

SPECIFICATION FOR THE PROVISION OF AIR QUALITY MONITORING SERVICES AT THE PORT OF PORT ELIZABETH AND PORT OF NGQURA FOR A PERIOD OF 36 MONTHS (3YEARS)

1. BACKGROUND

The promulgation of the National Environmental Management: Air Quality Act, No. 39 of 2004 requires industries to manage their pollutants in the environment through air quality management planning. In addition, the International Association for Ports and Harbours has recognised that air emissions from port-related activities are increasing and will continue if action is not taken.

Following the development of air quality management plans for the various ports, Transnet National Ports Authority (TNPA) commissioned its ambient air quality monitoring network in June 2017 to determine the ambient concentrations of pollutants identified as being emitted from port-related activities. The commissioning of ambient air quality monitoring stations has been an immense investment by TNPA. The Port of Port Elizabeth and Port of Ngqura has one continuous, real-time air quality monitoring station (AQMS).

LOCATION OF THE PORT OF PORT ELIZABETH AIR QUALITY STATION

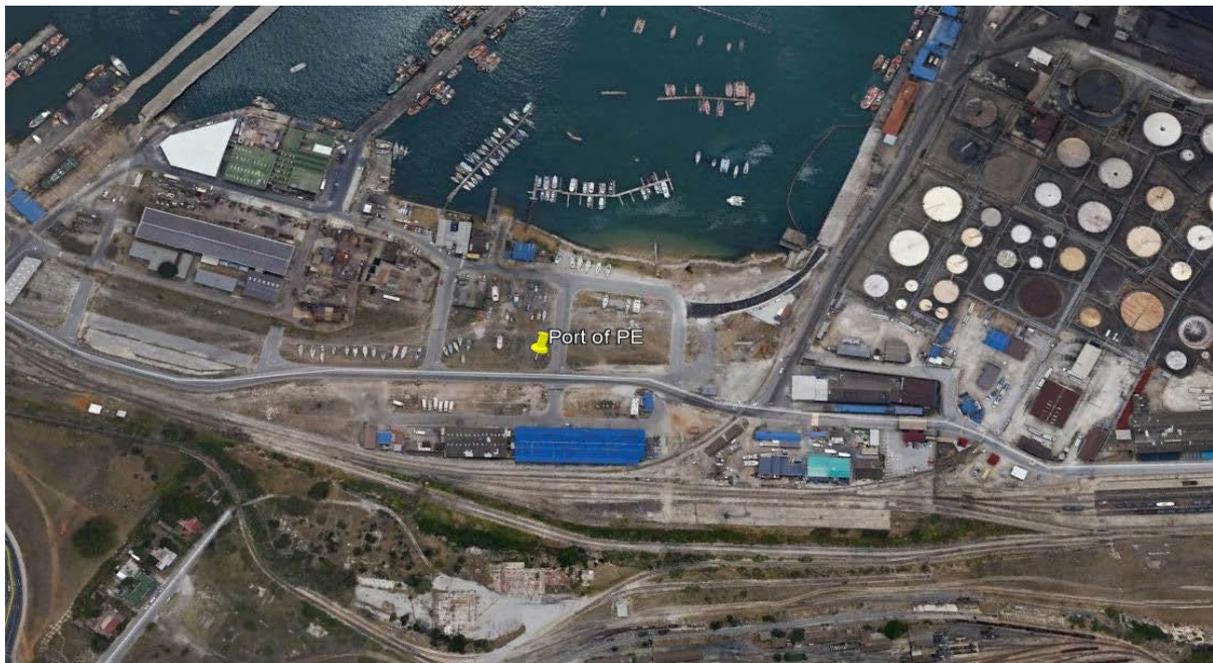


Fig1: Aerial view map showing the relative location of the Port of Port Elizabeth Air Quality Monitoring Station

