No. IENG/Env.Cell/APPCB/CFO-Comp/2026
Date:

To
The Environmental Engineer,
Regional Office,
Andhra Pradesh Pollution Control Board,
Beside RTA Office,
Madhavadhara VUDA Colony,
Visakhapatnam – 530018

Sir,

Sub: APPCB –RO- VSP-Half yearly compliance report on Consent for Authorization (CFO/CTO) - Reg.

Ref: 1. Order No. APPCB/VSP/VSP/45/CFO/HO/1933 dated: 13.04.2022 for VPA.
2. Order No. APPCB/VSP/CTO/HO/2023 dated 12.07.2023 for Cruise-Cum-Coastal Cargo Terminal, VPA.

With reference to Orders cited above, please find here with the condition wise (Half yearly) compliance for the subject for your kind information and records please.

Encl: As above.

Yours Sincerely,

7/2/26
CHIEF ENGINEER

CFO Order No. APPCB/VSP/VSP/45/CFO/HO/1933 dated 13.04.2022

&

VPA COMPLIANCE STATUS

VISAKHAPATNAM PORT AUTHORITY

Sub: APPCB Consent Order No: APPCB/VSP/VSP/45/CFO/HO/1933- dated: 13.04.2022 and VPT COMPLIANCE.

S. No	APPCB Condition	VPA Compliance
	SCHEDULED – A	
1.	Any up-set condition in any industrial plant / activity of the industry, which result in, increased effluent / emission discharge and / or violation of standards stipulated in this order shall be informed to this Board, under intimation to the Collector and District Magistrate and take immediate action to bring down the discharge/ emission below the limits.	**Noted.** VPA will comply as and when such incidents happen.
2.	The industry should carry out analysis of waste water discharges or emissions through chimneys for the parameters mentioned in this order on quarterly basis and submit to the Board.	**Complied.** • VPT is not generating any trade effluent since no processing activity is involved in port operations, however the city sewage which is entering into harbor water being treated through the existing a 10 MLD sewage treatment plant being monitored by M/s SV ENVIRO Labs & Consultants fort-nightly. The values of treated effluent are well within the norms (Copies are enclosed as **Annexure-I**). • VPA has not any process plant in port area. Due to which VPA does not generate emissions.
3.	All the rules & regulations notified by Ministry of Law and Justice, Government of India regarding Public Liability Insurance Act, 1991 should be followed as applicable.	**Complied.**
4.	Not with standing anything contained in this consent order, the Board hereby reserves the right and powers to review / revoke any and/or all the conditions imposed herein above and to make such variations as deemed fit for the purpose of the Acts by the Board.	**Noted.**
5.	The industry shall ensure that there shall not be any change in the process technology, source & composition of raw materials and scope of working without prior approval from the Board.	**-NA-**
6.	The applicant shall submit Environment statement in Form V before 30th September every year as per Rule No.14 of E(P) Rules, 1986 & amendments thereof.	**Complied.** Environment statement in Form - V is being submitted to the concerned before 30th September every year. Latest Submitted copy is enclosed as **Annexure-II**.

S. No	APPCB Condition	VPA Compliance
7.	The applicant should make applications through Online for renewal of Consent (under Water and Air Acts) and Authorization under HWM Rules at least 120 days before the date of expiry of this order, along with prescribed fee under Water and Air Acts and detailed compliance of CFO conditions for obtaining Consent & HW Authorization of the Board.	**Noted & Complied.**
8.	The industry should immediately submit the revised application for consent to this Board in the event of any change in the raw material used, processes employed, quantity of trade effluents & quantity of emissions. Any change in the management shall be informed to the Board. The person authorized should not let out the premises / lend / sell / transfer their industrial premises without obtaining prior permission of the State Pollution Control Board.	**Noted & Complied.**
9.	Any person aggrieved by an order made by the State Board under Section 25, Section 26, Section 27 of Water Act, 1974 or Section 21 of Air Act, 1981 may within thirty days from the date on which the order is communicated to him, prefer an appeal as per Andhra Pradesh Water Rules, 1976 and Air Rules 1982, to Appellate authority constituted under Section 28 of the Water (Prevention and Control of Pollution) Act, 1974 and Section 31 of the Air (Prevention and Control of Pollution) Act, 1981.	**Noted.**
10.	The industry shall be liable to pay Environmental Compensation / Other Environmental Taxes, if any environmental damage caused to the surroundings, as fixed by the Collector & District Magistrate or any other competent authority as per the Rules in vogue.	**Noted.**
11.	The industry may explore the possibility of tapping the solar energy for their energy requirements.	**Complied.** VPA has established 10.77MW Solar Power Plants and utilized for Port Operations.
12.	The industry should educate the workers and nearby public of possible accidents and remedial measures.	**Complied.** VPA Conducting Training Programmes for all Employees on various Subjects at HRD Section.

S. No	APPCB Condition	VPA Compliance
13.	The conditions stipulated are without prejudice to the rights and contentions of this Board in any Hon'ble court of law.	**Noted.**
	SCHEDULE – B	
1.	The VPT shall cover all dusty cargo with tarpaulins.	**Complied.** VPA is ensuring coverage of all dusty cargo stacks with tarpaulins (Photographs enclosed as **Annexure - III**).
2.	The VPT shall submit the plan/ drawing showing the earlier coal and other dusty cargo stack yards in city interface shifted to port interior areas as a part of re-organization of the stacking yards which are near to the city interface.	**Complied.** VPA has submitted plan/ drawing showing re-organization of the stacking yards vide Lr. No.: IENG / ENV / NGT / 2020 / 336 dated 28.02.2020
3.	The VPT shall remove the dusty cargo i.e., coal cargo near to city interface at R-2, R-4 & R-5, A, B yards at TM Office until the MDSS is installed and ready for operation as per the action plan submitted against NGT directions for which BG is given to APPCB.	**Complied.** A Bank Guarantee of 1.0 Cr has been submitted by VPA which is valid up to 31st July, 2026.
4.	The VPT shall construct 2 covered storage sheds of size 200m × 40m × 17m and 200m × 30m × 17m at R6-R9 areas for storing the cargo. Action plan with timelines shall be submitted.	**Complied.** VPA has constructed 4no.s covered storage sheds with a measurement of 200m X 40m X 17m & 200m X 30m X 17m. Another 5 sheds are constructed by PPP/BoT Operators. Photographs are enclosed as **Annexure - IV**.
5.	The VPT shall not store any dusty cargo without MDSS system at any location in the Port premises.	**Complied.** VPA ensuring water sprinkling on all dusty cargo stacks and yards by arrangement of MDSS / Water Sprinkling by Water Tankers and Covered with Tarpaulins.
6.	The VPT shall mechanize EQ-6 along with the proposed cargo and submit action plan.	**Complying.** VPA obtained EC & CRZ Clearance from MoEF&CC, New Delhi.
7.	The VPT shall submit action plan for completion of dismantle and reconstruct WQ-2 to WQ-4 berths.	**Noted for Comply.**
8.	The VPT shall not store stock piles in coal yards more than 6m.	**Complied.** VPA maintain stack height 6m.
9.	The VPT shall export aluminum powder bags and any other bagged cargo as a precautionary measure with sea wall nets at berths and shall not cause any spillages on berth as well as in sea water.	**Complied.** VPA provided Save all Nets while handling of Cargo loading and unloading from the vessels to control the spillages into harbour water.
10.	The VPT shall submit action plan to minimize the solid waste at source which suitable sustainable technology.	**Being Complied.** VPA collecting floating waste from geddas and disposed at GVMC Dumping yard, Kapuluppada to generate power

S. No	APPCB Condition	VPA Compliance
		from waste by M/s. Jindal Urban Waste Management Ltd., Visakhapatnam.
11.	The Port (including PPP operators) shall route the hazardous waste through APEMC and ensure routing the bilge oil generated from Ships through APEMC.	**Complied.** VPA & PPP Operators are following APPCB conditions to collect Hazardous Waste and disposed through APEMCL portal. (Screen Shot of the APEMCL is enclosed as **Annexure - V**).
12.	The Port shall connect the CC Cameras to APPCB website.	As per National Security reasons i.e. Indian Navy and Coast Guard, the CC Cameras are not connected to APPCB web site.
13.	The Port shall take measures to maintain the ambient air quality within the stipulated standards.	**Being Complied.** VPA carried out Ambient Air Quality Monitoring by MoEF&CC approved Laboratories. The monitoring values are well within the stipulated standards.
14.	The Port shall provide display sign boards at berths and cargo stocking area showing the details of the berth & cargo handling.	**Complied.** VPA arranged Display Boards are showing the details at both Stock Yards and Berths. (Photographs enclosed at **Annexure-VI**)
15.	The Port shall fill the gaps in between GI sheets with geo net installed above the compound wall from convent junction to Kobbarithota junction.	**Complied.** VPA Constructed 7.5m high rise wall along Convent Junction – Sea Horse Junction & H-8 Junction about 1.7 Km.
16.	The Port shall achieve 100% target under Green Visakha Program.	**Complied.**
17.	The VPT shall convert the coal handling trucks into Automated Tarpaulin Closure System and also ensure the PPP operators to comply with the same.	**Noted.** VPA provided Semi-Automated Tarpaulin Covering System at one of PPP operator and another PPP operator arranged Semi-automatic Tarpaulins Coverage on Wagons in Port area.
18.	Dry bulk cargo which is prone to dust emissions only to be handled through mechanization at all new/modified/ upgraded berths.	**Noted.** VPA obtained EC &CRZ Clearances for various projects i.e EQ-1&EQ-1A, EQ-6, EQ-7, WQ-6 and WQ-7&WQ-8 berths.
19.	All construction and Establishment activities must be started only after obtaining valid EC & CFE.	**Noted & Complied.**
20.	The Port shall comply the Task Force directions issued by the Board time to time.	**Complied.**
21.	The facility shall provide dry fogging system as per the condition stipulated by the Board as the facility has provided only water sprinkling system (MDSS systems) at cargo handling area and stacking area.	**Being Complied.** VPA Deployed 10 no.s of Fog Canon Machines (3 Truck Mounted and 7 Trolley Mounted) another 2no.s of Truck Mounted Fog Canons are operated by PPP Operators at Stock yards and Berths. Also provided Automated Dust

S. No	APPCB Condition	VPA Compliance
		Suppression System at Stock Yards and Berths.
22.	The facility shall explore the possibility to install tube conveyor system to transport dusty cargo to control dust pollution on surroundings effectively as the facility located in Visakhapatnam city and also receiving complaints from the nearby residents on air pollution problems and shall submit the action plan in this regard.	**Noted.** VPA examine for Tube Conveyor System but there is no possibility of install tube conveyor in port area due to each cargo having different characteristics.
23.	M/s. VPT shall submit the action plan for mechanization of partly mechanized berths (5 no's) and other berths.	**Complied.** VPA obtained Environment & CRZ Clearances for EQ-1&EQ-1A, EQ-6, EQ-7, WQ-6 and WQ-7&WQ-8 Berths.
24.	The Port shall handle dust free cargo like fertilizers, food grains and bagged cargo steel, granite etc. in EQ-2 to EQ-5.	**Complied.**
25.	M/s. VPT shall install PLC based MDSS at all dusty stacking areas and shall report implementation progress every month to ZO, Visakhapatnam and RO, Visakhapatnam.	**Complied.** VPA install PLC based MDSS i.e automated water sprinkling system at cargo stacking areas (Photos are enclosed as **Annexure-VII**).
26.	The district crisis group formed under MSIHC rules shall monitor and review the safety measures regarding of Ammonium Nitrate and ensure additional safety precautions to be taken by conducting periodical mock drills under the supervision of the District Crisis Group.	**Noted.** VPA carried out a Quantitative Risk Assessment Study by M/s. IRCLASS Systems and Solutions Pvt. Ltd., New Delhi (Extracted pages are enclosed as **Annexure - VIII**). VPA regularly conducting Mock Drills for all employees.
27.	The VPT shall take all the necessary measures to control the air pollution and shall ensure that $PM_{2.5}$ & PM_{10} daily/monthly and annual average values are within the standard.	**Complied.** VPA taking necessary actions to control the air pollution. VPA carried out AAQ, Marine Water monitoring and the parameters are within the limits.
28.	The effluent discharged shall not contain constituents in excess.	**Complied.** VPA established 10MLD Capacity of STP to treat city waste water and also VPA carried out Sewage Water Quality Monitoring Analysis by MoEF&CC approved laboratory. The Treated water being used for dust suppression in port area.
29.	The source of water is GVMC. The Port shall take steps to reduce water consumption to the extent possible and consumption shall Not exceed the quantities.	**Complied.** VPA reduce fresh water consumption by utilizing treated water from STP for sprinkling on stacks and roads for dust suppression.
30.	The Port shall maintain Electro Magnetic flow meters with totalizers for water and effluent quantity measurements for different streams of effluents and different	**Complied.** VPA Provided Electro Magnetic flow meters to measure the water consumptions.

S. No	APPCB Condition	VPA Compliance
	categories of water usage stipulated in this order.	
31.	Rain water shall not be allowed to mix with either trade or domestic effluents. Port shall maintain storm water drains, properly.	**Complied.** VPA provided separate rain runoff water drains.
32.	The Port shall ensure compliance with ambient air quality standards of PM_{10}-100 micro grams/ m^3; $PM_{2.5}$ – 60 micro grams / m^3; SO_2 – 80 micro grams/ m^3; NO_x – 80 micro grams/ m^3, (day average standards). The Port shall ensure compliance of the National Ambient Air quality standards notified by MoE&F, GoI vide notification No. GSR 826(E), dated, 16.11.2009.	**Complied.** VPA carried out Ambient Air Quality Monitoring by Authorized Agency. The monitoring results are within the standards.
33.	The Port shall comply with the following for controlling fugitive emissions: 1. Vehicle movement shall be minimized / eliminated by implementing mechanical operation. 2. All the vehicles involved in transportation of Cargo shall be covered with tarpaulin. 3. Vehicles shall be managed to avoid traffic congestion and shall provide empty dusting vehicle washings / dry cleaning system to clean all out going cargo vehicles. 4. Based on traffic density/ vehicular movements anticipated from the port, parking facilities shall be provided.	**Complied.** 1. VPA obtained Environment & CRZ Clearance for EQ-1&EQ-1A, EQ-6, EQ-7, WQ-6, WQ-7&WQ-8 berths. 2. All cargo transporting trucks & wagons are covered with Tarpaulins. 3. Existing 4 lane road to 6 lane road by NHAI to control the vehicle traffic. Also VPA deployed 3no.s mechanical road sweeping machines and water tankers to sprinkle on roads & stack yards for dust suppression. 4. VPA provided truck parking with amenities.
35.	The VPT shall maintain 3 CAAQM Station within the plant as per the specifications of CPCB for online monitoring of PM_{10}, $PM_{2.5}$, SO_2 & NO_x with networking facility to Head Office, APPCB.	**Complied.** VPA installed 3no.s continuous ambient air quality monitoring stations at 3 different locations. In addition to the above another 3no.s AAQ monitoring stations are proposed to install and work is in progress.
36.	The terminal shall take all measures to control dust emissions in and around the terminal.	**Complied.** VPA implemented dust emission control measures through mist fog arrangement in Hoppers, covered conveyor system with water sprinklers at transfer junction points to transfer the cargo, Stacker and Reclaimers is using for cargo transfer, Mechanical Dust Suppression System, Water Sprinkling on stock yards and berths. Truck mounted and trolley mounted fog canons are used while cargo handling.

