

# GOA STATE POLLUTION CONTROL BOARD

गोंय राज्य प्रदुशण नियंत्रण मंडळ

(An ISO 9001-2008 Certified Board)

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**BY SPEED POST**

**MOST URGENT**

No.1/25/17-PCB/12901/6689

Date:- 11/07/2017  
12

To,  
The Regional Officer,  
Ministry of Environment, Forests & Climate Change,  
Southern Zone, 4<sup>th</sup> floor, E & F Wing,  
17<sup>th</sup> Main Road, 2<sup>nd</sup> Block,  
Kormangala, Bangalore, 560034.

Sub:- Environmental Public Hearing.

Sir,

As per the revised Environmental Impact Assessment Notification No.15/3 (E) dated 14/09/2006 as amended, issued by the Ministry of Environment, Forests and Climate Change, Government of India, the Board has conducted Environmental Public Hearing as per the said notification with respect to the following project at the date, time & venue mentioned below:

Sr.no.	Project details	Date	Time	Venue
1	Deepening of Approach Channel and Inner Basin for Capesize Vessels at Mormugao Port" by M/s. Mormugao Port Trust, Headland Sada-Goa.	conducted on 27/04/2017 adjourned and taken up on 02/05/2017, 3/05/2017 & 04/05/2017	10.30 am onwards	Tilak Maidan, Vasco-da-Gama, Goa

In this regard, I am to enclose herewith the following documents for your perusal and necessary action.

1. The copies of the duly approved proceedings of the Environmental public hearing held on 27/04/2017 adjourned and taken up on 02/05/2017, 3/05/2017 & 4/05/2017, reflecting the views and concerns expressed by the public present for the hearing recorded and read out to the public on the same day, along with translation of the same in the official State Language i.e. Konkani – **Annexure “A”**.
2. Attendance sheet – **Annexure “B”**.
3. The CD recordings of the proceedings of three project - **Annexure “C”**.
4. The copies of the objections/suggestions/views received from the public - **Annexure “D”**.
5. ~~Corrected copies of Minutes (part) as given by the representative of the public after the conduct of Environmental Public Hearing - **Annexure “E”**.~~
1. Reply to queries submitted by project proponent raised during Environmental public hearing in English and Konkani. - **Annexure “F”**.

Further it is pertinent to bring you on record the following facts as regards to the air pollution caused due to handling of coal at M/s. MPT and the decisions taken by the Board.

1. Under Judgement dated 24/12/2012 passed by the Hon'ble High Court of Bombay at Goa SMWP No.8/2000. The Hon'ble High Court directed the GSPCB to monitor the pollution at MPT from time to time to protect the environment and issue directions as necessary from time to time. The GSPCB carried out AAQM at various locations from 2012 onwards and the analytical reports continuously indicates that concentration levels of PM10, PM2.5 and other parameters are exceeding the permissible limits. Various directions were issued to MPT for taking appropriate measures.
2. The Goa State Pollution Control Board conducted inspection of the MPT Port area in order to assess the point sources of discharge of air pollutants responsible for the pollution within and outside the port area and to identify sites for



conducting ambient air quality monitoring on 02/03/2016. Pursua it to the directions issued on 4/2/2016.

3. Ambient Air Quality monitoring for 24 occasions, out of which 14 occasions result indicate that values of PM<sub>10</sub> have exceeded the permissible limits of Ambient Air Quality data.
4. All the report and observations were placed before Board during 19<sup>th</sup> Board Meeting and it was decided that immediate measures will have to be taken in this regard. Accordingly Board had issued directions to M/s. MPT, M/s. South West Port Limited & M/s. Adani Mormugao Port Terminal Ltd., directing to take immediate measures to reduce the annual handling capacity for coaking coal/coke from 5.5 MMT/annum to 4.125 MMT/annum or should be reduced by 25% of the last 12 months load handled of coaking coal/coke whichever is lower on a pro-rata basis for the period from 01/02/2016 upto 30/04/2016
5. An interim study on AAQM was initiated by the Board in Feb 2016, at MPT due to the numerous complaints received in adjacent residential areas and it was noted as follows:-

