

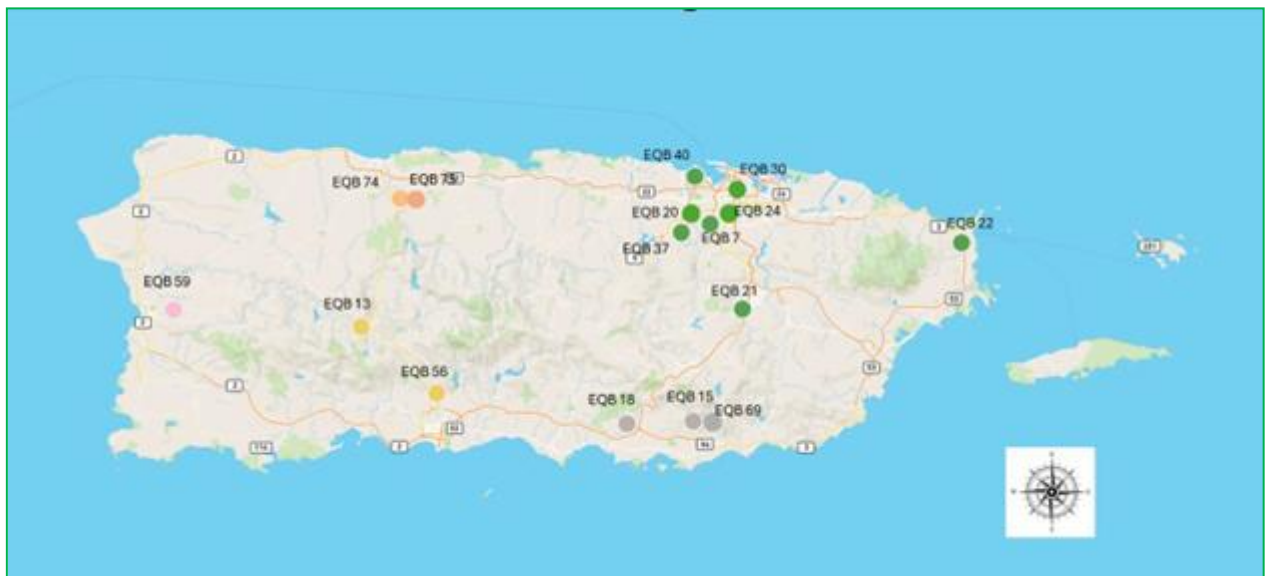


DEPARTMENT OF NATURAL
AND ENVIRONMENTAL
RESOURCES

DNER

GOVERNMENT OF PUERTO RICO

Puerto Rico Air Monitoring Network Plan 2026



Department of Natural and Environmental Resources

Air Quality Area

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Acronyms and Abbreviations

AQA: Air Quality Area
AQI: Air Quality Index
AQS: Air Quality System
CFR: Code of Federal Regulations
CPR: Commonwealth of Puerto Rico
CBSA: Core-based Statistical Area
DNER: Department Natural and Environmental Resources
EPA: Environmental Protection Agency
FEM: Federal Equivalent Method
FRM: Federal Reference Method
GPR: Government of Puerto Rico
MSA: Metropolitan Statistical Area
NAAQS: National Air Ambient Quality Standards
NAMS: National Air Monitoring Stations
NCore: National Core Multi-Pollutant Monitoring Stations
NO₂: Nitrogen Dioxide
O₃: Ozone
OSI: Information System Office
PAMS: Photochemical Assessment Monitoring Stations
Pb: Lead
PM₁₀: Particulate Matter
PM_{2.5}: Fine Particulate Matter
ppm: parts per million
PR: Puerto Rico
PRAMN: Puerto Rico Air Monitoring Network
PRDNER: Puerto Rico Department of Natural and Environmental Resources
PREL: Puerto Rico Environmental Laboratory
PREPA: Puerto Rico Power Electrical Authority
QA: Quality Assurance
QAMP: Quality Assurance Monitoring Plan
QAPP: Quality Assurance Project Plan
RCAP: Regulation for the Control of Atmospheric Pollution of Puerto Rico
SLAMS: State and Local Air Monitoring Stations
SO₂: Sulfur Dioxide
SO₄: Sulfate
SPM: Special Purpose Monitor
TEOM: Tapered Element Oscillating Microbalance
TBD: To Be Determined
TSD: Temporary Shutdown
TSP: Total Suspended Particulate

1. INTRODUCTION

The Puerto Rico Department of Natural and Environmental Resources (PRDNER) Air Monitoring Network Plan is an annual report required under the Code of Federal Regulations [40 CFR § 58.10(a)(1)]. The purpose of this plan is to provide evidence that through the 2026, the Puerto Rico Air Monitoring Network (PRAMN) meets the current federal monitoring requirements. The PRAMN Plan details any proposed changes for the next 18 months after publication, provides specific information for each of the existing and proposed monitoring stations, and offers the public the opportunity to comment on air sampling activities. The plan also includes information on other air monitoring projects occurring on the island.

A predominant goal of the air monitoring network in Puerto Rico is to collect data to assess compliance with the National Ambient Air Quality Standards (NAAQS). Established under the 1970 Clean Air Act by the U.S. Environmental Protection Agency (EPA), the NAAQS set allowable concentration limits for six criteria pollutants: Lead (Pb), Carbon Monoxide (CO), Particulate Matter (PM₁₀ and PM_{2.5}), Ozone (O₃), Sulfur Dioxide (SO₂), and Nitrogen Dioxide (NO₂). A complete list of the current NAAQS can be found at: <https://www.epa.gov/criteria-air-pollutants/naqs-table>

The Puerto Rico Department of Natural and Environmental Resources (PRDNER) has designed its ambient air monitoring network to achieve objectives beyond its primary compliance mission. In addition to assessing attainment of the National Ambient Air Quality Standards (NAAQS), the network provides timely air pollution data to the public, supports implementation of air quality standards and emissions control strategies, and contributes to air pollution research initiatives.

Data collected through Puerto Rico's EPA monitoring network are used to generate the daily Air Quality Index (AQI) report, prepare daily air quality forecasts, support both short- and long-term health risk assessments, identify localized public health concerns, and track long-term air quality trends that may pose risks to residents' health and overall quality of life.

The operation of the PRAMN is a vital component for the protection of public health and the environment. The operation of the network should meet the following requirements:

SIP requirements: Clean Air Act Section (CAA) 110(a)(2)(B) provides for the establishment and operation of monitoring systems for ambient air quality and that the data collected will be available. States are required to submit evidence that implement, maintain, and enforce new or revised NAAQS within 3 years of EPA issuing the standard.

Nonattainment Areas: Ambient air monitoring is important in the nonattainment areas for determining whether the areas are meeting the NAAQS. Air monitoring is also vital in providing air quality information to the public about areas not meeting the NAAQS because their health may be directly impacted.

Providing air quality information to the public: The air monitoring network is essential in providing air quality information to the public. This information helps the public make air quality-based decisions about what activities they can participate in or whether they are exposed to pollutant concentrations above healthy Air Quality Index (AQI) levels.

Monitor location takes into consideration: peak (the highest concentration of pollution in each area), population (presence of pollutants in areas with high population densities), sources (pollution resulting from significant sources or source categories), background (general pollutant levels), and transport (extent of regional pollutant transport between populated areas). Federal regulations prescribe requirements for monitor and probe siting to ensure that the ambient air quality data is accurately representative. The criteria for the placement and operation of each monitor and probe vary. Site surveys ensure that each requirement is satisfied.

The PRAMN plan describes and update the Puerto Rico Air Sampling Network. This plan will be presented to the Environmental Protection Agency (EPA) on or before July 1 of each year, after a public comment period of 30 days. The network modifications are made in consultation with the EPA. Also, it evaluates the operating cost of the network in accordance with the available budget for 2026-2027 fiscal year.

2. PUBLIC COMMENTS

In accordance with federal regulations, the plan will be available for public review and comment period for 30 days before submitting the final plan to the EPA. Comments received during the public consultation period will be forwarded to the Environmental Protection Agency (EPA) at the same time as the plan is submitted. This plan will be only available at the DNER website, <http://www.drna.pr.gov/acai/muestreo/>. Written comments should be sent to aire@drna.pr.gov. The final document will be submitted to EPA on or before July 1 of each year, along with the public comments received to comply with the federal regulatory requirements.

3. MONITORING DATA QUALITY ASSURANCE

The purpose of the Quality Assurance and Quality Control (QA/QC) Program is to ensure the quality, accuracy, and reliability of data obtained from the air monitoring network. The Puerto Rico Air Monitoring Network (PRAMN) meets or exceeds the requirements defined in 40 CFR Part 58 and all applicable appendices, including Appendix A (Quality Assurance Requirements for SLAMS, SPMs, and PSD Air Monitoring) and Appendix E (Probe and Monitoring Path Siting Criteria).

The QA/QC program includes, but is not limited to, the following activities: instrument performance audits, monitoring siting evaluations, precision and span checks, flow rate audits, leak checks, data validation, and bias determinations. These activities are conducted in accordance with the applicable procedures and quality assurance requirements established by the U.S. Environmental Protection Agency (EPA) and described in the EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II.

For independent quality assurance activities, the PRAMN participates in the National Performance Audit Program (NPAP) and the Performance Evaluation Program (PEP) for criteria pollutant monitoring. These programs provide independent assessments of monitoring system performance and measurement accuracy.

The Department operates under an approved Quality Management Plan (QMP) and a Quality Assurance Project Plan (QAPP) for the PRAMN. These documents were prepared by the Puerto Rico Department of Natural and Environmental Resources (PRDNER) and approved by the U.S. Environmental Protection Agency (EPA) Region 2. The air monitoring network operates in accordance with the policies, procedures, and quality assurance criteria established in the QMP and QAPP to ensure that data collected are of known and documented quality and meet applicable federal requirements.

Each sampling site is evaluated to ensure that all EPA siting requirements specified in 40 CFR Part 58 Appendix E are met as part of the instrument performance audit process. In addition, site evaluations include safety inspections to ensure a safe working environment for personnel who operate and maintain monitoring stations.

4. NETWORK DESIGN

The Puerto Rico Air Monitoring Network (PRAMN) currently consists of sixteen (16) monitoring locations with thirty-nine (39)¹ monitors distributed across the island to measure ambient concentrations of criteria pollutants, including both gaseous and particulate matter. The primary objective of PRAMN is to collect data to assess compliance with the National Ambient Air Quality Standards (NAAQS) and to provide comprehensive information on air pollution levels throughout Puerto Rico. This information is made available to the public through maps, websites, and public notices.

PRAMN is a critical component of Puerto Rico's air quality management program. It provides the public with timely information on current air quality conditions and progress toward improving air quality. The data are also used by health researchers, business and industry stakeholders, environmental organizations, and other interested parties. Measurements obtained from the monitoring sites are compared against the NAAQS to support the development of attainment and maintenance plans.

In addition to the existing network, the Puerto Rico Department of Natural and Environmental Resources (PRDNER) is expanding its sulfur dioxide (SO₂) monitoring capacity in the San Juan and Guayama–Salinas nonattainment areas. Six additional SO₂ State and Local Air Monitoring Stations (SLAMS) monitors—three in each nonattainment area—will enhance the current network by providing more comprehensive air quality data in areas where the SO₂ NAAQS are not being attained.

¹ Including QA monitors.

The following describe the various types of monitors at the sites within PRAMN:

- **NCore:** National Core multi-pollutant monitoring station. Puerto Rico is required by federal regulations to operate one NCore site, which includes monitors for CO, nitric oxide/reactive nitrogen (NO/NO_y), SO₂, O₃, PM₁₀, speciated PM_{2.5}, PM_{2.5}, PM_{10-2.5}. Puerto Rico operates an NCore site in Bayamon. The characteristic data of an NCore station and / or SLAMS stations are comparable with the data collected by research on the effects on health and atmospheric events, or very well for the work of method development.
- **Near-road:** Near-road monitoring sites are in proximity to high-traffic roadways and are designed to measure hourly concentrations of nitrogen dioxide (NO₂), carbon monoxide (CO), and fine particulate matter (PM_{2.5}) in urban areas. Puerto Rico operates two near-road monitoring stations, one located in Guaynabo and the other in Caguas.
- **SLAMS:** State or Local Air Monitoring Stations (SLAMS) are part of the ambient monitoring network used to measure criteria pollutants for comparison with the National Ambient Air Quality Standards (NAAQS). SLAMS data are used to evaluate ambient air quality, support the development of air quality management strategies, and assess trends in pollutant concentrations over time, including the effectiveness of emission control measures. Monitoring conducted near major emission sources can also help characterize the impact of these sources on local air quality.
- **AQI:** The Air Quality Index (AQI) was developed by the U.S. Environmental Protection Agency (EPA) to provide a simple and consistent way to report daily air quality conditions to the public. In Puerto Rico, AQI values are determined using measurements of fine particulate matter (PM_{2.5}), particulate matter (PM₁₀), and ground-level ozone (O₃). AQI values for each pollutant are calculated daily according to their respective averaging periods.

AQI information reported through EPA's AirNow system is updated hourly and made available to the public through the Air Quality Area (AQA) website (<https://www.drna.pr.gov/acai/aqi/>) to help inform residents about current air quality conditions and trends.

Currently, there are four (4) monitoring sites included in the AQI network in Puerto Rico, and two (2) additional sites are proposed. The AQI monitors are grouped into six locations: Cataño, Ponce, Mayagüez, and Bayamón (currently operating with full AQI capability), and Guayama, Salinas (proposed). Salinas site is on hold and will resume once the air quality network is fully restored. See Figure 10.

