Probe material	N/A			
Residence time (sec)	N/A			
Distance between co-located monitors	N/A			
Analytical laboratory	N/A			
Location of probe	stand-alone shelter on ground			
Shelter dimensions (H x W x D) (m)	N/A			
Horizontal distance from supporting structure (m)	N/A			
Vertical distance above supporting structure (m)	2.2			
Height of probe above ground (m)	2.2			
Distance (m) & direction from drip line of tree(s)	N/A			
Horizontal distance from edge of nearest traffic lane (m)	42			
Horizontal distance from nearest parking lot (m)	25			
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A			
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	3 NE/3			
Distance (m) & direction from furnace or incineration flues	N/A			
Unrestricted airflow	360°			
Located in paved (P) or vegetative (V) ground?	gravel			
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood			
Applicable NAAQS averaging time(s)	24-hr, annual			
Sampling season	12 months			
Site type[1]	3			
Purpose of Monitor[2]	1, 2, 4			
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	N			
DATA QUALITY				
Last PEP	N/A			
Last NPAP	N/A			
Date of last annual independent performance audit (CAB)	N/A			
Frequency of flow rate verification (automated PM)	Monthly			
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A			
Dates of last 2 semi-annual flow rate audits (PM)	12/7/21			
Frequency of 1-point flow rate verification (Pb)	N/A			
Dates of last 2 semi-annual flow rate audits (Pb)	N/A			
Precision & accuracy submitted to AQS	Quarterly			
Frequency of 1-pt. QC check (gases)	N/A			
Frequency of multi-point gas calibration	N/A			
Annual data certification submitted	5/1/22			
Changes in the next 18 months?	None			

(LE) LEILANI COMMUNITY ASSOCIATION CENTER			
AQS: 150012035	Type: SPMS	County: Hawaii	MSA: Not in an MSA
Address: Leilani Community Association Center, 13-3441 Moku Street, Pahoa, Hawaii 96778			
Latitude: 19.46566667 Longitude: - 154.91444444			Elevation: 243 m MSL
Location Description: This station is located in a residential subdivision within a fenced area that contains the Leilani Community Association Center. The station was established to monitor emissions from the nearby geothermal energy facility and has been monitoring for H_2S since September 17, 2019. The shelter was moved to a more suitable location at the center on September 20, 2020.			

LE TRAFFIC DESCRIPTION		
Type of Roadway	Leilani Avenue	Kupono Street
Freeway		
Major Street or Highway		
Local Street or Road	X	X
Distance from air intake (m)	130	45
Direction from air inlet	S	E
Composition of roadway	asphalt	asphalt
Number of traffic lanes	2	2
Average daily traffic	[1] Estimated <2,000	[1] Estimated <200
Average vehicle speed (est. mph)	25	20
Traffic one way or two	2	2
Street parking?	No	No
[1] Estimated only, no data available, roads are for local residential access		

For "Site Representativeness" in the following table:

[1]Site Types:
1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes:
1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(LE) Leilani Community Association Center continued

