

IPL/HAL/ENV/23-24/MOEF- ERO -01
Date: 08.05.2023

To,

The Director
Govt of India
MOEF&CC,
Integrated Regional Office, Kolkata, 1B-198,
Salt Lake City, Sector III, Kolkata- 700106

Subject: Half-yearly Compliance Report for compliance status of stipulated conditions of Environmental Clearance No. J-11011/136/2017-IA-II(I) dated 17.06.2022 for Proposed Expansion of Fertilizer Plant as on Period Oct 22- Mar 23

Dear Sir,

We are submitting herewith half yearly compliance report as per the stipulated conditions of the Environmental clearance granted for Proposed Expansion of Fertilizer Plant of Indorama India Pvt Ltd. at Haldia, West Bengal.

Hope you will find this in order.

We are also uploading the EC compliance report in our company website in the following link.

<https://ircagro.com/compliance-report/>

Thanking You

Yours Sincerely
For Indorama India Pvt Ltd
(Formerly IRC Agrochemicals Pvt Ltd)


Chandra Shekhar Prasad
Chief Operating Officer
Enclosures : Compliance status report



CC :-

- 1.The Scientist 'D' & In-charge, Central Pollution Control Board, Zonal Office, Kolkata Southernd Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata -700107
- 2.The Senior Environmental Engineer, EIM cell, West Bengal pollution Control Board, 10 A, Block-LA, Sector – III, Salt Lake City, Kolkata - 700106
3. Incharge & Environmental Engineer, Haldia Regional office.

HALF-YEARLY COMPLIANCE

Report of the Conditions of the Environmental Clearance of Proposed Expansion of Fertilizer Plant located at Durgachak, Haldia, Purba Medinipur, PO + PS- Durgachak, West Bengal

by M/s Indorama India Pvt. Ltd.

Period- October 2022 - March 2023



Indorama India Pvt Ltd

(Formerly IRC Agrochemicals Pvt Ltd)

PO:-Durgachak, Haldia,

Dist :Purba Medinipur,

West Bengal : 721602 T: +91(03224)660600

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Name of the Project:- Proposed Expansion of Fertilizer Plant located at Durgachak, Haldia, Purba Medinipur, PO + PS- Durgachak, West Bengal

Clearance Letter no:- J-11011/136/2017-IA-II(I) dated 17.06.2022

Period of compliance report:- 1st October 2022 to 31st March 2023

Sr. No.	Conditions stipulated in Environmental Clearance	Compliance Status
A . Specific Conditions		
(i).	The Unit shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, and risk mitigation measures relating to the project shall be implemented.	Unit is complying with all the environment protection measures and safeguards. Recommendation made in EIA/EMP report for environment management and risk mitigation measures will be implemented before installation of the project.
(ii).	No banned Fertilizer shall be manufactured by the project proponent. No banned raw materials shall be used in the unit. The project proponent shall adhere to the notifications/guidelines of the Government in this regard.	Noted and agreed.

<p>(iii).</p>	<p>The project proponent shall utilize modern technologies for capturing of carbon emitted and shall also develop carbon sink/carbon sequestration resources capable of capturing more than emitted. The implementation report shall be submitted to the IRO, MoEF&CC in this regard.</p>	<p>Our unit is a phosphatic fertiliser unit where scope 1 and scope 2 CO₂ emission is less compared to ammonia urea fertiliser plant. CO₂ emission sources are mainly grid electricity and fuel used in the plant We are constantly putting to reduce carbon footprint of site.To reduce the grid electricity consumption, captive power generated from waste heat recovery system of sulphuric acid plant is partially used in plant operations. 500 kwp solar panel installation job is process , which is expected to be commissioned within next 6 months. In place of Coal , biomass briquettes, a carbon neutral fuel is being used in DAP plants . Coal is used in case of unavailability of supply of biomass briquettes. 15040 no of trees planted inside and 5000 no of trees planted outside factory which will sequestreat CO₂ . Implementation report is attached in annexure -1.</p>
<p>(iv).</p>	<p>The species specific conservation plan of Schedule-I species shall be implemented within time limit and as per the approval of the Chief Wildlife Warden of the State Government.</p>	<p>This is in discussion with local divisional forest officer and will be implemented as per plan within time limit.</p>

(v).	<p>The project proponent shall comply with the environment norms for 'Fertilizer Industry' as notified by the Ministry of Environment, Forest and Climate Change, vide GSR 1607 (E), dated 29th December,2017 under the provisions of the Environment (Protection) Rules, 1986.</p>	<p>Emission and discharge norms as notified by the Ministry of Environment, Forest and Climate Change, vide GSR 1607 (E), dated 29th December,2017 under the provisions of the Environment (Protection) Rules, 1986 is strictly followed . The same is stipulated in existing consent to operate by West Bengal Pollution Control Board also . (Oct 22 –Mar 23) analysis report is provided in annexure -2.</p>
(vi).	<p>All necessary precautions shall be taken to avoid accidents and action plan shall be implemented for avoiding accidents. The Project proponent shall implement the onsite/offsite emergency plan/mock drill etc. and mitigation measures as prescribed under the rules and guidelines issued in the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, as amended time to time, and the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996.'</p>	<p>All the precautionary measures are taken to avoid accidents. Onsite emergency plan is available which is followed and updated as and when required. Mock drill on different scenario is being conducted quarterly once and report submitted to concerned authority as per Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, as amended time to time, and the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996. Latest Onsite emergency plan and mock drill report is attached in annexure -19.</p>
(vii).	<p>The volatile organic compounds (VOCs)/Fugitive emissions shall be controlled at 99.97 % with effective chillers/modern technology. Regular</p>	<p>This is not applicable for us.</p>

	monitoring of VOCs shall be carried out.	
(viii).	The project proponent shall explore possibilities for recycling and reusing of treated water in the unit to reduce the fresh water demand and waste disposal. Treated effluent shall be reused in the process/utilities. Treated Industrial effluent shall not be used for gardening/greenbelt development/horticulture.	<p>An effluent recycling unit (40 m³/Hr) has been installed and commissioned in Aug 22 . The main components of this effluent recycling plant are : HRSCC(High rate Solid Contact Clarifier) , DMF, UF and RO Membrane system. After treatment of utility effluent from sulphuric acid plant in ETP, it is sent to effluent recycling plant. The permeate water from RO system is used in DM plant /cooling tower make up and reject water is used in DAP & SSP plant. This has reduced the fresh water consumption significantly. Pictures of newly constructed effluent recycling plant is attached in annexure -3.</p> <p>It is ensured that treated effluent will not be used in gardening.</p>
(ix).	Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. For online continuous monitoring of effluent, the unit shall install web camera with night vision	<p>Continuous online analysers are installed for Particulate matter (PM) in DAP plant (Di ammonium phosphate Plant), SSP plant (single superphosphate Plant). Further NH₃, HF analysers in DAP plants and HF analyser in SSP plant are installed and connected to CPCB server as per CPCB guidelines of CEMS system of fertilizer industry.</p> <p>For online continuous monitoring of effluent,</p>

	<p>capability and flow meters in the channel/drain carrying effluent within the premises.</p>	<p>online analyser of PH , Fluoride, BOD, COD,TSS parameters are installed at final discharge pipeline. Flowmeter is also installed at final discharge pipeline.</p> <p>Pictures of Online analysers and sample display is attached in annexure -4.</p>
(x).	<p>The storage of toxic/hazardous raw material shall be bare minimum with respect to quantity and inventory. Quantity and days of storage shall be submitted to the Regional Office of Ministry and SPCB along with the compliance report.</p>	<p>Noted. Report is enclosed in annexure -5.</p>
(xi).	<p>The occupational health centre for surveillance of the worker's health shall be set up. The health data shall be used in deploying the duties of the workers. All workers & employees shall be provided with required safety kits/mask for personal protection.</p>	<p>We have occupational health centre in our plant. We carry out periodic medical check-up for all employees, which includes clinic examination of relevant pathological tests (CBC, FBS, Liver function tests, lipid profile, Pulmonary function tests etc. In Oct 22 –Mar23 , total 1042 no of employees medical check up was planned and 1040 nos completed i:e completion % is 99.8%.</p> <p>All mandatory (safety helmets , safety shoes, safety goggles, safety hand gloves) and specific personal protective equipments (nose mask , PVC apron,) are provided to all employees. Few pictures of PPE distribution is attached in annexure -6.</p>

(xii).	As committed by PP, the Industry will use Briquettes- as a first priority (Primary Fuel) and in case of unavailability, the Unit will use Indigenous/imported coal as available as alternative fuel.	Biomass Briquettes/pellets are used in both DAP plants. In case of hindrance in supply of biomass , coal is used.
(xiii).	Training shall be imparted to all employees on safety and health aspects of chemicals handling. Safety and visual reality training shall be provided to employees. Action plan for mitigation measures shall be properly implemented based on the safety and risk assessment studies.	<p>The detail information of hazardous chemical handling and storage risk and mitigation procedure is communicated to the workers concerned through different training programmes. Visual display is provided in the respective chemical handling area. We also provide the TREM card to all transporters and are sharing our expertise with transporters to train them for fighting emergency situation arising out of this hazardous chemicals during transportation. Drivers & helpers transporting hazardous chemicals, are trained by competent person as per CMV rule.</p> <p>Workers are also trained on ammonia emergency. Leaflet on ammonia emergency are also distributed among workers & other stakeholders.</p> <p>Risk assessment has been carried out and mitigation measures implemented at site.</p> <p>Pictures related to various safety training is attached in annexure- 7.</p>
(xiv).	The unit shall make the arrangement for protection of possible fire hazards	Fire-fighting system of the plant was designed based on TAC guide line . Necessary all fire

	during manufacturing process in material handling. Fire-fighting system shall be as per the norms.	protection system along with trained fireman are available for protection of possible fire hazards. Pictures related to fire fighting and training is attached in annexure- 8.
(xv).	The solvent management shall be carried out as follows: (a) Reactor shall be connected to chilled brine condenser system. (b) Reactor and solvent handling pump shall have mechanical seals to prevent leakages. (c) Solvents shall be stored in a separate space specified with all safety measures. (d) Proper earthing shall be provided in all the electrical equipment wherever solvent handling is done. (e) Entire plant shall be flame proof. The solvent storage tanks shall be provided with breather valve to prevent losses. (f) All the solvent storage tanks shall be connected with vent condensers with chilled brine circulation.	This is not applicable to us.
(xvi).	Total fresh water requirement, sourced from Haldia Development Authority, shall not exceed 3288 KLD. Prior permission in this regard shall be obtained from the concerned regulatory authority/CGWA and renewed from time to time.	This is being ensured and adhered. Permission from Haldia Development authority & SWID is available for water supply. Permission letters are attached in annexure – 9
(xvii).	The storm water from the roof top shall be channelized through pipes to	As per Ground water authority, SWID we are not allowed to recharge ground water.

	<p>the storage tank constructed for harvesting of rain water in the premises and harvested water shall be used for various industrial processes in the unit. No recharge shall be permitted within the premises. Process effluent/ any wastewater shall not be allowed to mix with storm water.</p>	<p>Currently to conserve fresh water we are having small rain water sumps in various plants to collect and use rain water in process. Apart from that we have a 2500 m³ of HDPE lined pond for storing of rain water from where we use the rain water in SSP Plant process .We have constructed additional 2000 & 2700 m³ of HDPE lined concrete pond for rain water harvesting (storage and utilization) and improvement in storm water management. To strengthen the storm water collection system, we have roof top water collection system. Rain water is used in SSP and DAP plant process.</p> <p>Pictures of rain water ponds are attached in annexure – 10.</p>
(xviii).	<p>The PP shall undertake waste minimization measures as below (a) Metering and control of quantities of active ingredients to minimize waste; (b) Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. (c) Use of automated filling to minimize spillage. (d) Use of Close Feed system into batch reactors. (e) Venting equipment through vapour recovery system. (f) Use of high pressure hoses for equipment clearing to reduce wastewater generation.</p>	<p>(a) We are always focused to minimize the waste generation and utilisation of waste in product. Flysh from burning coal/biomass is used as filler in DAP/NPK plant . Good quality sulphur is used in plant for reduction of generation of sulphur muck.</p> <p>(b) We have carried out trial run in presence of regulatory authority for use of sulphur sludge in SSP product. We have received permission from CPCB & WBPCB for utilisation of ETP Sludge in DAP/NPK manufacturing.</p> <p>(c) Automatic bagging machines are available to reduce the spillages</p> <p>(d) It is ensured that there is no spillage of leakage of raw materials entering into pressure</p>

		<p>neutralisation reactor or pipe reactor.</p> <p>(e)Vapour recovery compressor system is available in ammonia storage tank facility.</p> <p>(f)This is being ensured to use high pressure hose for cleaning purpose for reduction of waste water generation.</p>
(xix).	<p>The green belt of at least 5- 10 m width shall be developed in at least 33% of the total project area (@2500 Trees per ha), mainly along the plant periphery/additional land and additional 5000 trees shall be planted outside the plant. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department. Records of tree canopy shall be monitored through remote sensing map. The Trees have to be planted with spacing of 2m x 2m ratio and as in first year itself and subsequent years the greenbelt shall be monitored. The plant species can be selected that will give better carbon sequestration.</p>	<p>Green belt area has been developed to 27.87 acre (33% of total area) . Total number of additional 15500 no of trees has been planted to increase the green belt area. Different species of trees like Terminalia arjuna, Azadirachta indica , Alstonia scholaris, Delonix Regia , Mimusops elengi, Millettia pinnata, Syzygium cumini, Polyalthia longifolia, Ficus benghalensis has been planted in factory area. Green belt and maintenance and monitoring will be done in subsequent years.</p> <p>As per EC condition , 5000 no of trees has been planted outside factory . Haldia Municipality has allocated land for tree plantation. Completion certificate of tree plantation issued by Haldia Municipality and few pictures are attached in annexure -11.</p>
(xx).	<p>The activities and the action plan proposed by the project proponent to address the socio-economic issues</p>	<p>Agreed and noted .</p>

	in the study area shall be completed as per the schedule presented before the Committee and as described in the EIA/ EMP report in letter and spirit.	
(xxi).	A separate Environmental Management Cell (having qualified person with Environmental Science/Environmental Engineering/specialization in the project area) equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.	A separate environment department is formed with qualified team headed by COO (Chief Operating Officer) for environment management .The reporting hierarchy along with qualification details is mentioned in annexure-12. Full-fledged Lab facility along with qualified chemists are available to carry out environment monitoring.
B] General Conditions		
(i)	No further expansion or modifications in the plant, other than mentioned in the EIA Notification, 2006 and its amendments, shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change/SEIAA, as applicable. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry/SEIAA, as applicable, to assess the adequacy of conditions imposed and to add additional environmental protection	Noted and agreed.

	measures required, if any.	
(ii)	The Project proponent shall strictly comply with the rules and guidelines issued under the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, as amended time to time, the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996, and Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016 and other rules notified under various Acts.	Noted and agreed.
(iii)	The energy source for lighting purpose shall be preferably LED based, or advanced having preference in energy conservation and environment betterment.	Indorama India , Haldia unit is ISO 50,001, energy management standard certified company. Constant efforts are being put up for energy conservation. As per the condition , all conventional lights has been replaced by LED lights for energy conservation.
(iv)	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under the Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night	Noise survey in and around the plant conducted periodically to ensure the compliance. They are within permissible limits We are also measuring the ambient noise, which is conforming to the standards prescribed under Environmental Protection act, 1986. Reports are attached in annexure - 13 .Diesel generator rooms have acoustic enclosures, hoods and silencers.

	time).	
(v)	The company shall undertake all relevant measures for improving the socioeconomic conditions of the surrounding area. The activities shall be undertaken by involving local villages and administration. The company shall undertake eco developmental measures including community welfare measures in the project area for the overall improvement of the environment.	Eco development measures and community welfare measures are attached in annexure - 14.
(vi)	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.	Yearly budgets are raised and approved by management for various functions including Environment Management. Apart from budgets, environmental performance improvement related capital projects are approved every year. Details are in annexure-15.
(vii)	The project proponent shall send a copy of the clearance letter to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/	Copy of Environment Clearance letter was sent to Haldia Municipality , Haldia Development Authority .

	representations, if any, were received while processing the proposal.	
(viii)	The project proponent shall also upload/submit six monthly reports on Parivesh Portal on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data to the respective Integrated Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.	<p>Environmental clearance was issued on 17.06.2022 by MOEF&CC. Half-yearly compliance report (April – Sept 22) has been submitted through letter No IIP/ HAL/ENV/22-23/MOEF-ERO-02 dated 24.12. 2022 (Hard copy and soft Copy) to MOEF&CC Integrated regional office and zonal office of CPCB and SPCB. Report is also uploaded in company website. Environmental clearance is attached in annexure – 16.</p> <p>Company website: https://ircagro.com/compliance-report/</p>
(ix)	The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Integrated Regional Office of MoEF&CC by e-mail.	<p>Environmental statement (2021-22) has been submitted to West Bengal Pollution Control Board on 01.08.2022 and the same has been uploaded in our company website also. Half yearly EC compliance is also uploaded in company website. Environmental statement 21-22 is attached in annexure -17.</p> <p>Company website: https://ircagro.com/compliance-report/</p>

(x)	<p>The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry and at https://parivesh.nic.in/. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.</p>	<p>Environmental Clearance copy was sent to WBPCB and is available in company website .</p> <p>A public notice has been given to all through publishing the news for accord of Environmental clearances. Advertisement was published in local newspaper Anandabazar Patrika and The Telegraph on 23rd June 22. Copy of the same is attached in annexure – 18.</p>
(xi)	<p>The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.</p>	<p>Agreed and noted.</p>
(xii)	<p>This Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, if any, as may be applicable to this project.</p>	<p>Agreed and Noted.</p>

Annexure -1

Implementation report for reduction of carbon foot print/ increase in carbon sequestration (Oct'22 –Mar'23)

The following measures and actions provided below has been implemented in the period of Oct 22 - Mar 23.

1. Carbon foot print reduction form sulphuric acid waste heat

From sulphuric acid plant waste heat recovery system , Total power generation is : 11376.249 MWh

As per IPCC Grid emission factor (EF) for India 0.7229 tCO₂ e/Mwh (IEA 2019) So, equivalent carbon footprint reduced compared to use of grid power : **8223.89 tCO₂e**

2. Carbon foot print reduction from use of biomass in DAP1& DAP2 plant

Use of biomass briquettes, a carbon neutral fuel in complex fertilizer plants in place of Coal, a fossil fuel has reduced net greenhouse gas emission. Total quantity of biomass used during this period : 1787.04 MT

This has reduced carbon footprint : **2049 tco₂e** . (Considered : Emission factor for burning biomass considered 100 tco₂e/TJ , Calorific value of biomass 11464 KJ/Kg). Emission from burning of biomass is considered as biogenic emission.

3. Carbon foot print reduction by installation of Solar power:

It has been proposed to install 750 kWp solar panel in a phase wise manner within 4 years. 1st year – Feasibility study and proposal for installation of solar panel, 2nd Year – 250 kWp, 3rd Year -250 kWp, 4th year- 250 kWp. Total solar power generation: (750x 3.5x 365) kWh = 958125 KWH. This amount of power will not be required from grid Equivalent carbon footprint reduction: **689.85 tCO₂e**

Status as on 31st Mar , 23 : 500 kWp roof top solar has been installed and commissioned in Feb 23 . Up to Mar'23 Solar power generation is 49484 Kwh. This has reduced carbon footprint **35.72 tCO₂e**.

Over 25 yrs 500 KWP roof top solar will reduce carbon emission 14145 Ton , which is equivalent to 22632 teak trees over the life time. (Source :- National portal for roof top solar) (Docs attached in Annexure-1)

3. Existing and proposed Plantation/green belt development:

1. Plantation of additional 15040 no of trees inside plant and 5000 no. of trees outside plant will sequestrate **1207.7631 tCO₂e**. Existing plantation of 11711 no. of trees inside the plant sequestrates approx. **435.934 tCO₂e**. Detailed calculations of carbon sequestration by existing plantation (11711 no. of trees) and additional trees (15040 within the plant and 5000 no. of trees outside plant boundary limit) have been provided below in **Table 1, 2 & 3**:

Table 1: Calculation of Carbon Sequestration by Existing Old Trees Inside Plant

Species	Green Weight of Tree above ground level	Green weight (including root)	Dry Weight of tree	Weight of carbon in the tree	Weight of CO2	Weight of CO2 Sequestered in tree per year	No of tree Planted in Existing Plant	lbs/year	Ton/Year
<i>Lagerstroemia</i>	676	811.2	588.12	294.06	1078.11218	107.8112178	286	30834.01	13.76523
<i>Ficas bengalensis</i>	1134	1360.8	986.58	493.29	1808.54913	180.8549127	18	3255.388	1.453303
<i>Acacia sp.</i>	441	529.2	383.67	191.835	703.324661	70.33246605	175	12308.18	5.494741
<i>Swietenia mahagoni</i>	735	882	639.45	319.725	1172.20777	117.2207768	90	10549.87	4.709778
<i>Spathodea</i>	676	811.2	588.12	294.06	1078.11218	107.8112178	12	1293.735	0.577562
<i>Casuarina equisetifolia</i>	612	734.4	532.44	266.22	976.042386	97.6042386	65	6344.276	2.832275
<i>Butea monosperma</i>	787.5	945	685.125	342.5625	1255.93689	125.5936894	9	1130.343	0.504619
<i>Alstonia scholaris</i>	960	1152	835.2	417.6	1531.04688	153.104688	425	65069.49	29.04897
<i>Terminalia catappa</i>	504	604.8	438.48	219.24	803.799612	80.3799612	34	2732.919	1.220057
<i>Delonix regia</i>	784	940.8	682.08	341.04	1250.35495	125.0354952	65	8127.307	3.628274
<i>Peltophorum sp</i>	956.25	1147.5	831.9375	415.96875	1525.06623	152.5066228	160	24401.06	10.89337
<i>Tectona grandis</i>	676	811.2	588.12	294.06	1078.11218	107.8112178	8	862.4897	0.385041
<i>Cocos nucifera</i>	882	1058.4	767.34	383.67	1406.64932	140.6649321	58	8158.566	3.642229
<i>Mangifera indica</i>	784	940.8	682.08	341.04	1250.35495	125.0354952	42	5251.491	2.344423
<i>Eucalyptus</i>	718.25	861.9	624.8775	312.43875	1145.49419	114.5494189	72	8247.558	3.681957
<i>Mimusops elengi</i>	504	604.8	438.48	219.24	803.799612	80.3799612	125	10047.5	4.485503
<i>Azadirachta indica</i>	784	940.8	682.08	341.04	1250.35495	125.0354952	225	28132.99	12.55941
<i>Murraya</i>	14.4	17.28	12.528	6.264	22.9657032	2.29657032	1500	3444.855	1.537887
<i>Tabernaemontana</i>	9.45	11.34	8.2215	4.11075	15.0712427	1.507124273	2200	3315.673	1.480216
<i>Ficus Panda</i>	9.6	11.52	8.352	4.176	15.3104688	1.53104688	1400	2143.466	0.956907

Species	Green Weight of Tree above ground level	Green weight (including root)	Dry Weight of tree	Weight of carbon in the tree	Weight of CO2	Weight of CO2 Sequestered in tree per year	No of tree Planted in Existing Plant	lbs/year	Ton/Year
<i>Ficus benjamina</i>	6.75T	8.1	5.8725	2.93625	10.7651734	1.076517338	370	398.3114	0.177818
<i>Mussaenda erythrophylla</i>	14.4	17.28	12.528	6.264	22.9657032	2.29657032	25	57.41426	0.025631
<i>Calliandra haematocephala</i>	6.75	8.1	5.8725	2.93625	10.7651734	1.076517338	38	40.90766	0.018262
<i>Ficus benjamina</i>	1445	1734	1257.15	628.575	2304.54452	230.4544523	1225	282306.7	126.0302
<i>Ficas bengalensis</i>	1300.5	1560.6	1131.435	565.7175	2074.09007	207.409007	225	46667.03	20.83356
<i>Ficus elastic</i>	1408	1689.6	1224.96	612.48	2245.53542	224.5535424	18	4041.964	1.804454
<i>Cassia fistula</i>	576	691.2	501.12	250.56	918.628128	91.8628128	22	2020.982	0.902227
<i>Acacia sp.</i>	504	604.8	438.48	219.24	803.799612	80.3799612	170	13664.59	6.100284
<i>Peltophorum pterocarpum</i>	633.75	760.5	551.3625	275.68125	1010.73017	101.0730167	75	7580.476	3.384152
<i>Cascabela thevetia</i>	504	604.8	438.48	219.24	803.799612	80.3799612	120	9645.595	4.306083
<i>Foxtail plum</i>	195	234	169.65	84.825	310.993898	31.09938975	18	559.789	0.249907
<i>Ficas bengalensis</i>	1237.5	1485	1076.625	538.3125	1973.61512	197.3615119	1325	261504	116.7432
<i>Acacia</i>	504	604.8	438.48	219.24	803.799612	80.3799612	190	15272.19	6.817965
<i>Ficus Panda</i>	735	882	639.45	319.725	1172.20777	117.2207768	325	38096.75	17.00753
<i>Mimusops elengi</i>	504	604.8	438.48	219.24	803.799612	80.3799612	125	10047.5	4.485503
<i>Azadirachta indica</i>	833	999.6	724.71	362.355	1328.50214	132.8502137	175	23248.79	10.37896
<i>Swietenia mahagoni</i>	576	691.2	501.12	250.56	918.628128	91.8628128	115	10564.22	4.716186
<i>Alstonia scholaris</i>	504	604.8	438.48	219.24	803.799612	80.3799612	151	12137.37	5.418488
<i>Casuarina equisetifolia</i>	718.25	861.9	624.8775	312.43875	1145.49419	114.5494189	25	2863.735	1.278457
<i>Cycas circinalis</i>	150	180	130.5	65.25	239.226075	23.9226075	5	119.613	0.053399
TOTAL							11711		435.934 TPA

Considering a 10-year-old Greenbelt of 15040 trees and assuming the dia and tree height at the age of 10 year as per the standards, the total Carbon sequestered per year by the newly developed greenbelt at its initial age will be 764.8 tons per year.

Table 2: Calculation of Carbon Sequestration by Additional Trees inside Plant

Species	Green Weight of Tree above ground level	Green weight (including root)	Dry Weight of tree	Weight of carbon in the tree	Weight of CO2	Weight of CO2 Sequestered in tree per year	No of tree newly planted	CO2 Sequestered (lbs/year)	CO2 Sequestered Ton/Year
<i>Azadirachta indica</i>	900	1080	783	391.5	1435.356	143.535645	926	132914	59.3368
<i>Bauhinia racemosa</i>	896	1075.2	779.52	389.76	1428.977	142.8977088	1150	164332.4	73.3629
<i>Bougainvillea spectabilis</i>	14.4	17.28	12.528	6.264	22.9657	2.29657032	450	1033.457	0.461366
<i>Emblica officinalis</i>	735	882	639.45	319.725	1172.208	117.2207768	1050	123081.8	54.94741
<i>Muraya paniculata</i>	5.4	6.48	4.698	2.349	8.612139	0.86121387	650	559.789	0.249907
<i>Nerium indicum</i>	8.085	9.702	7.03395	3.516975	12.89429	1.289428544	700	902.6	0.402948
<i>Thevetia peruviana</i>	7.35	8.82	6.3945	3.19725	11.72208	1.172207768	794	930.733	0.415507
<i>Syzygium cumini</i>	882	1058.4	767.34	383.67	1406.649	140.6649321	1120	157544.7	70.33269
<i>Tamarindus indica</i>	1300.5	1560.6	1131.435	565.7175	2074.09	207.409007	1050	217779.5	97.22328
<i>Dalbergia sisoo</i>	784	940.8	682.08	341.04	1250.355	125.0354952	1200	150042.6	66.98352
<i>Albizia Lebback</i>	956.25	1147.5	831.9375	415.96875	1525.066	152.5066228	1250	190633.3	85.10441
<i>Melia azidarch</i>	676	811.2	588.12	294.06	1078.112	107.8112178	1100	118592.3	52.94318
<i>Delonix regia</i>	882	1058.4	767.34	383.67	1406.649	140.6649321	1150	161764.7	72.2166
<i>Pongamia pinnata</i>	784	940.8	682.08	341.04	1250.355	125.0354952	1200	150042.6	66.98352
<i>Casia fistuala</i>	718.25	861.9	624.8775	312.43875	1145.494	114.5494189	1250	143186.8	63.92287
TOTAL							15040	1713341	764.8869 TPA

Considering a 10-year-old additional plantation of 5000 trees and assuming the dia and tree heigh at the age of 10 year as per the standards, the total Carbon sequestered per year by the proposed additional plantation at its initial age will be 442.8 tons per year.

Table 3: Calculation of Carbon Sequestration by Additional Trees Outside Plant

Species	Green Weight of Tree above ground level	Green weight (including root)	Dry Weight of tree	Weight of carbon in the tree	Weight of CO2	Weight of CO2 Sequestered in tree per year	Additional plantation outside Plant premises (newly planted)	CO2 Sequestered (lbs/year)	CO2 Sequestered Ton/Year
<i>Ficus bengalensis</i>	1782	2138.4	1550.34	775.17	2842.00577	284.2005771	450	127890.3	57.09405
<i>Swietenia mahagoni</i>	735	882	639.45	319.725	1172.20777	117.2207768	560	65643.63	29.30529
<i>Butea monosperma</i>	900	1080	783	391.5	1435.35645	143.535645	600	86121.39	38.44717
<i>Terminalia catappa</i>	1280	1536	1113.6	556.8	2041.39584	204.139584	540	110235.4	49.21238
<i>Delonix regia</i>	1012.5	1215	880.875	440.4375	1614.77601	161.4776006	610	98501.34	43.97395
<i>Tectona grandis</i>	1280	1536	1113.6	556.8	2041.39584	204.139584	340	69407.46	30.98557
<i>Mangifera indica</i>	1152	1382.4	1002.24	501.12	1837.25626	183.7256256	400	73490.25	32.80825
<i>Ficus benamina</i>	1445	1734	1257.15	628.575	2304.54452	230.4544523	500	115227.2	51.44089
<i>Ficas relegiosa</i>	1782	2138.4	1550.34	775.17	2842.00577	284.2005771	450	127890.3	57.09405
<i>Ficus elastica</i>	1408	1689.6	1224.96	612.48	2245.53542	224.5535424	480	107785.7	48.11877
<i>Cassia fistula</i>	882	1058.4	767.34	383.67	1406.64932	140.6649321	70	9846.545	4.395793
TOTAL							5000		442.8762 MTPA

Current Status:

In factory 15040 no of trees has been planted to achieve 33% green area . Similarly 5000 no of tree plantation has been completed in Haldia region in Municipal Land. Supporting details regarding plantation is annexed herewith the Half-yearly Compliance report.

During calculation above trees were proposed. In actual , species of the trees may differ.

Annexure-1

➤ Installation of Solar Power :

Solar panel of 500 kWp installed to increase the use of renewable energy as a part of Eco Sustainability measures.



➤ Carbon di oxide emissions mitigated calculation for Rooftop solar:

The screenshot shows the 'Solar Rooftop Calculator' interface. The user has selected 'WEST BENGAL' and an average solar irradiation of 8. The calculator provides the following details:

- Average solar irradiation in WEST BENGAL state:** 1156.39 W / sq.m
- 1kWp solar rooftop plant will generate on an average over the year:** 4.6 kWh of electricity per day (considering 5.5 sunshine hours)
- 1. Size of Power Plant:** Feasible Plant size as per your Capacity: 500kW
- 2. Cost of the Plant:**
 - MNRE current Benchmark Cost (without GST): Rs. 35886 Rs. / kW
 - Without subsidy (Based on current MNRE benchmark without GST): Rs. 17943000
 - With subsidy 0 (Based on current MNRE benchmark without GST): Rs. 17943000
- 3. Total Electricity Generation from Solar Plant:**
 - Annual: 690000kWh
 - Life-Time (25 years): 17250000kWh
- 4) Financial Savings:**
 - a) Tariff @ Rs.8/ kWh (for top slab of traffic) - No increase assumed over 25 years:**
 - Monthly: Rs. 460000
 - Annually: Rs. 5520000
 - Life-Time (25 years): Rs. 138000000

Carbon dioxide emissions mitigated is 14145 tonnes.
This installation will be equivalent to planting 22632 Teak trees over the life time. (Data from IISc)

➤ Online Energy monitoring system:

The screenshot displays the 'Ecostruxure Power Monitoring Expert' dashboard for 'Indorama India Pvt. Limited, Haldia'. The dashboard includes a navigation menu on the left and a main area with a plant overview and a detailed equipment list.

Plant Overview Summary:

- TOTAL PLANT LOAD: 5,784.7
- EQUIPMENT LOAD: 5,598.9

Equipment List:

Type	Equipment/Dept	Unit Power (KW)
Distribution	SAP-1	1,068.1
	SAP-2	432.0
	STG AUXILIARY	319.8
	DAP-1	1,271.2
	DAP-2	1,910.4
	SSP	196.0
GRID Source	UTILITY	343.0
	CPP TRFO	58.5
DG Source	33KV GRID-1	354.0
	33KV GRID-2	1,312.0
	DG-1	0.0
Others	DG-2	0.0
	DG-3	0.0
	ATO	0.0
	ETP	0.0
STG Source	ZLD	32.9
	NSTG	4,098.7
	OSTG	0.0
	SOLAR Source	SOLAR-1
SOLAR-2		
SOLAR-3		
SOLAR-4		

Energy Management System – Developed By Schneider Electric

Annexure-2

Stack Monitoring Results

Month	DAP -1			DAP -2		
	PM (mg/NM3)	Fluoride as HF(mg/NM3)*	NH3 (mg/NM3))	PM (mg/NM3)	Fluoride as HF(mg/NM3)*	NH3 (mg/NM3))
Limit as per CTO(Jan 2019- Dec 2023)	150	10	300	150	10	300
October	87	0.72	88	92	0.64	72
November	86.7	0.97	262.5	85	0.67	82
December	72	0.83	59.9	94	0.66	87.9
January	51.3	1.1	273.5	56.9	1.05	264.8
February	20	2.84	44	34	2.02	68.4
March	83	0.86	75	76	1.1	125

Month	SSP (Main scrubber)		SSP (Ball Mill)
	PM (mg/NM3)	Fluoride as HF(mg/NM3)*	SPM (mg/NM3)
Limit as per CTO(Jan2019-Dec 2023)	125	20	125
October	68	1.02	53
November	26.7	1.17	40
December	59	0.95	53
January	70.1	1.95	-
February	40	0.46	56
March	72	1.73	47

Month	SAP - 1		SAP - 2	
	SO2 (mg/NM3)	Acid Mist (mg/NM3)	SO2 (mg/NM3)	Acid Mist (mg/NM3)
Limit as per CTO(Jan2019- Dec 2023)	1250	70	1250	70
October	174	48	86	13
November	176	45	232.5	31
December	176	45	145	19.6
January	271.8	34.7	-	-
February	140	45	136	24
March	162	46	-	-

Note:- *This is also measured in online analyser installed in stack and connected to CPCB server

NA indicates plant was not available for stack monitoring for shutdown or any other reason.

ETP discharge results:-

Month	ETP Water Outlet Form Final Outlet Drain									
	pH (mg/l)	BOD (mg/l)	COD (mg/l)	(TSS) (mg/l)	Fluoride (F) (mg/l)	Phosphate (as P) (mg/l)	Oil & Grease (mg/l)	Ammoniacal nitrogen as N (mg/l)	Kjeldahl Nitrogen as N (mg/l)	Free ammonia nitrogen as N (mg/l)
Limit as per CTO(Jan2019-Dec 2023)	6.5-8.5	30	250	100	10	5	10	50	75	4
October	7.85	<2.0	8	6.7	<0.1	<0.05	<5.0	0.30	0.38	0.16
November	7.68	<2.0	8	<2.5	0.54	<0.05	<5.0	3.1	6.4	2.0
December	7.65	<2.0	8	14	0.65	0.21	<5.0	<0.1	<0.3	<0.1
January	7.80	<2.0	<4.0	5.1	0.52	0.33	<5.0	<0.1	<0.3	<0.1
February	7.52	<2.0	8	<2.5	0.52	0.22	<5.0	<0.1	<0.3	<0.1
March	7.46	9.6	37	12	0.51	0.07	<5.0	<0.1	<0.3	<0.1

Annexure - 3
Effluent Recycle Plant:



Annexure - 4 Online Analysers & Sample Display:



Annexure - 5 Raw Materials Consumption:

SI. No.	Raw Materials	Consumption (MT)						Total	Factory Stock On 31.03.23 (MT)	No. of days running with stock
		Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23			
1	Phosphoric Acid	11990.6	15713.2	16080.4	20915.3	21133.0	6155.4	91987.8	3803	9
2	Ammonia	7375.6	8172.9	7941.3	9879.2	10071.5	2909.6	46350.1	2064	6
3	Sulphuric Acid	10445.9	8825.7	7509.5	8408.4	7946.4	1593.5	44729.2	2133	10
4	Rock Phosphate	7030	7664	8726	10742	9173	1688	45023	13136	36
5	Sulphur	7019.00	6866.00	7488.00	6791.00	6847.00	3447.00	38458.00	13781	55

Annexure – 6 Distribution of PPE kits & Medical Check up



Annexure – 7 Various Safety Training



Safety training on Height work, Hot work & confined space entry



Training on Safe work permit system



Road Safety Training



Road Safety training

Annexure – 08 Fire Fighting Equipment & Fire Training



External Firefighting & Emergency rescue training



Annexure – 09
Copy of SWID water permission letter

FORM 4
[See Rules 9(3) and 10(5)]

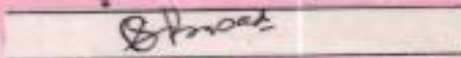
(EMBLEM OR HOLOGRAM OF THE CONCERNED AUTHORITY)

096076

PERMIT FOR SINKING OF NEW WELL
[U/S 7(3)(b) / 7(4)(b) / 7(5)(a) of the West Bengal Ground Water Resources (Management, Control and Regulation) Act 2005.]

PERMIT NO. P1152139002560000001TE

GM - PRODUCTION

1. (a) Name of the applicant (user) : Shri/Smt. **IRC AGROCHEMICALS PT. LTD**
 (b) Son / Daughter of : **DURGACHAK, HALDIA**
 (c) Address of the applicant : **NANDA KISHORECHAK, P.S. HALDIA**
 (d) Category of farmer (Please tick) : **Small Farmer / Marginal Farmer / Others ✓**
 (in case of irrigation well)
 (e) Serial No. of application Form : **07 of BF/A 0228 of 22.06.18**
 and date of submission
 (f) Specimen signature of the user : 

2. Location particulars—
 (a) District : **PURBA MEDINIPUR**
 (b) Block, Mouza, J. L. No., Plot No. : **HALDIA, NANDA KISHORECHAK, 139, 256**
 (c) Municipality / Corporation :
 Ward No. / Borough No., Holding No.

3. Particulars of the proposed well and pumping device—
 (a) Type of the well : **T.W**
 (b) Approx. depth of the well (m) : **270m**
 (c) Purpose of the well : **INDUSTRIAL**
 (d) Assembly size (for tube well) : **200mm X 200mm**
 (e) Approx. strainer length (for tube well) : **80m**
 (f) Diameter (for dug well) : **m.**
 (g) Type of pump to be used : **SUBMERSIBLE**
 (h) H. P. of the pump : **20HP**
 (i) Operational device : **ELECTRIC MOTOR**
 (j) Rate of withdrawal (m³/hr.) : **48 m³/hr**
 (k) Maximum allowable running hours per day : **18 hours (16th March to 15th July)**

This permit authorizes the owner applicant (user) to sink a well in the location specified at S1. (2) for extraction of ground water at a rate not exceeding that as shown at S1. (3) (j) and for running hours / day as shown at S1. (3) (K), and is valid subject to the observance of the conditions stated overleaf.

