Puerto Rico
Air Monitoring Network Plan

2013

PUERTO RICO
ENVIRONMENTAL QUALITY BOARD

APRIL, 2013

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Acronyms and Abbreviations

AQS: Air Quality System
CFR: Code Federal Register
CBSA: Core-based Statistical Area
EPA: Environmental Protection Agency
FEM: Federal Equivalent Method
FRM: Federal Reference Method
MSA: Metropolitan Statistical Area
NAAQS: National Air Ambient Quality Standards
NAMS: National Air Monitoring Stations
NCore: National Core Multi-pollutant Monitoring Stations
NO_2: Nitrogen Dioxide
O_3: Ozone
OSI: Information System Office
PAMS: Photochemical Assessment Monitoring Stations
PB: Lead
PM_{10}: Particulate Matter
$PM_{2.5}$: Fine Particulate Matter
ppm: parts per million
PR: Puerto Rico
PREQB: Puerto Rico Environmental Quality Board
PREPA: Puerto Rico Power Electrical Authority
QAMP: Quality Assurance Monitoring Plan
QAPP: Quality Assurance Project Plan
RCPA: Regulation for the Control of Atmospheric Pollution of Puerto Rico
SLAMS: State and Local Air Monitoring Stations
SO_2: Sulfur Dioxide
SO_4: Sulfate
SPM: Special Purpose Monitor
TEOM: Tapered Element Oscillating Microbalance
TSP: Total Suspended Particulate

1.0 INTRODUCTION

The Puerto Rico Environmental Quality Board (PREQB) develops an annual ambient air monitoring network plan which is a review of the ambient air monitoring network each year as required by Title 40 of the Code of Federal Regulation (CFR), Part 58. This Air Monitoring Network Plan meets the requirements of 40 CFR 58.10(a) (1). The purpose of this plan is to provide for the establishment and maintenance of an air quality monitoring system in Puerto Rico that consists of a network of National Air Monitoring Stations (NAMS), State and Local Air Monitoring Stations (SLAMS) and Special Purpose Monitoring (SPM) sites that include federal reference method (FRM) monitors.

The review finds the state's ambient air quality concentrations are demonstrating attainment with EPA's National Ambient Air Quality Standards (NAAQS). Modifications to the state's ambient air monitoring network are being proposed to adjust the sampling sites to meet the changing needs of Puerto Rico. A complete description of each station is on file at the Air Monitoring Area and is available to review upon request.

1.1 NETWORK MODIFICATION PROCESS

The Puerto Rico monitoring network is reviewed annually to verify that the objectives of the network met with the last review of the NAAQS. The most recent emissions inventories (2012) for each pollutant are reviewed along with population data, traffic volumes and ambient data gathered in the area. Also, if is possible the air pollution dispersion modeling are reviewed. Based on that information, Puerto Rico may identify the need to modify the network, that is adding more monitoring station or relocating the exiting station or eliminating the sites that are no longer needed for the monitoring needs of the State. If a change is needed in the monitoring network, a Network Modification Form is submitted to EPA Region II prior to or as part of installing, modifying, or removing a monitor.

1.2 REVIEW OF NETWORK MODIFICATIONS IN 2013-14

For PREQB is critical verify that the monitoring network is operating as efficiently as possible according with the new NAAQS review, with increasing monitoring needs and fiscal constraints. To meet that goal each station is evaluated to determine if the station addresses a critical need without duplicating existing information.

Also, PREQB consider the requirements for the monitoring objectives established under Nitrogen Dioxide (NO_2) NAAQS, Carbon Monoxide (CO) NAAQS and Particulate Matter (PM) NAAQS that include monitor near road with highest volume traffic to determine this pollutants concentrations middle and micro scale environments.

PREQB uses the regulations target the Core Based Statistical Areas (CBSAs) in Puerto Rico to determine the requires monitoring sites near road. The required monitoring sites will be deployed in according to population thresholds, describe in the Section 1.4 METROPOLITAN STATISTICAL AREAS (MSA) AND CORE BASED STATISTICAL AREAS CBSA, and the traffic volumes, traffic congestion pattern , topography and meteorology.

1.3 CURRENT PUERTO RICO AIR MONITORING NETWORK

The following sections describe the SLAMS, and SPM sites in Puerto Rico's current air monitoring network and identifies the location (address), the objective, and the spatial scale represented by each site.

- ✓ Location: is the actual address where each monitoring site is located
- ✓ The Air Quality System (AQS) number: is the number that identifies the site by state, county, and location.
- ✓ The monitoring objectives include: population exposure (Population), source impact (Source), highest expected concentration (High) or background station (Background)
- ✓ The spatial scale: is described in terms of the physical dimensions of the air parcel surrounding an air monitoring station throughout which pollutant concentrations are reasonably homogeneous.

The following pages discuss by each pollutant, the monitoring site, the objective of the monitoring site, and the instruments used at each site