- 1 The SO<sub>2</sub> and NO<sub>2</sub> data were found within stipulated limits,
- 2 However the PM 10 level were found significantly high for a maximum period especially at
  - i JSW AAQM 1: JIC1 Counterweight area , as noted on a few random days of monitoring for the month of April and May 2016
  - ii JSW AAQM 2: Junction house on E corner , as noted on all the days of monitoring for the month of April and May 2016
  - iii JSW/Adani (common station ) AAQM 3- On top of substation II on SE boundary as noted on most of the days of monitoring for the month of April and May 2016
  - iv AMPTPL AAQM 2: On SE corner near Gate to silo, as noted on more than two consecutive days in April & May'2016.
  - v AMPTPL AAQM 2: On SE corner near Gate to silo, as noted on all day of monitoring in April & May'2016.
  - vi MPT 9 AAQM. 1: Behind CCP on SE corner as noted on more than two consecutive days in April & May'2016.



- vii MPT 9 AAQM. 2: Behind Mech. Engineering Bldg. as noted on two consecutive days in May'2016.
- vii MPT 9 AAQM. 3: Near Fire Monitoring location at open platform , as noted on more than two consecutive days in May'2016
- viii MPT 10/11 AAQM 1: Near passenger launch jetty as noted on almost all the days in April & May'2016.
- ix MPT 10/11 AAQM 2: Near sulabh toilet as noted on almost all the days in April & May'2016.
- 3 These are active berths on the Port except for Berth 9, where the PM 10 levels are found within stipulated limits except at MPT 9 AAQM. 1: Behind CCP on SE corner, which is close to the railway track and road transport activities.
- 4 The Sulabh Toilet near Laxmi Temple at Khariwada was the only residential area showing PM 10 above permissible limits, as noted on all the days of monitoring for the month of April 2016.

~~5 The other residential areas namely, Colaco Arcade and residence of Hon'ble Power minister, the PM 10 levels was found exceeding on 21/04/16~~

~~6 The PM 2.5 levels showed occasional high peaks in most of the monitored locations except in MPT Berth 10/11-AAQM No. 3, on W boundary near overhead water storage tank, where it was noted on three occasions~~

~~7 The units namely JSW, AMPTPL, and MPT were directed to carry out joint exercise of AAQM at the above said sites vide Directions referred above, however the units refrained from doing so.~~

6. Subsequently Board has received data submitted by M/s. Mormugao Port Trust, from the year 2012-2016, the data was examined/analyzed by the Board officials and noted that M/s. South West Port Limited, (Berth no. 5A & 6A), Mormugao Goa, exceeds productions for the year 2012-2013(coal/coke), 2013-2014(steel), 2014-2015(coal/coke and steel) and 2015-2016(coal/coke) in comparison to the permitted capacity as per Consent to Operate granted.

7. It is further decided that comprehensive monitoring of MPT concerning coal, coke handling is necessary and also conduct source apportionment studies of the

particulate matter for the comprehensive study. And get a clarification from Ministry of Environment, Forests and Climate Change concerning standards to be adopted for source monitoring/ambient air. The Board is in receipt of clarification from CPCB.

- 8) AAQM was initiated to establish a baseline trend within the MPT active zones w.r.t reduced production capacity. The data obtained did not show any vast difference in particulate matter levels generated during handling.

Though JSW and AMPTPL were using sprinklers, at the time of visits MPT was not. In addition, the Goa State Pollution Control Board (GSPCB) requested the National Institute of Oceanography (CSIR-NIO) to provide assistance and expertise in their studies on particulate matter concentrations due to coal handling at the Mormugao Port Trust area, Mormugao Goa. The NIO Report was submitted by Dr. Ramaswamy, Sr. Scientist, on Coal dust concentrations in MPT.