Place : **TAMLUK**
 Date : **13.08.18.**

Govt. of West Bengal
Office of the Geologist
Geological Sub-Div. No.-113
Tamluk, Purba Medinipur

Sai Lakshmi
Geologist
and Designation

Member Secretary D.L.A.
Purba Medinipur

Conditions :
 (1) In case of any change of ownership of the proposed well, fresh registration has to be obtained.
 (2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at S1. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this permit.
 (3) In case, any of the particulars / information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
 (4) Any other condition imposed by the concerned Authority.

Govt. of West Bengal
Office of the Geologist
Geological Sub-Div. No.-113
Tamluk, Purba Medinipur

B.C.L/4/50,000/06

Additional Conditionality for Industries/Infrastructures including Package Drinking Water Projects:**1. Roof Top Rain Water Harvesting for Surface Storage :-**

- A. A Provision for Roof/Top rain Water Harvesting is a must that should be kept within the industrial campus area.
 - B. At least 20% or more of the roof top areas of the industrial building are required to be brought under RWH programme.
 - C. Rain water is required to be collected in a surface storage reservoir (concrete) through a number of pipelines from roofs.
 - D. The roof top rain water so collected should be utilized in-
 - i) Washing and cleaning purpose within the entire campus area.
 - ii) Plantations and gardening.
 - iii) Flashing in the toilets.
 - iv) To fulfill any other industrial needs.
 - E. i) Artificial Recharging Techniques into groundwater through any kind of recharge shafts/ filter points should not be allowed strictly by any user.
ii) Drinking water provisions through RWH structures should not be made.
2. Excavation of Storage reservoir or Pond of size 150 ft × 50 ft with 2 m. depth in average.
 3. Chemical Quality Test Report from Govt./Semi-Govt. approved Laboratory in each year to be submitted to the Geologist & Member Secretary, D.L.A., Purba Medinipur.
 4. The Permit Certificate will be reviewed in every year from the date of issuance of Permit- based on local hydrogeological conditions that may prevail afterwards.
 5. Arrangement of Water Meter conforming to ISO standards should be installed at the outlet point of Tube Well discharge for monitoring daily water consumption on cumulative basis. The user should maintain a logbook for daily water withdrawal which is to be monitored by Govt. Officials at a regular interval to ascertain the quantity of water utilize. A signed copy of the same should be submitted to the Geologist & Member Secretary, D.L.A., Purba Medinipur at a regular interval (Quarterly or Half yearly).
 6. The enhanced rate if any in future (including the rates revised retrospectively) of fees/charges/taxes for drawls of ground water on annual basis, should be borne by the applicants for operating their tube wells in a continuous manner.
 7. Any change in the tubewell parameters as approved in the Permit certificate should immediately be informed to the Geologist, SWID & Member Secretary, DLA, Purba Medinipur. The applicants are strictly instructed to take prior permission from the D.L.A. before making any change in the approved tubewell parameters.
 8. A compliance report after fulfilling the above conditions to be sent to the Geologist, SWID & Member Secretary, DLA, Purba Medinipur in every year.
 9. The applicant should follow all other Conditions if imposed in future.

Sai Lal Saha,
13.08.18.
Geologist & Member Secretary
DLA, Taminik, Purba Medinipur

FORM 4

[See Rules 9(3) and 10(5)]

(EMBLEM OR HOLOGRAM OF THE CONCERNED AUTHORITY)



016077

PERMIT FOR SINKING OF NEW WELL

[U/S 7(3)(b) / 7(4)(b) / 7(5)(a) of the West Bengal Ground Water Resources (Management, Control and Regulation) Act 2005.]

PERMIT NO. **P115218900047-0000002TLE**

1. (a) Name of the applicant (user) : Shri/Smt. **IRE AGROCHEMICALS PVT LTD**
 (b) Son / Daughter of : **DURGACHAK, HALDIA**
 (c) Address of the applicant : **NANDAKISHORECHAK, PS-HALDIA**
 (d) Category of farmer (Please tick) : Small Farmer / Marginal Farmer / Others ✓
 (in case of irrigation well)
 (e) Serial No. of application Form : **08 of B/P/A 0228 of 2206.18**
 and date of submission
 (f) Specimen signature of the user :

2. Location particulars—
 (a) District : **PURBA MEDINIPUR**
 (b) Block, Mouza, J.L. No., Plot No. : **HALDIA, NANDAKISHORECHAK, 139, 47**
 (c) Municipality / Corporation :
 Ward No. / Borough No., Holding No. :

3. Particulars of the proposed well and pumping device—
 (a) Type of the well : **T.W**
 (b) Approx. depth of the well (m) : **270m**
 (c) Purpose of the well : **INDUSTRIAL**
 (d) Assembly size (for tube well) : **200mm X 200mm**
 (e) Approx. strainer length (for tube well) : **30m**
 (f) Diameter (for dug well) : **m.**
 (g) Type of pump to be used : **SUBMERSIBLE**
 (h) H. P. of the pump : **20HP**
 (i) Operational device : **ELECTRIC MOTOR**
 (j) Rate of withdrawal (m³ / hr.) : **48 m³/hr**
 (k) Maximum allowable running hours per day : **18 hours (16th March to 15th July)**

This permit authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3) (j) and for running hours / day as shown at Sl. (3) (K), and is valid subject to the observance of the conditions stated overleaf.

Place : **TAMLUK**

Date : **13.05.18**

Govt. of West Bengal
 Office of the Geologist
 Geological Sub-Div. No.-1/D
 Tamiuk, Purba Medinipur

Saibal Saha
 Signature of the Issuing Authority
 and Designation
 Member Secretary D.L.A.
 Purba Medinipur

Conditions:

- (1) In case of any change of ownership of the proposed well, fresh registration has to be obtained.
- (2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this permit.
- (3) In case, any of the particulars / information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
- (4) Any other condition imposed by the concerned Authority.

Govt. of West Bengal
 Office of the Geologist
 Geological Sub-Div. No.-1/D
 Tamiuk, Purba Medinipur

Additional Conditionality for Industries/Infrastructures including Package Drinking Water Projects:**1. Roof Top Rain Water Harvesting for Surface Storage :-**

- A. A Provision for Roof Top rain Water Harvesting is a must that should be kept within the industrial campus area.
- B. At least 20% or more of the roof top areas of the industrial building are required to be brought under RWH programme.
- C. Rain water is required to be collected in a surface storage reservoir (concrete) through a number of pipelines from roofs.
- D. The roof top rain water so collected should be utilized in-
 - i) Washing and cleaning purpose within the entire campus area.
 - ii) Plantations and gardening.
 - iii) Flushing in the toilets.
 - iv) To fulfill any other industrial needs.
- E. I) Artificial Recharging Techniques into groundwater through any kind of recharge shafts/ filter points should not be allowed strictly by any user.
ii) Drinking water provisions through RWH structures should not be made.

2. Excavation of Storage reservoir or Pond of size 150 ft × 50 ft with 2 m. depth in average.

3. Chemical Quality Test Report from Govt./Semi-Govt. approved Laboratory in each year to be submitted to the Geologist & Member Secretary, D.L.A., Purba Medinipur.

4. The Permit Certificate will be reviewed in every year from the date of issuance of Permit- based on local hydrogeological conditions that may prevail afterwards.

5. Arrangement of Water Meter conforming to ISO standards should be installed at the outlet point of Tube Well discharge for monitoring daily water consumption on cumulative basis. The user should maintain a logbook for daily water withdrawal which is to be monitored by Govt. Officials at a regular interval to ascertain the quantity of water utilize. A signed copy of the same should be submitted to the Geologist & Member Secretary, D.L.A., Purba Medinipur at a regular interval (Quarterly or Half yearly).

6. The enhanced rate if any in future (including the rates revised retrospectively) of fees/charges/taxes for drawls of ground water on annual basis, should be borne by the applicants for operating their tube wells in a continuous manner.

7. Any change in the tubewell parameters as approved in the Permit certificate should immediately be informed to the Geologist, SWID & Member Secretary, DLA, Purba Medinipur. The applicants are strictly instructed to take prior permission from the D.L.A. before making any change in the approved tubewell parameters.

8. A compliance report after fulfilling the above conditions to be sent to the Geologist, SWID & Member Secretary, DLA, Purba Medinipur, in every year.

9. The applicant should follow all other Conditions if imposed in future.

Sai Lal Siba
13.08.18
Geologist & Member Secretary
DLA, Tamluk, Purba Medinipur

Annexure – 10 Guard Ponds



Annexure - 11

Tree Plantation (5000 nos.) at outside of the plant with associate with ‘Haldia Municipality’:





Office of the Haldia Municipality

Dr. B.R. Ambedkar Bhawan, Administrative Building, City Centre
P.O.-Debbug, Haldia, Purba Medinipur, West Bengal

☎: 03224-252996 / 252967
255051/252644

Fax : 03224-757154

E-mail : haldiamunicipality@gmail.com

Memo No. : 5073/HM/22

Date : 17.10.22

To,

M/S Indorama India Pvt Ltd

Sub: Completion Certificate for plantation of 5000 no of trees in Haldia region.

Reference: Your Letter no IIP/L/HAL/ENV/22-23/HM-03 dated 12th Oct , 2022

Sir,

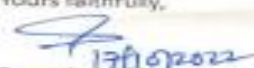
This is in reference to your letter with the above-mentioned subject matter, it is to certify that total 5000 no of trees have been planted in Haldia region by your organisation. Our team visited on 13th Oct 22 and found different species of trees like Arjun, Neem, Chatim, Krishnachura , Bakul, Karanch , Jamun, Debdaru in 4 locations namely Subhrana Jayanti Bhawan, Satahata, Kadamtala to NH41 avenue & Haldia Govt sponsored school and Balar more Children park. We have also observed that proper fencing has been provided to protect these trees.

Municipality will assist you in supplying water to take utmost care of the newly planted trees so that these trees grows properly.

We appreciate this and hope you will undertake this kind of activities in future also.

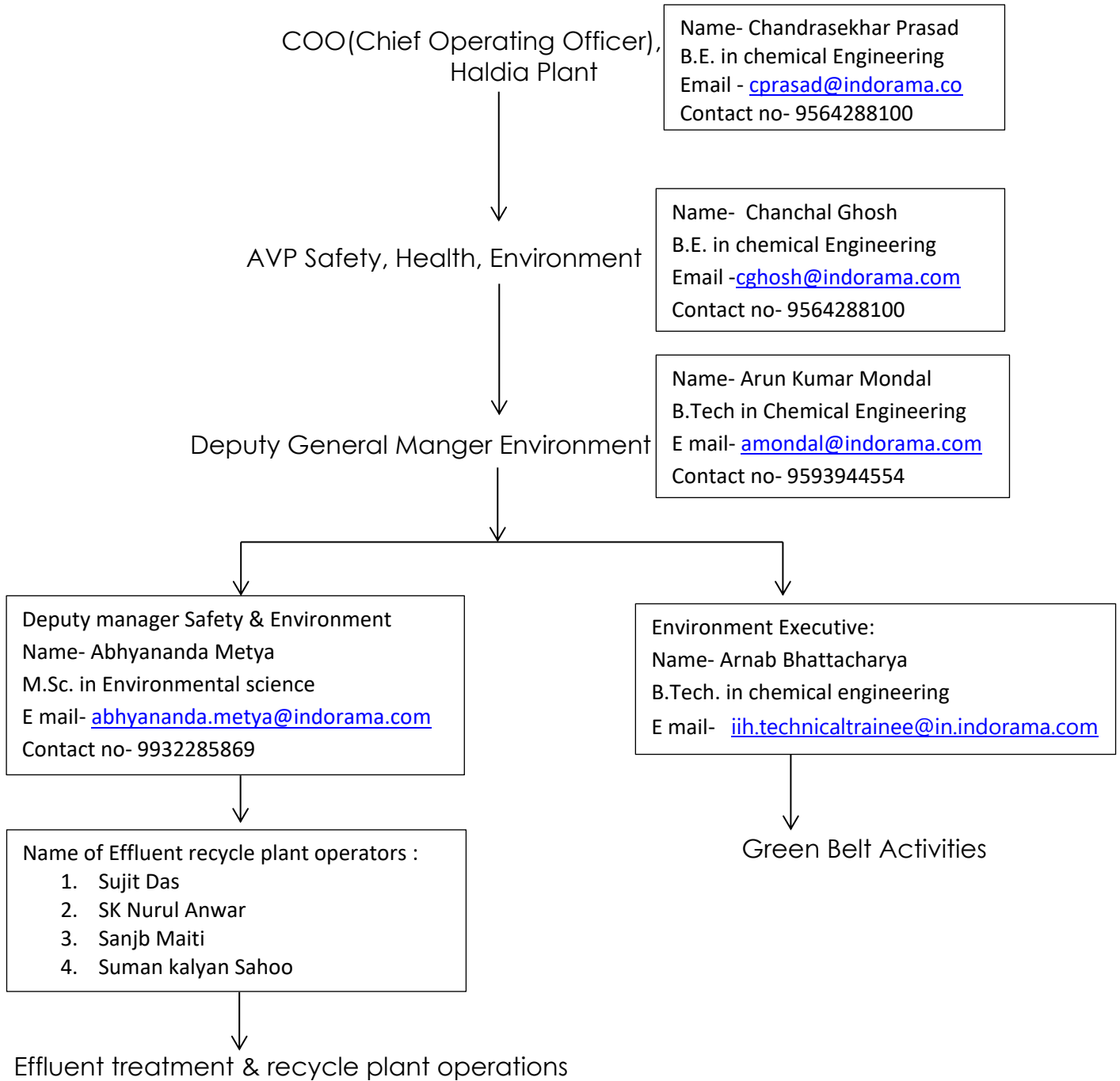
Thank you.

Yours faithfully,


Executive Officer
Haldia Municipality.



Annexure - 12
Environment Management Cell structure
With contact details



Annexure- 13

Ambient Noise Monitoring results

Location	Back Side Of DG room	Near Parking Gate	Near Main Gate	Near DAP Gate
Monitoring Date (26.12.2022- 28.12.2022)				
Results in Leq dB(A) Day Time	54.7	57.2	51.5	63.3
Results in Leq dB(A) Night Time	51.5	55.5	51	60.3
Location	Back Side Of DG room	Near Parking Gate	Near Main Gate	Near DAP Gate
Monitoring Date (11.03.2023 – 14.03.2023)				
Results in Leq dB(A) Day Time	59.3	53.7	55.1	52.6
Results in Leq dB(A) Night Time	57	50.3	51.4	48.5

Annexure- 14

Eco sustainability measures (Oct'22 –Mar'23)

CSR Report (October'22 – March'23)

We believe in creating synergy between business and the society at large by working closely with the local communities for the purpose of improving the quality of life of the communities we serve through long term stakeholder value creation. We believe in positively impacting the environment and supporting the communities we operate in, focusing on sustainability of our programs and empowerment of our communities.

➤ Livelihood

- **Beautician training**

Empowering women from underprivileged community and create opportunity for employment through beautician training. 60 underprivileged women from marginalized communities of South Kolkata have completed beautician training with the collaboration of Hope Kolkata Foundation.



After completion of the training each trainee have receive the certificate and start-up kit.



- **Tailoring training**

Empowering women from underprivileged community and create opportunity for employment through tailoring training. 20 underprivileged women from marginalized communities of South Kolkata and 50 women from Haldia and Baruipur have completed tailoring training with the collaboration of Hope Kolkata Foundation and Abhyudaya Haldia. After completion of the training each trainee have receive the certificate



and start-up kit.

- **Poultry farm management training**

100 women from economically backward community of the East Medinipur get the training on poultry farm management. After the training, they would be assisted with construction of the poultry farm and supported with chicks, poultry feed and medicines. The main objective of this project is to upgrade the skill on poultry management of the underserved women from the rural marginalized community.



➤ Health

- Overall health camp

To provide free medical benefits to the people from the underprivileged community the health camps have been organised at the local community. There are eight general health camp have been organised by Deulpota Seva Samitii at the villages in Sutahata block, Mahisadal Block. The health check-up have done for 2227 people from the marginalised community. The specialist doctors from the Indian Cancer Society, Kolkata were present at the camp for the health check-up at the community.



- Eye Screening camps

2809 socially and economically backward people in Sutahata block and Mahishadal block and Haldia Municipality of Purba Medinipur district were screened in 7 free eye screening camps organised in collaboration with Medical Research Foundation(Sankar-Nethralaya). Among the beneficiaries 1826 received free spectacle.



- **Water and Sanitation project at Govt. Schools**

We have provided safe sanitary blocks to students of the Govt. schools who still have little or no access to sanitary facilities within their school with proper light and ventilation and improved drainage system. Provided adequate supply of running water and wash water to sanitary blocks in the schools to support hygienic habits and safe drinking water.



- **Menstrual Hygiene Management project**

2 sanitary napkin vending machines and incinerator have installed at 2 govt. high schools to create awareness on Menstrual Hygiene to the school going adolescent girls. There are 20 awareness camps have been organised at the schools to aware the adolescent girls on menstrual hygiene management and there are 1200 girls child have participated at



these awareness camps. We also distributed menstrual hygiene kit to 700 adolescent girl child of 5 Govt. high schools.



- **Different species of trees planted inside factory as a part of Eco Sustainability measures:**



- Water sprinkling on road to mitigate air pollution as a part of Eco sustainability measures:



Annexure- 15

Cost for Environmental pollution control measures (Oct'22–Mar'23) are as follows:-

SI No	Item wise expenditure under Environmental Control Measures	Total Amount in Lacs(Approx.)
01	Stack and Effluent , Ambient air analysis cost	19.6
02	Effluent treatment and effluent recycling plant operational minor chemicals cost	27.3
03.	Manpower charges for operation of Effluent treatment plant and effluent recycling plant	26.8
04	Land development , tree planation (cost of saplings/trees)& Manpower charges for green belt development	10.7
05	Hazardous and biomedical waste management cost	9.82
06	Stack and effluent analyzers maintenance cost	9
07	Capex project for Environmental measure	322.38
Total Expenditure		425.6


Major Capex to improve Environmental performance in Oct'22–Mar'23:-

- Installation of Digital flow meters with telemetric system for Fresh water withdrawal monitoring. Cost- 21.95 lacs.
- Installation of 500 kWp rooftop solar. Cost - 264.14 lacs.
- Construction of RCC storm water drain & effluent pit. Cost – 36.29 lacs

Total Cost - 322.38 lacs.

Annexure- 16

Copy Of Environmental Clearance

ENVIRONMENTAL CLEARANCE	 Government of India Ministry of Environment, Forest and Climate Change (Impact Assessment Division)																	
PARIVESH <i>(Pro-Active and Responsive Facilitation by Interactive, and Virtuous Environment Single-Window Hub)</i>	<p>To,</p> <p>The Chief Operating Officer INDORAMA INDIA PVT LTD Durgachak, Haldia, Purba, Medinipur, PO - PS - Durgachak, WB, East Medinipur, West Bengal-721602</p>																	
	<p>Subject: Grant of Environmental Clearance (EC) to the proposed Project Activity under the provision of EIA Notification 2006-regarding</p> <p>Sir/Madam,</p> <p>This is in reference to your application for Environmental Clearance (EC) in respect of project submitted to the Ministry vide proposal number IA/WB/IND/3/261808/2006 dated 18 Apr 2022. The particulars of the environmental clearance granted to the project are as below.</p> <table border="0"> <tr> <td>1. EC Identification No.</td> <td>EC22A016WB183103</td> </tr> <tr> <td>2. File No.</td> <td>J-11011/136/2017-IA-II(I)</td> </tr> <tr> <td>3. Project Type</td> <td>Expansion</td> </tr> <tr> <td>4. Category</td> <td>A</td> </tr> <tr> <td>5. Project/Activity including Schedule No.</td> <td>S(a) Chemical fertilizers</td> </tr> <tr> <td>6. Name of Project</td> <td>Expansion of Fertilizer Plant at Durgachak, Haldia, Purba Medinipur, PO + PS- Durgachak, West Bengal-721602.</td> </tr> <tr> <td>7. Name of Company/Organization</td> <td>INDORAMA INDIA PVT LTD</td> </tr> <tr> <td>8. Location of Project</td> <td>West Bengal</td> </tr> <tr> <td>9. TOR Date</td> <td>20 Jan 2007</td> </tr> </table> <p>The project details along with terms and conditions are appended herewith from page no 2 onwards.</p> <p style="text-align: right;">(e-signed) Mr. Motpalli Ramesh Scientist E IA - (Industrial Projects - 3 sector)</p> <p>Date: 17/08/2022</p> <p><i>Note: A valid environmental clearance shall be one that has EC identification number & E-Sign generated from PARIVESH. Please quote identification number in all future correspondence.</i></p> <p><i>This is a computer generated cover page.</i></p>	1. EC Identification No.	EC22A016WB183103	2. File No.	J-11011/136/2017-IA-II(I)	3. Project Type	Expansion	4. Category	A	5. Project/Activity including Schedule No.	S(a) Chemical fertilizers	6. Name of Project	Expansion of Fertilizer Plant at Durgachak, Haldia, Purba Medinipur, PO + PS- Durgachak, West Bengal-721602.	7. Name of Company/Organization	INDORAMA INDIA PVT LTD	8. Location of Project	West Bengal	9. TOR Date
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3. Project Type	Expansion																	
4. Category	A																	
5. Project/Activity including Schedule No.	S(a) Chemical fertilizers																	
6. Name of Project	Expansion of Fertilizer Plant at Durgachak, Haldia, Purba Medinipur, PO + PS- Durgachak, West Bengal-721602.																	
7. Name of Company/Organization	INDORAMA INDIA PVT LTD																	
8. Location of Project	West Bengal																	
9. TOR Date	20 Jan 2007																	
																		

F. No. J-11011/136/2017-IA-II(I)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira Paryavaran Bhawan
 Jorbagh Road, New Delhi - 110003

Dated: 17th June, 2022

To

M/s Indorama India Pvt. Ltd.
 Durgachak, Haldia, Purba Medinipur, PO + PS
 Durgachak, West Bengal
 Email: amondal@indorama.co

Project: Expansion of Fertilizer Plant located at Durgachak, Haldia, Purba Medinipur, PO + PS- Durgachak, West Bengal by M/s Indorama India Pvt. Ltd. – Environmental Clearance

Sir,

This has reference to your proposal No. IA/WB/IND3/261808/2006 dated 18.04.2022, on the above mentioned subject.

2. The Ministry of Environment, Forest and Climate Change has examined the proposal for Environmental Clearance to the project for Expansion of Fertilizer Plant located at Durgachak, Haldia, Purba Medinipur, PO + PS- Durgachak, West Bengal by M/s Indorama India Pvt. Ltd.

3. The project/activity is covered under Category 'A' of Item 5(a) - Chemical fertilizers of schedule of Environment Impact Assessment (EIA) notification 2006 and is appraised at central level by Expert Appraisal Committee (EAC). The ToR for the proposed expansion was issued on 03.09.2020.

4. The existing project was initially established at Durgachak, Haldia, Purba Medinipur, PO +PS- Durgachak, West Bengal, in 1979 for manufacturing of DAP/NPK Complex, Single Super Phosphate & Sulphuric Acid. Since the project was established before the purview of EIA Notification, 1994 and its subsequent amendments, Environmental Clearance was not applicable. Later on M/s TATA Chemicals Ltd. had proposed for "Replacement of Furnace Oil based Hot Air Generator (HAG) by Fluidized Bed Biomass Gasifier in DAP-1 Plant" for which the application was submitted on 29th December, 2006 and the project was granted Environmental Clearance from MoEF&CC vide F.No. J-11011/136/2007-IA. II(I) dated 20.07.2007 to M/s TATA Chemicals Ltd. Thereafter, Ministry has granted Transfer of EC vide letter J-11011/136/2017-IA-II(I) dated 06.01.2021 to M/s Indorama India Private Limited for Replacement of furnace oil based Air generator (HAG) by Fluidized Bed Biomass Gasifier in the DAP-1 plant of Tata Chemicals Ltd.

5. The details of products and capacity are as under:

S. No.	Particulars	Unit	Existing	Proposed/ Additional	After Expansion
1.	SAP	MTPA	2,47,500	66,000	3,13,500
2.	DAP	MTPA	7,59,000	5,00,000	12,59,000
3.	Or NPK Complex	MTPA	9,24,000	8,85,000	18,09,000
4.	SSP	MTPA	2,08,980	0	2,08,980

5.	Ammonium Sulphate	MTPA	0	31,000	31,000
6.	Captive Power Plant (STG)	MW	10.17	0	10.17

6. The PP reported that total land area of the project site is 3,23,756.48 m² i.e., 80 Acres. The proposed expansion will be within the existing plant area and no additional land has been proposed for the expansion. Industry has developed greenbelt in an area of 18 Acres i.e., 22.5% out of total area of the project. Green Area will be increased to 33% of total plot area i.e., 26.4 Acres for the proposed expansion which is under development. Plantation is being done all around the plant area. Total green belt development of 26.4 Acres (33% of total plot area) will be completed prior operational phase of proposed expansion. The estimated project cost is Rs 550 Crores. Total capital cost earmarked towards environmental pollution control measures is Rs. 3547.836 Lakhs and the Recurring Cost (Operation and Maintenance) will be about Rs. 709.5 Lakhs per annum. Total Employment will be 1834 no. of persons (Permanent Employees- 359; Contractual Labours - 1475) persons during operation phase. Industry proposes to allocate Rs. 1.67 Crores towards Corporate Social Responsibility (CSR).

7. The PP reported that there are no national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. Hooghly River is flowing at 0.16 km (S) from the project site and Haldi River is flowing at 9.81 km (SSW) from the project site. As per District Action Plan for Disaster Preparedness of District Purba Medinipur, the project site does not fall in flood prone block (flood plain). Conservation of Schedule-I species has been prepared and submitted to Chief wildlife warden and PP committed to implement the plan in 5 years.

8. The PP reported that Ambient air quality monitoring was carried out at 8 locations during October 2020 to December 2020 and the baseline data indicated the ranges of concentrations as PM₁₀ (39-108 µg/m³), PM_{2.5} (15-63 µg/m³), SO₂ (5.6-12.9 µg/m³) and NO₂ (7.1-34.7 µg/m³). AAQ modelling study for point source emissions indicates that the maximum incremental GLCs after the proposed expansion project would be 4.39 µg/m³, 4 µg/m³, 5.86 µg/m³, and 0.375 µg/m³ with respect to PM₁₀, PM_{2.5}, NH₃ and HF, respectively. The resultant concentrations are within the National Ambient Air Quality Standards (NAAQS) except at AAQ-3 (Baneswar Chak) with parameter values of 108 µg/m³ for PM₁₀ and 63 µg/m³ for PM_{2.5} and AAQ-5 (Gandhinagar) with PM₁₀- 106 µg/m³ & PM_{2.5}- 62 µg/m³ due to proximity of location to coal-based power plant.

9. The PP reported that total water requirement after expansion will be 4723.2 KLD (196.8 m³/hr) of which freshwater requirement of 3288 KLD (137 m³/hr) being met by HAD (Haldia Development Authority) Supply. During emergency and summer season, deep tube well water is mixed with HDA supplied water for plant operations. The total wastewater generation from the project will be 1435.2 KLD (59.8 m³/hr). Out of total industrial effluent, 955.2 KLD (39.8 m³/hr) will be treated in existing Effluent Treatment Plant (Capacity-960 KLD) and then will be sent to proposed "Tertiary Treatment Plant (High-Rate Solid Contact Clarifier, Ultra-filtration, Reverse Osmosis System)". Rest of the effluent i.e., 360 KLD (15 m³/hr) will be sent directly to tertiary treatment plant. 1315.2 KLD (54.8 m³/hr) tertiary treatment plant treated water will be completely reused for various plant operations. Domestic sewage will be treated in Domestic Effluent Treatment Plant (Capacity -160 KLD).

120 KLD (5 m³/hr) of domestic effluent plant treated water will be reused in plant for horticultural purposes. The plant will be a "Zero-liquid Discharge" Complex after expansion.

10. The PP reported that the power requirement of the plant will be 10.5 MW which will be met through Captive Power Plant (10.17 MW) and WBSEDCL. DG sets of capacity 3x250 kW (with appropriate stack height as per CPCB norms) are installed as power backup. 2 no. of package boilers of capacity 7.8 TPH & 10 TPH have been installed in the plant with stack height of 35 m (common) for controlling emissions within statutory limit.

11. Details of solid waste/hazardous waste disposal and process emissions generation and its management, pollution load are as per the plan provided in the EIA & EMP report and as deliberated in the EAC.

12. Public Hearing for the proposed expansion project has been conducted by the State Pollution Control Board on 30th September, 2021 at Auditorium Hall of M/s Indorama India Pvt. Ltd., Haldia, P.O. and P.S.- Durgachak, District-Purba Medinipur, West Bengal. The main issues raised during the Public Hearing were related to employment, Corporate Social Responsibility, Pollution Control, COVID-19 management etc.

13. CTO has been accorded by the West Bengal Pollution Control Board dated 03.12.2018 valid till 31.12.2023. The project has been granted Certified Compliance by R.O, MoEF&CC vide Letter No. 102-211/EPE dated 12.08.2021.

14. The PP reported that the proposed expansion is expected for carbon footprint. In proposed expansion, 4.5 MWH power will be required. If this amount of power is taken from WBSEDCL grid. The total power required per day would be: 4.5x1000x24 = 108000 KWH. Considering that 310 days plant will run therefore, total grid power will be required: 33480000 KWH. As per IPCC Grid emission factor (EF) for India 0.7229 tCO₂ e/Mwh. So, total carbon footprint generated would be: 24,105 tCO₂e.

15. It has been proposed to install 750 kW solar panel in a phase-wise manner within 4 years. In 1st year the solar panel feasibility study and proposal for installation of panel will be conducted and from 2nd Year onwards, each year about 250 kW solar panel will be installed upto 4th year. Total solar power generation will be (750x 3.5x 365 KWH) 958125 KWH. This amount of power will not be required from grid Equivalent carbon footprint reduction i.e., 689.85 tCO₂e.

16. Expansion of sulphuric acid plant and increase of production capacity of 66000 MT will generate power of 3 MW from waste heat steam. Thus for 330 days a total of 23760000 KWH power generation would be required. Equivalent reduction of carbon footprint 17176 Tco₂ /Annum. Therefore, by installation of solar panel and increase in sulphuric acid plant capacity, total carbon footprint will be reduced by 17865 tCO₂e.

17. The PP reported that about 15040 no of trees inside the plant and 5000 no. of trees outside plant will be planted that sequester about 1207.7631 ton CO₂/year. The existing plantation of 11711 no. of trees inside the plant premises sequesters approx. 435.934 ton CO₂/year.

18. The PP informed that Indorama has planted 11711 no of tree in its existing unit. This greenbelt is more than 10-year-old and the total Carbon sequestered per year by the existing greenbelt is estimated to be 435.934 tons per year. The PP committed that they use of biomass briquettes, a carbon neutral fuel in complex fertilizer plants in place of Coal, a fossil fuel. Only in case of unavailability of biomass briquettes, coal can be used. If we consider 400 MT /Month of coal, then total coal required /annum for 310 days' plant run would be 4133 MT/Annum.

19. The proposal was considered by the Expert Appraisal Committee (Industry-3 Sector) in its 30th meeting held during 26-27 April, 2022, wherein the project proponent and their accredited consultant M/s. EQMS India Pvt. Ltd. having accreditation number NABET/EIA/1922/RA0197 valid till 23.11.2022) presented the EIA/EMP report. The Committee found the EIA/EMP report and reply of PP satisfactory and recommended the project for grant of environmental clearance. The minutes of the meeting were confirmed with factual corrections in the 31st meeting held during 11-12 May, 2022. The minutes of the meetings and all the project documents are available on PARIVESH portal which can be accessed at <http://parivesh.nic.in>

The EAC noted that the Project Proponent has given an undertaking that the data and information given in the application and enclosures are true to the best of his knowledge and belief and no information has been suppressed in the EIA/EMP reports. If any part of data/information submitted is found to be false/ misleading at any stage, the project will be rejected and Environmental Clearance given, if any, will be revoked at the risk and cost of the project proponent.

The Committee noted that the EIA/EMP report are in compliance of the ToR issued for the project, considering the present environmental concerns and the projected scenario for all the environmental components. The Committee found the baseline data and incremental GLC due to the proposed project within NAAQ standards. The Committee suggested that the storage of toxic/explosive raw material shall be bare minimum in quantity and inventory

The Committee suggested that the greenbelt development shall be taken up actively by the PP and trees shall be planted considered 2m x 2m ratio. The Committee opined that the industry shall undertake studies on the impact of fertilizers on the soil characteristics and ecology. The Committee noted that Ministry accorded Environmental Clearance (EC) to Tata Chemicals Ltd. at Haldia, West Bengal vide letter No. J-11011/136/2007-IA II (I) dated 20.07.2007 for replacement of furnace oil based hot air generator (HAG) by fluidized Bed Biomass Gassifier in the DAP1 plant of Tata Chemicals Ltd. at Haldia, West Bengal.

Further a copy of Certificate of Incorporation registered with the Registrar of Companies, Kolkata (West Bengal) with CIN: U74999WB2017FTC222920 is submitted to the Ministry for change of name from M/s Tata Chemicals Ltd. to IRC Agrochemicals Pvt. Ltd. in June 2018. The name of the Company has changed from IRC Agrochemicals Pvt. Ltd. to M/s Indorama India Pvt Ltd on 18.02.2020 with change of ownership or management of Company. As per the relevant provision of the EIA Notification, 2006, the Environmental Clearance was accorded to the project replacement of furnace oil based hot air generator (HAG) by fluidized Bed Biomass Gassifier in the DAP1 plant of Tata Chemicals Ltd. at Haldia, West Bengal granted by the Ministry vide letter of even no. dated 2007. The Committee deliberated the compliance status of earlier EC are found in order and adequate.

The Committee deliberated on life cycle assessment Carbon footprint and carbon sequestration study gap plan and resource plan, microbiology toxicity modified onsite and offsite emergency plan, conservation plan of schedule -I species, use of biomass Briquette, Greenbelt as per 2500 /ha and plantation of 5000 number of trees to be planted outside the plant, submitted by PP and found satisfactory.

The Committee deliberated the Onsite and Offsite Emergency plan and various mitigation measures to be proposed during implementation of the project and advised the PP to implement the provisions of the Rules and guidelines issued under the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, as amended time to

time, and the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996.

20. The environmental clearance granted to the project/activity is strictly under the provisions of the EIA Notification 2006 and its subsequent amendments. It does not tantamount/construe to approvals/consent/permissions etc. required to be obtained or standards/conditions to be followed under any other Acts/ Rules/ Subordinate legislations, etc., as may be applicable to the project. The project proponent shall obtain necessary permission as mandated under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981, as applicable from time to time, from the State Pollution Control Board, prior to construction & operation of the project.

21. Based on the proposal submitted by the project proponent and recommendations of the EAC (Industry-3), Ministry of Environment, Forest and Climate change hereby accords Environmental clearance to the project for Expansion of Fertilizer Plant located at Durgachak, Haldia, Purba Medinipur, PO + PS- Durgachak, West Bengal by M/s Indorama India Pvt. Ltd. under the provisions of the EIA Notification, 2006, subject to the compliance of terms and conditions as under: -

A. Specific Conditions:

- (i). The Unit shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, and risk mitigation measures relating to the project shall be implemented.
- (ii). No banned Fertilizer shall be manufactured by the project proponent. No banned raw materials shall be used in the unit. The project proponent shall adhere to the notifications/guidelines of the Government in this regard.
- (iii). The project proponent shall utilize modern technologies for capturing of carbon emitted and shall also develop carbon sink/carbon sequestration resources capable of capturing more than emitted. The implementation report shall be submitted to the IRO, MoEF&CC in this regard.
- (iv). The species specific conservation plan of Schedule-I species shall be implemented within time limit and as per the approval of the Chief Wildlife Warden of the State Government.
- (v). The project proponent shall comply with the environment norms for 'Fertilizer Industry' as notified by the Ministry of Environment, Forest and Climate Change, vide GSR 1607 (E), dated 29th December, 2017 under the provisions of the Environment (Protection) Rules, 1986.
- (vi). All necessary precautions shall be taken to avoid accidents and action plan shall be implemented for avoiding accidents. The Project proponent shall implement the onsite/offsite emergency plan/mock drill etc. and mitigation measures as prescribed under the rules and guidelines issued in the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, as amended time to time, and the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996.'

- (vii). The volatile organic compounds (VOCs)/Fugitive emissions shall be controlled at 99.97 % with effective chillers/modern technology. Regular monitoring of VOCs shall be carried out.
- (viii). The project proponent shall explore possibilities for recycling and reusing of treated water in the unit to reduce the fresh water demand and waste disposal. Treated effluent shall be reused in the process/utilities. Treated Industrial effluent shall not be used for gardening/greenbelt development/horticulture.
- (ix). Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel/drain carrying effluent within the premises.
- (x). The storage of toxic/hazardous raw material shall be bare minimum with respect to quantity and inventory. Quantity and days of storage shall be submitted to the Regional Office of Ministry and SPCB along with the compliance report.
- (xi). The occupational health centre for surveillance of the worker's health shall be set up. The health data shall be used in deploying the duties of the workers. All workers & employees shall be provided with required safety kits/mask for personal protection.
- (xii). As committed by PP, the Industry will use Briquettes- as a first priority (Primary Fuel) and in case of unavailability, the Unit will use Indigenous/Imported coal as available as alternative fuel.
- (xiii). Training shall be imparted to all employees on safety and health aspects of chemicals handling. Safety and visual reality training shall be provided to employees. Action plan for mitigation measures shall be properly implemented based on the safety and risk assessment studies.
- (xiv). The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire-fighting system shall be as per the norms.
- (xv). The solvent management shall be carried out as follows: (a) Reactor shall be connected to chilled brine condenser system. (b) Reactor and solvent handling pump shall have mechanical seals to prevent leakages. (c) Solvents shall be stored in a separate space specified with all safety measures. (d) Proper earthing shall be provided in all the electrical equipment wherever solvent handling is done. (e) Entire plant shall be flame proof. The solvent storage tanks shall be provided with breather valve to prevent losses. (f) All the solvent storage tanks shall be connected with vent condensers with chilled brine circulation.
- (xvi). Total fresh water requirement, sourced from Haldia Development Authority, shall not exceed 3288 KLD. Prior permission in this regard shall be obtained from the concerned regulatory authority/CGWA and renewed from time to time.
- (xvii). The storm water from the roof top shall be channelized through pipes to the storage tank constructed for harvesting of rain water in the premises and harvested water shall be used for various Industrial processes in the unit. No recharge shall be

permitted within the premises. Process effluent/ any wastewater shall not be allowed to mix with storm water.

- (xviii). The PP shall undertake waste minimization measures as below (a) Metering and control of quantities of active ingredients to minimize waste; (b) Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. (c) Use of automated filling to minimize spillage. (d) Use of Close Feed system into batch reactors. (e) Venting equipment through vapour recovery system. (f) Use of high pressure hoses for equipment cleaning to reduce wastewater generation.
- (xix). The green belt of at least 5- 10 m width shall be developed in at least 33% of the total project area (@2500 Trees per ha), mainly along the plant periphery/additional land and additional 5000 trees shall be planted outside the plant. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department. Records of tree canopy shall be monitored through remote sensing map. The Trees have to be planted with spacing of 2m x 2m ratio and as in first year itself and subsequent years the greenbelt shall be monitored. The plant species can be selected that will give better carbon sequestration.
- (xx). The activities and the action plan proposed by the project proponent to address the socio-economic issues in the study area shall be completed as per the schedule presented before the Committee and as described in the EIA/ EMP report in letter and spirit.
- (xxi). A separate Environmental Management Cell (having qualified person with Environmental Science/Environmental Engineering/specialization in the project area) equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.

