

PPL / Env. Mgt/ F- 05 / 2018 /72

24<sup>th</sup> November, 2018

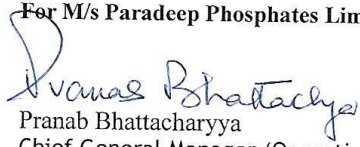
To,  
Director (S).  
Ministry of Environment, Forests & Climate Change (Govt. Of India)  
Eastern Regional Office  
A/3 Chandrasekharapur,  
Bhubaneswar- 751023 (Odisha)

**Sub-** Submission of half yearly compliance report for the period from April to September -2018  
**Ref –** Environment Clearance No - 11011/17/86-IA-II DATED 23<sup>rd</sup> JULY 1990

Dear Sir,

This has reference to above subject & Environment clearance No-. 11011/17/86-IA-II dated 23<sup>rd</sup> JULY 1990, enclosed please find the details of compliance and monitoring data for the period from April to September -2018 along with the relevant annexure.

Thanking You,  
**For M/s Paradeep Phosphates Limited**



Pranab Bhattacharyya  
Chief General Manager (Operations)  
& Factory Manager

Encl: as above

CC: Advisor to Govt. of India,  
Ministry of Environment & Forest  
Paryavaran Bhavan, CGO Complex  
Lodi Road, New Delhi – 110 003  
CC: Member Secretary,  
Odisha State Pollution Control Board,  
Paribesh Bhawan, A- 118  
Nilakantha Nagar, Bhubaneswar – 751012 (Odisha)  
CC: Member Secretary,  
Central Pollution Control Board,  
Paribesh Bhawan, CBD-cum-Office Complex  
East Arjun Nagar, DELHI - 110 032, INDIA

**PARADEEP PHOSPHATES LTD.**

CIN No.:U241290R1981PLC001020

P.O:PPL Township Paradeep-754145 Dist.Jagatsinghpur,Odisha.Tel:06722 259600

Registered Office: Bayan Bhawan, Pt. Jawaharlal Nehru Marg, Bhubaneswar,-751001, www.paradeepphosphates.com

**SIX MONTHLY COMPLIANCE REPORT OF ENVIRONMENTAL  
CLEARANCE LETTER No. 11011/17/86-IA-II DATED 23<sup>rd</sup> JULY 1990;  
FOR THE PERIOD FROM APRIL TO SEPTEMBER, 2018**

Sl No	Conditions	Compliance status
1	The project authority must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government of Odisha.	The important stipulations made by the State Pollution Control Board , Odisha and the measures that have been already taken are summarized below;
<u>1.DAP PLANT :</u>		
i	All stacks shall confirm to the prescribed norms of 150 mg/Nm <sup>3</sup>	The SPM emissions from the stacks are below the prescribed limit of 150mg/Nm <sup>3</sup> . Please refer <b>Annexure-1 A</b> .
ii	In exigency when waste water can not be recycled shall discharge to effluent drain leading to the Effluent Treatment Plant.	DAP plant has four sump pumps to recycle the all effluent generated in the plant .And also the sump drains are connected with the ETP in case of emergency.
<u>2.SULPHURIC ACID PLANT :</u>		
i	Quantification of Sulphur muck generation , its use in DAP plant shall be done and submitted to the Board.	This is being informed to the State Pollution Control Board regularly on monthly basis. Please refer <b>Annexure-2A</b>
ii	Sulphur Dioxide emission through stack shall not exceed 2 Kg/Ton of 100% concentrated acid produced.	SO <sub>2</sub> emission is well within the limit( Less than 2 Kg/Ton) .Please refer <b>Annexure-1A</b>
<u>3. PHOSPHORIC ACID PLANT :</u>		
i	No effluent shall be discharged outside the premises of Phosphoric acid plant except Gypsum pond.	PPL is maintaining the closed loop from PAP to Gypsum pond and back to PAP there is no effluent is being discharged to outside.
ii	The unit shall provide scrubbing arrangements for reduction of fluoride from the gaseous emission.	A fumes scrubber is in place to scrub the fluoride gases emitted during the operation / process
<u>4.CAPTIVE POWER PLANT :</u>		
i	DM plant waste water to be neutralized before discharge.	There are two nos of neutralization tanks in DM plant for handling the effluent.
2	Any further expansion of the plant either with existing product or any new product can be taken up only with the prior	Noted please, necessary prior approval shall be taken from MoEF.