#### 9. The Highlights of the said report included:

- ~~Compared to minerals like limestone, sand or iron ore, coal transport is a bigger~~ source of pollution because of the special properties of coal like low density, friable nature and black/grey colour.
- Density of coal varies from 0.6 to 1.5 and can be very easily airborne
- ~~The friable nature cause coal lumps to easily turn into coal dust. Because of its~~ low density, even particles as large as 10 to 30 microns can get airborne easily in relatively low wind speeds.
- The black/grey colour of coal leaves stains easily on any surface and coal coatings can damage vegetation by reducing the amount of sunlight falling on leaves.
- Because of the high temperatures in tropical regions like Goa, water evaporates rapidly reducing the moisture in coal dust and thereby making them prone to lifting
- coal dust which if inhaled can have adverse health effects like coal worker's pneumoconiosis which is known colloquially as "black lung", because the

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colour of the lungs turn black on continuous exposure. Coal dust can coat almost everything from vegetation, exterior and interior of houses, food, clothing etc

10. The major NIO recommendations are

- (iv) Setting up of continuous air quality and weather monitoring station
- (v) Measuring dust fall
- (vi) Hundred percent concretization of coal handling area to facilitate cleaning up and reducing pollution in MPT and Vasco area.

**11. Based on the above the Board made the following recommendations:**

- 13.1 The MPT, AMPTPL, JSW may be directed to further streamline their coal handling activities taking into consideration Best Industrial Practices in such activities
- 13.2 The MPT, AMPTPL, JSW may be directed to concretize their work areas/transportation routes to minimize fugitive dust emissions.
- 13.3 A post monsoonal AAQM study be continued at the above locations to establish a baseline trend w.r.t AAQM
- 13.4 The MPT may provide a survey outlay of its boundary to re-establish the AAQM siting locations.
- 13.5 MPT and JSW may be directed to relocate their existing CAAQMS to the identified areas and make them fully functional.
- 13.6 The Units operating in the respective Berths may be directed to install a CA AQMS in a residential area on both the southern and eastern side which shows presence of high particulate matter levels
- 13.7 Dust fall measurement after monsoon i.e October 2016
- 13.8 Dust to be analysed & characterised to ascertain the source/fingerprinting
- 13.9 Assessment of actual coal handled by both coal operators with respect to Board direction to 25% reduction has to be verified after checking with records of MPT and correlated.
- 13.10 To evaluate the exceeded data and correlate with activities on site



13.11 Comparison of Ambient Air data monitored by NEERI with this study.

The details of the final report with study period from Feb'16 to May 16 & from Nov'16 to Dec'16 are produced below.

**Objective:**

The Board has received a number of complaints regarding air pollution in the vicinity of the MPT port area from the public. Acting on the same, a status study was initiated by the Board in Feb'2016, the findings of which are given as under In order to ascertain the same, the Board initiated an Ambient Air Quality study in and around the immediate vicinity of MPT Port Area, including Vasco city, in light of the coal handling activities of MPT Port. And to further correlate it, to the to the compliance of Board Consent Conditions and Board direction to reduce coal handling by 25% in order to ascertain that the reduction in coal handling can impact the existing dust pollution noted and improve the air quality

**Study Details:**

- b. As per agenda No. 19 of the 119th Board meeting held on 28/01/16, regarding coal pollution in Vasco city, the following was decided :
  2. To reduce the coal handling capacity of the berths of M/s South West Port Ltd.(Berth 5A & 6A) and M/s Adani Mormugao Port Terminal Pvt. Ltd.(Berth &) by 25% of the load handled in the previous 12 months.
  2. To monitor the air quality around the operations of M/s South West Port Ltd. M/s Adani Mormugao Port Terminal Pvt Ltd., and M/s Mormugao Port trust at cost to the parties from 1 st February 2016 to 30th April 2016.



3. Installation of CAAQMS by of M/s South West Port Ltd., M/s Adani Mormugao Port Terminal Pvt.Ltd.and M/s Mormugao Port Trust

b. W.r.t 4.2.1 (1), the Board issued orders to MPT, JSW and AMPTPL.

c. Pursuant to the decisions taken at 4.2.1 (2) ,the Board further conducted the following studies:

The study was done by the Board using Board manpower through deployment of the the Board equipment i.e. Respirable Dust Sampler (RDS) and Fine Particulate Sampler (FPS) of make: M/s Envirotech , Model Nos' RDS:APM460 NL with gaseous attachment AP 411 and FPS: Model No 550 MFC (Mass Flow Controller) . The sampling and analytical methodology is as per CPCB namely, Guidelines for Ambient Air Quality Monitoring, NATIONAL AMBIENT AIR QUALITY MONITORING SERIES : NAAQMS/ ... /2003-04, April 2003 and and Guidelines for the Measurement of Ambient Air Pollutants : NAAQS Monitoring & Analysis Guidelines Volume-I: Guidelines for Manual Sampling & Analyses, May, 2011, respectively.