S. No	APPCB Condition	VPA Compliance
37.	The terminal shall provide and maintain Water sprinkling effectively at all container handling & truck moment areas.	**Complied.** VPA deployed Water Tankers to Sprinkle on Roads and Truck Mounted & Trolley Mounted Fog Canon Machines at the time of cargo loading & unloading.
	GENERAL	
38.	The VPT shall not increase the cargo handling capacity beyond the permitted capacity mentioned in this order, without obtaining CFE & CFO of the Board.	**Complied.** VPA has handling cargo as per CFO.
39.	The terminal shall maintain the following records and the same shall be made available to the inspecting officers of the Board: 1. Daily cargo handling & containers details. 2. Quantity of Effluents generated, treated, Recycled/reused. 3. Log Books for pollution control measures. 4. Characteristics of effluents and emissions. 5. Hazardous/non-hazardous solid waste generated & disposed. 6. Inspection book. 7. Manifest copies of effluents/hazardous waste.	**Complied.**
40.	Fire detection and firefighting facilities with adequate water storage facility shall be provided in fire prone area in consultation with competent authorities.	**Complied.** VPA provided fire detection system at LPG berth, Oil Warf and IT center areas. Also VPA have a dedicated fire brigade with trained personnel with equipment.
41.	Onsite & offsite Disaster Management plan shall be prepared to meet any eventuality in case of any accident. Mock drills shall be conducted at least twice a year and modifications required if any shall be incorporated in Disaster Management Plan and shall submit to Board.	**Complied.** VPA having Disaster Management Plan along with Emergency Evacuation Plan. VPA conducting Mock Drills periodically.
42.	DO levels in the sea water at the dredging area shall be monitored at regular interval and the dredging time shall be suitably regulated to prevent depletion of DO levels in the sea water.	**Complied.** VPA carried out Marine Water Quality Monitoring by Approved agency M/s. S.V. Enviro Labs and Consultancy Services.
43.	The Port shall maintain valid PLI policy which includes Environmental Relief Fund (ERF) and submit copy to RO, Visakhapatnam on yearly base.	**Noted.** VPAs of PPP/BOT Operators are having PLI Policy, those who are handling hazardous cargoes.
44.	The Port shall comply with SoPs issued by CPCB time to time for all the wastes.	**Noted and Complied.**

S. No	APPCB Condition	VPA Compliance
45.	The VPT shall remove the dusty cargo (Gypsum) which is stored newly at S6 area or provide a closed shed for storage of cargo of S6 area.	**Noted and Complied.**
46.	M/s. Visakhapatnam Port Trust shall clean the internal roads on a daily basis. It shall ensure that GVMC clean the roads around the Port area and NHAI shall clean the flyover connecting the national highway and Port area on a daily basis.	**Complied.** VPA deployed 3no.s of Mechanical Road Sweeping Machines to clean internal/ external roads on daily basis and it is ensuring by Environmental Task Force Team. Manual Sweeping is also carried out to clean the spillages on berths & roads.
47.	The VPT shall maintain their own Task Force for regular monitoring and to take stringent action against the defaulters.	**Complied.** VPA having Environmental Task Force Team for monitoring environmental issues and addressed to rectify.
48.	The terminal shall use the NAVIS software to detect the material inside the containers.	**Complied.**
49.	The terminal shall not undertake any industry cargo stuffing/ de-stuffing at the exciting premises. There shall not be intra container transfer of material in the premises.	**Noted & Complied.**
50.	The terminal shall put sign boards (demarcation) on each container representing type of material stored in the container.	**Complied.** Photographs are enclosed as **Annexure – IX.**
51.	The terminal shall maintain leaky container enclosure with a provision for collection of the International Maritime Dangerous Goods (IMDG) in case of leakage as hazardous waste and same shall be disposed to TSDF, Parawada.	**Noted.** Photographs are enclosed as **Annexure – X .**
52.	Thick green belt should be developed covering an area of minimum 33% of the total area, without disturbing existing green belt. Action plan to comply with this condition shall be submitted to the Board.	**Being Complied.** VPA has developed green belt with 6,80,000 plants in and around port area. VPA proposed 1million plantation drive in phased manner.
53.	The terminal shall install digital display boards at publicly visible places at the main gate indicating the products manufactured Vs permitted quantities, Treated effluent concentrations Vs discharge standards, Stack emission & AAQ concentrations Vs standards, hazardous waste generation, disposed, stock Vs permitted quantities and validity of CFO; and exhibit the CFO order at a prominent place in the factory premises.	**Complied.**
54.	The terminal shall submit half yearly compliance reports to all the stipulated	**Complied.** VPA has been submitted half yearly

S. No	APPCB Condition	VPA Compliance
	conditions in Environmental Clearance (EC), Consent for Establishment (CFE) and Consent for Operation (CFO) through website i.e., https://pcb.ap.gov.in by 1st of January and 1st of July of every year. The first half yearly compliance reports shall be the audited through MoEF&CC recognized and National Accreditation Board for Laboratory Testing (NABL) accredited third party.	compliance in respect of EC IRO, to MoEF&CC, Vijayawada. CFO Half yearly compliance report is submitted to R.O., APPCB, Visakhapatnam and the same is hosted in VPA website.
55.	The Port Authorities shall obtain prior permission from MoEF&CC, GoI and APPCB for any changes in the cargo type / capacity.	**Complied.** VPA taking prior permission from MoEF&CC and PCB if any changes in cargo type and handling.
56.	Any other directions / circulars / notices issued by CPCB, MoEF&CC and APPCB shall be followed from time to time.	**Noted for Complied.**
57.	The VPT shall comply the Hon'ble NGT orders / directions from time to time.	**Noted & Complied.**
	Special Conditions	
1.	The Port shall prepare a safety report and carry out an independent safety audit report of the respective industrial activities including chemical storages / isolated storages by an expert not associated with such industrial activity as required under Rule 10 of MSIHC Rules, 1989 and get it approved by the Factories Dept., and submit the compliance along with copy of the safety report, safety audit report and safety certificate at concerned Regional Office, APPCB.	**Complied.** VPA carried out Safety Audit by National Productivity Council, New Delhi.
2.	The Port shall extend training to the working personnel for the prevention of accidents and necessary antidotes to ensure safety, as per the MSIHC Rules, 1989.	**Complied.** VPA conducting Trainings programmes and Mock Drills for all employees with internal and external trainers.
3.	The Port shall carryout calibration of safety equipment and leak detection systems at regular intervals and shall certify the same with the Factories Department. That certified copy shall be submitted to the APPCB, Regional Office.	**Complied.** Leakage detection system with alarming is provided. Photographs are enclosed as **Annexure – XI**.
4.	The Port shall install fluorescent Wind Vane at the highest point in the Port premises.	**Complied.** VPA provided fluorescent Wind Vane at the highest point in the Port premises to know the wind direction and speed. Photographs are enclosed as **Annexure – XII**.
5.	The Port shall submit Risk analysis and risk assessment covering worst scenario	**Noted.** VPA carried out Quantitative Risk

S. No	APPCB Condition	VPA Compliance
	clearly describing impact within the Port premises and outside the Port premises and emergency response system.	Assessment Study by M/s. IRCLASS, Mumbai.
6.	The Port shall submit the copy of the safety audit report and On-Site / Off Site Emergency Plans as applicable after being certified by the Factories Department to the APPCB, Regional Office from time to time, if the storage quantity of hazardous chemicals is equal to or, in excess of the threshold quantities specified in schedule 2 & 3 of MSIHC Rules, 1989.	**Noted & Complied.** VPA having Disaster Management Plan along with Emergency Evacuation Plan. As per the Plan VPA conducting mock drills periodically.
	SCHEDULE – C	
	[See rule 6(2)][CONDITIONS OF AUTHORISATION FOR OCCUPIER OR OPERATOR HANDLING HAZARDOUS WASTES]	
1.	The authorized person shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.	**Noted & Complied.**
2.	The authorization shall be produced for inspection at the request of an officer authorized by the State Pollution Control Board.	**Noted & Complied.**
3.	The person authorized shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorization.	**Complied.**
4,	Any unauthorized change in personnel, equipment or working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorization.	**Complied.**
5.	The person authorized shall implement Emergency Response Procedure (ERP) for which this authorization is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time.	**Complied.** VPA having Emergency Evacuation Plan, as per the plan VPA conducting Mock Drills periodically.
6.	The person authorized shall comply with the provisions outlined in the Central Pollution Control Board guidelines on "Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and Penalty".	**Noted.**
7.	It is the duty of the authorized to take prior permission of the State Pollution Control Board to close down the facility.	**Noted for Comply.**

S. No	APPCB Condition	VPA Compliance
8.	An applicable for the renewal of an authorization shall be made as laid down under these Rules.	**Noted & Complied.**
9.	Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.	**Noted & Complied.**
	Specific Conditions	
10.	The terminal shall store Used / Waste Oil and Used Lead Acid Batteries in a secured way in their premises till its disposal to the manufacturers / dealers on buyback basis.	**Complied.** VPA collecting and disposed through authorized vendors routed by APEMCL portal.
11.	The terminal shall not store hazardous waste for more than 90 days as per the Hazardous and Other Wastes (Management & Trans boundary Movement) Rules, 2016.	**Complied.** VPA disposed through authorized agencies as and when the sufficient quantity is reached to transport is routed by APEMCL portal.
12.	The terminal shall comply with the provisions of HWM Rules, 2016 in terms of interstate transport of Hazardous Waste and manifest document prescribed Under Rule 18 and 19 of the HWM Rules, 2016.	**Noted & Complied.**
13.	The terminal shall maintain 7 copy manifest system for transportation of waste generated and a copy shall be submitted to concern Regional Office of APPCB.	**Noted.** VPA maintain APEMCL website to transport and dispose of hazardous waste.
14.	The terminal shall maintain proper records for Hazardous and Other Wastes stated in Authorization in Form-3 i.e., quantity of Incinerable waste, land disposal waste, recyclable waste etc., and file annual returns in Form-4 as per Rule 20 (2) of the Hazardous and Other Wastes (Management & Trans boundary Movement) Rules, 2016.	**Complied.** VPA maintaining records and submitting as per the conditions.

CFO Order No. APPCB/VSP/VSP/45/CFO/HO/1933 dated 13.04.2022

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VPA COMPLIANCE STATUS

VISAKHAPATNAM PORT AUTHORITY

Sub: Half Yearly Compliance Status Report on Consent to Operate and Authorization for Cruise-Cum-Coastal Cargo Terminal at Visakhapatnam Port.

Ref: Consent Order No.: APPCB/VSP/45/CTO/HO/2023 dated 12.07.2023.

S.No.	Condition	VPA Compliance Report
	SCHEDULE - A	
1.	Any up-set condition in any industrial plant / activity of the industry, which result in, increased effluent / emission discharge and/ or violation of standards stipulated in this order shall be informed to this Board, under intimation to the Collector and District Magistrate and take immediate action to bring down the discharge / emission below the limits.	**Noted.** VPA will comply as and when such incidents happen.
2.	The industry should carryout analysis of waste water discharges or emissions through chimneys for the parameters mentioned in this order on quarterly basis and submit to the Board.	**Complied.** VPA is not having any processing in port area. Due to which there is no effluent generation by port operations. VPA establish 10MLD capacity of STP to treat city waste water which is entering into harbour. The quality of harbour water is monitored by M/s. SV Enviro Labs & Consultants (test reports are enclosed as **Annexure - I**). There are no emissions generated from chimneys, as there is no processing is involved in port activities.
3.	Notwithstanding anything contained in this consent order, the Board hereby reserves the right and powers to review / revoke any and/or all the conditions imposed herein above and to make such variations as deemed fit for the purpose of the Acts by the Board.	**Noted for Comply.**
4.	The industry shall ensure that there shall not be any change in the process technology, source & composition of raw materials and scope of working without prior approval from the Board.	**Complied.** VPA taking prior permission from MoEF&CC and PCB if any changes in cargo type and handling.
5.	The applicant shall submit Environment statement in Form V before 30th September every year as per Rule No.14 of E(P) Rules, 1986 & amendments thereof.	**Complied.** Environment statement in Form - V is being submitted to the concerned before 30th September every year. Latest Submitted copy is enclosed as **Annexure-II**.

S.No.	Condition	VPA Compliance Report
6.	The applicant should make applications through Online for renewal of Consent (under Water and Air Acts) and Authorization under HWM Rules at least 120 days before the date of expiry of this order, along with prescribed fee under Water and Air Acts and detailed compliance of CFO conditions for obtaining Consent & HW Authorization of the Board.	**Noted & Complied.**
7.	The industry should immediately submit the revised application for consent to this Board in the event of any change in the raw material used, processes employed, quantity of trade effluents & quantity of emissions. Any change in the management shall be informed to the Board. The person authorized should not let out the premises / lend / sell / transfer their industrial premises without obtaining prior permission of the State Pollution Control Board.	**Noted & Complied.** If any changes or modifications in project of VPA were take prior approval from the APPCB.
8.	Any person aggrieved by an order made by the State Board under Section 25, Section 26, Section 27 of Water Act, 1974 or Section 21 of Air Act, 1981 may within thirty days from the date on which the order is communicated to him, prefer an appeal as per Andhra Pradesh Water Rules, 1976 and Air Rules 1982, to Appellate authority constituted under Section 28 of the Water (Prevention and Control of Pollution) Act, 1974 and Section 31 of the Air (Prevention and Control of Pollution) Act, 1981.	**Noted.**
9.	The industry shall be liable to pay Environmental Compensation / Other Environmental Taxes, if any environmental damage caused to the surroundings, as fixed by the Collector & District Magistrate or any other competent authority as per the Rules in vogue.	**Noted.**
10.	The industry may explore the possibility of tapping the solar energy for their energy requirements.	**Complied.** VPA has established 10.77MW Solar Power Plants and utilized for captive power requirement.
11.	The industry should educate the workers and nearby public of possible accidents and remedial measures.	**Complied.** VPA conducting training programmes and Mock Drills periodically for all employees.

<table>
<tr><th>S.No.</th><th>Condition</th><th>VPA Compliance Report</th></tr>
<tr><td></td><td colspan="2">SCHEDULE – B</td></tr>
<tr><td></td><td colspan="2">The item was placed in the CTO committee meeting held on 07.07.2023 and the committee recommended to issue 1st CTO & HWA order to the industry for a period upto 31.05.2028. The industry shall comply with the following:</td></tr>
<tr><td>1.</td><td>The terminal shall obtain permission from GVMC for sending domestic waste water to STP, Old Town, GVMC.</td><td>Complied.
VPA having agreement with GVMC for supply of fresh water for domestic purpose.</td></tr>
<tr><td>2.</td><td>The terminal shall install flow meter for water consumption and wastewater generation for various purposes mentioned in CTO order.</td><td>Complied.
Water meters are provided to know the consumption & Treated waste water used for dust suppression.</td></tr>
<tr><td>3.</td><td>The terminal shall not handle dusty cargo and shall handle MS ingots, Cement and Food grains only.</td><td>Complied.
VPA not handle any dusty cargo at this berth.</td></tr>
<tr><td>4.</td><td>The terminal shall develop 33 % green belt of the total area with native species within 1 month.</td><td>Being Complied.
VPA has developed green belt with 6,80,000 plants in and around port area. VPA proposed 1million plantation drive in phased manner.</td></tr>
<tr><td>5.</td><td>The terminal shall submit a copy of the NOC obtained from the National Board for Wild Life (NBWL) at the Regional office: Visakhapatnam, as stipulated in the EC order dt. 26.10.2021.</td><td>Noted for Comply.</td></tr>
<tr><td>6.</td><td>The facility shall install Continuous Ambient Air Quality Monitoring Stations to the main pollutants released PM_{10} and $PM_{2.5}$ in reference to PM emission, and SO_2 and NOx in reference to SO_2 and NOx emissions and covering the total area of the port in consultation with the Regional Officer In addition to the existing 3 CAAQM stations data to the APPCB website without interruption.</td><td>Complied.
VPA installed 3no.s continuous ambient air quality monitoring stations at 3 different locations.

In addition to the above another 3no.s AAQ monitoring stations are proposed to install and work is in progress.</td></tr>
<tr><td></td><td colspan="2">WATER POLLUTION</td></tr>
<tr><td>7.</td><td>The source of water is GVMC. The Port shall take steps to reduce water consumption to the extent possible and consumption shall NOT exceed the quantities mentioned below:
<table>
<tr><th>S. No.</th><th>Purpose</th><th>Quantity in KLD</th></tr>
<tr><td>1.</td><td>Domestic (Cruise (Nov –March) – 1.68 KLD, Terminal building Staff – 0.9 KLD, Cargo handling (April-Oct) – 0.3 KLD)</td><td>2.88</td></tr>
<tr><td>2.</td><td>Landscaping</td><td>3.0</td></tr>
<tr><td>3.</td><td>Dust Suppression</td><td>3.0</td></tr>
<tr><td>4.</td><td>Others</td><td>5.0</td></tr>
<tr><td></td><td>Total</td><td>13.88</td></tr>
</table></td><td>Complied.
VPA provided water meter to know the consumption of water.