Table 1: Site Information-Puerto Rico Air Monitoring Stations

PR Id.	AQS Num.	County	Coordinates		Parameter
			Latitude	Longitude	
San Juan - Caguas Metropolitan Area					
EQB 7	72-061-0001	Guaynabo	18.423559	-66.114453	PM ₁₀
EQB 20	72-061-0006	Guaynabo	18.422595	-66.120012	CO, NO ₂
EQB 76	72-127-0012	San Juan	18.38446	-66.052724	SO ₂ New
EQB 77	72-137-0004	Toa Baja	18.453355	-66.149606	SO ₂ New
EQB 78	72-061-0016	Guaynabo	18.430193	-66.112519	SO ₂ New
EQB 21	72-025-0007	Caguas	18.198712	-66.052237	PM _{2.5} , NO ₂ , CO
EQB 22	72-053-0003	Fajardo	18.381414	-65.617799	PM _{2.5} , PM ₁₀
EQB 24	72-061-0005	Guaynabo	18.432122	-66.114702	PM _{2.5} , PM ₁₀ , PM ₁₀ QA, PM _{2.5} QA
EQB 30	72-127-0003	San Juan	18.449814	-66.052510	CO
EQB 37	72-021-0010	Bayamon	18.420089	-66.150615	NCore (PM _{2.5} , SO ₂ , CO, NO _x , O ₃ , PM ₁₀ , PM _{2.5} Spec, PM _{2.5} AQI)
EQB 40	72-033-0004	Cataño	18.428427	-66.141648	SO ₂ , PM _{2.5} AQI, PM ₁₀ AQI
Ponce Metropolitan Area					
EQB 13	72-001-0002	Adjuntas	18.172695	-66.726262	PM _{2.5}
EQB 56	72-113-0004	Ponce	18.009558	-66.272249	CO, PM _{2.5} , PM ₁₀ , PM ₁₀ AQI, PM _{2.5} AQI
Guayama - Salinas Metropolitan Area					
EQB 15	72-057-0012	Guayama	17.955378	-66.617792	PM _{2.5} , PM ₁₀ , PM _{2.5} AQI
EQB 18	72-123-0004	Salinas	17.968873	-66.261423	SO ₂
EQB 69	72-057-0011	Guayama	17.965713	-66.186803	SO ₂
EQB 79	72-123-0005	Salinas	17.952912	-66.236504	SO ₂ New
EQB 80	72-123-0006	Salinas	18.022171	-66.236657	SO ₂ New
EQB 81	72-057-0013	Guayama	17.971926	-66.113524	SO ₂ New
Mayaguez Metropolitan Area					
EQB 59	072-097-0007	Mayagüez	18.21428	-67.14461	O ₃ , PM _{2.5} AQI
Arecibo Metropolitan Area					
EQB 74	72-013-0001	Arecibo	18.457166	-66.696468	Pb
EQB 75	72-013-0002	Arecibo	18.453062	-66.695688	Pb, Pb-QA

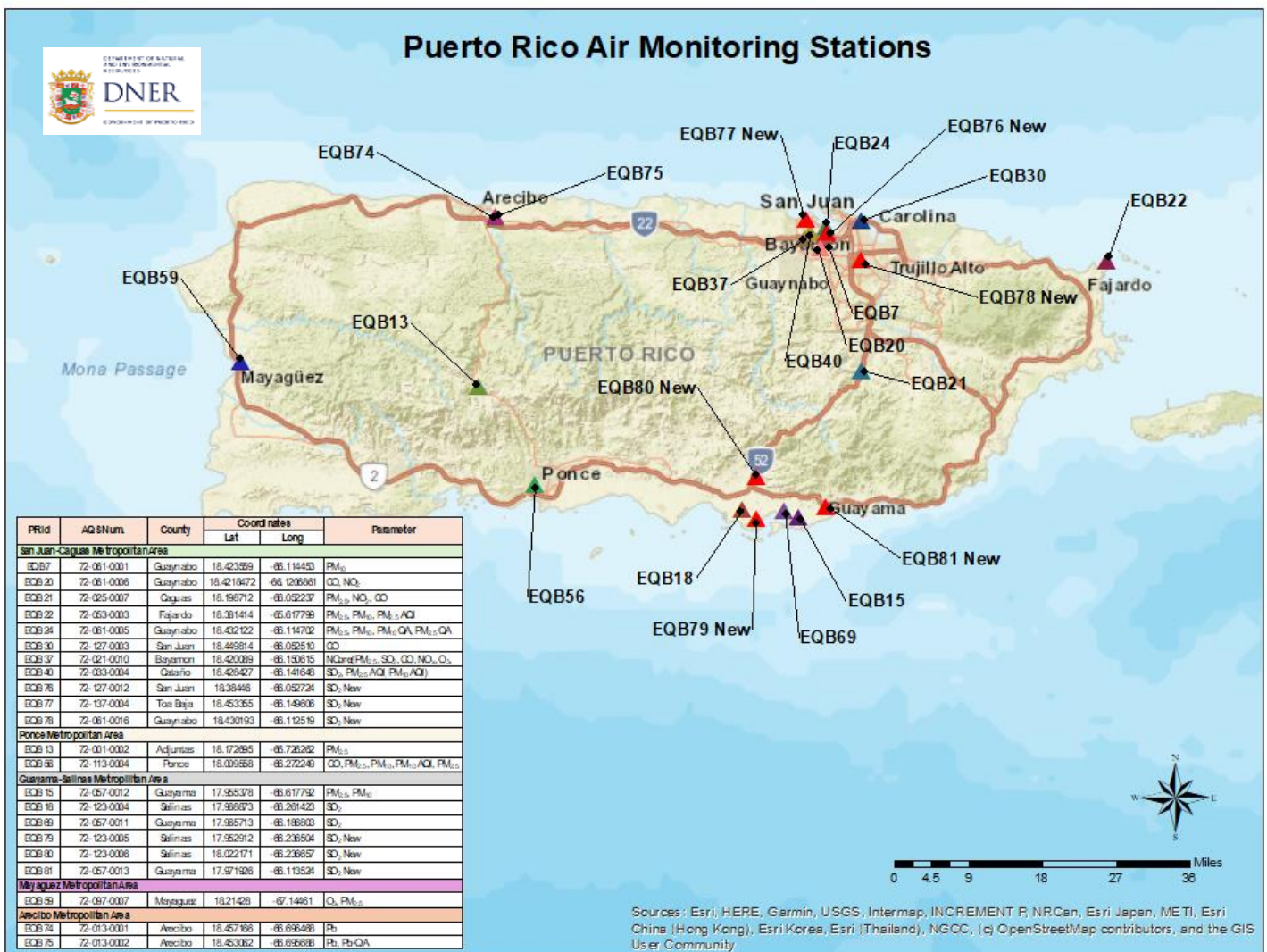
Currently, Puerto Rico meets all minimum air monitoring requirements. The EPA in Appendix D of 40 CFR Part 58 establishes the minimum number of monitoring sites necessary to meet the environmental monitoring objectives. The minimum monitoring requirements are specific for each of the pollutants or based on objectives (NCore, Ozone, PM_{2.5}, NO₂, near-roads). Generally, the monitoring requirements depend on the population and the air emissions of the area.

The network design is according to the Clean Air Act, the 40 Code of the Federal Regulations (CFR) Part 58, which presents a balance between the desired number of monitors, the

sampling frequency, the available budget, and the employees necessary for its management and operation. The recommended changes will be implemented during the period from July 2026 to December 2027, depending on the available budget.

The operation of the network may change over the years without public notification based on unexpected circumstances. For example: equipment failure, construction or demolition activities at the sampling site, loss of access to the site, equipment damaged by electrical failures, or natural events (hurricanes or storms).

solicitud **Figure 1: Puerto Rico Air Monitoring Network-2026**



4.1 Network Status

The EPA establishes the minimum number of monitoring sites required to meet national ambient monitoring objectives. The minimum monitoring requirements are codified in Appendix D of 40 CFR Part 58. Minimum monitoring requirements are specific to each individual pollutant (e.g Ozone, PM_{2.5}) or are objective-based monitoring networks (e.g. NCore, PAMs). Minimum monitoring requirements typically rely on population and/or air pollution emissions data. The Appendix provides a detailed description of these requirements.

Currently, PRAMN meets the minimum sampling requirements even though in recent years the network has not been operated 100% as proposed in previews plan. The efforts, in terms of personnel and budget, are destined to begin in these next 18 months at 100% operation of the sampling network. The table below contains details of the stations in operation and the reasons why they are not in operation, including the estimated time to begin operation. All the changes are made in coordination with EPA. The AQA maintains continuous communication with EPA Region 2.

To carry out the Lead and PM_{2.5} analysis of the sampling network, PRDNER uses the services of the EPA National Laboratory. Table 2 contains details of the stations in operation and the reasons why they are not in operation, including the estimated time to begin operation.

Table 2: Puerto Rico Network Status

PR Id	AQS Num.	County	Parameter	Active	Comments
EQB 7	72-061-0001	Guaynabo	PM ₁₀	√	
EQB 13	72-001-0002	Adjuntas	PM _{2.5}	TSD	Estimated re-start date, September 2026.
EQB 15	72-057-0012	Guayama	PM _{2.5}	TSD	Change equipment for BAM 1022 Met-One, estimate re-start date, July of 2026.
			PM ₁₀	√	
EQB 18	72-123-0004	Salinas	SO ₂	√	An AQI and NO2 monitor was proposed and approved by EPA in the last network plan; however, DNER is prioritizing in the next 18 months, the reestablishment of the closed sites before making additional changes to the network as requested by EPA in their December 18, 2024, memorandum to DNER. After that DNER will resume the proposed changes to Salinas site.
EQB 20	72-061-0006	Guaynabo	CO	TSD	After being damaged during a traffic accident the shelter was replaced. The

			estimate re-start date, end of 2026.		
EQB 21	72-025-0007	Caguas	NO ₂	TSD	Estimated re-start date, end of 2026.
			PM _{2.5}	√	
			NO ₂	TSD	Waiting for spare parts and/or replacement. Estimate re-started date, end of 2026.
EQB 22	72-053-0003	Fajardo	CO	TSD	Waiting for spare parts and/or replacement. Estimate re-started date, end of 2026.
			PM _{2.5}	√	
EQB 24	72-061-0005	Guaynabo	PM ₁₀	√	
			PM _{2.5}	√	
EQB 30	72-127-0003	San Juan	PM _{2.5} QA	√	
			PM ₁₀	√	
			PM ₁₀ QA	√	
			CO	TSD	New air conditioning installed and new CO monitor was purchased. Estimated re-start date, July 2026.
EQB 37	72-021-0010	Bayamon	PM _{2.5}	√	
			PM ₁₀	√	
			SO ₂	TSD	Waiting for spare parts and/ or replacement. Estimate re-started date, end of 2026.
			CO	TSD	Waiting for spare parts and/ or replacement. Estimate re-started date, end of 2026.
			O ₃	TSD	Waiting for spare parts and/or replacement. Estimate re-started date, end of 2026.
			NO _y	TSD	Waiting for the new equipment, estimate re-start date, end of 2026.
			PM _{2.5} Spec.	TSD	Waiting for the new equipment, estimate re-start date, end of 2026.
			PM _{2.5} Cont. AQI	√	
EQB 40	072-33-0004	Cataño	SO ₂	√	
			AQI PM _{2.5}	√	Equipment will be changed with BAM 1022; estimate replacement date end of 2026.
			AQI PM ₁₀	TSD	Equipment will be changed for BAM 1022 Met-One; estimate re-start date, end of 2026.
EQB 56	72-113-0004	Ponce	CO	√	

			PM _{2.5}	√	
			PM ₁₀	√	
			AQI PM ₁₀	TSD	Equipment will be changed to a BAM 1022 Met-One, estimate re-start date, end of 2026.
			AQI PM _{2.5}	TSD	Equipment will be changed to BAM 1022 Met-One, estimate re-start date August of 2026.
EQB 59	72-097-0007	Mayagüez	O ₃	TSD	Monitor is out of service. Waiting for spare parts or new monitor. Estimated re-start August 2026
			PM _{2.5}	TSD	Waiting for spare parts and/ or replacement. Estimate re-started date, end of 2026.
EQB 69	72-057-0011	Guayama	SO ₂	TSD	Waiting for spare parts and/ or replacement. Estimate re-started date, end of 2026.
EQB 74	72-013-0001	Arecibo	Pb	√	
EQB 75	72-013-0002	Arecibo	Pb	√	
			Pb-QA	√	
EQB 76	72-127-0012	San Juan	SO ₂	New	Estimate start date, end of 2026.
EQB 77	72-137-0004	Toa Baja	SO ₂	New	Estimate start date, end of 2026.
EQB 78	72-061-0016	Guaynabo	SO ₂	New	Estimate start date, end of 2026.
EQB 79	72-123-0005	Salinas	SO ₂	New	Estimate start date, end of 2026.
EQB 80	72-123-0006	Salinas	SO ₂	New	Estimate start date, end of 2026.
EQB 81	72-057-0013	Guayama	SO ₂	New	Estimate start date, end of 2026.

4.2 Network Equipment

The PRAMN uses the equipment recommended and approved in the *List of Designated Reference and Equivalents Method* of Title 40, Part 53 of the Code of Federal Regulations (40 CFR Part 53) to carry out the sampling according to each parameter being sampled. These consist of two types, continuous and intermittent (manual) sampling.

- Intermittent or manual sampling is used for the particulate stations (PM₁₀, PM_{2.5} and Pb). It takes samples for 24 hours, with different frequencies, PM₁₀ and Lead every six days (1-6 days) and PM_{2.5} every three days (1-3 days). This equipment uses filters that are weighed and/or analyzed through chemical processes either in the DNER environmental laboratory or by EPA national contract laboratory.
- Continuous sampling is used for NO₂, CO, SO₂, O₃, PM₁₀, and PM_{2.5}. The continuous equipment takes samples continuously 24 hours every day. This equipment calculates averages of five (5) minutes and hourly averages of the values taken.

Both types of equipment are calibrated and have preventive maintenance according to the *QA Handbook Vol. II App D Measurement Quality Objectives and Validation Templates*. All the equipment has and meets the specifications of certainty and quality control, and the captured data is reliable for comparison with the NAAQS.

Table 3: Equipment used in the Puerto Rico Air Monitoring Network by Parameter.

Parameter	Equipment	Type
Particulate Matter (PM ₁₀)	Thermo Scientific Hi-Vol SA/GMW-321B	manual
	Met-One E-Seq-FRM PM10	manual
	Thermo Scientific TEOM 1405F ²	continuous
Particulate Matter (PM _{2.5})	Met-One E-Seq-FRM PM2.5 / VSCC	manual
	Met-One BAM 1022 PM2.5 / VSCC	continuous
	Thermo Scientific TEOM 1405F AVF PM2.5 VSCC ³	continuous
Sulfur Dioxide (SO ₂)	Teledyne T-100 Pulsed Fluorescence	continuous
Nitrogen Dioxide (NO ₂)	Teledyne T-200 Chemiluminescence	continuous
Ozone (O ₃)	Teledyne T-400 Instrumental Ultraviolet Abs.	continuous
Lead (Pb)	Thermo Scientific Hi-Vol ICP-MS	manual
Carbon Monoxide (CO)	Teledyne T-300 Gas Filter Corr. CO Analyzer	continuous
PM _{2.5} Speciation	Met-One SASS Teflon Energy Dispersive XRF / URG - 3000N Sequential Particulate Speciation	manual

² To be replaced by Met-One BAM 1022 Particulate Monitor

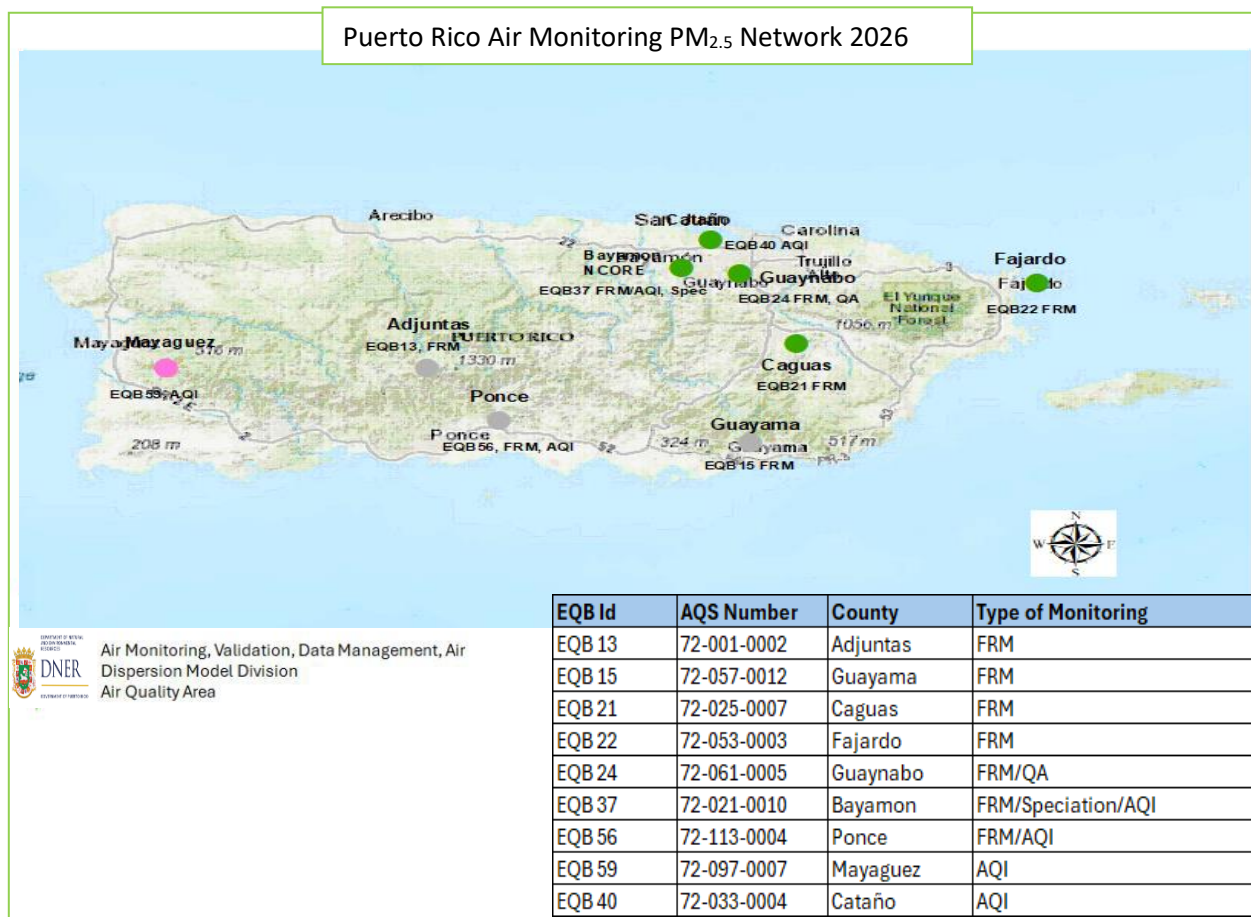
³ To be replaced by Met-One BAM 1022 Particulate Monitor / VSCC

4.3 PM_{2.5} Air Monitoring Network

The PRAMN operates nine (9) sites of PM_{2.5} in the air sampling network, seven (7) of them use the FRM samplers and four (4) of them use continuous samplers (Figure 2). The FRM PM_{2.5} sampling equipment is reference sampling equipment included in the EPA-Designated Reference List as Met One E-SEQ- FRM PM_{2.5}/ VSCC. The FRM sites operate one every three days (1-3). The FRM QA monitor located at Guaynabo (72-061-0005) operates one day every 6 days.