**STUDY IA: PRE MONSOON (Feb-May'16):**

The Board monitors ambient air on the open terraces of Fuse Call Office of Electricity Department, Vasco and the MPT Fire Brigade Station, Mormugao Port Trust (MPT) 24 hourly twice a week under the National Ambient Air Monitoring Programme (NAMP , a Central Pollution Control Board (CPCB) ongoing Project. As directed, the MPT Fire Brigade Station, (MPT) was monitored on a daily basis for AAQM parameters from 15.02.16 to 27.02.16. The Vasco Fuse call office was monitored twice a week

**STUDY IB: PRE MONSOON (Apr'-May'16)**

As per the directions of the Member Secretary, the Board Official inspected the MPT Port area on 02/03/2016 in order to assess the particulate matter emissions from various areas of discharge of air pollutants responsible for the pollution within and outside the port area and to identify sites for conducting ambient air quality monitoring, in compliance to Board Consent conditions. Based on the findings, 15 AAQM locations were identified and monitored from 05/14/16 to 31/05/16 (Refer Annex IA & IB)





**Observations:**

**JSW: MPT Berth 5&6**

2. The CAAQMS which is installed by JSW on the terrace of the canteen building was directed to be shifted due to its unsuitability w.r.t. wind directions and noncompliance of siting guidelines, -PENDING
2. Concretization was also asked for the work area including the adjacent rail track area, in order to minimize fugitive dust re-suspension of the settled particles during the movement of vehicles. -PENDING
3. Rakes are filled through the conveyor-hopper- chute system and the rakes are covered with a tarpaulin
4. The berths handled by SWPL appeared to be clean as a coal dust sweeper and vacuum cleaner truck was in operation.
5. The area near the railway tracks has large amounts of dust and fine coal dust which could be easily entrained by even a Light wind

**AMPTPL MPT Berth 7**

1. The berths were found unclean with litter and un-maintained and require to be cleaned -PENDING
2. Concretization was asked for the work area in order to minimize settled dust emissions during the movement of vehicular movement. -PENDING
3. Rakes are filled through the conveyor-hopper- chute system and the rakes were being covered with a tarpaulin

**MPT Berth 8&9 :**

1. MPT 8 is used for the handling of liquid products like POL (Petroleum Oil and Lubricants) , phosphoric acid, ammonia, caustic soda, edible oil etc.
2. MPT 9 is presently not in use and is having small piles of iron ore , which are left uncovered.

**MPT Berths 10&11:**



1. The berths were found unclean with litter and un-maintained and require to be cleaned  
- PENDING
2. Concretization was also asked for the work area in order to minimize fugitive dust emissions during the movement of vehicular movement. -PENDING

**Mooring Dolphins:**

1. These are isolated marine mooring structures for berthing and mooring of vessels in off shore waters
2. 06 Nos of off shore mooring dolphins were located approximately 0.5 kms from MPT berths.

**National Institute of Oceanography (NIO):**

Sr. Scientist, Dr. Ramaswamy was requested for his expert assessment on the Characterization and Source Identification studies of the particulate matter on the filters along with the sample of material handled at respective berths. Dr. Ramaswamy has highlighted the following

1. As the coal handling berths and the storage areas are close to heavily populated areas, spread of coal dust to surrounding villages and towns, the same must be evaluated and controlled
2. A joint visit was conducted by NIO and GSPCB officials to the Mormuga Port Trust on 23rd March 2016. The report findings are provided at Sr.No.12

MPT and JSW were earlier directed to relocate their existing CAAQMS to the identified areas in the downwind direction where most of the effect was noted. The former is yet to be made fully functional, which is till date still pending

MPT CAAQMS at MPT Institute was not operational and is to be made operational with immediate effect as the same has been pending since January'2016.