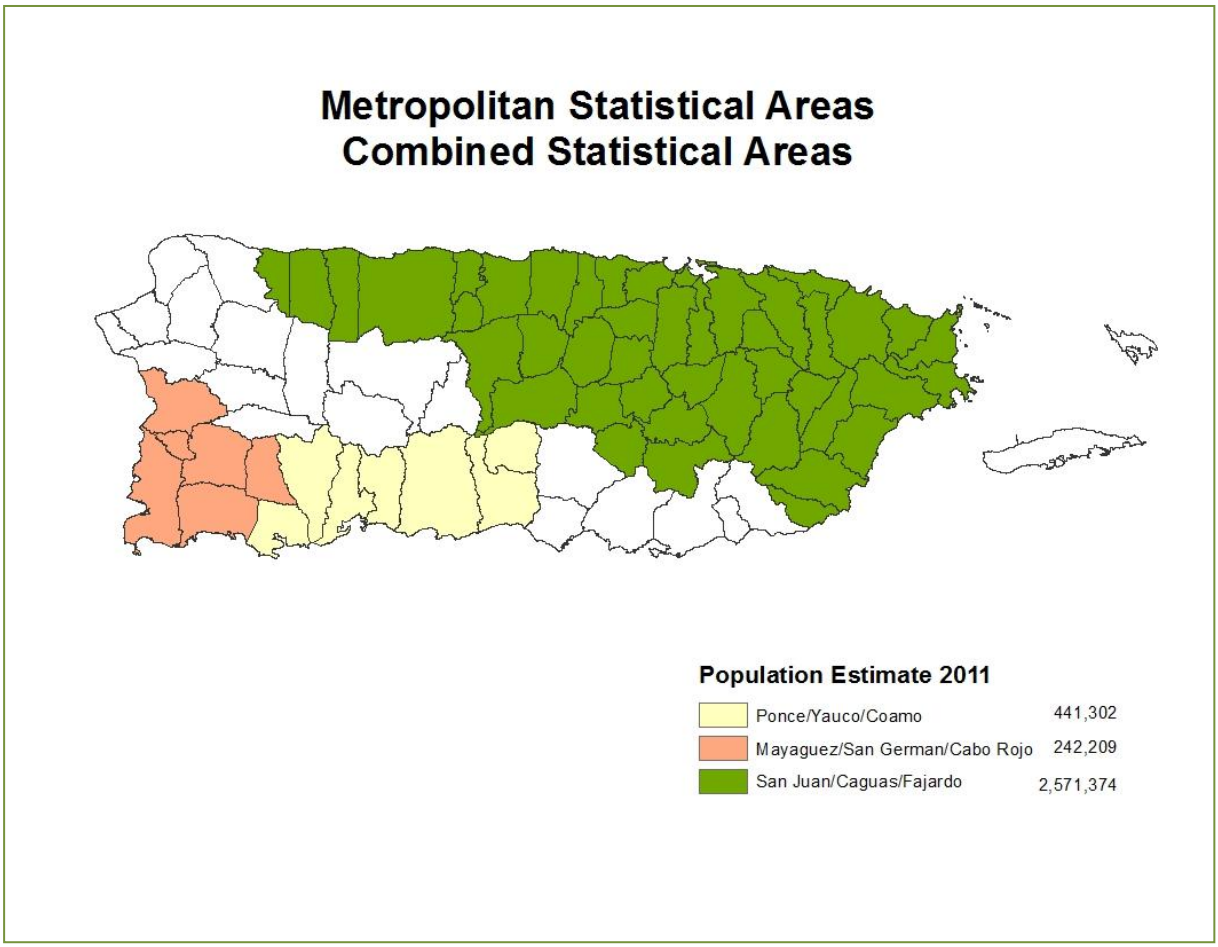
The instruments used in the PREQB monitoring network are EPA reference or equivalent instruments. The instruments used to measure the criteria pollutants comply with 40 CFR Part 58, Appendix C. according to the list dated February 1, 2011.

1.4 METROPOLITAN STATISTICAL AREAS (MSA) AND CORE BASED STATISTICAL AREAS CBSA

To review the PR Monitoring Network, PREQB uses the statistical definitions provided by the Office of Management and Budget and the Census Bureau (April 2012). The U.S. Census Bureau produces annual estimates of the resident population for the Commonwealth of Puerto Rico and its counties. The estimates are produced by age and sex using a cohort-component approach.

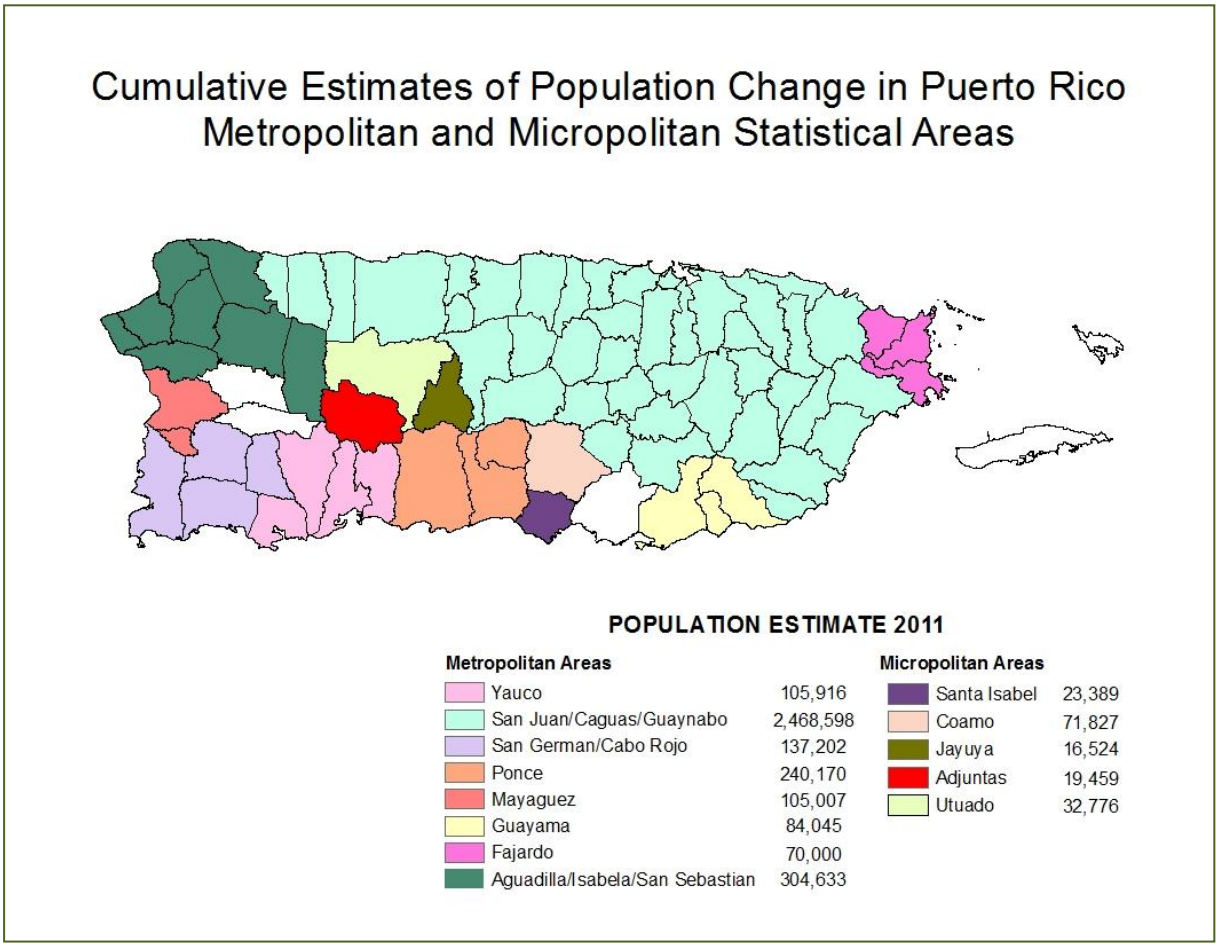
Core-based statistical area (CBSA) - Defined by the U.S. Office of Management and Budget, as a statistical geographic entity consisting of the county or counties associated with at least one urbanized area/urban cluster of at least 10,000 population, plus adjacent counties having a high degree of social and economic integration.