VPA proposed to conduct Water Audit by third party for reduce the consumption of water.</td></tr>
</table>

S.No.	Condition	VPA Compliance Report
	Separate meters with necessary pipe-line shall be maintained for assessing the quantity of water used for each of the purposes mentioned above.	
8.	Proper drains and wind barriers shall be provided around the stack yards.	**Noted & Complied.** VPA provide drains, High raised wall and dust barriers along city interface.
9.	Under any circumstances, the facility shall not discharge any effluents into any water bodies.	Being Complied. VPA has not any processing facility in port premises. There is no effluents are generated. VPA installed 10MLD capacity of STP to treat the city waste water, which is entering into harbor water. The treated water being used for dust suppression in port area.
	AIR POLLUTION	
10.	The terminal shall comply with emission limits for DG sets upto 800 KW as per the Notification G.S.R.520 (E), dated 01.07.2003 under the Environment (Protection) Amendment Rules, 2003 and G.S.R.448(E), dated 12.07.2004 under the Environment (Protection) Second Amendment Rules, 2004. In case of DG sets more than 800 KW shall comply with emission limits as per the Notification G.S.R.489 (E), dated 09.07.2002 at serial no.96, under the Environment (Protection) Act, 1986.	**Complied.** VPA having 10.77MW Solar Power Plant and it is utilized for Captive power requirement. VPA have DG sets with acoustic facility to control noise and it is used for any emergency of power failures.
11.	The terminal shall ensure compliance with ambient air quality standards of PM_{10} - 100 micro grams/ m^3; $PM_{2.5}$ - 60 micro grams / m^3; SO_2 - 80 micro grams/ m^3; NOx – 80 micro grams/m^3, (day average standards).	**Complied.** VPA carried out AAQ monitoring at 3 different locations. The monitoring results are within the standards.
12.	The terminal shall ensure compliance of the National Ambient Air quality standards notified by MoE&F, GoI vide notification No. GSR 826(E), dated. 16.11.2009 during construction and regular operational phase of the project.	**Complied.** VPA ensured the compliance of Ambient Air Quality with NAAQ Standards. The resultant parameters are within the limits.
13.	The stacking height of the materials stored on ground shall not exceed 8m above ground level.	**Noted.** VPA maintaining stacking height as per the condition.
14.	All the cargo shall be stored in closed warehouse(s).	**Complied.** VPA has constructed 4no.s covered storage sheds. Another 5 sheds are constructed by PPP/BoT Operators. Photographs are enclosed as **Annexure - IV**.
15.	The Port shall comply with the following for controlling fugitive emissions:	**Complied.**

S.No.	Condition	VPA Compliance Report
a.	Vehicle movement shall be minimized / eliminated by implementing mechanical operation.	a. VPA obtained Environment & CRZ Clearances for EQ-1&1A, EQ-6, EQ-7, WQ-6 and WQ-7&8 berths.
b.	All the vehicles involved in transportation of cargo shall be covered with tarpaulin.	b. All cargo transporting trucks & wagons are covered with Tarpaulins.
c.	Vehicles shall be managed to avoid traffic congestion and shall provide empty dusting vehicle washings / dry cleaning system to clean all out going cargo vehicles.	c. VPA deployed 3no.s mechanical road sweeping machines and water tankers to sprinkle water on roads for dust suppression.
d.	Based on traffic density/ vehicular movements anticipated from the port, parking facilities shall be provided.	d. VPA provided truck parking with amenities.
e.	All the conveyor belts shall be covered with MS sheets	e. VPA having covered conveyor belt.
f.	The railway wagons and trucks shall be covered	f. The Cargo Transporting Trucks & Wagons are covered with Tarpaulins.
16.	All the transfer points, loading / unloading points and conveyor systems shall be covered completely with leak proof arrangements. Adequate dust suppression and containment measures shall be implemented for effective control of fugitive emissions	**Noted.** VPA having covered conveyor belt system with water sprinkling system at transfer points of belt conveyor, hoppers. Also VPA deployed Water Tankers to sprinkle water on roads to suppress the dust.
17.	The facility shall provide water sprinklers preferably rain guns at all dust emanating areas to avoid dust nuisance to the surroundings. Automatic water sprinklers shall be provided along the internal roads peripheral drainage system, firefighting system etc. are to be provided.	**Noted.** VPA Provided Automated Mechanical Dust Suppression System (MDSS) at Stock yards and Berths. VPA deployed Water Tankers to Sprinkle on Roads and Truck Mounted & Trolley Mounted Fog Canon Machines at the time of cargo loading & unloading.
	GENERAL	
18.	The port shall not increase the cargo handling capacity beyond the permitted capacity mentioned in this order, without obtaining CTE & CTO of the Board.	**Complied.** If any changes or modifications in project, Visakhapatnam Port Authority were take prior approval from the APPCB.
19.	The terminal shall maintain the following records and the same shall be made available to the inspecting officers of the Board:	**Complied.** VPA maintaining Records and the same will be provided while inspecting of board members.
a.	Daily cargo handling & containers details.	
b.	Quantity of Effluents generated, treated, recycled/reused.	
c.	Log Books for pollution control measures.	
d.	Characteristics of effluents and emissions.	

S.No.	Condition	VPA Compliance Report
e.	Hazardous/ nonhazardous solid waste generated and disposed.	
f.	Inspection book.	
g.	Manifest copies of effluents / hazardous waste.	
20.	The Port shall provide display sign boards at berths and cargo stocking area showing the details of the berth & cargo handling.	**Complied.** VPA provide Display Boards at Stock Yards and Berths. (Photographs enclosed at **Annexure-VI**)
21.	The terminal shall submit action plan to minimize the solid waste at source which suitable sustainable technology.	**Being Complied.** VPA is Collecting and disposing solid waste to GVMC dump yard, Kapuluppada to generate power from waste by M/s. Jindal Urban Waste Management Ltd.
22.	The terminal shall route the hazardous waste through APEMC and ensure routing the bilge oil generated from Ships through APEMC.	**Complied.** VPA routed to dispose Hazardous Waste through APEMCL portal. (Screen Shot of the APEMCL is enclosed as **Annexure - V**).
23.	Fire detection and firefighting facilities with adequate water storage facility shall be provided in fire prone area in consultation with competent authorities.	**Complied.** VPA had a dedicated fire brigade with trained personnel.
24.	Onsite & offsite Disaster Management plan shall be prepared to meet any eventuality in case of any accident. Mock drills shall be conducted at least twice a year and modifications required if any shall be incorporated in Disaster Management Plan and shall submit to Board.	**Complied.** VPA having Disaster Management Plan along with Emergency Evacuation Plan. As per the Plan VPA conducting Mock Drills periodically.
25.	DO levels in the sea water at the dredging area shall be monitored at regular interval and the dredging time shall be suitably regulated to prevent depletion of DO levels in the sea water.	**Complied.** VPA had 10MLD capacity STP to treat the city waste water which is entering into harbour water. The treated water being used for Dust Suppression and VPA carried out Marine Water Quality Monitoring by approved agency.
26.	The terminal shall maintain valid PLI policy which includes Environmental Relief Fund (ERF) and submit copy to RO, Visakhapatnam on yearly base.	**Complied.** VPAs of PPP/BOT Operators are having PLI Policy, those who are handling hazardous cargoes.
27.	The terminal shall comply with SoPs issued by CPCB time to time for all the wastes.	**Noted for Comply.**
28.	The terminal shall install digital display boards at publicly visible places at the main gate indicating the products manufactured Vs permitted quantities, Treated effluent concentrations Vs discharge standards, Stack emission &	**Complied.**

S.No.	Condition	VPA Compliance Report
	AAQ concentrations Vs standards, hazardous waste generation, disposed, stock Vs permitted quantities and validity of CTO; and exhibit the CTO order at a prominent place in the factory premises.	
29.	The terminal shall submit Half yearly compliance reports to all the stipulated conditions in Environmental Clearance (EC), Consent to Establish (CTE) and Consent to Operate (CTO) through website i.e., https://pcb.ap.gov.in by 1st of January and 1st July of every year. The first half yearly compliance reports shall be furnished by the terminal and second half yearly compliance reports shall be the audited through MoEF&CC recognized and National Accreditation Board for Laboratory Testing (NABL) accredited third party.	**Complied.** VPA has been submitted half yearly compliance in respect of EC IRO, to MoEF&CC, Vijayawada. CFO Half yearly compliance report is submitted to R.O., APPCB, Visakhapatnam and the same is hosted in VPA website.
30.	The facility Authorities shall comply with all the conditions stipulated in the Environmental Clearance dt.26.10.2021 issued by SEIAA	**Complied.**
31.	The Port Authorities shall obtain prior permission from MoEF&CC, GoI and APPCB for any changes in the cargo type / capacity.	**Complied.** If any changes or modifications in project, Visakhapatnam Port Authority were take prior approval from the APPCB.
32.	Any other directions / circulars / notices issued by CPCB, MoEF&CC and APPCB shall be followed from time to time.	**Noted & Complied.**
33.	The conditions are stipulated without prejudice to the rights and contentions of this Board in any Hon'ble Court of Law.	**Noted.**
	Special conditions	
34.	The Port shall prepare a safety report and carry out an independent safety audit report of the respective industrial activities including chemical storages / isolated storages by an expert not associated with such industrial activity as required under Rule 10 of MSIHC Rules, 1989 and get it approved by the Factories Dept., and submit the compliance along with copy of the safety report, safety audit report and safety certificate at concerned Regional Office, APPCB.	**Complied.** VPA carried out Safety Audit by National Productivity Council, Mumbai.
35.	The Port shall extend training to the working personnel for the prevention of	**Complied.** VPA conducting Trainings and Mock

S.No.	Condition	VPA Compliance Report
	accidents and necessary antidotes to ensure safety, as per the MSIHC Rules, 1989.	Drills for all employees with internal and external trainers.
36.	The Port shall carryout calibration of safety equipment and leak detection systems at regular intervals and shall certify the same with the Factories Department. That certified copy shall be submitted to the APPCB, Regional Office.	**Complied.** Leakage detection system with alarming is provided. Photographs are enclosed as **Annexure – XI**.
37.	The Port shall install fluorescent Wind Vane at the highest point in the Port premises.	**Complied.** VPA provided fluorescent Wind Vane at the highest point in the Port premises to know the wind direction and speed. Photographs are enclosed as **Annexure – XII**.
38.	The Port shall submit Risk analysis and risk assessment covering worst scenario clearly describing impact within the Port premises and outside the Port premises and emergency response system.	**Complied.**
39.	The Port shall submit the copy of the safety audit report and On-Site / Off Site Emergency Plans as applicable after being certified by the Factories Department to the APPCB, Regional Office from time to time, if the storage quantity of hazardous chemicals is equal to or, in excess of the threshold quantities specified in schedule 2 & 3 of MSIHC Rules, 1989.	**Noted.** VPA carried out Quantitative Risk Assessment Study by M/s. IRCLASS, Mumbai.
	SCHEDULE - C	
	CONDITIONS OF AUTHORISATION FOR OCCUPIER OR OPERATOR HANDLING HAZARDOUS WASTES	
1.	The authorised person shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.	**Complied.**
2.	The authorisation shall be produced for inspection at the request of an officer authorised by the State Pollution Control Board.	**Noted & Complied.**
3.	The person authorised shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorisation.	**Noted & Complied.**
4.	Any unauthorised change in personnel, equipment or working conditions as mentioned in the application by the person authorised shall constitute a breach of his authorisation.	**Noted.**

S.No.	Condition	VPA Compliance Report
5.	The person authorised shall implement Emergency Response Procedure (ERP) for which this authorisation is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time;	**Complied.** VPA having Disaster Management Plant with Emergency Evacuation Plan, as per the plan VPA conducting Mock Drills periodically.
6.	The person authorised shall comply with the provisions outlined in the Central Pollution Control Board guidelines on "Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and Penalty".	**Noted.**
7.	It is the duty of the authorised person to take prior permission of the State Pollution Control Board to close down the facility.	**Noted.**
8.	An application for the renewal of an authorisation shall be made as laid down under these Rules.	**Noted.**
9.	Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.	**Noted.**
	Specific Conditions	
10.	The terminal shall store Used / Waste Oil and Used Lead Acid Batteries in a secured way in their premises till its disposal to the manufacturers / dealers on buyback basis.	**Complied.** VPA collecting and disposed through authorized vendors routed by APEMCL portal.
11.	The terminal shall not store hazardous waste for more than 90 days as per the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.	**Complied.** VPA disposed through authorized agencies as and when the sufficient quantity is reached to transport is routed by APEMCL portal.
12.	The terminal shall comply with the provisions of HWM Rules, 2016 in terms of interstate transport of Hazardous Waste and manifest document prescribed Under Rule 18 and 19 of the HWM Rules, 2016.	**Noted.**
13.	The terminal shall maintain 7 copy manifest system for transportation of waste generated and a copy shall be submitted to concerned Regional Office of APPCB.	**Complied.**
14.	The terminal shall maintain proper records for Hazardous and Other Wastes stated in Authorisation in Form-	**Complied.** VPA maintaining records and submitting as per the conditions.

S.No.	Condition	VPA Compliance Report
	3 i.e., quantity of Incinerable waste, land disposal waste, recyclable waste etc., and file annual returns in Form-4 as per Rule 20 (2) of the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.	

ANNEXURE – I

SV ENVIRO LABS & CONSULTANTS

(ENVIRONMENTAL ENGINEERS & CONSULTANTS IN POLLUTION CONTROL)
Corporate Office & Laboratory : Enviro House, B-1, Block-B, IDA Autonagar, Visakhapatnam-530012
Hyderabad Office: #402, SaiKrishna Villa, Behind CMR Shopping Mall, AS Raju Nagar, Kukatpally, Hyderabad-500072
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Recognized by Govt. of India-MoEF & CC, New Delhi, Accredited by : NABL & NABET

Ref: SVELC/VPT-STP/25-04/01 Date: 23-04-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : CHANNEL INLET

DATE OF COLLECTION : 15-04-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD FOLLOWED
1.	pH	-	7.58	APHA, 4500-H+B,24th Ed., 2023
2.	Total Suspended Solids	mg/l	140	APHA, 2540-D, 24th Ed., 2023
3.	Chemical Oxygen Demand – COD	mg/l	310	APHA, 5220-B, 24th Ed., 2023
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	98.0	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	13.2	APHA, 4500-NO3-B & C, 24th Ed., 2023
6.	Nitrite Nitrogen	mg/l	2.19	APHA, 4500-NO2-B, 24th Ed., 2023
7.	Total Phosphate	mg/l	1.13	APHA, 4500-PD,
8.	Ammonical Nitrogen	mg/l	1.81	APHA, 4500-NH3 B-C, 24th Ed., 2023
9.	Sulphide	mg/l	0.37	APHA, 4500-S2D, 24th Ed., 2023
10.	Fluoride	mg/l	0.46	APHA, 4500-FD,24th Ed., 2023
11.	Oil & Grease	mg/l	3.0	APHA, 5520-D, 24th Ed., 2023
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,

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Ref: SVELC/VPT-STP/25-04/05 Date: 23-04-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : TREATED OUTLET

DATE OF COLLECTION : 15-04-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD FOLLOWED	Standards For Disposal Of Land Irrigation
1.	pH	-	7.63	APHA, 4500-H+B,24th Ed., 2023	5.5-9.0
2.	Total Suspended Solids	mg/l	6.0	APHA, 2540-D, 24th Ed., 2023	200
3.	Chemical Oxygen Demand – COD	mg/l	53.0	APHA, 5220-B, 24th Ed., 2023	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	16.0	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	1.17	APHA, 4500-NO3-B & C, 24th Ed., 2023	-
6.	Nitrite Nitrogen	mg/l	0.66	APHA, 4500-NO2-B, 24th Ed., 2023	-
7.	Total Phosphate	mg/l	1.52	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	2.06	APHA, 4500-NH3 B-C, 24th Ed., 2023	-
9.	Sulphide	mg/l	0.49	APHA, 4500-S2D, 24th Ed., 2023	-
10.	Fluoride	mg/l	0.13	APHA, 4500-FD,24th Ed., 2023	-
11.	Oil & Grease	mg/l	<1.0	APHA, 5520-D, 24th Ed., 2023	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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Ref: SVELC/VPT-STP/25-04/01 Date: 07-05-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : CHANNEL INLET

DATE OF COLLECTION : 30-04-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD FOLLOWED
1.	pH	-	7.22	APHA, 4500-H+B,24th Ed., 2023
2.	Total Suspended Solids	mg/l	110	APHA, 2540-D, 24th Ed., 2023
3.	Chemical Oxygen Demand – COD	mg/l	390	APHA, 5220-B, 24th Ed., 2023
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	120	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	16.7	APHA, 4500-NO3-B & C, 24th Ed., 2023
6.	Nitrite Nitrogen	mg/l	3.62	APHA, 4500-NO2-B, 24th Ed., 2023
7.	Total Phosphate	mg/l	1.47	APHA. 4500-PD,
8.	Ammonical Nitrogen	mg/l	1.53	APHA, 4500-NH3 B-C, 24th Ed., 2023
9.	Sulphide	mg/l	0.47	APHA, 4500-S2D, 24th Ed., 2023
10.	Fluoride	mg/l	0.38	APHA, 4500-FD,24th Ed., 2023
11.	Oil & Grease	mg/l	5.0	APHA, 5520-D, 24th Ed., 2023
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,

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Ref: SVELC/VPT-STP/25-04/05 Date: 07-05-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : TREATED OUTLET

DATE OF COLLECTION : 30-04-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD FOLLOWED	Standards For Disposal Of Land Irrigation
1.	pH	-	7.34	APHA, 4500-H+B,24th Ed., 2023	5.5-9.0
2.	Total Suspended Solids	mg/l	4.0	APHA, 2540-D, 24th Ed., 2023	200
3.	Chemical Oxygen Demand – COD	mg/l	60.0	APHA, 5220-B, 24th Ed., 2023	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	19.0	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	1.44	APHA, 4500-NO3-B & C, 24th Ed., 2023	-
6.	Nitrite Nitrogen	mg/l	0.61	APHA, 4500-NO2-B, 24th Ed., 2023	-
7.	Total Phosphate	mg/l	1.29	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	1.71	APHA, 4500-NH3 B-C, 24th Ed., 2023	-
9.	Sulphide	mg/l	0.40	APHA, 4500-S2D, 24th Ed., 2023	-
10.	Fluoride	mg/l	0.19	APHA, 4500-FD,24th Ed., 2023	-
11.	Oil & Grease	mg/l	<1.0	APHA, 5520-D, 24th Ed., 2023	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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Ref: SVELC/VPT-STP/25-05/01 Date: 22-05-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ CHANNEL INLET

DATE OF COLLECTION : 14-05-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)
1.	pH	-	7.12	APHA, 4500-H+B
2.	Total Suspended Solids	mg/l	32	APHA, 2540-D
3.	Chemical Oxygen Demand – COD	mg/l	130	APHA, 5220-B
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	76.3	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	3.21	APHA, 4500-NO3-B & C
6.	Nitrite Nitrogen	mg/l	0.22	APHA, 4500-NO2-B
7.	Total Phosphate	mg/l	4.84	APHA, 4500-PD
8.	Ammonical Nitrogen	mg/l	2.54	APHA, 4500-NH3 B-C
9.	Sulphide	mg/l	0.42	APHA, 4500-S2D
10.	Fluoride	mg/l	0.47	APHA, 4500-FD
11.	Oil & Grease	mg/l	4.0	APHA, 5520-D
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B