The equipment of the site 72-057-0002 (EQB 15) will be replaced by continuous sampling (BAM 1022).

Figure 2: PM_{2.5} Network

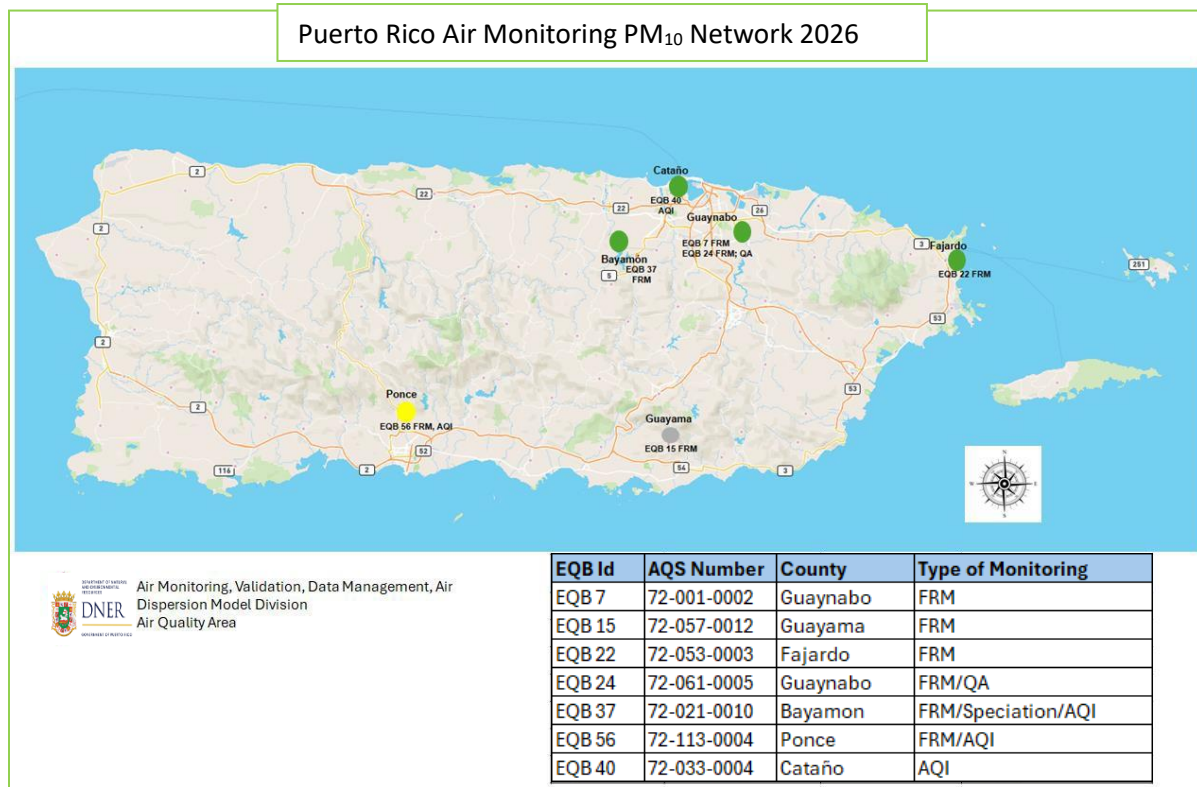


The continuous PM_{2.5} monitors operate throughout the year, and data is sent to EPA's AQS database in one-hour value. The equipment used for continuous PM_{2.5} sampling will be replaced by VSCC Met One BAM 1022 Attenuation Particulate Monitors. This analyzer is part of the new equipment financed with the funds from the America Rescue Plan. Details of these sites are in Appendix and Figure 2.

4.4 PM₁₀ Air Monitoring Network

The PRAMN operates seven (7) PM₁₀ sites. Six (6) of the sites have intermittent FRM monitors, one of them has a (1) collocated, and three (3) of the PM₁₀ sites use continuous monitors in the air sampling network.

Figure 3: PM₁₀ Network



The FRM PM₁₀ sampling equipment used in the network is the Hi-Vol SA/GMW-321B. The monitor located at Bayamón operates every three days (1 in 3) and while the other five (5) monitors, including the QA monitor, operate every six days (1 in 6).

The continuous PM₁₀ monitors take samples throughout the year, and the concentrations are sent to EPA-AQS. The monitors are used for AQI purposes and are reported to AirNow as part of the AQI network of Puerto Rico. For continuous PM₁₀ sampling, the TEOM 1405F-AVF is used, which will be replaced by the BAM 1022 in both sites (Cataño and Ponce). The details of the sites are included in Appendix and Figure 3.

4.5 Ozone Air Monitoring Network

The PRAMN operates two (2) ozone sites in the air sampling network; one of these monitors is at the NCore station. The ozone monitors operate throughout the year, and the concentrations are sent in one-hour values to AQS of the EPA. The monitors are classified as SLAMS and the equipment used is FEM Teledyne T-400 Instrumental Ultraviolet Abs. Both monitors are reported to AirNow as part of the AQI network of Puerto Rico.

Both stations are temporarily out of service due to technical difficulties. The details of the location of the sites are included in Appendix and Figure 4.

Figure 4: O₃ Network



4.6 SO₂ Air Monitoring Network

The PRAMN operates four (4) sulfur dioxide (SO₂) monitoring sites within its air sampling network; one of these monitors is located at the NCore station. All SO₂ monitors operate year-round. Concentration data are reported to the EPA's Air Quality System (AQS) as one-hour averages and five-minute values. All SO₂ monitors are source oriented. The equipment used is Federal Equivalent Method (FEM) instrumentation (Teledyne T-100 Pulsed Fluorescence).

4.6.1 New SO₂ Monitoring Sites

In addition to the SO₂ existing sites, the PRDNER will establish six (6) new SO₂ monitoring stations in the nonattainment areas of San Juan and Guayama-Salinas, with three (3) sites in each area. These monitors are intended to enhance data coverage, improve spatial representation, and support a more accurate characterization of air quality in those areas.

The following is a description of the new SO₂ sites in San Juan and Guayama-Salinas area.

SAN JUAN AREA

Emergency Management Office, Amelia Sector-Guaynabo: This monitor is in Guaynabo County, and it's estimated start and sampling date are at the end of 2026. The AQS ID is 72-061-0016. The purpose of this monitor is population oriented and high concentration. The monitor is a Teledyne 100U, the analysis method is ultraviolet fluorescence, the schedule is continuous and the spatial scale is micro. The monitor probe material is Teflon, and the residence time is 20 seconds⁴. See Appendix C. The unrestricted air flow for this probe is 354° around monitoring path. The coordinates of this site are 18.430193, -66.112519. Aerial map, pictures and siting criteria verification of this location are in Appendix B.

Hidrogas Facility- Toa Baja: This monitor is in Toa Baja County, and it's estimated start and sampling date are at the end of 2026. The AQS ID is 72-137-0004. The purpose of this monitor is population oriented and high concentration. The monitor is a Teledyne 100U, the analysis method is ultraviolet fluorescence, the schedule is continuous and the spatial scale is micro. The monitor probe material is Teflon, and the residence time is 20 seconds. See Appendix C. This site probe has unrestricted air flow, more than 270° around, 90% of the monitoring path do not have significant obstructions. The coordinates of this site are 18.453355, -66.149606. Aerial map, pictures and siting criteria verification of this location are in Appendix B.

⁴ According to manufacturer manual, Teledyne T100 UV Fluorescence SO₂ Analyzer.

DNER Comandancia Cuerpo de Vigilantes-San Juan: This monitor is in San Juan County, and it's estimated start and sampling date are at the end of 2026. The AQS ID is 72-127-012. The purpose of this monitor is background. The monitor is a Teledyne 100U, the analysis method is ultraviolet fluorescence, the schedule is continuous and the spatial scale is middle. The monitor probe material is Teflon, and the residence time is 20 seconds. See Appendix C. The unrestricted air flow for this site probe 320° around monitoring path, and this is according to the only obstruction that is less than 20 meters distance from the inlet. The coordinates of this site are 18.38446, -66.052724. Aerial map, pictures and siting criteria verification of this location are in Appendix B.

GUAYAMA-SALINAS AREA

Fire Station-Guayama: This monitor is in Guayama County, and it's estimated start and sampling date are at the end of 2026. The AQS ID is 72-057-0013. The purpose of this monitor is background and regional transport. The monitor is a Teledyne 100U, the analysis method is ultraviolet fluorescence, the schedule is continuous and the spatial scale is regional. The monitor probe material is Teflon, and the residence time is 20 seconds. See Appendix C. The unrestricted air flow for this probe is 345° around monitoring path. The coordinates of this site are 17.971926, -66.113524. Aerial map, pictures and siting criteria verification of this location are in Appendix B.

Gravity Park-Salinas: This monitor is in Salinas County, and its estimated start and sampling date are at the end of 2026. The AQS ID is 72-123-0006. The purpose of this monitor is population oriented and high concentration. The monitor is a Teledyne 100U, the analysis method is ultraviolet fluorescence, the schedule is continuous and the spatial scale is micro. The monitor probe material is Teflon, and the residence time is 20 seconds. See Appendix C. This site probe has unrestricted air flow, more than 270° around, 90% of the monitoring path do not have significant obstructions. The coordinates of this site are 18.022171, -66.236657. Aerial map, pictures and siting criteria verification of this location are in Appendix B.

EC Waste -Salinas: This monitor is in Salinas County, and its estimated start and sampling date is at the end of 2026. The AQS ID is 72-123-0005. The purpose of this monitor is population oriented and high concentration. The monitor is a Teledyne 100U, the analysis method is ultraviolet fluorescence, the schedule is continuous and the spatial scale is micro. The monitor probe material is Teflon, and the residence time is 20 seconds. See Appendix C. The unrestricted air flow for this site probe is 274° around monitoring path. The coordinates of this site are 17.952912, -66.236504. Aerial map, pictures and siting criteria verification of this location are in Appendix B.

The details of the location of the sites are included in Appendix B and Figure 5.

Figure 6: Lead Network

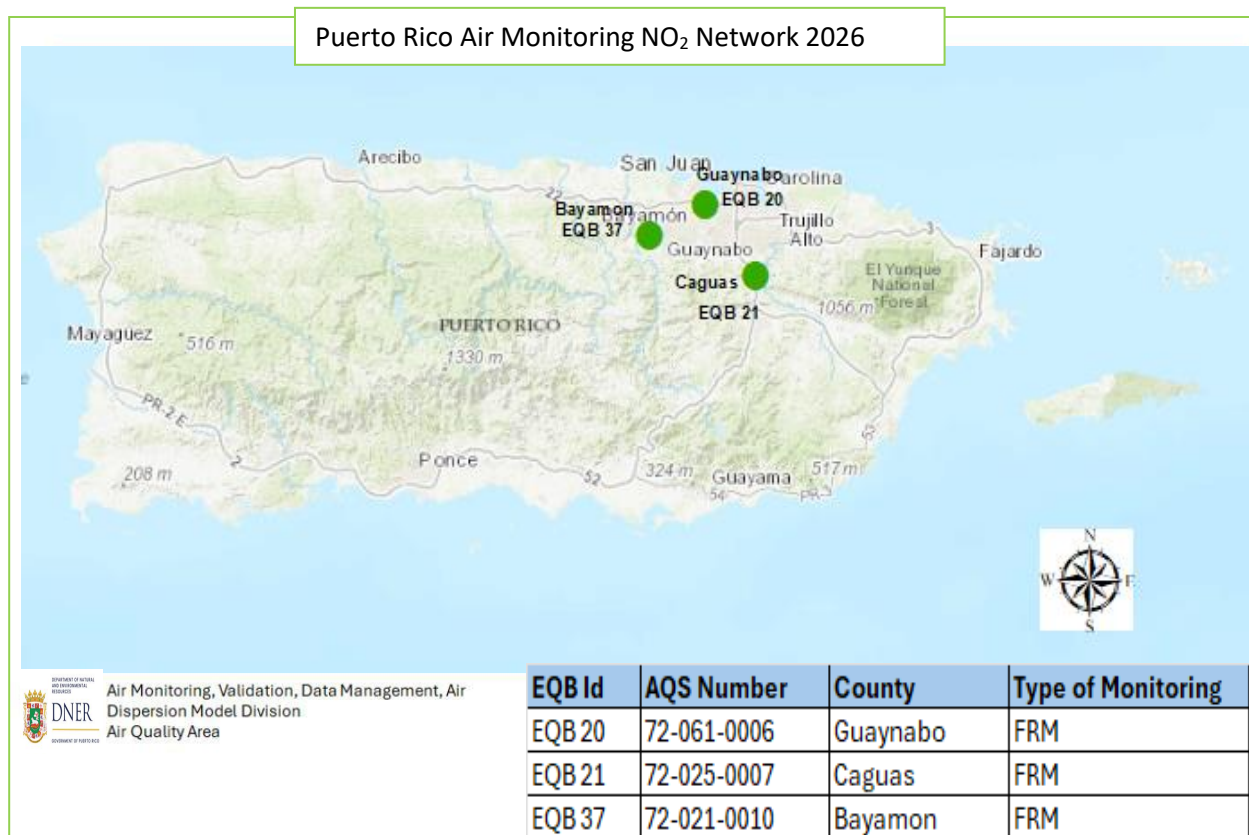


4.8 NO₂ Air Monitoring Network

PRAMN operates three (3) nitrogen dioxide (NO₂) sites in the air-monitoring network, two (2) as parts of the near road program, (at Guaynabo and Caguas) and one (1) at Bayamon NCore site.

The NO₂ samplers are operated year-round, and the measurements are sent to the EPA AQS on an hourly basis. The SLAMS NO₂ sites use FRM; and the equipment used is Teledyne T-200 Chemiluminescence. The details of the sites are included in Appendix and Figure 7.