B. General Conditions: The grant of environmental clearance is further subject to compliance of other general conditions as under: -

- (i) No further expansion or modifications in the plant, other than mentioned in the EIA Notification, 2006 and its amendments, shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change/SEIAA, as applicable. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry/SEIAA, as applicable, to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.
- (ii) The Project proponent shall strictly comply with the rules and guidelines issued under the Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989, as amended time to time, the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996, and Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016 and other rules notified under various Acts.
- (iii) The energy source for lighting purpose shall be preferably LED based, or advanced having preference in energy conservation and environment betterment.
- (iv) The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under the Environment (Protection) Act, 1986

Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).

- (v) The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. The activities shall be undertaken by involving local villages and administration. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.
- (vi) The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.
- (vii) A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.
- (viii) The project proponent shall also upload/submit six monthly reports on Parivesh Portal on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data to the respective Integrated Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.
- (ix) The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Integrated Regional Office of MoEF&CC by e-mail.
- (x) The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry and at <https://parivesh.nic.in/>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.
- (xi) The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.
- (xii) This Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, if any, as may be applicable to this project.

22. The Ministry reserves the right to stipulate additional conditions, if found necessary at subsequent stages and the project proponent shall implement all the said conditions in a time bound manner. The Ministry may revoke or suspend the environmental clearance, if implementation of any of the above conditions is not found satisfactory.

23. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may

result in withdrawal of this clearance and attract action under the provisions of the Environment (Protection) Act, 1986.

24. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

25. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.

This issues with approval of the competent authority.



Ramesh
(Dr. Motipalli Ramesh)
Scientist 'E'
Tel. 011-20819249
Email: ramesh.motipalli@nic.in

Copy to: -

1. Secretary, Department of Environment, Government of West Bengal, Secretariat Kolkata.
2. Secretary, Department of Forests, Government of West Bengal, Kolkata.
3. Regional Officer, Ministry of Environment, Forest and Climate Change, Integrated Regional Office, IB – 198, Sector-III, Salt Lake City, Kolkata - 700106.
4. Chairman, Central Pollution Control Board, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
5. Chairman, West Bengal Pollution Control Board, Paribesh Bhawan, 10A- Block LA, Sector –III, Salt Lake City, Kolkata – 700 098.
6. Member Secretary, Central Ground Water Authority, A2, W3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.
7. The District Collector, District East Medinipur, West Bengal
8. Guard File/Monitoring File/Website/Record File/Parivesh Portal

Ramesh
(Dr. Motipalli Ramesh)
Scientist 'E'
Tel. 011-20819249
Email: ramesh.motipalli@nic.in

Validity unknown

Digitally signed by Dr. Motipalli Ramesh
Scientist E
Date: 6/17/2022 8:59:59 PM

Annexure- 17

Copy Of Environmental Statement

INDORAMA

Indorama India Private Limited
(Formerly IIC Agrochemicals Private Limited)

IIP/HA/Env /2022-23/WBPCB-HRD-6
Date: August 01, 2022

To,

Environmental Engineer & In charge
West Bengal Pollution Control Board,
Haldia Regional office

Sub: Environmental Statement for the year 2021-22 for factory

Dear Sir,

Please find enclosed herewith, the Environmental Statement (Form-V) for the year 2021-22 for factory .

Hope you will find this in order.

Thanking You

Yours Sincerely
For Indorama India Pvt Ltd


Chanchal Ghosh

AVP- SHE
Enclosed: - Environment Statement (filled Form V) for year 2021-22





Haldia Plant: Durgachak, Haldia, Dist: Purba Medinipur, West Bengal 721602, T: +91-3224-860800
Regd. Office: Broomfield, S.M.A, 12th Floor, Unit No ECSL-1201, Sector 3, Salt Lake, Kolkata 700091, West Bengal, India. T: +91-33-66241100, F: +91-33-66554
CIN: U14999WB2017PTC222920, www.indorama.in, email: corporate@indorama.in

INDORAMA

Indorama India Private Limited



ENVIRONMENTAL STATEMENT

2021-22

Prepared by Environment
Team, Indorama India Pvt. Ltd.

7/26/22

Form -V

ENVIRONMENTAL STATEMENT**[FORM-V]****Environmental Statement for the financial year ending the 31st March 2022****PART-A**

(i) Name and address of the owner/occupier of the industry operation or process:

- Name : Mr. Ashvini Hiran
- Address of Unit : Indorama India Pvt Ltd
P.O. Durgachak, Haldia
District Purba Medinipur
West Bengal - 721 602
- Address of Corporate Office :
Indorama India Pvt Ltd
Formerly IRC Agrochemicals Private Limited
Regd & Corporate Office: Ecocentre, EM-4, 12th floor, Unit No
ECSL 1201, Sector V, Salt Lake, Kolkata 700091
Telephone No. : 033-66343100
FAX No. : 033-66343102

(ii) Industry category: RED

(iii) Production capacity – Units

- Sulphuric Acid : 247500MT/Annum
- Di-ammonium Phosphate : 759000 MT/Annum
Or NPK : 924000 MT/Annum
- Single Super Phosphate : 208980MT/Annum

(iv) Year of establishment : 1979

(v) Date of the last environmental statement submitted: 19th Aug, 2021

PART-8

Water and Raw Material Consumption

Raw water consumption m³/d (Yearly avg)

Process : 637
 Cooling & boiler feed : 1773
 Domestic : 72

Name of Product	Process water consumption per unit of product output (m ³ /MT of production)	
	During the current financial year (2020-21)	During the current financial year (2021-22)
Sulphuric Acid (cooling+ boiler feed water included)	2.96	2.82
Di-ammonium Phosphate/ NPK	0.11	0.11
Single Super Phosphate	0.020	0.020

Raw material consumption

*Name of raw materials	Name of Products	Consumption of raw material per unit of output (Ton/Ton of production)	
		During the current financial year (2020-21)	During the current financial year (2021-22)
Sulphur	Sulphuric Acid	0.331	0.332
Ammonia	Di-ammonium Phosphate	0.221	-
P ₂ O ₅		0.462	-
Ammonia	NPK 10:26:26	0.121	0.121
P ₂ O ₅		0.262	0.263
MOP		0.4400	0.444
Ammonia	NPK 12:32:16	0.151	0.1472
P ₂ O ₅		0.323	0.323
MOP		0.276	0.273
Ammonia	NPK 14:35:14	0.1736	0.1712
P ₂ O ₅		0.3575	0.3595

MOP		0.2491	0.2453
Ammonia	NP 16:20	-	0.2032
P ₂ O ₅		-	0.2201
Ammonia	NP 14:28	-	0.1739
P ₂ O ₅		-	0.2845
Rock Phosphate	Single Super Phosphate	0.5966	0.6078
Sulphuric Acid		0.373	0.359

PART-C

Pollution discharged to environment / unit of output (Parameter as specified in the consent issued)

(a) Water

Pollutants	Quantity of Pollutants discharged (kg/d)	Concentration of Pollutants discharged (mg/L) except PH	Prescribed Standards (Consent Limits)
pH	-	7.78	Between 6.5 - 8.5
TSS	4.92	2.87	Not to exceed 100 mg/L
BOD	4.35	7.47	Not to exceed 30 mg/L
COD	23.15	39.75	Not to exceed 250 mg/L
Oil & Grease	1.16	2	Not to exceed 10 mg/L
Phosphate	0.08	0.13	Not to exceed 5 mg/L
Fluorides	0.33	0.56	Not to exceed 10 mg/L
Ammonical Nitrogen as N	4.2	7.2	Not to exceed 50 mg/L

Kjeldhal Nitrogen as N	5.7	9.7	Not to exceed 75 mg/L
Free Ammonical Nitrogen as N	0.33	0.57	Not to exceed 4 mg/L

(b) Air

Pollutants	Quantity of Pollutants discharged (kg/d)	Concentration of Pollutants discharged (mg/Nm ³)	Prescribed Standards (Consent Limits) ^{***}
Sulphuric Acid Plant -1			
SO ₂	54.8	169	<1250 mg/ Nm ³
Acid mist	10.9	34	< 70 mg/ Nm ³
Sulphuric Acid Plant -2			
SO ₂	80.7	168	<1250 mg/ Nm ³
Acid mist	19	40	< 70 mg/ Nm ³
DAP Plant -1			
Fluoride as HF	5.82	1.83	< 10 mg/ Nm ³
PM	222	70	< 150 mg/ Nm ³
NH ₃	464	146	<300 mg/Nm ³
DAP Plant -2			
Fluoride as HF	9.5	3	< 10 mg/ Nm ³
PM	217	66	< 150 mg/ Nm ³
NH ₃	427	130	<300 mg/Nm ³
SSP plant			
Fluoride as HF	0.51	1.9	< 20 mg/ Nm ³
PM	14.13	53	< 125 mg/ Nm ³

NOTE: Actual emissions are well within the permissible limits, there is no violation of prescribed standards. Ammonia terminal facility (erst while

Sanjana Cryogenics storage Ltd) is part of Indorama Corporation. There is no emission from ammonia terminal facility except emergency DG.

PART-D

HAZARDOUS WASTES

(As specified under Hazardous Wastes / Management and handling Rules, 1989)

Hazardous Waste Generated

Hazardous Wastes	Total Quantity (MT/year)	
	During the previous financial year (2020-21)	During the current financial year (2021-22)
(a) From Process		
Vanadium Pentoxide Catalyst	12.6	11.64
Used Oil	12.18	4.17
Sludge and filters contaminated with oil	-	0.8
Residues from production of mineral acid	0.78	0
Sulphur Sludge	388	61.6
Spent Resin	-	-
(b) From pollution control facilities		
ETP Sludge	106	74.5

PART E

Solid Waste

Solid Waste	Mode of Disposal	Total Quantity (Kg/year)	
		During the previous financial year (2020-21)	During the current financial year (2021-22)
(a) From Process			
Fly ash	Re-used in DAP	688	1615
(b) From pollution control facilities			
NIL	--	--	-

PART-F

Please specify the characterization (in terms of composition and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both the categories of wastes.

Hazardous waste / Solid Waste	Source	Quantity Disposal (MT/year)	Method of Disposal
(a) Hazardous Waste			
Vanadium Pentoxide Catalyst	Spent catalyst dust generated from Sulphuric acid plant	11.64	Sent to West Bengal Waste Management Ltd. (Common Hazardous Waste Transfer, Storage, Disposal Facility) for disposal
Used Oil	Spent lubricant oil generated from maintenance applications	4.17	Sold to CPCB registered used oil recyclers
Waste Oil	From FO, Diesel tank	0.8	Sold to CPCB registered used oil recyclers
Sulphur Sludge	Generated from Sulphuric Acid plant during cleaning of Raw Sulphur.	43.79	Sent to West Bengal Waste Management
ETP Sludge	Chemical sludge from waste water treatment	48.16	ETP Sludge sent to West Bengal Waste Management Ltd
Solid Waste			

Fly Ash	Generated from new hot air generator due to burning of biomass and coal	1 & 15	Re-used in DAP
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PART-G

Impact of pollution abatement measures taken up on conservation of natural resources and on the cost of production.

Please refer to Annexure - 1 & 2

PART-H

Additional measures/investment proposal for environment protection including abatement of pollution prevention of pollution

Please refer to Annexure - 3

PART-I

Any other particular for improving the quality of the environment

Please refer Annexure -4

ANNEXURE - 1

Measures taken to reduce water consumption and for conservation of energy & pollution control measures are as follows.

Resource Conservation:-

A. Energy Conservation:

For GHG reduction and improvement in energy management system we have taken the initiative such as

- To avoid steam venting and improving the energy efficiency of the site, steam turbogenerator capacity 8.3 MW installation and commissioning done in Dec 2020 . Scope 1 & 2 Carbon foot print reduced 15% from previous year (20-21).
- To support Carbon sequestration to the extent possible from Fertilizer manufacturing process , biomass pellets and briquettes are used in place of coal and Furnace oil in DAP 1 & DAP 2 plant. Only in case of unavailability of biom ass , coal is used.

B. Water Conservation:-

- DM & RO plant reject water(Effluent) as a scrubbing media is utilized in DAP/NPK plant instead of using raw water. Approx 12-13 m3/Hr effluent is consumed .
- Rainwater in SSP plant enchament area & part of cooling tower blowdown is utilised in scrubber system of SSP plant water to minimize the raw water consumption.
- Condensate recovery system in SAP Plant is working to reduce fresh water consumption,
- Utilization of ETP treated water in Greenery development & horticulture area .

- Construction of two rain water storage pond of 2700 and 2000 m³ completed. Stored rainwater is utilized in process to reduce fresh water consumption.
- Installation of 40 m³/Hr effluent recycling plant is in progress. This will reduce the fresh water consumption and effluent discharge from plant premises.

ANNEXURE - 2

Treatment facilities for Gaseous emission

Sulphuric Acid Plant:

- The plant was converted in DCDA Process in 1983 to improve conversion of SO₂ to SO₃ thereby reducing the SO₂ emissions. Both the plant has alkali scrubber system to control the emission of SO₂ through stack. Ammonia or soda solution can be used as scrubbing media.
- High Efficiency Mist Eliminators have been installed in the Absorption Tower to control acid mist in stack gas.
- All critical plant parameters are indicated in central control panel in the plant control room. Suitable alarms have been provided to warn the operators in case any critical control parameter goes beyond limits.
- An on line stack monitoring instrument has been installed to continuously measure SO₂ emissions from the stack. This has been connected to Distributed Control System for getting real time record of plant emission levels. This is connected to CPCB server also. The online analyser has remote calibration facility.
- To comply with the provision of new notification for Sulphuric Acid plants 2008, pH recorders for on-line pH meters are installed and interlock facility provided with high level indication alarm and auto-trip along with the on-line monitoring system
- Interlock facility provided of Sulphur pump tripping in case of any high SO₂ emission from stack.

Di-ammonium Phosphate Plant:

- Ammonia Scrubber has been provided to recover ammonia from exhaust gas of reactor and granulator . A set of Cyclone separator followed by Gas Scrubber and Ventury scrubber has been provided to remove DAP dust from exhaust gases. Dust is scrubbed by water in gas scrubber.
- Fluorine Scrubber has been provided to remove any traces of Fluorides present in exhaust gases. The scrubbing medium is water. This is recycled back to the plant and thereby there is no liquid effluent coming out of the plant.
- PM, NH₃, HF online analyser installed to the stack of both the plants and connected to CPCB server .
- In both the DAP plants system is designed such as in case of any scrubbing system failure, the plant will trip instantly . Intelocking system provided of dryer tripping with the gas scrubber pump failure.

SSP PLANT

- Bag filters are provided to arrest dust from the Ball Mill vent gases.
- A multi -stage fluorine scrubber is provided to efficiently scrub the vent gases from the main plant. The scrubbers are made of MSRL. The water is pumped to the scrubbers and sprayed inside void towers by means of nozzles.
- Ventury Scrubber was provided to undergo efficient scrubbing of pollutants. All Four Scrubber are now provided with ventury scrubber.
- Extra spray Lechler Nozzles provided into Gas duct for intimate contact and hence better scrubbing in the SSP scrubber.SPM, HF analyser connected to SSP main stack . Data transferred to CPCB server real time basis.

- In SSP plant system is designed such as in case of any scrubbing system failure, the plant will trip instantly. Interlocking system provided of scrubber pump with RAL-1 (Rotary valve- rock input to mixer)

Effluent Treatment plant

- In Effluent treatment plant treated water discharge online pH ,flowmeter, TSS, BOD, COD analyser installed and connected to CPCB server. Treated water discharge pump having interlock system with the discharge parameters of online analyser which is out of range.
- A effluent recycling plant of 40 m³/Hr installation job is under progress to minimize the fresh water consumption and effluent discharge outside plant.

Components of effluent Recycling plant :

- High-rate Solid Contact Clarifier (HRSCC)
- Ultra-Filtration (UF)
- Reverse Osmosis (RO)

ETP treated effluent will be treated in HRSCC if required. Effluent will be fed to Ultra-Filter (UF) followed by Reverse Osmosis. From RO plant the permeate water generated will be used in cooling tower and DM plant. The reject water from RO plant will be used in DAP/NPK and SSP plant.

Photograph of effluent recycling plant



Effluent Recycling Plant Overview (40 m³/Hr)



RO Section

ANNEXURE - 3

Additional measures/investment proposal for environment protection including abatement of pollution prevention of pollution

Total expenditure in various Environment protection measures in 2021-22

Sl no	Item wise Expenditure under Environmental control measures	Total Amount in Lacs (Approx)
01	Effluent treatment plant operational raw material cost	24
02	Manpower charges for operation of ETP Plant	33
02	Hazardous and Biomedical Waste management	14
03	Stack, effluent, ground water monitoring charges	30
04	Green belt Development Cost(Purchase of plant , manpower for maintainenece)	32
05	Capex project in Environmental measures	25
06	Stack and effluent analyser maintenance cost	28
	Total	186

Major Capex in 2021 -22 for Environment protection measure:-

1. Replacement of PM analyser in DAP & SSP plant , Expenditure: 11.48 Lacs
2. Installation of new pump at equilisation tank , effluent treatment sump and final discharge , Expenditure : 13.52 Lacs

Capex planned in 2022-23 for improving the sustainability performance of the site :-

01. Installation of effluent recycling plant of 40 m³/hr along with HRSCC [High rate solid Contact Clarifier]. This will include UF and RO system. ETP treated water will be fed to RO system and the permeate water from RO will be used in cooling tower make up and reject will be used in process plant. This will reduce the effluent discharge and fresh water consumption. Approx cost – 600 Lakhs (Carry forward Capex 2021-22)
02. Installation of 4 no of digital flow meters and connectivity to Cloud sever in water withdrawal system.– as per CGWA guideline.

Annexure-4

Eco development measures and community welfare measures are as below :

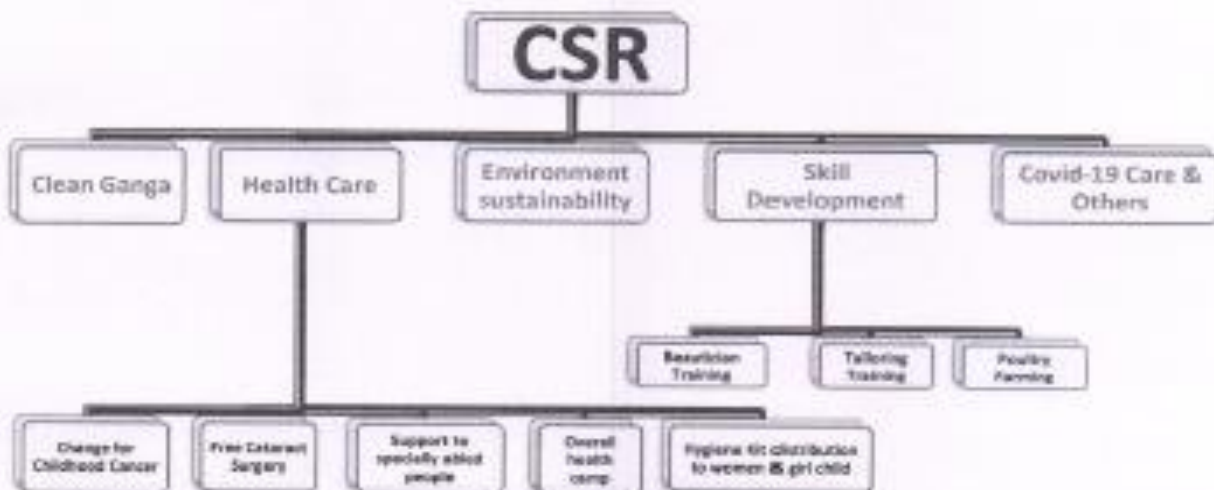
➤ **Environment Day Celebration 5th June ,2021**

Environment Day celebration done in factory on 5th June 21 with tree plantation programme. Total 2000 no of tree plantation done in factory and township.



CSR Report (April'21 - March '22)

We believe in creating synergy between business and the society by working closely with the local communities for the purpose of improving the quality of life of the communities we serve through long term stakeholder value creation. We believe in positively impacting the environment and supporting the communities we operate in, focusing on sustainability of our programs and empowerment of our communities.



➤ General Health Camp

There are many villages in rural pockets of West Bengal where people have to travel to other villages for basic primary health care services. There are multiple limitations for villagers to avail proper health service. Few of them include – lack of medicines at health center, unavailability of doctors, traveling to other village or even cities.

To address such issues we organised regular health camps in villages and provide some basic health care support to the villagers with the support of Deulpata Seva Samiti. The specialised doctor's from the Cancer Research Institute, Kolkata was there to treat the patients. In these camps primary focus was given on healthcare of children, women and senior citizens.

1438 people from under privileged community have benefited through ten health camps at South24 Parganas, West Medinipur and East Medinipur district.



➤ Free Cataract Surgery

Cataract is defined as opacity within clear lens of the eye which reduce the amount of incoming light and cause deterioration of vision. Cataract remains a concern for public health, especially in low and

middle-income countries. 520 identified people from marginalized community have been benefited through free cataract surgery.



➤ **Raising awareness about menstrual hygiene**

We have create awareness at the villages and the schools. We installed sanitary napkin vending machine and incinerator at the Govt. Offices and also distributed hygiene kits to the women and the adolescent girls.

8 sanitary napkin vending machine and incinerator installed at different govt offices of Sutahata block and hygiene kit have been distributed to 500 women of this block.

Support to differently abled people

The main objective of this project is to provide aid to the differently abled people. We have provided the opportunity to differently abled people for social interaction with each other which boosted up their courage and new hope of life to counter disability. 122 wheel chair, 181 tricycle, 68 hearing aid, 15 scratch & 14 artificial limb distributed to the selected people from marginalised community of South 24 Parganas and East Medinipur district of West Bengal.



➤ Installation of Oxygen plant at Digha Hospital

We have successfully commissioned the 233 LPM, PSA medical oxygen plant at Digha SG hospital. The CMOH team members of Nandigram Health District had already visited the PSA plant. We have also provided in hand training to the active team members of Hospital for plant operation and maintenance.



➤ Women Empowerment

Poultry farming training 44 women from economically backward community of the East Medinipur & West Medinipur get the training on poultry farming. After the training, they would be assisted with construction of the poultry farm and supported with chicks, poultry feed and medicines.



Tailoring & Beautician training

100 Young women from marginalized communities of South Kolkata & South 24 Parganas have trained on beautician & tailoring training with the collaboration of Hope Kolkata Foundation and Abhyudaya-Haldia.

After completion of the training each trainee will receive the certificate and startup kit.



Annexure- 18

Copy Of Advertisement in Anandabazar and in the Telegraph



Emergency Plan & Mock drill reports

Annexure-19

EMERGENCY RESPONSE PROCEDURE ON-SITE PLAN



VERSION NUMBER: 5.0

VERSION DATE: 22.12.2022

Emergency Response Procedure On-Site Plan

Indorama India Pvt. Ltd., Haldia

Foreword

The On-site Emergency Response Plan has been made for Indorama India Pvt. Ltd. taking considerations of all potential emergency incidents for the site. This document is reviewed & updated once in a year to incorporate the changes & improvements. The latest revision is done on Feb'22 and now the plan is reviewed & updated in Dec '22 to incorporate the Odd hours emergency response plan & organizational changes.

Responsibility

- The responsibility of following guidelines, procedures & instructions lies with all concerned personnel.
- The responsibility of reviewing the booklet periodically & communicating to all stakeholders lies with Fire & Safety dept.

Revision

- This manual has been prepared and ratified on Dec'22 (Revision 5.0).



Chandra Shekhar Prasad
Factory Manager
Indorama India Pvt. Ltd., Haldia

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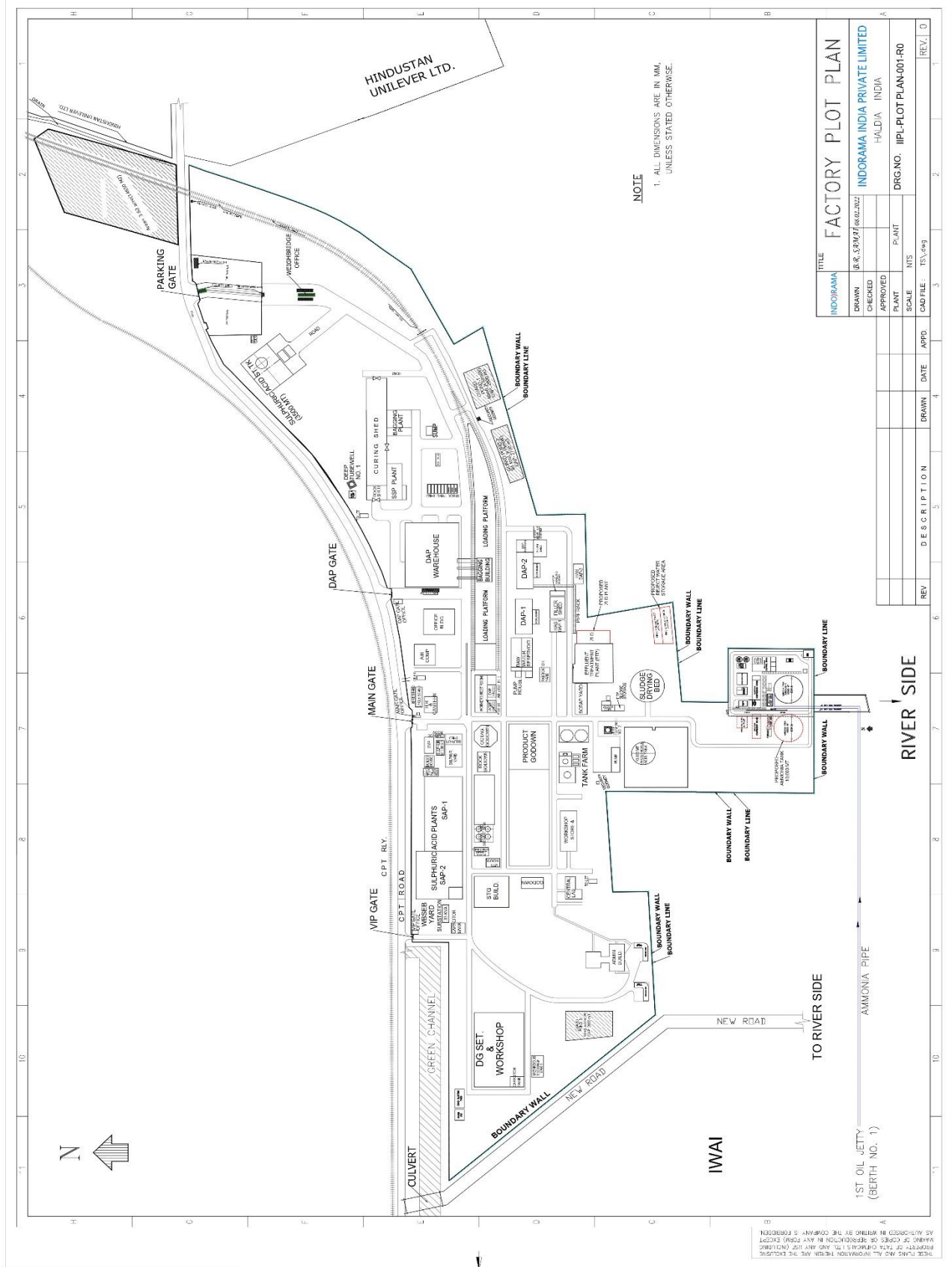
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NOTE
1. ALL DIMENSIONS ARE IN MM.
UNLESS STATED OTHERWISE.

INDORAMA		INDORAMA	
TITLE		FACTORY PLOT PLAN	
DRAWN	β.R. SUDHAR	DATE	06/12/2022
CHECKED		APPROVED	
PLANT	INDORAMA INDIA PRIVATE LIMITED	SCALE	1:1
PLANT	HALDIA	DRG. NO.	IPL-PLANT PLAN-001-R0
SCALE	INTS	GAD FILE	TEV/veg
REV.	DESCRIPTION	DRAWN	DATE
1			
2			
3			
4			
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9			
10			
11			

RIVER SIDE

TO RIVER SIDE

1ST OIL JETTY
(BERTH NO. 1)

AMMONIA PIPE

IWAI

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INTRODUCTION

This plan has been prepared to deal with a major emergency at Indorama India Pvt. Ltd., Haldia Factory. A major emergency is defined as an event which affects or threatens to affect either a large number of personnel, or persons beyond the boundaries of the factory. An event, which will cause extensive property damage, is also considered a major emergency.

Following major emergency situations are covered by this plan.

EMERGENCIES IDENTIFIED AT INDORAMA INDIA PVT. LTD., HALDIA

1. Major Release of Ammonia
 - a. from DAP plants & transfer lines from ATO-1
 - b. from Ammonia terminal
 - c. from Cross Country Pipelines (4" & 16")
2. Major Fire in the Sulphur Yard at Factory/Dock Site
3. Major Fire in Tank Farm Area Located next to Store
4. Major Leakage of Sulphuric Acid from Storage Tanks
5. Accidents with Tankers Carrying Hazardous Chemicals
6. Emergency Due to loss, theft, fire, explosion & failure of shutter or damage to the nucleonic gauges.

1.0 SOME IMPORTANT DEFINITIONS

EMERGENCY means a situation or condition leading to a circumstances or set of circumstances in which there is danger to the life or health of persons or which may result in big fire or explosion or pollution to the work and outside environment, affecting the workers or neighborhood in a serious manner, demanding immediate action.

LEVEL-1 EMERGENCY is the emergency in which healthy people would not suffer any long lasting effect except discomfort and property loss.

- a) Small spot fire in the plant.
- b) Low toxic gas release for short duration.
- c) Collapsing of small equipment's.

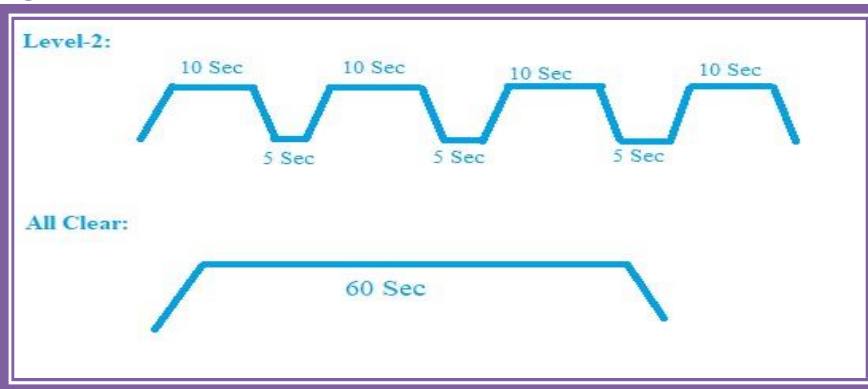
LEVEL-2 EMERGENCY Significant part of those exposed would be seriously injured or killed.

- a) Big fire in factory premises.
- b) Medium scale explosion.
- c) Heavy leakage of toxic gas for short duration.
- d) Loss, theft, fire, explosion & failure of shutter or damage to the nucleonic gauges

LEVEL-3 EMERGENCY affects surrounding area beyond the premises.

- a) Explosion in high pressure vessel containing toxic/flammable material,
- b) Heavy leakage of toxic material for a long duration from pipeline or storage tanks.
- c) Flood
- d) Severe earthquake warning or striking.

EMERGENCY ALARM is the warbling not produced the large sirens located at the Factory.

SIREN

EMERGENCY CONTROL CENTRE is the point which the Emergency controller directs the movements of Personnel and equipment during an Emergency. There are two designated Emergency control Centers on the Factory Site:

EMERGENCY CONTROLLER is the person who assumes absolute control of the Factory and determines the action necessary to control the Emergency. He will wear a Red & White Helmet to confirm his identity.

INCIDENT CONTROLLER is the person who goes to the scene of emergency and supervises the actions taken at the incident to overcome the Emergency.

EMERGENCY CONTROL TEAM is the designated group of Senior Managers and practical advisers who assist the Emergency Controller. The team consists of three groups:

EMERGENCY CONTROL CENTRE TEAM which will operate from the Emergency control Centre which comprises of External Communication Team and Control Centre Team.

INCIDENT CONTROL TEAM which remains at the site of incident to bring the event under control.

ASSEMBLY POINT TEAM which guides non-essential personnel at various Emergency Assembly Points.

EMERGENCY ASSEMBLY POINT is a place containing or adjacent to a place containing an internal telephone and paging system, where people can wait in a group to receive instructions from the Emergency Controller.

ROLL CALL LEADERS are the persons who carryout Roll Calls at the Emergency Assembly Points.

2.0 EMERGENCY CONTROL CENTRE

LOCATION

There are two designated emergency control centers at Indorama India Pvt. Ltd., Haldia factory site.

EMERGENCY CONTROL CENTRE-1[ECC-1] Emergency Control Centre-1 is the main Control Centre located at welfare block (Next to Head-HR, IR).

EMERGENCY CONTROL CENTRE-2[ECC- 2] Emergency Control Centre-2 located in the Administrative Building, ground floor. In the event of the Main Control Centre becoming in-operable, the alternative center room on the ground floor of the Administrative Block.

CONTENTS OF EMERGENCY CONTROL CENTRES

1. Copy of the on-site emergency plan.
2. Emergency Controller's Red & White Helmet and green reflective jacket.
3. List of Emergency control team(with telephone numbers),who must be called in
4. List of persons trained in First Aid & Fire Fighting.
5. External telephone line and a list of relevant telephone numbers.
6. Internal telephone and telephone list of Emergency Assembly Points.

Site actions

1.0 ACTIONS BY PERSONS FINDING THE EMERGENCY

1. Actuate emergency Manual call point from nearest call point.
2. Dial 666 on internal telephone and give the details of incident to Security and shift manager(Emergency controller)
3. Inform concerned Incident Controller/control room of the Plant
4. Take actions to contain emergency as per applicable plan

2.0 ACTION BY SECURITY

1. After receiving call on emergency telephone no. 666 or upon hearing the emergency hooter & blink on the panel board at main gate, inform shift Manager/Emergency controller for Level-1 Emergency.
2. Send one guard to start the fire pump without waiting for any further information.
3. Attend incoming telephones and obtain details of incident.
4. Await instructions from the Emergency Controller & as per emergency controller direction actuate emergency siren (Declare level-2 Emergency).
5. Upon hearing the emergency siren, guards from the previously identified stations shall rush to gate lodge
6. If an ammonia leak is reported, wait for further instructions from the Emergency Controller. Meanwhile open the ECC (Emergency Control Centre) and keep emergency car & Ambulance ready.
7. If a fire is reported, rush to the location of incident with fire hoses and fight fire under guidance of incident controller. However one guard should remain at gate lodge.
8. Do not admit visitors, but allow employees at tending the emergency to enter in side through the gate.
9. Keep the main gate open for movement of emergency vehicles only. Regulate movement of vehicles through the gate. Stop all other traffic and keep the gate clear for the movement of emergency vehicles.

10. Arrange to escort external fire brigade vehicles/ambulances etc. to the incident site as per requirement.
11. Security shall control the traffic inside the factory and speed limit is not applicable during emergency for emergency vehicle movements.
12. Reconcile the Head Count with the help of Time Office for counting number of persons present at that particular instant as per counting system.
13. Deployment of security team during emergency is as follows
 - a. Main gate designated shift assistant security officer (ASO) will lead the security team,
 - b. DAP gate designated shift assistant security officer (ASO) will act as foam monitor.
 - c. Security Guard Round & Night Patrolling will act as pump operator.
 - d. Security Guard at DAP gate & parking gate will act as branch man.
 - e. Security Guard at store and HAG will act as water hydrant to Fire Tender.
 - f. Security Guard at Phosphoric Acid tank area will act as signal man.
 - g. Shift fire man will act as fire tender operator.
14. Quick response team is to search for missing employee in effected area.
15. Security will provide number on employee & contract employee inside the factory.
16. In case of emergency is activated in night security supervisor will inform emergency control team.

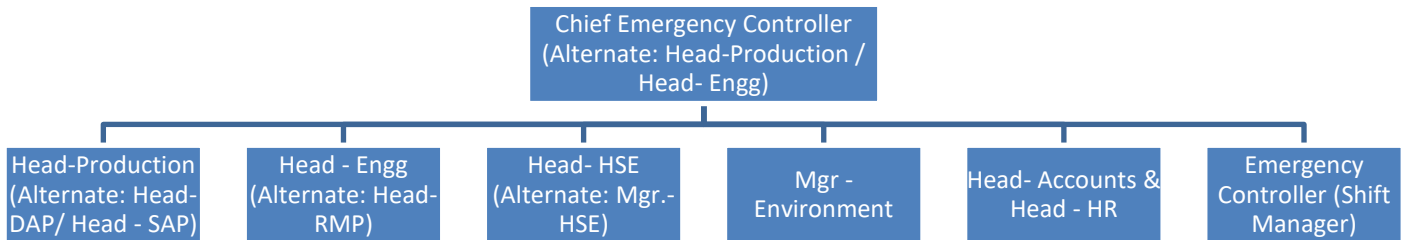
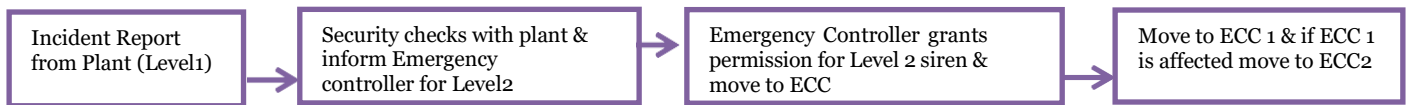
3.0 ACTIONS BY EMERGENCY CONTROL TEAM

An Emergency Control Team is the designated group of Senior Managers and practical advisers who assist the Emergency Controller. As soon as an emergency is identified and actions are initiated as described above, the Emergency Control Team will assemble at ECC-1 / 2. The following actions will be initiated by the Emergency Control Team which consists of three groups:

Group-1 EMERGENCY CONTROL CENTRE (ECC) TEAM

The emergency control team is headed by Site head as Chief Emergency Controller & in his absence Head-Production/Engineering will act as CEC.

Emergency Control Centre (ECC) Team shall be overall in-charge of all the activities at site, during an emergency. The team shall be headed by Emergency controller and each member of the team will have a specific function to assist Emergency Controller. Incident Control Team and Assembly point Team also reports to Emergency Controller. In day time, the members of Emergency Control Centre team should rush to the Emergency Control Center (ECC), immediately after hearing emergency siren. In night time Emergency controller should ask them to proceed to factory.



DUTIES & RESPONSIBILITIES OF THE CHIEF EMERGENCY CONTROLLER

1. As soon as he receives the information of the incident, he shall proceed to the Emergency Control Centre and take charge as CEC.
2. The Chief Emergency Controller (CEC) shall have overall responsibility for directing and bringing emergency situation under control.
3. If required, he may call help from outside emergency services and mutual help,
4. Chief Emergency Controller may ask any executive to carry out a particular task with responsibility.
5. Continually review and assess that suitable actions are being taken
6. Direct the safe shut down and evacuation of plants in consultation with the incident controller and key personnel. If necessary, arrange for evacuation of neighboring population.
7. Ensure that casualties are receiving adequate attention. Arrange for hospitalization of victims and additional help, if required. Ensure that the relatives are advised.
8. Ensure the accounting for personnel and rescue of missing persons.
9. Check that all non-essential workers, visitors and contractors are evacuated to assembly points and shifted to safe place if required.
10. He may give instructions to the Fire Fighting and call second line/ third line of defense personnel. Advise Head - HR & Admin if necessary, to issue authorized statements to the news media. Where necessary, inform head office.
11. In case of offsite emergency or situation developing towards that inform District Emergency Authority, the chief officers of the fire & police service and the factory inspectorate and experts on health and safety. Provide advice on possible effects on areas outside the factory.
12. Ensure that HOD (HR & Admin.) liaise without-side agencies such as Police, District Emergency Authorities, DM, ADM and Director of Factories. Provide advice on possible effects to the areas out-side the factory.
13. Ensure that search for casualties within the affected area has been carried out & arrange for hospitalization of victims and additional help if required like shelter, catering etc. If necessary arrange for evacuation and rescue of the neighboring population.
14. Arrange for maintaining of records of activities during control of emergency.
15. Control rehabilitation of affected areas and victim so necessitation of the emergency
16. Do not restart the plant unless it is ensured safe to start and cleared by authorities.