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Ref: SVELC/VPT-STP/25-05/05 Date: 22-05-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ TREATED OUTLET

DATE OF COLLECTION : 14-05-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)	Standards For Disposal Of Land Irrigation
1.	pH	-	7.87	APHA, 4500-H+B,	5.5-9.0
2.	Total Suspended Solids	mg/l	10.0	APHA, 2540-D,	200
3.	Chemical Oxygen Demand – COD	mg/l	50	APHA, 5220-B,	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	22.5	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	19.4	APHA, 4500-NO3-B & C,	-
6.	Nitrite Nitrogen	mg/l	0.84	APHA, 4500-NO2-B,	-
7.	Total Phosphate	mg/l	2.05	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	2.87	APHA, 4500-NH3 B-C,	-
9.	Sulphide	mg/l	0.35	APHA, 4500-S2D,	-
10.	Fluoride	mg/l	0.47	APHA, 4500-FD,	-
11.	Oil & Grease	mg/l	1.0	APHA, 5520-D,	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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Ref: SVELC/VPT-STP/25-05/01

Date: 06-06-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ CHANNEL INLET

DATE OF COLLECTION : 31-05-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)
1.	pH	-	6.92	APHA, 4500-H+B,
2.	Total Suspended Solids	mg/l	44	APHA, 2540-D,
3.	Chemical Oxygen Demand – COD	mg/l	140	APHA, 5220-B,
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	78.4	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	2.98	APHA, 4500-NO3-B & C,
6.	Nitrite Nitrogen	mg/l	0.14	APHA, 4500-NO2-B,
7.	Total Phosphate	mg/l	2.23	APHA, 4500-PD,
8.	Ammonical Nitrogen	mg/l	2.89	APHA, 4500-NH3 B-C,
9.	Sulphide	mg/l	0.49	APHA, 4500-S2D,
10.	Fluoride	mg/l	0.45	APHA, 4500-FD,
11.	Oil & Grease	mg/l	5.0	APHA, 5520-D,
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,

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Ref: SVELC/VPT-STP/25-05/05

Date: 06-06-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ TREATED OUTLET

DATE OF COLLECTION : 31-05-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)	Standards For Disposal Of Land Irrigation
1.	pH	-	7.94	APHA, 4500-H+B,	5.5-9.0
2.	Total Suspended Solids	mg/l	14.0	APHA, 2540-D,	200
3.	Chemical Oxygen Demand – COD	mg/l	60	APHA, 5220-B,	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	23.9	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	21.2	APHA, 4500-NO3-B & C,	-
6.	Nitrite Nitrogen	mg/l	0.97	APHA, 4500-NO2-B,	-
7.	Total Phosphate	mg/l	2.27	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	3.05	APHA, 4500-NH3 B-C,	-
9.	Sulphide	mg/l	0.39	APHA, 4500-S2D,	-
10.	Fluoride	mg/l	0.44	APHA, 4500-FD,	-
11.	Oil & Grease	mg/l	1.0	APHA, 5520-D,	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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Ref: SV/VPT-STP/25-06/01

Date: 21-06-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ CHANNEL INLET

DATE OF COLLECTION : 14-06-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)
1.	pH	-	7.16	APHA, 4500-H+B
2.	Total Suspended Solids	mg/l	28	APHA, 2540-D
3.	Chemical Oxygen Demand – COD	mg/l	140	APHA, 5220-B
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	78.1	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	3.42	APHA, 4500-NO3-B & C
6.	Nitrite Nitrogen	mg/l	0.25	APHA, 4500-NO2-B
7.	Total Phosphate	mg/l	4.91	APHA, 4500-PD
8.	Ammonical Nitrogen	mg/l	2.59	APHA, 4500-NH3 B-C
9.	Sulphide	mg/l	0.45	APHA, 4500-S2D
10.	Fluoride	mg/l	0.49	APHA, 4500-FD
11.	Oil & Grease	mg/l	4.0	APHA, 5520-D
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B

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Ref: SV/VPT-STP/25-06/05 Date: 21-06-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ TREATED OUTLET

DATE OF COLLECTION : 14-06-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)	Standards For Disposal Of Land Irrigation
1.	pH	-	7.30	APHA, 4500-H+B,	5.5-9.0
2.	Total Suspended Solids	mg/l	11.0	APHA, 2540-D,	200
3.	Chemical Oxygen Demand – COD	mg/l	60	APHA, 5220-B,	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	20.5	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	18.6	APHA, 4500-NO3-B & C,	-
6.	Nitrite Nitrogen	mg/l	0.81	APHA, 4500-NO2-B,	-
7.	Total Phosphate	mg/l	2.12	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	2.65	APHA, 4500-NH3 B-C,	-
9.	Sulphide	mg/l	0.31	APHA, 4500-S2D,	-
10.	Fluoride	mg/l	0.43	APHA, 4500-FD,	-
11.	Oil & Grease	mg/l	1.0	APHA, 5520-D,	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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Ref: SV/VPT-STP/25-06/01

Date: 05-07-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ CHANNEL INLET

DATE OF COLLECTION : 28-06-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)
1.	pH	-	7.11	APHA, 4500-H+B,
2.	Total Suspended Solids	mg/l	41	APHA, 2540-D,
3.	Chemical Oxygen Demand – COD	mg/l	150	APHA, 5220-B,
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	80.1	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	3.11	APHA, 4500-NO3-B & C,
6.	Nitrite Nitrogen	mg/l	0.18	APHA, 4500-NO2-B,
7.	Total Phosphate	mg/l	2.63	APHA, 4500-PD,
8.	Ammonical Nitrogen	mg/l	2.99	APHA, 4500-NH3 B-C,
9.	Sulphide	mg/l	0.52	APHA. 4500-S2D,
10.	Fluoride	mg/l	0.51	APHA, 4500-FD,
11.	Oil & Grease	mg/l	6.0	APHA, 5520-D,
12.	Residual Chlorine	mg/l	<0.1	APHA. 4500-Cl B,

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Date: 05-07-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ TREATED OUTLET

DATE OF COLLECTION : 28-06-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)	Standards For Disposal Of Land Irrigation
1.	pH	-	7.85	APHA, 4500-H+B,	5.5-9.0
2.	Total Suspended Solids	mg/l	15.0	APHA, 2540-D,	200
3.	Chemical Oxygen Demand – COD	mg/l	70	APHA, 5220-B,	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	22.5	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	20.4	APHA, 4500-NO3-B & C,	-
6.	Nitrite Nitrogen	mg/l	0.91	APHA, 4500-NO2-B,	-
7.	Total Phosphate	mg/l	2.12	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	2.27	APHA, 4500-NH3 B-C,	-
9.	Sulphide	mg/l	0.31	APHA, 4500-S2D,	-
10.	Fluoride	mg/l	0.39	APHA, 4500-FD,	-
11.	Oil & Grease	mg/l	1.0	APHA, 5520-D,	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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Ref: SV/VPT-STP/25-07/01 Date: 22-07-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ CHANNEL INLET

DATE OF COLLECTION : 15-07-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)
1.	pH	-	7.36	APHA, 4500-H+B
2.	Total Suspended Solids	mg/l	21	APHA, 2540-D
3.	Chemical Oxygen Demand – COD	mg/l	120	APHA, 5220-B
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	74.2	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	3.14	APHA, 4500-NO3-B & C
6.	Nitrite Nitrogen	mg/l	0.21	APHA, 4500-NO2-B
7.	Total Phosphate	mg/l	4.55	APHA, 4500-PD
8.	Ammonical Nitrogen	mg/l	2.33	APHA, 4500-NH3 B-C
9.	Sulphide	mg/l	0.40	APHA, 4500-S2D
10.	Fluoride	mg/l	0.52	APHA, 4500-FD
11.	Oil & Grease	mg/l	3.0	APHA, 5520-D
12.	Residual Chlorine	mg/l	<0.1	APHA. 4500-Cl B

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Ref: SV/VPT-STP/25-07/05 Date: 22-07-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ TREATED OUTLET

DATE OF COLLECTION : 15-07-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)	Standards For Disposal Of Land Irrigation
1.	pH	-	7.22	APHA, 4500-H+B,	5.5-9.0
2.	Total Suspended Solids	mg/l	9.0	APHA, 2540-D,	200
3.	Chemical Oxygen Demand – COD	mg/l	50.0	APHA, 5220-B,	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	17.4	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	17.5	APHA, 4500-NO3-B & C,	-
6.	Nitrite Nitrogen	mg/l	0.71	APHA, 4500-NO2-B,	-
7.	Total Phosphate	mg/l	2.35	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	2.92	APHA, 4500-NH3 B-C,	-
9.	Sulphide	mg/l	0.37	APHA, 4500-S2D,	
10.	Fluoride	mg/l	0.48	APHA, 4500-FD,	-
11.	Oil & Grease	mg/l	1.0	APHA, 5520-D,	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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Ref: SV/VPT-STP/25-07/01 Date: 06-08-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ CHANNEL INLET

DATE OF COLLECTION : 30-07-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)
1.	pH	-	7.32	APHA, 4500-H+B,
2.	Total Suspended Solids	mg/l	55	APHA, 2540-D,
3.	Chemical Oxygen Demand – COD	mg/l	170	APHA, 5220-B.
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	84.6	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	3.58	APHA, 4500-NO3-B & C
6.	Nitrite Nitrogen	mg/l	0.21	APHA, 4500-NO2-B,
7.	Total Phosphate	mg/l	2.96	APHA, 4500-PD,
8.	Ammonical Nitrogen	mg/l	3.36	APHA, 4500-NH3 B-C,
9.	Sulphide	mg/l	0.47	APHA, 4500-S2D,
10.	Fluoride	mg/l	0.44	APHA, 4500-FD,
11.	Oil & Grease	mg/l	6.0	APHA, 5520-D,
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,

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Ref: SV/VPT-STP/25-07/05 Date: 06-08-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ TREATED OUTLET

DATE OF COLLECTION : 30-07-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)	Standards For Disposal Of Land Irrigation
1.	pH	-	7.61	APHA, 4500-H+B,	5.5-9.0
2.	Total Suspended Solids	mg/l	13.0	APHA, 2540-D,	200
3.	Chemical Oxygen Demand – COD	mg/l	50.0	APHA, 5220-B,	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	20.7	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	17.8	APHA, 4500-NO3-B & C,	-
6.	Nitrite Nitrogen	mg/l	0.84	APHA, 4500-NO2-B,	-
7.	Total Phosphate	mg/l	2.77	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	2.18	APHA, 4500-NH3 B-C,	-
9.	Sulphide	mg/l	0.26	APHA, 4500-S2D,	-
10.	Fluoride	mg/l	0.41	APHA, 4500-FD,	-
11.	Oil & Grease	mg/l	2.0	APHA, 5520-D,	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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Sv Enviro Labs & Research Pvt. Ltd. VSP-12

AUTHORIZED SIGNATOTY

Recognized by GOI - MoEFCC, Accredited by NABL & NABET

SV ENVIRO LABS & RESEARCH PRIVATE LIMITED
formerly known as SV ENVIRO LABS & CONSULTANTS
Researching for better Environmental Solutions

Ref: SV/VPT-STP/25-08/01 Date: 23-08-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ CHANNEL INLET

DATE OF COLLECTION : 14-08-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)
1.	pH	-	7.22	APHA, 4500-H+B
2.	Total Suspended Solids	mg/l	25	APHA, 2540-D
3.	Chemical Oxygen Demand – COD	mg/l	110	APHA, 5220-B
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	72.5	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	2.98	APHA, 4500-NO3-B & C
6.	Nitrite Nitrogen	mg/l	0.19	APHA, 4500-NO2-B
7.	Total Phosphate	mg/l	4.32	APHA, 4500-PD
8.	Ammonical Nitrogen	mg/l	2.16	APHA, 4500-NH3 B-C
9.	Sulphide	mg/l	0.38	APHA, 4500-S2D
10.	Fluoride	mg/l	0.50	APHA, 4500-FD
11.	Oil & Grease	mg/l	3.0	APHA, 5520-D
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B

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PAN: ABQCS0643F
CIN: U74909AP2025PTC119098

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Researching for better Environmental Solutions

Ref: SV/VPT-STP/25-08/05

Date: 23-08-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ TREATED OUTLET

DATE OF COLLECTION : 14-08-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)	Standards For Disposal Of Land Irrigation
1.	pH	-	7.12	APHA, 4500-H+B,	5.5-9.0
2.	Total Suspended Solids	mg/l	8.0	APHA, 2540-D,	200
3.	Chemical Oxygen Demand – COD	mg/l	40.0	APHA, 5220-B,	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	16.7	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	16.8	APHA, 4500-NO3-B & C,	-
6.	Nitrite Nitrogen	mg/l	0.68	APHA, 4500-NO2-B,	-
7.	Total Phosphate	mg/l	2.41	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	3.20	APHA, 4500-NH3 B-C,	-
9.	Sulphide	mg/l	0.35	APHA, 4500-S2D,	-
10.	Fluoride	mg/l	0.51	APHA, 4500-FD,	-
11.	Oil & Grease	mg/l	1.0	APHA, 5520-D,	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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SV ENVIRO LABS & RESEARCH PRIVATE LIMITED
formerly known as SV ENVIRO LABS & CONSULTANTS
Researching for better Environmental Solutions

Ref: SV/VPT-STP/25-08/01

Date: 08-09-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ CHANNEL INLET

DATE OF COLLECTION : 30-08-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)
1.	pH	-	7.46	APHA, 4500-H+B,
2.	Total Suspended Solids	mg/l	58	APHA, 2540-D,
3.	Chemical Oxygen Demand – COD	mg/l	180	APHA, 5220-B,
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	82.5	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	3.41	APHA, 4500-NO3-B & C,
6.	Nitrite Nitrogen	mg/l	0.19	APHA, 4500-NO2-B,
7.	Total Phosphate	mg/l	2.88	APHA, 4500-PD,
8.	Ammonical Nitrogen	mg/l	3.29	APHA, 4500-NH3 B-C,
9.	Sulphide	mg/l	0.45	APHA, 4500-S2D,
10.	Fluoride	mg/l	0.41	APHA, 4500-FD,
11.	Oil & Grease	mg/l	5.0	APHA, 5520-D,
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,

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Ref: SV/VPT-STP/25-08/05

Date: 08-09-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ TREATED OUTLET

DATE OF COLLECTION : 30-08-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)	Standards For Disposal Of Land Irrigation
1.	pH	-	7.47	APHA, 4500-H+B,	5.5-9.0
2.	Total Suspended Solids	mg/l	11.0	APHA, 2540-D,	200
3.	Chemical Oxygen Demand – COD	mg/l	40.0	APHA, 5220-B,	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	18.8	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	16.5	APHA, 4500-NO3-B & C,	-
6.	Nitrite Nitrogen	mg/l	0.81	APHA, 4500-NO2-B,	-
7.	Total Phosphate	mg/l	2.62	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	2.05	APHA, 4500-NH3 B-C,	-
9.	Sulphide	mg/l	0.19	APHA, 4500-S2D,	-
10.	Fluoride	mg/l	0.37	APHA, 4500-FD,	-
11.	Oil & Grease	mg/l	2.0	APHA, 5520-D,	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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Researching for better Environmental Solutions

Ref: SV/VPT-STP/25-09/01

Date: 23-09-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ CHANNEL INLET

DATE OF COLLECTION : 15-09-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)
1.	pH	-	7.36	APHA, 4500-H+B
2.	Total Suspended Solids	mg/l	32	APHA, 2540-D
3.	Chemical Oxygen Demand – COD	mg/l	130	APHA, 5220-B
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	75.4	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	3.23	APHA, 4500-NO3-B & C
6.	Nitrite Nitrogen	mg/l	0.21	APHA, 4500-NO2-B
7.	Total Phosphate	mg/l	4.48	APHA, 4500-PD
8.	Ammonical Nitrogen	mg/l	2.65	APHA, 4500-NH3 B-C
9.	Sulphide	mg/l	0.41	APHA, 4500-S2D
10.	Fluoride	mg/l	0.59	APHA, 4500-FD
11.	Oil & Grease	mg/l	4.0	APHA, 5520-D
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B

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Ref: SV/VPT-STP/25-09/05 Date: 23-09-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ TREATED OUTLET

DATE OF COLLECTION : 15-09-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)	Standards For Disposal Of Land Irrigation
1.	pH	-	7.36	APHA, 4500-H+B,	5.5-9.0
2.	Total Suspended Solids	mg/l	12.0	APHA, 2540-D,	200
3.	Chemical Oxygen Demand – COD	mg/l	40.0	APHA, 5220-B,	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	17.5	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	15.4	APHA, 4500-NO3-B & C,	-
6.	Nitrite Nitrogen	mg/l	0.75	APHA, 4500-NO2-B,	-
7.	Total Phosphate	mg/l	2.82	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	3.49	APHA, 4500-NH3 B-C,	-
9.	Sulphide	mg/l	0.39	APHA, 4500-S2D,	-
10.	Fluoride	mg/l	0.57	APHA, 4500-FD,	-
11.	Oil & Grease	mg/l	2.0	APHA, 5520-D,	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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AUTHORIZED SIGNATORY