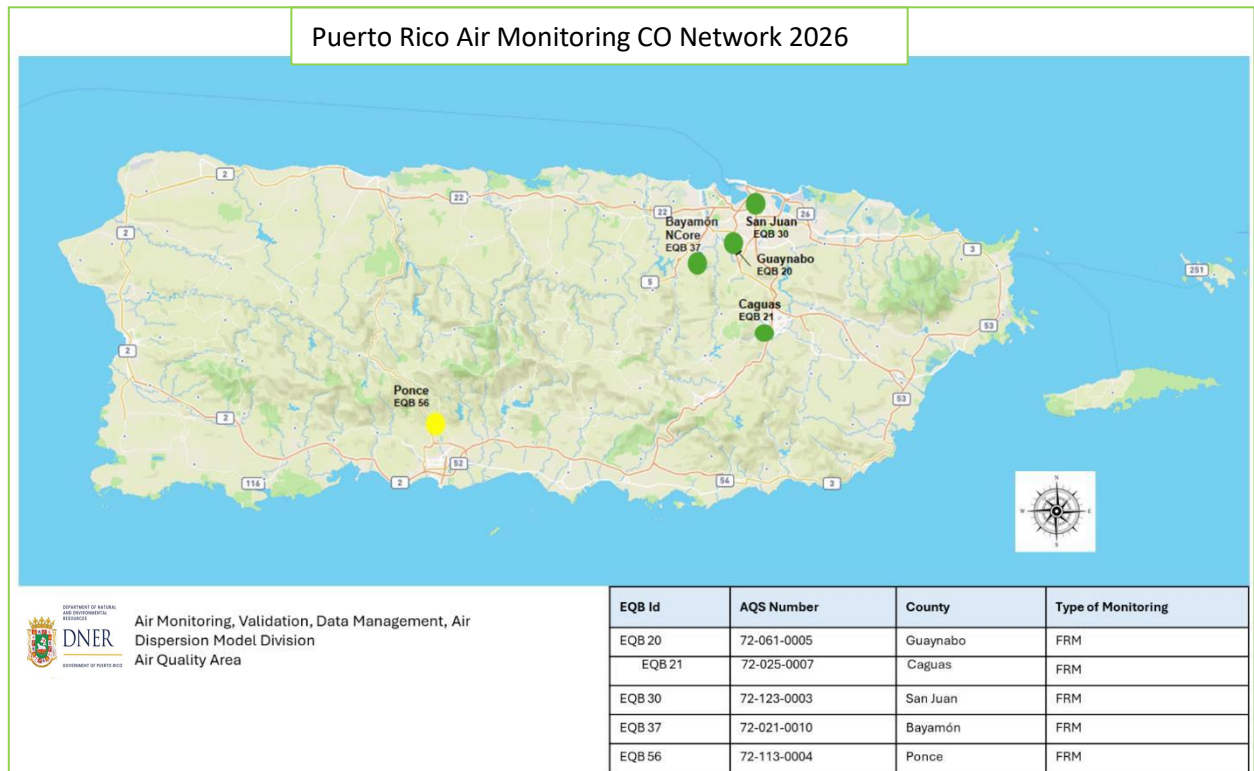
Figure 7: NO₂ Network



4.9 CO Air-Monitoring Network

The PRAMN operates five (5) carbon monoxide (CO) sites in the air-monitoring network, one (1) of them at Bayamon NCore site. All CO samplers are operated year-round, and the measurements are sent to the EPA AQS on an hourly basis. The SLAMS CO sites use FRM monitors. The equipment used is Teledyne T-300 Gas Filter Corr. CO Analyzer. The details of these sites are included in Appendix and Figure 8.

Figure 8: CO Network



4.10 NCore Air Monitoring Network

Puerto Rico operates an NCore monitoring site as part of the national air quality sampling network. This network uses advanced instrumentation to measure a wide range of air pollutants and meteorological parameters. The U.S. Environmental Protection Agency (EPA) requires each state and territory to operate at least one NCore site.

The parameters monitored at the Puerto Rico NCore site include carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂), total reactive nitrogen (NO_y), nitric oxide (NO), sulfur dioxide (SO₂), particulate matter (PM_{2.5}, PM₁₀, and PM_{10-2.5}), PM_{2.5} speciation, PM_{2.5} Air Quality Index (AQI), and basic meteorological measurements.

The Bayamón station (AQS: 72-021-0010) is designated as the NCore site for Puerto Rico. Continuous PM_{2.5} measurements at this site are collected using a Met One BAM-1022 monitor. Additional details about the monitoring equipment are provided in the Appendix and Figure 9.

Figure 9: NCore Site

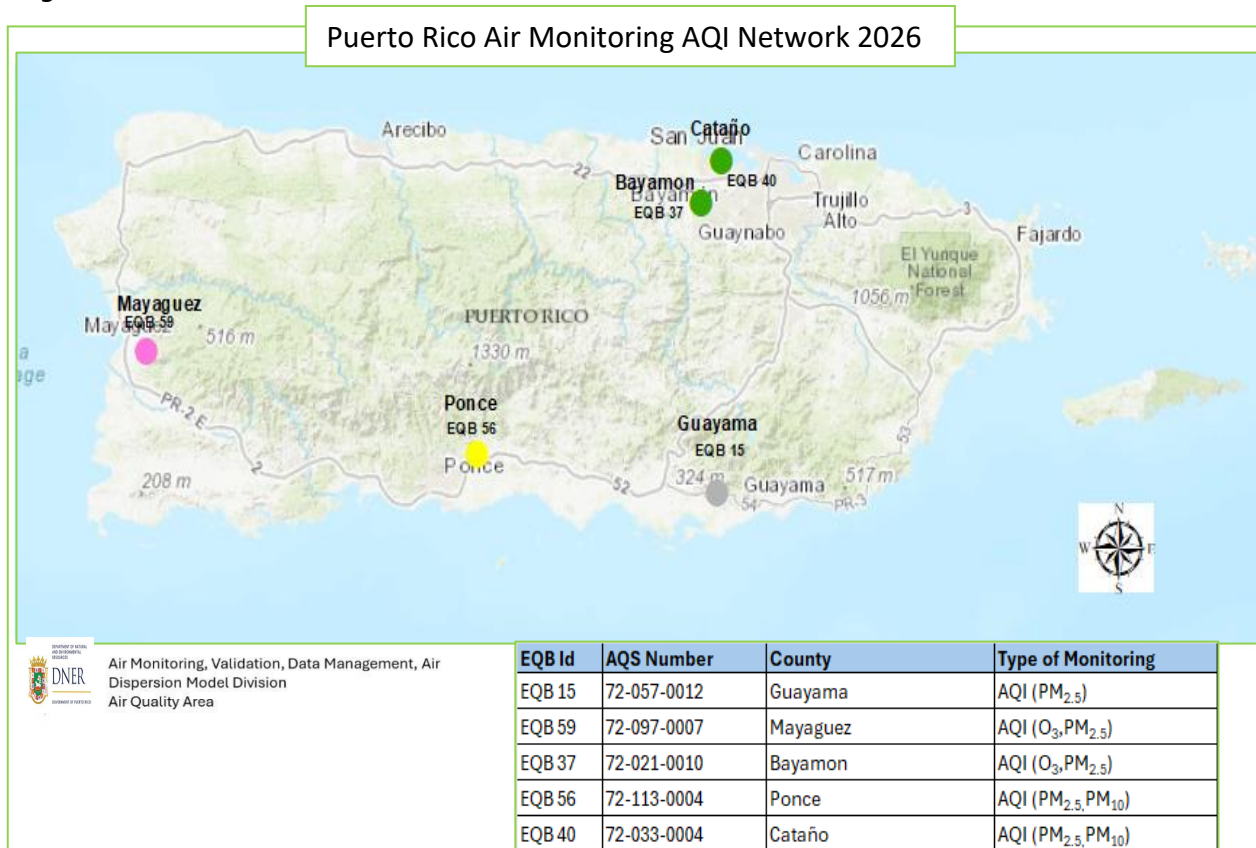


4.11 AQI Air Monitoring Network

The AQI values for each pollutant are calculated daily and applied to the respective averaging period. The EPA’s AirNow AQI values are updated hourly and posted on the AQA website at [https://www. www.drna.pr.gov/acai/aqi/](https://www.www.drna.pr.gov/acai/aqi/) , to help inform the public of current air quality conditions and trends.

There are currently four (4) sites in the AQI network in Puerto Rico and one (1) proposed at Guayama site EQB 15 that will replace the FRM equipment that is currently out of service. The monitors are grouped into six locations: Cataño, Ponce, Mayaguez, Bayamon (currently full AQI); Guayama (proposed). See Figure 10. Daily AQI values are generally the highest for these two pollutants and are responsible for most poor air quality events in Puerto Rico.

Figure 10: AQI Network



5. LOW-COST SENSOR AIR MONITORING

Low-cost air sensors are planned to be used to complement network monitoring by focusing on distant areas of Puerto Rico. The network of air quality sensors will be used to evaluate the air quality and estimate the levels of exposure to pollution of the population in distant areas of Puerto Rico. The sensors will provide data from areas of Puerto Rico for which there is currently no evidence of air quality, due to lack of budget or infrastructure that would allow the location of an air sampling station.

Low-cost sensors monitoring will occur in areas outside the reach of the PRAMN, near sources of contamination or areas where the infrastructure would not allow the location of an air sampling station. To determine air quality, sensors will be located near pollution sources. Site selection criteria will be based on community priorities and emissions inventories will be used to select sensor locations. Figure 11 below shows the locations of low- cost sensors in communities of interest.

Figure 11: Puerto Rico Low-Cost Air Monitoring Sensor Network



6. NETWORK BUDGET AND LIMITATIONS

The air monitoring network has several limitations that affect its implementation, operation, and maintenance. Although EPA funding is expected to support the replacement of equipment and components, the following are some of the limitations that make it difficult to get the network fully operational quickly:

Limited personnel resources:

The network lacks sufficient staff to perform maintenance, routine checks, and data management. Currently, these responsibilities are handled by only one (1) field technician, one (1) maintenance worker, no electronics technician, and two (2) statisticians.

Delays and restrictions in funding and procurement processes:

Delays and restrictions in funding and procurement processes significantly hinder timely project implementation. Although funds may be approved and available, they are not immediately accessible due to federal and state requirements, including review by the U.S. Environmental Protection Agency (EPA) Region 2, the need for matching state funds, and additional authorizations from external agencies. All purchases must be processed through the General Services Administration and require approval from the Office of Management and Budget. Previously, purchases could be made directly from U.S. vendors; however, current regulations have lengthened processing times, reduced flexibility, and increased the overall cost of equipment and supplies.

Constraints on equipment acquisition and site development: Specialized monitoring equipment is not manufactured in Puerto Rico, and regulations limiting direct purchases from manufacturers further increase costs and delays. Establishing new monitoring sites requires coordination among multiple agencies and depends on factors such as topography, electrical infrastructure, security, permitting, and property owner approval, all of which complicate implementation and can add additional costs.

7. NETWORK CHANGES

In 2026, efforts will focus on restoring the monitoring network to full operation and maximizing data capture above 75%, despite limited budget and personnel. Network adjustments, including relocation, closure, or addition of sites, will be based on whether existing sites meet their original objectives. Previously proposed low-cost sensors will complement the network in hard-to-access areas lacking permanent infrastructure. All changes will require EPA approval and will be submitted once detailed site information is available.

A. Activities on Existing Sites / Pending from Previous Network Plan

Complete and restart the Guaynabo station (Metropista); the shelter has already been replaced.

Reestablish operation of stations previously closed due to personnel shortages.

Implement the American Rescue Plan funding to replace aging ambient air monitoring equipment with new monitoring systems.

Complete the replacement of continuous PM_{2.5} and PM₁₀ sampling equipment used

for AQI reporting with upgraded instruments.

B. New Activities

Establish a low-cost sensor air monitoring network to complement the existing Puerto Rico air monitoring network.

Install six SO₂ monitors in nonattainment areas—three in San Juan and three in Guayama-Salinas—to strengthen SO₂ monitoring and support SO₂ NAAQS attainment efforts.

Install a new AQI monitor at Guayama EQB 15 station.

7.1 Limitations to Implement the Proposed Changes.

The implementation of all proposed changes depends on the following conditions:

1. **EPA Approval:** Requests for changes and the establishment of new sites must be submitted to and approved by the EPA.
2. **Funding Approval / NCTE:** Certain proposed activities require Non-Competitive Technical Eligibility (NCTE) from the EPA in addition to funding approval under the Inflation Reduction Act (IRA) Air Monitoring Grants. These grants are non-competitive, but only activities or equipment that meet EPA's technical eligibility requirements and are approved for NCTE can receive funding. Puerto Rico must ensure that all proposals clearly document technical eligibility and comply with EPA submission requirements to secure the award.
3. **Personnel Availability:** Puerto Rico must have sufficient personnel for the maintenance, operation, administration, and data management of the network. This requires allocating funds for recruiting and hiring staff.
4. **Site Suitability:** Sampling sites must meet required criteria, including accessible topography, adequate infrastructure, and reliable electricity for equipment operation.

8. NETWORK MODIFICATIONS FORMS

A network modification document will be prepared with full details of the proposed changes to be submitted to EPA Region 2 to implement the network changes identified in this plan.

9. SUMMARY AND CONCLUSIONS

The Puerto Rico air monitoring network, as presented in this plan, meets the monitoring requirements of federal regulations. The procedures employed and instruments operated comply with the standards established by the EPA.

The most significant changes include:

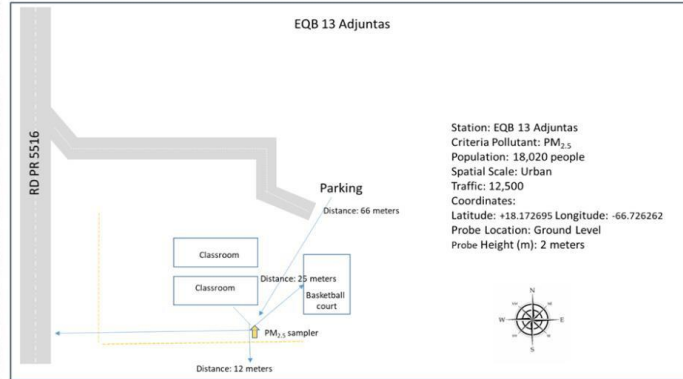
- Replacement of continuous PM2.5 and PM10 samplers.
- Reestablishment of stations previously closed.
- Implementation of American Rescue Plan funding to upgrade aging monitoring equipment.
- Enhancement of real-time air quality reporting through new particulate matter equipment and the deployment of low-cost sensors in areas with limited access.

Additionally, the network will expand with the installation of **six new SO2 monitors** in nonattainment areas of **San Juan** and **Guayama-Salinas** to strengthen SO2 monitoring and support attainment efforts.