	approval of this Ministry.	
3	The project authorities should come with a proposal for bringing the stack emission levels within standards. An action plan in this regard should be prepared and submitted to this Ministry within a period of one year.	The stack emissions from all the plants conform to the standards of OPCB. Please refer <b>Annexure-1A</b>
4	Adequate number ( a minimum of 3 to 5) of air quality monitoring stations should be set up in the down- wind direction as well as where the maximum ground level concentration is anticipated. Also stack emission should be monitored by setting up automatic stack monitoring units.	The following online instruments have been installed in PPL as detailed below: <ol style="list-style-type: none"> <li>1. Continuous Ambient Air Quality Monitoring Station -1 near Main gate</li> <li>2. Continuous Ambient Air Quality Monitoring Station -2 near Guest House</li> <li>3. Continuous Ambient Air Quality Monitoring Station -3 near MOP Silo</li> <li>4. Continuous Ambient Air Quality Monitoring Station -4 near Rock Silo</li> </ol> Electronic display system has been installed in front of main gate to display real time data.
5	There should be no change in the stack design without the approval of the State Pollution Control Board.	The plants are already constructed and are in operation. Any change in stack design at a later date shall be with the approval of the State Pollution Control Board.
6	A re examination of the discharge into river should be undertaken at the time of operation of the plant , and if necessary relocation of discharge points into the coastal water should be envisaged. .	PPL has installed a recycling arrangement of the treated water from ETP to PAP, gardening and balance is being diverted to the Gypsum Pond .Zero discharge is achieved at both storm drains during non -monsoon period.
7	Cooling tower blow down along with spillages, floor washings etc. from Phosphoric acid plant may be fully treated.	Cooling water blow down of Phosphoric acid plant is recycled to Gypsum pond in a closed circuit. Washings and spillages are re-circulated to reactor through Gypsum pond.
8	A comprehensive waste water treatment for treating all the liquid effluents including domestic sewage should be set up.	Two treatment plants namely Effluent Treatment Plant and Sewage Treatment Plant are in place to take care of the industrial effluent and domestic sewage respectively.
9	Routine Toxicity – Bioassay based on the effluent with fish and fish food organisms must be carried out at least once a year.	It is being complied .The latest study is attached. Please refer <b>Annexure- 3A</b>

10	Fluoride which present in the effluent should be recovered and converted into useful product within a period of two years, in order to meet the effluent standard stipulated by Orissa State Prevention and Control of Pollution Board.	The effluent generated from the PAP is being collected in the Gypsum Pond which is not allowed to go out of the closed circuit of Phosphoric acid plant; it is re-circulated in the process for recovery of P <sub>2</sub> O <sub>5</sub> and fluorine.
11	Slurry water from ponds should be treated for removal of fluoride and phosphate before recycling.	Pond water is being re-circulated in the process to recover phosphate and fluoride present in it. The recycling is an integral part of process.
12	The supernatant liquid from Gypsum Ponds at no stage should be allowed to escape into drains.	No supernatant liquid from the gypsum pond is allowed to escape into drain
13	The treated effluent confirming to the prescribed standards should be utilized for green belt development to the maximum extent possible. The green belt should preferably be developed within the plant boundary.	<p>PPL has planted massive plantation comprising around 6.74 lakhs trees within plant premises, colony area and road side .PPL has installed water sprinkler system in the plant gardens and lawns. There is regular plantation of trees; up to September-2018 detail plantation is as under</p> <p>Plant area- 157160 nos  Colony/Gypsum Pond area- 399771 nos  Road side- 118966 nos  Total plantation -675897 nos  The above trees has been developed in 39.2 % area of total area.,</p>
14	A plan for complete utilization of gypsum should be worked out and within 3 years and in the interim period. The gypsum has to be stored in ponds and a close monitoring of ground water in the vicinity of ponds has to be carried out.	<p>Gypsum is being stored in the Gypsum pond with proper stack management. A part of it is being sold to out side parties. Ten number of test wells have been constructed around Gypsum pond and close monitoring of ground water quality around Gypsum pond are being carried out. The sale figure of Gypsum for last three years is as follows;</p> <p>2016-17            651422 MT  2017-18            715662 MT  2018-19            283496 MT Till Oct  Moreover, a Zypmite plant having capacity 240 TPD is installed and commissioned for utilization of Gypsum.</p>