DUTIES & RESPONSIBILITIES OF THE CHIEF EMERGENCY CONTROLLER IN ODD-HOURS

1. As soon as he receives the information of the incident, he shall proceed to the emergency control centre in IIPL Township and take charge as CEC.
2. A team comprising of Head-Engineering(Mr R P Singh), HOD –DAP Production (Mr Anjan Bhowmik), Head-Supply Chain (Mr. Soumitra Dey), Manager-Electrical (Mr Ranjan Chakraborty), Manager-Environment (Mr Arun Mondal), Head-HR (Mr Saurabh Bhattacharya) and factory doctor(Dr. Monica Das) will report to CEC for support.
3. The Chief Emergency Controller (CEC) shall have overall responsibility for directing and bringing emergency situation under control.
4. In absence of CEC, Mr. R P Singh -Head-Engg will act as CEC. Other alternate team members are Manager-TS & Project (Mr Prasanta Pal), Manager -TS (Mr Samar Mahapatra), Manager-DAP Production (Mr Samar Samanta).
5. On receiving information, Safety team will rush to the site and act under guidance of Head-SHE
6. Keep directly communication with Emergency controller in plant.
7. If required, he may call help from outside emergency services and mutual help,
8. Chief Emergency Controller will assign the responsibility to any member based on requirement.
9. CEC/alt. CEC will continually review, assess and ensure that suitable actions are taken.
10. Direct the safe shut down and evacuation of plants in consultation with the Emergency/ incident controller and key personnel. If necessary, arrange for evacuation of neighboring population.
11. Ensure that injured people are attended as advised by Factory Doctor. Arrange for hospitalization of victims and additional help, if required.
12. Ensure the head counts for personnel inside the factory premises.
13. Ensure that all non-essential workers, visitors and contractors are moved to nearest assembly points and shifted to safe place if required.
14. CEC/alt. CEC shall give instructions to the Fire Fighting team and call second line/ third line of defence personnel. Advise Head - HR & Admin if necessary, to issue authorized statements to the news media and inform head office.
15. In case of offsite emergency or situation, inform District Emergency Authority, the chief officers of the fire & police service and the factory inspector, WBPCB and experts on health and safety. Provide advice on possible effects on areas outside the factory.
16. HOD (HR & Admin.) shall liaise with Govt. agencies such as Police, District Emergency Authorities, DM, ADM and Director of Factories for offsite emergency.
17. Maintain records of activities during control of emergency by team members as advised by CEC.
18. Control rehabilitation of affected areas and victim of the emergency.
19. Ensure not to restart the plant unless it is ensured safe to start and cleared by authorities

ECC Team Comprises of–**DUTIES & RESPONSIBILITIES OF SHIFT MANAGER (EMERGENCY CONTROLLER)**

Shift Manager shall take initial charge as Emergency Controller, till he is relieved by Chief Emergency Controller. In case of any emergency at Acids or emergency at tank farm area during odd hours, Shift In-charge – Acids/Ammonia Terminal-1 shall take the role of incident controller and senior most Shift In-charge of DAP1/DAP2 will act as Emergency Controller.

Emergency controller shall wear a Red & White helmet and green reflective jacket for easy identification.

Immediately after taking charge as Emergency Controller, Shift Manager shall take following actions–

1. After getting information from Security Supervisor, make an assessment of the incident and activate emergency Plan if it is a Level-2 Emergency situation.
2. Emergency Controller shall ensure that all members of his team have been informed to gather at Emergency Control Centre. He will then proceed to Emergency Control Centre to take charge.
3. After first hand assessment of situation, give necessary instructions to Emergency Control Team.
4. Alert Ammonia Terminal-1 personnel in case of ammonia emergency.
5. Check wind direction in case of ammonia leakage & Sulphur fire.
6. Alert all the assembly points about wind direction & prepare for evacuation after shutting the plants and taking a head count.
7. Keep in touch with the incident controller.
8. Meet outside Emergency services on arrival at site and guide them.
9. Incident controller keeps in touch with other member of Emergency Control Center Team and help to provide resources with his team members.
10. He will depute people to attend telephone, Keep in touch with incident controller, Communicate with Assembly Points, Meet outside emergency services, Ensure proper flow of traffic control by security.

ACTIONS BY HEAD-OPERATIONS

1. Keep in touch with other member of Emergency Control Center Team and help to provide resources
2. Ensure that information is sent to outside emergency services (Police and Fire Bridge).
3. Depute people to attend telephone, Keep in touch with incident controller, Communicate with Assembly Points, Meet outside emergency services, Ensure proper flow of traffic control by security, Meet media/other people coming at site from outside, Arrange for Media Aid.
4. COO-Haldia Plant can take over as Emergency Controller from Shift Manager. In his absence Head-Production shall take over as Emergency Controller.

ACTIONS BY HEAD- ENGG (ALTERNATE: HEAD-MECHANICAL)

1. Keep in touch with other member of Emergency Control Center Team and help to provide resources.
2. Coordinate engineering support in combating emergency.
3. Assist Emergency controller in communicating with incident controller.

ACTIONS BY HEAD-ELECTRICAL (ALTERNATE: MANAGER - ELECTRICAL)

1. Immediately on hearing of the Emergency Siren, reach at Emergency Control Centre and wait for instruction of Head-(Maintenance)/CEC.
2. By hearing emergency siren (or on getting message), electrical engineers should get touch with Head for consultation and instructions.
3. Mobilize more electrical staff including second line of defense for help if required for Emergency Work.
4. Remain in contact with Head-Maintenance.
5. Direct the concerned person for providing extra lighting/isolating of electrical supply as per requirements.
6. Ensure that telephone exchange is manned for smooth communication.
7. Ensure power supply to emergency area.

ACTIONS BY FACTORY MEDICAL OFFICER (ALTERNATE: PHARMACIST IN SHIFT)

1. Immediately on being intimated (or by hearing siren) about the Emergency, contact the Chief Emergency Controller.
2. Render necessary treatment at First -Aid Centre.
 - a) Arrange for Hospitalization and treatment in the outside Hospitals, if required.
 - b) Mobilize extra Medical Assistance from outside if necessary.
3. Make arrangement for treating public if affected with the help of Admin. Officer.
4. Ensure the availability of oxygen and emergency medicine insufficient quantity in the hospital.
5. Report hospital immediately on hearing/getting information about emergency.

ACTIONS BY HEAD—HSE (ALTERNATE: MANAGER- HSE)

- On getting to know about the emergency he shall quickly reach the Emergency Control Center.
- Keep in constant touch with Chief Emergency Controller & Incident Controller and offer his expert advice.
- Ensure that rescue is provided to affected persons, as needed on priority.
- Mobilize Personal Protective Equipment's and other Safety Appliance.
- Keep communicated with the Manager- HSE at the Site of Emergency for further requirements of emergency support.

RESPONSIBILITIES OF TEAM-II EXTERNAL COMMUNICATION TEAM

Head-HR/ Head-Commercial/ Manager-HR shall be overall responsible for the emergency and related communications. He shall remain in constant contact with Chief Emergency Controller to assess the situation after getting details from the Chief Emergency Controller, and take following actions—

1. He will report immediately to Chief Emergency Controller
2. Prepare record of affected personnel with local and permanent address.
3. Inform Director of Factories about the incident.
4. Remain in contact with CEC.
5. Get in touch with the Administration, competent person, Police, MD-Office, CHRO, Corporate communication to communicate the details of emergency.
6. The team shall indicate to all, should there be a likelihood of an offsite Emergency emanating from the onsite Emergency.
7. All information to stockholders will be provided by Chief emergency controller (Site Head) or Head-HR, IR & personal.
8. The responsibility of site head & head-HR,IR & Personal to make draft report for communication to media & community.
9. Name of casualties to be passed in writing by **Mr.Saurabh Bhattacharya** via SMS,email WhatsApp to next of kin.
10. All message & communication released to outside factory will be approved by Site head or Head-HR, IR& Personal.

Haldia
SDO Haldia
Police
HDA(Haldia Development Authority)
Fire Brigade
State General Hospital
WBPCB(West Bengal Pollution Control Board)
Factory Inspector
SDPO
Local Media
General Manager(IOC,HPL,MCPI)
Deputy Chairman(HDC–Haldia Dock Complex)
Local MLA
Public and Employees
Tamluk
District Magistrate
Corporate Office, Kolkata
Managing Director

Group-2 INCIDENT CONTROL TEAM

Incident Control Team has been identified to handle emergency from site. The team is headed by designated "Incident Controller" which works at emergency site under the guidance of Manager- Safety until it takes over by any other Sr. Manager as Incident controller if the severity of situation is high. The team will be responsible for all the activities at the site of accident. It will be assisted by Process operators/fitters/security guards as per requirement.

RESPONSIBILITIES OF INCIDENT CONTROL TEAM

1. Direct all efforts to contain and the control incident.
2. Keep non-essential persons away from the site
3. Guide outside emergency services at the site

For Ammonia Emergency

1. Incident Controller – Shift In-charge Ammonia Terminal-1 (For Ammonia tank site area) / Shift In-charge-DAP-1 & 2 (for DAP area)
2. Plant Head-DAP(Alternate Incident Controller)
3. Shift In-charge-DAP Engineering
4. Head-Security/Security Supervisor
5. Manager-HSE

For Fire in Sulphur Yard/Leak in Sulphuric Acid Storage Tank

1. Incident Controller–Shift In-charge-SAP(Alternate-Plant Head-Acids)
2. Shift In-charge-Acids Engineering
3. Head-Security/Security Supervisor
4. Manager - HSE

For Fire in Tank Farm

1. Incident Controller- Sr. Manager Stores(Alternate-HOD-Stores)
2. Incident Controller (Odd hours) –Shift In-charge-SAP
3. Shift In-Charge-Acids Engineering
4. Head-Security/Security Supervisor
5. Manager - HSE

For Major Fire in Other Area

1. Incident Controller–Shift In-Charge-Plant(Alternate-Plant Head)
2. Shift In-Charge–Plant Engineering
3. Head-Security/Security Supervisor
4. Manager - HSE

For Emergency due to Loss, theft, fire, explosion& Failure of shutter or damage to the Nucleonic Gauges

1. IncidentController–Head-Instrumentation(Alternate-ShiftIn-charge–Instrumentation)
2. Shift In-Charge–DAP1/2
3. Head-Security/Security Supervisor
4. Manager - HSE

4. Plant RSO
5. Arrange to remove any casualties at the site
6. Keep in touch with Emergency Controller

ACTIONS BY INCIDENT CONTROLLER

Designated Assistant Manager / Manager shall act as the Incident controller till he is relieved by another Sr. Manager (if required). Respective Plant Manager (HOD) will take the charge from incident controller if he is present at site. Incident Controller shall report to the location of emergency and shall use his specialized knowledge to control the incident. Following managers are designated as Incident Controllers, till they are relieved by a designated manager.

Ammonia related emergency	:Shift In-charge Ammonia Terminal-1 (For Ammonia tank site) / Shift In-charge-DAP-1 & 2 (for DAP area))
Sulphur fire/Sulphuric acid leak	: Shift In-Charge-Acid(Alternate: Plant Head-Acids)
Fire in tank farm	:Shift In-Charge-Acid(Alternate: Plant Head-Acids)
Any other fire	:Shift In-charge-Plant(Alternate: Plant Head-Plant)

In case of emergency in respective area, identified Incident Controller shall take the following actions—

1. Incident controller shall wear a Red & White helmet and Orange reflective jacket for easy identification. Provided from Fire tender.
2. Rush to the site of incident and take necessary steps to control the incident. Incident controller shall remain at the site of incident till the incident is brought under control.
3. Keep the Emergency Controller informed regarding status of the incident and take actions as per his advice.
4. Control all actions at site of incident, including shutting down of affected plant.
5. Guide Fire fighting personnel.
6. Evacuate the affected plant, if necessary.
7. If anybody is affected by the incident, ask security supervisor to move him to the hospital.

ACTIONS BY MANAGER-HSE

Manager- HSE will be at the location of the Incident and will guide the Incident Control Team which is headed by Incident Controller. He will be responsible for all the activities at the site of accident.

ACTIONS BY ESSENTIAL PERSONNEL

During Emergency operators, filters, technicians have to participate in handling the emergency.

1. In case of ammonia emergency DAP Process operators, the Ammonia plant operator and fitters should work under the guidance of Incident Controller.
2. In case of Sulphur fire SAP operators should work under the guidance of Incident Controller.

3. In case of a Fire in Tank Farms to re personnel should work under the guidance of Incident Controller. Similarly in odd hours the acid operators should work under the guidance of Incident controller.
4. In case of any other emergency situation, personnel in the concerned department should assist the Incident Controller to handle the emergency.
5. Panel Operators of each plant should keep a watch on plant operation during an emergency. They should take emergency shut down of their plant when advised by their Plant Manager or Emergency Controller.

Group-3 ASSEMBLY POINT TEAM

Assembly point team is a group of people which guides non-essential personnel at various Emergency Assembly Points. Typically Plant Manager of shift are the part of Assembly Point Team. Each assembly point will have two display boards marked with "FIRST AIDERS" and "FIRE FIGHTERS" to identify those critical personnel easily from the crowd. So the first aiders will stand in front of First Aider board and the fire fighters will stand in front of Firefighter board.

ACTION BY PLANT IN CHARGE OF THE SHIFT

On hearing emergency siren plant shift incharge shall take following actions-

1. Rush to respective assembly points.
2. Ring up gate lodge (Phoneno.607) and find out the cause of siren. If phone is not working send a running messenger to the gate.
3. Guide personnel who have assembled at the Assembly points.
4. Head count of personnel in their sections. If somebody from another section is present then inform that section on phone.
5. If a major emergency is declared by the Emergency Controller, then Plant Assistant Manager should be prepared to take following actions as per advice of Emergency Controller.
 - Safe stoppage of plant if advised by Emergency controller.
 - Evacuation of personnel if advised by Emergency controller. Officer concerned should advice personnel about safe route for escape.
 - Assist Emergency Controller in any other way as required by the Emergency controller.

ACTION BY FIRST AIDERS

1. Designated First Aiders shall report to respective Assembly points and may be called to the Medical Centre or the location of emergency by the Medical staff or the Emergency controller as needed. The trained first aiders can be identified by RED CROSS mark on the helmets/ or, display board at every assembly points to identify First Aider. First Aiders to stand separately in front of Display board marked with "FIRST AIDERS" at every Emergency Assembly points.

4.0 ACTIONS BY ALL OTHER IIP PERSONNEL

1. Persons who have not been specified a duty in case of emergency should proceed to/contact the Emergency Assembly Point in their area.
2. Designated persons will carry out the actions detailed in Emergency Procedure, under the guidance of the Plant Assistant Manager, after that they will go to their emergency assembly point.
3. The assembly point leader at each point will hold a roll call.
4. Personnel not at their normal work place must go to the emergency assembly point of area they are visiting.
5. Personnel will remain at these points and wait instructions from the Emergency controller.

5.0 ACTIONS BY CONTRACTORS EMPLOYEES

1. Contractor's employees have been instructed in the Emergency Procedures before commencing work on this site (Induction training and re-training)
2. They will report to the nearest emergency assembly point on this site. The Emergency Controller will ask any member of the emergency control team to guide them in case a major decision like evacuation from the factory is taken.

6.0 ACTIONS BY VISITORS

1. Infrequent visitors registered on each visit and given a visitors pass. Such visitors are allowed access at the Administration building only. They should proceed to the assembly point close to Administrative building or else they may be directed by Manager (to whom the visitor has planned to visit) to leave the site if safe.

EMERGENCY RESPONSE PROCEDURES FOR IDENTIFIED EMERGENCY SITUATIONS

1.0 MAJOR RELEASE OF AMMONIA

Ammonia is stored in a 10000 MT atmospheric storage of Ammonia Terminal-1. Ammonia spillage of even a few tonnes should be regarded as a major hazard. A major spillage of ammonia should be regarded as a disaster situation. Information on toxic limits of ammonia in air is given in 3.2.3. Practical experience on ammonia spillage has shown that, when released from pressure vessels, the gas in contact with air forms a thick white suffocating cloud which sticks close to the ground and does not disperse easily especially in humid atmosphere. By virtue of this property, ammonia gas does not readily penetrate into sealed buildings, so that any person who is prevented from leaving an office or similar structure by ammonia cloud, may remain there in reasonable safety for some time, simply by closing and sealing all windows and doors and switching off Air-conditioning systems. Further, it has been found that the

Ammonia could be approached closely from up-wind without breathing equipment. This property should be noted by tackling the source of the leak.

ACTION PLAN

This plan outlines the Emergency Response procedures for the following situations

1. Leakage from Atmospheric storage tank of Ammonia Terminal-1

Steps to be taken on identification of leak

- a. Actuate Emergency Siren.
- b. Take action as per Emergency shut down Procedure. Use personal protective equipment.
- c. Phone 666 and give details of emergency of the security guard.
- d. Phone 632/634 and give details of emergency to plant officer/panel operator.
- e. Inform to the Emergency Controller & keep in touch with him regarding further resource requirements.
- f. For minor leakage, attempt to attend the leakage with the help of maintenance team using SCBA set & other PPEs. Fire tender to be reached quickly & water curtain to be used for water spray system.
- g. For major leakage, follow the Off-site Emergency plan.

2. Leakage of ammonia from pipe line inside/outside granulation plant

Steps to be taken on identification of leak

- a. Actuate Emergency Siren.
- b. Take action as per Emergency shut down Procedure. Use personal protective equipment.
- c. Phone 666 and give details of emergency of the security guard.
- d. Phone 632/634 and give details of emergency to plant officer.
- e. Keep personal protective equipment ready for use.
- f. Inform to the Emergency Controller & keep in touch with him regarding further resource requirements.

In case of leak in ammonia Cross Country pipe line (CCPL)

a) During precooling

1. Stop pre-cooling pump at Ammonia terminal
2. Isolate the interconnecting valve of 16" & 4" lines at jetty platform
3. Send the Fire tender for making the water curtain at leaky area
4. Inform the local police and the fire services, Factory inspector, WBPCB, ADM through External communication team.
5. Start evacuation by depressurizing the line towards the storage tank. To increase the evacuation rate take flare in line.
6. For minor leakage, attempt to attend the leakage with the help of maintenance team using SCBA set & other PPEs.
7. For major leakage, follow the Off-site Emergency plan.
- 8.

b) During Ship unloading

1. Stop Ship pump at HDC jetty
2. Isolate the valve at Jetty platform
3. Send the Fire tender for making the water curtain at leaky area
4. Inform the local police and the fire services, Factory inspector, WBPCB, ADM through External communication team.
5. Start evacuation by depressurizing the line towards the storage tank. To increase the evacuation rate take flare in line.
6. For minor leakage, attempt to attend the leakage with the help of maintenance team using SCBA set & other PPEs.
7. For major leakage, follow the Off-site Emergency plan.

c) During normal condition (no flow-pipe hold up)

1. Isolate the valve at Jetty platform
2. Send the Fire tender for making the water curtain at leaky area
3. Inform the local police and the fire services, Factory inspector, WBPCB, ADM through External communication team.
4. Start evacuation by depressurizing the line towards the storage tank. To increase the evacuation rate take flare in line.
5. For minor leakage, attempt to attend the leakage with the help of maintenance team using SCBA set & other PPEs.
6. For major leakage, follow the Off-site Emergency plan.

Safety measures against certain incident which may cause major hazards

EVENTS	MEASURES ADOPTED
a) Rupture of pipeline due to impact of running vehicles	<ul style="list-style-type: none"> • Ship unloading pipeline is passing through the bank of river Hoogly and is regular movement vehicles. Crash barrier has been provided at critical area wherever there is road, for the movement of vehicles. Also caution sign and safety posters displayed for awareness.
b) Rupture of pipeline due to high pressure	<ul style="list-style-type: none"> • Ship unloading pipeline is designed for 30kg per cm² whereas operating pressure is 10kg per cm² and pump shut off pressure is 22 kg per cm². • Thermal relief valves have been provided to prevent high pressure of ammonia. • In PLC at control room line temperature and pressure indicator provided for constant watch on the status of the pipeline.

	<ul style="list-style-type: none"> • Within three to four days 90% of the hold of volume of the pipeline is evacuated and constant draw of vapour from the pipeline do not allow the pipeline pressure to increase.
c) Rupture of pipeline due to slug flow or thermal shock during initial stage of ship unloading.	<ul style="list-style-type: none"> • Before 72 hours of arrival of ammonia ship cooling down process of the pipeline is started under close supervision of engineers who have 15 to 20 years of experience in similar operations. • Pipeline is designed to withstand any inadvertent slug flow. • Pipeline is provided with sliding support and anchor support along with expansion loop to take care of construction / expansion due to thermal shock. • Supports are regularly checked.
d) Leakage from pipeline due to corrosion	<ul style="list-style-type: none"> • Ammonia is not corrosive as such inside corrosion is practically ruled out. • Pipeline is insulated with special type PUF insulation which adequately prevents any ingress of water from outside which can cause corrosion. • Adequate corrosion allowances has been incorporated in design itself.
e) Overfilling of tank	<ul style="list-style-type: none"> • Two different type of level indicators have been provided. • In case of high level inlet valve to tank will automatically close
f) Over pressurization of Tank	<ul style="list-style-type: none"> • Two independent Pressure indicator and alarm system provided. • Adequate refrigeration system provided with back up power. • At a preset pressure Flare valve will open and flaring will start with Alarm. • Two safety valves have been provided to take care of high tank pressure.

2.0 MAJOR FIRE IN SULPHUR YARD AT FACTORY/DOCKSITE

1000 MT of sulphur is stored in the sulphur yard in the factory and 9000 MT sulphur is stored at the dock site storage. Sulphur can catch fire due to any source of ignition. A fire in the yard will emit toxic fumes of SO₂ gas. This can affect personnel in the vicinity as well as people in the neighborhood. While fighting a fire in sulphur yard, one must stay upwind of the fire and use suitable respiratory aid if necessary. Water is the most suitable media to fight against Sulphur fire.

ACTION PLAN

Fire in the Sulphur Yard at factory

- a. Blow Level-1 emergency hooter from nearest MCP and then inform security on internal telephone 666.
- b. Phone 639/647 and give details of emergency to plant officer/panel operator.
- c. Check air direction and stray up wind. Evacuate people from down wind direction.
- d. Connect fire hoses on the hydrant points located on the up wind direction. (use fire engine/portable fire pump to fight fire from welfare block end).
- e. Spray water on the Sulphur heap to put out the fire.
- f. If fire is in one compartment only, prevent spread to the second compartment by spraying water on the second compartment.
- g. If fire is big, call fire brigade for assistance.
- h. Use canister mask or breathing sets if required. A wet nose mask or cloth covering nose will also be of help.

Fire at the Dock site storage yard

- a. Security guard will inform the factory and West Bengal fire brigade and HDC fire brigade.
- b. Start extinguishing fire from the fire hydrant system located at Dock site.
- c. Shift Manager/security supervisor will send fire engine, portable fire pump and canister type mask.
- d. Water hoses available at Dock site will be used to fight fire till the fire brigade arrives.

3.0 MAJOR FIRE IN TANK FARM LOCATED NEXT TO STORE

276 KL Furnace Oil, 100 KL of High Speed Diesel is stored in the Tank Farm area. A fire in this area can spread to any of the tank and become a major emergency. If burning liquid finds its way into the drains, the fire can spread to other parts of the factory. Details of action plan to fight a fire in the tank farm area are given below.

ACTION PLAN

- a. Blow emergency siren and inform security on the internal telephone 666.
- b. While fighting a fire it is advisable to stay up wind.
- c. If fire is small use appropriate fire extinguisher. For fires in liquid hydrocarbons Foam type, ABC or CO₂ fire extinguishers can be used.
- d. If fire is big use foam eject or available in Central Workshop. Connect it to fire hydrant point depending on location of the fire. Call fire brigade immediately; clearly inform that it is a liquid hydrocarbon fire.

- e. Ensure all outlets from the tank are closed, to prevent oil from entering the drains.
- f. If fire is in one area, keep adjoining tanks cool by spraying water from fire hydrants.
- g. Water should not be used to fight a liquid fire. At best it can be used as a fine spray from a fog nozzle.

4.0 MAJOR LEAK OF SULPHURIC ACIDS TO RAGE TANKS

Sulphuric acid (98.4%) is stored in four nos. of MS storage tanks. Three tanks having storage capacity of 750 MT & one having 3500 MT of acid. Sulphuric acid is highly corrosive acid. In case of a major leak from one of the tanks due to collapse of tank or tank's structural foundation, acid will spill into dyke constructed around the tank. In case acid does come out of the dyke, it may go to the green belt canal through factory storm water drain. This will affect marine life in the canal.

ACTION PLAN

- a. Blow Level-1 emergency hooter from nearest MCP and inform security on the internal telephone 666.
- b. Avoid contact with acid. Put on proper personal protective equipment before handling the emergency.
- c. Ensure that drain valve of dyke is closed.
- d. If acid is being transferred to the tank, stop immediately.
- e. Stop Sulphuric acid plant. However keep acid circulation on, so that space is available in the circulation tank.
- f. Stop leak if possible i.e. in case leak is in the outlet pipe line close the outlet valve or plug valve operated from top of the tank.
- g. Transfer acid from the leaky tank to the other tank/circulation tank/DAP day tank/road tankers. Use sump pump/acid export pump for this.
- h. In case acid has spilled into storm water drain, neutralize with soda ash stored in the area, to prevent contamination of Storm water drain.
- i. In case acid has spilled on ground near by, contain by constructing a temporary mud/sand dyke and gradually neutralize with lime/soda ash and then flush the area with water.

Note: Do not spray water directly on a large spill as it will generate large amount of heat and acid will splash around. For small spills acid can be flushed with large amount of water taking care that water jet is directed on outside of spill and gradually moving inside.

5.0 ACCIDENTS WITH TANKERS CARRYING HAZARDOUS CHEMICALS

Tankers are used for transporting Phosphoric acid from factory to Dock site, transporting spent acid from factory to factory, sulfuric acid from factory to 3P, Caustic and other chemicals from suppliers to our factory. Depending on the type of hazardous chemicals, the action plan will change as mentioned below.

The frequencies of tanker operation in the factory are given below–

- Phosphoric acid–Average 70 tankers/day
- Sulfuric acid-Average 20-25 tankers/day
- Caustic-Average 1 tanker/day
- Spent acid-Average 6 tankers/day
- Molten Sulphur-Average 5-8 tankers/day

ACTION PLAN

Material Safety Data Sheet of the materials handled in tankers namely Phosphoric acid, Sulfuric acid, caustic, Spent Acid are given in annexure XX.

- a) First of all the area where the accident has happened needs to be cordoned off.
- b) The injured persons need to be rushed to nearest medical center. Based on the advice of the Doctors, the treatment of the injured needs to be carried out.
- c) At site, it has to be seen that the spilled chemicals do not spread to a larger area or water body.
- d) Based on the MSDS recommendations, the chemicals need to be recovered, if possible with proper PPE. Then the balance spilled materials need to be neutralized.
- e) Utmost care to be taken to ensure that the materials do not spread to a larger area, which can affect the human plant & animal life.
- f) Adequate precautions to be taken for flammable & toxic materials in line with the recommendations of MSDS.
- g) Communication to be done with external private & governmental agencies in line with statutory guidelines or for external help.

ACCIDENTS WITH TANKERS CARRYING MOLTEN SULPHUR

Steam jacketed tankers are used for transporting molten Sulphur from Indian Oil Corporation Ltd, Haldia to factory. Depending on the type of hazards involved, the action required to combat the road emergency scenario are as mentioned below.

The frequencies of tanker operation in the factory are given below–

- Molten Sulphur–Average 5-8 tankers/day

ACTION PLAN

Material Safety Data Sheet of molten Sulphur is given in annexure XX.

- First of all the area where the accident has happened needs to be cordoned off.
- The injured persons need to be rushed to nearest medical center. Based on the advice of the Doctors, the treatment of the injured needs to be carried out.
- At site, it has to be seen that the spilled chemicals do not spread to a larger area or water body.
- The molten Sulphur becomes solidified immediately if water is sprayed on it. So it is recommended to spray water on the spilled over materials from nearby water sources.
- Inform factory emergency no.666 for fire tender as soon as possible.
- Utmost care to be taken to ensure that the materials do not spread to a larger area, which can affect the human, plant & animal life.

- Prevent ignition source or naked flame exposed to the spilled sulphur (liq or solid) to avoid fire. In case of fire Sulphur di-oxide gas will evolve and create gaseous atmosphere surrounding and may cause eye and throat irritation to the people.
- Communication to be done with external private & governmental agencies in line with statutory guidelines or for external help.

Based on the MSDS recommendations, the molten Sulphur needs to be recovered, if possible with proper PPE.

6.0 EMERGENCY DUE TO LOSS, THEFT, FIRE, EXPLOSION & FAILURE OF SHUTTER OR DAMAGE TO THE NUCLEONIC GAUGES

There are two nucleonic gauges installed at DAP1 & DAP 2 reactor tank. The nucleonic gauges are protected by SS/MS body with lead plate in side to absorb the rays & protect the gauge from three sides. An emergency may occur due to Loss, theft, fire, explosion & Failure of shutter or damage to the nucleonic device by accidents / operation / servicing /maintenance after installation.

Emergency Response Committee (ERC):

Members of the Emergency Response Committee of our institution is as follows,

- Chairman & Site-In-Charge
- Head- Health, Safety, Environment & Fire
- Head – HR & Administration
- Head– Medical Services
- Radiological Safety Officer (RSO)

List of RSO responsible for each site:

Name of NG Site	RSO Name	Contact Numbers
DAP-1 Plant	RSO-1: Prasenjit Barik	9593465100
DAP-2 Plant	RSO-2: Ankit Rustagi	8145112458
	RSO-3: Prabudhha Sundar Kar	8697567849
	RSO-4: Binit Das	9681106490

The above Radiation Safety Officers/Site-in-charges are responsible for handling emergencies involving radiography devices and Radiography sources at their respective radiography sites. All the emergencies and subsequent operation for handling emergency should be intimated to the Chairman, ERC.

List of Emergency Handling Equipment at Site:

- i. Radiation Survey Meter

Radiation Monitoring Instruments for Handling Emergencies available at site. (Site-wise distribution)

Name of the Radiation Survey Meter	Make of radiation Survey Meter	Range of Survey meter
MINIRAD	Pulsecho	0-5 R/hr
Smart rad Mini	Pulsecho	0-10R/hr

The Site-in-charge of respective site is responsible for carrying out the maintenance of emergency handling accessories regularly.

Procedure for Reporting Emergency:

- i. RSO to report to employer/licensee/Chairman, ERC of the Institution with copy to Head, RSD,AERB.
- ii. Employer/Licensee to report the incident to AERB within 24 hours of its occurrence. Format for reporting Emergency will be used as provided by the AERB.
- iii. RSO to carryout investigations and submit report to AERB
- iv. Lodge a written compliant with the Police in case of loss/theft if IGRED not traced with in 24hours.

General Guide lines to handle emergency situations:

- Rescue is primary concern with ALARA principle
- Cordon off the area
- In fire, fight from up wind side
- Notification to the Responsible person
- Monitoring of radioactive contamination
- Ensure Security of the area

Emergency Situations:

The occurrence if any one or more of the following situations may be deemed constitute an emergency:

- i. Loss/theft of Nucleonic Gauge sources from the stipulated location/sites.
- ii. Loss of Nucleonic Gauge sources during transport.
- iii. Receipt of a nucleonic device from the supplier in a damaged condition.
- iv. Failure of shutter during operation/servicing/maintenance.

Any one noticing any of the above instances should immediately bring the matter to the notice of RSO/Site-in-charge available at the site. Site-in-charge is the only person at site who is responsible person for handling any emergency taking place at site. Radiographer should cordon off the area and act as per the instructions and guidance of Site-in-charge/RSO.

Action Plans for handling the above emergency scenarios:

The following action plans for each of the above emergency scenarios.

Loss/theft of radiography sources from storage/radiography site

- Y Gathered Information Regarding the Source
- Y Collect Handling & Monitoring Equipment
- Y Inform the security.

Procedure to be followed, if area is known;

- Y Determine with survey meter presence of source
- Y Cordon off the area
- Y Switch on survey meter & move in direction where radiation level increases.
- Y Radiation level in R/h indicates source is nearby (RL<1R/hr)
- Y Bring the lead pot and transfer the source with 2 m CV tong to the container
- Y Bend the female coupling portion of the pig tail and connect the drive cable and draw the pig tail back in to the camera.

Procedure to be followed, if location of Source not known

- Y Search for the source in suspected areas
- Y Deploy more search teams
- Y Intimate Regulatory Body
- Y Lodge Police Complaint
- Y Public Announcement after getting clearance from AERB.
- Y Intimation to Government & Municipal Hospitals

- **Loss of Nucleonic Gauge sources during transport.**

RSO to act in consultation with Chairman, ERC

- Upon receipt of information about a transport accident involving the nucleonic device dispatched from the institution, inform Chairman, ERC, or his alternate.
- Proceed to the accident site and act as directed by Chairman, ERC
- Upon controlling the radiation exposure situation at the accident site intimate Chairman, ERC thereof and recommend termination of the emergency
- Upon receipt of advice from Chairman, ERC, about the termination of the emergency return to the institution with the device if it is in a damaged condition or accompany it to its actual destination, if the device is in a damaged condition.

Responsibility of Chairman, ERC

- Y Verify the information provided regarding the off-normal situation before declaring emergency
- Y Convene meeting of the ERC
- Y Direct the Security Officer to trace the device
- Y Intimate to AERB, Niyamak Bhavan, Anu Shakti nagar, Mumbai 400094 regarding the emergency

- Y Upon ensuring that the arrangements have been made for the safe disposal of the device or that it has been safely traced and regained or that it is safe for installation and use, terminate the emergency.
- Y Intimate AERB, Niyamak Bhavan, Anu Shakti nagar, Mumbai 400 094 regarding the termination of the emergency.

- **Receipt of a nucleonic device from the supplier in a damaged condition.**

RSO to act in consultation with Chairman, ERC

- Y Contact the carrier and check how the device was damaged.
- Y Inform AERB, Niyamak Bhavan, Anu Shakti nagar, Mumbai 400 094 and the seller of the device that the device was received in a damaged condition.
- Y Measure the radiation level around the device and record the observations. If the measured levels are in excess of the prescribed limits, report the matter to Chairman, ERC and to AERB, Niyamak Bhavan, Anu Shakti nagar, Mumbai 400094.
- Y Arrange for adequate security for the device in an exclusive storage room.
- Y Act as advised by AERB, Niyamak Bhavan, Anu Shakti nagar, Mumbai 400094 for safe disposal of the device.
- Y If the device is examined by the supplier and thereupon declared safe for installation and operation advise Chairman, ERC to terminate the emergency
- Y Inform AERB, Niyamak Bhavan, Anu Shakti nagar, Mumbai 400094.

Security Officer to act in consultation with Chairman, ERC

- Y Ensure that adequate security is provided to the device until the emergency is terminated.

Fire Officer to act in consultation with Chairman, ERC

- Y Rescue the injured, if any
- Y Fight fire, if there is a fire accident
- Y Segregate the nucleonic device under the supervision of the RSO

Responsibility of Chairman, ERC

- Y Verify the information provided regarding the off-normal situation before declaring emergency
- Y Convene a meeting of the ERC
- Y Direct the Security Officer to provide security to the device
- Y Intimate to AERB, Niyamak Bhavan, Anu Shakti nagar, Mumbai 400 094 regarding the emergency.
- Y Upon ensuring that the device has been safely removed from the premises or that it is safe for installation and use terminate the emergency.
- Y Intimate AERB, Niyamak Bhavan, Anu Shakti nagar, Mumbai 400 094 regarding the termination of the emergency.

- **Failure of shutter during operation/servicing/maintenance**

This incident will be consider as emergency for DAP Plant only & level 1 siren only will be actuated.

Responsibility of RSO

- Υ Inform Chairman, ERC or his alternate
- Υ In case of theft or loss, inform the security department
- Υ In case of fire or explosion contact the fire department for help
- Υ In case of damage to the device, measure the radiation level around the device and record the observations. If the measured levels are in excess of the prescribed limits, report the matter to Chairman, ERC and to AERB, Niyamak Bhavan, Anu Shakti nagar, Mumbai 400094

Responsibility of Fire Officer

- Υ Rescue the injured, if any
- Υ Fight fire, if there is a fire accident
- Υ Segregate the nucleonic device under the supervision of the RSO

Responsibility of emergency controller

- Υ Keep in touch all the emergency response personnel
- Υ Act as directed by Chairman, ERC.

Responsibility of Transport Officer

- Υ If it is required to transport persons out of the institution premises, arrange for the necessary transportation.

Responsibility of Medical Officer

- If any person is injured or undergoes trauma, provide the necessary medical attention.

Responsibility of Chairman, ERC

- Υ Verify the information provided regarding the off-normal situation before declaring emergency.
- Υ Convene a meeting of the ERC
- Υ Direct the Security Officer to provide security to the device after cordon off the radiation zone.
- Υ Intimate to AERB, Niyamak Bhavan, Anu Shakti nagar, Mumbai 400 094 regarding the emergency.
- Υ Upon ensuring that the arrangements have been made for the safe disposal of the device or that it has been safely traced and regained or that it is safe for installation and use, terminate the emergency.
- Υ Intimate AERB, Niyamak Bhavan, Anu Shakti nagar, Mumbai 400094 regarding the termination of the emergency.