Figure 1



Metropolitan Statistical Area (MSA) - A Core-based statistical area (CBSA) associated with at least one urbanized area of 50,000 populations or over. The Central County plus adjacent counties with a high degree of integration comprise the area.

Figure 2



1.5 COMMENTS ON PUERTO RICO AIR MONITORING NETWORK PLAN

The annual plan is published in the PREQB's website to provide public review and comments so adjustments can be made to meet the needs of the general public before the annual plan is finalized. This Monitoring Network Plan was available for public inspection for 30 days until May 30, 2013. Comments will be reviewed to determine if changes or modifications to the plan are necessary.

1.6 MONITORING DATA QUALITY ASSURANCE

The Quality Assurance Management Plan (QAMP) was prepared by the Puerto Rico Environmental Quality Board and approved by EPA Region II. The air monitoring network meets the criteria identified in the QAMP.

The Quality Assurance Project Plan (QAPP) is under revision. The QAPP describes in greater detail the monitoring effort and quality assurance procedures that the data must meet before it is considered as quality assured and acceptable for submittal to the public and EPA.

The Standard Operating Procedure (SOP) manuals have been prepared by the Air Quality Area. It identifies the steps, procedures and criteria that must be meets in operating of the monitoring network and the validation of the air quality data.

2.0 PUERTO RICO AIR MONITORING NETWORK

2.1 $PM_{2.5}$ Air-Monitoring Network

$PM_{2.5}$ FRM

The PREQB operates ten (10) $PM_{2.5}$ FRM sites in the air-monitoring network. All of the sites operate on a 1-in-3 day sample schedule. Two sites, Guaynabo and Baldorioty Ave. in San Juan, operate collocated $PM_{2.5}$ FRM samplers on a 1-in-6 day sample schedule. The details of these sites are included in Section 5.0 Site Description.

Continuous $PM_{2.5}$

The PREQB operates three (3) continuous $PM_{2.5}$ sites in the air-monitoring network. All continuous $PM_{2.5}$ samplers are operated year-round and the measurements are sent to the EPA AQS on an hourly basis. All continuous $PM_{2.5}$ samplers have TEOM 1400 AB. All the sites of $PM_{2.5}$ continuous will be for AQI purposes.

Changes proposed to $PM_{2.5}$ network

PREQB don't propose changes to the $PM_{2.5}$ network. EQB propose to 2013 complete the changes proposed in the monitoring network plan 2012 and approved by EPA.

The details of these sites and changes are included in Section 5.0 Site Description.

2.2 PM_{10} Air-Monitoring Network

PM_{10} FRM

The PREQB operates five (5) PM_{10} FRM sites in the air-monitoring network. Two of the sites, Fajardo and Guaynabo are operated every day. Three sites, USGS Office in Guaynabo, Guayama and Ponce are operated every three days (1-in-3 day) sample schedule. Two sites, Guayama and AEE Substation in Guaynabo, operate collocated PM_{10} FRM samplers on a 1-in-6 day sample schedule. The details of these sites are included in Section 5.0 Site Description.

Continuous PM_{10}

The PREQB operates two (2) continuous PM_{10} site in the air-monitoring network. The continuous PM_{10} sampler is operated year-round and the measurements are sent to the EPA AQS website and used for AQI purposes on an hourly basis. One site is deployed at Las Vegas in Cataño and the second site is located at Ponce.

Changes proposed to PM_{10} network

PREQB don't propose changes to the PM_{10} network

2.3 $PM_{2.5}$ Speciation Network

$PM_{2.5}$ chemical speciation measurements are being obtained at one site in the PREQB air-monitoring network. The principal objective of the site is to determine the contribution of the exceptional events in the PM data of Puerto Rico. The site will be located at the NCore site as was suggested by EPA. It will be operated on the same 1-in-6 day sample schedule and provides 24-hour integrated filter-base measurements. EQB is waiting for the EPA HQ decision to establish the monitor.

2.4 Ozone Air-Monitoring Network

The PREQB operates two ozone sites in the air-monitoring network. One ozone air-monitoring site is located at Cataño and the other site is located at Juncos municipality. All ozone samplers are operated year-round and the measurements are sent to the EPA AQS on an hourly basis. The ozone sites are classified as SLAMS and use FEM monitors. Details of the sites location are included in Section 5.0 Site Description.

Changes proposed to Ozone network

PREQB don't propose changes to the Ozone network

2.5 SO_2 Air-Monitoring Network

The PREQB operates five (5) sulfur dioxide (SO_2) sites in the air-monitoring network. All SO_2 samplers are operated year-round and the measurements are sent to the EPA AQS on an hourly basis. The SLAMS SO_2 sites use FEM monitors. The sites are located two at San Juan-Caguas Area, two at Industrial Area (Guayama – Salinas), and one at Juncos.

Although EPA is not prepared to propose designation action for Puerto Rico; the existing SO_2 monitoring locations represent appropriate monitoring locations for the new 1-hour standard monitoring requirements

The monitoring network was design to meet three primary monitoring objectives, as listed in 40 CFR Part 58 Appendix D, Section 1.

- ✓ San Juan – Caguas area: three (3) stations, three existing monitors (EQB #40 72-033-0004, EQB #8 72-077-0001 and EQB #37 72-021-0006)
- ✓ Industrial Area Guayama-Salinas: two (2), one existing monitor in Guayama (EQB #69 72-057-0009) and the EQB #18 72-123-0002 in Salinas.
- ✓ Ponce Area: one (1) new station (Guayanilla).

In summary, the EQB SO_2 network ensures that monitors meet today's network design regulations for the new 1-hour. The details are including at Section 5.0 Site Description.

Changes proposed to SO_2 network

EQB proposes maintain the SO_2 networks as identical to the Network Plan 2012 approved by EPA. EQB maintain five (5) stations and propose install one (1) new station at Guayanilla according to the minimum required by the regulation, PWEI values and the results of the air dispersion models.

2.6 Lead Air-Monitoring Network

The PREQB operates four (4) lead (Pb) sites in the air-monitoring network. All Pb samplers are operated year-round and the measurements are sent to the EPA AQS on daily basis. The SLAMS Pb sites use FRM monitors. Two sites are located at Arecibo, 72-013-0001 and 72-013-0002, other is located at Salinas 72-123-0002 and one monitor non-source oriented at Bayamón 72-021-0010.The details of these sites are included in Section 5.0 Site Description.

Changes proposed to lead network

EQB proposes maintain the lead networks as identical to the Network Plan 2012 approved by EPA. EQB maintain four (4) stations and propose install one (1) new station at Guayanilla according to the regulation. The Guayanilla new lead monitor proposed will be located on a new site near the industrial area of South Coast (PREPA) with emissions more than 0.5 ton/yr of lead. This site was proposed in the Network Plan 2012 approved by EPA.