LE MONITOR INFORMATION (N/A = Not Applicable)				
	H_2S	**SO_2**		
POC/FRM or FEM	N/A	1/FEM		
Type of Monitor	SPMS	SPMS		
AQS parameter code	N/A	42401		
Manufacturer	TECO	TECO		
Model No.	450IQ	43IQ		
AQS method code	N/A	060		
Monitoring start date	9/17/2019	9/12/2019		
Monitoring frequency	Continuous	Continuous		
Probe material	Stainless Steel	Stainless Steel		
Residence time (sec)	11.89	14.15		
Distance between co-located monitors	N/A	N/A		
Analytical laboratory	N/A	N/A		
Location of probe	shelter roof	shelter roof		
Shelter dimensions (H x W x D) (m)	3x2.3x7	3x2.3x7		
Horizontal distance from supporting structure (m)	N/A	N/A		
Vertical distance above supporting structure (m)	1.0	1.0		
Height of probe above ground (m)	4	4		
Distance (m) & direction from drip line of tree(s)	10 W	10 W		
Horizontal distance from edge of nearest traffic lane (m)	45	45		
Horizontal distance from nearest parking lot (m)	175	175		
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A	N/A		
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	N/A	N/A		
Distance (m) & direction from furnace or incineration flues	N/A	N/A		
Unrestricted airflow	360°	360°		
Located in paved (P) or vegetative (V) ground?	gravel	gravel		
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood	Neighborhood		
Applicable NAAQS averaging time(s)	1-hour state standard 25 ppb	1-hour		
Sampling season	12 months	12 months		
Site type[1]	3	3		
Purpose of Monitor[2]	1, 4	1, 4		
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	N/A	N/A		
DATA QUALITY				
Last PEP	N/A	N/A		
Last NPAP	N/A	None yet		
Date of last annual independent performance audit (CAB)	5/12/2021	5/12/2021		
Frequency of flow rate verification (automated PM)	N/A	N/A		
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (PM)	N/A	N/A		
Frequency of 1-point flow rate verification (Pb)	N/A	N/A		
Dates of last 2 semi-annual flow rate audits (Pb)	N/A	N/A		
Precision & accuracy submitted to AQS	Quarterly	Quarterly		
Frequency of 1-pt. QC check (gases)	Weekly	Weekly		
Frequency of multi-point gas calibration	6 months	6 months		
Annual data certification submitted	5/1/22	5/1/22		
Changes in the next 18 months?	None	None		

KAHE (Data Requirements Rule)			
AQS: 150034001	Type: SLAMS	County: Honolulu	MSA: Honolulu
Address: Palehua Road, Makakilo, Oahu			
Latitude: 21.3678	Longitude: -158.1053		Elevation: 388 m MSL
Location Description: This station is located on the hillside south of Palehua Road and overlooks the Pacific Ocean. The area around the station is undeveloped and is currently used for cattle grazing. The station is approximately 2.7 kilometers northeast of the Kahe Generating Station. The city of Makakilo is located to the east and southeast. The areas immediately to the west through north are undeveloped.			

TRAFFIC DESCRIPTION			
Type of Roadway	Palehua Road	Farrington Highway	
Freeway			
Major Street or Highway	X	X	
Distance from air intake (m)	12.8	2,750	
Direction from air inlet	N	SW	
Composition of roadway	asphalt	asphalt	
Number of traffic lanes	1	4	
Average daily traffic	20 (estimate)	52,300[1]	
Average vehicle speed (est. mph)	15	40	
Traffic one way or two	2	2	
Street parking?	No	No	
[1] Source: State of Hawaii Department of Transportation 2015 count			

For “Site Representativeness” in the following table:

[1]Site Types:1) located to determine the highest concentrations;
2) located to measure typical concentrations in areas of high population density;
3) located to determine the impact of significant sources or source categories on air quality;
4) located to determine general background concentration levels;
5) located to determine extent of regional pollutant transport among populated areas and in support of secondary standards;
6) located to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts

[2] Purposes: 1) Provide air pollution data to the general public in a timely manner;
2) Support compliance with ambient air quality standards;
3) Support emissions strategy development and track trends in air pollution abatement control measures;
4) Support for air pollution research