APPENDIX A: SITES DESCRIPTION

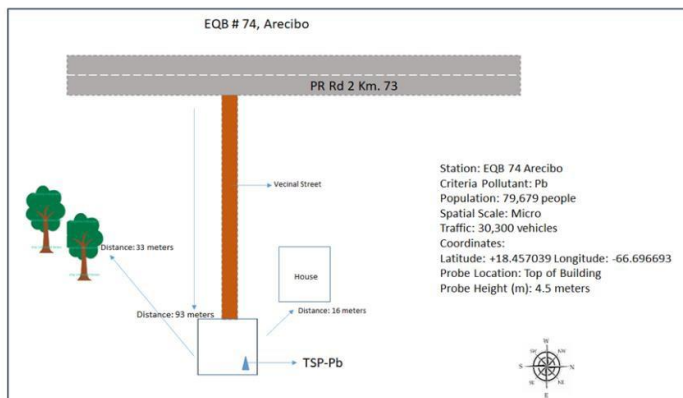
Site Name		EQB 13				
Address		Road #123				
City		Adjuntas				
AQS Code		72-001-0002				
PR County		Adjuntas				
MSA/CSA		N/A				
Latitude		+18.172695				
Longitude		-66.726262				
Suitable for Comparison to PM _{2.5} NAAQS?		Yes				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
Ambient Average Temperature	Instrumental	Electronic	1 in 3	Urban	Extreme Downwind	2005/01/01
Sample Average Barometric Pressure	Instrumental	Barometric Sensor	1 in 3	Urban	Extreme Downwind	2005/01/01
PM _{2.5}	E-Seq-FRM/VSCC	Gravimetric	1 in 3	Urban	Upwind Background	2005/01/01
Site Purpose		Reference for Extreme downwind				
Plans for the next 18 months		Re-start				
Other Comments		TSD 2021/01/20 (due lack or personnel)				

Station EQB 13 Adjuntas



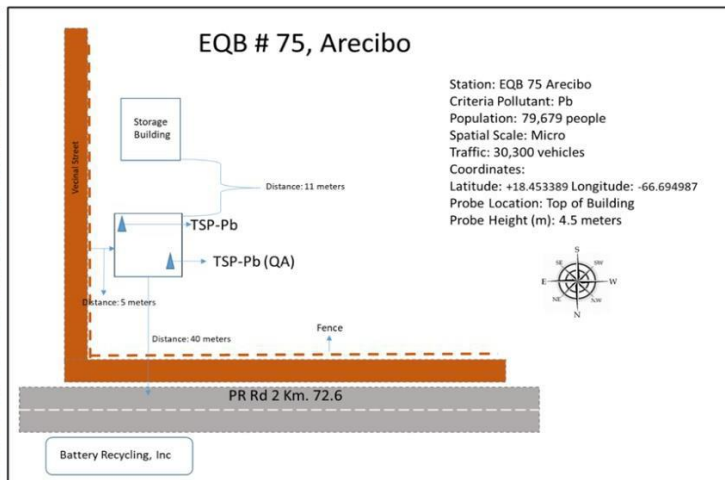
Site Name		EQB 74				
Address		Victor Santoni Cordero Road				
City		Arecibo				
AQS Code		72-013-0001				
PR County		Arecibo				
MSA/CSA		Arecibo				
Latitude		+18.457166				
Longitude		-66.696468				
Suitable for Comparison to PM _{2.5} NAAQS?		N/A				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
Ambient Average Temperature	Instrumental	Offsite Avg. Pressure	1 in 6	Micro	Source Oriented	2010/01/02
Sample Average Barometric Pressure	Instrumental	Offsite Avg. Pressure	1 in 6	Micro	Source Oriented	2010/01/02
Lead	Hi-Vol	ICP-MS	1 in 6	Micro	Source Oriented	2010/01/02
Site Purpose		Population Protection				
Plans for the next 18 months		No Changes				
Other Comments		Part of Lead SIP				

Station EQB 74 Arecibo



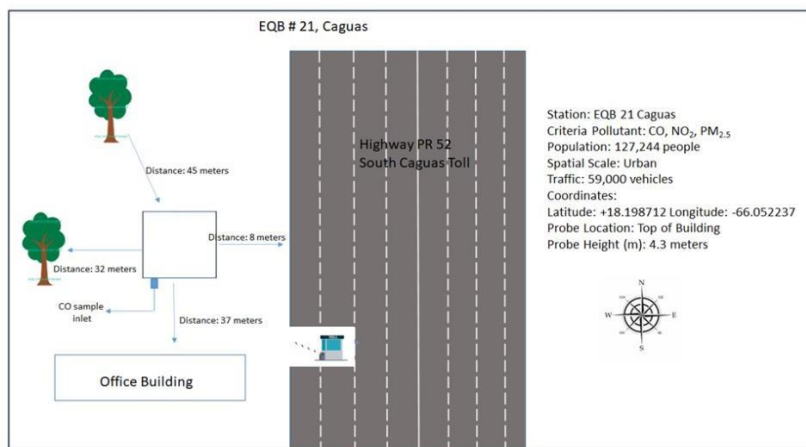
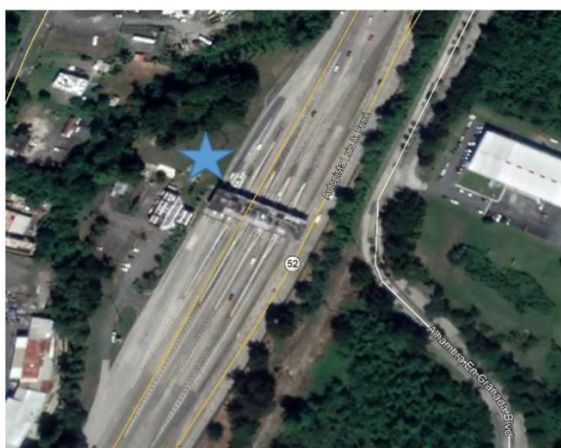
Site Name		EQB #75				
Address		PR Road #2				
City		Arecibo				
AQS Code		72-013-0002				
PR County		Arecibo				
MSA/CSA		Arecibo				
Latitude		+18.453062				
Longitude		-66.695688				
Suitable for Comparison to PM _{2.5} NAAQS?		N/A				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
Ambient Average Temperature	Instrumental	Offsite Avg. Pressure	1 in 6	Micro	Source Oriented	2012/08/19
Sample Average Barometric Pressure	Instrumental	Offsite Avg. Pressure	1 in 6	Micro	Source Oriented	2012/08/19
Lead	Hi-Vol	ICP-MS	1 in 6	Micro	Source Oriented	2012/08/19
Site Purpose		Population Protection				
Plans for the next 18 months		No Changes				
Other comments		Pb collocated (QA), Part of Lead SIP				

Station EQB 75 Arecibo



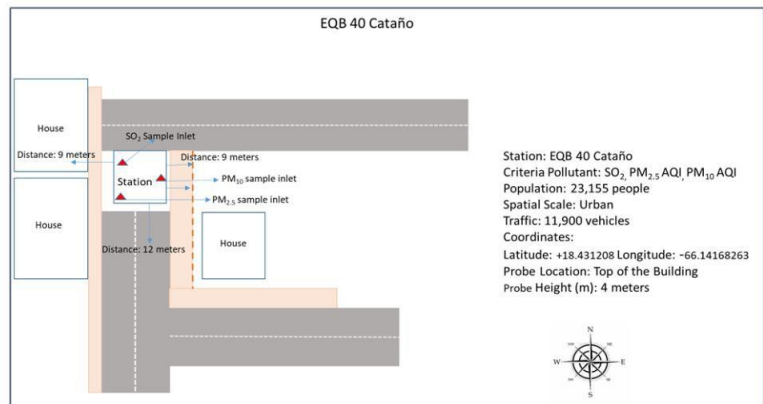
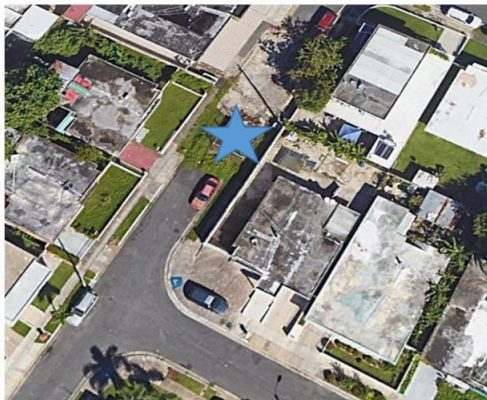
Site Name		EQB 21				
Address		Highway 22 Caguas South Toll				
City		Caguas				
AQS Code		72-25-0007				
PR County		Caguas				
MSA/CSA		San Juan-Caguas				
Latitude		+18.198712				
Longitude		-66.052237				
Suitable for Comparison to PM _{2.5} NAAQS?		N/A				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
NO ₂	Teledyne T200u	Chemiluminescence	Continuous	Urban	High Concentration	2016/12/19
CO	Teledyne T300U	Gas filter Correlation CO analyzer	Continuous	Urban	High concentration	2017/02/06
PM _{2.5}	Met-One E-Seq-FRM/VSCC	Gravimetric	1 in 3	Urban	High concentration	2017/06/01
Ambient Average Temperature	Instrumental	Electronic	1 in 3	Urban	High concentration	2017/06/01
Sample Average Barometric Pressure	Instrumental	Barometric Sensor	1 in 3	Urban	High concentration	2017/06/01
Site Purpose		Near Roads				
Plans for the next 18 months		No Changes				
Other comments						

Station EQB 21 Caguas



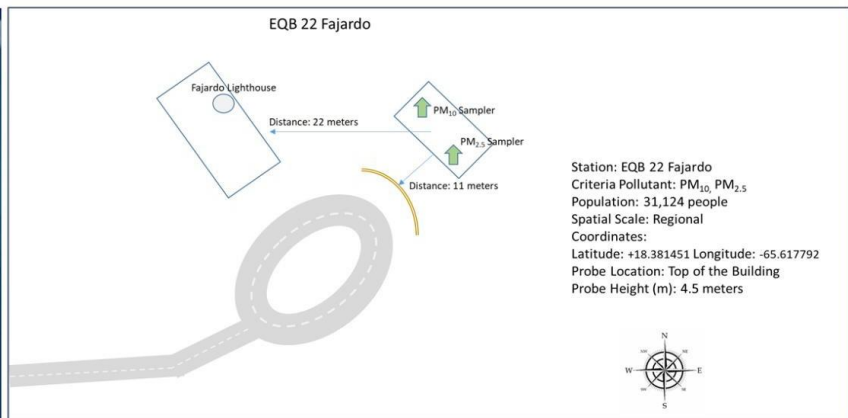
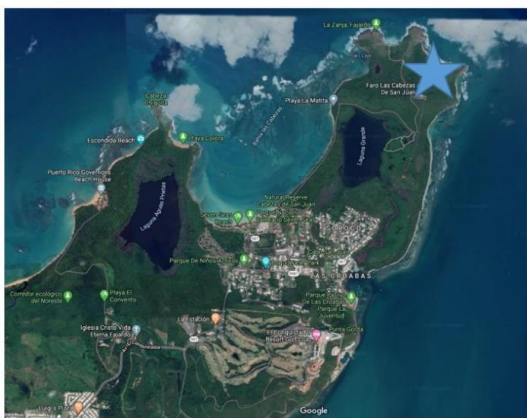
Site Name		EQB 40				
Address		11 Final St. Las Vegas				
City		Cataño				
AQS Code		72-033-0004				
PR County		Cataño				
MSA/CSA		San Juan-Caguas				
Latitude		+18.428427				
Longitude		-66.141648				
Suitable for Comparison to PM _{2.5} NAAQS?		N/A				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
SO ₂	Teledyne T100u	Ultraviolet Pulsed Fluorescent	Continuous	Neighborhood	Population Exposure	1993/12/07
PM ₁₀ Continuous	Inst. R&P SA246B-Inlet	TEOM Gravimetric	Continuous	Urban	Population Exposure	2000/07/13
PM _{2.5} Continuous	TEOM PM _{2.5} VSCC	FDMS Gravimetric	Continuous	Urban	Population Exposure	2015/01/01
Site Purpose		Population Protection				
Plans for the next 18 months		Replace the PM _{2.5} analyzer for BAM 1022 Met-One / VSCC				
Other comments		AQI (PM ₁₀ , PM _{2.5}) PM _{2.5} continuous monitor				

Station EQB 40 Cataño



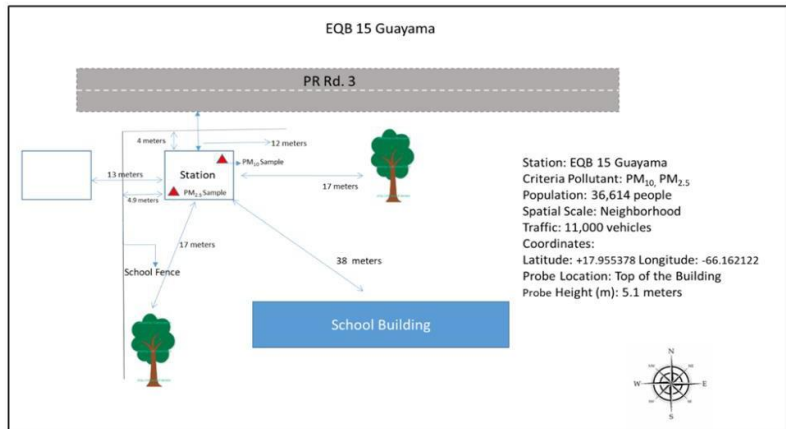
Site Name		EQB 22				
Address		Fajardo Lighthouse				
City		Fajardo				
AQS Code		72-053-0003				
PR County		Fajardo				
MSA/CSA		San Juan-Caguas				
Latitude		+18.381414				
Longitude		-66.617799				
Suitable for Comparison to PM _{2.5} NAAQS?		Yes				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
PM ₁₀	Hi-Vol SA/GMW-1200	Gravimetric	1 in 6	neighborhood	Regional Transport	1989/03/05
PM _{2.5}	Met-One E-Seq-FRM /VSCC	Gravimetric	1 in 3	Regional	Background	1999/04/20
Ambient Temperature Average	Instrumental	Electronic	1 in 3	Regional	Background	1999/04/20
Ambient Pressure Average	Instrumental	Barometric Sensor	1 in 3	Regional	Background	1999/04/20
Site Purpose		Background / Regional Transport				
Plans for the next 18 months		No Changes				
Other comments						

Station EQB 22 Fajardo



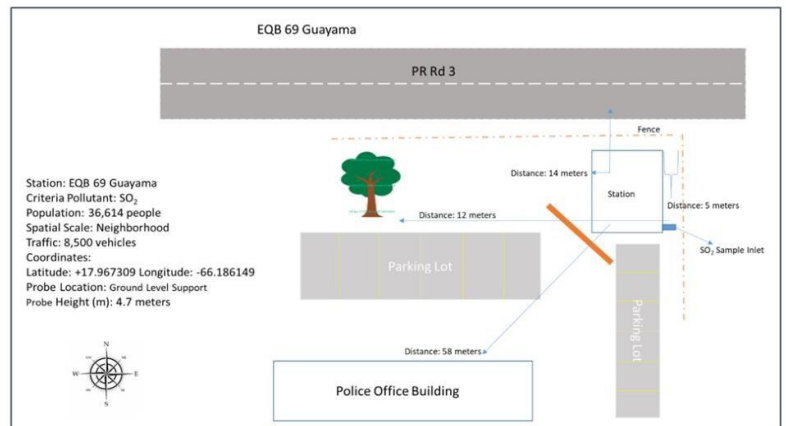
Site Name		EQB 15				
Address		PR Rd. 3				
City		Guayama				
AQS Code		72-057-0012				
PR County		Guayama				
MSA/CSA		Guayama-Salinas				
Latitude		17.955378				
Longitude		-66.617792				
Suitable for Comparison to PM _{2.5} NAAQS?		Yes				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
PM ₁₀	Hi-Vol SA/GMW-1200	Gravimetric	1 in 6	neighborhood	Population Exposure	2019/10/30
PM _{2.5}	Met-One BAM 1022 / VSCC	BAM 1022 Attenuation	continuous	neighborhood	Population Exposure	2019/10/03
Ambient Temperature Average	Instrumental	Electronic	1 in 3	neighborhood	Population Exposure	2019/10/03
Ambient Pressure Average	Instrumental	Barometric Sensor	1 in 3	neighborhood	Population Exposure	2019/10/03
Site Purpose		Protection for the Population				
Plans for the next 18 months		Replace the PM _{2.5} sampler for BAM 1022 Met-One / VSCC (AQI)				
Other comments						