2.7 NO_2 Air-Monitoring Network

The existing nitrogen dioxide (NO_2) monitoring stations were installed at their current locations based on a combination of emissions inventories and population centers.

The PREQB operates two (2) nitrogen oxide (NO_2) sites in the air-monitoring network. The NO_2 samplers are operated year-round and the measurements are sent to the EPA AQS on an hourly basis. The SLAMS NO_2 sites are used as a FRM. The sites are located at Cataño (72-033-0008) and Salinas (72-123-0002). The monitor locates at Salinas is temporary shutdown. The details of these sites are included in Section 5.0 Site Description.

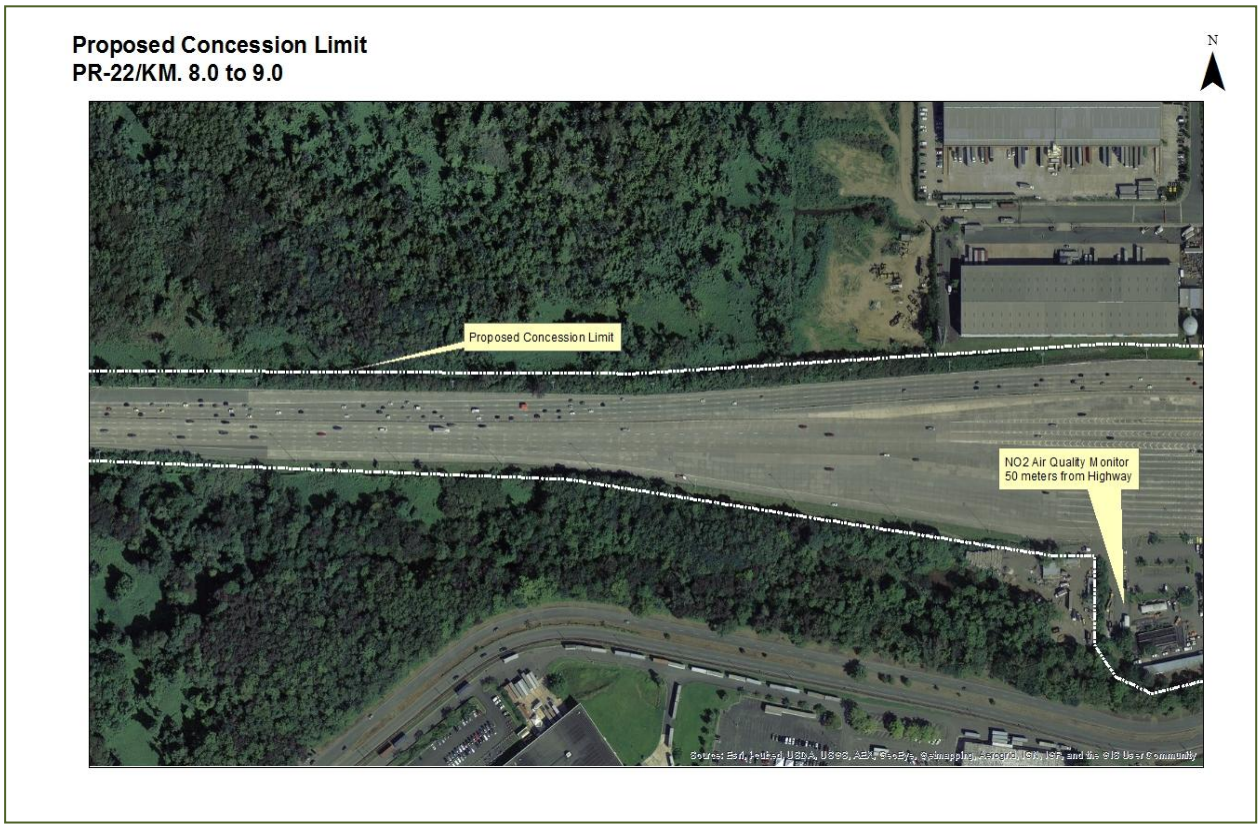
Changes NO_2 Network

In compliance with the revised new short-term standard, PREQB proposes installed three (3) monitors in the Network Plan 2013. The locations proposed was in areas where maximum NO_2 concentrations are expected to occur, including within 50 meters of major roadways, as well as monitors that will be sited to measure the area-wide NO_2 concentrations that occur more broadly across communities.

The criteria to consider for these sites include traffic volume, roadway design, traffic congestion and meteorology. Also, the population exposure was considered in the sitting criteria. The required sites will be deployed in stages according to population thresholds. The first two near road sites will be installed in the CBSAs with populations over 2,500,000 (San Juan/Caguas/Fajardo) and finally other site will be installed in the smaller CBSAs with population over 500,000 (Ponce/Yauco/Coamo).

The first two (2) new sites proposed in the CBSAs San Juan/Caguas/Fajardo will be located one (1) in Buchanan Area and the other one in Caguas. The Buchanan' site (see Figure 3) was selected, PREQB are in the process to obtain the entire permit to establish the monitor. For the Caguas site, PREQB is in the process to selects the site. Also, PREQB is coordinating the Ponce/Yauco/Coamo CBSAs' monitoring site deployments with EPA Region 2.

Figure 3 Buchanan



2.8 CO Air-Monitoring Network

The PREQB operates three (3) carbon monoxide (CO) sites in the air-monitoring network. 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. One site is located at San Juan, 72-127-0003 Baldorioty De Castro Ave., one site at 72-021-0006 at Bayamón and the other one is located at Ponce 72-113-0004. The details of these sites are included in Section 5.0 Site Description.

Changes proposed to CO network

PREQB don't propose changes to the CO network.

2.9 PM Sulfate Air Monitoring Network

The PREQB operates four (4) PM_{10} -Sulfates (SO_4) sites in the air-monitoring network. The particulate sulfate-monitoring network utilizes PM_{10} filter sampling analysis to generate ambient sulfate concentrations.

The SO_4 sites are located at USGS in Guaynabo (72-061-0001), Amelia in Guaynabo (72-061-0005), Fajardo (72-053-0003) and Guayama (72-057-0008). All SO_4 samplers are operated year-round and the measurements are sent to the EPA AQS on a daily basis. Details of the sites locations are included in Section 5.0 Site Description.

Changes proposed to PM Sulfate network

PREQB don't propose changes to the PM Sulfate network.