PERSONS TO BE CONTACTED IN THE EVENT OF AN EMERGENCY

	Name of Person/Agency	Designation	Mobile Number	Telephone Number
Site-in-charge / Head of the Institute / Chairman, ERC	Chandra Shekhar Prasad	Chief Operating Officer	9564288100	03224-660658
Radiation Safety Officer-1	Prasenjit Barik	Instrumentation Engineer	9593465100	03224-660709
Radiation Safety Officer-2	Ankit Rustagi	Instrumentation Engineer	8145112458	03224-660724
Radiation Safety Officer-3	Prabuddha Sundar Kar	Instrumentation Engineer	8697567849	03224-660725
Radiation Safety Officer-4	Binit Das	Instrumentation Engineer	9681106490	03224-660725
Fire & Safety Officer		Head – Health, Safety, Environment & Fire	9564241100	03224-660682
Medical Officer		Head - Medical Services	7602478999	03224-660662
HR & Administration		Head – HR & Administration	9593060100	03224-660701
Police	Durgachak Police Station			03224 - 251111
Local Hospital	State General Hospital			03224- 274108/ 278112
AERB Official	Shri R. K. Singh	Section Head, AERB		022-25990417
AERB Official	Dr. P.K. Dash Sharma	Head, Radiological Safety Division		022-25990656

EMERGENCY FIRE ALARM

1.0 EMERGENCY FIRE ALARM ZONE AND MANUAL CALL POINTS

Zone No. – 1	Location of Manual Call Point
DAP1	DAP1ground Floor
Zone No. – 2	Location of Manual Call Point
DAP1	DAP1 First Floor
Zone No. – 3	Location of Manual Call Point
DAP1	DAP1ControlRoom
Zone No. – 4	Location of Manual Call Point
DAP2	DAP2 Ground Floor
Zone No. – 5	Location of Manual Call Point
DAP2	DAP2 First Floor
Zone No. – 6	Location of Manual Call Point
DAP2	DAP2 Control Room
Zone No. – 7	Location of Manual Call Point
DAP1	DAP1 Back site Hag(Near ETP)
Zone No. – 8	Location of Manual Call Point
FCC Building	FCC First Floor Laboratory
Zone No. – 9	Location of Manual Call Point
DAP Bagging	DAP Bagging Ground Floor(Near P K Das Supervisor Office)
DAP Bagging	DAP Bagging First Floor
Zone No. – 10	Location of Manual Call Point
SSP	SSP Control Room
SSP	SSP Ground Floor
SSP	SSP Bagging
Zone No. – 11	Location of Manual Call Point
New Ware House	New Ware House Loading Point=01
New Ware House	New Ware House Loading Point=02
New Ware House	New Ware House Loading Point =03
Zone No. – 12	Location of Manual Call Point
Compressor House	Compressor House

Zone No. –13	Location of Manual Call Point
SAP1	SAP1 Control Room
Zone No. –14	Location of Manual Call Point
SAP2	SAP2 Control Room
Zone No. –15	Location of Manual Call Point
SAP2TG	SAP2 TG Control Room
Zone No. –16	Location of Manual Call Point
PAP	PAP Control Room
Zone No. –17	Location of Manual Call Point
Central Lab	Central Lab First Floor
Zone No. –18	Location of Manual Call Point
Tank Farm Area	Tank Farm Area Near Electrical Department
Zone No. –19	Location of Manual Call Point
Work Shop	Central Workshop
Zone No.– 20	Location of Manual Call Point
Ammonia Control Room	Ammonia Control Room
Zone No.–21	Location of Manual Call Point
New Weight Bridge	New Weight Bridge(Logistic Department)
Zone No.– 22	Location of Manual Call Point
ADM	ADM Ground Floor
Zone No.– 23	Location of Manual Call Point
CPP	CPP Ground Floor
CPP	CPP Control Room
Zone No.–24	Location of Manual Call Point
Main Gate	Repetition From Smoke Panel

2.0 EMERGENCY SMOKE FIRE ALARM ZONE

ZONE-1

1. System Computer Room
2. System Servicing Room

ZONE-2

1. Accounts Department

ZONE-3

1. Engineering Store

ZONE-4

1. HR Department

ZONE-5

1. Zeolite Office Building 1st Floor

ZONE-6

1. Zeolite both Training hall 1st Floor

❖ Location Wise Smoke detector Installation List

Sr.no.	Plant/Location	No. of SD	ISD	OSD	HD	MD
01	SAP-1	10	7	03	-	
	Zone-1 New mcc room	02	1	1		
	Zone-2 DM plant mcc room	02	1	1		
	Zone-2 DM plant control room	01	1			
	Zone-2 RO plant	01	1			
	Zone-2 Package boiler	02	1	1		
	Zone-3 SAP-1 control room (Instrument cabin backside)	01	2			
02	SAP-2	23	20	-	03	
	Zone-1 TG control room		04			
	Zone-2 SAP-2 Mcc room 1 st floor		10			
	Zone-3 SAP-1 New mcc room		04			
	Zone-3 SAP-2 Control room		02			
03	SAP (Other)	40	37		03	
	Zone-1 Control room		02			
	Zone-2 MCC room		10			
	Zone-3 Instrument DCS room		03			
	Zone-4 VFD room		05			
	Zone-5 PCC & New mcc room 1 st floor		12			
	Zone-5 Transformer area		03		03	
	ZONE-6 Sulphur Grinding Shed		2			
04	DAP-1	36	30	02	04	
	Zone-1 Control room		03			
	Zone-2 Transformer room (Northside)		04	02	04	
	Zone-3 MCC room (WestSide)		08			
	Zone-4 MCC room (MiddleSide)		11			
	Zone-5 MCC room (EastSide)		02			
	Zone-6 MCC & Ammonia VFD		02			
05	DAP-2	36	32	-	04	
	Zone-1 Control room		04			
	Zone-2 MCC room 1 st floor		22			
	Zone-3 MCC room 1 st floor		01			
	Zone-4 Booth transformer room				04	
	Zone-5 VFD & NPK MCC room G/f		01			
	Zone-6 Substation (New)		04			

06	DAP Bagging Plant	11	11			
	Zone-1Control room 1 st floor		02			
	Zone-1-2 nd floor MCC room		05			
	Zone-2 New warehouse MCC room		04			
07	SSP Plant	18	14		4	
	Zone-1SSP Control room		02			
	Zone-2 MCC & VFD room		12			
	Zone-3 Both transformer room				04	
08	CPP	14	14			
	Zone-1 MCC room		07			
	Zone-2 Front side MCC room		07			
09	HR Dept.	15	00	15		
10	ADM building	56		56		
11	Engineering store	40		40		
12	33 KV Substation	16	16			
	Zone-1 33 KV MCC room		08			
	Zone-2 33 KV MCC room		08			
13	Compressor house	05	0	05		
	Zone-1 Compressor-C			01		
	Zone-1 Compressor-D			01		
	Zone-1 compressor-E			02		
	Zone-2 MCC room			02		
14	Sulphonation	08	08			
	Zone-1 MCC panel room 1 st floor		08			
15	Ammonia control room	07	03	04		
	Zone-1 MCC room		02	02		
	Zone-2 east side MCC			02		
	Zone-3 Control room		01			
16	Zeolite Building	35	08	27		
	Zone-5 Workstation		08	07		
	Zone-6 New Training Centre 1&2			20		
17	Empty Bag Godown	08		08		
18	Employee canteen	07		07		
19	STG building	27			02	25
20	VFD building	04				04

SUMMARY

Smoke Detector Category	Qty
Ionization Smoke detector(ISD)-	340
Optical Smoke Detector(OSD)-	56
Heat Detector(HD)-	21
Multisensory Detector	29

Total=446

Fire Alarm Control Panel Board

Capacity	Qty
30-ZoneControlPanel	04
06-ZonecontrolPanel	11
04-ZoneControlPanel	04
10-ZoneControlPanel	01

Total=20-Nos

☐ In ATO-1:

Optical Smoke Detector (OSD) : 23 nos.
09-Zone Fire alarm Control Panel : 16

ASSEMBLY POINTS

1.0 ASSEMBLY POINTS LOCATIONS AND CONTACT NUMBERS

SL	Assembly Point	Area Covered	Intercom
1	East side of STG building	SAP-1&2,STG	639/630
2	Infront of DAP/SAP Engineering	DAP-1&2,Engineering (Acids& DAP), Stores, RM Stores, Central workshop, Electrical, Instrument, Lab	634/630/648
3	Infront of SSP Engineering	SSP,SSP Bagging & DAP Bagging Area, Old and New Ware house	672/641
4	Near Parking Gate Weighbridge	Weigh bridge, Parking	613/608
5	Infront of Admin Building	Admin Building	758/671/661
6	Lawn Welfare Block(During General Shift only)	HR, Canteen, Zeolite office, Compressor	700/618
7	Ammonia Terminal1 (South side gate)	Ammonia terminal -1 area	686 / 9800227307
8	Ammonia Terminal 1 (North side of Cooling tower)	Ammonia terminal - 1 area	686 / 9800227307

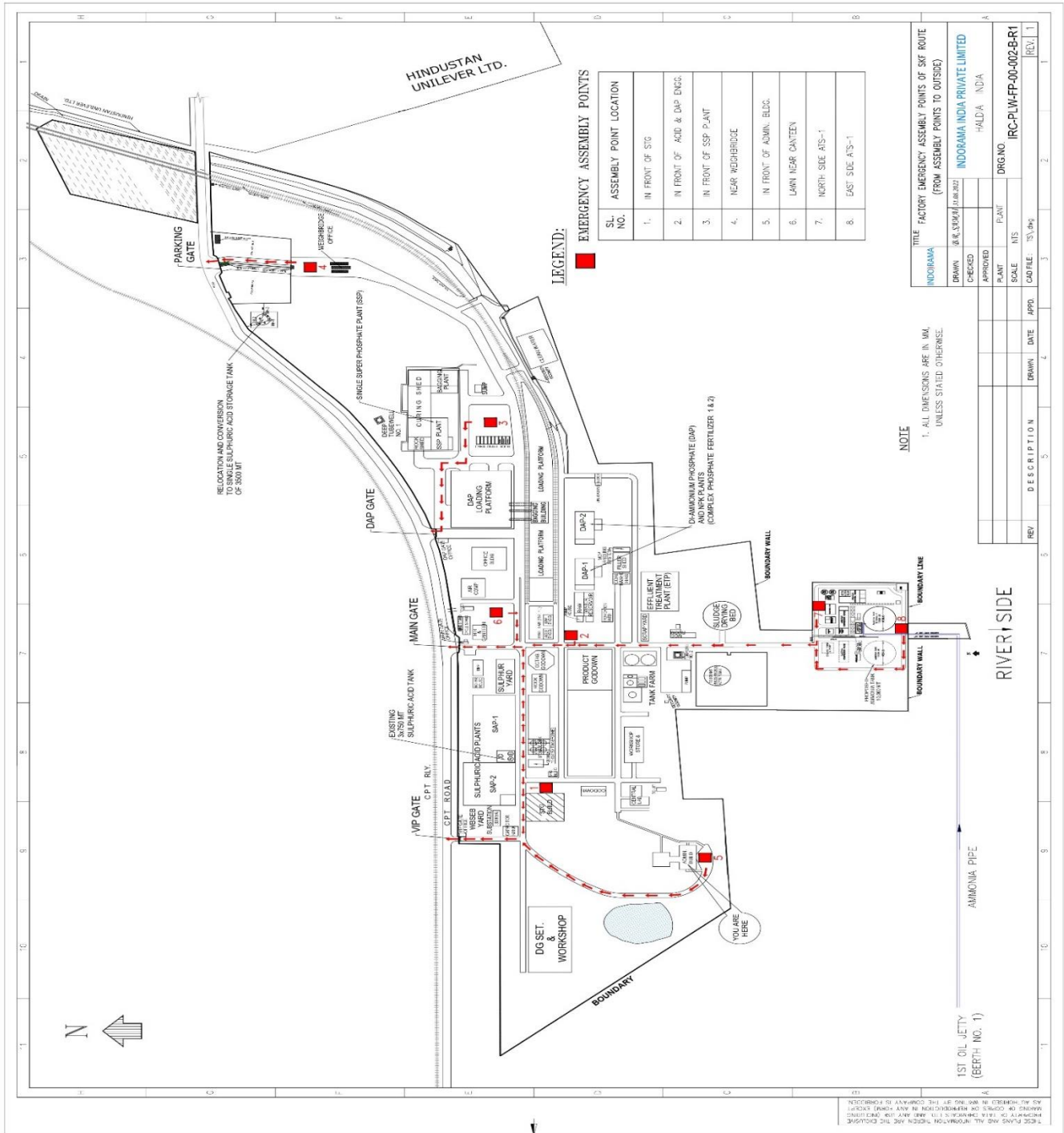
2.0 ROLL CALLER TEAM RESPONSIBILITY

ROLL CALL LEADERS are the persons who carryout Roll Calls at the Emergency Assembly Points.

1. To assemble at assembly point were designated for roll call.
2. To make assemble employee & contractor at assembly points.
3. The head count is to be carried out at assembly point.
4. To gather information from emergency control center.
5. To be in constant touch with emergency control center.
6. To find out first aider& fire fighter at assembly point & make them stand near designated board.
7. To inform ECC team about the number of employee &contract employee assembled at assembly point.

List of Roll Call Leaders

SL. NO.	Assembly Point	Roll Call Leaders	Intercom
1	East side of STG building	Field Operator of SAP1/2	639/630
2	Infront of DAP/SAP Engineering	Field Operator of DAP1/2	634/630/648
3	Infront of SSP Engineering	Shift Incharge of SSP	672/641
4	Near Parking Gate Weighbridge	Manager - SCM	613/608
5	Infront of Admin Building	Manager – Purchase (Alt.: Officer/ Manager – Accounts)	758/671/661
6	Lawn Welfare Block(During General Shift only)	Manager - HR	700/618
7	Ammonia Terminal1 (South side gate)	Shift Incharge - Electrical	686 / 9800227307
8	Ammonia Terminal 1 (North side of Cooling tower)	Shift Incharge - Electrical	686 / 9800227307



EMERGENCY CONTACT NUMBER

1.0 CONTACT NUMBERS FOR INTERNAL COMMUNICATIONS

Team	Name	Designation	Office	Mobile
Chief Emergency Controller	C.S.Prasad	Plant Head	660	9564288100
Chief Emergency Controller(Alternate)	Bhaskar Datta / R P Singh	Head – Production / Head - Engg	658 / 678	9564139100 / 9593516100
Emergency Controller		Emergency Controller		7602111004
Emergency Controller (Alternate)		Shift Incharge-Acid	639	
		Shift Incharge-DAP	632/633/634	
		Shift Incharge-SSP	672	
Control Centre	C S Prasad	COO	660	9564288100
	RP Singh	Head - Engg.	678	9593516100
	Amitabh Chouhan	Head - E&I	723	9564062100
	Chanchal Ghosh	Head - HSE	682	9564241100
Control Centre(Alternate)	Amitabh Chouhan	Shift In-charge-Electrical	654	9564062100
	Dr. Monica Das	Medical Officer	662	8250149610
External Communication	Saurabh Bhattacharya	Head-HR	700	9593060100
	Binod Agarwal	Head-Accounts	702	9734144413
Incident Controller		Shit In Charge – DAP	632/633/634	
		Shift In charge - SAP	639	
	Ashes Adhikary	Store In charge	722	9564275430
Incident Controller (Alternate)	Anjan Bhowmick	Plant Head - DAP	762	9434300426
	Harihar Datta	Plant Head –Acids	640	9227434600
	Sanjoy Roy	Plant Head –SSP	672	9564138100
		HOD-Stores	722	9593461100
Incident Control Team	Samir Dinda	Head - Mech	731	9593501100
	Abhik Saha	Manager–HSE	683	9564438100
Others	Atish Panda	Head-RMP & Civil	601	9564191100
	Sukanta Singh	Head-Commercial		9732921100
	Prasenjit Barik / Ankit Rustogi	Manager–Inst./RSO	606	9593465100 / 8145112458
Corporate Communication			(033) 66343100	
Incident controller (Alternate)		Ammonia terminal-1 Control Room	686	9800227307

N.B.: Manager defined as Asst. Mgr, Dy. Mgr., Mgr., Sr. Mgr., AGM, DGM & GM except HOD.

EMERGENCY CONTROL ROOM : 666/664/663/657
STD CODE-HALDIA : 03224

2.0 CONTACT NUMBERS FOR EXTERNAL COMMUNICATIONS

	Contact No.	
FIRE BRIGADE(HALDIA)		
WEST BENGAL FIRE BRIGADE	252500	101
HPCL FIRE BRIGADE	222647/278113	
IOC FIRE BRIGADE	251108	
MCPI FIRE BRIGADE	277472/273651	
HDC FIRE BRIGADE	252480/252433	
HPL FIRE BRIGADE	222675	
POLICE STATION (HALDIA)		
HALDIA POLICE STATION	251112	100
DURGACHAK POLICE STATION	251111	--
HOSPITAL (HALDIA)		
STATE GENERAL HOSPITAL	274108/278112	--
DR.B.C.ROYHOSPITAL	269048	--
HDC HOSPITAL	263265/263388	--
AMBULANCE(HALDIA)		
HALDIA MUNICIPALTY	275289	102
GOVERNMENT AUTHORITIES(HALDIA)		
FACTORY INSPECTOR	274105	--
WBPCB,HALDIA	274190/276847	
S.D.O.	274015/263131	
HDA,CEO	274154/274164	
TAMLUK (STD CODE 03228)		
DISTRICT MAGISTATE	266098	--
POLICE SUPERIDENT	269850	-
STATE GENERAL HOSPITAL	266059	--
KOLKATA (STD CODE 033)		
CHIEF INSPETORATE OF FACTORIES	22103274	--
WBPCB(MEMBER SECRETARY)	23356213/23356730	

3.0 TELEPHONE HOT NETWORK

Sr.No.	Name	PhoneNo.
1	Additional District Magistrate, Haldia Central Control Room(OFFICE)	278100
2	Additional District Magistrate, Haldia(R)	262100
3	Additional S. P. Haldia	278116
4	Sub-Divisional Officer. Haldia	278110
5	Sub-Divisional Police Officer, Haldia	278109
6	Haldia. P.S.(Alternate Control Room)	251112
7	Durgachak P.S	251111
8	Bhawbanipur P.S	251113
9	Sub-Divisional Hospital. Haldia	278112
10	I.O.C Hospital. Haldia Township	262101
11	K.P.T. Hospital Haldia Township	262102
12	Haldia Development Authority	278111
14	B.P.C.L.	251103
16	Exide Industries Ltd.	251102
17	ElectoSteel Castings Ltd.	278107
18	Haldia Petro Chemicals Ltd.	278113
19	Hindusthan Uni-Lever Ltd.	251105
21	H.P.C.L	251104
22	I.O.C.L.Haldia Refinery	251108
23	I.O.C.L.Haldia Baruani Crude Oil Pipeline	278103
24	Indian Oil Petronas Pvt.Ltd.	278104
26	Marcus Oil& Chemicals Pvt Ltd	278106
27	MCPI Private Ltd.	275572/73
29	Praxair India Pvt Ltd.	278101
31	R.D.B.Rasayans Ltd.	278108
32	IVL Dhunseri Petrochem Ltd.	278114
33	United Phosphorus Ltd.	251109

ANNEXURE-1

CONTINGENCY PLAN FOR HANDLING NATURAL CALAMITIES

INTRODUCTION

Natural Calamities are the occurrence that causes damage, economic disruption, loss of life and deterioration of health and health services on sufficient scale to warrant an extra ordinary response from outside the affected community or area or it is a crises situation which cannot be dealt by the affected community with its own resources. Classification of Natural Calamities–Natural Calamities can be classified into three types

- Cyclone
- Earthquake
- Floods.

SCALE OF EMERGENCY

Stage:I

Public authority intimates automatically as soon as the emergency is declared. The objective of this stage is smooth flow of traffic on the evacuation routes to ensure that these routes are kept cleared.

Stage:II

This stage shall be implemented when the emergency requires evacuation or when spontaneous evacuation begins to occur. In this stage traffic shall not be permitted to enter the primary zones and it shall be suitably diverted.

Stage:III

This stage shall be implemented when sectors and zones are specified for liable evacuation and Trucks; Buses, Ambulance etc. shall be deployed to enter the specific areas for evacuation of designated temporary shelters.

TYPE OF EMERGENCY

Level-1

The healthy people would not suffer any long lasting effect except discomfort and property loss.

Level-2

Significant part of those exposed would be seriously injured or killed.

SCOPE OF CONTINGENCY PLAN

In case of major natural calamities, the population and environment of and around the factory premises are likely to be effected. To great extent various public authorities required to act quickly and take action as marked in Contingency Plan.

OBJECTIVE

1. To minimize the damage/loss of properties & environment and to safe guard the people.
2. If necessary, to rescue/evacuate and shift them to safe place(including injured persons)
3. To provide the information both about the incident and the action taken by authorities.

This plan covers various activities to be taken by the different public authorities in case of a major emergency arising out of the natural calamities taking place in Haldia and surrounding. The Plant Head will be in-charge of all activities for handling the emergency in inception stage; later on SDO- Haldia District Collector, East Medinipur will take the charge of incident.

ACTIVATION OF DISASTER CONTROL PLAN

As a general guidance for the public authorities after notification of emergency, the initial implementation of this contingency plan is carried out accordingly to the category assigned as per plan.

IMPLEMENTATION OF PROTECTIVE MEASURES

The guide lines laid down in the plan are to be observed for implementation of protective measures during early phase of emergency.

1. TRAFFIC CONTROL

A traffic control plan will be made and implemented for Entry & Exist roads.

2. COMMUNICATION OF INFORMATION

- To communicate public likely to be affected through appropriate media including advice and guidance for action to ensure safety and wellbeing of public.
- To provide accurate information to general public on the state of emergency and measures being taken to deal with the same.
- To monitor and assess the sectors of emergency operations and provide feedback for decision making.

TRANSITION PHASE

Transition from early phase to intermediate phase: Once it is established on technical grounds that early phase of emergency is over. Off-site controller should be continue the responsibility for co-ordinating the post emergency action for restoration and implementation of medical services called for

RETURN OF EVACUEES

The evacuees shall only be allowed to return on affected area after technically ascertaining that the area is safe for their return. There turn of evacuees would be received and regulated as per the guidance.

OPERATIONAL CONVENTIONS

Time: The local time shall be standard time unless and otherwise specified as expressed for a 24 hrs. Clock starting with 00:00 hrs.at mid night. Location shall be expressed with reference to side area map within the radius of the plant with details of Haldia Industrial Planning zone.

Wind Directions: This is always expressed as direction from which the wind is coming and is expressed in degrees with respect to north in clockwise direction.

RESPONSIBILITIES OF VARIOUS AGENCIES

CONTINGENCY PLAN SITE CONTROLLER

The District Magistrate- East Medinipur and SDO is designated as contingency plan site controller for handling the natural calamities. He is responsible for review, co-ordination. He will also ensure co-ordination between various departments and other organization involving for helping to each other near by industries. Various responsibilities are given for different department.

KEY PERSONNEL

A separate list of addresses and telephone numbers of the key personnel as well as others connected with the off-site emergency plan are maintained by the off-site main controller, Indorama India Pvt. Ltd., Haldia. The list shall be updated, maintained as and when required.

INFORMATION GROUP

This group provides inputs regarding public and media perspective and reactions. This group is also responsible for issuing information. Bulletins as authorized by disaster control committee.

STATE INFORMATION CENTRE

The information is to be provided by center to media. This Centre will deal with–

- Media
- Enquiries from public
- Enquiries from official sources

This center would release bulletins based on the material approved by the Government.

MEDIA

The media may be significantly useful to inform the general public through press release / special bulletins which can be published by the newspaper, Broad Casts on Radio or relayed over Television network. To give authentic information on the developing situation regarding emergency however due course is necessary to counter the spread rumors leading to panic in public.

ACTION TO BE TAKEN IN THE EVENT OF AN EMERGENCY

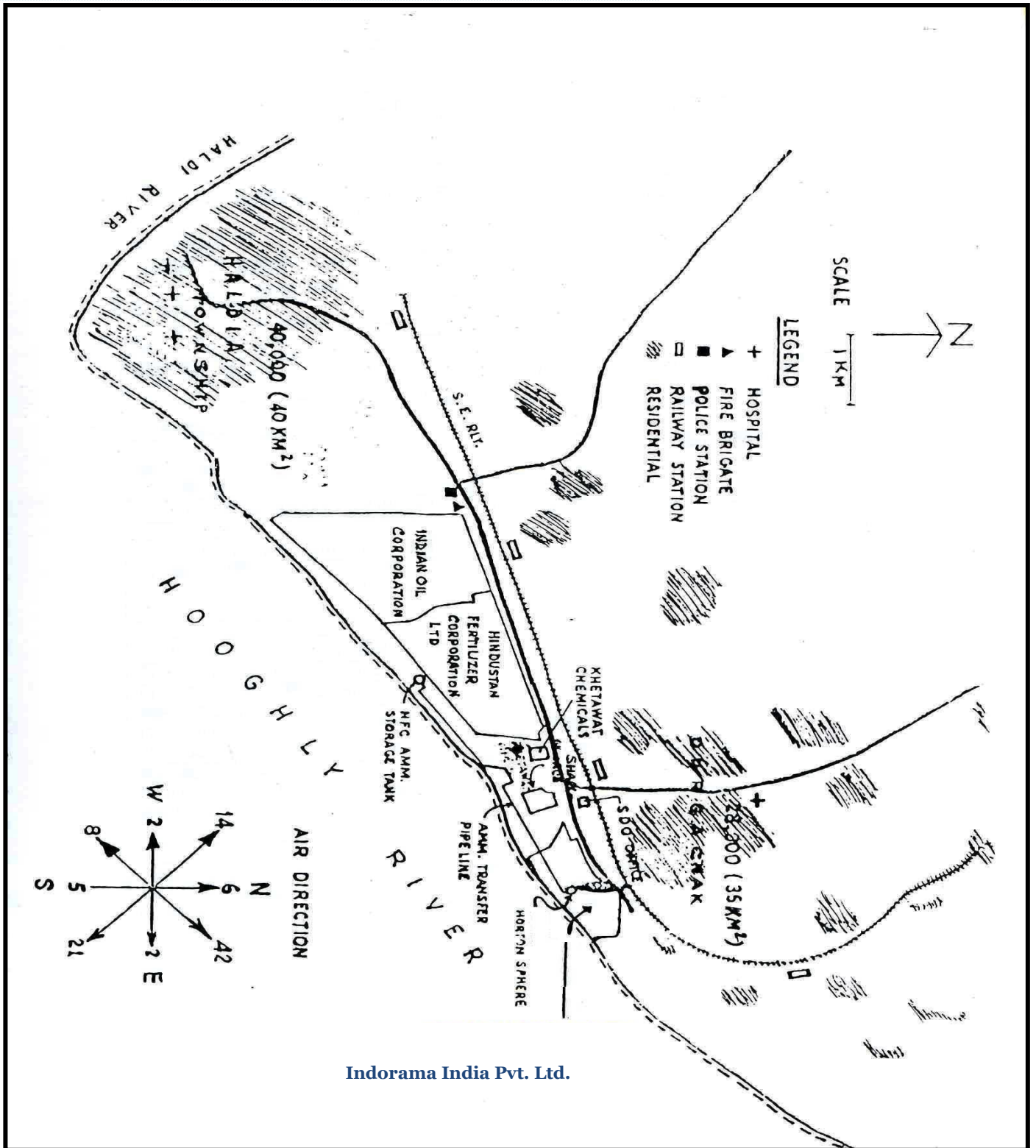
The proposed response to any incident must be appropriate to that particular situation and the news of the emergency services will be paramount. The advice in the following paragraphs should be regarded as general and is provided mainly to indicate the extent of emergency planning that may be necessary. Several different planned responses may be necessary at any one site, depending on the nature of the various incidents foreseen. In many cases involving toxic or flammable hazards evacuation may not be the appropriate action to take. This is because in certain instances such a response might expose people to a greater risk than if they had stayed indoors.

REHEARSALS, PRACTICES AND REVISION OF PLANS

- It is essential that all aspects of the emergency plans are tested and revised regularly. Local authority may wish to be present at major exercises, if resources permit, but firms should not necessarily expect are present at ive to attend.
- District Authority will be involved in consultation on emergency plans, in particular with local authorities responsible for drawing up off-site emergency plans.
- It is the responsibility of District Authority to monitor the adequacy of both on site & off-site plans. District Authority should ensure that, where plans are required, they are realistic well documented and rehearsed and updated regularly.

REVISION

At regular intervals following a major change in telephone numbers and personnel, the emergency plan should be reassessed and altered or updated as necessary. All personnel involved should be made aware of the revision and appropriately revised instructions plans made available.



Indorama India Pvt. Ltd.

Do's and Don'ts (Earthquake)

- Learn about an earthquake's causes and effects. Speak about them in a calm and composed manner, not spreading anxiety about the phenomenon.
- Keep portable transistor radio handy.
- Keep the corridors in the house clear of furniture, making movement easier.
- Attach shelves, gas cylinders, vases and flower pots to the walls of your home.
- Place heavy or bulky objects on the floor or on the lowest shelves.
- Teach all members of your family how to turn off the electricity, water and gas supply.

During an earthquake

- Keep calm and help others to do that.

If you are at home or inside a building

- Do not rush to the doors or exits; never use the lifts; keep well away from windows, mirrors, chimneys and furniture.
- Protect yourself by staying under the lintel of an inner door, in the corner of a room, under a table or even under a bed.

If you are in the street

- Walk towards an open place in a calm and composed manner. Do not run and do not wander round the streets.
- Keep away from buildings, especially old, tall or detached buildings, electricity wires, slope sand walls, which are liable to collapse.

If you are driving

- Stop the vehicle away from buildings, walls, slopes, electricity wire sand cables, and stay in the vehicle.

After an earthquake

- Keep calm, switch on the radio/TV and obey any instructions you hear on it.
- Keep away from beaches and low banks of rivers. Huge waves may sweep in.
- Expect after shocks. Be prepared.
- Turn off the water, gas and electricity.
- Do not smoke and do not light matches or use a cigarette lighter. Do not turn on switches. There may be gas leaks or short-circuits.
- Use a torch.
- If there is a fire, try to put it out. If you cannot, call the fire brigade.
- If people are seriously injured, do not move them unless they are in danger.
- Immediately clean up any inflammable products that may have spilled (alcohol, paint, etc).
- If you know that people have been buried, tell the rescue teams. Do not rush and do not worsen the situation of injured persons or your own situation.
- Avoid places where there are loose electric wires and do not touch any metal object in contact with them.
- Do not drink water from open containers without having examined it and filter edit through a sieve, a filter or an ordinary clean cloth.

- Eat something. You will feel better and more capable of helping others.
- If your home is badly damaged, you will have to leave it. Collect water containers, food, and ordinary and special medicines (for persons with heart complaints, diabetes, etc.)
- Do not re-enter badly damaged buildings and do not go near damaged structures.
- Do not walk around the streets to see what has happened. Keep clear of the streets to enable rescue vehicles to pass.

Due to earthquake Collapse of building structure, overhead belt conveyor, chimney/scrubber may also lead to emergency. In that case area in charge will take the initial responsibility (act as incident controller) & Control the emergency situation.

DO'S AND DON'TS (CYCLONE)

Listen to the radio for advance information and advice. Allow considerable margin for safety. A cyclone may change direction, speed or intensity within a few hours, so stay tuned to the radio for updated information.

If storm-force winds or severe gales are forecast for your area, then

- Store or secure loose boards, corrugated iron, rubbish tins or anything else that could become dangerous.
- Tape up large windows to prevent them from shattering.
- Move to the nearest shelter or vacate the area if this is ordered by the appropriate government agency.

When the storm hits

- Stay indoors and take shelter in the strongest part of your house.
- Listen to the radio and follow instructions.
- Open windows on the sheltered side of the house, if the roof begins to lift.
- Find shelter if you are caught out in the open.
- Do not go outside or into a beach during a lull in the storm.

Cyclones are often accompanied by largest or surges from the ocean and the precautions listed for floods should be taken if you live near the coast.

DO'S AND DONT'S (FLOOD)

- Listen to the radio for advance information and advice.
- Disconnect all electrical appliances and move all valuable personal and house hold goods and clothing out of reach of flood water, if you are warned or if you suspect that flood waters may reach the house.
- Move vehicles, farm animals and movable goods to the highest ground nearby.
- Prevent dangerous pollution-move all insecticides out of reach of the water.
- Turn off electricity, gas if you have to leave the house.
- Lock all outside doors and Windows & you have to leave the house.
- Do not enter flood waters on foot if you can avoid it.
- Never wander around a flooded area.

Medical emergency due to Food Poisoning in Canteen

Medical emergency may occur owing to consumption of food contaminated with bacteria/ virus/ parasites / toxins. There are two Canteens at our site where direct & indirect employees consume food respectively. There is a probability that food may get contaminated and people become ill. Then a medical emergency may happen.

Measures to be taken when such food poisoning scenario emerges:

- Information should be immediately passed on to the emergency contact number '666' & the Emergency Controller.
- Emergency Controller will seek help of factory doctor and HR for immediate treatment of the affected people and arrange for transportation for external medical support if necessary.
- HR Manager in coordination with Canteen in charge will isolate contaminated food and remove carefully from the canteen. Sample to be tested for knowing cause of contamination at latter stage, if required.
- Emergency Controller must inform Factory Manager & other senior people.
- Company Doctor will liaise with hospital authorities and decide if hospitalization is required for affected people on case to case basis.
- HR Manager will communicate the necessary information to employees.
- Once the emergency is over the canteen committee to sit together to normalize the situation, note the lesson learnt from the incident and arrange suitably to prevent similar incident in future.

ANNEXURE-2

FIRE FIGHTING AND OTHER FACILITIES

1.0 FIRE FIGHTING

WATER RESERVOIR

- a. Capacity of Fire Water tank in liters : 567KL
Capacity for Fire water tank (2 nos.) in AT1 : 600 KL
- b. Sources of inflow : PHE, Deep Tube Well (2No.)
- c. Aggregate In flow in liters per minute : 7000
 - i) Details of Public Water Supply in liters per minute 5000
 - ii) Pumping capacity of each Deep Tube Well in liters per minute 2000

PUMPS

Name of the pump/Type	Capacity	Discharge pressure	Make by	Model	Switch System
Electrical Pump no.-01 (Vertical) Centrifugal	273M ³ /hrs.	8.8Kg/Cm ²	Kirloskar	-	Auto
Electrical pump no.-02 (Horizontal) Centrifugal	172M ³ /hrs.	7Kg/Cm ²	Deacon	-	Manually
Electrical Pump no.-03 (Vertical) Centrifugal	273M ³ /hrs.	8.8Kg/Cm ²	Kirloskar	-	Auto
Diesel pump Centrifugal	273M ³ /hrs.	8.8Kg/Cm ²	Kirloskar	-	Manually
Jockey pump 1Centrifugal	13M ³ /hrs.	7Kg/Cm ²	Khimlime (Sulzar)	-	Auto
Jockey pump 2Centrifugal	13M ³ /hrs.	7Kg/Cm ²	Khimlime (Sulzar)	-	Auto
Portable pump N-01Centrifugal	275LPM	4Kg/Cm ²	Minimax Firex	-	Manually
Portable pump N -02 Centrifugal	275LPM	4Kg/Cm ²	Minimax	-	Manually
Ammonia Terminal - 1					
Electrical pump (Horizontal) Centrifugal	273 M ³ /hrs.	8.8 Kg/Cm ²	Crompton & Gribbs	-	Manually
Diesel pump Centrifugal	273 M ³ /hrs.	8.8 Kg/Cm ²	Kirloskar	-	Manually
Jockey pump Centrifugal	13 M ³ /hrs.	7 Kg/Cm ²	Crompton & Gribbs	-	Auto

HYDRANTS

Over ground M.S. Fire hydrant line (internal diameter rings mains-6'') with inter changeable couplings maintained at 6kg/cm²pressure.

No. of Single-headed hydrants -113

No. of Double-headed hydrants -3

Length of Fire Hydrant line networks –Around 4500m

Length of the Fire Hydrant line networks in AT1: 160 m

No of single headed hydrants in ATO1: 6

WATER MONITORS DETAILS

No. of water monitors–1

1 No. outside of Sulphur yard wall (eastside).

No of water monitor in ATO1: 2

FOAM MONITERS DETAILS

No. of foam monitors–4

Sprinkler system

- MVWS Sprinkler system in Sulphur yard
- HVWS Sprinkler system for STG Transformer 10.5 MVA
- MVWS Sprinkler system for STG Cable gallery with LHS cable system
- **At Ammonia Terminal -1**
- MVWS Sprinkler system for Ammonia compressor house
- MVWS Sprinkler system for Ammonia pump house
- MVWS Sprinkler system for Ammonia tank top
- MVWS Sprinkler system for Ammonia tanker loading area

BA Set

6.8 Ltr. & 300bar : 24 nos.
: 5 nos. in AT-1

Fire proximity suit :6 nos.

HOSE

- a. Material diameter and length :dia-63mm and length-15m
- b. Guarantee for bursting pressure :10.5kg/cm²
- c. No. of lengths of 15m : 73Nos. in Plant area
: 12 nos. in AT-1
- d. in No. of branch :39 Nos. in plant area

e. Diameter of branch pipes : 4 nos. in AT1
:dia-63mm

CANISTER : 39 nos. in plant area
: 15 nos. in AT1

PORTABLE FIRE EXTINGUISHERS

Name	Capacity	Plant area	Fire Store	AT-1 area
Water type Gas Cartridge (Water type CO2)	9 lt	12	22	-
Mechanical Foam	9 lt	31	20	10
Mechanical Foam	50 lt	4	4	-
Dry Chemical Powder (DCP)	5 Kg	14	62	-
Dry Chemical Powder (DCP)	50 Kg	-	-	2
Dry Chemical Powder (DCP)	75 Kg	1	1	-
CO2	2 Kg	3	14	-
CO2	4.5 Kg	82	28	15
CO2	22.5 Kg	9	15	-
ABC Type	1 Kg	4	3	-
ABC Type	2 Kg	-	-	4
ABC Type	4 Kg	11	12	-
ABC Type	5 Kg	7	7	-
ABC Type	6 Kg	132	13	-
Clean agent	2 Kg	6	2	-
Clean agent	5 Kg	01	02	-

FIRE TENDER-1

Water Tank Capacity(Lit.)	4500
Foam AFFF Capacity(Lit.)	500
Pump capacity(Lit./min)	2250
Pressure(kg-f/cm ²)	7

FIRE TENDER-2

Water Tank Capacity (Lit)	5000
Foam AFFF Capacity (Lit)	500
DCP capacity (Kg)	500
Pump Capacity (Lit/min)	3000
Pressure (Kg-f/cm ²)	7

2.0 Personal Protective Equipment

Name of PPE	ECC-1	ECC-2	SAP Control room	DAP-1 Control room	DAP-2 Control room	SSP Control room	Ammonia Terminal 1
PVC Suits	3	2	2	2	2	2	2
Rubber gloves	11	6	--	2	2	2	4
Gumboots	5	5	1	1	1	1	--
Safety goggles	9	5	1	2	2	2	1
Self-Contained Breathing Apparatus(SCBA)–55 min duration	1	1	1	2	2	1	3
Cotton nose masks	20	20	--	2	2	2	--
Chemical Canister Mask	2	2	4	2	2	2	9
Air supplied Breathing Apparatus	--	--	2	--	--	1	2

Other Locations

- Individual issues to employees as per requirement
- Adequate spares maintained in stores

3.0 LIST OF FIRST AIDERS

Display board at every assembly points to identify First Aider. First Aider to stand separately in front of respective demarked board during Emergency at Assembly points.