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Researching for better Environmental Solutions

Ref: SV/VPT-STP/25-09/01 Date: 09-10-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ CHANNEL INLET

DATE OF COLLECTION : 30-09-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)
1.	pH	-	7.52	APHA, 4500-H+B,
2.	Total Suspended Solids	mg/l	54	APHA, 2540-D,
3.	Chemical Oxygen Demand – COD	mg/l	170	APHA, 5220-B,
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	80.4	IS 3025 P - 44
5.	Nitrate Nitrogen	mg/l	3.22	APHA, 4500-NO3-B & C,
6.	Nitrite Nitrogen	mg/l	0.21	APHA, 4500-NO2-B,
7.	Total Phosphate	mg/l	3.12	APHA, 4500-PD,
8.	Ammonical Nitrogen	mg/l	3.14	APHA, 4500-NH3 B-C,
9.	Sulphide	mg/l	0.43	APHA, 4500-S2D,
10.	Fluoride	mg/l	0.51	APHA, 4500-FD,
11.	Oil & Grease	mg/l	5.0	APHA, 5520-D,
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,

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Recognized by GOI - MoEFCC, Accredited by NABL & NABET

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Ref: SV/VPT-STP/25-09/05 Date: 09-10-2025

NAME AND ADDRESS : **M/s. VISAKHAPATNAM PORT TRUST CIVIL ENGINEERING DEPARTMENT, VISAKHAPATNAM.**

SAMPLE PARTICULARS : **EFFLUENT (SEWAGE WATER)**

SOURCE OF COLLECTION : 10 MLD STP @ TREATED OUTLET

DATE OF COLLECTION : 30-09-2025

TEST REPORT

S.No	PARAMETER	UNIT	RESULT	METHOD (APHA 24th Ed, 2023)	Standards For Disposal Of Land Irrigation
1.	pH	-	7.42	APHA, 4500-H+B,	5.5-9.0
2.	Total Suspended Solids	mg/l	14.0	APHA, 2540-D,	200
3.	Chemical Oxygen Demand – COD	mg/l	40.0	APHA, 5220-B,	250
4.	Bio-Chemical Oxygen Demand – BOD 3day 27°C	mg/l	17.2	IS 3025 P - 44	30
5.	Nitrate Nitrogen	mg/l	15.8	APHA, 4500-NO3-B & C,	-
6.	Nitrite Nitrogen	mg/l	0.76	APHA, 4500-NO2-B,	-
7.	Total Phosphate	mg/l	2.36	APHA, 4500-PD,	-
8.	Ammonical Nitrogen	mg/l	2.11	APHA, 4500-NH3 B-C,	-
9.	Sulphide	mg/l	0.22	APHA, 4500-S2D,	-
10.	Fluoride	mg/l	0.40	APHA, 4500-FD,	-
11.	Oil & Grease	mg/l	2.0	APHA, 5520-D,	10
12.	Residual Chlorine	mg/l	<0.1	APHA, 4500-Cl B,	-

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AUTHORIZED SIGNATOTY

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PAN: ABQCS0643F
CIN: U74909AP2025PTC119098

ANNEXURE – II

No.: IENG/Env.Cell/Form-V/2025
Date: ~~30.09.2025~~
07.10.2025

To,
The Environmental Engineer,
Regional Office,
A.P. Pollution Control Board,
Beside RTA Office,
Madhavadhara VUDA Layout,
Visakhapatnam – 530018.

Sir,

Sub: Submission of Environmental Statement Form-V –Reg.

Ref: As per EC General Conditions.

With reference to the subject cited, the Environmental Statement in Form-V for the Financial Year ending 31.03.2025 as per Rule No.: 14 of E(P) Act, 1986 is herewith submitted please.

Encl: As above

Yours faithfully,

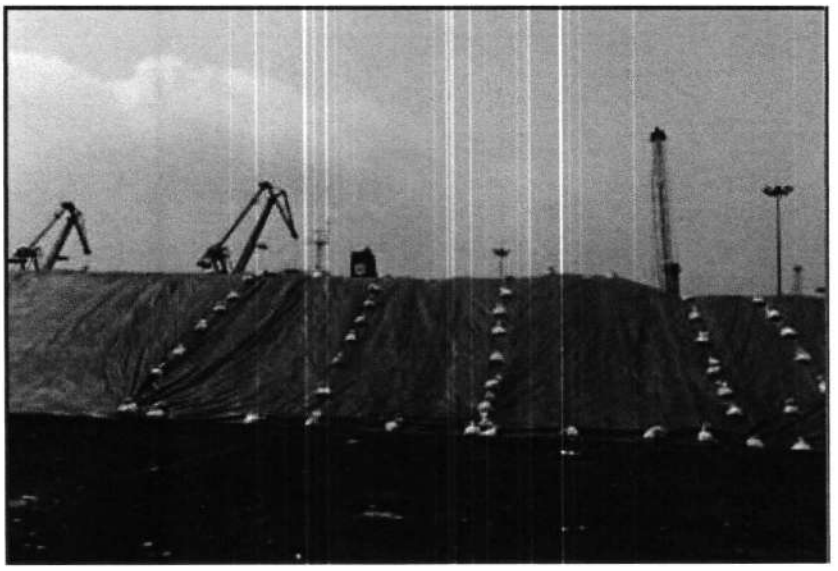
CHIEF ENGINEER

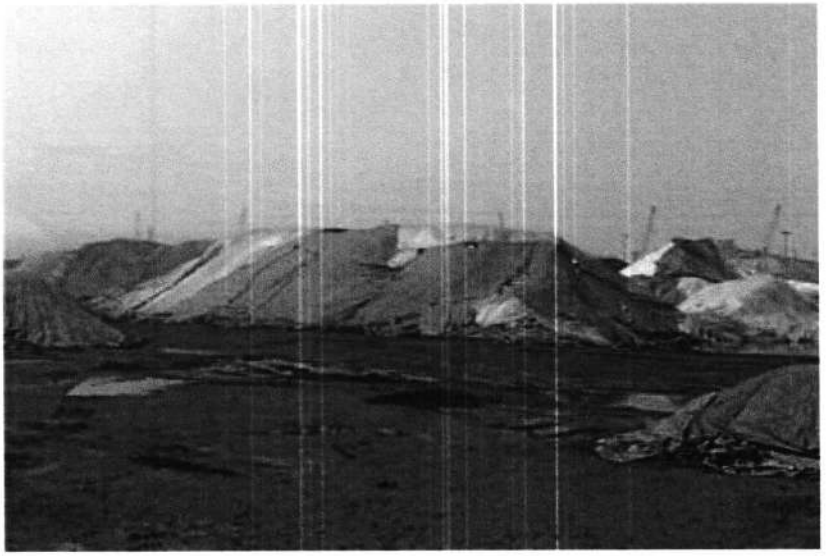
A.P. Pollution Control Board Regional Office, Visakhapatnam

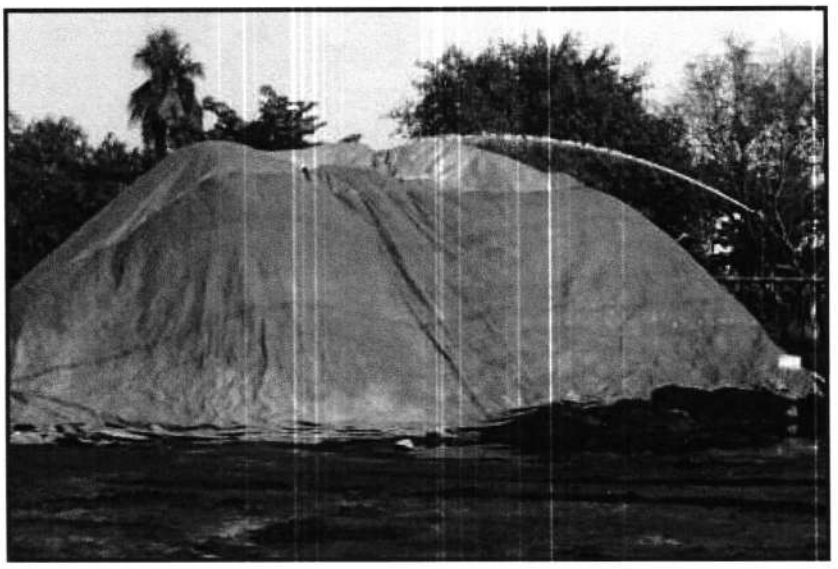
7/10/25

ANNEXURE – III

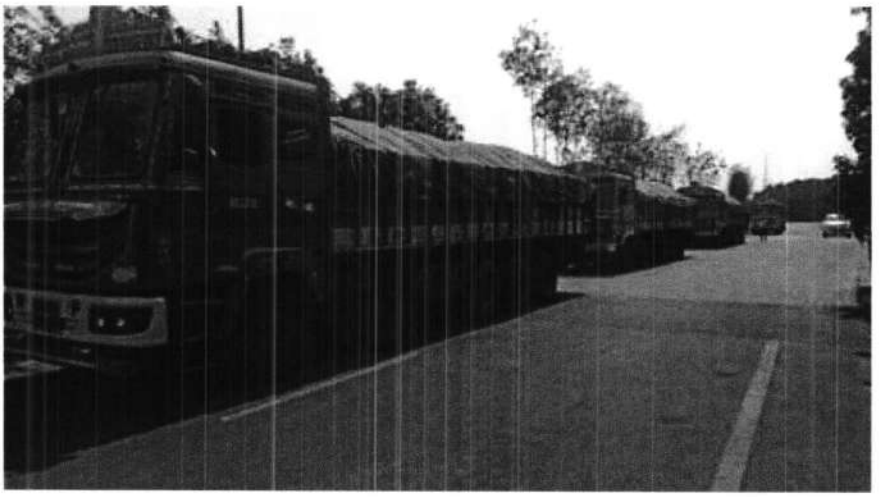
COVERING DUSTY CARGO _ITH TARPAULINS

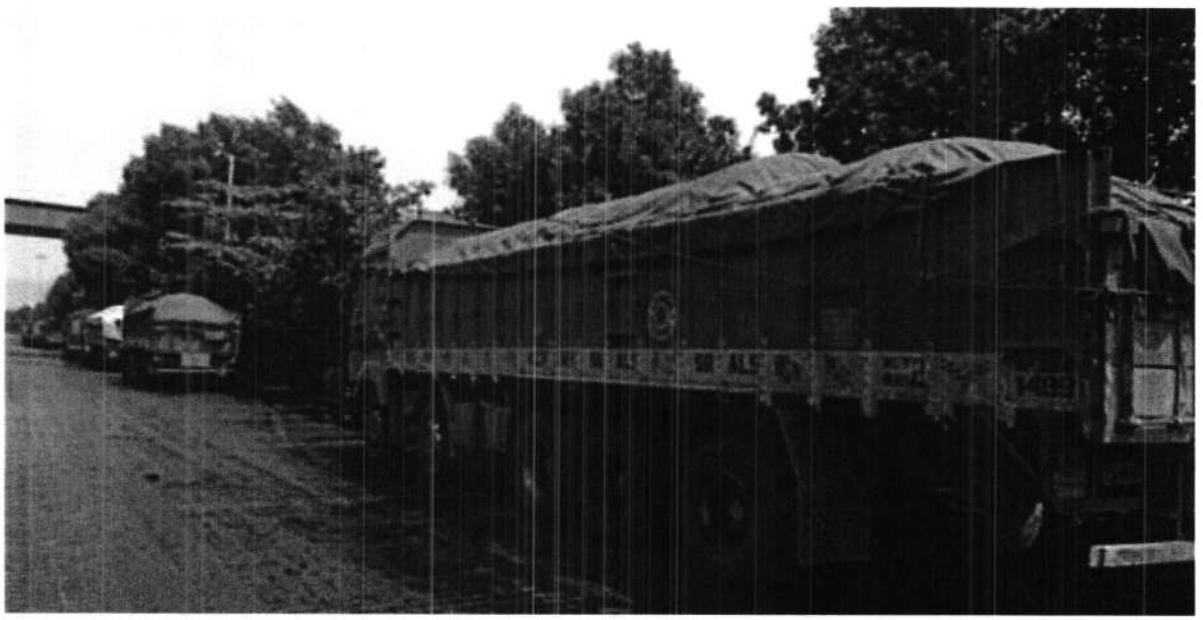






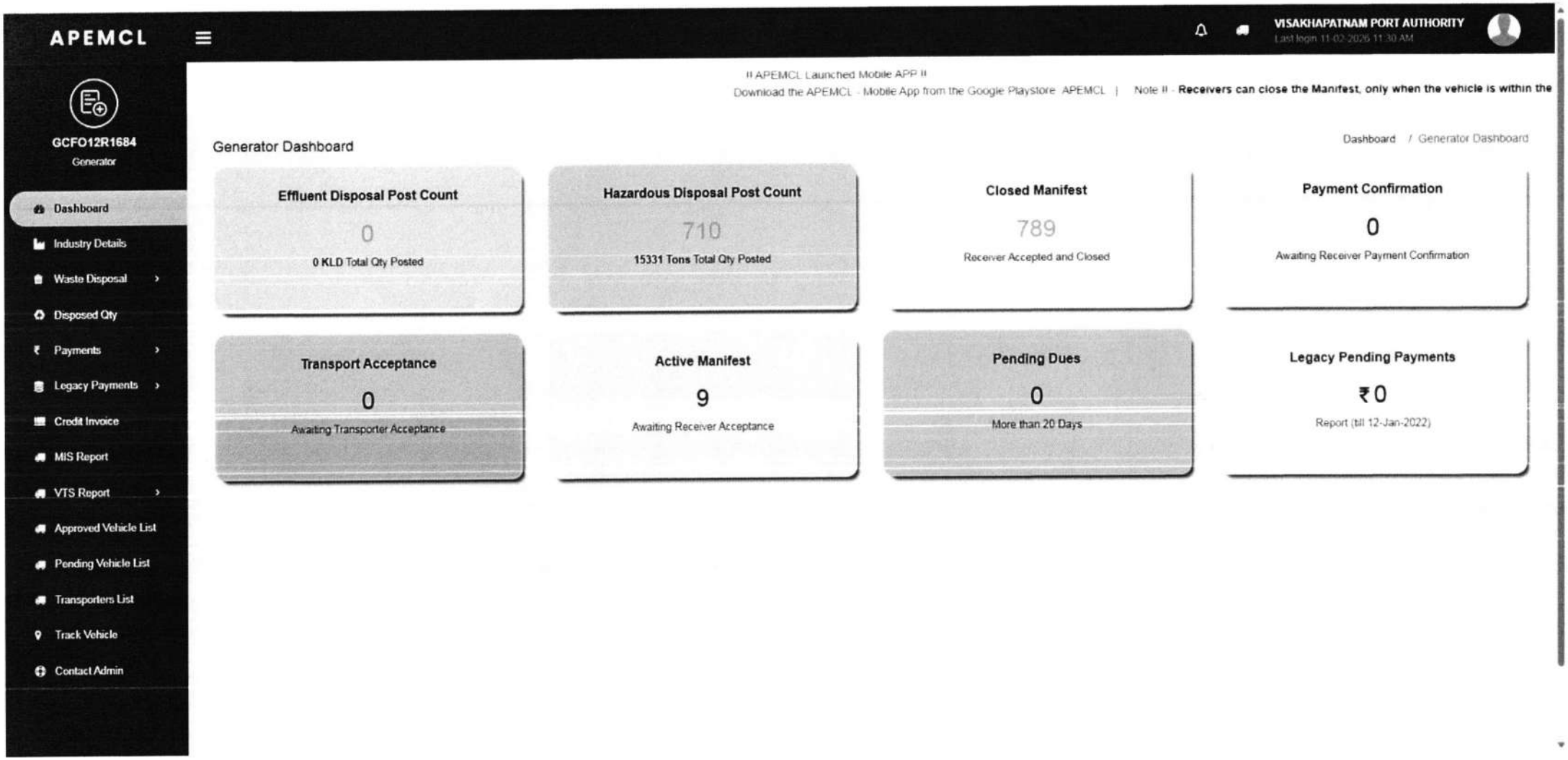
Cargo Transporting Trucks covered with Tarpaulins