2.10 NCore – Air Monitoring Network

NCore, or National Core multi-pollutant monitoring stations, is a new National Monitoring Network required in the October 17, 2006 revisions to the Air Monitoring Regulations (40 CFR, Part 58). NCore sites are required to measure, at a minimum, $PM_{2.5}$ particle mass using continuous and integrated/filter-based samplers, speciation $PM_{2.5}$, $PM_{10-2.5}$ particle mass, speciation $PM_{10-2.5}$, O_3, SO_2, CO, NO/NO_x, wind speed, wind direction, relative humidity, and ambient temperature. Sampling methods for $PM_{2.5}$, speciation $PM_{2.5}$, O_3, SO_2, NO/NO_x are described under the individual pollutant sections throughout this document. Trace level measurements of CO and SO_2 are performed at NCore sites. $PM_{10-2.5}$ or PM Coarse is determined by the difference between collocated PM_{10} and $PM_{2.5}$ FRM samplers.

For Puerto Rico is required to operate at least one NCore site. According with the requirements, PREQB selected the AIRS 72-021-0010 site at Bayamón to establish the NCore.

PREQB is waiting for installation and operation from EPA.

3.0 METEOROLOGICAL DATA

By measuring surface wind speed and direction, one can attempt to determine where a pollutant-laden air mass has come from and where it is going. This information is essential any time an attempt is made to determine the cause of high pollution periods.

The wind patterns in the mountainous geography of Puerto Rico can be very difficult to analyze. Because of these complex wind patterns, EQB will establish meteorological stations in the cardinal points: northwest, southeast, and southwest of the Island. The sites to be located are being evaluated by EQB according with their industrial development. Each station must be evaluated separately because of the complex micrometeorology in Puerto Rico.

4.0 EMERGENCY EPISODE MONITORING

One of the responsibilities of EQB is to ensure that the public is protected from air pollution concentrations that will cause immediate damage or impact to their health.

Rule 107 of RCAP establishes emergency response criteria in accordance with Subpart H and Appendix L of 40 CFR 51. Whenever air pollution concentrations meet or exceed the Alert, Warning, or Emergency levels, an emergency episode is determined to exist and actions are taken to reduce the emissions of air pollutants. It is the responsibility of the monitoring section to collect the air pollution data used to determine when an emergency episode occurs. The Air Quality Area staff has the primary responsibility to notify an emergency episode exists. This is a critical function that is required by State and Federal law.

The PREQB operates two (2) PM_{10} -continuous site in the air-monitoring network. One site is located at Cataño 72-033-0004 and the other is located at Ponce 72-113-0004.

PREQB establish a $PM_{2.5}$ monitor at Cataño at existing site 72-033-0008. Also, propose change the PM_{10} continuous monitor located at Ponce to a $PM_{2.5}$ continuous monitor. The monitors used to AQI are part of the PM_{10} and $PM_{2.5}$ network at Section 2.1 and 2.2.

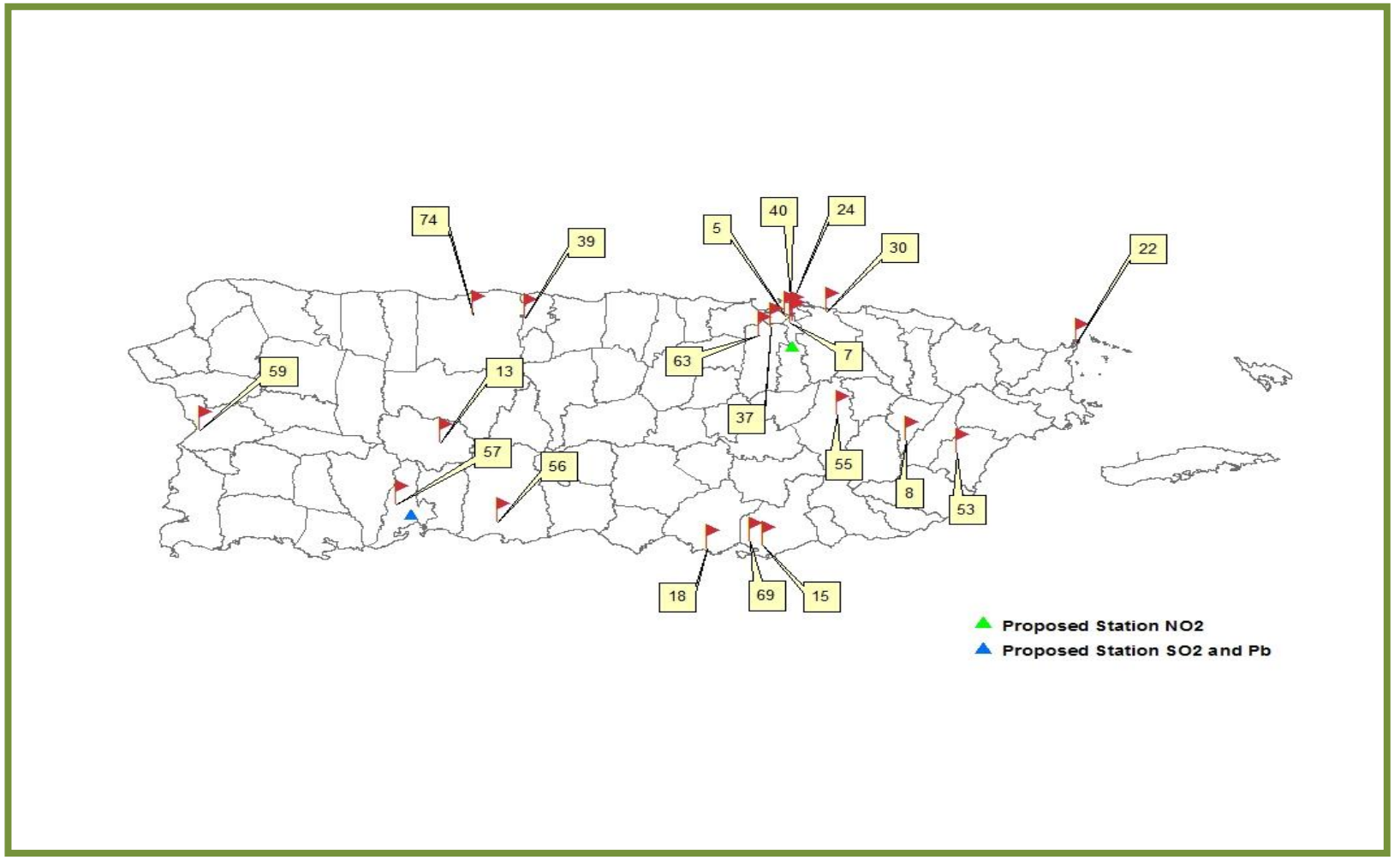
The details of the sites locations are included in Section 5.0 Site Description.