15	A preliminary study on the radioactivity level in gypsum and its likely impact on the environment should be carried out within six months.	As per the MoEF condition every shipment of rock phosphate samples along with its produced gypsum samples are being sent to the AERB for analysis of U-238& Ra -226. The results are well within the norms i.e. for U-238 in range of 0.1 - 0.2 Bq/g and Ra -226 shall be in the range of 0.5- 1.3 Bq/g, There is no impact on the environment Please refer <b>Annexure-4A</b>
16	A detailed risk analysis study should be undertaken. Disaster management plan should be prepared after risk assessment within six months.	Risk assessment study has already been carried out by M/s Ram Safety Consultants, Chennai. , Compliance status of recommendation and compliance status is <b>Annexure-5A</b>
17	A separate Environment Management Cell with suitable qualified people to carry out various functions related to environmental management should be set up under the control of a Senior Technical Personnel who will report directly to the head of the organization.	A full fledged Environment Management Section consisting of qualified personnel under a senior technical person has been set up for the periodical monitoring of all environmental related jobs in the plant
18	The project authorities must set up a laboratory facility for collection and analysis of samples under the supervision of competent technical personnel who will directly report to the Chief Executive.	A well equipped and full fledged Env Mgt laboratory with NABL accredited is set up with latest and sophisticated modern analytical instruments for the measurement and analysis of Environmental parameters along with quality related parameters. The results are being immediately informed to the top management as well as the concerned person in charge for immediate corrective action; if required
19	The project authority will provide adequate funds for environmental control measures along with implementation schedule for all the conditions stipulated above.	Adequate funds have been provided for environmental control measures.
20	The Ministry or any other competent authority may stipulate any further condition after reviewing the impact assessment report or any other reports prepared by the project authority	Noted please.
21	The Ministry may revoke clearance if implementation of the stipulated conditions is not satisfactory.	Noted please.
22	The above conditions will be enforced interalia under the Water (Prevention and Control of Pollution) Act, 1974, The Air (Prevention and Control of Pollution) Act, 1981 and Environment (Protection) Act, 1986along with their amendments.	Noted please

**Separately attached**

**SULPHUR MUCK GENERATION AND REUSE**  
**APRIL TO SEPTEMBER 2018**

<b>Month</b>	<b>Generation (MT)</b>	<b>Reuse (MT)</b>
April	309	267
May	266	160
June	183	363
July	295	174
August	298	300
September	186	335

**Separate file is attached**





क्रम सं. / SL. NO. : A

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BRIT/ BARC Vashi Complex,  
सेक्टर-20, वाशी / Sec-20, Vashi,  
नवी मुंबई / Navi Mumbai-400 703  
www.briatom.gov.in

भारत सरकार / GOVERNMENT OF INDIA

परमाणु ऊर्जा विभाग / DEPARTMENT OF ATOMIC ENERGY

रेडियोसक्रियता प्रयोगशाला / BOARD OF RADIATION & ISOTOPE TECHNOLOGY

# रेडियोसक्रियता परीक्षण प्रमाण-पत्र / RADIOACTIVITY TEST CERTIFICATE

RADIOANALYTICAL LABORATORY

Page 1 of 1

Ref: BRIT/RAL/D/145-60/MISC/113-28/18-19  
TO

SEP 14, 2018

M/S. PARADEEP PHOSPHATES LIMITED  
PPL TOWNSHIP, PARADEEP,  
JAGATSINGHPUR, ODISHA- 754 145,

This is regarding the "ROCK PHOSPHATE & PHOSPHO GYPSUM" samples submitted by you  
vide your letter dt.27.06.2018 for radioactivity analysis.

The samples were analysed for U-238 & Ra-226 radioactivity content and the values obtained are  
as follows:

SAMPLE DESCRIPTION : ROCK PHOSPHATE & PHOSPHO-GYPSUM  
DATE OF SAMPLING : 25.06.2018  
PLACE OF SAMPLING : ROCK PHOSPHATE FROM ROCK SILO & GYPSUM FROM PAP PLANT