**CONCLUSION:**



The AAQM study in MPT indicated the AAQM standard for monitoring as per schedule VII of the Environment Protection Rules 1986 as amended and the Board Consent Conditions issued to the said Berth operators were exceeding for the said monitoring period and further indicates that exceedances have occurred on two or more consecutive days of monitoring, which is in violation of the issued Board Consent conditions stipulated for the same. (Refer Table 22) The Particulate Matter was found to be more or less consistently high in MPT area with the highest AAQM levels observed in Berth 5 A-6A ( M/s JSW ) and Berth 7 M/s AMPTP ) berths .

This can be attributed to the material transfer that occurs through an excavator which loads/unloads coal/coke, as well as scooping coal/coke from the ship holding tank with the help of grabs into a waiting chute on the berth in a conventional method and typically leads to possible spilling of coal/coke, both onto the berth and into the water and further leading to fugitive emissions . The following activities are evident at the MPT Berths and are possible contributory sources : 1. Train emissions 2. Stock piling of (coal, coke, woodchips, bauxite etc) 3. Stackers 4. Loading/unloading activities (coal, coke, woodchips and related dust, bauxite, ore dumps , coal conveyor systems, ship loading/unloading, grabs, mobile reclaimers , use of heavy machinery , excavators etc.) 5. Truck movement 6. Ship emissions The residential/commercial AAQ monitoring stations at Khariwada and Fuse call Office also showed exceedances (Refer Table 22) during pre- and post monsoon period of monitoring , which can be attributed to the wind patterns observed during the said monitoring period. ( Refer Fig. 12) The present AAQM was initiated to establish a baseline trend within the MPT active zones w.r.t reduced production capacity. The data obtained did not show any vast difference in particulate matter levels generated during handling. (Refer Fig. 3.0 & 4.0) Though JSW , MPT and AMPTL are using sprinklers for their coal handling or related activities, , coupled with the un-tarred/in concreted roads, vehicular/rail transportation the contributions to dust generation need to be quantified w.r.t Dust generation through a source apportionment study.

#### **RECOMMENDATIONS:**

The port operations include –

1. Dry Bulk Storage & Handling
2. Liquid Bulk Storage & Transfer (Loading/Unloading)
3. Non-bulk Chemical Storage & Handling
4. Port Cargo Handling Equipment & Rail/Truck Operations Powered by Diesel Engines

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5. Vehicle & Equipment Fuelling

6. Management of Hazardous and Non-hazardous Waste Generated by Port/Tenant Activities

7. General Operations that can Impact Neighboring residential/commercial Areas like Noise, Light, Odor, Trash, Dust.

8. Berths Maintenance Taking the above into consideration:

The MPT, AMPTPL, JSW may be directed to further streamline their coal /ore / wood chip handling activities in such activities by directing primarily MPT and its lease holders to:

b. Take into consideration Best Available Technology (BAT) or Good International Industry Practices (GIIP).w.r.t DUST MANAGEMENT when determining air quality management techniques ,generally and in specific cases, including during expansion or up gradations.

b. Use enclosures (detachable if required) on conveyors or chutes and telescoping arm loaders, hoppers to reduce spillage and dust; also, minimize the distance between the working area and trucks/trains being loaded to reduce the area exposed to fugitive dust generation and area that has to be swept/cleaned. Free fall of material should be avoided.

c. Cover the cargo stock pile with an impervious tarpaulin , adequately anchored , as soon as possible after loading/ unloading and adjusting the cover as material is removed from the pile thereby ensuring maximum closure of the pile and minimum exposure to existing weather conditions

d. Maintain pile size/volume to maximum height specified by the Board or consistent with customer demand, transportation schedules and materials cost , whichever is lesser , to reduce the amount of material exposed to weather conditions; and for the shortest time as possible. Dry cargo pile heights should remain low, to minimize material from becoming airborne.