5.0 SITE AND MAP DESCRIPTION

The following tables provide a technical summary of the air monitoring network. They include: the site name, AQS code, the type of analyzer used and frequency of data collection, the source of gases used to calibrate the gaseous monitors, sampling method, analysis method, spatial scale, and the latitude and longitude of each site and plans for the next 18 months.

Also, you see a map with the locations of existing stations and new stations propose.

Figure 4 : Map: Air Monitoring Network 2013



Site Name	EQB #13
Address	Road #123
City	Adjuntas
AQS Code	72-001-0002
PR County	Adjuntas
MSA/CSA	N/A
Latitude	+18.175378
Longitude	-66.725988
Suitable for Comparison to $PM_{2.5}$ NAAQS?	Yes

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Average Temperature		Electronic	1 in 3	Urban		2005/01/01
Sample Average Barometric Pressure		Barometric Sensor	1 in 3	Urban		2005/01/01
$PM_{2.5}$	R&P Model 2025	Gravimetric	1 in 3	Urban	Upwind Background	2005/01/01

Parameter	Monitor Type
$PM_{2.5}$	SLAMS

Site Purpose	Reference for Extreme downwind
Plans for the next 18 months	No changes
Other comments	

Site Name	EQB #74
Address	Victor Santoni Cordero Road #123
City	Arecibo
AQS Code	72-013-0001
PR County	Arecibo
MSA/CSA	N/A
Latitude	+18.457039
Longitude	-66.696693
Suitable for Comparison to $PM_{2.5}$ NAAQS?	n/a

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Temperature Average			1 in 6			
Ambient Pressure Average			1 in 6			
Lead TSP	Hi-Vol	Atomic Emission Spectrometry	1 in 6	Micro Scale	Source Oriented	2010/01/01

Parameter	Monitor Type
Lead	SLAMS

Site Purpose	Reference for Extreme downwind
Plans for the next 18 months	No changes
Other comments	Pb collocated

Site Name	EQB #75
Address	PR Road #2
City	Arecibo
AQS Code	72-013-0002
PR County	Arecibo
MSA/CSA	N/A
Latitude	+18.270986
Longitude	-66.414386
Suitable for Comparison to $PM_{2.5}$ NAAQS?	n/a

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Temperature Average			1 in 6			
Ambient Pressure Average			1 in 6			
Lead TSP	Hi-Vol	Atomic Emission Spectrometry	1 in 6	Micro Scale	Source Oriented	2012/08/19

Parameter	Monitor Type
Lead	SLAMS

Site Purpose	Reference for Extreme downwind
Plans for the next 18 months	No changes
Other comments	

Site Name	EQB #39
Address	Centro Comunal Tiburones
City	Barceloneta
AQS Code	72-017-0003
PR County	Barceloneta
MSA/CSA	Arecibo-Manatí
Latitude	+18.436794
Longitude	-66.580020
Suitable for Comparison to $PM_{2.5}$ NAAQS?	No

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
$PM_{2.5}$ (88501)	$PM_{2.5}$ wins w/correction factor	TEOM	Continuous	Neighborhood	Population Exposure	2000/04/10

Parameter	Monitor Type
$PM_{2.5}$ (88501)	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	To be close and relocated to Manatí
Other comments	

Site Name	EQB # (new)
Address	
City	Manatí
AQS Code	
PR County	Manatí
MSA/CSA	Arecibo-Manatí
Latitude	
Longitude	
Suitable for Comparison to $PM_{2.5}$ NAAQS?	

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
$PM_{2.5}$ (88501)	$PM_{2.5}$ wins w/correction factor	TEOM	Continuous	Neighborhood	Population Exposure	

Parameter	Monitor Type
$PM_{2.5}$ (88501)	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	Add new monitor and new site according with the new NAAQS
Other comments	

Site Name	EQB #37
Address	Regional Jail of Bayamón
City	Bayamón
AQS Code	72-021-0010
PR County	Bayamón
MSA/CSA	San Juan - Bayamón
Latitude	+18.417315
Longitude	-66.150293
Suitable for Comparison to $PM_{2.5}$ NAAQS?	N/A

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Sulfur Dioxide	Instrumental	Pulsed Fluorescent	Continuous	Neighborhood	Population Exposure	2011/03/16
Carbon Monoxide	Instrumental	Non Dispersive Infrared	Continuous	Neighborhood	Population Exposure	2011/03/16
Lead TSP	Hi-Vol	Atomic Emission Spectrometry	1 in 6	Neighborhood	Population Exposure	2011/03/22
Ambient Temperature Average			1 in 6			
Ambient Pressure Average			1 in 6			

Parameter	Monitor Type
Sulfur Dioxide	SLAMS
Carbon Monoxide	SLAMS
Lead TSP	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	The NCore site waiting for install operation by EPA contractor
Other comments	As part of NCore will be establish $PM_{2.5}$ speciation monitor

Site Name	EQB #63
Address	Escuela Juan Morell Campos – Villa Rica
City	Bayamón
AQS Code	72-021-0009
PR County	Bayamón
MSA/CSA	San Juan - Bayamón
Latitude	+18.399820
Longitude	-66.171125
Suitable for Comparison to $PM_{2.5}$ NAAQS?	Yes

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Average Temperature		Electronic	1 in 3	Urban	Extreme Downwind	
Sample Average Barometric Pressure		Barometric Sensor	1 in 3	Urban	Extreme Downwind	
$PM_{2.5}$	R&P Model 2025	Gravimetric	1 in 3	Urban	Extreme Downwind	1999/02/02

Parameter	Monitor Type
$PM_{2.5}$	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	No changes
Other comments	

Site Name	EQB #55
Address	Calle Muñoz Rivera Calle Georgetti
City	Caguas
AQS Code	72-025-0003
PR County	Caguas
MSA/CSA	San Juan
Latitude	+18.233331
Longitude	-66.036474
Suitable for Comparison to $PM_{2.5}$ NAAQS?	No

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
$PM_{2.5}$ (88501)	$PM_{2.5}$ wins w/correction factor	TEOM	Continuous	Neighborhood	Population Exposure	2003/05/02

Parameter	Monitor Type
$PM_{2.5}$ (88501)	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	No changes
Other comments	

Site Name	EQB #40
Address	11 Final St. Las Vegas
City	Cataño
AQS Code	72-033-0004
PR County	Cataño
MSA/CSA	San Juan - Bayamón
Latitude	+18.431208
Longitude	-66.141683
Suitable for Comparison to $PM_{2.5}$ NAAQS?	N/A

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Sulfur Dioxide	Instrumental	Pulsed Fluorescent	Continuous	Neighborhood	Population Exposure	1993/12/07
PM_{10}	R&P SA246B	Continuous	Urban	Population exposure	TEOM-AQI	2000/07/13