SL.NO	NAME	EMP NO. /AGENCY	DEPARTMENT	VALIDITY
1	BIDYUT ACHARYA	30099	A/C	11.01.26
2	RAJESH MAITY	30392	ATO 1	11.01.26
3	ATANU SAMANTA	30395	ATO 1	11.01.26
4	RITWIK MANNA	30396	ATO 1	11.01.26
5	SK. SAMIR	MANNA CONST	AMBULANCE	11.01.26
6	ASHOK HALDER	MANNA CONST	AMBULANCE	11.01.26
7	PINTU PADA SAHOO	MANNA CONST	AMBULANCE	11.01.26
8	SUKESH PRAMANIK	MANNA CONST	AMBULANCE	11.01.26
9	SANTANU SASMAL	30082	C LAB	26.11.24
10	SURAJIT UTTHASINI	MITRA SK	C LAB	11.12.24
11	ANUPAM JANA	30083	F LAB	11.12.24
12	MANIK KR GHOSH	RANDSTD	FCO LAB	23.12.24
13	DEBASIS PANDIT	RANDSTD	FCO LAB	26.11.24
14	SAYANI GURIA	RANDSTAD	QC & LAB	11.01.26
15	SUDHESHNA BHATTACHARYA	RANDSTAD	QC & LAB	11.01.26
16	TANMOY SAU	10220	DAP1	11.12.24
17	SUMAN HAZRA	PCPL	DAP1	11.12.24
18	PRALAY SAMANTA	30127	DAP1	11.01.26
19	TAMAL BERA	30141	DAP1	11.01.26
20	ATANU MAITY	30125	DAP2	11.12.24
21	AYAN SINHA	10245	DAP2	26.11.24
22	SUSEN MONDAL	HBE	DAP2	26.11.24
23	MANAS BHOWMIK	30126	DAP2	11.01.26
24	ATANU MAITY	30125	DAP2	11.01.26
25	PRASANTA BALIDA	PCPL	DAP WH	26.11.24
26	SUVANKAR MAITY	RPS	DAP WH	11.12.24
27	PURUSUTTAM DAS	10104	PP & WH	26.11.24
28	SUPRIYA DAS	RPS	PP & WH	11.12.24
29	NARAYAN CH DAS	PCPL	PP & WH	11.12.24
30	SAMAR MAITI	10135	PP & WH	11.01.26
31	K MAHESH NAIDU	30142	ELECTRICAL	11.12.24
32	ARINDAM SARKAR	30138	ELECTRICAL	11.12.24
33	ARJU KR BERA	DCC	ELECTRICAL	11.12.24
34	ANIRUDDHA PATHAK	30094	ELECTRICAL	23.12.24
35	SIDDHARTHA SAHOO	30088	ELECTRICAL	23.12.24
36	BISWAJIT PAL	10612	ELECTRICAL	11.01.26
37	SUCHARIT GAYEN	10560	ELECTRICAL	11.01.26
38	CHITTARANJAN DEY	30139	ELECTRICAL	11.01.26
39	BIDHAN CH GHOSH	30145	ELECTRICAL	11.01.26
40	DEBAPRASAD KHATUA	30387	ELECTRICAL	11.01.26

41	SK. ABID HOSSEN	LOKNATH	F&S	26.11.24
42	SUKHENDU DOLAI	RANDSTAD	F&S	11.01.26
43	SURAJ SAMANTA	RANDSTAD	F&S	11.01.26
44	BINIT DAS	10126	INSTRUMENTATION	11.01.26
45	SUBIR CHAUDHARY	30044	INSTRUMENTATION	11.01.26
46	RINTU PRAMANIK	30130	INSTRUMENTATION	11.01.26
47	SURIYA ARI	30391	INSTRUMENTATION	11.01.26
48	KRIPAMOY GANGULY	10252	IT	23.12.24
49	SUBIR ROY CHOWDHURY	MANNA	SCM	26.11.24
50	SUDIP SENGUPTA	10021	SCM	11.12.24
51	SAIKAT PRADHAN	10234	SCM	11.01.26
52	MANAS PAL	MANNA CONST	SCM	11.01.26
53	SK. SAMIM AKTAR	HBE	SAP	23.12.24
54	PARTHAJIT NANDA	10619	SAP	11.01.26
55	SUJOY ADHIKARI	30380	SAP	11.01.26
56	KAMALESH MAITY	30379	SAP	11.01.26
57	BIJOY KARATI	30417	SAP	11.01.26
58	SUDHIR DEBEY	30411	SAP	11.01.26
59	SHILBHADRA GIRI	30117	SAP/STG	26.11.24
60	SATYABRATA BERA	30132	STG	26.11.24
61	ABHIJIT HALDER	30133	STG	11.01.26
62	SOMNATH DEY	RPS	WARE HOUSE	11.01.26
63	SK. USIAR RAHAMAN	RPS	WARE HOUSE	11.01.26
64	MANIK KR DAS	PCPL	WARE HOUSE	11.01.26
65	CHANDAN GURIA	PCPL	WARE HOUSE	11.01.26
66	CHANDAN KR BHARAS	KCC	SECURITY	26.11.24
67	SRIMAN JANA	KCC	SECURITY	23.12.24
68	BAPI MIDYA	KCC	SECURITY	23.12.24
69	SUBHANKAR BETAL	KCC	SECURITY	23.12.24
70	SURAJIT PRAMANIK	KCC	SECURITY	11.01.26
71	SANTU SANTRA	KCC	SECURITY	11.01.26
72	BABLU DEY	KCC	SECURITY	11.01.26
73	SWAPAN SHIT	KCC	SECURITY	11.01.26
74	PALASH PATRA	KCC	SECURITY	11.01.26
75	BIJOY MONDAL	KCC	SECURITY	11.01.26
76	BIMAL DAS	KCC	SECURITY/4 ACRE	11.01.26
77	SK. MANIRUDDIN	KCC	SECURITY/Girish More Guest	11.01.26
78	PRASENJIT ROUT	HBE	SSP	26.11.24
79	ARUN ROY	30124	SSP	23.12.24
80	SUMAN ROY	10160	SSP	11.01.26
81	TAPAN DAS	ISK	SSP	11.01.26
82	SK. RAJU	30118	SSP	11.01.26
83	DIPAK JANA	HBE	SSP	11.01.26

4.0 LIST OF AUXILLIARY FIRE FIGHTING TEAM

Display board at every assembly points to identify Fire Fighter. Fire Fighter to stand separately in front of respective demarked board during Emergency at Assembly point.

Sl. No.	Name of the person	Dept.
1	Rajib Datta	Stores
2	Dolon Roy	LAB
3	Sudip Koley	LAB
4	Debashish Pandit	LAB/Ranstad
5	Nihar Ranjan Mandal	ATO1
6	Atanu Samanta	ATO1
7	Khokhan Maity.	ATO1
8	Pabitra Das	Instrument
9	Santanu Bose	DAP
10	Tanmay Sau	DAP
11	Prodyut Gorai	DAP
12	Goutam Hazra	DAP
13	Krishanu Ghosh	DAP
14	Sandip Das	DAP
15	Gobinda Mitra	DAP
16	Ramkrishna Sasmal	DAP
17	Sukummar Das	DAP
18	Almamun Khan	DAP/PCPL
19	Chandan Sardar	DAP/PCPL
20	Mrinmay Paik	DAP/HBE
21	Sk Montu	DAP/HBE
22	Goutam Dinda	DAP/DCC
23	Arun Ray	SSP
24	S S Das	SSP
25	Tarak Mandal	SSP
26	Suman Ray	SSP
27	Kuntal Mandal	PP
28	Chandan Guria	PP/PCPL
29	Dipanjan Hazra	RMP
30	S K Das	Acids
31	T Samanta	Acids
32	Shilbhadra Giri	Acids
33	Biplab Biswas	Acids
34	K Midyadas	Acids
35	S Dutta	Acids
36	N Maji	Acids
37	S B Bera	Acids
38	S. S. Das	Acids
39	Nemai Maji	Electrical
40	Purnendu Das	Electrical

41	Gopal Bhakta	Electrical
42	Arindam Sarkar	Electrical
43	Bidyut Acharya	Accounts
44	Sk Abid Hossen	Safety/Loknath
45	Subrata Midyadas	Mechanical
46	Pravat Kumar Acharya	Mechanical
47	Chandan Tilak Das	Mechanical
48	Kripamoy Ganguli	IT
49	Arnab Bhattacharjee	Env/Manna
50	Manoj Maity	DS/Manna
51	Tapas Sil	DS/Manna
52	Saikat Pradhan	SCM
53	Subir Roychowdhury	SCM
54	Ayan Sen	Stores
55	Soumitra Chowdhury	LAB
56	Sanjib Bera	LAB/Ranstad
57	Pratap Paria	LAB/Mitra SK
58	Chandan Mandal	ATO1
59	Sibnarayan Panda	ATO1
60	Arnab Maity	ATO1
61	M.S. Midya	ATO1
62	Binoy Roy	ATO1
63	Binit Das	Instrument
64	Ankit Rustagi	Instrument
65	Prabuddha Sundar Kar	Instrument
66	Subir Chaudhuri	Instrument
67	Kinker Pramanik	Instrument
68	Monotosh Chakraborty	Instrument
69	Gourhari Patra	DAP
70	Sourav Mondal	DAP
71	Soumen Das	DAP
72	Samar Samanta	DAP
73	S A Mallick	DAP
74	Arindam Das	DAP
75	Tuhin Pradhan	DAP
76	Pralay Samanta	DAP
77	A C Guria	DAP
78	Jharu Bhunia	DAP
79	Subrata Bhowmik	DAP
80	Manas Bhowmik	DAP

81	Aminul Khan	DAP/PCPL
82	Suman Hazra	DAP/PCPL
83	Sk Haresh Ali	DAP/PCPL
84	Biplab Paik	DAP/HBE
85	Bidhan Bharasa	DAP/HBE
86	Susen Mondal	DAP/HBE
87	Sk. S Ali	SSP
88	Sk.Raju	SSP
89	Rajkumar Jana	PP
90	Manik Chandra Das	PP/PCPL
91	K Nandi	Acids
92	Kamalesh Maity	Acids
93	Santu Pramanik	Acids
94	T Mondal	Acids
95	P. Gaswami	Acids
96	A .N . Prasad	Acids
97	Chandan Maity	Electrical
98	Siddhartha Sahoo	Electrical
99	Sadhan Dasbokshi	Electrical
100	Chittaranjan Dey	Electrical
101	Narayanji Mishra	Accounts
102	Asit Kumar Das	Mechanical
103	Sambit Kumar Senapati	Mechanical
104	Md Jakir Khan	Mechanical
105	Subhashis Das	HR
106	Arindam Patra	DS/Manna
107	Sudip Samanta	DS/Manna
108	Tarun Chakraborty	DS/Ranstad
109	Saurav bhattacharjee	SCM
110	Anal Bera	SCM
111	Chandra Shekhar Acharya	Stores
112	Tanmoy Mondal	LAB
113	Anupam Jana	LAB
114	Joydeep Mahapatra	LAB/Ranstad
115	Subrata Samanta	ATO1
116	Rajesh Maity	ATO1
117	Supriyo Ari	ATO1
118	Ritwik Manna	ATO1
119	Prasenjit Barik	Instrument
120	Abhirup Biswas	Instrument
121	Arup Kumar Manna	Instrument
122	Ramgyan Prajapati	Instrument

123	Subhas Sautya	Instrument
124	Mrinmay Bhakta	Instrument
125	Ayan Sinha	DAP
126	Anijit Ghara	DAP
127	Anjan Bhawmik	DAP
128	A R Pramanik	DAP
129	H D Samanta	DAP
130	Tamal Bera	DAP
131	Prasanta Kundu	DAP
132	R S Debta	DAP
133	Sankar Maity	DAP
134	Atanu Maity	DAP
135	S D Manna	DAP
136	Arun Das	DAP/PCPL
137	Kamal Patra	DAP/PCPL
138	Buddhadeb Adak	DAP/PCPL
139	Sk Islam	DAP/HBE
140	Sankar Samanta	DAP/DCC
141	D Bharosa	SSP
142	U Mandol	SSP
143	Samar Maity	PP
144	Narayan Das	PP/PCPL
145	Sudhir Dubey	Acids
146	Sujoy Adhikari	Acids
147	Surojit Das	Acids
148	G Das	Acids
149	Hiralal Midya	Acids
150	Mrinmoy Koyal	Acids
151	A Halder	Acids
152	T Ghara	Acids
153	Mahesh Maidu	Electrical
154	Swapn Bej	Electrical
155	Rabindranath Kunti	Electrical
156	Bidhan Ghosh	Electrical
157	Shuvankar Jana	Accounts
158	Dilip Kumar Chakraborty	Mechanical
159	Ganesh Chandra Kuanar	Mechanical
160	Aritra Pramanik	Mechanical
161	Abhinaba Ghosh	HR
162	Surojit Ghosh	DS/Manna
163	Sandip Adak	DS/Ranstad
164	Subhashish Das	SCM
165	Manas Pal	SCM

166	CHITTA RANJAN DAS	SECURITY
167	NABADWIP DAS	SECURITY
168	BISWA RANJAN MONDAL	SECURITY
169	CHANDAN KUMAR BHARASA	SECURITY
170	TAPAS KUMAR MIDYA	SECURITY
171	AVIJIT HAZRA	SECURITY
172	ANANDA RIT	SECURITY
173	BABLU DEY	SECURITY
174	AJOY KUMAR PANDEY	SECURITY
175	TARAK PRAMANIK	SECURITY
176	NIRANJAN SEET	SECURITY
177	BIKASH CHANDRA DAS	SECURITY
178	AJIT MAITY	SECURITY
179	PRASAD SAMANTA	SECURITY
180	PRABHAS KHALUA	SECURITY
181	SUSANTA MONDAL	SECURITY
182	SK NOZRUL ISLAM	SECURITY
183	AJOY KUMAR MAITY (DOCK SITE)	SECURITY
184	PRASANTA MIDYA (DOCK SITE)	SECURITY
185	PIYARI MOHAN MONDAL (DOCK SITE)	SECURITY
186	MUKTI PADA MAITY	SECURITY
187	ANUPAM MAITY	SECURITY
188	SWAPAN SHIT	SECURITY
189	BIMAL DAS (4 ACRE)	SECURITY
190	DEBABRATA ROUTH (4 ACRE)	SECURITY
191	SK MANIRODDIN (GIRISH MORE)	SECURITY
192	SK SIRAJ ALI (GIRISH MORE)	SECURITY
193	BABLU KRISHNA BISWAS	SECURITY
194	BHRANTI KUMAR PATRA	SECURITY
195	AMIT KALSA	SECURITY
196	SUBRATA DAS	SECURITY
197	MALAY KUMAR DAS	SECURITY
198	SURAJIT PRAMANIK	SECURITY
199	ARUP MAITY	SECURITY
200	BISWANATH MONDAL	SECURITY
201	SANTOO SANTRA	SECURITY
202	SUBRATA MIDYA DAS	SECURITY
203	SUBHAS CHANDRA SWARAN	SECURITY
204	TAPAN DAS	SECURITY
205	SANJIT MONDAL	SECURITY
206	DHANANJOY MONDAL	SECURITY
207	BABLU ADAK	SECURITY

208	TAPAN PRAMANIK	SECURITY
209	SUBHASH PRAMANIK	SECURITY
210	SAKTIPADA MONDAL (DOCK SITE)	SECURITY
211	BARUN ADAK (DOCK SITE)	SECURITY
212	NIRMAL KUMAR PANDEY (DOCK SITE)	SECURITY
213	SUPRIYA CHAKRABORTY	SECURITY
214	SHIBARAM DATTA	SECURITY
215	PRADYOT DUTTA CHOWDHURY	SECURITY
216	RAMKRISHNA DAS (4 ACRE)	SECURITY
217	BISWAJIT DAS (GIRISH MORE)	SECURITY
218	KHUM BAHADUR DHAKAL	SECURITY
219	TAPAS DANDAPAT	SECURITY
220	BASUDEV PRAMANIK	SECURITY
221	SWAPAN JANA	SECURITY
222	SUHRID PRAMANIK	SECURITY
223	ARNAB BHOWMIK	SECURITY
224	PRAHALAD GOSWAMI	SECURITY
225	ASIM DAS	SECURITY
226	KHOKAN PRAMANIK	SECURITY
227	ARABINDA MAITI	SECURITY
228	SUBHANKAR BETAL	SECURITY
229	SRIJIB ROY PRAMANIK	SECURITY
230	MANAS DAS	SECURITY
231	BAPI MIDYA	SECURITY
232	SOUMITRA GHORAI	SECURITY
233	MOHAN DAS	SECURITY
234	TRINANJAN GHORAI	SECURITY
235	PALASH PATRA	SECURITY
236	BIJOY MONDAL (DOCK SITE)	SECURITY
237	SUK BAHADUR GURUNG (DOCK SITE)	SECURITY
238	SRIMAN JANA (DOCK SITE)	SECURITY
239	BIDHAN CHANDRA PATRA (DOCK SITE)	SECURITY
240	SHYAMAL KUMAR JANA	SECURITY
241	GOUTAM SAMANTA	SECURITY
242	CHANDAN KUMAR MAITY	SECURITY
243	SUVENDU BIKASH MAITY (4 ACRE)	SECURITY
244	SK AMIR ALI (GIRISH MORE)	SECURITY
245	SUBRATA KARAN (GIRISH MORE)	SECURITY

ANNEXURE-3

MEDICAL AID ON EXPOSURE TO AMMONIA

Exposure to ammonia effects tissues in two manners–

- a. The freeze dry effects: Contact with super cooled liquid ammonia will freeze and desiccate the tissues. The damage is similar to frost bite.
- b. The caustic effect: Ammonia is highly soluble in water and forms a strongly alkaline solution. When people are exposed to ammonia vapour, the body fluid dissolves ammonia and resulting corrosive alkaline solution damages tissues. An exposure to vapours will first result in lesions to eyes, mucosa, respiratory tract and gastro intestinal tract. A concentration of 0.2% will produces kin blisters and chemical burns.

Ammonia conc.(ppm)	Effect on Health
5	Odour can be detected by most people
25	TLV-TWA: recommended exposure limit for 8 hrs.
35	TLV-STEL:recommendedexposurelimitfor15min
100	Can be tolerated for several hours
400	Immediate eye & throat irritation
700	May cause eye injury
1700	Larynges- spasm and coughing on inhalation and glottal edema follows with in a few hours
2000–5000	An exposure beyond 1.5 min can be fatal
5000&above	Death may result with in minutes due to respiratory arrest

People exposed to ammonia vapours should be decontaminated immediately as speed is essential. First eyes must be flushed with water after opening the eyelids for 15 minutes continuously. Contaminated clothing should be removed and skin should be flushed with plenty of water. Mouth should be rinsed. The victim should be kept in fresh air. Creams etc. should not be used.

In extreme exposure decontamination has to be very aggressive. One must rinse ears. Open skin rolls for flushing, the axilla & groin as well as the under chain should be flushed properly.

In case of exposure to liquid ammonia similar procedure has to be followed. Victim may have to put under a showerbeforehiscontaminatedclothscanberemovedwhichcanbecomestiffduetolowtemperatureofammonia.

Cardiopulmonary resuscitation should be given if there are any signs of cardiac arrest or respiratory arrest. Victim can be given oxygen in case of asphyxia. Control of bleeding and treatment of shock should also begin immediately.

People engaged in rescue and first aid work themselves should not get exposed to ammonia. Care should be taken to remove contaminated clothing before a victim is put in an enclosed room or ambulance.

Following have also been recommended as a first aid measure

- Eyes can be washed with 0.5–1% alum. SOS ophthalmologist
- Skin can be washed with 5% citric/acetic/salicylic acid
- Inhalation of warm water vapours
- In case of asphyxia Oxygen followed by sub cut 1cc of 1% Atropin is recommended.

ANNEXURE-4

LIST OF VITAL EQUIPMENT

In case of major emergency when a decision is taken to evacuate the personnel from the factory and simultaneously bring the plants to a safe shutdown, care of following equipments should be taken on a priority basis as per the instructions in respective plant operating manuals:

Sulphuric Acid Plant(SAP)

1)Turbo blower	
2)Sul.Acid cir.PpN	7)DM water PpS/Side
3)Sul.Acid cir.PpS	8)Steam Turbine Generator
4)Clean sul.PpS	9)Boiler Feed Water PpE
5)Clean sul.PpN	10)Boiler Feed Water PpW
6)DM water PpN/Side	

DI-AMMONIUM PHOSPHATE PLANT(DAP)

Ammonia.Scr.Fan	Ammonia.Scr.Fan
Bucket Elevator 4204	Atomising Fan
Bucket Elevator 4206	Belt Conv.101
Cooler Inlet Fan A	Belt Conv.4205
Cooler Outlet Fan A	Belt Conv.4209
Drier	Belt Conv.4212
Drier Exhaust Fan	Bucket Elevator 4204
Granulator	Bucket Elevator4206
Induced Draft Fan	Combustion Fan
Forced Draft Fan	Cooler Inlet Fan A
De Dusting Fan	Cooler Inlet Fan B
BC 4212	Cooler Outlet Fan A
BC 4205	Cooler Outlet Fan B
BC 4209	De Dusting Fan
BC1	Dilution Fan
	Drier
	Drier Exhaust Fan
	Granulator

Ball Mill**Den Cutter****Ball Mill ID Fan****Mixer****Underground Conv.****Old Vent Fan****Scrubber Fan****New Vent Fan****Bucket Elevator****Den****Roller Mill / ID Fan****Ammonia Terminal - 1****Ammonia transfer pump – 4 nos.****Ammonia Compressor – 5 nos.**

ANNEXURE-5

GAS DISPERSION CONCENTRATION

Assuming leak rate (Q) - 3 kg/sec. i.e. 3x10⁶ mg/sec. And Wind velocity (u) = 2 and 5 m/sec., Downwind concentration of gases at various distances are calculated and tabulated as follows :

Distance	100M	200M	300M	400M	500M	700M	1KM	2KM	3KM	4KM	5KM
Material											
Maximum concentration (PPM) in downwind direction at distance X, wind velocity 2 m/sec, for most unstable afternoon weather condition (A)											
Ammonia	1832	458	171	115	89	51	17.18	4.29	1.91	1.07	0.69
Maximum concentration (PPM) in downwind direction at distance X, wind velocity 5 m/sec, for most unstable afternoon weather condition (A)											
Ammonia	732	183	69	46	36	20	6.87	1.72	0.76	0.43	0.28

ANNEXURE - 6

WEATHER CONDITIONS

Sr. No	Period of year		Wind velocity M/Second	Wind direction	Weather Conditions : Dry, Moist, Rainy, Cold, Hot, Stable, Unstable, Stormy etc.	Pasquill Classification A to F
	Date				HUMID	B- 50%
	From	To	1 - 2		ANNL, Humidity- 75%	E- 25% Yr.: NT
1	January	February	1 - 2			R- 25% Yr.: NT
2	October	December	1 - 2	8.30 AM N/NE/E/SE/S/SW/W/NW /CALM 25/6/2/8/14/23/4/5/13		
3	December	April	1 - 2			
4	September	December	1 - 2	5.50 PM N/NE/E/SE/S/SW/W/NW /CALM 4/2/2/14/39/13/1/1/24		
5	May	August	2 - 0			

FORMATS

Incident Report

Location of incident:	Date of incident:	Time of incident:
Describe how the incident occurred?		
What were the consequences of the incident?		
What action has been taken to prevent reoccurrence?		
Who has been notified of this incident?		
Persons Involved in Incident(Include contact details eg address for non-response persons)		
Name:	Role:	Contact number:
Name:	Role:	Contact number:
Witnesses names(if any)		
Name:	Role:	Contact number:
Name:	Role:	Contact number:
Reporting Officer:(print name)	Role:	
Signature:	Date:	
Supervisor-OIC/Manager/Controller:(print name)	Role:	
Signature:	Date:	

#Complete an Injury Notification form



Indorama India Pvt. Ltd.
Haldia

Press Release Template

FOR IMMEDIATE RELEASE :(DD/MM/YYYY)

[Title Here]

[CITY], [STATE], [Date]–[This is the opening paragraph.]

Contact Information:

[Company Name]

[Address]

[Telephone]

[Website]

Checklist for 1st person entering emergency control center

Sl. No.	Items to be checked	Yes	No
1	Check whether walky- talky provided or not		
2	Check whether the telephone is working		
3	Ensure that emergency siren has been blown		
4	Inform other team members		
5	Inform the medical officer		
6	Ensure the incident controller has received walky - talky		
7	Receive information on wind direction		
8	Inform the respective assembly points not to assemble which might get affected depending upon wind direction		
9	Inform QRT team to check the affected areas if any one get strapped		
10	Inform security personnel to prepare a list of visitors inside		



Indorama India Pvt. Ltd.
Durgachack, Haldia,
District- East Medinipur
West Bengal, Pin-721602

MOCK DRILL REPORT

Mock drill Scenario	Stucked of shutter of Nucleonic Gauge in DAP1
Date	23.12.2022
Time	07.35 PM
Chief Emergency Controller	Mr. C. S. Prasad
Emergency Controller	Mr. Ayan Sinha
Incident Controller	Mr. Gour Hari Patra
Control team	Mr. Chanchal Ghosh, Mr. Amitabh Chouhan, Mr. Prasenjit Barik, Mr. Binit Das, Mr. Rajat Sankar Pradhan (Fireman) & Security team
External Communication Team	Mr. Prakash Bhowmik
Observers	Mr. Abhayananda Metya, Mr. Purusottam Das, Mr. Bhakti Nayak, Mr. Utpal Bhowmik, Mr. Abhik Saha, Mr. Sovan Kr. Maity, Mr. Sk Abid Hossen
Operator/Tecnician	Mr. Prasanta Kundu
Emergency Description	<p>On 23.12.2022 at 07.35 pm, Mr. Gour Hari Patra had seen PNR level was fluctuating in DAP-1 control room monitor. He immediately went to FCV 210 at PNR top and found that the shutter of the Nucleonic gauge of the PNR was stucked and not closed & suspected exposure of the radioactive ray to the nearby environment. He immediately informed to The Radiation Safety Officer (RSO) Mr. Binit Das and then he raised the level 1 siren at 07.37 pm by pressing the MCP at control room. Mr. Patra immediately informed security at main gate about the details of emergency and immediately evacuated the area & cordoned off the area with the help of his team. Security informed to the emergency controller Mr. Ayan Sinha about the same with zone details and the emergency controller Mr. Sinha on consulting with the incident controller Mr. Patra & Mr. B. Das, instructed the main gate security officer to raise the level-2 siren and he immediately came to the emergency control center-1 (ECC-1). Security team raised the Level-2 siren at 07.39 pm and immediately instructed the Fireteam to reach the spot with fire tender, ambulance & QRT team. Along with that, Emergency Controller Mr. Sinha informed to Mr. C.S. Prasad (Chief Emergency Controller), Mr. R. P. Singh (AVP-Engineering), Mr. Bhaskar Datta (AVP-Production), Mr. Prasenjit Barik (Head Instrumentation), Mrs. Monika Das (Factory Medical Doctor) and other senior leaders about the emergency. They also reached at ECC-3 one by one and cooperate with the emergency situation. Factory Fire team carrying fire tender, ambulance reached to the spot at 07.51 pm. Shortly AVP –HSE Mr. Chanchal Ghosh reached to the spot and guide the incident controller. The Radiation Safety Officer (RSO) Mr. Binit Das reached the spot with radiation survey meter & they thoroughly checked and measured the level of exposure of radiation from control room floor to PNR floor at 08.12 p.m. They found very negligible level of exposure from half meter distance of the source. They isolated the nucleonic gauge. Mr. P. Barik also reached at the spot at 08.17 pm. Then the RSO messaged the incident controller that the environment is safe. The incident controller gave a message to the Emergency controller that the situation was under control at 08.24 pm. As per emergency controller's instruction all clear siren was blown at 08.26 pm.</p>
Sequence of events	<ol style="list-style-type: none">1. Mr. Gour Hari Patra blew emergency Siren (level 1) at 07.37 pm after observing the failure of shutter for the PNR nucleonic gauge.2. Security informed to the Emergency controller Mr. Ayan Sinha about the emergency.3. After understanding the situation from Incident controller about the severity, asked the security to raise the level-2 siren. Level -2 siren was actuated at 07.39 pm.4. Emergency controller rushed to the ECC 1 at 07.42 pm.5. Factory Fire team carrying fire tender, ambulance reached to the spot at 07.51 pm.6. Incident Controller Mr. Gour Hari Patra instructed his team to barricade the area and evacuate the people surrounding. Shortly AVP–Safety, Health & Environment Mr. C. Ghosh joined and guide him.7. The Radiation Safety Officer (RSO) Mr. Binit Das reached the spot with radiation survey meter at 08.12 p.m.8. All other people assembled at respective assembly points.9. Chief Emergency controller Mr. C.S. Prasad & other senior leaders reached the emergency control center-3 shortly.10. Constant interaction was there between emergency controller & the incident control team.11. External Communication team was in touch with CEC for external help if required.12. The situation was controlled by the incident control team by 08.24 pm & cleared by incident controller to EC.13. Call off siren was raised by security at 08.26 pm.

MOCK DRILL REPORT

Positives

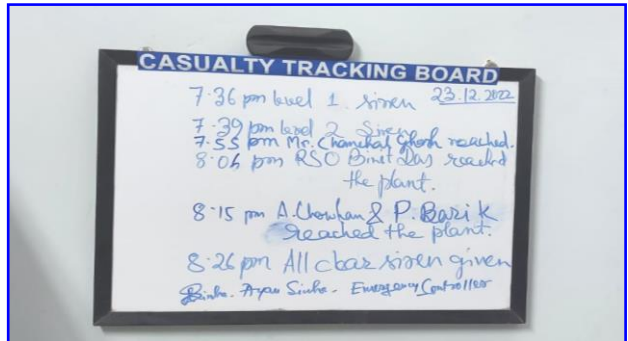
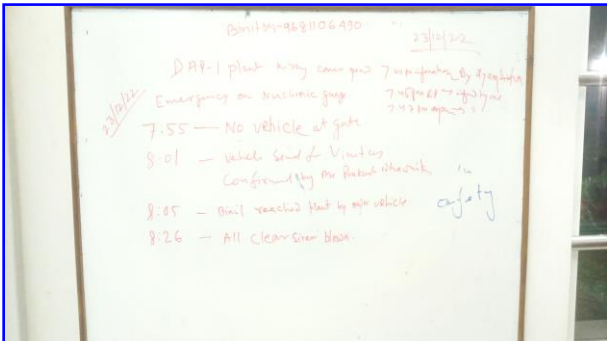
1. All the people responded well, and actions were taken very sharp.
2. Emergency alarm was clearly audible from all corners of the plant.
3. RSO, Fire team along with security & others were the main combatants.
4. Truck movement was stopped.
5. Main gate was kept opened during emergency.
6. Senior leaders were present at ECC-3 during silent hours from different areas.
7. Traffic management was also good during emergency by security team.

Observation

1. One vehicle should be always available at site for any kind of emergency.
2. PA system for announcement of emergency to be improved.
3. Emergency siren was not audible at DAP-1 control room floor.
4. Front gate of ECC-3 was closed.

MOCK DRILL REPORT

Photographs:





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Indorama India Pvt. Ltd.
HALDIA

MOCK DRILL REPORT

Mock drill Scenario	Ammonia leakage on supply line from ATO-1 to DAP2 Plant (Downstream flange joint of TRV)
Date	17.02.2023
Time	11.13 AM
Chief Emergency Controller	Mr. C. S. Prasad (COO)
Emergency Controller	Mr. Santanu Bose (AGM-DAP Production)
Other Emergency Control team members	Mr. Ravindra Singh (AVP-Engineering), Mr. Bhaskar Datta (AVP-Production), Mr. Chanchal Ghosh (AVP-HSEF), Mr. Saurabh Bhattacharya (Head-HR), Mr. Arun Mondal (DGM- Environment)
Incident Controller	Mr. Soumen Das (Sr. Manager-DAP-2 Plant) & Mr. Anjan Bhowmik (GM-DAP Plant)
Control team	Mr. Abhik Saha (DGM-Safety), Mr. Rajib Sen (Sr. Manager Security) & QRT team, Sk. Saifuddin (Fireman), Mr. Rajat Shankar Pradhan (Fireman), Mr. Sunil Singh (AGM-Maintenance), Sk Abid Hossain (Fireman) & Maintenance team
Observers	Mr. Saubhik Sarkar, Mr. Ashes Adhikari, Mr. Ankit Rustogi, Mr. Bikash Maity, Mr. Arun Mondal, Mr. Mainak Chatterjee, Mr. Anindya Sengupta, Mr. Sovan Maity.
Operator	Mr. Tamal Bera (DAP-2)
Chief Guest	Mr. Santanu Banerjee, Joint Director, Directorate of factories, Govt. of WB Mr. Debasish Mahato, Factory Inspector, Chemical, Govt. of WB

Emergency Description

On 17.02.2023 at 11.13 a.m., Mr. Soumendranath Dhara (TOYO Eng.) got smell of ammonia gas near ammonia supply line battery limit valve area near Ammonia project site and he observed the leakage of ammonia vapour on the DAP-2 ammonia supply line from downstream flange of TRV (Temperature release valve). He immediately actuated the level 1 siren by breaking the glass of nearest MCP (Manual Call Point) and dialed 666 (03224660666-Emergency Contact Number), described about the situation to Security Officer Mr. Abhijit Maity at 11.15 a.m. Mr. Maity immediately informed to the area Shift In-charge (DAP-2) Mr. Soumen Das about the emergency zone & alerted the QRT for preparedness at 11.16 am.

Mr. Soumen Das (Incident Controller) immediately rushed to the spot wearing an ammonia canister mask along with an operator and after observing the leakage informed to the DAP2 control room to stop the ammonia transfer pump located at Ammonia Terminal Operation-1 (ATO-1), accessing the remote stop switch from DAP2 control room and informed to the Emergency controller Mr. Santanu Bose. Emergency controller after understanding the severity of the situation from incident controller instructed the security to raise the level-2 siren and he immediately rushed to the (ECC-1) emergency control center-1. at 11.18 am.

Emergency controller after reaching to the ECC-1, informed to Site head, Chief Operating Officer (Chief Emergency Controller), Safety Head, Engineering Head and Production Head about the emergency. Security raised the Level-2 siren at 11.20 am and immediately instructed the fire team to reach the spot with two nos. fire tenders & QRT (quick response team).

DGM Safety and DAP Plant Manager also rushed to the spot. DAP plant Manager assessed the gravity of the situation and started guiding the incident controller. The emergency controller was in constant touch with incident controller and QRT. Announcement about emergency was carried out throughout the whole plant using portable PA system, by QRT member.

Within few minutes, Chief emergency controller and other members reached to the ECC-1, took over the control of the situation, and instructed to take safe shutdown for both DAP1 & 2 plant at 11.30 am. After reaching to the spot, the firefighting team acted under guidance of DGM Safety & Incident controller. Both fire tenders were positioned at opposite side keeping 90° angle to the wind direction. The fire team made full water curtain in the down wind direction to prevent escaping of ammonia gas and spread into the atmosphere and one support line provided to dilute the released ammonia during process isolation. The leaky part was isolated by closing the isolation valve by operation team using BA Set and other PPEs under the guidance of Plant Manager and gradually the leak was arrested safely. Meanwhile, the help of mechanical team was asked from emergency controller. The mechanical team under guidance of AGM, Mr. Sunil Singh reached to the spot within 2 mins.

Sk Abul Hossain of mechanical department helper tried to approach towards leaky point after the isolation valve was closed, but he inhaled the ammonia gas present in surrounding atmosphere and became unconscious at 11.33 a.m. He was immediately rescued by rescue team and given First Aid (CPR). He was then shifted to the OHC by ambulance with the help of QRT for medical treatment at 11.39 am. Doctor attended the patient and kept him under her observation.

The fitter and helper were asked to wear the BA sets and other PPEs for attending the leaky flange. After clearance given by Plant Manager, the fitter with helper approached to the spot and opened the flange bolts using spanner. The flange gasket was found damaged which was then replaced.

As the wind direction was towards North-West direction, the emergency controller immediately instructed the QRT to evacuate the assembly point 5 (located in front of Admin Building) which was under the travel path of wind direction and shifted all people to the assembly point 1 (located at East side of STG Building) at 11.30 am. Emergency controller ensured the safe assembly of all (direct employee, indirect employee, visitors) in assembly points by communicating with all Assembly point roll callers.

Incident Controller using Ammonia detector ensured that the leakage had been arrested completely and informed to the Emergency controller that the situation was under control. Emergency controller gave the clearance for all clear siren to the security team at 11.42 am.

This drill was conducted in presence of Mr. Santanu Banerjee, Joint Chief, Director of Factories, WB and Mr. Debasish Mahato, Inspector of Factories (Chemicals), WB. After all clear siren, the senior management team along with Joint Chief Director of Factories visited the incident spot to visualize the situation. They also visited the ATO-1 control room, field and emergency control center and appreciated about our emergency preparedness.

MOCK DRILL REPORT

Sequence of events

1. Mr. Soumendranath Dhara (TOYO Eng.) observed the ammonia leakage in DAP2 ammonia transfer line at 11.13 am & immediately informed to Mr. Abhijit Maity (Security officer).
2. Mr. Dhara actuated Emergency Siren (level 1 was blown) by breaking the MCP (manual call point) glass at 11.15 am.
3. Mr. Maity immediately informed to the Area Shift In-charge DAP-2 Mr. Soumen Das about the emergency zone & alerted the QRT for preparedness at 11.16 am.
4. Mr. Soumen Das (Incident Controller) immediately rushed to the incident spot and instructed DAP2 control room to stop the ammonia transfer pump located at Ammonia Terminal Operation-1 (ATO-1), accessing the remote stop switch from DAP2 control room and informed to Emergency Controller 11.18 am.
5. After understanding the situation from Incident controller about the severity, emergency controller asked the security to raise the level-2 siren. Level -2 siren was actuated at 11.20 am.
6. Emergency controller reached at ECC1 at 11.21 am.
7. QRT members started their activity very quickly. & the main fire pump had started on auto mode when hydrant valve was opened at incident spot. Emergency announcement was being carried out throughout the whole plant by the help of QRT team members, using PA system.
8. All other people except QRT assembled at designated assembly points by 11.22 am.
9. Both Factory fire tenders carrying fire hoses, nozzles, SCBA and fire suit reached to the spot at 11.25 am and made water curtain surrounding the leakage point to prevent spread of ammonia gas. Factory ambulance also reached to the spot at the same time along with fire tender.
10. Shortly DGM –Safety and Manager DAP reached to the spot.
11. Chief Operating Officer reached to emergency control Centre, ECC-1 at 11.26 am and took over the charge as CEC (Chief Emergency Controller) from Emergency controller.
12. Chief Emergency Controller instructed safe shutdown for both DAP1 & 2 plant at 11.30 am.
13. The leaky flange was isolated by closing the downstream isolation valve at 11.32 a.m. by DAP2 Operator.
14. Mechanical maintenance team reached to the emergency spot at 11.32 am.
15. Chief emergency controller was in close contact with the incident control team and assembly point leaders to get update about the situation continuously.
16. CEC was also ready to seek help from WB fire service and other industries in consultation with EC and IC
17. The leak was confined by water curtain. Gradually the rate of leak reduced due to cut off from source.
18. Due to inhalation of ammonia gas, one of the maintenance workers became unconscious and shifted to OHC at 11.33 am.
19. There was continuous communication between the medical officer & CEC about the victim's condition.
20. Incident controller informed to CEC that the situation was under control at 11.40 am.
21. All clear siren was raised by security at 11.42 am as instructed by CEC.

MOCK DRILL REPORT

Positives

1. All the people responded well, and actions were taken very sharp.
2. Communication and coordination between External team and CEC/EC as well between IC and CEC were good.
3. All communication between emergency team members happened properly.
4. By using PA system, emergency announcement also carried out throughout the whole plant with the help of QRT team members.
5. Fire team along with QRT & others were the main combatants.
6. As per the instruction of Emergency controller, the QRT team evacuated the assembly point 5 (located in front of Admin Building) which was under the travel path of wind direction and shifted all people to the assembly point 1 (located at East side of STG Building).
7. Fire tenders reached to the spot very quickly.
8. Ambulance also reached the spot-on time.
9. Truck & tanker movement stopped.
10. Main gate was kept opened during emergency.
11. ECC-1 was equipped with Red & White Helmet, copy of On-Site Emergency plan and one register, list of emergency control team with telephone numbers, list of First aiders, external telephone numbers, and internal telephone numbers of assembly points and control room.
12. First aider & fire fighter team members' names displayed for different zone/assembly point.
13. Post drill meeting was also arranged & all observations were noted for future improvements.

Observation

1. Canister mask should be available inside Ambulance.
2. Explore Special Firefighting helmet with canister mask for firefighting team.
3. Security personnel to guide assembly point people for movement during emergency, if required
4. Walkie- talkie was not working properly.

Action plan:

1. Canister mask has been provided.
2. Special firefighting helmet will be explored by 31.03.2023.
3. Security personnel to be trained by 15th April.
4. Supplier will be talked about Walkie-Talkie malfunctioning and corrective action will be taken by 30.04.2023.

MOCK DRILL REPORT

Photographs



Fire Tender reached at the incident site



Assembly Point in front of Welfare block lawn



Water curtain at incident spot



Process operator rushed for valve isolation.



Causality rescued by QRT.



Medical treatment given to victim.