SR. NO.	SAMPLE ID	U-238 (Bq/Kg)	Ra-226 (Bq/Kg)
1	RP-313 ROCK PHOSPHATE	813.7 ± 6.0	786.1 ± 6.7
2	RP-314 ROCK PHOSPHATE	631 ± 6.5	598.1 ± 14.6
3	RP-315 ROCK PHOSPHATE	695.8 ± 2.8	751.8 ± 6.6
4	RP-316 ROCK PHOSPHATE	761 ± 18.0	791.1 ± 6.2
8	PG-313 PHOSPHO GYPSUM	600 ± 3.5	602.1 ± 8.0
9	PG-314 PHOSPHO GYPSUM	567.7 ± 6.3	480.2 ± 17.7
10	PG-315 PHOSPHO GYPSUM	559 ± 7.5	534.5 ± 2.8
11	PG-316 PHOSPHO GYPSUM	504.3 ± 7.7	400.1 ± 16.1

Date of receipt of sample : 03.06.2018

Date of completion of test: 31.08.2018

The measurement values are below the clearance level for radionuclides of natural origin  
in bulk solid materials, as per AERB directive 01/2010 (table-3) dated 26/11/2010

Note: (i)The report pertains to the given sample only. (ii)The sample will be retained in this laboratory for a  
period of one month from certificate date and thereafter it will be disposed off. (iii)This report shall not be  
reproduced except in full, without written approval of the laboratory. (iv) The sampling is not done by this  
laboratory.

Checked by:

DEVIKAR

Authorized Signatory

*(Signature)*

एन. जयचंदन / N. Jayachandran

प्रभारी अधिकारी / Officer-in-Charge

रेडियोसक्रियता प्रयोगशाला / Radioanalytical Laboratory

विभाग एवं आणविक प्रयोगशाला

Board of Radiation & Isotope Technology

सेक्टर-20, वाशी कॉम्प्लेक्स / Vashi Complex

नवी मुंबई / Navi Mumbai - 400 703

\*\*\*\*End of Report\*\*\*\*



## Quantitative Risk Assessment (QRA)

### Paradeep Phosphates Limited

Sr. no	<b><i>Recommendations</i></b>	<b>Compliance status</b>
1	The emergency isolation valves and their actuating systems on the liquid inlet and outlet lines of the storage tanks should be of high reliability conforming to Safety Integrity Level SIL 3. These valves should be air failure-to-close type and provided with partial strike testing arrangement. A review may be conducted to ascertain the current position and take improvement action as necessary.	All liquid Ammonia storage tank outlet control valves are air fail to close except storage tank NO 4& 5. Storage tank NO- 4 & 5 liquid outlet Control valves have air receiver before them. In case of ammonia tank area air supply fails for any reason, these two tanks can supply the ammonia to DAP plants.
2	The following safety interlocks of the storage tanks should be reviewed for their reliability: <b>i</b> -Overfill protection system <b>ii</b> -High-High Level interlock <b>iii</b> -Overpressure protection system <b>iv</b> - High-High Pressure interlock <b>v</b> -Protection against excessive negative pressure in the tank <b>vi</b> -Low-Low Pressure interlock	All the following safety interlock control valve systems of storage tanks are reviewed for their reliability which are in working condition. The Record of the same is being maintained. <b>i</b> -Overfill protection system <b>ii</b> -High-High Level interlock <b>iii</b> -Overpressure protection system <b>iv</b> - High-High Pressure interlock <b>v</b> -Protection against excessive negative pressure in the tank <b>vi</b> -Low-Low Pressure interlock
3	Consider providing emergency switches for operating the ROVs additionally in the field at a suitable location for prompt operation of the valves without having to communicate with the Control Room in an emergency. The electric actuator of the MOV at the jetty will not operate in the event of power failure. Hence, it is important to ensure that the hand wheel arrangement is in good working condition.	One Emergency switch is available at local and one emergency switch is available in control room also for operating ROV. Hand wheel arrangement is in good working condition.
4	Increase the number of ammonia leak detectors (with alarm and hooter) for more effective surveillance. Presently one detector is installed at the jetty and at the transfer pump area. Locations like outlet liquid outlet valves, refrigeration compressor / ammonia pre-heater and ammonia tanker loading area may be considered for the additional detectors. These detectors should be connected to the Control Room.	Ammonia leak detectors were increased from 2 to total 9 numbers and installed at the following places. 1) At conveyors Zero point. 2) NH <sub>3</sub> transfer pump 1 area 3) NH <sub>3</sub> transfer pump4 and tanker loading area 4) Refrigeration Compressor house area 5) Ammonia storage Tank NO 5 area 6) DAP plant granulator area of four trains (four nos.)