Parameter	Monitor Type
Sulfur Dioxide	SLAMS
PM_{10}	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	No changes
Other comments	AQI (PM_{10})

Site Name	EQB #5
Address	PR Rd. 165
City	Cataño
AQS Code	72-033-0008
PR County	Cataño
MSA/CSA	San Juan - Bayamón
Latitude	+18.440774
Longitude	-66.12631
Suitable for Comparison to $PM_{2.5}$ NAAQS?	NO

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ozone	Instrumental	Ultra Violet	Continuous	Urban	Population exposure	2004/07/22
$PM_{2.5}$ (88501)	$PM_{2.5}$ wins w/correction factor	TEOM	Continuous	Neighborhood	Population exposure	2004/06/30
Nitrogen Dioxide	Instrumental	Chemiluminescence's	Continuous	Urban	Population exposure	2004/10/21

Parameter	Monitor Type
Ozone	SLAMS
$PM_{2.5}$ (88501)	SLAMS
Nitrogen Dioxide	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	No changes
Other comments	

Site Name	EQB #22
Address	Fajardo Lighthouse
City	Fajardo
AQS Code	72-053-0003
PR County	Fajardo
MSA/CSA	Humacao - Fajardo
Latitude	+18.383333
Longitude	-66.619444
Suitable for Comparison to $PM_{2.5}$ NAAQS?	Yes

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Average Temperature		Electronic	1 in 3			
Sample Average Barometric Pressure		Barometric Sensor	1 in 3			
$PM_{2.5}$	R&P Model 2025	Gravimetric	1 in 3	Regional	Regional Trnsport	1999/04/20
PM_{10}	Hi-Vol	Gravimetric	1 in 1	Neighborhood	Background	1989/03/05
PM_{10} Sulfate	Colorimetric		1 in 6	Neighborhood	Background	1998/01/05

Parameter	Monitor Type
$PM_{2.5}$	SLAMS
PM_{10}	SLAMS
PM_{10} Sulfate	SLAMS

Site Purpose	Reference and Background
Plans for the next 18 months	No changes
Other comments	

Site Name	EQB #15
Address	Barrio Jobos, Intersection Highway 3 & 707
City	N/A
AQS Code	72-057-0008
PR County	Guayama
MSA/CSA	Guayama
Latitude	+17.957894
Longitude	-66.165016
Suitable for Comparison to $PM_{2.5}$ NAAQS?	Yes

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Average Temperature		Electronic	1 in 3			
Sample Average Barometric Pressure		Barometric Sensor	1 in 3			
$PM_{2.5}$	R&P Model 2025	Gravimetric	1 in 3	Neighborhood	Population Exposure	1999/01/15
PM_{10}	Hi-Vol	Gravimetric	1 in3	Neighborhood	Population Exposure	1988/10/06
PM_{10} Sulfate	Hi-Vol	Colorimetric	1 in 6	Neighborhood	Population Exposure	1998/01/05

Parameter	Monitor Type
$PM_{2.5}$	SLAMS
PM_{10}	SLAMS
PM_{10} Sulfate	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	No changes
Other comments	PM_{10} collocated monitor

Site Name	EQB #69
Address	At the south side of the police station
City	Guayama
AQS Code	72-057-0009
PR County	Guayama
MSA/CSA	Guayama
Latitude	+17.967638
Longitude	-66.187471
Suitable for Comparison to $PM_{2.5}$ NAAQS?	N/A

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Sulfur Dioxide	Instrumental	Pulsed Fluorescence	Continuous	Neighborhood	Source Oriented	2001/11/14

Parameter	Monitor Type
Sulfur Dioxide	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	No changes
Other comments	

Site Name	EQB #57
Address	Road 377 Bo. Quebrada
City	Guayanilla
AQS Code	72-059-0016
PR County	Guayanilla
MSA/CSA	Ponce
Latitude	+18.045111
Longitude	-66.802253
Suitable for Comparison to $PM_{2.5}$ NAAQS?	Yes

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Average Temperature		Electronic	1 in 3			
Sample Average Barometric Pressure		Barometric Sensor	1 in 3			
$PM_{2.5}$	R&P Model 2025	Gravimetric	1 in 3	Neighborhood	Population Exposure	1999/01/15

Parameter	Monitor Type
$PM_{2.5}$	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	No changes
Other comments	

Site Name	EQB # (new)
Address	
City	Guayanilla
AQS Code	72-059-0001
PR County	Guayanilla
MSA/CSA	Ponce
Latitude	
Longitude	
Suitable for Comparison to $PM_{2.5}$ NAAQS?	N/A

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Sulfur Dioxide	Instrumental	Pulsed Fluorescent	Continuous	Neighborhood	Source Oriented	
Lead TSP	Hi- Vol	Atomic Absorption	1 in 6	Micro Scale	Population Exposure	2011
Ambient Temperature Average			1 in 6			
Ambient Pressure Average			1 in 6			

Parameter	Monitor Type
Sulfur Dioxide	SLAMS
Lead TSP	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	New Site
Other comments	Near South Coast PREPA

Site Name	EQB #7
Address	USGS & Water Resources Bldg.
City	Guaynabo
AQS Code	72-061-0001
PR County	Guaynabo
MSA/CSA	San Juan - Bayamón
Latitude	+18.425652
Longitude	-66.115846
Suitable for Comparison to $PM_{2.5}$ NAAQS?	No

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
PM_{10}	Hi-Vol	Gravimetric	1 in 3	Micro Scale	Highest Concentration	1999/02/28
PM_{10} Sulfate	Hi-Vol	Colorimetric	1 in 6	Neighborhood	Population Exposure	1999/02/28

Parameter	Monitor Type
PM_{10}	SLAMS
PM_{10} Sulfate	SLAMS

Site Purpose	Determine Highest Concentration
Plans for the next 18 months	No changes
Other comments	PM_{10} Monitor is part of PM_{10} SIP for Guaynabo LMP

Site Name	EQB #24
Address	Electrical Substation
City	Guaynabo
AQS Code	72-061-0005
PR County	Guaynabo
MSA/CSA	San Juan - Bayamón
Latitude	+18.440095
Longitude	-66.114460
Suitable for Comparison to $PM_{2.5}$ NAAQS?	Yes

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Average Temperature		Electronic	1 in 3			
Sample Average Barometric Pressure		Barometric Sensor	1 in 3			
$PM_{2.5}$	R&P Model 2025	Gravimetric	1 in 3	Neighborhood	Population Exposure	1999/01/15
PM_{10}	Hi-Vol	Gravimetric	1 in 1	Neighborhood	Population Exposure	1988/01/05
PM_{10} Sulfate	Hi-Vol	Colorimetric	1 in 6	Neighborhood	Population Exposure	1998/01/05