MOCK DRILL REPORT



Emergency control team in ECC-1



Emergency Control Team at incident Spot



Address by COO, Indorama



Address by Joint Chief Director of factories, Government of West Bengal



Address by Inspector of factories, Government of West Bengal

Monitoring Reports

Annexure-2

TEST REPORT


Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
Haldia, Pin- 721602

Report No. : WB/ED -4697
Date : 30.03.2023
Sample Description : Stack Monitoring
Sample Mark : DAP-1
Date & Time of Sampling :06.03.2022
at 01.30 PM

Reference No.& Date: 4700013395 ,Dtd: 02.08.2021

ANALYSIS RESULT

A. <u>General information about stack :</u>		
1.	Stack connected to	: DAP-1
2.	Emission due to	: Vapour Generation from process reaction ; Granulation, Screening Milling & Drying operation
3.	Material of construction of Stack	: MS
4.	Shape of Stack	: Circular
5.	Whether stack is provided with permanent platform & ladder	: Yes
6.	capacity	:---- Working Load - 38 TPH
B. <u>Physical characteristics of stack :</u>		
1.	Height of the stack from ground level	: 42 m
2.	Diameter of the stack at sampling point	: 2.5 m
3.	Height of the Sampling Point from Ground level	:40 m
4.	Area of Stack	: 4.91 m ²
C. <u>Analysis/Characteristic of stack:</u>		
1.	Fuel used	: ----
		2. Fuel Consumption : ----
D. <u>Result of sampling & analysis of gaseous emission</u>		
	Result	Method
1.	Temperature of emission (° c)	54 IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	755 IS 11255 (Part III),2008RA 2018
3.	Velocity of gas (m/s)	13.29 IS 11255 (Part III),2008RA 2018
4.	Quantity of gas flow (Nm ³ /hr)	187001.84 IS 11255 (Part III),2008RA 2018
5.	Concentration of Particulate Matters (mg/Nm ³)	83.0 IS 11255 (Part I):1985,RA 2014
6.	Concentration of Gaseous Fluoride (mg/Nm ³)	0.86 USEPA-13B - 20/08/1996
7.	Concentration of Amonia (mg/Nm ³)	75.0 IS 11255 (Part 6) -1999; Rffm: 2003
E. <u>Pollution control device</u>		
1.	Details of pollution control devices attached with the stack : 4 Stage Scrubber	
F. <u>Remarks</u> : Nil		

Report Prepared By 

for Mitra S. K. Private Limited
Authorized Signatory

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Page 1 of 1



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

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E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com
CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/22-23/1340

Date: February 20, 2023

Page 1 of 2

Issued to : M/S. INDORAMA INDIA PRIVATE LIMITED					
Address : P.O.: Durgachak, Haldia, Dist: Purba Mednipour, Pin: 721602					
Your Ref. P.O. No. : 4700017754, dtd. 27.10.2022	<u>Parameters Tested</u>				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 17.02.2023 at 10:40 A.M. to 11:30 A.M.	Chemical : CO, CO ₂ , F, NH ₃ & PM				
Test Completed on : 20.02.2023					
A. General information about stack :					
1. Stack connected to : DAP - 1					
2. Emission due to : Vapours Generated from Process Reaction, Granulation Screening, Milling & Drying Operation					
3. Material of construction of stack : M.S.					
4. Shape of stack : Circular.					
5. Whether stack is provided with permanent platform & ladder : Yes.					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 42.0 M	(b) from roof level : ---				
2. Diameter of the stack (a) at bottom : ---	(b) at top : ---				
3. Diameter of the stack at sampling point : 2.5 M					
4. No. of Traverse point : 32 Nos.					
5. Height of the sampling point from GL : 40.0 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : ---	2. Load : 30 PTH				
D. Results of Physical Parameters of Flue Gas : Barometric pressure : 757 mmHg					
SI No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 (Part 3) : 2008	°C	40	
2.	Velocity of gas in duct	IS 11255 : (Part 3) : 2008	m/sec	12.18	
3.	Quantity of gas flow	IS 11255 : (Part 3) : 2008	NM ³ /hr	178815	
E. Results of gaseous emission :					
SI No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 13270 (By Orsat) : 1992	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 13270 (By Orsat) : 1992	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : (Part 1) : 1985	mg/Nm ³	20	150 max.
4.	Gasous Fluoride	IS 11255 (Part 5) : 1990	mg/Nm ³	2.84	Not Available
5.	Ammonia as NH ₃	Methods of Air Sampling & Analysis, 3rd Ed. (Indophenol Method), Method 401	mg/Nm ³	44.0	Not Available
F. Pollution control device					
Details of pollution control devices attached with the stack : NH ₃ Scrubber, Gas Scrubber & Fluoride Scrubber.					

S. Mondal
Report Verified by
S. Mondal

:- END OF TEST REPORT :-

(Dr. R. KARIM)
Technical Manager
Authorised Signatory

For R.V.BRIGGS & CO. (P) LTD.

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TEST REPORT


Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -4354
 Date : 28.02.2023
 Sample No. : MSKGL/ED/2022-23/01/01416
 Sample Description : Stack Monitoring
 Sample Mark : DAP-1
 Date & Time of Sampling : 30.01.2023
 at 12.54 PM

Reference No.& Date: 4700013395 ,Dtd: 02.08.2021

ANALYSIS RESULT

A. <u>General information about stack :</u>		
1.	Stack connected to	: DAP-1
2.	Emission due to	: Vapour Generation from process reaction ; Granulation, Screening Milling & Drying operation
3.	Material of construction of Stack	: MS
4.	Shape of Stack	: Circular
5.	Whether stack is provided with permanent platform & ladder	: Yes
6.	capacity	:---- Working Load - 40 TPH
B. <u>Physical characteristics of stack :</u>		
1.	Height of the stack from ground level	: 42 m
2.	Diameter of the stack at sampling point	: 2.5 m
3.	Height of the Sampling Point from Ground level	: 40 m
4.	Area of Stack	: 4.91 m ²
C. <u>Analysis/Characteristic of stack:</u>		
1.	Fuel used	: ----
2.	Fuel Consumption	: ----
D. <u>Result of sampling & analysis of gaseous emission</u>		
	Result	Method
1.	Temperature of emission (° c)	52 IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756 IS 11255 (Part III),2008RA 2018
3.	Velocity of gas (m/s)	14.1 IS 11255 (Part III),2008RA 2018
4.	Quantity of gas flow (Nm ³ /hr)	196453 IS 11255 (Part III),2008RA 2018
5.	Concentration of Carbon monoxide (% v/v)	<0.2 IS 13270:1992, Rffm 2009
6.	Concentration of Oxygen (% v/v)	18.4 IS:13270 :1992 Reaff,2014
7.	Concentration of Carbondioxide (% v/v)	1.0 IS:13270 :1992 Reaff,2014
8.	Concentration of Particulate Matters (mg/Nm ³)	51.3 IS 11255 (Part I):1985,RA 2014
9.	Moisture content (%)	13.4 IS 11255 (Part III),2008RA 2018
10.	Concentration of Gaseous Fluoride (mg/Nm ³)	1.1 US EPA part 13 A_(O)
11.	Concentration of Amonia (mg/Nm ³)	273.5 IS 11255 (Part 6) -1999; Rffm: 2003
E. <u>Pollution control device</u>		
1.	Details of pollution control devices attached with the stack : 5 Stage Scrubber	
F. <u>Remarks</u> : Nil		

Report Prepared By 

for Mitra S. K. Private Limited

 Authorised Signatory

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ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

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E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007

TEST REPORT

No. AP-FG/22-23/988

Date: December 16, 2022

Page 1 of 2

Issued to : M/S. INDORAMA INDIA PRIVATE LIMITED					
Address : P.O.: Durgachak, Haldia, Dist: Purba Mednipour, Pin: 721602					
Your Ref. P.O. No. : 4700017754, dtd. 27.10.2022	<u>Parameters Tested</u>				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 15.12.2022 at 11:30 A.M. to 12:18 P.M.	Chemical : CO, CO ₂ , F, NH ₃ & PM				
Test Completed on : 16.12.2022					
A. General information about stack :					
1. Stack connected to : DAP - 1					
2. Emission due to : Vapours Generated from Process Reaction, Granulation Screening, Milling & Drying Operation					
3. Material of construction of stack : M.S.					
4. Shape of stack : Circular.					
5. Whether stack is provided with permanent platform & ladder : Yes.					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 42.0 M (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : ---					
3. Diameter of the stack at sampling point : 2.5 M					
4. No. of Traverse point : 32 Nos.					
5. Height of the sampling point from GL : 40.0 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : ---	2. Load : 40 PTH				
D. Results of Physical Parameters of Flue Gas : Barometric pressure : 759 mmHg					
SI No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 (Part 3) : 2008	°C	55	
2.	Velocity of gas in duct	IS 11255 : (Part 3) : 2008	m/sec	12.44	
3.	Quantity of gas flow	IS 11255 : (Part 3) : 2008	NM ³ /hr	175220	
E. Results of gaseous emission :					
SI No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 13270 (By Orsat) : 1992	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 13270 (By Orsat) : 1992	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : (Part 1) : 1985	mg/Nm ³	72	150 max.
4.	Gasous Fluoride	IS 11255 (Part 5) : 1990	mg/Nm ³	0.83	Not Available
5.	Ammonia as NH ₃	Methods of Air Sampling & Analysis, 3rd Ed. (Indophenol Method), Method 401	mg/Nm ³	59.9	Not Available
F. Pollution control device					
Details of pollution control devices attached with the stack : NH ₃ Scrubber, Gas Scrubber & Fluoride Scrubber.					

:- END OF TEST REPORT :-

Report Verified by
S. Mondal

(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

BB

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- ★ Results relate only to the parameters tested.

TEST REPORT

Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -3098
 Date : 30.11.2022
 Sample No. : MSKGL/ED/2022-23/11/00774
 Sample Description : Stack Monitoring
 Sample Mark : DAP-1
 Date & Time of Sampling : 11.11.2022
 at 11.47 AM

Reference No.& Date: 4700013395 ,Dtd: 02.08.2021

ANALYSIS RESULT

A . General information about stack :			
1.	Stack connected to	: DAP-1	
2.	Emission due to	: Vapour Generation from process reaction ; Granulation, Screening Milling & Drying operation	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	:----	Working Load - 40 TPH
B . Physical characteristics of stack :			
1.	Height of the stack from ground level	: 42 m	
2.	Diameter of the stack at sampling point	: 2.5 m	
3.	Height of the Sampling Point from Ground level	: 40 m	
4.	Area of Stack	: 4.91 m ²	
C. Analysis/Characteristic of stack:			
1.	Fuel used	: ----	2. Fuel Consumption :----
D . Result of sampling & analysis of gaseous emission		Result	Method
1.	Temperature of emission (° c)	54	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	755	IS 11255 (Part III),2008RA 2018
3.	Velocity of gas (m/s)	10.7	IS 11255 (Part III),2008RA 2018
4.	Quantity of gas flow (Nm ³ /hr)	158277	IS 11255 (Part III),2008RA 2018
5.	Concentration of Carbon monoxide (% v/v)	<0.2	IS 13270:1992, Rffm 2009
6.	Concentration of Oxygen (% v/v)	18.2	IS:13270 :1992 Reaff,2014
7.	Concentration of Carbondioxide (% v/v)	1.0	IS:13270 :1992 Reaff,2014
8.	Concentration of Particulate Matters (mg/Nm ³)	86.7	IS 11255 (Part I):1985,RA 2014
9.	Moisture content (%)	7.45	IS 11255 (Part III),2008RA 2018
10.	Concentration of Gaseous Fluoride (mg/Nm ³)	0.97	USEPA-13B - 20/08/1996
11.	Concentration of Amonia (mg/Nm ³)	262.5	IS 11255 (Part 6) -1999; Rffm: 2003
E . Pollution control device			
1.	Details of pollution control devices attached with the stack : 5 Stage Scrubber		
F. Remarks : Nil			

Report Prepared By 

for Mitra S. K. Private Limited


 Authorised Signatory

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TEST REPORT


Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -4698
 Date : 30.03.2023
 Sample Description : Stack Monitoring
 Sample Mark : DAP-2
 Date & Time of Sampling :08.03.2023
 at 11.00 am

Reference No.& Date: 4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A . General information about stack :			
1.	Stack connected to	: DAP-2	
2.	Emission due to	:Vapour Generation from process reaction ; Granulation, Screening Milling & Drying operation	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ---- Working Load - 50 TPH	
B . Physical characteristics of stack :			
1.	Height of the stack from ground level	: 42 m	
2.	Diameter of the stack at sampling point	: 2.5 m	
3.	Height of the Sampling Point from Ground level	: 40.0 m	
4.	Area of Stack	: 4.91 m ²	
C. Analysis/Characteristic of stack:			
1.	Fuel used : Briquette	2. Fuel Consumption : 0.5 Ton/hr	
D . Result of sampling & analysis of gaseous emission			
		Result	
		Method	
1.	Temperature of emission (°c)	57	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756	IS 11255 (Part III),2008RA 2018
3.	Velocity of gas (m/s)	13.78	IS 11255 (Part III),2008RA 2018
4.	Quantity of gas flow (Nm3/hr)	196788.81	IS 11255 (Part III),2008RA 2018
5.	Concentration of Particulate Matters (mg/Nm ³)	76.0	IS 11255 (Part I):1985,RA 2014
6.	Concentration of Gaseous Fluoride (mg/Nm ³)	1.1	USEPA-13B - 20/08/1996
7.	Concentration of Amonia (mg/Nm ³)	125.0	IS 11255 (Part 6) -1999; Rffm: 2003
E. Pollution control device			
1.	Details of pollution control devices attached with the stack	: 5 Stage Scrubbers (NH3, Scrubber;Gas Scrubber, Venturies Scrubber & Fluoride Scrubber)	
F. Remarks : Nil			

Report Prepared By: 

for Mitra S. K. Private Limited
 Authorised Signatory

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Head Office: Shrachi Centre (5th floor), 74B, A.J.C. Bose Road, Kolkata - 700 016, West Bengal, India.
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Page 1 of 1



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

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CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/22-23/1341

Date: February 20, 2023

Page 1 of 2

Issued to : M/S. INDORAMA INDIA PRIVATE LIMITED					
Address : P.O.: Durgachak, Haldia, Dist: Purba Mednipour, Pin: 721602					
Your Ref. P.O. No. : 4700017754, dtd. 27.10.2022	<u>Parameters Tested</u>				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 17.02.2023 at 09:27 A.M. to 10:09 A.M.	Chemical : CO, CO ₂ , F, NH ₃ & PM				
Test Completed on : 20.02.2023					
A. General information about stack :					
1. Stack connected to : DAP - 2					
2. Emission due to : Vapours Generated from Process Reaction, Granulation Screening, Milling & Drying Operation					
3. Material of construction of stack : M.S.					
4. Shape of stack : Circular.					
5. Whether stack is provided with permanent platform & ladder : Yes.					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 42.0 M (b) from roof level : ---					
2. Diameter of the stack (a) at bottom : --- (b) at top : ---					
3. Diameter of the stack at sampling point : 2.5 M					
4. No. of Traverse point : 32 Nos.					
5. Height of the sampling point from GL : 40.0 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : ---	2. Load : 52 TPH				
D. Results of Physical Parameters of Flue Gas : Barometric pressure : 757 mmHg					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 (Part 3) : 2008	°C	57	
2.	Velocity of gas in duct	IS 11255 : (Part 3) : 2008	m/sec	13.57	
3.	Quantity of gas flow	IS 11255 : (Part 3) : 2008	NM ³ /hr	193042	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 13270 (By Orsat) : 1992	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 13270 (By Orsat) : 1992	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : (Part 1) : 1985	mg/Nm ³	35	150 max.
4.	Gasous Fluoride	IS 11255 (Part 5) : 1990	mg/Nm ³	2.02	Not Available
5.	Ammonia as NH ₃	Methods of Air Sampling & Analysis, 3rd Ed. (Indophenol Method), Method 401	mg/Nm ³	68.4	Not Available
F. Pollution control device					
Details of pollution control devices attached with the stack : NH ₃ Scrubber, Gas Scrubber & Fluoride Scrubber.					

Report Verified by
S. Mondal

-: END OF TEST REPORT :-

(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

BB

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- ★ Results relate only to the parameters tested.

TEST REPORT


Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -4353
 Date : 28.02.2023
 Sample No. : MSKGL/ED/2022-23/01/01415
 Sample Description : Stack Monitoring
 Sample Mark : DAP-2
 Date & Time of Sampling :30.01.2023
 at 11.32 AM

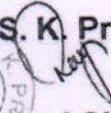
Reference No.& Date: 4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A . <u>General information about stack :</u>		
1.	Stack connected to	: DAP-2
2.	Emission due to	: Vapour Generation from process reaction ; Granulation, Screening Milling & Drying operation
3.	Material of construction of Stack	: MS
4.	Shape of Stack	: Circular
5.	Whether stack is provided with permanent platform & ladder	: Yes
6.	capacity	: ---- Working Load - 70 TPH
B . <u>Physical characteristics of stack :</u>		
1.	Height of the stack from ground level	: 42 m
2.	Diameter of the stack at sampling point	: 2.5 m
3.	Height of the Sampling Point from Ground level	: 40.0 m
4.	Area of Stack	: 4.91 m ²
C . <u>Analysis/Characteristic of stack:</u>		
1.	Fuel used	: ----
2.	Fuel Consumption	: ----
D . <u>Result of sampling & analysis of gaseous emission</u>		
	Result	Method
1.	Temperature of emission (°c)	56 IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756 IS 11255 (Part III),2008RA 2018
3.	Velocity of gas (m/s)	13.69 IS 11255 (Part III),2008RA 2018
4.	Quantity of gas flow (Nm ³ /hr)	195922 IS 11255 (Part III),2008RA 2018
5.	Concentration of Carbon Monoxide (% v/v)	<0.2 IS 13270 : 1992
6.	Concentration of Oxygen (% v/v)	17.8 IS 13270 : 1992
7.	Concentration of Carbon Dioxide (% v/v)	1.4 IS 13270 : 1992
8.	Concentration of Particulate Matters (mg/Nm ³)	56.9 IS 11255 (Part I):1985,RA 2014
9.	Moisture content (%)	9.6 IS : 11255 (Part 3) : 2008
10.	Concentration of Gaseous Fluoride (mg/Nm ³)	1.05 US EPA part 13 A (O)
11.	Concentration of Amonia (mg/Nm ³)	264.8 IS 11255 (Part 6) : 1999
E . <u>Pollution control device</u>		
1.	Details of pollution control devices attached with the stack	: 5 Stage Scrubbers (NH ₃ , Scrubber; Gas Scrubber, Venturies Scrubber & Fluoride Scrubber)
F . <u>Remarks</u> : Nil		

Report Prepared By 

for Mitra S. K. Private Limited


 Authorised Signatory

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R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

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E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007

TEST REPORT

No. AP-FG/22-23/1003

Date: December 17, 2022

Page 1 of 2

Issued to : M/S. INDORAMA INDIA PRIVATE LIMITED					
Address : P.O.: Durgachak, Haldia, Dist: Purba Mednipour, Pin: 721602					
Your Ref. P.O. No. : 4700017754, dtd. 27.10.2022	Parameters Tested				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 16.12.2022 at 11:20 A.M. to 12:02 P.M.	Chemical : CO, CO ₂ , F, NH ₃ & PM				
Test Completed on : 17.12.2022					
A. General information about stack :					
1. Stack connected to	: DAP - 2				
2. Emission due to	: Vapours Generated from Process Reaction, Granulation Screening, Milling & Drying Operation				
3. Material of construction of stack	: M.S.				
4. Shape of stack	: Circular.				
5. Whether stack is provided with permanent platform & ladder	: Yes.				
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 42.0 M	(b) from roof level : ---				
2. Diameter of the stack (a) at bottom : ---	(b) at top : ---				
3. Diameter of the stack at sampling point	: 2.5 M				
4. No. of Traverse point	: 32 Nos.				
5. Height of the sampling point from GL	: 40.0 M				
C. Analysis / Characteristic of stack :					
1. Fuel used : ---	2. Load : 70 TPH				
D. Results of Physical Parameters of Flue Gas : Barometric pressure : 759 mmHg					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 (Part 3) : 2008	°C	54	
2.	Velocity of gas in duct	IS 11255 : (Part 3) : 2008	m/sec	13.62	
3.	Quantity of gas flow	IS 11255 : (Part 3) : 2008	NM ³ /hr	197136	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 13270 (By Orsat) : 1992	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 13270 (By Orsat) : 1992	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : (Part 1) : 1985	mg/Nm ³	94	150 max.
4.	Gasous Fluoride	IS 11255 (Part 5) : 1990	mg/Nm ³	0.66	Not Available
5.	Ammonia as NH ₃	Methods of Air Sampling & Analysis, 3rd Ed. (Indophenol Method), Method 401	mg/Nm ³	87.9	Not Available
F. Pollution control device					
Details of pollution control devices attached with the stack : NH ₃ Scrubber, Gas Scrubber & Fluoride Scrubber.					

:- END OF TEST REPORT :-

Report Verified by
S. Mondal

(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

BB

TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -3288
Date : 06.12.2022
Sample Description : Stack Monitoring
Sample Mark : DAP-2
Date & Time of Sampling : 30.11.2022

Reference No.& Date: 4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A . General information about stack :			
1.	Stack connected to	: DAP-2	
2.	Emission due to	: Vapour Generation from process reaction ; Granulation, Screening Milling & Drying operation	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ----	Working Load - 70 TPH
B . Physical characteristics of stack :			
1.	Height of the stack from ground level	: 42 m	
2.	Diameter of the stack at sampling point	: 2.5 m	
3.	Height of the Sampling Point from Ground level	: 40.0 m	
4.	Area of Stack	: 4.91 m ²	
C. Analysis/Characteristic of stack:			
1.	Fuel used	: Briquette	2. Fuel Consumption : 0.5 Ton/hr
D . Result of sampling & analysis of gaseous emission		Result	Method
1.	Temperature of emission (°c)	57	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756	IS 11255 (Part III),2008RA 2018
3.	Velocity of gas (m/s)	13.71	IS 11255 (Part III),2008RA 2018
4.	Quantity of gas flow (Nm ³ /hr)	197216.13	IS 11255 (Part III),2008RA 2018
5.	Concentration of Particulate Matters (mg/Nm ³)	85.0	IS 11255 (Part I):1985,RA 2014
6.	Concentration of Gaseous Fluoride (mg/Nm ³)	0.67	USEPA-13B - 20/08/1996
7.	Concentration of Amonia (mg/Nm ³)	82.0	IS 11255 (Part 6) -1999; Rffm: 2003
E . Pollution control device			
1.	Details of pollution control devices attached with the stack : 5 Stage Scrubbers (NH ₃ , Scrubber; Gas Scrubber, Venturies Scrubber & Fluoride Scrubber)		
F. Remarks : Nil			

Report Prepared By 

for Mitra S. K. Private Limited


 Authorised Signatory

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TEST REPORT


Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -4700
 Date : 30.03.2023
 Sample Description : Stack Monitoring
 Sample Mark : SSP-Ball Mill
 Date & Time of Sampling :03.03.2023
 at 02.00 pm

Reference No.& Date:4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A .	General information about stack :		
1.	Stack connected to	: SSP - Ball Mill	
2.	Emission due to	:Milling Operation	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ----	Working Load - 12 TPH
B .	Physical characteristics of stack :		
1.	Height of the stack from ground level	: 34.3 m	
2.	Diameter of the stack at sampling point	: 0.7 m	
3.	Height of the Sampling Point from Ground level	: 31.5 m	
4.	Area of Stack	: 0.39 m	
C .	Analysis/Characteristic of stack:		
1.	Fuel used	: ----	2. Fuel Consumption : ----
D .	Result of sampling & analysis of gaseous emission	Result	Method
1.	Temperature of emission (°C)	46	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	757	Lab Method
3.	Velocity of gas (m/sec.)	8.97	IS 11255 (Part III),2008RA 2018
4.	Quantity of Gas Flow (Nm ³ /hr)	11269.39	IS 11255 (Part III),2008RA 2018
5.	Concentration of Particulate Matter (mg/Nm ³)	47.0	USEPA-13B - 20/08/1996
E .	Pollution control device		
1.	Details of pollution control devices attached with the stack : Cyclone Bag Filter		
F .	Remarks : Nil		

Report Prepared By: 

for Mitra S. K. Private Limited
 Authorised Signatory

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TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
Haldia, Pin- 721602

Report No. : WB/ED -4431
Date : 09.03.2023
Sample Description : Stack Monitoring
Sample Mark : SSP-Ball Mill
Date & Time of Sampling : 24.02.2023
at 02.30 pm

Reference No.& Date:4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A. <u>General information about stack :</u>			
1.	Stack connected to	: SSP - Ball Mill	
2.	Emission due to	:Milling Operation	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ----	Working Load - 15 TPH
B. <u>Physical characteristics of stack :</u>			
1.	Height of the stack from ground level	: 34.3 m	
2.	Diameter of the stack at sampling point	: 0.7 m	
3.	Height of the Sampling Point from Ground level	: 31.5 m	
4.	Area of Stack	: ---	
C. <u>Analysis/Characteristic of stack:</u>			
1.	Fuel used	: ----	
		2. Fuel Consumption : ----	
D. <u>Result of sampling & analysis of gaseous emission</u>			
		Result	Method
1.	Temperature of emission (°C)	47	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756	Lab Method
3.	Velocity of gas (m/sec.)	8.77	IS 11255 (Part III),2008RA 2018
4.	Quantity of Gas Flow (Nm ³ /hr)	11012.11	IS 11255 (Part III),2008RA 2018
5.	Concentration of Particulate Matter (mg/Nm ³)	56.0	USEPA-13B - 20/08/1996
E. <u>Pollution control device</u>			
1.	Details of pollution control devices attached with the stack : Cyclone Bag Filter		
F. <u>Remarks</u> : Nil			

Report Prepared By



for Mitra S. K. Private Limited



Authorised Signatory

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TEST REPORT

Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -3650
 Date : 12.01.2023
 Sample Description : Stack Monitoring
 Sample Mark : SSP-Ball Mill
 Date & Time of Sampling :26.12.2022
 at 01.50 pm

Reference No.& Date:4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A . General information about stack :			
1.	Stack connected to	: SSP - Ball Mill	
2.	Emission due to	:Milling Operation	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ----	Working Load - 15 TPH
B . Physical characteristics of stack :			
1.	Height of the stack from ground level	: 34.3 m	
2.	Diameter of the stack at sampling point	: 0.7 m	
3.	Height of the Sampling Point from Ground level	: 31.5 m	
4.	Area of Stack	: 0.385 m ²	
C. Analysis/Characteristic of stack:			
1.	Fuel used	: ----	
		2. Fuel Consumption : ----	
D . Result of sampling & analysis of gaseous emission		Result	Method
1.	Temperature of emission (°C)	46	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756	Lab Method
3.	Velocity of gas (m/sec.)	9.30	IS 11255 (Part III),2008RA 2018
4.	Quantity of Gas Flow (Nm ³ /hr)	11668.57	IS 11255 (Part III),2008RA 2018
5.	Concentration of Particulate Matter (mg/Nm ³)	53.0	USEPA-13B - 20/08/1996
E . Pollution control device			
1.	Details of pollution control devices attached with the stack : Cyclone Bag Filter		
F. Remarks : Nil			

Report Prepared By 

for Mitra S. K. Private Limited



Authorised Signatory

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TEST REPORT


Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -3290
Date : 06.12.2022
Sample Description : Stack Monitoring
Sample Mark : SSP-Ball Mill
Date & Time of Sampling : 29.11.2022

Reference No.& Date:4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A . General information about stack :			
1.	Stack connected to	: SSP - Ball Mill	
2.	Emission due to	:Milling Operation	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ----	Working Load - 10.5 TPH
B . Physical characteristics of stack :			
1.	Height of the stack from ground level	: 34.3 m	
2.	Diameter of the stack at sampling point	: 0.7 m	
3.	Height of the Sampling Point from Ground level	: 31.5 m	
4.	Area of Stack	: 0.385 m ²	
C. Analysis/Characteristic of stack:			
1.	Fuel used	: ----	
		2. Fuel Consumption : ----	
D . Result of sampling & analysis of gaseous emission		Result	Method
1.	Temperature of emission (°C)	46	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756	Lab Method
3.	Velocity of gas (m/sec.)	8.96	IS 11255 (Part III),2008RA 2018
4.	Quantity of Gas Flow (Nm ³ /hr)	11241.98	IS 11255 (Part III),2008RA 2018
5.	Concentration of Particulate Matter (mg/Nm ³)	40.0	USEPA-13B - 20/08/1996
E . Pollution control device			
1.	Details of pollution control devices attached with the stack : Cyclone Bag Filter		
F. Remarks : Nil			

Report Prepared By 

for Mitra S. K. Private Limited




Authorised Signatory

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TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -2983
Date : 04.11.2022
Sample Description : Stack Monitoring
Sample Mark : SSP-Ball Mill
Date & Time of Sampling : 31.10.2022
 at 03.00 pm

Reference No.& Date:4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A . General information about stack :			
1.	Stack connected to	: SSP - Ball Mill	
2.	Emission due to	:Milling Operation	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ----	Working Load - 10.5 TPH
B . Physical characteristics of stack :			
1.	Height of the stack from ground level	: 34.3 m	
2.	Diameter of the stack at sampling point	: 0.7 m	
3.	Height of the Sampling Point from Ground level	: 31.5 m	
4.	Area of Stack	: 0.385 m ²	
C. Analysis/Characteristic of stack:			
1.	Fuel used	: ----	2. Fuel Consumption : ----
D . Result of sampling & analysis of gaseous emission		Result	Method
1.	Temperature of emission (°C)	98	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756	Lab Method
3.	Velocity of gas (m/sec.)	8.89	IS 11255 (Part III),2008RA 2018
4.	Quantity of Gas Flow (Nm ³ /hr)	11083.48	IS 11255 (Part III),2008RA 2018
5.	Concentration of Particulate Matter (mg/Nm ³)	53.0	USEPA-13B - 20/08/1996
E . Pollution control device			
1.	Details of pollution control devices attached with the stack : Cyclone Bag Filter		
F. Remarks : Nil			

Report Prepared By 

for Mitra S. K. Private Limited




 Authorised Signatory

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TEST REPORT


Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -4701
 Date : 30.03.2023
 Sample Description : Stack Monitoring
 Sample Mark : SSP Fluoride Scrubber
 Date & Time of Sampling :03.03.2023
 At 03.10 PM

Reference No.& Date: 4700013395 ,Dtd: 02.08.2021

ANALYSIS RESULT

A . General information about stack :			
1.	Stack connected to	: SSP Fluoride Scrubber	
2.	Emission due to	: Process Reaction , Vapour	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ---- Working Load- 25 TPH	
B . Physical characteristics of stack :			
1.	Height of the stack from ground level	: 40 m	
2.	Diameter of the stack at sampling point	: 1.5 m	
3.	Height of the Sampling Point from Ground level	: 25.0 m	
4.	Area of Stack	: 1.766 m ²	
C. Analysis/Characteristic of stack:			
1.	Fuel used	: ----	
2.	Fuel Consumption	: ----	
D . Result of sampling & analysis of gaseous emission			
		Result	Method
1.	Temperature of emission (° C)	70	
2.	Barometric pressure (mm of Hg)	757	IS 11255 (Part III),2008RA 2018
3.	Velocity of gas (m/s)	2.88	IS 11255 (Part III),2008RA 2018
4.	Quantity of gas flow (Nm ³ /hr)	14414.96	IS 11255 (Part III),2008RA 2018
5.	Concentration of Particulate Matters (mg/Nm ³)	72.0	IS 11255 (Part I):1985,RA 2014
6.	Concentration of Gaseous Fluoride (mg/Nm ³)	1.73	USEPA-13B - 20/08/1996
E . Pollution control device			
1.	Details of pollution control devices attached with the stack : 4 Stage Fluoride Scrubber		
F. Remarks			
: Nil			

Report Prepared By: 

for Mitra S. K. Private Limited
 Authorized Signatory

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R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

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Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/22-23/1343

Date: February 20, 2023

Page 1 of 2

Issued to	: M/S. INDORAMA INDIA PRIVATE LIMITED				
Address	: P.O.: Durgachak, Haldia, Dist: Purba Mednipour, Pin: 721602				
Your Ref. P.O. No.	: 4700017754, dtd. 27.10.2022	<u>Parameters Tested</u>			
Sample Description	: Stack Gas	Physical : Temp., Velocity, Gas flow			
Date & time of sampling	: 17.02.2023 at 02:26 P.M. to 03:16 P.M.	Chemical : CO, CO ₂ , F & PM			
Test Completed on	: 20.02.2023				
A. General information about stack :					
1. Stack connected to	: SSP Scrubber				
2. Emission due to	: Process Activity				
3. Material of construction of stack	: M.S.				
4. Shape of stack	: Circular.				
5. Whether stack is provided with permanent platform & ladder	: Yes.				
B. Physical characteristics of stack :					
1. Height of the stack	(a) from ground level : 40.0 M	(b) from roof level : ---			
2. Diameter of the stack	(a) at bottom : ---	(b) at top : ---			
3. Diameter of the stack at sampling point	: 1.5 M				
4. No. of Traverse point	: 20 Nos.				
5. Height of the sampling point from GL	: 25.0 M				
C. Analysis / Characteristic of stack :					
1. Fuel used	: ---		2. Load : 25 TPH		
D. Results of Physical Parameters of Flue Gas :					
				Barometric pressure : 757 mmHg	
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 (Part 3) : 2008	°C	68	
2.	Velocity of gas in duct	IS 11255 : (Part 3) : 2008	m/sec	3.08	
3.	Quantity of gas flow	IS 11255 : (Part 3) : 2008	NM ³ /hr	15450	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 13270 (By Orsat) : 1992	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 13270 (By Orsat) : 1992	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : (Part 1) : 1985	mg/Nm ³	40	150 max.
4.	Gasous Fluoride	IS 11255 (Part 5) : 1990	mg/Nm ³	0.46	Not Available
E. Pollution control device					
Details of pollution control devices attached with the stack : 4 Stage Water Scrubber.					

:- END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal

R. Karim
(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

BB

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- ★ Results relate only to the parameters tested.

TEST REPORT


Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -4355
 Date : 28.02.2023
 Sample No. : MSKGL/ED/2022-23/01/01417
 Sample Description : Stack Monitoring
 Sample Mark : SSP Fluoride Scrubber
 Date & Time of Sampling :30.01.2023
 at 03.15 PM


Reference No.& Date: 4700013395 ,Dtd: 02.08.2021

ANALYSIS RESULT

A. General information about stack :			
1.	Stack connected to	: SSP Fluoride Scrubber	
2.	Emission due to	: SSP Fluoride Scrubber	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ----	Working Load- 20 TPH
B. Physical characteristics of stack :			
1.	Height of the stack from ground level	: 40 m	
2.	Diameter of the stack at sampling point	: 1.5 m	
3.	Height of the Sampling Point from Ground level	: 25.0 m	
4.	Area of Stack	: 1.766 m ²	
C. Analysis/Characteristic of stack:			
1.	Fuel used	: ----	2. Fuel Consumption : ----
D. Result of sampling & analysis of gaseous emission			
		Result	Method
1.	Temperature of emission (° C)	69	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756	IS 11255 (Part III),2008RA 2018
3.	Velocity of gas (m/s)	3.2	IS 11255 (Part III),2008RA 2018
4.	Quantity of gas flow (Nm ³ /hr)	14828	IS 11255 (Part III),2008RA 2018
5.	Concentration of Carbonmonoxide (% v/v)	<0.2	IS 13270:1992, Rffm 2009
6.	Concentration of Oxygen (% v/v)	18.6	IS:13270 :1992 Reaff,2014
7.	Concentration of Carbondioxide (% v/v)	1.0	IS:13270 :1992 Reaff,2014
8.	Concentration of Particulate Matters (mg/Nm ³)	70.1	IS 11255 (Part I):1985,RA 2014
9.	Moisture content (%)	15.9	IS 11255 (Part III),2008RA 2018
	Concentration of Gaseous Fluoride (mg/Nm ³)	1.95	USEPA-13B - 20/08/1996
E. Pollution control device			
1.	Details of pollution control devices attached with the stack	: 4 Stage Fluoride Scrubber	
F. Remarks : Nil			

Report Prepared By 

for Mitra S. K. Private Limited


 Authorised Signatory

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R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

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TAHER MANSION, 1ST FLOOR

9, BENTINCK STREET, KOLKATA - 700 001

Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007

TEST REPORT

No. AP-FG/22-23/990

Date: December 16, 2022

Page 1 of 2

Issued to		: M/S. INDORAMA INDIA PRIVATE LIMITED			
Address		: P.O.: Durgachak, Haldia, Dist: Purba Mednipour, Pin: 721602			
Your Ref. P.O. No.	: 4700017754, dtd. 27.10.2022	<u>Parameters Tested</u>			
Sample Description	: Stack Gas	Physical : Temp., Velocity, Gas flow			
Date & time of sampling	: 15.12.2022 at 03:00 P.M. to 03:52 P.M.	Chemical : CO, CO ₂ , F & PM			
Test Completed on	: 16.12.2022				
A. General information about stack :					
1. Stack connected to	: SSP Scrubber				
2. Emission due to	: Process Activity				
3. Material of construction of stack	: M.S.				
4. Shape of stack	: Circular.				
5. Whether stack is provided with permanent platform & ladder	: Yes.				
B. Physical characteristics of stack :					
1. Height of the stack	(a) from ground level : 40.0 M	(b) from roof level : ---			
2. Diameter of the stack	(a) at bottom : ---	(b) at top : ---			
3. Diameter of the stack at sampling point	: 1.5 M				
4. No. of Traverse point	: 20 Nos.				
5. Height of the sampling point from GL	: 25.0 M				
C. Analysis / Characteristic of stack :					
1. Fuel used	: ---		2. Load : 25 PTH		
D. Results of Physical Parameters of Flue Gas :					
				Barometric pressure : 759 mmHg	
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 (Part 3) : 2008	°C	70	
2.	Velocity of gas in duct	IS 11255 : (Part 3) : 2008	m/sec	2.91	
3.	Quantity of gas flow	IS 11255 : (Part 3) : 2008	NM ³ /hr	14576	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 13270 (By Orsat) : 1992	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 13270 (By Orsat) : 1992	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : (Part 1) : 1985	mg/Nm ³	59	150 max.
4.	Gasous Fluoride	IS 11255 (Part 5) : 1990	mg/Nm ³	0.95	Not Available
E. Pollution control device					
Details of pollution control devices attached with the stack : 4 Stage Water Scrubber.					