Station EQB 15 Guayama



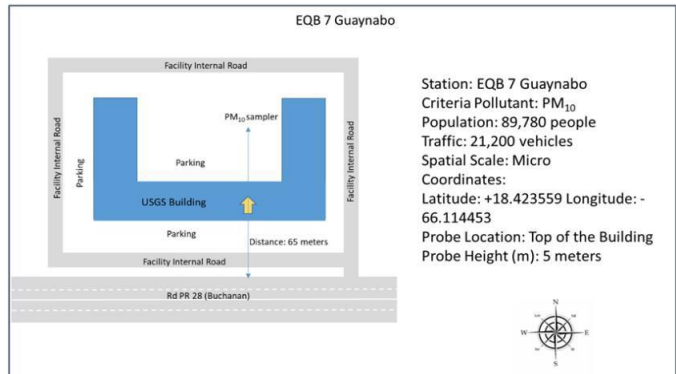
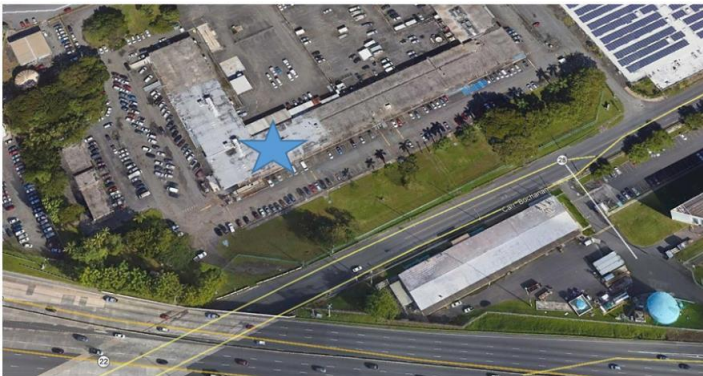
Site Name		EQB 69				
Address		PR Police Station, Stolen Vehicles Division				
City		Guayama				
AQS Code		72-057-0011				
PR County		Guayama				
MSA/CSA		Guayama-Salinas				
Latitude		+17.965713				
Longitude		-66.186803				
Suitable for Comparison to PM _{2.5} NAAQS?		N/A				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
SO ₂	Teledyne	Ultraviolet	continuous	neighborhood	Source oriented	2017/04/06
	T100u	Fluorescence				
Site Purpose		Protection for the population				
Plans for the next 18 months		Install or replace a new SO ₂ monitor.				
Other comments						

Station EQB 69 Guayama



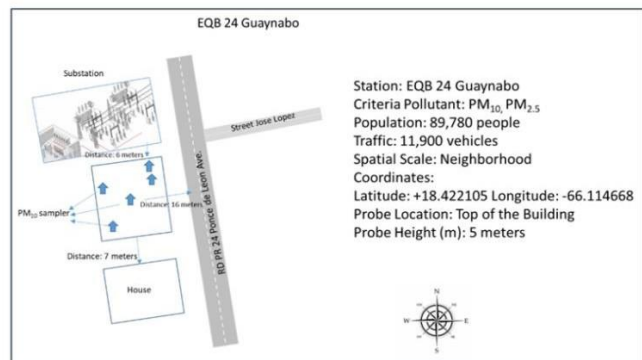
Site Name		EQB 7				
Address		USGS & Water Resources Bldg.				
City		Guaynabo				
AQS Code		72-061-0001				
PR County		Guaynabo				
MSA/CSA		San Juan- Caguas				
Latitude		+18.423559				
Longitude		-66.114453				
Suitable for Comparison to PM _{2.5} NAAQS?		No				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
PM ₁₀	Hi-Vol SA/GMW- 321B	Volumetric	1 in 6	Micro Scale	Highest Concentration	1999/02/28
Site Purpose		Determine High Concentration				
Plans for the next 18 months		No changes				
Other comments		Part of the LMP PM ₁₀ of Guaynabo				

Station EQB 7 Guaynabo



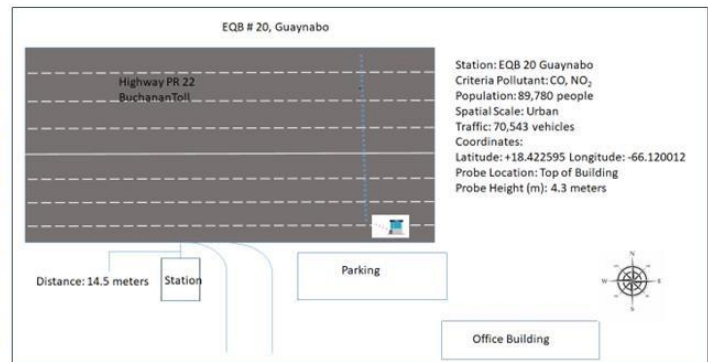
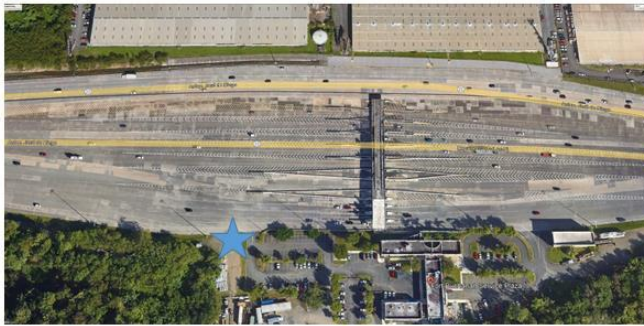
Site Name		EQB 24				
Address		Electrical Substation				
City		Guaynabo				
AQS Code		72-061-0005				
PR County		Guaynabo				
MSA/CSA		San Juan- Caguas				
Latitude		+18.432122				
Longitude		-66.114702				
Suitable for Comparison to PM _{2.5} NAAQS?		yes				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
PM _{2.5}	E-Seq FRM/ VSCC	Gravimetric	1 in 3	Neighborhood	Population Exposure	1999/01/15
PM ₁₀	Hi-Vol SA/GMW- 321B	Volumetric	1 in 3	Neighborhood	Population Exposure	1988/01/05
Ambient Average Temperature	Instrumental	Electronic	1 in 3	Neighborhood	Population Exposure	1999/01/15
Average Barometric Pressure	Instrumental	Barometric Sensor	1 in 3	Neighborhood	Population Exposure	1999/01/15
Site Purpose		Population Protection				
Plans for the next 18 months		No Changes				
Other comments		PM ₁₀ & PM _{2.5} collocate (QA), Part of the LMP PM ₁₀ of Guaynabo				

Station EQB 24 Guaynabo



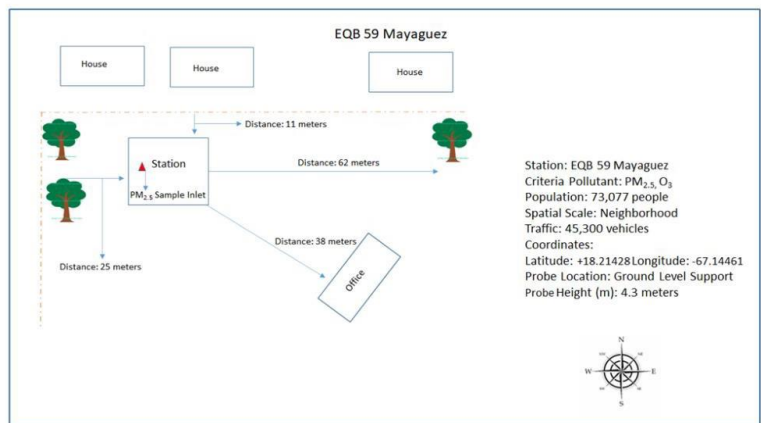
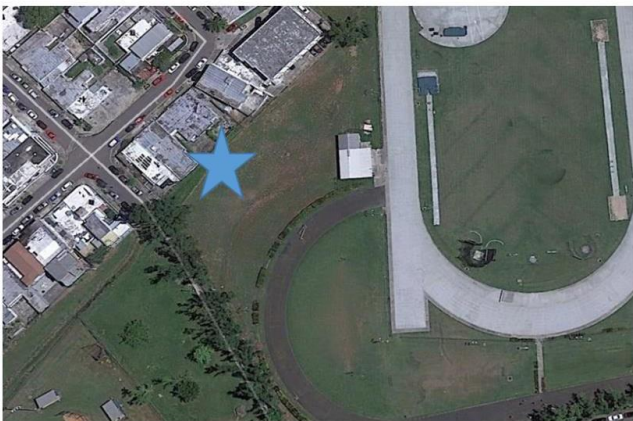
Site Name		EQB 20				
Address		Highway 22 Buchanan Toll				
City		Guaynabo				
AQS Code		72-061-0006				
PR County		Guaynabo				
MSA/CSA		San Juan- Caguas				
Latitude		+18.422595				
Longitude		-66.120012				
Suitable for Comparison to PM _{2.5} NAAQS?		n/a				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
CO	Teledyne T300U	Gas filter Correlation CO	Continuous	Urban	High concentration	2014/07/08
NO ₂	Teledyne T200u	Chemiluminescence	Continuous	Urban	High concentration	2015/02/20
Site Purpose		Near Roads				
Plans for the next 18 months		Re- Start				
Other comments		TSD 2020/01/26, the site was affected by traffic accident in Jan. 2020				

Station EQB 20 Guaynabo



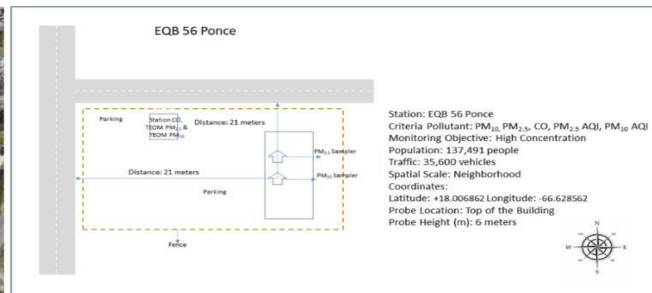
Site Name		EQB 59				
Address		University of PR Mayaguez Campus				
City		Mayagüez				
AQS Code		72-097-0007				
PR County		Mayagüez				
MSA/CSA		Mayagüez				
Latitude		18.21428				
Longitude		-67.14461				
Suitable for Comparison to PM _{2.5} NAAQS		No				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
PM _{2.5} Continuous	TEOM 1405 PM _{2.5} VSCC	FDMS Gravimetric	Continuous	neighborhood	Population exposure	2019/06/11
O ₃	Teledyne T400U	Ultraviolet Abs	Continuous	Urban	Population exposure	2019/06/11
Site Purpose		AQI purpose				
Plans for the next 18 months		Replace the PM _{2.5} analyzer for BAM 1022 Metone / VSCC and repair the Ozone analyzer				
Other comments		PM _{2.5} & Ozone (AQI)				

Station EQB 59 Mayaguez



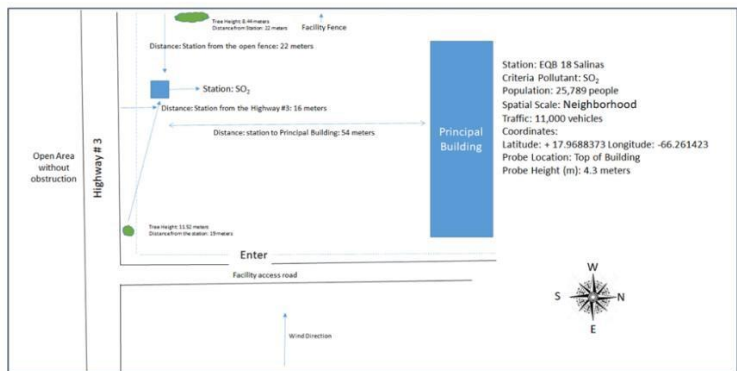
Site Name		EQB 56				
Address		Civil Defense Building Urb. San Antonio				
City		Ponce				
AQS Code		72-113-0004				
PR County		Ponce				
MSA/CSA		Ponce				
Latitude		+18.009558				
Longitude		-66.627249				
Suitable for Comparison to PM _{2.5} NAAQS?		yes				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
PM _{2.5}	E-Seq VSCC	Gravimetric	1 in 3	Neighborhood	Population Exposure	1999/01/15
PM ₁₀	Hi-Vol SA/GMW-1200	Volumetric	1 in 6	Neighborhood	High Concentration	1999/01/06
CO	Instrumental	T300U Gas filter Correlation CO	Continuous	Neighborhood	Population Exposure	2011/10/01
PM ₁₀ continuous	Met-One BAM 1020	BAM 1020 Attenuation	Continuous	Neighborhood	Source oriented	2011/10/05
PM _{2.5} continuous	Met-One BAM 1020 / VSCC	BAM 1020 Attenuation	Continuous	Neighborhood	Source Oriented	2017/07/05
Ambient Average Temperature		Barometric Sensor		Neighborhood	Source Oriented	1999/01/15
Sample Average Barometric Pressure		Electronic		Neighborhood		1999/01/15
Site Purpose		AQI purpose, Population Protection				
Plans for the next 18 months		Replace the PM _{2.5} continuous analyzer for BAM 1022 Metone / VSCC. Re-install BAM 1020 (PM ₁₀).				
Other comments		AQI (PM _{2.5} & PM ₁₀)				

Station EQB 56 Ponce



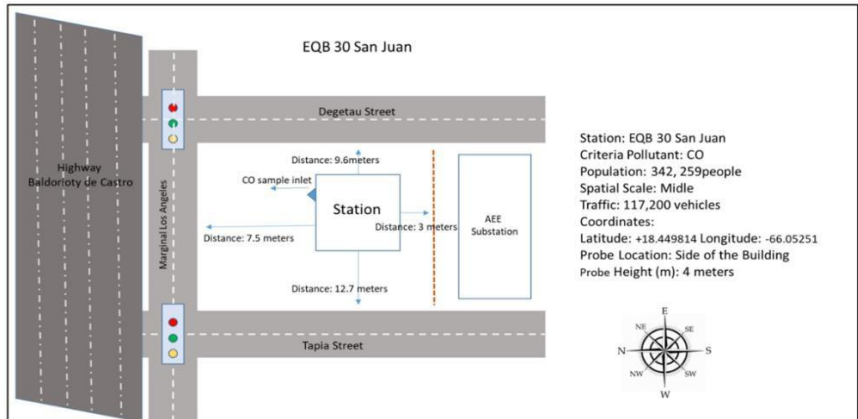
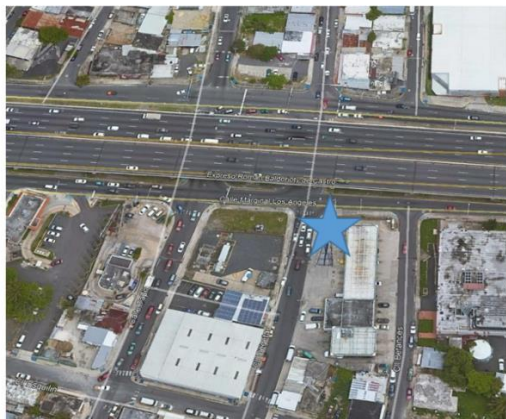
Site Name		EQB 18				
Address		PR Rd. 3 (Inside Syngenta Company area)				
City		Salinas				
AQS Code		72-123-0004				
PR County		Salinas				
MSA/CSA		Guayama - Salinas				
Latitude		+17.9688373				
Longitude		-66.261423				
Suitable for Comparison to PM _{2.5} NAAQS?		N/A				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
SO ₂	Teledyne T100	Ultraviolet Fluorescence	Continuous	Neighborhood	High Concentration	2023/01/19
Site Purpose		Population Protection & High Concentration				
Plans for the next 18 months		N/A				
Other comments						

Station EQB 18 Salinas



Site Name		EQB 30				
Address		Baldorioty de Castro Ave.				
City		San Juan				
AQS Code		72-127-0003				
PR County		San Juan				
MSA/CSA		San Juan- Bayamon				
Latitude		+18.449814				
Longitude		-66.052510				
Suitable for Comparison to PM _{2.5} NAAQS?		No				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
CO	Teledyne T- 300U	Gas Filter Corr. CO	Continuous	Middle	High Concentration	1995/04/01
Site Purpose		Determine High Concentration and protection of population				
Plans for the next 18 months		Re-Start				
Other comments		TSD 2021/01/01 (due to lack of personnel)				