LOCATION OF THE PORT OF NGRURA AIR QUALITY STATION

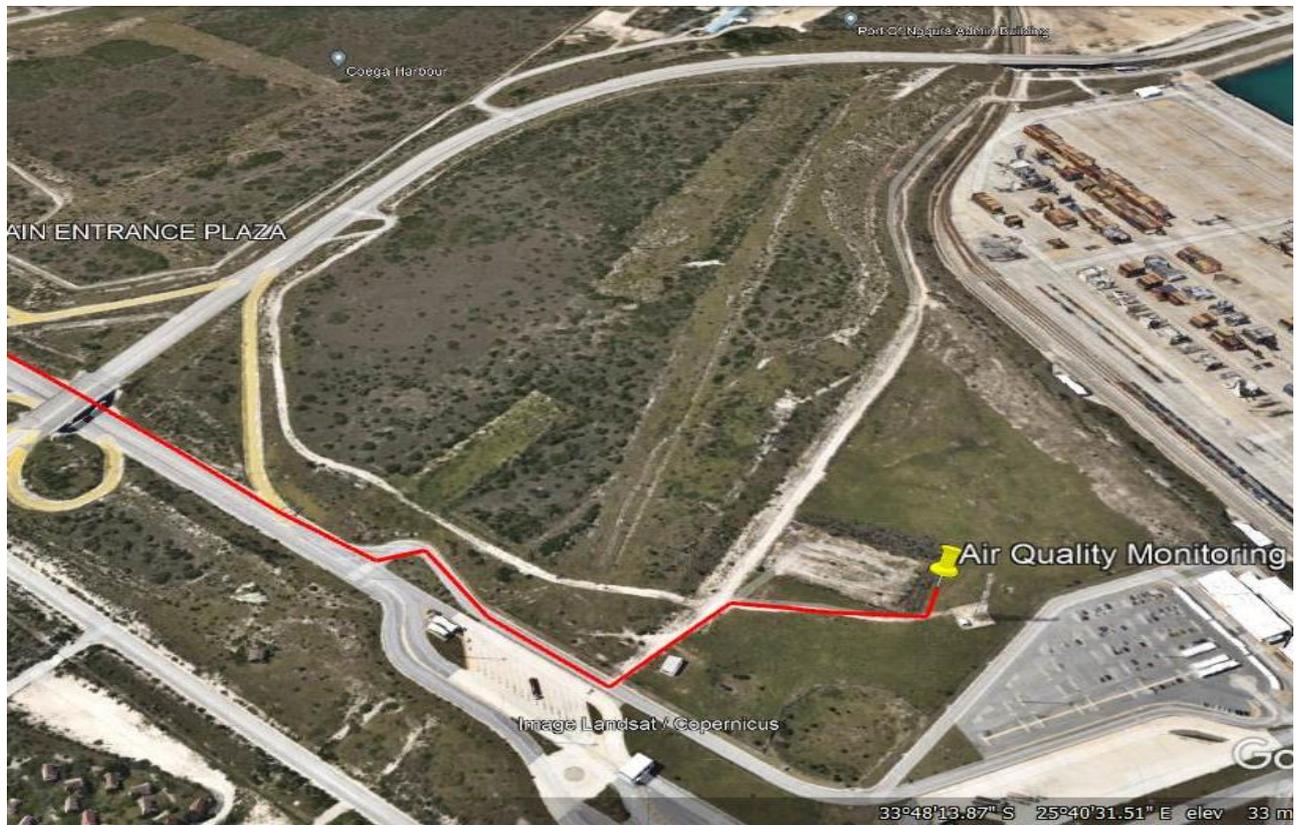


Fig2: Aerial view map showing the relative location of the Port of Ngqura Air Quality Monitoring Station

Monitoring Site	GPS Coordinates
Port of PE Air Quality Station	33°58'6.28"S, 25°38'1.85"E
Port of Ngqura Quality Station	33°48'20.04"S, 25°40'38.88"E

1.1 PURPOSE

The purpose of this project is to ensure the continuous management (calibration, monitoring, and maintenance) of the AQMS. This is to ensure the station continuously produces credible and reliable ambient air quality data which will inform TNPA of the general quality of air in the vicinity of the Port and determine whether the air quality is compliant with National Ambient Air Quality Standards

(NAAQS). The monitoring data will in the long run also provide TNPA with information on air quality trends in the vicinity of the Port and whether its activities are resulting in a deterioration in air quality.