(KE) Kahe continued

KAHE MONITOR INFORMATION (N/A = Not Applicable)				
	SO_2			
POC/FRM or FEM	1/FEM			
Type of Monitor	SLAMS			
AQS parameter code	42401			
Manufacturer	Thermo Scientific			
Model No.	43i-TLE			
AQS method code	060			
Monitoring start date	12/16/2016			
Monitoring frequency	Continuous			
Probe material	Borosilicate glass			
Residence time (sec)	18.1			
Distance between co-located monitors	N/A			
Analytical laboratory	N/A			
Location of probe	Shelter roof			
Building dimensions (H) (m)	3.3			
Horizontal distance from supporting structure (m)	0			
Vertical distance above supporting structure (m)	1.0			
Height of probe above ground (m)	4.3			
Distance (m) & direction from drip line of tree(s))	N/A			
Horizontal distance from edge of nearest traffic lane (m)	12.8			
Horizontal distance from nearest parking lot (m)	N/A			
Distance (m) & direction from obstructions on roof, vertical height above probe (m)	N/A			
Distance (m) & direction from possible obstructions not on roof, vertical height (m)	N/A			
Distance (m) & direction from furnace or incineration flues	2,740 SW			
Unrestricted airflow	360°			
Located in paved (P) or vegetative (V) ground?	V			
SITE REPRESENTATIVENESS				
Spatial scale	Neighborhood			
Applicable NAAQS averaging time(s)	1-hr			
Sampling season	12 months			
Site type[1]	3			
Purpose of Monitor[2]	2, 3			
Suitable for comparison against the annual $PM_{2.5}$ NAAQS?	N/A			
DATA QUALITY				
Last PEP	N/A			
Last NPAP	NA			
Date of last annual independent performance audit	11/18/20			
Frequency of flow rate verification (automated PM)	N/A			
Frequency of flow rate verification (manual $PM_{2.5}$)	N/A			
Dates of last 2 semi-annual flow rate audits (PM)	N/A			
Frequency of 1-point flow rate verification (Pb)	N/A			
Dates of last 2 semi-annual flow rate audits (Pb)	N/A			
Precision & accuracy submitted to AQS	N/A			
Frequency of 1-pt. QC check (gases)	Biweekly			
Frequency of multi-point gas calibration	Quarterly			
Annual data certification submitted	4/24/22			
Changes in the next 18 months?	None			

Appendix A

Public Notice Documentation

The 2022 Air Monitoring Network Plan was made available for public viewing online only on the Clean Air Branch web site. This report, based on 40 CFR 58.10, documents, and describes the establishment and maintenance of Hawaii's ambient air monitoring network.

Public notification of the availability of the Plan for public inspection was published in the major newspapers on all counties. The public comment period was for 30 days from May 24, 2022 to June 22, 2022.

The public notice was published in the following newspapers for the following counties:

- Kauai County: The Garden Island
- City and County of Honolulu: The Star Advertiser
- Maui County: The Maui News
- Hawaii County: West Hawaii Today and Hawaii Tribune Herald (East Hawaii)

Documentations of the public notice are attached.

Comments received will be addressed and included in this plan. No comments were received.

Appendix B

EPA Response Letter

to

The Request to Discontinue SO_2 Monitoring at the Waiau DRR/SLAMS Station

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

October 8, 2021

Marianne Rossio
Manager, Clean Air Branch
State of Hawaii, Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801-3378

Re: Data Requirements Rule Sulfur Dioxide (SO_2) Monitoring Shutdown Request

Dear Manager Rossio:

This letter provides the U.S. Environmental Protection Agency's (EPA) review and approval of the State of Hawaii Department of Health's (HDOH) request for discontinuation of the sulfur dioxide (SO_2) State/Local Air Monitoring Station (SLAMS) monitor at the Waiau site (Air Quality System (AQS) Site ID: 15-003-4100). A request for EPA approval of this network change was submitted to EPA on May 15, 2020. Monitoring agencies are required to obtain EPA approval for the discontinuation of SLAMS monitors.