Station EQB 30 San Juan



Site Name	EQB #37 NCore Station
Address	Regional Jail of Bayamon
City	Bayamon
AQS Code	72-021-0010
PR County	Bayamon
MSA/CSA	San Juan - Bayamon
Latitude	+18.420089
Longitude	-66.150615
Suitable for Comparison to PM _{2.5} NAAQS?	N/A

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Begin Date
SO ₂	Teledyne T100u	Ultraviolet Fluorescent	Continuous	Neighborhood	Population Exposure	2011/03/16
CO	Teledyne T300u	Gas Filter Corr. CO Analyzer	Continuous	Neighborhood	Population Exposure	2011/03/16
NO	Teledyne T200u	Chemiluminescence	Continuous	Neighborhood	Population Exposure	2014/05/21
NO _y	Teledyne T200u	Chemiluminescence	Continuous	Neighborhood	Population Exposure	2014/05/21
NO _y -NO	Teledyne T200u	Chemiluminescence	Continuous	Neighborhood	Population Exposure	2014/05/21
PM ₁₀	E-FRM PM ₁₀	Gravimetric	1-3	Neighborhood	Population Exposure	2015/05/09
PM _{2.5}	E-Seq FRM PM _{2.5} /VSCC	Gravimetric	1-3	Neighborhood	Population Exposure	2015/04/12
PM _{10-2.5}	E-FRM PM _{10-2.5} Sampler Pair	Paired Gravimetric	1-3	Neighborhood	Population Exposure	2015/05/09
PM _{2.5} AQI	BAM 1022 Metone VSCC	BAM Attenuation Mass	Continuous	Neighborhood	Source Oriented	2023/10/01

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Begin Date
O ₃	Teledyne T-400	Ultraviolet	Continuous	Neighborhood	Population Exposure	2014/05/21
PM _{2.5} Speciation	Met-One SASS Teflon	Energy Dispersive XRF	1-3	Neighborhood	Population Exposure	2015/11/20
	URG-3000N Sequential	Sequential Particulate Speciation	1-3	Neighborhood	Population Exposure	2015/11/20
Wind Speed Resultant	Instrumental	RM Young Ultrasonic Anemometer Model 81000	Continuous	Neighborhood	Population Exposure	2014/05/21
Wind Direction Resultant	Instrumental	RM Young Ultrasonic Anemometer Model 81000	Continuous	Neighborhood	Population Exposure	2014/05/21
Outdoor Temperature	Instrumental	Met One 083D	Continuous	Neighborhood	Population Exposure	2014/05/21
Relative Humidity	Instrumental	Met One 083D	Continuous	Neighborhood	Population Exposure	2014/05/21
Barometric Pressure	Instrumental	Barometric sensor	Continuous	Neighborhood	Population Exposure	2014/05/21

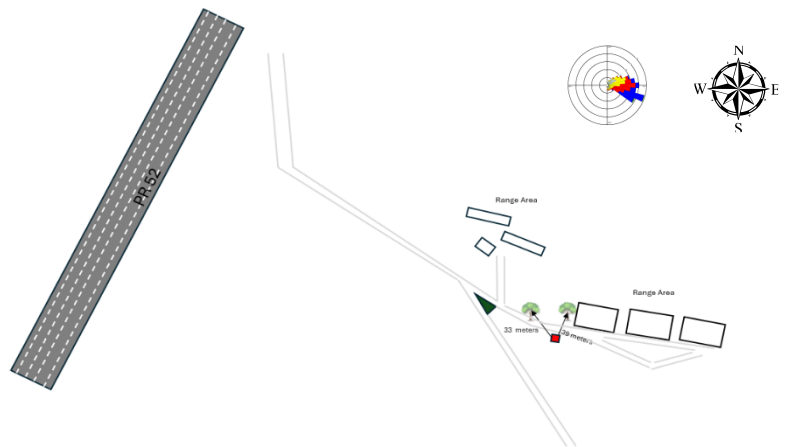
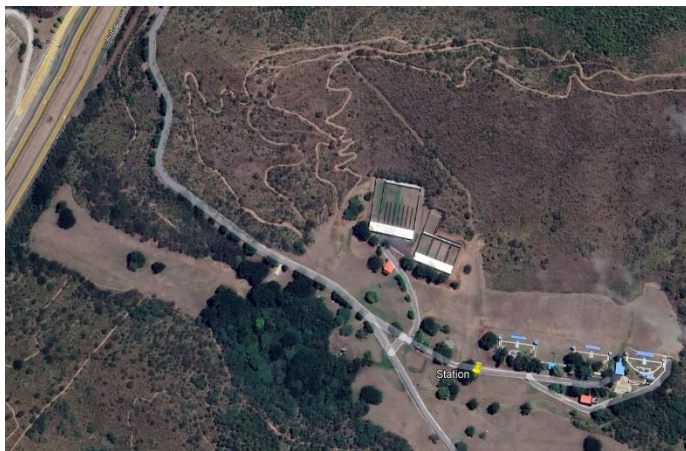
Parameter	Monitor Type
Sulfur Dioxide	SLAMS
Carbon Monoxide	SLAMS
Oxide Nitrogen	SLAMS
Oxide Nitrogen (NO _y)	SLAMS
Ozone	SLAMS
PM _{2.5}	SLAMS
PM ₁₀	SLAMS
PM _{2.5} /PM ₁₀	SLAMS
PM _{2.5} Speciation	SLAMS
PM _{2.5} AQI	SLAMS/AQI

Site Purpose	NCore Site
Plans for the next 18 months	Re-start NO _y , CO, SO ₂ and PM _{2.5} Spec.
Comments	O ₃ TBD.

APPENDIX B: SO₂ New Sites

Site Name		EQB 80				
Address		PR-712, Km 0.3 (Inside Albergue Olimpico-Gravity Park)				
City		Salinas				
AQS Code		72-123-0006				
PR County		Salinas				
MSA/CSA		Guayama - Salinas				
Latitude		18.022171				
Longitude		-66.236657				
Suitable for Comparison to PM _{2.5} NAAQS?		N/A				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
SO ₂	Teledyne T100	Ultraviolet Fluorescence	Continuous	Micro	High Concentration	END of 2026
Site Purpose		Population Protection & High Concentration				
Plans for the next 18 months		N/A				
Other comments						

EQB 80 Gravity Park Salinas



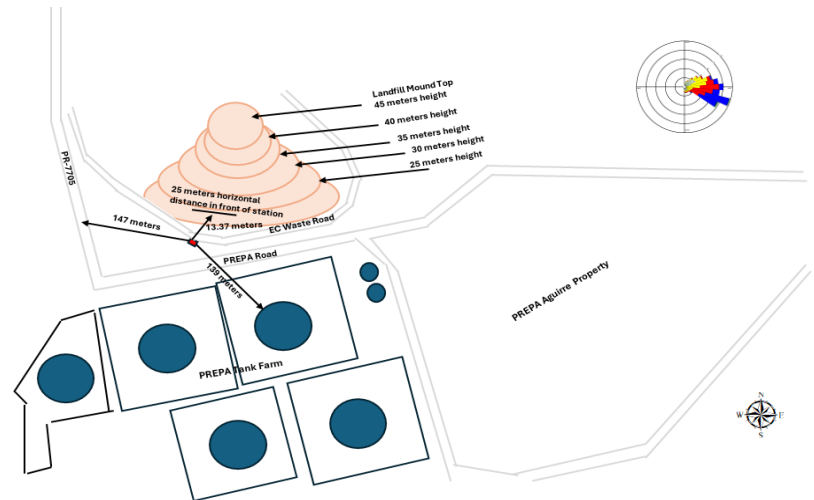
Gravity Park, Salinas
 Criteria Pollutant: SO₂
 PR 712, Salinas
 Population: 25,000 people
 Spatial Scale: Micro
 Traffic: vehicles: 30,300 vehicles
 Coordinates:
 Lat/Long: 18.022171 -66.236657
 Probe Location: top of shelter
 Probe Height: 4.5 meters
 Unrestricted air flow: the probe has a continuous arc greater that 270°
 Probe is away from furnace, incineration flues or minor sources.
 Probe Inlet: No obstacles, supporting structures or walls around the probe inlet.

EQB 80 Gravity Park Salinas Pictures



Identificación		EQB 79				
Dirección		PR-3, Km 152.7 (Inside EC Waste Property)				
Municipio		Salinas				
Código de AQS		72-123-0005				
MSA/CSA		Salinas				
Latitud		Guayama - Salinas				
Longitud		17.952912				
Utilizarse cumplimiento PM _{2.5} NAAQS		-66.236504				
Tipo Monitor		N/A				
Identificación		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
SO ₂	Teledyne T100	Ultraviolet Fluorescence	Continuous	Micro	High Concentration	END of 2026
Site Purpose		Population Protection & High Concentration				
Plans for the next 18 months		N/A				
Other comments						

EQB 79 EC Waste Salinas



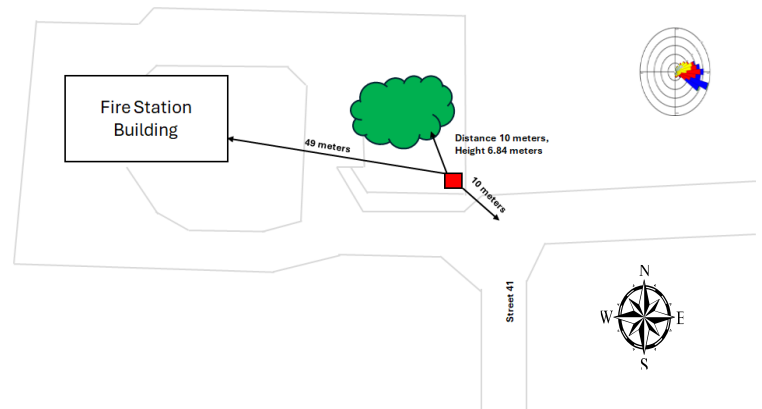
EC Waste Salinas
 Criteria Pollutant: SO₂
 PR 3, Km 152.7, Salinas
 Population: 25,000 people
 Spatial Scale: Micro
 Traffic: 10,591 vehicles
 Coordinates:
 Lat/long: 17.95912 -66.236504
 Probe Location: top of shelter
 Probe Height: 4.5 meters
 Unrestricted air flow: the probe has a continuous arc greater that 274°
 Obstacle horizontal distance to the height of the probe is 11 meters (Landfill Mound), meets the 2:1 ratio.
 Probe is away from furnace, incineration flues or minor sources.
 Probe Inlet: No supporting structures or walls around the probe inlet.

EQB 79 EC Waste Salinas Pictures



Site Name		EQB 81				
Address		PR-744, 41 Street (Inside Fire Station)				
City		Guayama				
AQS Code		72-057-0013				
PR County		Guayama				
MSA/CSA		Guayama - Salinas				
Latitude		17.971926				
Longitude		-66.113524				
Suitable for Comparison to PM _{2.5} NAAQS?		N/A				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
SO ₂	Teledyne T100	Ultraviolet Fluorescence	Continuous	Regional	Background	End of 2026.
Site Purpose		Background				
Plans for the next 18 months		N/A				
Other comments						

EQB 81 Fire Station Guayama



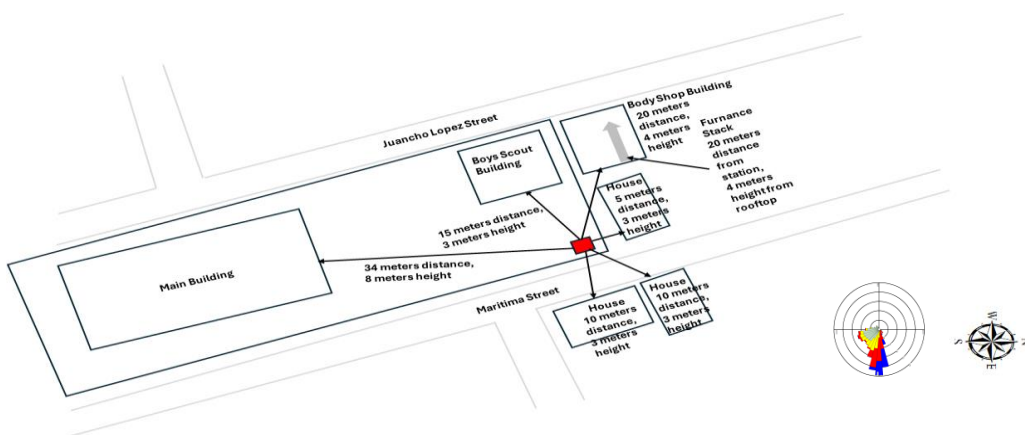
Fire Station Guayama
 Criteria Pollutant: SO₂
 PR 744, 41 Street, Guayama
 Population: 35,262 people
 Spatial Scale: Regional
 Traffic: 9,082 vehicles
 Coordinates:
 Lat/Long: 17.971926 -66.113524
 Probe Location: top of shelter
 Probe Height: 4.5 meters
 Unrestricted air flow: the probe has a continuous arc greater than 345°
 Obstacle horizontal distance to the height of the probe is 4.68 meters, meets the 2:1 ratio.
 Probe is away from furnace, incineration flues or minor sources.
 Probe Inlet: No supporting structures or walls around the probe inlet.

EQB 81 Fire Station Guayama Pictures



Site Name		EQB 78				
Address		Maritima Street (Inside Emergency Management Office)				
City		Guaynabo				
AQS Code		72-061-0016				
PR County		Guaynabo				
MSA/CSA		San Juan				
Latitude		18.430193				
Longitude		-66.112519				
Suitable for Comparison to PM _{2.5} NAAQS?		N/A				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
SO ₂	Teledyne T100	Ultraviolet Fluorescence	Continuous	Micro	High Concentration	End of 2026.
Site Purpose		Population Protection & High Concentration				
Plans for the next 18 months		N/A				
Other comments						

EQB 78 Emergency Management Office Guaynabo

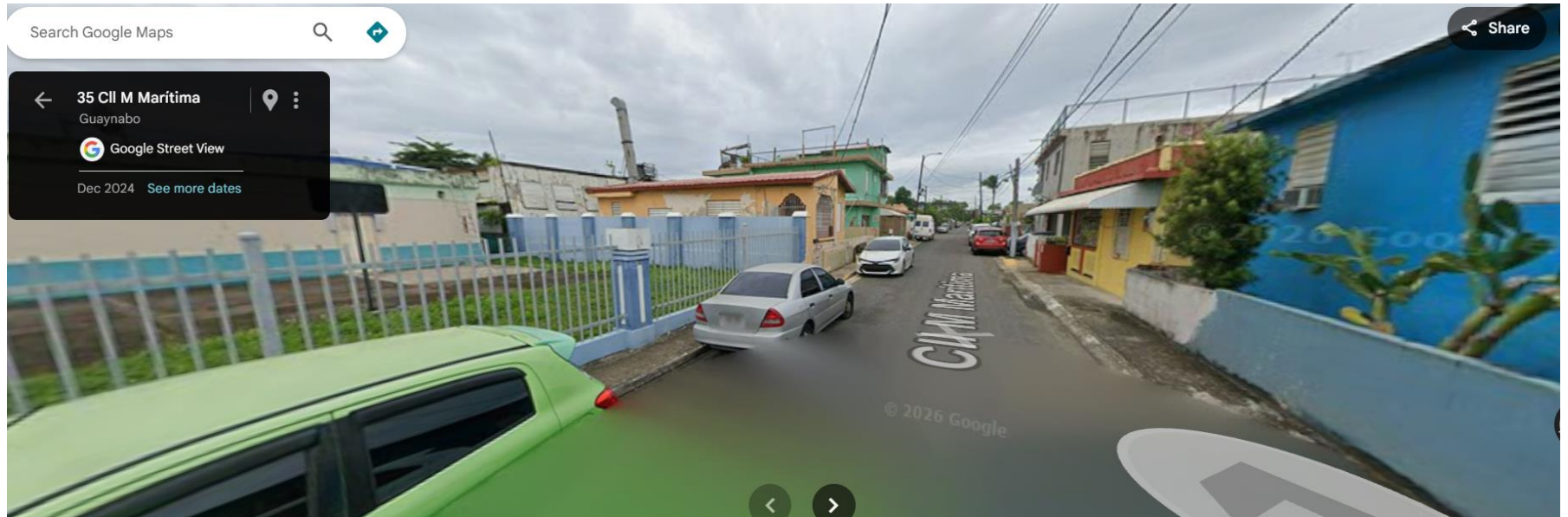


Emergency Management Office Guaynabo
 Criteria Pollutant: SO₂
 Maritima Street, Amelia Sector, Guaynabo
 Population: 21,874 people
 Spatial Scale: Micro
 Traffic: 21,238 vehicles
 Coordinates:
 Lat/Long: 18.430193 -66.112519
 Probe Location: top of shelter
 Probe Height: 4.5 meters
 Unrestricted air flow: the probe has a continuous arc greater than 354°
 Obstacle horizontal distance to the height of the probe is 7 meters, meets the 2:1 ratio.
 Body Shop furnace, 20 meters distance to the northwest from the probe.
 Probe Inlet: No supporting structures or walls around the probe inlet.