e. Insert the ship loader or loading mechanism in the ship's hold before loading/unloading begins. All ship loader booms should be fitted with fogging sprays at the loading chute.

f. Divert stormwater/run-off around the stock pile with drainage channels or impermeable perimeter berms (Compacted clay is preferably preferred over either concrete or asphalt as it is less likely to crack, thereby preventing groundwater infiltration<sup>2</sup> ; ) , tyre washing areas, channelling the run off into adequately sized and

suitably lined holding tanks prior to disposal post treatment and compliance to stipulated standards.

g. Periodically clean the drainage channels and properly dispose of the sediment as per applicable regulations. Storm drainage channels/holding tanks should not be discharge directly into surface waters without prior Consent of the Board and compliance verification..

h. Wash down or spray the underside and tires of trucks/other vehicles suitably bermed allotted areas transporting dry bulk materials/otherwise and complete cover of the cargo prior to exiting on to public roads to reduce dust transfer and fugitive emission .

~~j. Establish the Dust Extinction Moisture (DEM) for the various cargoes handles as applicable and ensure that all ore/coal/bauxite/sawdust/other powder form of material (directly or indirectly derived ) brought into, stockpiled and unloaded/loaded through the MPT is at, or above, the Dust Extinction Moisture (DEM) for that particular material type. DEM, as well as any specific characteristics such as hydrophobicity which would indicate that practices relying on water application would be effective enough or ineffective. Both the DEM and the hydrophobicity of ore/coal/bauxite/ sawdust/other powder form of material (directly or indirectly derived) should be determined and the reports of the same should be submitted to the Board including their respective Material (or mineral) characteristics of the bulk material.~~

k. Use Water cannons/sprinklers on all stockpile areas to maintain the Dust Extinction Moisture (DEM) of the product and prevent dust emissions associated with wind erosion. Use of low-volume misting nozzles directed along the raw material stream. Use of water addition nozzles in conjunction with the low volume misting nozzles where the raw material is not at DEM.

l. Explore the use of total or partly retractable permanent enclosures for stock pile handling areas , during loading /unloading or installation of an additional windscreen (height to be established keeping in mind, the elevation height of the hill top residences and the structural stability of the same ) adjacent to the road adjoining MPT and the residences , whichever is feasible , for control of dust generation with extraction to



suitable bag or appropriate filters to minimize fugitive dust emissions, thereby controlling material loss.

m. Consider predominant wind patterns when stock piling, avoiding dry and windy conditions where possible. Spray stockpiles immediately prior to strong wind events or dry weather conditions

n. Consider removal of materials from the bottom of piles to minimise dust re-uspension .

o. Regularly vacuum clean the docks, and handling areas, trucks, rail storage areas, and paved roadway surfaces.

p. In Mobile reclaimers , the bucket wheel reclaimers can be fitted with two sets of nozzles (one set to spray the face of the stockpile immediately ahead of and behind the cutting wheel, and the second set to spray into the raw material stream as it cascades out of the buckets into the transfer chute and onto the conveyor

~~q. All roads/handling/storage areas within MPT premises are regularly cleaned and maintained (including truck/rail routes) on a daily basis.~~

~~r. Where practicable during expansion, designing new facilities to minimize travel distance from ships off-loading and on-loading facilities to storage areas.~~

~~s. Provide details of water source for sprinklers and provide flow meters to the sprinkling systems line and submit daily readings of input and output at the end of the month to the Board~~

~~The Board has initiated the process to conduct proposal for Particulate Source Apportionment Study for Air Quality in Vasco Da Gama Goa, through Indiar Institute of Technology Bombay.~~

The source apportionment study is not a part of the approved ToR by MOE for the two (2) capacity addition projects (SWMPL capacity enhancement and MPT's redevelopment of berths 8 & 9), this study needs to be done before considering the projects for grant of Environmental Clearance.

Yours faithfully,



(Member Secretary)

Goa State Pollution Control Board

Encl: As above.

Copy to:-

1	The Chief Engineer, Mormugao Port Trust, Headland Sada Goa	
2	Legal file	
3	Office copy	
4	Guard file	