Parameter	Monitor Type
$PM_{2.5}$	SLAMS
PM_{10}	SLAMS
PM_{10} Sulfate	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	No changes
Other comments	PM_{10} Monitor is part of PM_{10} SIP for Guaynabo LMP, $PM_{2.5}$ collocated monitor, PM_{10} collocated monitor

Site Name	EQB #53
Address	Gladiola & Girasol St. Víctor Rincón School, Barrio Junquito
City	Humacao
AQS Code	72-069-0001
PR County	Humacao
MSA/CSA	Fajardo - Humacao
Latitude	+18.153440
Longitude	-65.828617
Suitable for Comparison to $PM_{2.5}$ NAAQS?	Yes

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Average Temperature		Electronic	1 in 3			
Sample Average Barometric Pressure		Barometric Sensor	1 in 3			
$PM_{2.5}$	R&P Model 2025	Gravimetric	1 in 3	Neighborhood	Population Exposure	2000/02/12

Parameter	Monitor Type
$PM_{2.5}$	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	No changes
Other comments	

Site Name	EQB #59
Address	Nenadich Street
City	Mayagüez
AQS Code	72-097-0006
PR County	Mayagüez
MSA/CSA	Mayagüez
Latitude	+18.200099
Longitude	-67.145880
Suitable for Comparison to $PM_{2.5}$ NAAQS?	Yes

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Average Temperature		Electronic	1 in 3			
Sample Average Barometric Pressure		Barometric Sensor	1 in 3			
$PM_{2.5}$	R&P Model 2025	Gravimetric	1 in 3	Neighborhood	Source Oriented	2007/02/21

Parameter	Monitor Type
$PM_{2.5}$	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	No changes
Other comments	

Site Name	EQB #8
Address	Road 183
City	Juncos
AQS Code	72-077-0001
PR County	Juncos
MSA/CSA	Juncos
Latitude	+18.177939
Longitude	-65.915482
Suitable for Comparison to $PM_{2.5}$ NAAQS?	N/A

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Sulfur Dioxide	Instrumental	Pulsed Fluorescent	Continuous	Neighborhood	Population Exposure	2007/10/03
Ozone	Instrumental	Ultra violet	Continuous	Neighborhood	Population Exposure	2007/10/03

Parameter	Monitor Type
Sulfur Dioxide	SLAMS
Ozone	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	No changes
Other comments	Meteorological monitor

Site Name	EQB #56
Address	Civil Defense Bldg. 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

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Average Temperature		Electronic	1 in 3			
Sample Average Barometric Pressure		Barometric Sensor	1 in 3			
$PM_{2.5}$	R&P Model 2025	Gravimetric	1 in 3	Neighborhood	Population Exposure	1999/01/15
PM_{10}	Hi-Vol	Gravimetric	1 in3	Neighborhood	High Concentration	1999/01/06
Carbon Monoxide	Instrumental	Non Dispersive Infrared	Continuous	Neighborhood	Population Exposure	2011/10/01
PM_{10} continuous	R&P SA246B	Continuous	Continuous	Population exposure	TEOM-AQI	2011/10/05

Parameter	Monitor Type
$PM_{2.5}$	SLAMS
PM_{10}	SLAMS
CO	SLAMS
PM_{10-} continuous	SLAMS

Site Purpose	Determine High Concentration
Plans for the next 18 months	PM_{10} monitor will be change to $PM_{2.5}$ continuous monitor to AQI purposes
Other comments	

Site Name	EQB #18
Address	Road Las Mareas
City	Salinas
AQS Code	72-123-0002
PR County	Salinas
MSA/CSA	Ponce
Latitude	+17.953006
Longitude	-66.261461
Suitable for Comparison to $PM_{2.5}$ NAAQS?	N/A

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Sulfur Dioxide	Instrumental	Pulsed Fluorescent	Continuous	Neighborhood	Population Oriented	2008/09/24
NO_2						new
Lead TSP	Hi-Vol	Atomic Emission Spectrometry	1 in 6	Micro Scale	Source Oriented	2011/10/18

Parameter	Monitor Type
Sulfur Dioxide	SLAMS

Site Purpose	Protection for the population
Plans for the next 18 months	Proposed a NO_2 monitor
Other comments	Meteorological monitor

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- Bayamón
Latitude	+18.449814
Longitude	-66.052510
Suitable for Comparison to $PM_{2.5}$ NAAQS?	Yes

Parameter	Sampling Method	Analysis Method	Schedule	Spatial Scale	Monitoring Objective	Date Established
Ambient Average Temperature		Electronic	1 in 3			
Sample Average Barometric Pressure		Barometric Sensor	1 in 3			
$PM_{2.5}$	R&P Model 2025	Gravimetric	1 in 3	Neighborhood	Population Exposure	1999/03/21
Carbon Monoxide	Instrumental	Non Dispersive Infrared	Continuous	Neighborhood	High Concentration	1995/04/01

Parameter	Monitor Type
$PM_{2.5}$	SLAMS
Carbon Monoxide	SLAMS

Site Purpose	Determine High Concentration and protection of population
Plans for the next 18 months	Not changes
Other comments	$PM_{2.5}$ collocated monitor

6.0 NETWORK MODIFICATION FORMS

Network modification forms will be prepared for submittal to EPA Region II to implement the network modifications identified in this network plan.

7.0 SUMMARY AND CONCLUSIONS

The monitoring requirements identified by federal regulation are currently met with the existing monitoring network in Puerto Rico. The procedures that are being used and the instruments that are being operated meet the standards that have been established by EPA.

The significant network changes proposed through 2013 include:

- Establish one new TSP lead filter sampling with atomic emission spectrometry analysis to generate ambient lead concentrations at Guayanilla.
- Establish the $PM_{2.5}$ Speciation Site at NCore site.
- Begin the NCore site at AIRS Number 72-021-0006 at Bayamón.
- Reactive the NO_2 monitor 72-123-0002 located at Salinas's municipality.
- Relocate the $PM_{2.5}$ continuous monitor at Barceloneta to Manatí.
- Establish a new SO_2 site al Guayanilla according with the regulations for the new 1-hour.
- Change the PM_{10} continuous monitor at Ponce to a $PM_{2.5}$ continuous monitor to be use for AQI.
- Establish the near road NO_2 new sites.

COMMENTS ON MONITORING PLAN

The public was invited to submit comments or recommendations to the attention of Mrs. Lucía Fernández Fontán, Chief of Data Validation and Air Dispersion Models Division or to the Air Quality Area. The comments received during the public review of the monitoring plan will be evaluated and the plan will be modified if needed.