5	<p>The full containment (cup-in-tank) design of the tanks has a high reliability and a catastrophic failure of the inner and outer tanks at the same time is not considered. Hence a dyke / bund wall may not be necessary from the point of view of such a failure. However, spillage due to failure of valves, fittings, instrument tappings etc. in the pipeline system connected to the tanks has a higher probability of occurring. Containment of liquid spills and minimizing the vapour escaping into adjoining areas will go a long way in mitigating the effect of toxic release. With this in view, the following recommendations are made:</p> <p><b>i-</b>Provide bund / dyke for the storage tanks and the transfer pump areas. Making the bund/dyke from insulating concrete can also reduce the evaporation rate.</p> <p><b>ii-</b>Provide water curtain at the periphery of the bund walls to be operated in case of a spillage, to restrict the escape of ammonia vapours to adjoining areas. Provide water curtains also around the valves/safety valves area on top of the storage tanks with isolation valves that can be operated from the ground level, preferably by remote operated valves. Water curtains may also be provided around the compressor area.</p>	<p>Bund/dyke wall for storage and transfer pump areas may obstruct the pathways and hence the same was not provided. However fire hydrant system is available inside the plant and Water spray nozzle system (Fire monitor) is available which can spray up to Ammonia tank top in case of emergency.</p>
6	<p>Emergency power from the DG Set and alternative cooling water supply arrangement should be available for running the refrigeration compressors during outage of normal supply.</p>	<p>Emergency power supply for cooling Tower pump and refrigeration compressors is available through DG set.</p>
7	<p>A large number of Instruments and safety devices are provided for the safe operation of the storage system. Scheduled and effective maintenance of the instruments and safety devices should be ensured and properly documented.</p>	<p>We are regularly checking, maintaining and documenting the records of all instruments provided in Storage tank.</p>
8	<p>Service and test all PSVs and TSVs at regular intervals and properly tracked. Identification tags showing set pressures, last test date, date of next test due may be provided on each safety valve.</p>	<p>PSVs of storage tanks are being tested periodically. Set pressure of safety valve is already painted on the valve Body. Display of last test dates tags on safety valves is available.</p>

9	The SOP for transfer of ammonia into the storage tank should elaborate the risk of overpressure and overfilling – the two most common causes for failure of storage tanks - and the actions / precautions to be taken to prevent them.	SOP for transfer of Ammonia in to storage tank elaborating the risk of over pressure and over filling is available.
10	The flare stack and its ignition system should be tested periodically.	We are testing the Flare stack and its ignition system periodically and the record of the same is being maintained.
11	The isolation valves, especially the vent valve should be 'eased' periodically to make sure that these will operate freely in case of need.	The isolation valve especially the vent valve is being 'eased' periodically to operate freely in case of need
12	Monitor moisture content in liquid ammonia in each shipment. Presence of 0.2% water in liquid ammonia provides protection against stress corrosion cracking (SCC).	We are receiving Ammonia that contains around 0.2% moisture in liquid Ammonia.
13	The tank shell plates are susceptible to stress corrosion cracking (SCC) in presence of oxygen. During normal service no oxygen is present inside the tank. However, oxygen will enter the system during decommissioning, testing and maintenance. Under such circumstances great care is to be taken for removal of oxygen before taking the tank back in service	We are following SOP and taking extra care by Nitrogen purging, N2 gas exchanging and Ammonia gas exchanging for removal of oxygen before taking the tank back in service.
14	As a practice, the drains of pipelines, equipments, instruments etc. that are not frequently used should be plugged or blinded in a consistent manner	All drains of pipe lines, equipments and instruments that are not being used frequently were blinded and the same practice is being followed strictly.
15	A scheme to monitor the settlement if any of the foundation of the Storage Tank may be put in place. An expert study of the condition of the foundation and piles may also be carried out.	Settlement checking of the foundation of all ammonia storage tanks are being carried out periodically (once in a year) by our Civil department. Condition of foundation and piles are being carried out on regular basis.
16	Carry out detailed periodic inspection of the tanks to ensure their integrity.	Ammonia tanks Thickness survey was done during decommissioning period and found thickness was alright. Further our E&I Team are inspecting all tanks periodically to ensure their integrity
17	Review the inventory management practice to determine if the maximum permitted storage in a tank can be lowered from the current level of ~80%.	We are keeping maximum inventory 40000MT or less against our maximum storage capacity of 50000 MT, which is 80%.
18	<u>Ammonia Unloading</u> During ammonia unloading from ship tanker, necessary patrolling and surveillance is to be ensured to prevent emergency due to major	Our operation and maintenance team is taking care for zero leakage by preventive maintenance further during Ammonia unloading, our patrolling team is available to