ANNEXURE – IV

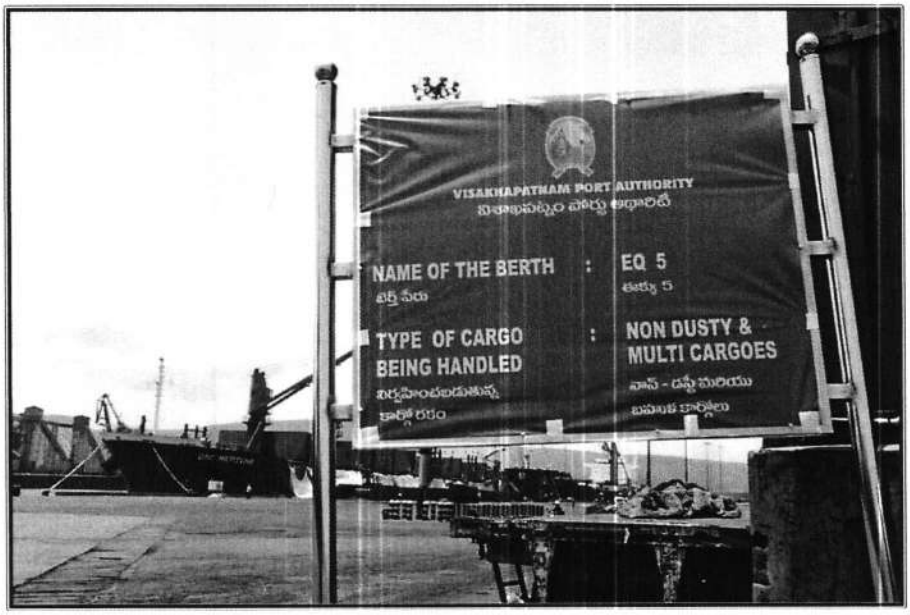
ANNEXURE – V

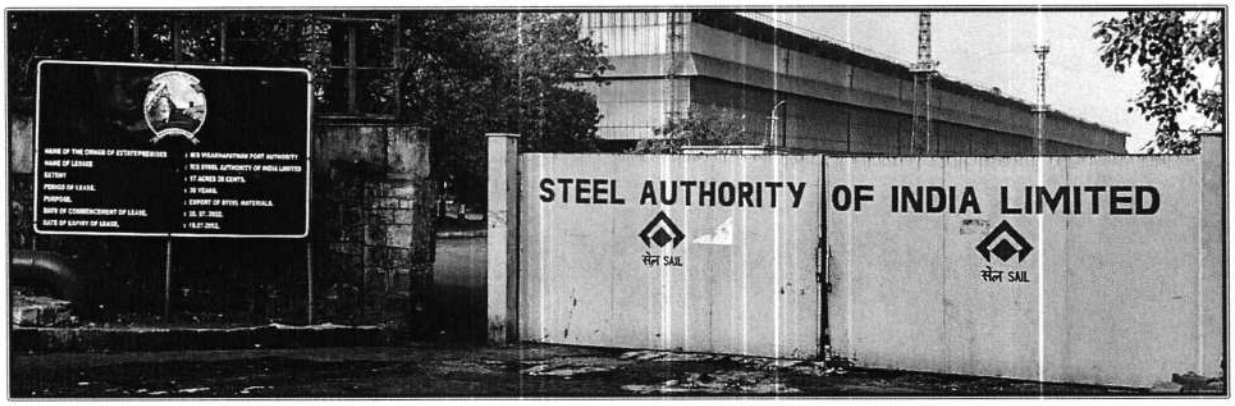

APEMCL
VISAKHAPATNAM PORT AUTHORITY
Last login 11-02-2026 11:30 AM
GCFO12R1684
Generator
Dashboard
Industry Details
Waste Disposal
Disposed Qty
Payments
Legacy Payments
Credit Invoice
MIS Report
VTS Report
Approved Vehicle List
Pending Vehicle List
Transporters List
Track Vehicle
Contact Admin
!! APEMCL Launched Mobile APP !!
Download the APEMCL - Mobile App from the Google Playstore :APEMCL | Note !! - Receivers can close the Manifest, only when the vehicle is within the
Generator Dashboard
Dashboard / Generator Dashboard
Effluent Disposal Post Count
0
0 KLD Total Qty Posted
Hazardous Disposal Post Count
710
15331 Tons Total Qty Posted
Closed Manifest
789
Receiver Accepted and Closed
Payment Confirmation
0
Awaiting Receiver Payment Confirmation
Transport Acceptance
0
Awaiting Transporter Acceptance
Active Manifest
9
Awaiting Receiver Acceptance
Pending Dues
0
More than 20 Days
Legacy Pending Payments
₹0
Report (till 12-Jan-2022)

ANNEXURE – VI

VISAKHAPATNAM PORT AUTHORITY
CIVIL ENGINEERING DEPARTMENT

Display Boards:

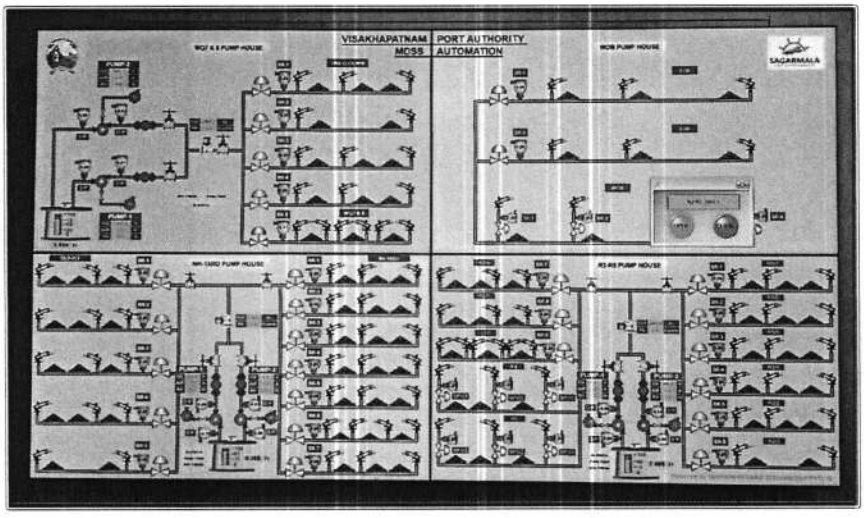


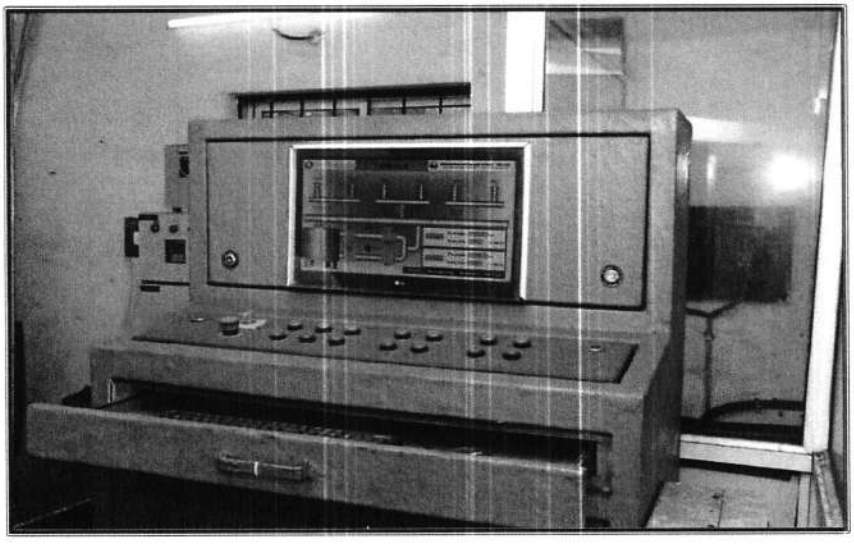


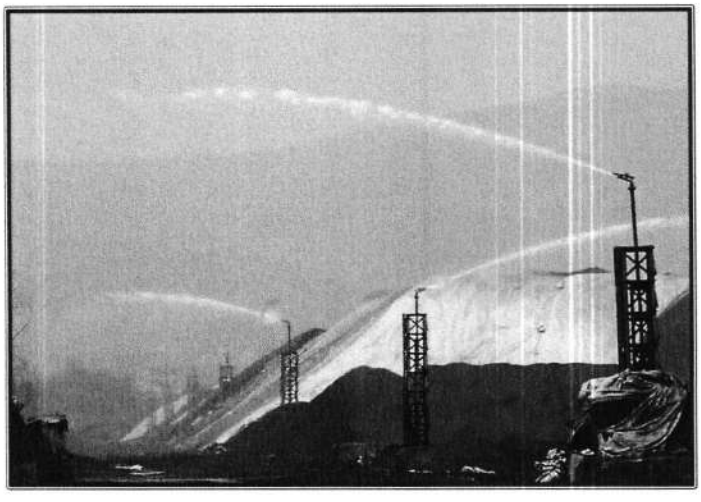
ANNEXURE – VII

VISAKHAPATNAM PORT AUTHORITY
CIVIL ENGINEERING DEPARTMENT

PLC Based MDSS (Mechanical Dust Suppression System)







ANNEXURE – VIII

IRCLASS
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Quantitative Risk Assessment (QRA) for Ammonium Nitrate Handling at VPA

VISAKHAPATNAM PORT AUTHORITY

Port Area, Visakhapatnam-530 035, Andhra Pradesh

Site Visit: 12th - 13th May 2023

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SYSTEMS AND SOLUTIONS PRIVATE LIMITED

Acknowledgement

We, IRCLASS Systems and Solutions Private Limited are obliged to the Management representative and Employees of Visakhapatnam Port Authority, Andhra Pradesh for their co-operation and support to the IRCLASS Systems and Solutions Private Limited Team during the Quantitative Risk Assessment (QRA).

SIGN-OFF SHEET			
Project Name	QRA STUDY FOR AMMONIUM NITRATE HANDLING AT VISAKHAPATNAM PORT AUTHORITY	**HAZOP Study Conducted by**	IRCLASS Systems and Solutions Pvt. Ltd., 52-A, Adi Shankaracharya Marg Opp Powai Lake, Powai, Mumbai – 400072
Document Title	QRA STUDY REPORT	**Issued By**	IRCLASS Systems and Solutions Pvt. Ltd.
Client	VISAKHAPATNAM PORT AUTHORITY		
Contact Person	FIRE & ASSISTANT SAFETY OFFICER	**Accepted By**	
Date of Issue	10.06.2023		
Report Number	ISSPL/R&S/VPA/QRA/2023		

10.06.2023	0	Issued as Final	DS/SD/PM	DH
29.05.2023	0	Issued as Draft	DS/SD/PM	DH
Date of Issue	**Revision**	**Description**	**Prepared**	**Reviewed**

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Abbreviations:

AN	Ammonium Nitrate
QRA	Quantitative Risk Assessment
VPA	Visakhapatnam Port Authority
PHAST	Process Hazard Analysis Software
UDM	Unified Dispersion Model
HSE	Health Safety Executive, UK
TNT	Tri Nitrotoluene
Te	Tonnes Equivalent
ALARP	As Low As Reasonably Practicable
SOP	Standard Operating Procedure
NFPA	National Fire Protection Association

Table of Contents

Executive Summary

The report represents the QRA study carried out for Ammonium Nitrate Handling at EQ-3 and EQ-6 wharf of Visakhapatnam Port Authority (VPA), Andhra Pradesh. The study refers the layout drawing, Ammonium Nitrate Analysis report and other documents. The study team comprises Mr. Pradyut Mitra, experienced Process and safety professional having more than 30 years of experience and Mr. Dipak Sonawane & Mr. Sudarshan Daga, Risk & Safety Experts who has conducted analysis for the study.

A special gratitude goes to Visakhapatnam Port Authority, Andhra Pradesh for sharing the required information.

For the benefit of the implementers, the observations have been identified and highlighted as recommendations. The recommendations can also be designated as Opportunities for improvement and relate to best practices.

This study for the said facility has been carried out based on the data and information provided by the client.

The following accidental scenarios and consequences have been considered for the study:

- A fire on transport vehicle at jetty:
- An Explosion Risk
- Decomposition after the fire and toxic gases release in the environment (NH3, NO, NO2 and CO).

1. Introduction

Visakhapatnam Port Authority receive Ammonium Nitrate (AN) with Fertilizer Grade by ships. Ammonium Nitrate is unloaded on wharf and then transported to destination by the users. Generally, 1.2 tons of Ammonium nitrate in baggage form is unloaded at EQ-3 and EQ-6 wharf and 12-15 bags are packaged in a container at a time. Approx 20 Tons quantity of AN handling is considered for the analysis. The transportation by road will be by closed container or open truck and passing by the port limit to the consignee.

1.1 Objective

The objectives of the Risk Analysis study are to identify and quantify all potential failure modes that may lead to hazardous consequences and extent. Typical hazardous consequences include fire, explosion, and toxic releases.

This is achieved by the following:

- Identification of hazards that could be realized from hazardous material.
- Identify the potential failure scenarios that could occur within the facility.
- To asses, the potential risks associated with identified hazards to which the plant and its personnel and community outside may be subjected. Consequence analysis of various hazards is carried out to determine the vulnerable zones for each probable accident scenario.
- Evaluate the process hazards emanating from the identified potential accident scenarios.
- Analyse the damage effects to the surroundings due to such accidents.
- Conclusion and Recommendations in order to mitigate the hazard.

1.2 Scope

- The study addresses the hazards that can be realized due to Ammonium Nitrate handling and transport operations at EQ-3 and EQ-6 wharf of Visakhapatnam Port Authority (VPA).

2. Site Condition

2.1 Site Location and vicinity

The layout of EQ-3 and EQ-6 wharf of Visakhapatnam Port Authority (VPA):

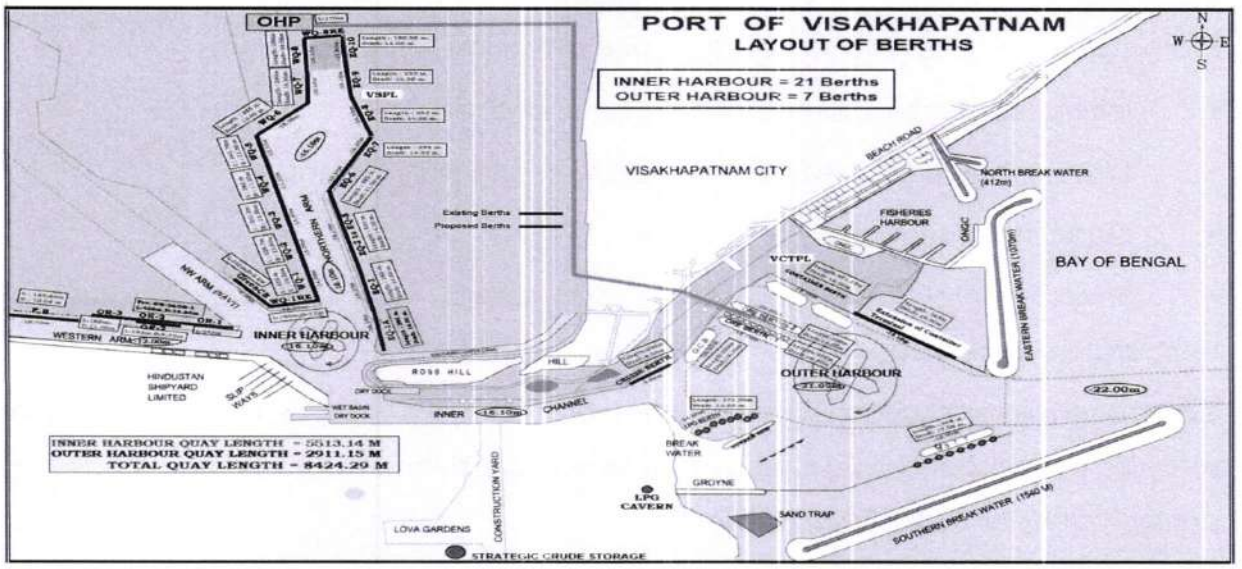


Figure: Layout of Berths, Port of Visakhapatnam

2.2 Material Handling Data:

Ammonium Nitrate (AN) unloaded at EQ-3 and EQ-6 wharf of Visakhapatnam Port Authority (VPA). The cargo handled details provided by port are as below.

Sr. No.	Year	Total vessels	Low avg. tonnage	High avg. tonnage	Total tonnage
1	2021-22	21	1,604	16,029	2,08,761
2	2022-23	18	3,011	22,469	2,70,846
		39	4,615	38,498	4,79,607

3. Methodology

The consequences of released toxic or flammable material are largely dependent on the prevailing weather conditions. Consequences of loss of containment can lead to hazardous situation in any industry handling potentially hazardous materials. Following factors govern the severity of consequence of the loss of containment.

- Intrinsic properties: flammability, toxicity, and reactivity.
- Dispersive energy: pressure, temperature, and state of matter.
- Quantity present
- Environmental factors: weather (wind speed, wind direction, atmospheric temperature &pressure).

Consequence analysis and calculations are effectively performed by computer software using models validated over several applications. Consequence modeling is carried out by PHAST of DNV Software.