1.2 PARAMETERS MONITORED

The air quality parameters monitored by the AQMS include:

- Sulphur dioxide (SO₂)
- Nitrogen dioxide (NO₂)
- Particulate matter smaller than 10 microns (PM₁₀)
- Particulate matter smaller than 2.5 microns (PM_{2.5})
 - Note: Laboratory analysis will be required to determine the precise type of pollutant being captured on the particulate matter filters.

These pollutants are classified as priority pollutants in South Africa, for which health-based ambient air quality standards have been set. A range of meteorological parameters are also monitored, which include:

- Wind speed
- Wind direction
- Ambient temperature
- Internal temperature
- Solar radiation
- Humidity
- Rainfall

2. TNPA SCOPE OF WORK

TNPA will follow an open tender process to source a suitably qualified professional air quality service provider that will be able to assist TNPA Port of Port Elizabeth and Port of Ngqura with the operation of the Air Quality Monitoring Station. Transnet National Ports Authority is therefore looking for a team consisting of seasoned Air Quality Specialists and Technicians that can not only generate air quality data but add value to the data by performing meaningful interpretations and advise Transnet National Ports Authority on the results and interpretations. The successful bidder will be responsible for providing all the services specified in the scope of work for a period of 36 months (3years).

2.1 Undertake an assessment of the station and establish an asset registry

The service provider must assess all assets in the station in order to establish if the station is working effectively. The assessment must include but not be limited to:

- 2.1.1 Compile an Asset Inventory Register of all assets / equipment within the station.
- 2.1.2 Assess the condition of the station shelter and working condition of all equipment. e.g. analysers, electrical circuitry, work benches, drawers, sample manifolds, analyser racks, sample inlets, internal ventilation system (single unit air conditioning), data connectivity to the base station, standard alarm system, power points and lighting, temperature sensor and ladder, lightening protection and 3kVA UPS.
- 2.1.3 Upon completion of the detailed condition assessment, the Service Provider shall compile a comprehensive report detailing the total inventory in each station, the condition of each equipment in each station, the defects report where applicable, recommendations of remedial actions with budget quotes and estimated timelines to remedy.
- 2.1.4 TNPA will not be obligated to use/appoint the appointed Service Provider to execute the proposed remedial actions, TNPA reserves the right to conduct their own market analysis relating to the costs of the remedial actions/ repairs.
- 2.1.5 List all equipment that must be repaired or replaced.
- 2.1.6 Indicate any other maintenance requirements needed at the station to ensure effective functionality of the station including electricity, security, air conditioning, shelters, etc.
- 2.1.7 Compile an inventory of all critical spares to ensure that the equipment downtime is kept at a minimum.

2.2 Communication system requirements:

The service provider shall as a minimum:

- 2.2.1 Setup or upgrade the data acquisition system (DAS) and obtain applicable licences where required.
- 2.2.2 The DAS (new or existing) should log raw data, calculate some basic statistical results and store the results as backup and regularly transmit to the base station.

- 2.2.3 The DAS should also be web-based /windows based to provide TNPA the ability to access the real-time data daily.
- 2.2.4 Ensure that the DAS can accept and processing all signals from the pollution analysers and meteorological sensors.
- 2.2.5 Ensure that the acquired software is compatible with the Port's other existing networks.
- 2.2.6 The DAS must allow for data to be flagged during calibration checks.
- 2.2.7 The DAS shall allow local access to the data at station level.
- 2.2.8 The DAS should have certain data analysis tools such as data availability calculations and data averaging capabilities.
- 2.2.9 Submission of a reporting system in line with current international standards. The system must be able to give graphs and other forms of reporting that make reporting effective and easy.