The Waiau SO_2 SLAMS monitor was installed in 2017 for the purpose of satisfying the 2015 SO_2 Data Requirements Rule (DRR) (80 FR 51052) for Hawaiian Electric Company's (HECO) Waiau Generating Station on Oahu. Discontinuation of the Waiau SO_2 SLAMS monitor was reviewed by EPA against criteria contained in 40 CFR 51.1203(c)(3) which states (in part): "Any SO_2 monitor identified by an air agency in its approved Annual Monitoring Network Plan as having the purpose of meeting the requirements of this paragraph (c) that: Is not located in an area designated as nonattainment as the 2010 SO_2 NAAQS is not also being used to satisfy other ambient SO_2 minimum monitoring requirements listed in 40 CFR part 58, appendix D, section 4.4; and is not otherwise required as part of a SIP, permit, attainment plan or maintenance plan, may be eligible for shut down upon EPA approval if it produces a design value no greater than 50 percent of the 2010 SO_2 NAAQS from data collected in either its first or second 3-year period of operation." The design values produced by the Waiau SO_2 SLAMS monitor for periods 2017-2019 and 2018-2020 are less than 50% of the 2010 SO_2 National Ambient Air Quality Standards (NAAQS) and the monitor is not located in a 2010 SO_2 NAAQS nonattainment area, is not being used to satisfy other ambient SO_2 minimum monitoring requirements listed in 40 CFR Part 58, Appendix D, and is not otherwise required as part of a SIP, permit, attainment or maintenance plan. Therefore, the monitor may be considered eligible for shut down with the EPA's approval under 40 CFR 51.1203(c)(3).

Additionally, the Waiau SO_2 monitor passed the National Performance Audit Program (NPAP) audit performed on June 22, 2021 as well as a closure audit (including all appropriate audit levels) performed on July 23, 2021. Based on these analyses, EPA approves HDOH's discontinuation of the Waiau SO_2 SLAMS monitor. Please include this letter and the relevant monitor and site information in the next HDOH annual monitoring network plan.

If you have any questions, please contact me at (415) 947-4134 or Randall Chang of my staff at (415) 947-4180.

Sincerely,

GWEN YOSHIMURA Digitally signed by GWEN YOSHIMURA Date: 2021.10.08 07:15:20 -07'00'

Gwen Yoshimura, Manager
Air Quality Analysis Office
Air and Radiation Division

cc (via email):
Lisa Young, HDOH/CAB
Lisa Wallace, HDOH/CAB
James Ciszewski, HDOH/EHASB
Richard Saiki, HDOH/EHASB
Stanton Oshiro, HECO

Appendix C

Supporting Documentation

for

The Request to Discontinue CO and SO_2 Monitoring at the Kapolei SLAMS Station

and

To Close the Pearl City, Kihei, and Honaunau Stations

Table C-1. $PM_{2.5}$ Data Completion Percentages

Site	AQS No.	Completion Percentage 2016	Completion Percentage 2017	Completion Percentage 2018	Completion Percentage 2019	Completion Percentage 2020
Pearl City	150032004	99	98	96	98	94
Kihei	150090006	97	96	93	98	91
Niumalu	150070007	97	96	89	96	88 [1]

[1] 2020 3rd quarter completeness percentage <75% but >50%, substitution test allowed.

Table C-2. $PM_{2.5}$ Annual Design Values for Station Closures

Site	AQS No.	Annual Design Value (µg/m³) 2016 – 2018	Annual Design Value (µg/m³) 2017 – 2019	Annual Design Value (µg/m³) 2018 – 2020	Percent of Annual NAAQS (12 µg/m³)
Pearl City	150032004	3.3	3.6	3.2	28 / 30 / 27
Kihei	150090006	4.1	4.2	3.8	34 / 35 / 32
Niumalu	150070007	2.9	2.7	2.9 [1]	24 / 23 / 24

[1] Design value valid after completing quarterly substitution test per 40 CFR 50 Appendix N.4.1.c.ii.

Table C-3. $PM_{2.5}$ 24-Hour Design Values for Station Closures

Site	AQS No.	24-Hour Design Value (µg/m³) 2016 – 2018	24-Hour Design Value (µg/m³) 2017 – 2019	24-Hour Design Value (µg/m³) 2018 – 2020	Percent of 24-Hour NAAQS (35 µg/m³)
Pearl City	150032004	11.6	9.8	7.2	33 / 28 / 21
Kihei	150090006	11.3	12.9	11.6	32 / 37 / 33
Niumalu	150070007	8.8	8.3	8.1 [1]	25 / 24 / 23

[1] Design value valid after completing quarterly substitution test per 40 CFR 50 Appendix N.4.2.c.i.