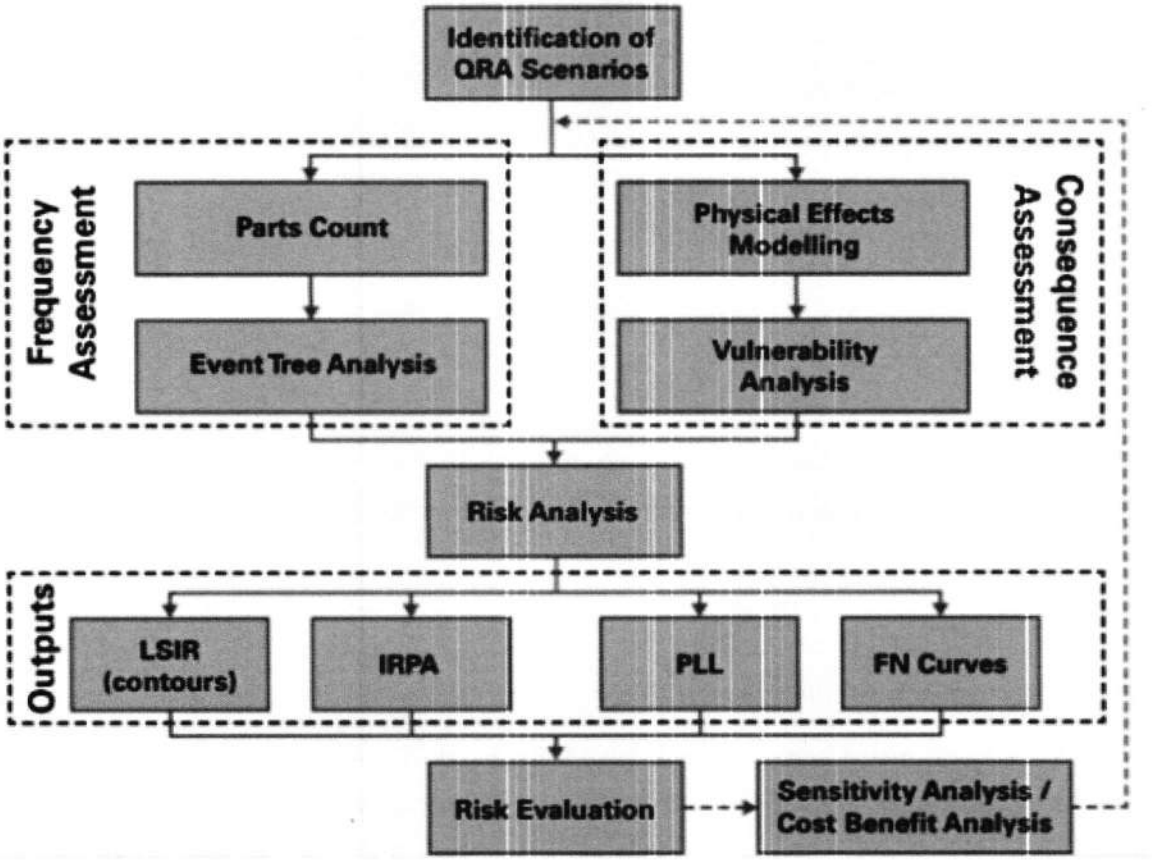
PHAST uses the Unified Dispersion Model (UDM) capable of describing a wide range of types of accidental releases. The Model uses a particularly flexible form, allowing for sharp-edged profiles, which become more diffuse downwind.

PHAST contains data for many chemicals and allows definition of mixtures of any of these chemicals in the required proportion. The calculations by PHAST involve following steps for each modeled failure case:

- Run discharge calculations based on physical conditions.
- Model first stage of release (for weather category).
- Determine gas release after decomposition.
- Dispersion modeling considering weather conditions.

Flow chart for consequence analysis is shown in the form of event tree for release of flammable liquid.

Figure 0-1: Methodology adopted for the study



3.1 Assumptions

1.2 tons of Ammonium nitrate in baggage form is unloaded at EQ-3 and EQ-6 wharf and 12-15 bags are packaged in a container at a time. Approx 20 Tons quantity of AN handling in is considered for the analysis. The transportation by road will be by closed container or open truck and passing by the port limit to the consignee.

There are Two Building Nearby Berth:

Berth EQ-6: Building With 10 People Within 500 M

Berth EQ-3: Building With 20 People Within 100 M

While Unloading, Gang of 12 will be present.

Atmospheric Parameters

The atmospheric parameters which are considered while conducting this study is as under:

Atmospheric Temperature	27^{0}C
Atmospheric pressure (mmHg)	760
Relative humidity	70%
Solar Radiation flux (KW/m2)	0.7

Wind Speed

It is observed that average wind speed of magnitude of 2-5 m/s blows for majority of the time in a year. Hence predominant wind speed for Visakhapatnam is 2-5 m/s.

Weather Category

One of the most important characteristics of atmosphere is its stability. Stability of atmosphere is its tendency to resist vertical motion or to suppress existing turbulence. This tendency directly influences the ability of atmosphere to disperse pollutants emitted into it from the facilities. In most dispersion scenarios, the relevant atmospheric layer is that nearest to the ground, varying in thickness from a few meters to a few thousand meters. Turbulence induced by buoyancy forces in the atmosphere is closely related to the vertical temperature gradient.

Temperature normally decreases with increasing height in the atmosphere. The rate at which the temperature of air decreases with height is called Environmental Lapse Rate (ELR). It will vary from time to time and from place to place. The atmosphere is said to be stable, neutral, or unstable according to ELR is less than, equal to or greater than Dry Adiabatic Lapse Rate (DALR), which is a constant value of 0.98°C/100 meters.

Pasquill stability parameter, based on Pasquill – Gifford categorization, is such a meteorological parameter, which describes the stability of atmosphere, i.e., the degree of convective turbulence. Pasquill has defined six stability classes ranging from

`A' (extremely unstable) to `F' (moderately stable). Wind speeds, intensity of solar radiation (daytime insulation) and nighttime sky cover have been identified as prime factors defining these stability categories.

Table 0-1: Pasquill stability classes

Stability class	Definition	Stability class	Definition
A	Very Unstable	D	Neutral
B	Unstable	E	Slightly Stable
C	Slightly Unstable	F	Stable

When the atmosphere is unstable and wind speeds are moderate or high or gusty, rapid dispersion of pollutants will occur. Under these conditions, pollutant concentrations in air will be moderate or low and the material will be dispersed rapidly. When the atmosphere is stable and wind speed is low, dispersion of material will be limited and pollutant concentration in air will be high. In general, worst dispersion conditions (i.e. contributing to greater hazard distances) occur during low wind speed and very stable weather conditions.

Stability category for the present study is identified based on the cloud amount and wind speed. For risk analysis the representative average annual weather conditions are assessed based on the following:

Predominant weather stability classes of "F" & "D" are selected with wind speed 2 m/s & 5 m/s respectively for consequence analysis.

Wind Speed (m/s)	Pasquill Stability
2	F
5	D

The consequence results are reported in tabular form for all the weather conditions and graphs for worst case weather conditions.

3.2 Software Used

DNV PHAST 8.7.1 has been used for consequence analysis include discharge and dispersion calculations.

4. Hazards Associated with Handling Ammonium Nitrate

The release of Ammonium Nitrate can lead to different types of fire or explosion scenarios. These depend on the material released, mechanism of release, temperature and pressure of the material and the point of ignition. Types of flammable effects are as follows.

In this analysis it was assumed that:

- The probability of fatality was 100% at locations where the overpressure would be greater than 42 kPa.
- The probability of fatality was 50% at locations where the overpressure would be between 42 kPa and 21 kPa.
- The probability of fatality was 10% where the overpressure would be between 21 kPa and 3.5 kPa.
- The probability of fatality was zero at locations where the overpressure would be less than 3.5 kPa.
- Distances to the various overpressure levels were then calculated using the standard methodology described above.
- The overpressure vs distance after the calculation of 20 tonnes of Ammonium nitrate for the overpressure criteria are as below.

Sr. No.	Overpressure (kPa)	Prob. of fatality
1	42	100%
2	21	50%
3	3.5	10%

Decomposition after the fire and toxic gases release in the environment (NH3, NO, NO2 and CO).

When heated to temperatures above 175°C AN starts to decompose. A number of decomposition reactions can take place, the actual balance of which is very sensitive to the particular conditions (e.g. temperature, pressure, degree of confinement, extent of contamination etc.)

4.1 Hazards Associated with Explosive Material

Damage Criteria:

Damage estimates due to overpressure & toxic dispersion have been arrived at by taking in to consideration the published literature on the subject. The consequences can then be visualized by the superimposing the damage effects zones on the proposed plan site and identifying the elements within the project site as well as in the neighboring environment, which might be adversely affected, should one or more hazards materialize in real life.

4.2 Overpressure Damage:

The following tables give effect due to different overpressure on equipment and people.

Table 0-2: Over Pressure Damage Criteria with Damage to People

Over Pressure (mbar)	Mechanical Damage to Equipment	Damage To People
300	Heavy damage to plant & structure	1% death from lung damage >50% eardrum damage >50% serious wounds from flying objects

100	Repairable damage	>1% eardrum damage >1% serious wounds from flying objects
30	Major glass damage	Slight injury from flying glass
10	10% glass damage	No damage

Table 0-3: Over Pressure Damage Criteria with Mechanical Damage to Equipment

Over Pressure		Mechanical damage to Equipment
Bar	K Pa	
0.0014	0.14	Annoying noise (137 dB if of low frequency 10–15 Hz)
0.0021	0.21	Occasional breaking of large glass windows already under strain
0.0028	0.28	Loud noise (143 dB), sonic boom, glass failure
0.0069	0.69	Breakage of small windows under strain
0.0103	1.03	Typical pressure for glass breakage
0.0207	2.07	Safe distance" (probability 0.95 of no serious damage below this value); projectile limit; some damage to house ceilings; 10% window glass broken
0.0276	2.76	Limited minor structural damage
0.03-0.069	3.4-6.9	Large and small windows usually shattered; occasional damage to window frames
0.048	4.8	Minor damage to house structures
0.069	6.9	Partial demolition of houses, made uninhabitable
0.138	13.8	Corrugated asbestos shattered; corrugated steel or aluminum panels, fastenings fail, followed by buckling; wood panels (standard housing) fastenings fail, panels blown in
0.09	9.0	Steel frame of clad building slightly distorted
0.138	13.8	Partial collapse of walls and roofs of houses

Over Pressure		Mechanical damage to Equipment
Bar	K Pa	
0.207	20.7	Concrete or cinder block walls, not reinforced, shattered
0.158	15.8	Lower limit of serious structural damage
0.172	17.2	50% destruction of brickwork of houses
0.207	20.7	Heavy machines (3000 lb.) in industrial building suffered little damage; steel frame building distorted and pulled away from foundations.
0.207-0.276	20.7-27.6	Frameless, self-framing steel panel building demolished; rupture of oil tanks
0.276	27.6	Cladding of light industrial buildings ruptured
0.345	34.5	Wooden utility poles snapped; tall hydraulic press (40,000 lb) in building slightly damaged
0.345-0.482	34.5-48.2	Nearly complete destruction of houses
0.482	48.2	Loaded, lighter weight (British) train wagons overturned
0.482-0.551	48.2-55.1	Brick panels, 8 –12 in. thick, not reinforced, fail by shearing or flexure
0.62	62.0	Loaded train boxcars demolished
0.689	68.9	Probable destruction of buildings; heavy machine tools (7,000 lb) moved and badly damaged, very heavy machine tools (12,000 lb) survive

4.3 COMPOSITION OF AN DECOMPOSITION GASES

The toxic components (CO, NO, NO2, NH3) collectively represent 1.9% by weight (1.5% by volume) of the total mixture. The molecular weight of the mixture is calculated as 24.46 which is lighter than air.

5. Consequence Analysis

The consequence analysis is carried out to determine the extent of spread (dispersion) by accidental release which may lead to fire & explosion resulting in generation of overpressures and toxic dispersion etc.

In order to form an opinion on potentially serious hazardous situations and their consequences, consequence analysis of potential failure scenarios are conducted. It is qualitative analysis of hazards due to various failure scenarios. In consequence analysis, each failure case is considered in isolation and damage effects predicted, without considering the secondary events or failures it may cause, leading to a major disastrous situation. The results of consequence analysis are useful in developing Disaster Management Plan and in developing a sense of awareness among operating and maintenance personnel. It also gives the operating personnel and population living in its vicinity, an understanding of the hazard they are posed to.

5.1 Consequences associated with the handling of Ammonium Nitrate:

5.1.1 An Explosion risks

The HSE have previously advised (Technica, 1990a) that explosion efficiencies applicable to storage of AN for bulk over 2 m pile size as 80%. The TNT mass equivalence of AN is considered as 55%.

The equivalent mass of TNT used as the basis for consequence modelling is as below;

20 Tonnes × 0.8 × 0.55 = 8.8 Te (Tonne's equivalent)

Overpressure vs. Distance Model

Using the efficiency and equivalence factors, a mass of Ammonium Nitrate is equated to a mass of TNT. The distances to defined overpressures of interest are calculated using the 'TNT overpressure vs. scaled distance' relationship. An 'Overpressure vs. Scaled

Distance' relationship can take the form of an equation or graph. In this case an equation is used which is sourced from the US Army [Bulson 1997] and has the form:

$$p_0 = \frac{4120}{Z^3} - \frac{105}{Z^2} + \frac{39.5}{Z}$$

Where, 2 < po < 160 psi gauge

$$Z = \frac{R}{W^{1/3}}$$

and, 3 < Z < 20 ft/lbs1/3

In this analysis it was assumed that:

- The probability of fatality was 100% at locations where the overpressure would be greater than 42 kPa.
- The probability of fatality was 50% at locations where the overpressure would be between 42 kPa and 21 kPa.
- The probability of fatality was 10% where the overpressure would be between 21 kPa and 3.5 kPa.
- The probability of fatality was zero at locations where the overpressure would be less than 3.5 kPa.
- Distances to the various overpressure levels were then calculated using the standard methodology described above.
- The overpressure vs distance after the calculation of 20 tonnes of Ammonium nitrate for the overpressure criteria are as below.

Sr. No.	Overpressure (kPa)	Prob. of fatality	Distance (m)
1	42	100%	88
2	21	50%	130
3	3.5	10%	460

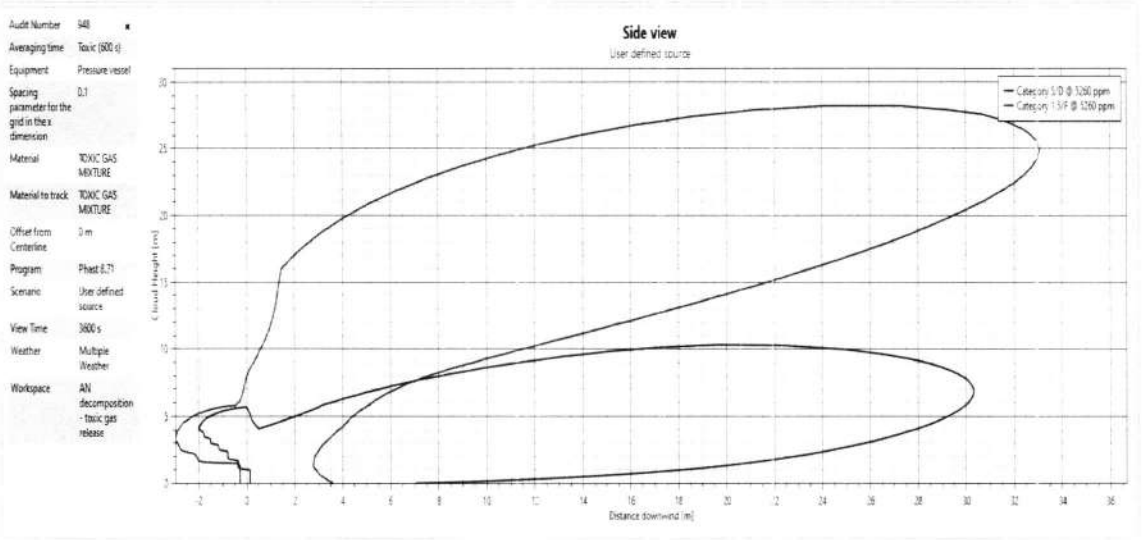
5.1.2 Decomposition after the fire and toxic gases release in the environment (NH3, NO, NO2 and CO).

When heated to temperatures above 175°C AN starts to decompose. A number of decomposition reactions can take place, the actual balance of which is very sensitive to the particular conditions (e.g. temperature, pressure, degree of confinement, extent of contamination etc.)

Decomposition Products:

The toxic components (CO, NO, NO2, NH3) collectively represent 1.9% by weight (1.5% by volume) of the total mixture. The molecular weight of the mixture is calculated as 24.46 which is lighter than air.

The toxic dispersion downwind distance has been determined using the DNV-PHAST software. The toxic dispersion results are shown below for the various wind speed and atmospheric stability conditions (1.5 F and 5 D):



As per above figure the 5260 ppm level conc. is reached till 30 meters at height around 5 meters. The table below shows the downwind distance for the conc. level with height.

Sr. No.	Height of interest (m)	Wind speed	Downwind Distance (m)
1	0	1.5-F	3.59
		5-D	7
2	1	1.5-F	2.8
		5-D	18
3	2	1.5-F	2.9
		5-D	22
4	3	1.5-F	3.3
		5-D	25
5	4	1.5-F	3.8
		5-D	27
6	5	1.5-F	4
		5-D	29

From above table and figure, it is evident that the gas mixture is remained buoyant and the effects are mostly at height above the ground level and in case of 5 m/s wind speed and D stability conditions. So, the 100% fatalities will be in the range of 22 meters for 2 m height conditions.

5.2. Failure frequency for the explosion and decomposition of Ammonium Nitrate:

AN fire on road vehicles:

For AN fire on road vehicles as per the literature the event frequency is as 2×10^{-9} per vehicle-km. For the approximately 10,000 movements (for approximately 2,00,000 Tonnes per year) per year this equates to 2×10^{-5} per km-yr.