:- END OF TEST REPORT :-

Report Verified by
S. Mondal

(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

BB

TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -3100
Date : 30.11.2022
Sample No. : MSKGL/ED/2022-23/11/00776
Sample Description : Stack Monitoring
Sample Mark : SSP Fluoride Scrubber
Date & Time of Sampling : 11.11.2022
 at 04.38 PM

Reference No.& Date: 4700013395 ,Dtd: 02.08.2021

ANALYSIS RESULT

A . General information about stack :			
1.	Stack connected to : SSP Fluoride Scrubber		
2.	Emission due to : SSP Fluoride Scrubber		
3.	Material of construction of Stack : MS		
4.	Shape of Stack : Circular		
5.	Whether stack is provided with permanent platform & ladder : Yes		
6.	capacity : ---- Working Load- 20 TPH		
B . Physical characteristics of stack :			
1.	Height of the stack from ground level : 40 m		
2.	Diameter of the stack at sampling point : 1.5 m		
3.	Height of the Sampling Point from Ground level : 25.0 m		
4.	Area of Stack : 1.766 m ²		
C. Analysis/Characteristic of stack:			
1.	Fuel used : ----		
2.	Fuel Consumption : ----		
D . Result of sampling & analysis of gaseous emission			
	Result	Method	
1.	Temperature of emission (° C)	67	
2.	Barometric pressure (mm of Hg)	755	IS 11255 (Part III),2008RA 2018
3.	Velocity of gas (m/s)	2.94	IS 11255 (Part III),2008RA 2018
4.	Quantity of gas flow (Nm ³ /hr)	15077	IS 11255 (Part III),2008RA 2018
5.	Concentration of Carbonmonoxide (% v/v)	<0.2	IS 13270:1992, Rffm 2009
6.	Concentration of Oxygen (% v/v)	18.6	IS:13270 :1992 Reaff,2014
7.	Concentration of Carbondioxide (% v/v)	1.0	IS:13270 :1992 Reaff,2014
8.	Concentration of Particulate Matters (mg/Nm ³)	26.7	IS 11255 (Part I):1985,RA 2014
9.	Moisture content (%)	7.35	IS 11255 (Part III),2008RA 2018
10.	Concentration of Gaseous Fluoride (mg/Nm ³)	1.17	USEPA-13B - 20/08/1996
E . Pollution control device			
1.	Details of pollution control devices attached with the stack : 4 Stage Fluoride Scrubber		
F. Remarks : Nil			

Report Prepared By 

for Mitra S. K. Private Limited


 Authorised Signatory

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R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

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Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007

TEST REPORT

No. AP-FG/22-23/816

Date: November 05, 2022

Page 1 of 2

Issued to : M/S. INDORAMA INDIA PRIVATE LIMITED					
Address : P.O.: Durgachak, Haldia, Dist: Purba Mednipour, Pin: 721602					
Your Ref. P.O. No. : 4700017754, dtd. 27.10.2022	<u>Parameters Tested</u>				
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow				
Date & time of sampling : 28.10.2022 at 03:40 P.M. to 04:28 P.M.	Chemical : CO, CO ₂ , F & PM				
Test Completed on : 05.11.2022					
A. General information about stack :					
1. Stack connected to : SSP Scrubber					
2. Emission due to : Process Activity					
3. Material of construction of stack : M.S.					
4. Shape of stack : Circular.					
5. Whether stack is provided with permanent platform & ladder : Yes.					
B. Physical characteristics of stack :					
1. Height of the stack (a) from ground level : 40.0 M	(b) from roof level : ---				
2. Diameter of the stack (a) at bottom : ---	(b) at top : ---				
3. Diameter of the stack at sampling point : 1.5 M					
4. No. of Traverse point : 20 Nos.					
5. Height of the sampling point from GL : 25.0 M					
C. Analysis / Characteristic of stack :					
1. Fuel used : ---	2. Load : 25 PTH				
D. Results of Physical Parameters of Flue Gas : Barometric pressure : 755 mmHg					
Sl No	Test Parameters	Test Method	Unit	Results	
1.	Temperature of emission	IS 11255 (Part 3) : 2008	°C	68	
2.	Velocity of gas in duct	IS 11255 : (Part 3) : 2008	m/sec	2.82	
3.	Quantity of gas flow	IS 11255 : (Part 3) : 2008	NM ³ /hr	14115	
E. Results of gaseous emission :					
Sl No	Test Parameters	Test Method	Unit	Results	Norms as per CPCB
1.	Carbon monoxide	IS 13270 (By Orsat) : 1992	% v/v	<0.2	Not Available
2.	Carbon dioxide	IS 13270 (By Orsat) : 1992	% v/v	0.2	Not Available
3.	Particulate Matters	IS 11255 : (Part 1) : 1985	mg/Nm ³	68	150 max.
4.	Gasous Fluoride	IS 11255 (Part 5) : 1990	mg/Nm ³	1.02	Not Available
E. Pollution control device					
Details of pollution control devices attached with the stack : 4 Stage Water Scrubber.					

:- END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal

R. Karim
(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

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TEST REPORT


Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -4699
 Date : 30.03.2023
 Sample Description : Stack Monitoring
 Sample Mark : SAP-1
 Date & Time of Sampling : 11.03.2023
 at 10.00 AM

Reference No. & Date: 4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A . General information about stack :			
1.	Stack connected to	: SAP-1	
2.	Emission due to	: Process tail gas	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ---- Working Load- 18 TPH	
B . Physical characteristics of stack :			
1.	Height of the stack from ground level	: 40.0 m	
2.	Diameter of the stack at sampling point	: 0.95 m	
3.	Height of the Sampling Point from Ground level	: 21.0 m	
4.	Area of Stack	: 0.71 m ²	
C . Analysis/Characteristic of stack:			
1.	Fuel used	: ----	
2.	Fuel Consumption	: ----	
D . Result of sampling & analysis of gaseous emission			
		Result	
		Method	
1.	Temperature of emission (°C)	37	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756	Lab Method
3.	Velocity of gas (m/sec.)	11.75	IS 11255 (Part III),2008RA 2018
4.	Quantity of Gas Flow (Nm ³ /hr)	27942.06	IS 11255 (Part III),2008RA 2018
5.	Concentration of Sulphur Dioxide (mg/Nm ³)	162.0	IS 11255 (Part II)-1985, RA:2014
6.	Acid Mist (mg/Nm ³)	46.0	IS 11255 (Part 6) -1999; Rffm: 2003
E . Pollution control device			
1.	Details of pollution control devices attached with the stack		: Continuous Alkaline Scrubber
F . Remarks			
: Nil			

Report Prepared By: 

for Mitra S. K. Private Limited
 Authorised Signatory

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TEST REPORT


Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -4432
 Date : 09.03.2023
 Sample Description : Stack Monitoring
 Sample Mark : SAP-1
 Date & Time of Sampling :23.02.2023
 at 02.45 PM

Reference No.& Date: 4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A .	General information about stack :		
1.	Stack connected to	: SAP-1	
2.	Emission due to	:Process tail gas	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ----	Working Load- 14 TPH
B .	Physical characteristics of stack :		
1.	Height of the stack from ground level	: 40.0 m	
2.	Diameter of the stack at sampling point	: 0.95 m	
3.	Height of the Sampling Point from Ground level	: 21.0 m	
4.	Area of Stack	: 0.71 m ²	
C.	Analysis/Characteristic of stack:		
1.	Fuel used	: ----	
		2. Fuel Consumption : ----	
D .	Result of sampling & analysis of gaseous emission	Result	Method
1.	Temperature of emission (°C)	38	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	755	Lab Method
3.	Velocity of gas (m/sec.)	11.81	IS 11255 (Part III),2008RA 2018
4.	Quantity of Gas Flow (Nm ³ /hr)	27878.31	IS 11255 (Part III),2008RA 2018
5.	Concentration of Sulphur Dioxide (mg/Nm ³)	140.0	IS 11255 (Part II)-1985, RA:2014
6.	Acid Mist (mg/Nm ³)	45.0	IS 11255 (Part 6) -1999; Rffm: 2003
E .	Pollution control device		
1.	Details of pollution control devices attached with the stack : Continuous Alkaline Scrubber		
F.	Remarks : Nil		

Report Prepared By 

for Mitra S. K. Private Limited



Authorised Signatory

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TEST REPORT


Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -4356
 Date : 28.02.2023
 Sample No. : MSKGL/ED/2022-23/01/01418
 Sample Description : Stack Monitoring
 Sample Mark : SAP-1
 Date & Time of Sampling :30.01.2023
 at 04.11 PM

Reference No.& Date: 4700013395 ,Dtd: 02.08.2021

ANALYSIS RESULT

A . General information about stack :			
1.	Stack connected to	: SAP-1	
2.	Emission due to	:Process tail gas	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ----	Working Load- 10 TPH
B . Physical characteristics of stack :			
1.	Height of the stack from ground level	: 40.0 m	
2.	Diameter of the stack at sampling point	: 0.95 m	
3.	Height of the Sampling Point from Ground level	: 21.0 m	
4.	Area of Stack	: 0.71 m ²	
C. Analysis/Characteristic of stack:			
1.	Fuel used	: ----	
		2. Fuel Consumption : ----	
D . Result of sampling & analysis of gaseous emission			
		Result	Method
1.	Temperature of emission (°C)	44	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756	Lab Method
3.	Velocity of gas (m/sec.)	9.23	IS 11255 (Part III),2008RA 2018
4.	Quantity of Gas Flow (Nm ³ /hr)	21554	IS 11255 (Part III),2008RA 2018
5.	Concentration of Carbonmonoxide(% v/v)	<0.2	IS 13270 : 1992
6.	Concentration of Carbondioxide (% v/v)	1.2	IS 13270 : 1992
7.	Concentration of Sulphur Dioxide (mg/Nm ³)	271.8	IS 11255 (Part II)-1985, RA:2014
8.	Concentration of Particulate Matters (mg/Nm ³)	32.3	IS : 11255 (Part I): 1985
9.	Moisture content (%)	<2.0	IS : 11255 (Part 3) : 2008
10.	Acid Mist as H ₂ SO ₄ (mg/Nm ³)	34.7	IS 11255 (Part 6) -1999; Rffm: 2003
E . Pollution control device			
1.	Details of pollution control devices attached with the stack : Continuous Alkaline Scrubber		
F. Remarks : Nil			

Report Prepared By 

for Mitra S. K. Private Limited



Authorised Signatory

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TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
Haldia, Pin- 721602

Report No. : WB/ED -3648
Date : 13.01.2023
Sample Description : Stack Monitoring
Sample Mark : SAP-1
Date & Time of Sampling : 19.12.2022
at 10.00 AM

Reference No.& Date: 4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A .	General information about stack :		
1.	Stack connected to	: SAP-1	
2.	Emission due to	:Process tail gas	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder : Yes		
6.	capacity	: ----	Working Load- 18 TPH
B .	Physical characteristics of stack :		
1.	Height of the stack from ground level	: 40.0 m	
2.	Diameter of the stack at sampling point	: 0.95 m	
3.	Height of the Sampling Point from Ground level	: 21.0 m	
4.	Area of Stack	: 0.71 m ²	
C.	Analysis/Characteristic of stack:		
1.	Fuel used	: ----	2. Fuel Consumption : ----
D .	Result of sampling & analysis of gaseous emission	Result	Method
1.	Temperature of emission (°C)	37	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756	Lab Method
3.	Velocity of gas (m/sec.)	11.37	IS 11255 (Part III),2008RA 2018
4.	Quantity of Gas Flow (Nm ³ /hr)	26966.96	IS 11255 (Part III),2008RA 2018
5.	Concentration of Sulphur Dioxide (mg/Nm ³)	176	IS 11255 (Part II)-1985, RA:2014
6.	Ammonia (mg/Nm ³)	45.0	IS 11255 (Part 6) -1999; Rffm: 2003
E .	Pollution control device		
1.	Details of pollution control devices attached with the stack : Continuous Alkaline Scrubber		
F.	Remarks : Nil		

Report Prepared By 

for Mitra S. K. Private Limited



Authorised Signatory

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TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -3289
Date : 06.12.2022
Sample Description : Stack Monitoring
Sample Mark : SAP-1
Date & Time of Sampling : 26.11.2022

Reference No.& Date: 4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A .	General information about stack :		
1.	Stack connected to	: SAP-1	
2.	Emission due to	:Process tail gas	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder : Yes		
6.	capacity	: ----	Working Load- 18 TPH
B .	Physical characteristics of stack :		
1.	Height of the stack from ground level	: 40.0 m	
2.	Diameter of the stack at sampling point	: 0.95 m	
3.	Height of the Sampling Point from Ground level	: 21.0 m	
4.	Area of Stack	: 0.71 m ²	
C.	Analysis/Characteristic of stack:		
1.	Fuel used	: ----	2. Fuel Consumption : ----
D .	Result of sampling & analysis of gaseous emission	Result	Method
1.	Temperature of emission (°C)	36	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	756	Lab Method
3.	Velocity of gas (m/sec.)	11.62	IS 11255 (Part III),2008RA 2018
4.	Quantity of Gas Flow (Nm ³ /hr)	27657.15	IS 11255 (Part III),2008RA 2018
5.	Concentration of Sulphur Dioxide (mg/Nm ³)	176.0	IS 11255 (Part II)-1985, RA:2014
6.	Ammonia (mg/Nm ³)	45.0	IS 11255 (Part 6) -1999; Rffm: 2003
E .	Pollution control device		
1.	Details of pollution control devices attached with the stack : Continuous Alkaline Scrubber		
F.	Remarks : Nil		

Report Prepared By 

for Mitra S. K. Private Limited




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TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -2982
Date : 04.11.2022
Sample Description : Stack Monitoring
Sample Mark : SAP-1
Date & Time of Sampling : 19.10.2022
 at 10.00 AM

Reference No.& Date: 4700017438 ,Dtd: 13.09.2022

ANALYSIS RESULT

A . General information about stack :		
1. Stack connected to	: SAP-1	
2. Emission due to	:Process tail gas	
3. Material of construction of Stack	: MS	
4. Shape of Stack	: Circular	
5. Whether stack is provided with permanent platform & ladder	: Yes	
6. capacity	: ---- Working Load- 18 TPH	
B . Physical characteristics of stack :		
1. Height of the stack from ground level	: 40.0 m	
2. Diameter of the stack at sampling point	: 0.95 m	
3. Height of the Sampling Point from Ground level	: 21.0 m	
4. Area of Stack	: 0.71 m ²	
C. Analysis/Characteristic of stack:		
1. Fuel used	: ----	
2. Fuel Consumption	: ----	
D . Result of sampling & analysis of gaseous emission		
	Result	Method
1. Temperature of emission (°C)	38	IS 11255 (Part III),2008RA 2018
2. Barometric pressure (mm of Hg)	756	Lab Method
3. Velocity of gas (m/sec.)	12.28	IS 11255 (Part III),2008RA 2018
4. Quantity of Gas Flow (Nm ³ /hr)	29031.61	IS 11255 (Part III),2008RA 2018
5. Concentration of Sulphur Dioxide (mg/Nm ³)	174	IS 11255 (Part II)-1985, RA:2014
6. Ammonia (mg/Nm ³)	48	IS 11255 (Part 6) -1999; Rffm: 2003
E . Pollution control device		
1. Details of pollution control devices attached with the stack	: Continuous Alkaline Scrubber	
F. Remarks		
: Nil		

Report Prepared By 

for Mitra S. K. Private Limited




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R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

(AN ISO 9001:2015 & ISO 45001: 2018 CERTIFIED COMPANY)

TAHER MANSION, 1ST FLOOR

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Phone : (033) 4044-3380/3381/3382 / 3383, Fax : 33 2248-0447

E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007



TC-7815

TEST REPORT

No. AP-FG/22-23/1342

Date: February 20, 2023

Page 1 of 1

Issued to : M/S. INDORAMA INDIA PRIVATE LIMITED				
Address : P.O.: Durgachak, Haldia, Dist: Purba Mednipour, Pin: 721602				
Your Ref. P.O. No. : 4700017754, dtd. 27.10.2022	Parameters Tested Physical : Temp., Velocity, Gas flow Chemical : CO, CO ₂ , SO ₂ , PM & Acid Mist			
Sample Description : Stack Gas				
Date & time of sampling : 18.02.2023 at 12:30 P.M. to 01:12 P.M.				
Test Completed on : 20.02.2023				
A. General information about stack :				
1. Stack connected to : SAP-2				
2. Emission due to : Process of Tail Gas				
3. Material of construction of stack : M.S.				
4. Shape of stack : Circular.				
5. Whether stack is provided with permanent platform & ladder : Yes.				
B. Physical characteristics of stack :				
1. Height of the stack (a) from ground level : 40.0 M (b) from roof level : ---				
2. Diameter of the stack (a) at bottom : --- (b) at top : ---				
3. Diameter of the stack at sampling point : 1.2 M				
4. No. of Traverse point : 12 Nos.				
C. Analysis / Characteristic of stack :				
1. Fuel used : Tail Gas				
D. Results of Physical Parameters of Flue Gas : Barometric pressure : 757 mmHg				
SI No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 (Part 3) : 2008	°C	40
2.	Velocity of gas in duct	IS 11255 : (Part 3) : 2008	m/sec	5.36
3.	Quantity of gas flow	IS 11255 : (Part 3) : 2008	NM ³ /hr	19935
E. Results of gaseous emission :				
SI No	Test Parameters	Test Method	Unit	Results
1.	Sulphur dioxide	IS 11255 : Part 2 : 1985	mg/Nm ³	136
2.	Carbon monoxide	IS 13270 (By Orsat): 1992	% v/v	<0.2
3.	Carbon dioxide	IS 13270 (By Orsat): 1992	% v/v	0.2
4.	Particulate Matters	IS 11255 : (Part 1) : 1985	mg/Nm ³	12
5.	Acid Mist	SOP No.: RVB/SOP/01/20 Issue No. 04, Issue Date: 10.01.2018: 2018	mg/Nm ³	24
F. Pollution control device				
Details of pollution control devices attached with the stack : Continuous Alkaline scrubber.				

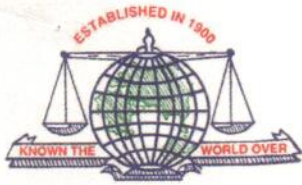
:- END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal

R. Karim
(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

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- ★ Results relate only to the parameters tested.



R. V. BRIGGS & CO. PRIVATE LTD.

ANALYTICAL CONSULTING & TECHNICAL CHEMISTS

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TAHER MANSION, 1ST FLOOR

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E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007

TEST REPORT

No. AP-FG/22-23/989

Date: December 16, 2022

Page 1 of 1

Issued to : M/S. INDORAMA INDIA PRIVATE LIMITED				
Address : P.O.: Durgachak, Haldia, Dist: Purba Mednipour, Pin: 721602				
Your Ref. P.O. No. : 4700017754, dtd. 27.10.2022	<u>Parameters Tested</u>			
Sample Description : Stack Gas	Physical : Temp., Velocity, Gas flow			
Date & time of sampling : 15.12.2022 at 04:15 P.M. to 04:57 P.M.	Chemical : CO, CO ₂ , SO ₂ , PM & Acid Mist			
Test Completed on : 16.12.2022				
A. General information about stack :				
1. Stack connected to : SAP-2				
2. Emission due to : Process of Tail Gas				
3. Material of construction of stack : M.S.				
4. Shape of stack : Circular.				
5. Whether stack is provided with permanent platform & ladder : Yes.				
B. Physical characteristics of stack :				
1. Height of the stack (a) from ground level : 40.0 M (b) from roof level : ---				
2. Diameter of the stack (a) at bottom : --- (b) at top : ---				
3. Diameter of the stack at sampling point : 1.2 M				
4. No. of Traverse point : 12 Nos.				
C. Analysis / Characteristic of stack :				
1. Fuel used : Tail Gas				
D. Results of Physical Parameters of Flue Gas : Barometric pressure : 759 mmHg				
Sl No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 (Part 3) : 2008	°C	38
2.	Velocity of gas in duct	IS 11255 : (Part 3) : 2008	m/sec	5.40
3.	Quantity of gas flow	IS 11255 : (Part 3) : 2008	NM ³ /hr	20304
E. Results of gaseous emission :				
Sl No	Test Parameters	Test Method	Unit	Results
1.	Sulphur dioxide	IS 11255 : Part 2 : 1985	mg/Nm ³	145
2.	Carbon monoxide	IS 13270 (By Orsat) : 1992	% v/v	<0.2
3.	Carbon dioxide	IS 13270 (By Orsat) : 1992	% v/v	0.2
4.	Particulate Matters	IS 11255 : (Part 1) : 1985	mg/Nm ³	10
5.	Acid Mist	SOP No.: RVB/SOP/01/20 Issue No. 04, Issue Date: 10.01.2018: 2018	mg/Nm ³	19.6
F. Pollution control device				
Details of pollution control devices attached with the stack : Continious Alkaline scrubber.				

:- END OF TEST REPORT :-

Report Verified by
S. Mondal

(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

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TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED -3099
Date : 30.11.2022
Sample No. : MSKGL/ED/2022-23/11/00775
Sample Description : Stack Monitoring
Sample Mark : SAP-2
Date & Time of Sampling : 11.11.2022
 at 01.50 PM


Reference No.& Date: 4700013395 ,Dtd: 02.08.2021

ANALYSIS RESULT

A . General information about stack :			
1.	Stack connected to	: SAP-2	
2.	Emission due to	: Process Tail Gas	
3.	Material of construction of Stack	: MS	
4.	Shape of Stack	: Circular	
5.	Whether stack is provided with permanent platform & ladder	: Yes	
6.	capacity	: ----	
B . Physical characteristics of stack :			
1.	Height of the stack from ground level	: 40 m	
2.	Diameter of the stack at sampling point	: 0.95 m	
3.	Height of the Sampling Point from Ground level	: 21.0 m	
4.	Area of Stack	: 0.7085 m ²	
C. Analysis/Characteristic of stack:			
1.	Fuel used	: ----	
		2. Fuel Consumption :---	
D . Result of sampling & analysis of gaseous emission			
		Result	Method
1.	Temperature of emission (°C)	32	IS 11255 (Part III),2008RA 2018
2.	Barometric pressure (mm of Hg)	755	Lab Method
3.	Velocity of gas (m/sec.)	5.78	IS 11255 (Part III),2008RA 2018
4.	Quantity of Gas Flow (Nm ³ /hr)	22201	IS 11255 (Part III),2008RA 2018
5.	Concentration of Carbonmonoxide (% v/v)	<0.2	IS 13270:1992, Rffm 2009
6.	Concentration of Carbondioxide (% v/v)	1.2	IS:13270 :1992 Reaff,2014
7.	Concentration of Sulphur dioxide (mg/Nm ³)	232.5	IS 11255 (Part II)-1985, RA:2014
8.	Concentration of Particulate Matters (mg/Nm ³)	9.2	IS 11255 (Part I):1985,RA 2014
9.	Moisture content (%)	2.7	IS 11255 (Part III),2008RA 2018
10.	Acid Mist as H ₂ SO ₄ (mg/Nm ³)	31.0	USEPA Part 8 - 29/10/1996
E . Pollution control device			
1.	Details of pollution control devices attached with the stack : Continuous Alkaline Scrubber		
F. Remarks : Nil			

Report Prepared By 

for Mitra S. K. Private Limited


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E-mail : rvbriggs.kolkata@gmail.com, Website : www.rvbriggs.com

CIN : U51109WB1931PTC007007

TEST REPORT

No. AP-FG/22-23/815

Date: November 05, 2022

Page 1 of 1

Issued to	: M/S. INDORAMA INDIA PRIVATE LIMITED			
Address	: P.O.: Durgachak, Haldia, Dist: Purba Mednipour, Pin: 721602			
Your Ref. P.O. No.	: 4700017754, dtd. 27.10.2022	<u>Parameters Tested</u>		
Sample Description	: Stack Gas	Physical : Temp., Velocity, Gas flow		
Date & time of sampling	: 29.10.2022 at 10:15 A.M. to 10:57 A.M.	Chemical : CO, CO ₂ , SO ₂ , PM & Acid Mist		
Test Completed on	: 05.11.2022			
A. General information about stack :				
1. Stack connected to	: SAP-2			
2. Emission due to	: Process of Tail Gas			
3. Material of construction of stack	: M.S.			
4. Shape of stack	: Circular.			
5. Whether stack is provided with permanent platform & ladder	: Yes.			
B. Physical characteristics of stack :				
1. Height of the stack	(a) from ground level : 40.0 M	(b) from roof level : ---		
2. Diameter of the stack	(a) at bottom : ---	(b) at top : ---		
3. Diameter of the stack at sampling point	: 1.2 M			
4. No. of Traverse point	: 12 Nos.			
C. Analysis / Characteristic of stack :				
1. Fuel used	: Tail Gas			
D. Results of Physical Parameters of Flue Gas :				
			Barometric pressure : 755 mmHg	
Sl No	Test Parameters	Test Method	Unit	Results
1.	Temperature of emission	IS 11255 (Part 3) : 2008	°C	37
2.	Velocity of gas in duct	IS 11255 : (Part 3) : 2008	m/sec	5.43
3.	Quantity of gas flow	IS 11255 : (Part 3) : 2008	NM ³ /hr	20473
E. Results of gaseous emission :				
Sl No	Test Parameters	Test Method	Unit	Results
1.	Sulphur dioxide	IS 11255 : Part 2 : 1985	mg/Nm ³	86
2.	Carbon monoxide	IS 13270 (By Orsat): 1992	% v/v	<0.2
3.	Carbon dioxide	IS 13270 (By Orsat): 1992	% v/v	0.2
4.	Particulate Matters	IS 11255 : (Part 1) : 1985	mg/Nm ³	12
5.	Acid Mist	SOP No.: RVB/SOP/01/20 Issue No. 04, Issue Date: 10.01.2018: 2018	mg/Nm ³	13
F. Pollution control device				
Details of pollution control devices attached with the stack : Continious Alkaline scrubber.				

:- END OF TEST REPORT :-

S. Mondal
Report Verified by
S. Mondal

R. Karim
(Dr. R. KARIM)
Technical Manager
Authorised Signatory
For R.V.BRIGGS & CO. (P) LTD.

BB

TEST REPORT

Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED-0166
Date : 27.04.2023
Sample No. : MSKGL/ED/2022-23/03/01725
Sample Description : Effluent Water
Sampling Location: ETP Treated Water
 from Plant Outlet
Sample Drawn on: 30.03.2023

Reference No.& Date: 4700017438

ANALYSIS RESULT

Sl No.	Test Parameters	Unit	Result	Method
1.	pH value at 25° C	---	7.46	APHA (23rd Edition) 4500 -H-B : 2017
2.	Fluoride (as F)	mg/l	0.51	APHA (23rd Edition) 4500 -F- C/D: 2017
3.	Total Suspended Solid (as TSS)	mg/l	12	APHA (23rd Edition) 2540D : 2017
4.	Biochemical Oxygen Demand (as BOD)	mg/l	9.6	APHA (23rd Edition) 5210B : 2017
5.	Chemical Oxygen Demand (COD)	mg/l	37	APHA (23rd Edition) 5220B : 2017
6.	Oil and Grease	mg/l	<5.0	APHA (23rd Edition) 5520B : 2017
7.	Ammoniacal Nitrogen (as N)	mg/l	<0.1	APHA (23rd Edition) 4500 - NH3-F : 2017
8.	Dissolved Phosphate (as P)	mg/l	0.07	APHA (23rd Edition) 4500 P B, D : 2017
9.	Total Kjeldahl Nitrogen as N	mg/l	<0.3	APHA (23rd Edition) 2017 4500 -Norg B: 2017
10.	Free Ammoniacal Nitrogen as N	mg/l	<0.1	APHA (23rd Edition) 4500-NH3-F 2017_(O)

Report Prepared By 

for Mitra S. K. Private Limited


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TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED-4705
Date : 30.03.2023
Sample No. : MSKGL/ED/2022-23/02/01236
Sample Description : Effluent Water
Sampling Location: ETP Treated Water
 from Plant Outlet
Sample Drawn on: 17.02.2023

Reference No.& Date: 4700017438

ANALYSIS RESULT

Sl No.	Test Parameters	Unit	Result	Method
1.	pH value at 25° C	----	7.52	APHA (23rd Edition) 4500 -H-B : 2017
2.	Fluoride (as F)	mg/l	0.52	APHA (23rd Edition) 4500 -F- C/D: 2017
3.	Total Suspended Solid	mg/l	<2.5	APHA (23rd Edition) 2540D : 2017
4.	Biochemical Oxygen Demand	mg/l	<2.0	APHA (23rd Edition) 5210B : 2017
5.	Chemical Oxygen Demand	mg/l	8	APHA (23rd Edition) 5220B : 2017
6.	Oil and Grease	mg/l	<5.0	APHA (23rd Edition) 5520B : 2017
7.	Ammoniacal Nitrogen (as N)	mg/l	<0.1	APHA (23rd Edition) 4500-NH3-F 2017_(O)
8.	Dissolved Phosphate (as P)	mg/l	0.22	APHA (23rd Edition) 4500 P B, D : 2017
9.	Total Kjeldahl Nitrogen as N	mg/l	<0.3	APHA (23rd Edition) 2017 4500 -Norg B: 2017
10.	Free Ammoniacal Nitrogen as N	mg/l	<0.1	APHA (23rd Edition) 4500-NH3-F 2017_(O)

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for Mitra S. K. Private Limited


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TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED-4360
Date: :28.02.2023
Sample No. : MSKGL/ED/2022-23/02/00129
Sample Description : Effluent Water
Sampling Location: ETP Treated Water
 from Plant Outlet
Sample Drawn on: 30.01.2023

Reference No.& Date: 4700017438

ANALYSIS RESULT

SI No.	Test Parameters	Unit	Result	Method
1.	pH value at 25.5 ^o C	---	7.80	APHA (23rd Edition) 4500 -H-B : 2017
2.	Fluoride (as F)	mg/l	0.52	APHA (23rd Edition) 4500 -F- C/D: 2017
3.	Total Suspended Solid	mg/l	5.1	APHA (23rd Edition) 2540D : 2017
4.	Biochemical Oxygen Demand	mg/l	<2.0	APHA (23rd Edition) 5210B : 2017
5.	Chemical Oxygen Demand	mg/l	<4.0	APHA (23rd Edition) 5220B : 2017
6.	Oil and Grease	mg/l	<5.0	APHA (23rd Edition) 5520B : 2017
7.	Ammoniacal Nitrogen (as N)	mg/l	<0.1	APHA (23rd Edition) 4500-NH3-F 2017
8.	Dissolved Phosphate (as P)	mg/l	0.33	APHA (23rd Edition) 4500 P B, D : 2017
9.	Total Kjeldahl Nitrogen as N	mg/l	<0.3	APHA (23rd Edition) 2017 4500 -Norg B: 2017
10.	Free Ammoniacal Nitrogen as N	mg/l	<0.1	APHA (23rd Edition) 4500-NH3-F 2017

Report Prepared By 

for Mitra S. K. Private Limited



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TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED-3885
Date : 31.01.2023
Sample No. : MSKGL/ED/2022-23/01/00061
Sample Description : Effluent Water
Sampling Location:ETP Outlet Water
 From Final Outside Drain
Sample Drawn on: 29.12.2022

Reference No.& Date: 4700017438

ANALYSIS RESULT

Sl No.	Test Parameters	Unit	Result	Method
1.	pH value at 23 ^o C	----	7.65	APHA (23rd Edition) 4500 -H-B : 2017
2.	Fluoride (as F)	mg/l	0.65	APHA (23rd Edition)4500 - F C/D, 2017_(O)
3.	Total Suspended Solid	mg/l	14	APHA (23rd Edition) 2540D : 2017
4.	Biochemical Oxygen Demand	mg/l	<2.0	APHA (23rd Edition) 5210B : 2017
5.	Chemical Oxygen Demand	mg/l	8	APHA (23rd Edition) 5220B : 2017
6.	Oil and Grease	mg/l	<5.0	APHA (23rd Edition) 5520B : 2017
7.	Ammoniacal Nitrogen (as N)	mg/l	<0.1	APHA (23rd Edition) 4500-NH3-F 2017
8.	Dissolved Phosphate (as P)	mg/l	0.21	APHA (23rd Edition) 4500- P B, D 2017_(O)
9.	Total Kjeldahl Nitrogen as N	mg/l	<0.3	APHA (23rd Edition) 2017 4500 -Norg B: 2017
10.	Free Ammoniacal Nitrogen as N	mg/l	<0.1	APHA (23rd Edition) 4500-NH3-F 2017

Report Prepared By 

for Mitra S. K. Private Limited




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TEST REPORT

Name & Address of the Customer :
'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED-3352
Date: 31.12.2022
Sample No. : MSKGL/ED/2022-23/11/00779
Sample Description : Effluent Water
Sampling Location:ETP Outlet Water
 From Final Outside Drain
Sample Drawn on: 11.11.2022

Reference No.& Date: 4700017438

ANALYSIS RESULT

SI No.	Test Parameters	Unit	Result	Method
1.	pH value at 25°C	---	7.68	APHA (23rd Edition) 4500 -H-B : 2017
2.	Fluoride (as F)	mg/l	0.54	APHA (23rd Edition)4500 - F C/D, 2017_(O)
3.	Total Suspended Solid	mg/l	<2.5	APHA (23rd Edition) 2540D : 2017
4.	Biochemical Oxygen Demand	mg/l	<2.0	APHA (23rd Edition) 5210B : 2017
5.	Chemical Oxygen Demand	mg/l	8.0	APHA (23rd Edition) 5220B : 2017
6.	Oil and Grease	mg/l	<5.0	APHA (23rd Edition) 5520B : 2017
7.	Ammoniacal Nitrogen (as N)	mg/l	3.1	APHA (23rd Edition) 4500-NH3-F 2017_(O)
8.	Dissolved Phosphate (as P)	mg/l	<0.05	APHA (23rd Edition) 4500- P B, D 2017_(O)
9.	Total Kjeldahl Nitrogen (as N)	mg/l	6.4	APHA (23rd Edition) 2017 4500 -Norg B: 2017
10.	Free Ammoniacal Nitrogen (as N)	mg/l	2.0	APHA (23rd Edition) 4500-NH3-F 2017_(O)

Report Prepared By 

for Mitra S. K. Private Limited


 Authorised Signatory

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TEST REPORT

Name & Address of the Customer :
 'INDORAMA INDIA PRIVATE. LIMITED.'
 Haldia, Pin- 721602

Report No. : WB/ED-3251
Date: 30.11.2022
Sample No. : MSKGL/ED/2022-23/11/00108
Sample Description : Effluent Water
Sampling Location:ETP Outlet Water
 From Final Outside Drain
Sample Drawn on: 31.10.2022

Reference No.& Date: 4700017438

ANALYSIS RESULT

SI No.	Test Parameters	Unit	Result	Method
1.	pH value at 25°C	---	7.85	APHA (23rd Edition) 4500 -H-B : 2017
2.	Fluoride (as F)	mg/l	<0.1	APHA (23rd Edition)4500 - F C/D, 2017_(O)
3.	Total Suspended Solid	mg/l	6.7	APHA (23rd Edition) 2540D : 2017
4.	Biochemical Oxygen Demand	mg/l	<2.0	APHA (23rd Edition) 5210B : 2017
5.	Chemical Oxygen Demand	mg/l	8.0	APHA (23rd Edition) 5220B : 2017
6.	Oil and Grease	mg/l	<5.0	APHA (23rd Edition) 5520B : 2017
7.	Ammoniacal Nitrogen (as N)	mg/l	0.30	APHA (23rd Edition) 4500-NH3-F 2017_(O)
8.	Dissolved Phosphate (as P)	mg/l	<0.05	APHA (23rd Edition) 4500- P B, D 2017_(O)
9.	Total Kjeldahl Nitrogen (as N)	mg/l	0.38	APHA (23rd Edition) 2017 4500 -Norg B: 2017
10.	Free Ammoniacal Nitrogen (as N)	mg/l	0.16	APHA (23rd Edition) 4500-NH3-F 2017_(O)

Report Prepared By 

for Mitra S. K. Private Limited



Authorised Signatory

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Noise Monitoring Reports

Annexure-13

TEST REPORT

Name & Address of the Customer :
Indorama India Private Limited
 Durgachak, Haldia, Dist. – Purba Medinipur,
 Pin- 721602

Report No. : WB/ED-4561
Date : 17.03.2023
Sample No. : MSKGL/ED/2022-23/03/00523-26
Sample Description : Noise

Ref. No. & Date : 4700013546, dtd:20.08.2021

ANALYSIS RESULT

Location	Near DAP Gate	Near DG Room	Near Main Gate	Near Parking Area
Monitoring Date	11.03.2023 to 12.03.2023	11.03.2023 to 12.03.2023	13.03.2023 to 14.03.2023	13.03.2023 to 14.03.2023
Time (In Hrs.)	Hourly Leq dB(A)			
06.00-07.00	59.1	55.1	56.1	53.7
07.00-08.00	61.2	55.3	56.4	54.1
08.00-09.00	62.7	55.0	57.9	55.1
09.00-10.00	63.8	54.2	58.2	55.9
10.00-11.00	65.1	56.7	58.5	54.3
11.00-12.00	63.4	56.7	57.0	54.8
12.00-13.00	61.8	56.1	56.4	54.2
13.00-14.00	61.3	55.3	56.2	53.6
14.00-15.00	61.2	53.6	55.4	53.3
15.00-16.00	58.3	53.3	54.8	53.1
16.00-17.00	59.2	52.0	53.5	51.4
17.00-18.00	59.2	51.6	53.8	50.2
18.00-19.00	57.8	51.5	51.7	48.8
19.00-20.00	55.8	50.2	52.0	48.1
20.00-21.00	58.0	49.7	51.5	47.8
21.00-22.00	57.2	50.1	50.6	47.5
22.00-23.00	56.3	49.2	49.2	47.6
23.00-00.00	53.9	48.5	49.0	46.8
00.00-01.00	52.4	48.3	50.5	48.7
01.00-02.00	53.3	50.2	51.5	49.0
02.00-03.00	54.9	50.4	51.7	49.1
03.00-04.00	56.7	52.7	52.2	50.2
04.00-05.00	57.4	54.0	53.5	51.2
05.00-06.00	58.7	54.3	55.8	52.7
Results in Leq dB(A) Day Time	59.3	53.7	55.1	52.6
Results in Leq dB(A) Night Time	57.0	50.3	51.4	48.5

Noise Limit as per CPCB		
Category of Area/Zone	Leq dB(A) Day Time	Leq dB(A) Night Time
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence	50	40

NOTE :
 Day Time : 06.00 Hr.-22.00 Hr.
 Night Time:22.00 Hr.-06.00 Hr.

Report Prepared By 

for Mitra S. K. Private Limited

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TEST REPORT

Name & Address of the Customer :
Indorama India Private Limited

 Durgachak, Haldia, Dist. – Purba Medinipur,
 Pin- 721602

Report No. : WB/ED-3904

Date : 31.01.2023

Sample No. : MSKGL/ED/2022-23/03/00519-522

Sample Description : Noise

Ref. No. & Date : 4700013546, dtd:20.08.2021

ANALYSIS RESULT

Location	Near DG Room	Near Main Gate	Near Parking Gate	Near DAP Gate
Monitoring Date	26.12.2022 to 27.12.2022	26.12.2022 to 27.12.2022	27.12.2022 to 28.12.2022	27.12.2022 to 28.12.2022
Time (In Hrs.)	Hourly Leq dB(A)			
06.00-07.00	55.2	56.1	48.8	63.3
07.00-08.00	55.9	57.0	50.9	65.2
08.00-09.00	56.5	58.5	52.5	65.1
09.00-10.00	57.4	59.4	53.5	66.6
10.00-11.00	56.8	60.2	54.6	67.6
11.00-12.00	57.5	61.2	56.2	67.7
12.00-13.00	57.9	62.2	56.7	67.3
13.00-14.00	58.1	61.0	55.9	65.2
14.00-15.00	56.4	61.2	54.8	63.6
15.00-16.00	55.8	59.5	53.1	63.1
16.00-17.00	55.0	58.7	53.4	62.3
17.00-18.00	54.2	57.8	53.5	61.0
18.00-19.00	52.3	56.7	51.9	61.0
19.00-20.00	52.0	55.8	52.4	60.3
20.00-21.00	52.5	54.7	51.3	59.5
21.00-22.00	49.0	54.8	50.7	59.4
22.00-23.00	49.3	53.5	48.2	59.9
23.00-00.00	48.9	53.2	47.7	59.2
00.00-01.00	47.9	51.0	46.4	58.6
01.00-02.00	50.7	51.9	49.0	59.6
02.00-03.00	51.4	53.0	48.9	58.8
03.00-04.00	51.8	53.9	47.8	60.0
04.00-05.00	53.4	54.8	49.1	61.0
05.00-06.00	54.1	55.4	50.4	62.2
Results in Leq dB(A) Day Time	54.7	57.2	51.5	63.3
Results in Leq dB(A) Night Time	51.5	55.5	51.0	60.3

Noise Limit as per CPCB

Category of Area/Zone	Leq dB(A) Day Time	Leq dB(A) Night Time
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence	50	40

NOTE :
 Day Time : 06.00 Hr.-22.00 Hr.
 Night Time:22.00 Hr.-06.00 Hr.

 Report Prepared By 

for Mitra S. K. Private Limited


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