Table C-4. PM_{10} Data Completion Percentages

Site	AQS No.	Completion Percentage 2016	Completion Percentage 2017	Completion Percentage 2018	Completion Percentage 2019	Completion Percentage 2020
Pearl City	150032004	99	96	97	96	94

Table C-5. PM_{10} Design Values for Station Closure

Site	AQS No.	24-Hour Design Value* 2016-2018	24-Hour Design Value* 2017-2019	24-Hour Design Value* 2018-2020
Pearl City	150032004	0	0	0

* The standards are attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3, is equal to or less than one.

Table C-6. SO_2 Data Completion Percentages

Site	AQS No.	Completion Percentage 2016	Completion Percentage 2017	Completion Percentage 2018	Completion Percentage 2019	Completion Percentage 2020
Kapolei	150030010	92	93	94	89	94

Table C-7. SO_2 Design Values for Station Closures

Site	AQS No.	Design Value (ppb) 2016 – 2018	Design Value (ppb) 2017 – 2019	Design Value (ppb) 2018 – 2020	Percent of 1-Hour NAAQS (75 ppb)
Kapolei	150030010	7.3	6.0	6.2	10 / 8 / 8

Table C-8. NO_2 Completion Percentages

Site	AQS No.	Completion Percentage 2016	Completion Percentage 2017	Completion Percentage 2018	Completion Percentage 2019	Completion Percentage 2020
Niumalu	150070007	74 [1]	68 [2]	91	96	97

[1] 2016 1st quarter completeness percentage at 14%, substitution test not allowed for 1-Hour design value.
[2] 2017 1st, 2nd, and 4th quarters completeness percentage <75% but >50%, substitution test allowed for 1-Hour design value.

Table C-9. NO_2 Annual Design Values for Station Closure

Site	AQS No.	Design Value (ppb) 2016	Design Value (ppb) 2017	Design Value (ppb) 2018	Design Value (ppb) 2019	Design Value (ppb) 2020
Niumalu	150070007	3 [1]	2 [1]	5	4	3

[1] Design value needs EPA approval per 40 CFR 50 Appendix S.3.1.c.

Table C-10. NO_2 1-hour Design Values for Station Closure

Site	AQS No.	Design Value (ppb) 2016 – 2018	Design Value (ppb) 2017 – 2019	Design Value (ppb) 2018 – 2020	Percent of 1-Hour NAAQS (100 ppb)
Niumalu	150070007	34.9 [1]	36.2 [2]	37.0	35 / 36 / 37

[1] Design value needs EPA approval per 40 CFR 50 Appendix S.3.2.d; substitution test not allowed per 40 CFR 50 Appendix S.3.2.c.ii.
[2] Design value valid after completing quarterly substitution test per 40 CFR 50 Appendix S.3.2.c.ii.

Table C-11. CO Data Completion Percentages

Site	AQS No.	Completion Percentage 2016	Completion Percentage 2017	Completion Percentage 2018	Completion Percentage 2019	Completion Percentage 2020
Kapolei	150030010	88	94	92	92	97

Table C-12. Exceedance of CO 1-Hour and 8-Hour NAAQS

Site	AQS No.	Number of Exceedances 2016	Number of Exceedances 2017	Number of Exceedances 2018	Number of Exceedances 2019	Number of Exceedances 2020
Kapolei	150030010	0	0	0	0	0

* The standards are not to be exceeded more than once per; 1-Hour standard is 35 ppm and the 8-Hour standard is 9 ppm.

The Honaunau Station has not been in operation for more than 3 years, therefore, there is not enough data to calculate design values.