EQB 78 Emergency Management Office Guaynabo Pictures

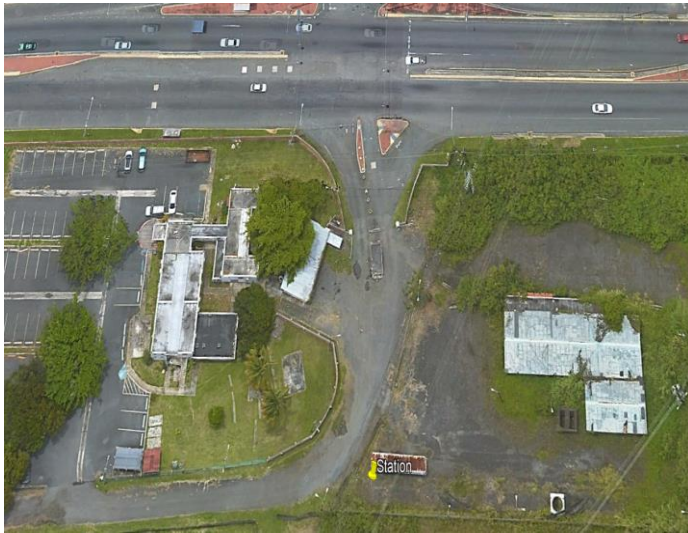


EQB 78 Emergency Management Office Guaynabo Pictures



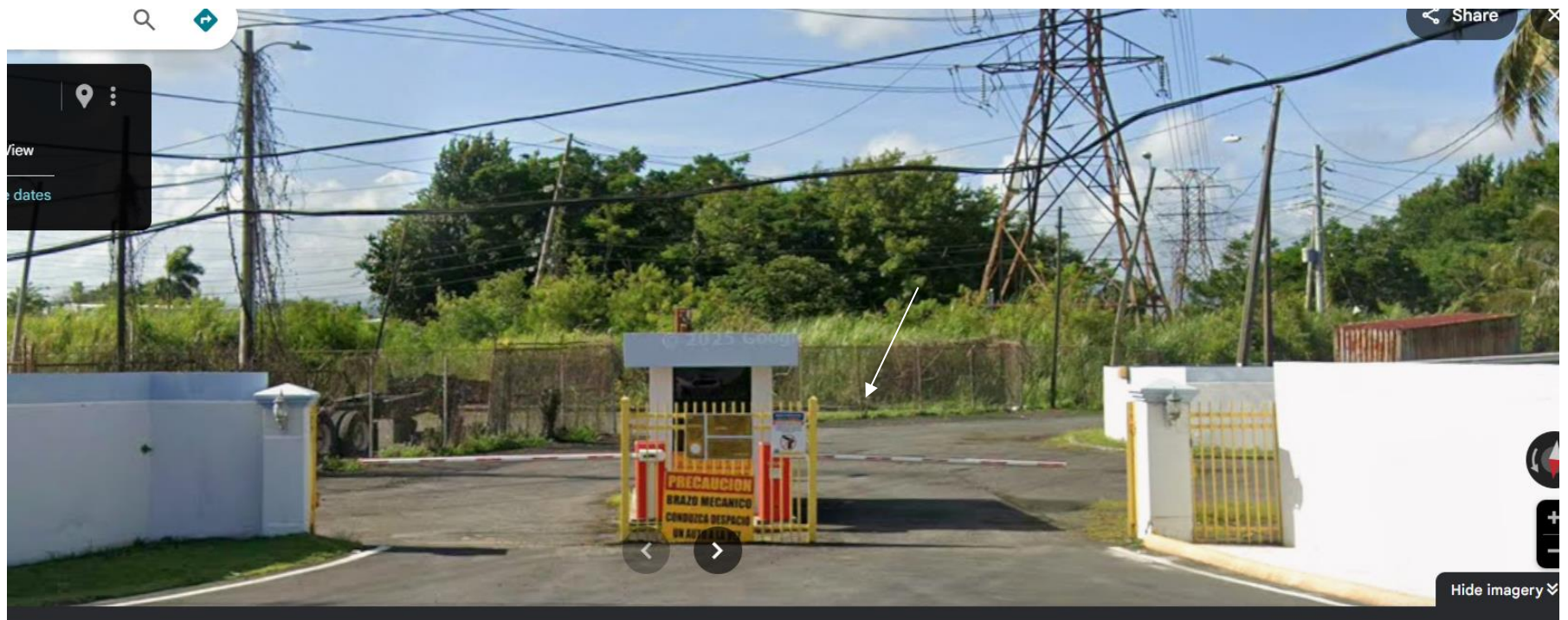
Site Name		EQB 77				
Address		PR 165 (Inside Hidrogas Facility)				
City		Toa Baja				
AQS Code		72-137-0004				
PR County		Toa Baja				
MSA/CSA		San Juan				
Latitude		18.453355				
Longitude		-66.149606				
Suitable for Comparison to PM _{2.5} NAAQS?		N/A				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
SO ₂	Teledyne T100	Ultraviolet Fluorescence	Continuous	Micro	High Concentrations	End of 2026.
Site Purpose		Population Protection & High Concentration				
Plans for the next 18 months		N/A				
Other comments						

EQB 77 Hidrogas Toa Baja



AEE Hidrogas, Toa Baja
 Criteria Pollutant: SO₂
 PR 165, Toa Baja
 Population: 72,783 people
 Spatial Scale: Micro
 Traffic: 16,842 vehicles
 Coordinates:
 Lat/Long: 18.453355 -66.149606
 Probe Location: top of shelter
 Probe Height: 4.5 meters
 Unrestricted air flow: the probe has a continuous arc greater than 270°
 Obstacle horizontal distance to the height of the probe is 17 meters, meets the 2:1 ratio.
 Probe is away from furnace, incineration flues or minor sources.
 Probe Inlet: No supporting structures or walls around the probe inlet.

EQB 77 Hidrogas Toa Baja Pictures

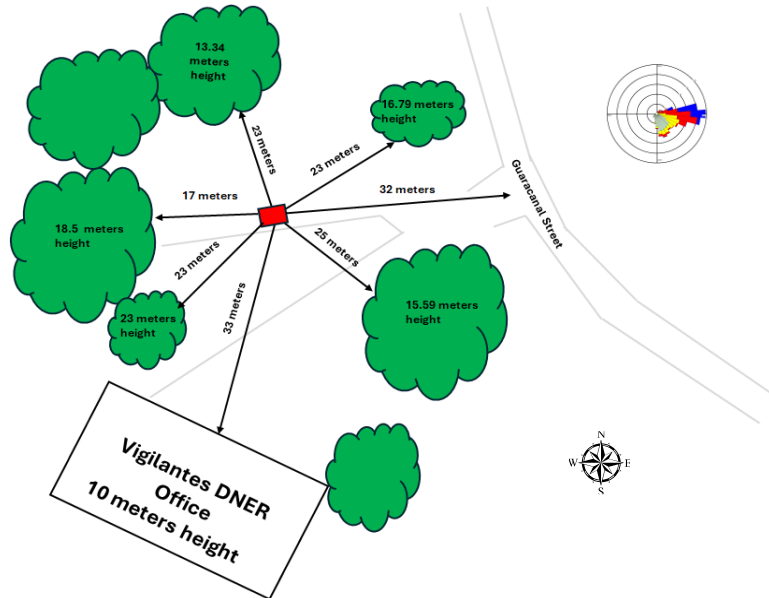


EQB 77 Hidrogas Toa Baja Pictures



Site Name		EQB 76				
Address		DNER Comandancia de Cuerpo de Vigilantes, Guacaranal Street				
City		San Juan				
AQS Code		72-127-0012				
PR County		San Juan				
MSA/CSA		San Juan				
Latitude		18.38446				
Longitude		-66.052724				
Suitable for Comparison to PM _{2.5} NAAQS?		N/A				
Monitor Type		SLAMS				
Parameter	Method	Analysis Method	Schedule	Spatial Scale	Objective	Begin Date
SO ₂	Teledyne T100	Ultraviolet Fluorescence	Continuous	Middle	Background	END of 2026
Site Purpose		Background				
Plans for the next 18 months		N/A				
Other comments						

EQB 76 Comandancia Cuerpo de Vigilantes



DNER Comandancia Cuerpo de Vigilantes

Criteria Pollutant: SO₂

Guacaranal Street, San Juan

Population: 334,776 people

Spatial Scale: Middle

Traffic: 30,300 vehicles

Coordinates:

Lat/Long: 18.38446 -66.052724

Probe Location: top of shelter

Probe Height: 4.5 meters

Unrestricted air flow: the probe has a continuous arc greater than 320°

Obstacle horizontal distance to the height of the probe is 28 meters, less than the 2:1 ratio, but the probe is 17 meters from the tree drip line.

Probe is away from furnace, incineration flues or minor sources.

Probe Inlet: No supporting structures or walls around the probe inlet.

EQB 76 Comandancia Cuerpo de Vigilantes Pictures



EQB 76 Comandancia Cuerpo de Vigilantes Pictures



APPENDIX C: NEW SO₂ SHELTER TECHNICAL INFORMATION

RESIDENCE TIME INFORMATION

2. SPECIFICATIONS, APPROVALS & COMPLIANCE

This section presents specifications for the T100 analyzer and the O₂ and CO₂ sensor options, Agency approvals, EPA equivalency designation, and CE mark compliance.

2.1. SPECIFICATIONS AND APPROVALS

Table 2-1 T100 Basic Unit Specifications

Parameter	Description	
Ranges (Physical Analog Output)	Min: 0-50 ppb Full Scale Max: 0-20,000 ppb Full Scale (selectable, dual ranges and auto ranging supported)	
Measurement Units	ppb, ppm, µg/m ³ , mg/m ³ (selectable)	
Zero Noise ¹	<0.2 ppb (RMS)	
Span Noise ¹	<0.5% of reading, above 50 ppb	
Lower Detectable Limit ²	<0.4 ppb	
Zero Drift	<0.5 ppb/24 hours	
Span Drift	<0.5% of full scale/24 hours	
Lag Time ¹	20 seconds	
Rise/Fall Time ¹	<100 sec to 95%	
Linearity	1% of full scale	
Precision ¹	0.5% of reading above 50 ppb	
Sample Flow Rate	650 cc/min. ±10%	
Power Requirements	Power Rating	Typical Power Consumption
	110-120 V~, 60 Hz 3.0A 220-240 V~, 50/60 Hz 3.0A	165W 140W
Analog Output Ranges	10 V, 5 V, 1 V, 0.1 V (selectable)	
Recorder Offset	± 10 %	
Standard I/O	1 Ethernet: 10/100Base-T 2 RS-232 (300 – 115,200 baud) 2 USB device ports 8 opto-isolated digital outputs 6 opto-isolated digital inputs 4 analog outputs	
Optional I/O	1 USB com port 1 RS485 8 analog inputs (0-10V, 12-bit) 4 digital alarm outputs Multidrop RS232 3 4-20mA current outputs	

Specifications, Approvals & Compliance

Teledyne API - T100 UV Fluorescence SO₂ Analyzer

Parameter	Description
Environmental	Installation category (over-voltage category) II; Pollution degree 2 Intended for Indoor use only at altitudes ≤ 2000m
Operating Temperature	5 - 40 °C (with EPA Equivalency)
Humidity Range	0 - 95% RH, non-condensing
Dimensions HxWxD	7" x 17" x 23.5" (178 mm x 432 mm x 597 mm)
Weight	31 lbs (14 kg); 35.7 lbs (16.2 kg) with internal pump
¹ As defined by the USEPA.	
² Defined as twice the zero noise level by the USEPA.	

Table 2-2: O₂ Sensor Option Specifications

Parameter	Description
Ranges	0-1% to 0-100% user selectable. Dual ranges and auto-ranging supported.
Zero Noise ¹	<0.02% O ₂
Lower Detectable Limit ²	<0.04% O ₂
Zero Drift (24 hours) ³	<± 0.02% O ₂
Zero Drift (7 days)	<± 0.05% O ₂
Span Noise ¹	<± 0.05% O ₂
Span Drift (7 days)	<± 0.1% O ₂
Accuracy	(intrinsic error) <± 0.1% O ₂
Linearity	<± 0.1 % O ₂
Temp Coefficient	<± 0.05% O ₂ /°C,
Rise and Fall Time	<60 seconds to 95%
¹ As defined by the USEPA	
² Defined as twice the zero noise level by the USEPA	
³ Note: zero drift is typically <± 0.1% O ₂ during the first 24 hrs of operation	

Table 2-3: CO₂ Sensor Option Specifications

Parameter	Description
Ranges	0-1% to 0-20% user selectable. Dual ranges and auto-ranging supported.
Zero Noise ¹	<0.02% CO ₂
Zero Drift (24 hours)	<± 0.02% CO ₂
Zero Drift (7 days)	<± 0.05% CO ₂
Span Noise ¹	<± 0.1% CO ₂
Span Drift (7 days)	<± 0.1% CO ₂
Lower Detectable Limit ²	<0.04% CO ₂
Accuracy	<± (0.02% CO ₂ + 2% of reading)
Linearity	<± 0.1% CO ₂
Temperature Coefficient	<± 0.01% CO ₂ /°C
Rise and Fall Time	<60 seconds to 95%
¹ As defined by the USEPA	
² Defined as twice the zero noise level by the USEPA	

PROBE MATERIAL INFORMATION

TEFLON CAP
 ROOF FLANGE W/COMPRESSION FITTING
 0.50\"/>
 TYPICAL CONFIGURATION

A1	8x8 AMBIENT AIR MONITORING SHELTER
A	3x2 ALUMINUM BASE
B	ALUMINUM EXTERIOR SKIN: IVORY
C	RUBBER MEMBRANE ROOF
D	R25 INSULATED WALLS / CEILING
E	INTERIOR WALLS: FRP PANELS (WHITE)
F	36\"/>
G	HASP ON 3 OF 12 DOORS (RE KEY SHELTER PER CUSTOMER KEY)
H	STAINLESS CORNER CAPS W/WELDED SS JACK POCKETS
J	SINGLE ANALYZER INLET WITH RAINCAP, W/FLANGE

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8x8 SHELTER

DATE	2/21/2024
DESIGNED BY	CS
DRAWN BY	CS
CHECKED BY	CS
SCALE	1:1

CONSOLIDATED ANALYTICAL SYSTEMS
 2028 Spring Grove Ave
 Channahon, IL 61424

TITLE: **PALADIUS**

CAS
 CONSOLIDATED ANALYTICAL SYSTEMS

SIZE: D DWG. NO.: 23-5441 REV: -
 SCALE: 1:24 | WEIGHT: SHEET 4 OF 6