AN Explosion During Road Transport:

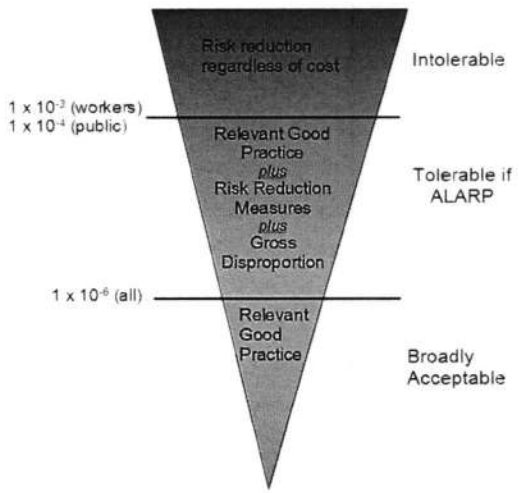
For AN explosion as per the literature the conditional probability of explosion in the event of fire is considered as 10%. The event frequency for AN explosion is therefore calculated as 2×10^{-10} per vehicle-km. For the postulated 10,000 movements (for approximately 2,00,000 Tonnes per year) per year this equates to 2×10^{-6} per km-yr.

5.3 Individual Risk Criteria:

The individual risk contours have been plotted on the below port layout after assessing the consequences and frequency of explosion and decomposition of AN.

Individual risk criteria are often used with the As Low As Reasonably Achievable (ALARP) principle which sets an upper bound below which risk must be reduced (Intolerable level) and a lower bound that is a target that may not be achieved (Broadly acceptable level). The UK HSE has suggested the following values for individual annual fatality risk:

Figure: Individual risk criteria



Intolerable (per year)		Broadly acceptable (per year)	
Workers	Public	Workers	Public
1×10^{-03}	1×10^{-04}	1×10^{-06}	1×10^{-06}

Distance and Individual Risk

Sr. No.	Distance (m)	Individual Risk (per year)
1	30	6.03×10^{-6}
2	100	3.20×10^{-6}
3	130	1.20×10^{-6}
4	450	2.00×10^{-7}

6. Individual Risk Contour

Individual Risk contours are shown in below figures:

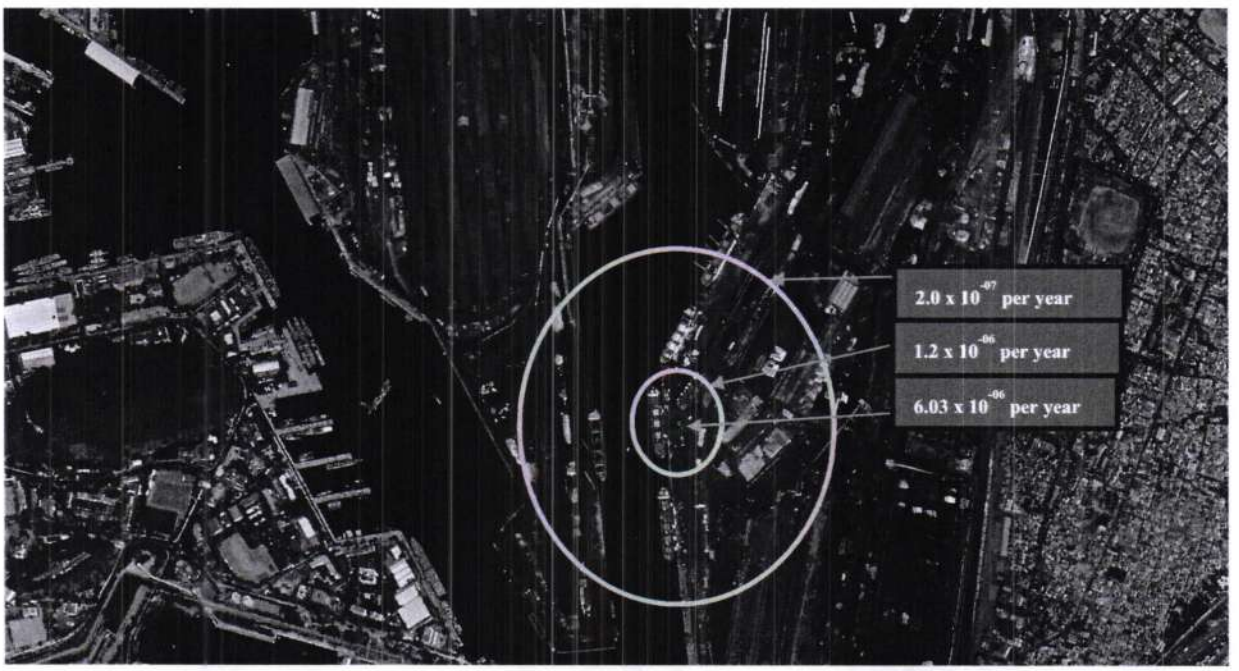


Figure: Individual risk contours for EQ-3 wharf

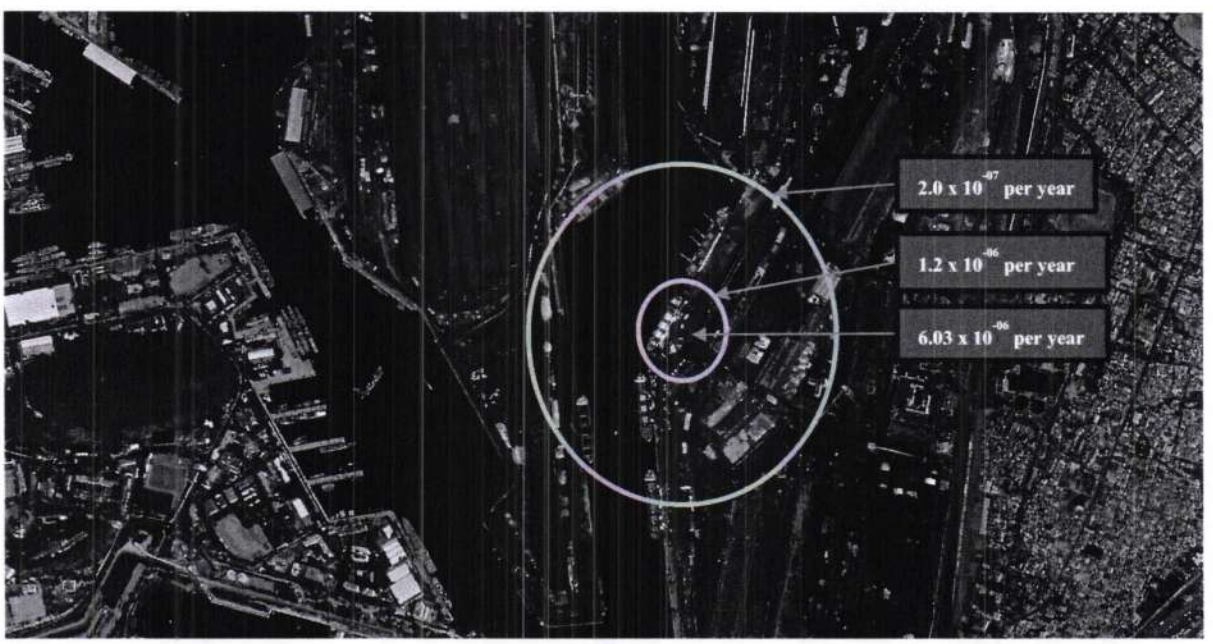


Figure: Individual risk contours for EQ-6 wharf

7. Conclusion

The individual risk contours for the 30 meters from the handling area are 6.03×10^{-6} per year compared to the UK HSE criteria and it is falling in ALARP region.

8.Recommendations & Mitigation Measures

- Adequate fire-fighting facility as per NFPA 490 (replaced by 400) shall be provided at ammonium nitrate storage and handling premises.
- The Emergency action plan should be in place in case of emergencies arises during the handling of Ammonium nitrate cargo.
- Follow the Standard operating procedure (SOP), 2020 for handling Ammonium Nitrate prepared by VPT traffic department.
- The firefighting arrangements and precautions are mentioned for vessel/ship side fire. but during the unloading operations at EQ-3 and EQ-6 wharf, the firefighting arrangements are not mentioned in SOP. SOP shall be revised to include all the precautionary measure required for handling Ammonium Nitrate.
- Training shall be imparted to all personnel involved in handling Ammonium Nitrate.
- Provision of The Ammonium Nitrate Rules, 2012, amended in 2021 shall be ensured.

9.References

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- Quantitative Risk Assessment report of Bunbury outer harbour for marlston hill, DNV Technica, Jan 1994.
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- An investigation into the relative risks from the road transport of blasting explosives in maximum loads of 5 tonne and 16 tonne, R. Merrifield, HSE, 1994.
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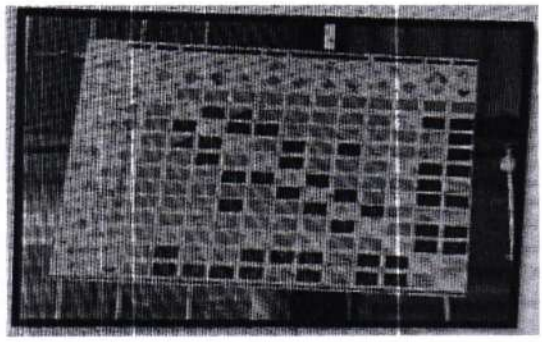
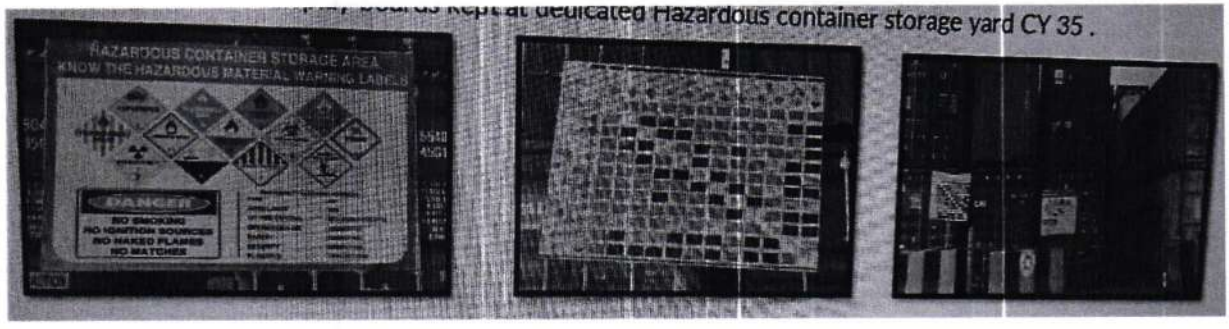
- Loss prevention in the process industries, Volume 2, Second edition, Lees, F. P., 1996.
- Guidance on ALARP decisions on COMAH, UK HSE, SPC / Permissioning / 37.

10. Appendix-A: MSDS – Ammonium Nitrate
B: AN Analysis Report

ANNEXURE – IX





dedicated Hazardous container storage yard CY 35 .

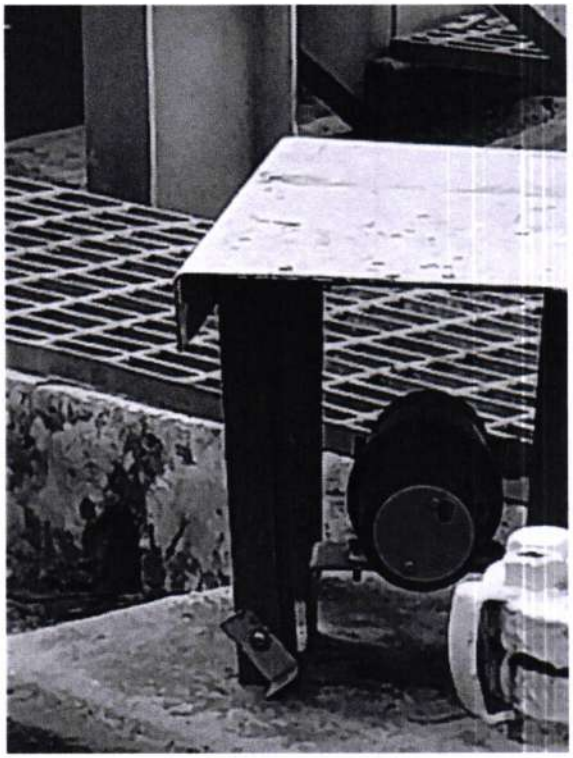
ANNEXURE – X

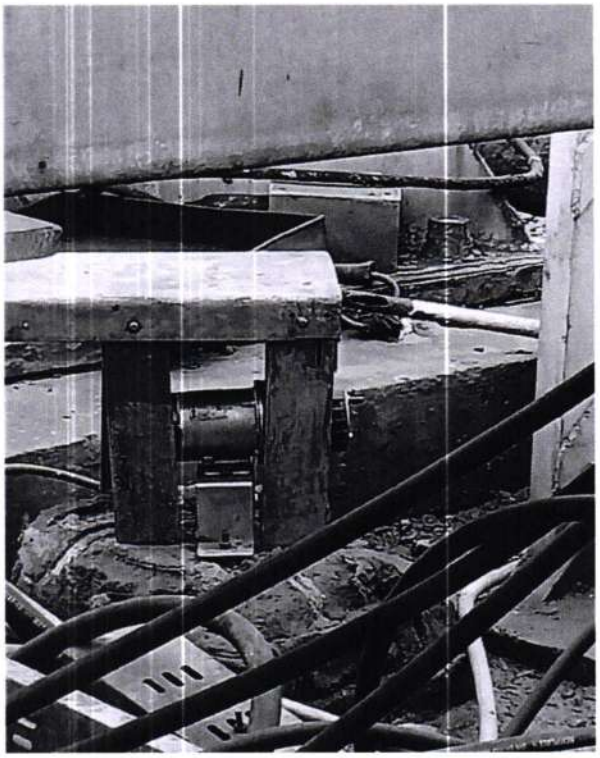

LEAKY CONTAINER AREA
CAUTION
FIRE
AMBULANCE
OPERATIONS SIC
SAFETY
SECURITY
PLANNING

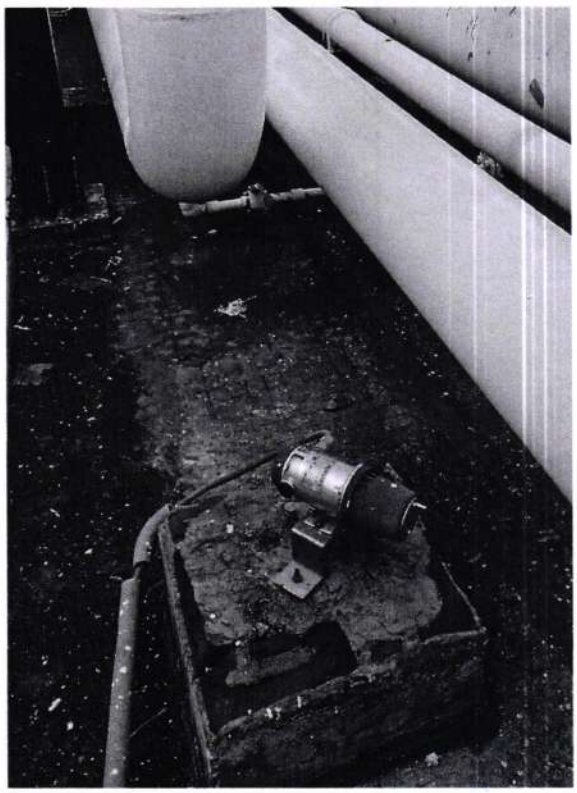
ANNEXURE – XI

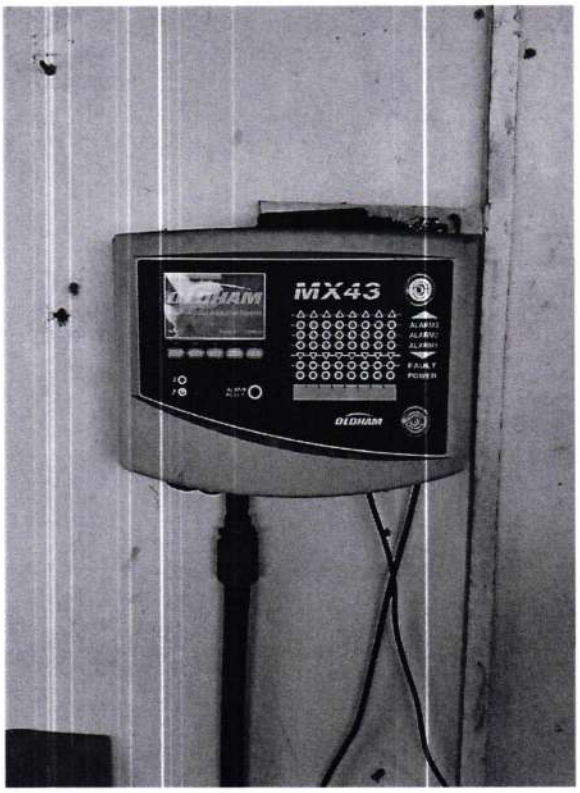
VISAKHAPATNAM PORT AUTHORITY

Leakage Detection System at Various locations.









ANNEXURE – XII

Visakhapatnam Port Authority

Fluorescent Wind Vane in Visakhapatnam Port Authority for Fire Escape