	leak in the pipeline.	ensure for preventing emergency due to any major leak in pipe line.
19	<b><u>Tanker Loading</u></b> Use a detailed checklist to inspect the ammonia tanker before it is accepted for loading. Only tankers having valid test certificates and fulfilling other conditions should be accepted for loading.	Check list and SOP has been provided for Ammonia tanker loading .We are allowing those tankers only after verification of valid certificates and fulfilling other conditions.
20	The ammonia hoses should be hydraulically pressure tested periodically and a record should be maintained. An identification tag with the test details and the due date for next test should be attached to the hoses. There should also be a replacement schedule for the hoses.	This condition is not applicable to us since we are not using hoses for loading ammonia tankers.
21	Keep SCBAs handy at the tanker loading area while loading tankers. The loading operator alone, with PPE, shall have access to the tanker during loading activity. Others like the drivers may stay away.	We are keeping two no of SCBAs and 6 no of masks and other PPEs at site always /while loading tankers.
22	The tanker drivers shall be trained in ammonia tanker safety and a record shall be maintained.	Training to drivers is being given regularly. Record are being maintained.
23	The tanker should carry respiratory protection PPE for the drivers for use in emergencies.	Strict instructions have been given to Tanker owners to carry respiratory protection PPE for their drivers for use in emergencies and the same is being ensured.
24	<b><u>DAP Plant</u></b> Provide a ROV in the liquid ammonia line at the battery limit of DAP Plant to enable quick isolation of supply in case of a major leak in DAP Plant. This valve may be operable from the DAP Control Room as well as from the field.	ROVs in liquid ammonia line is available at battery limit of DAP Plant to enable quick isolation of supply in case of a major leak in DAP Plant and the same valve can be operated from the DAP Control Room as well as from the field.
25	<b><u>General</u></b> Breathing apparatus with encapsulated suits should be stocked in sufficient numbers to manage rescue works in case of major ammonia leak. As the number of breathing apparatus, spare cylinders, gas masks etc. required to tackle a major emergency will be large compared with presently stored numbers, it is suggested that a special storage facility may be provided at a suitable place for storing them and maintaining them properly for use in emergencies.	We have kept one suit in control room and two no in F&S department Total 25 nos of breathing apparatus are available with F&S department to manage rescue works in case of major ammonia leak One compressor is also available in F&S Department.
26	Plant personnel should be trained to undertake emergency measures in case of ammonia disaster. At least 30% of the personnel	Mock drills, Onsite emergency plan training are being conducted regularly by F&S Department and our plant personnel are well trained to

	employed should also be trained to carry out rescue work.	undertake emergency measures in case of ammonia disaster.
27	Review the number and location of wind socks installed in the plants and township areas.	Total 6 no of wind socks are installed at the following areas 1)WTP 2) Offsite 3)PAP/SAP area 4) Gate house near F&S depart 5) DAP .Two no of wind socks shall be installed in township area.
28	<b><u>Toxic Release - Chlorine</u></b> Efforts should be concentrated on reducing the probability of release of Chlorine in the chlorine handling area - WTP - especially since this is in the high risk region of township.	Use of chlorine dioxide in place of chlorine is being explored.
29	Only chlorine tonners with assured integrity should be allowed. It is suggested that the management insist on a copy of the test certificate to accompany the tonners when they are received.	During receiving time, we are strictly insisting/checking the test certificate and allowing the chlorine tonners.
30	The Chlorine tonner in use should be fitted with a leak extraction hood connected to a caustic scrubbing system. The caustic scrubbing system (blower, caustic circulation pump etc.) should always be kept in a ready-to-start condition. It is desirable to have the system to start automatically based on chlorine leak detector for added safety.	Caustic scrubbing system shall be studied for implementation
31	The chlorine sensor installed in WTP should be fitted with a hooter to alert personnel about a leak. It should be serviced and calibration checked periodically.	Chlorine Sensor is available and the same is being checked periodically. Calibration of the same is being carried out.
32	The tonner leak arrestor kit inspected at regular intervals to ensure that all items are available in the kit. A list of items should be available in the kit.	Tonner leak arrestor Kit is being inspected regularly the list of item kits are available in the kit.
33	A programme for replacing the chlorine tonner connecting tubes at fixed frequency is to be implemented.	Replacement of chlorine tonner connecting tubes is being done as per requirement and physical inspection during tonner changeover.
34	Ensure that gaskets of correct material is procured and used. As a safe practice, a fresh gasket should be used every time tubing is connected and the used gaskets should be destroyed to avoid accidental reuse.	We are using Gaskets of correct material and as a safe practice, only fresh gaskets are being used every time tubing is connected. Also used gaskets are being destroyed.
35	Respiratory protection in the area is self-contained breathing apparatus giving supply for 30-40 minutes, with audible alarm when the pressure falls below a stipulated figure.	Two numbers of SCBAs are available in WTP control room and 4 nos available in F&S department in case of emergency.