2.3 Calibration, Monitoring and Sample Analysis

- 2.3.1 Management of the real-time monitoring network, including the meteorological equipment, for a period of 36 months, which shall include operation, maintenance and data management in accordance with a robust Quality Assurance / Quality Control (QA/QC) system to ensure a data capture rate of 100%.
- 2.3.2 Undertaking of quarterly multi-point calibrations of all gas analysers, one of which must be conducted by a SANAS accredited laboratory.
- 2.3.3 Undertaking the calibration of meteorological equipment (wind anemometer, temperature sensors, solar radiation monitor).
- 2.3.4 Development of a robust QA/QC system to ensure sustainable operation of the air quality monitoring network.
- 2.3.5 The analysis shall be in accordance to the latest National Ambient Air Quality Standard (GN 1210 of 2009 and GN 486 of 2012, or as amended) and SANAS Methods.

2.4 MAINTENANCE AND CALIBRATION

- 2.4.1 The service provider will as a minimum be required to undertake the maintenance and calibration activities as listed in Table 1 below. Further recommendations can be discussed

between TNPA and the appointed service provider with regards to the type of activity and frequencies, if required.

Table 1: Routine maintenance activities and frequencies

Activity	Frequency
Zero/span (z/s) check.	Permeation tubes: Once a week, except when standard gas is used. Standard gas: Every 2 weeks
Change of particulate filters.	At least every month, but dependent on the dust loading. Zero/span check to be performed prior to changing filter/s
Cleaning of inlet gas sample manifold.	Monthly
Cleaning of inlet particulate monitor inlet gas sample line.	Quarterly
Cleaning of particulate monitor inlets (heads).	Quarterly
Particulate monitor pump and flow controller checks.	Every six months
Multi point calibration and validation of permeation tubes.	Quarterly
Internal performance audit.	Every six months
Major service of NOx, SO2 monitors	Annually
Calibration of meteorological equipment (wind anemometer, temperature sensors, solar radiation monitor)	Every 6 months
Major service of Tapered Element Oscillating Microbalance (TEOM) particulate monitor.	Annually
Certification of working gas standard.	Annually
Gas monitor pump performance assessment.	Annually
Air conditioner service.	Annually

Note:

1. TNPA requires submission of annual calibration certificates
2. The service provider must be capable of providing a quick (within 72hours) response in case of breakdowns, TNPA Personnel will not respond to any breakdowns.

2.5 MONTHLY REPORTING

Monthly reports to be prepared including the following items as a minimum:

- 2.5.1 Relevant legislative requirements.
- 2.5.2 Summary of station checks, and calibration conducted during the month.
- 2.5.3 Summary of monitoring results for the month and comparison to previous months.
- 2.5.4 Detailed monitoring results for PM₁₀, PM_{2.5}, SO₂, NO_x and meteorological data .
- 2.5.5 Results of data capturing rates indicating any recording of data issues, corrective actions taken, equipment replaced/repaired, etc.
- 2.5.6 Recommendations, if required.
- 2.5.7 Executive Summary that will capture the essence of the Report and also assist those who are not Air Quality Specialists with better understanding.
- 2.5.8 Reports submitted to TNPA must be in line with current international standards.
- 2.5.9 The Reports submitted to TNPA must also be able to show graphs, trends and other forms of reporting that make reporting easy and effective.
- 2.5.10 Monthly Reports must be submitted monthly to SAAQIS
- 2.5.11 TNPA reserves the right to request the service provider to revise the format of the Reports.

2.6 ANNUAL REPORTING

- 2.6.1 The Service Provider will be expected to compile an annual report for each of the two Ports that includes an overall summary of the Port's ambient air quality information for the year under review. The report must be submitted to TNPA not later than 30 days after the end of each year. The annual report must include, amongst others, the following items:
 - 2.6.1.1 Methodology and monitoring locations
 - 2.6.1.2 Summary of the monitoring results for the year including a meteorological overview
 - 2.6.1.3 Overview of maintenance and calibrations carried out on the air quality monitoring equipment
 - 2.6.1.4 Recommendation for improvement on Ports ambient air quality controls and management
 - 2.6.1.5 Executive Summary that will capture the essence of the Report and also assist those who are not Air Quality Specialists with better understanding.
 - 2.6.1.6 Reports submitted to TNPA must be in line with current international standards.
 - 2.6.1.7 The Reports submitted to TNPA must also be able to show graphs, trends and other forms of reporting that make reporting easy and effective.
 - 2.6.1.8 TNPA reserves the right to request the service provider to revise the format of the Reports.