	Sufficient number of these SCBA should be stocked at a convenient place nearby where these can be accessed without difficulty in an emergency.	
36	Escape suits for use only for emergency evacuation, in adequate numbers, should also be available.	Two no of escape suits are available for emergency evacuation in control room. We have emergency stock available in F&S Department also.
37	More than having these self-contained breathing apparatus, it is very important that the users are imparted adequate training. The upkeep of this safety equipment is equally important	Our operating staff is well trained and also adequate training is imparted periodically.
38	As a measure to remove the risk emanating from the use of chlorine tonner on a long term basis, it is recommended to consider changing over from chlorine to chlorine dioxide for treating water.	Replacement of chlorine with chlorine dioxide is under study for implementation.
39	Since the residents and the occupants of several establishments in the township are likely to get exposed to the chlorine leak, the following additional measures are suggested: <b>i-</b> Provide wind socks at several locations surrounding the WTP to guide the people in case of a gas leak. <b>ii-</b> Educate the residents and other members of the public on the actions to be taken in the event of a leak. <b>iii-</b> Develop gas shelters at a few places in the township to be identified for the purpose and equip these shelters with PPEs and communication equipment. Some of the rooms / halls in existing buildings can be nominated for this purpose.	1) Wind socks is provided in township to guide the people in case of a gas leak. 2) We are Educating our residents and other members of the public on the actions to be taken in the event of a leak.
40	<b><u>Fire – FO and HSD Storage Tanks and Day Tanks</u></b> A detailed inspection of the storage and day tanks should be carried out at regular intervals to ensure the mechanical integrity of the tanks.	Inspection of storage and day tanks are being carried out periodically by our E&I Department to ensure the mechanical integrity of the tanks.
41	The monitoring instruments of the tanks for level and temperature should be maintained in good condition and the tank conditions monitored regularly.	Level and Temperature monitoring instruments are being maintained in good condition by our Instrumentation department. Records are maintained
42	The fire hydrants, monitors, foam trolleys and hose boxes near the storage tanks and day tanks should be identified for more focussed	Fire hydrants, foam trolleys and hose boxes Foam type and CO2 Fire Extinguishers and fire buckets are kept near the storage tanks.

	maintenance and upkeep	
43	Adequate quantity of foam to be stored in the premises. Additional inventory of foam should be maintained in the Fire Station / Fire-, Foam Tenders	Adequate quantity of foam is stored in premises and additional quantity is being maintained by F&S department
44	In the storage tank areas, the fire fighting procedure may be displayed for the information of the plant personnel who will be the first responders in the event of a fire.	Fir fighting procedure is displayed near storage tank area.
45	In view of its importance as secondary containment in the case of a tank failure or other spillages, the integrity of the dykes of the tanks should be ensured at all times. Any drains or other outlets from the dyke should remain closed except when opened under supervision for draining water or spillage.	The drains and other outlets from the dyke are normally kept closed. We open these drains only under supervision for draining water..
46	Clean the flame arrestors on the tank vents at regular intervals to ensure that they are clear of choking which could lead to pressure / vacuum condition in the tanks.	Not applicable.
47	Ensure that the storage tanks are covered by adequate lightning protection.	Lightening protection is available
48	The unloading hoses should be inspected periodically and maintained in good condition.	We do not use unloading hoses and hence not applicable.
49	Ensure that all hot works on or near the tanks are carried out under safe work permits.	SWP system is being followed strictly.
50	Install a system of Manual Fire Call Points in the factory, connected to a control panel in the Fire Station to reduce the response time to fires.	Already installed .