2.7 PRESENTATION OF RESULTS TO TNPA

The Service Provider shall be expected to present the results of the Port of Port Elizabeth and Port of Ngqura Air Quality Monitoring Programme to TNPA and relevant stakeholders who play an important role in air quality. These shall include but not limited to TNPA employees, TNPA customers, Regulatory Authorities, Public stakeholders etc. The presentation of the results will be undertaken on a quarterly basis.

2.8 DEVELOPMENT OF A WORK INSTRUCTION

The appointed service provider shall develop and provide to TNPA a Work Instruction for the operation of the AQMS, instrument maintenance and calibration, troubleshooting and replacement of wearing parts, preventative maintenance, servicing requirements, including any other requirements needed to ensure effective operation of the AQMS.

2.9 TRAINING

The appointed service provider shall train the TNPA representatives on technical skills to ensure they understand the overall functioning of the Air Quality Monitoring Station and to better understand the reports that will be generated as part of this project.

2.10 PROJECT MEETINGS

Once the tender has been awarded the following meetings will be held with the appointed service provider:

- 2.10.1 The project kick-off meeting with all team members at each Port.
- 2.10.2 The project management meetings will be coordinated when required and key team members must be part of the meetings.

2.11 PRICING REQUIREMENTS

All the specific deliverables must be costed all-inclusive of:

- 2.11.1 Cost of deliverable
- 2.11.2 Resources to be used
- 2.11.3 Time needed (in hours)

2.12 CONTRACTOR MANAGEMENT DOCUMENTATION

- 2.12.1 Please refer to the EMP Template and submit as part of the SHE File returnable documents

- 2.12.2 Please refer to the Contractor Compliance File Assessment Checklist and submit as part of the SHE File returnable documents.
- 2.12.3 The Contractor is required to develop a COVID 19 Safe Operating Procedure and Risk Assessment
- 2.12.4 The Contractor needs to ensure a registered Occupational Health & Safety Doctor is used for the medicals.
- 2.12.5 The Contractor needs to ensure that the nature of business on the Letter of Good Standing is aligned to the services to be rendered

Abbreviations

- SHE: Safety, Health and Environment
- OEMP: Operational Environmental Management Plan
- EMP: Environmental Management Plan
- OHS: Occupational Health and Safety

Note:

The Contractor may only commence with work on site after all the above requirements have been met and employees have attended TNPA SHE induction.

The documentation received by the SHE Department from the contractor must be kept on the Contract SHE File.

2.13 INSURANCE REQUIREMENTS:

Before the service provider commences with the works, the service provider must effect and maintain (if the service provider does not already carry these insurances under its annual policies of insurance) at its own expense, all insurances required by law and the contract, including:

- a) Public liability insurance covering liability to third parties for injuries, death, loss of and damage to the property from anything done or omitted to be done for the public liability insurance.
- b) Motor vehicles third party insurance for all relevant vehicles.

Before commencement of the works and whenever subsequently requested in writing by the TNPA Project Managers, the service provider must provide TNPA Port of Port Elizabeth and Port of Ngqura with certificates of currency to demonstrate that the insurance policies referred to have been affected and are being maintained.

The service provider must notify TNPA Port of Port Elizabeth and Port of Ngqura immediately of any circumstances, injuries, deaths or incident that may occur on site which may, or may not, involve a claim against both the service provider and TNPA Port of Port Elizabeth and Port of Ngqura.

TNPA Port of Port Elizabeth and Port of Ngqura will not be liable for any claim or part of claim against the service Provider's liability.