

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH AT NEW DELHI
ORIGINAL APPLICATION NO. 930/2024**

IN THE MATTER OF:

Mahesh Patel

Applicant

Versus

State of Madhya Pradesh &
Ors.

Respondents

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through



Place: Delhi

Dated: 27.11.2024

Adv. Mohit Singh

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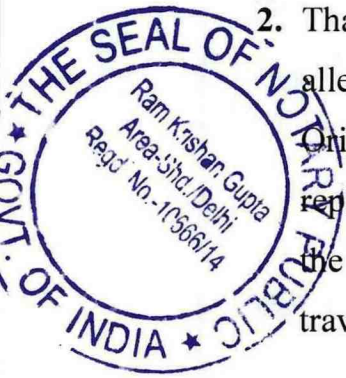
Versus

State of Madhya Pradesh & Ors.

Respondents

**REPLY ON BEHALF OF RESPONDENT NO. 4, CENTRAL POLLUTION
CONTROL BOARD (CPCB)**

1. That, Hon'ble National Green Tribunal, Principal Bench (hereinafter referred to as Hon'ble Tribunal) vide order 24.10.2024 has sought the reply of Answering Respondent No. 4 i.e., Central Pollution Control Board (hereinafter referred to as CPCB) in the instant matter. Thereby, the reply is made in succeeding paragraphs.
2. That at the very outset, the answering Respondent deny all claims, contentions, allegations and averments against answering respondent CPCB in the above Original Application (OA) contrary to anything stated or submitted in this reply. Nothing in the OA may be deemed to have been accepted or admitted by the answering Respondent for want of a specific denial or on the ground of non-traverse, save any averment which has been expressly admitted hereinafter.
3. That, CPCB is a statutory Board constituted under Section 3 of the Water (Prevention and Control of Pollution) Act, 1974. It performs the functions under The Water (Prevention and Control of Pollution) Act, 1974, The Air (Prevention and Control of Pollution) Act, 1981 and The Environment (Protection) Act, 1986.



4. That, it is humbly submitted that Hon'ble Tribunal (PB) has accepted a letter petition dated 15.09.2023 submitted by Shri Mahesh Patel, President, Ayudh Nirmani Majdoor Sangh. The application is related to Ordinance factory at Itarsi which is producing defence products i.e., ammunition for small weapons to missiles. It is alleged that the said industrial unit is discharging industrial effluent containing toxic elements and heavy metals in a water body located near Kendriya Vidyalaya No.1, Ordinance factory Itarsi. Untreated industrial effluent discharged by Ordinance factory is causing damage to environment by adversely affecting aquatic life, plants and also contaminating ground water which ultimately meets Narmada River and pollutes.

REPLY TO THE PETITION

1. That, as per the averments made in the letter petition related to discharge of treated or untreated effluent by the Ordinance factory Itarsi, it is humbly submitted that, as per the directions dated March 07, 2016 issued by CPCB. under Section 18 (1) (b) of the Water Act, 1974 and the Air Act, 1981, Industries Manufacturing of explosives, detonators, fuses including management and handling activities are categorized under 'Red' Category of industries. SPCB/PCC are the authorized statutory bodies to issue Consent to Establish (hereinafter referred to as 'CTE') and Consent to Operate (hereinafter referred to as 'CTO') and all such industrial units are required to obtain CTE/CTO from the concerned SPCB/PCC. The Explosive Manufacturing units shall be established only after obtaining CTE and shall operate after obtaining CTO from the concerned SPCB/PCC and shall comply with the conditions stipulated therein. A copy of the said directions is annexed herewith and marked as **Annexure R – 4/I.**

2. That, as the current letter petition is related to discharge of trade effluent/ sewage to the natural stream, it is humbly submitted that under Section 17 (f)



of the Water (Prevention and Control of Pollution) Act, 1974, SPCBs / PCCs have been entrusted with the statutory mandate to inspect sewage or trade effluents, works and plants for the treatment of sewage and trade effluents and to review plans, specifications or other data relating to plants set up for the treatment of waste water, works for the purification thereof and the system for the disposal of sewage or trade effluents or in connection with the grant of any consent as required by this Act.

3. That, the Hon'ble Tribunal constituted a Joint Committee comprising of Madhya Pradesh State Pollution Control Board (MPPCB); Central Pollution Control Board (CPCB) and; District Magistrate, Hoshangabad, for obtaining a factual report vide order dated 05.09.2024. In pursuant to the above order, Joint Committee has inspected the industry premises along with all the surrounding points mentioned in the petition as affected by water pollution and submitted its report vide email dated 17.10.2024. The joint committee collected the water & air samples for the analysis of heavy metals. However, due to ongoing analysis work at laboratory of Madhya Pradesh Pollution Control Board (MPPCB), the committee submitted the report without incorporating the same. Further, after the Hon'ble NGT order dated 24.10.2024, MPPCB has again carried out water sampling on 5.11.2024 to get more assessment on the water quality w.r.t. Heavy metals concentration. The analysis reports of sampling dated 3rd October 2024 and 5th November 2024 are enclosed as **Annexure- R-4/II**.

The heavy metal analysis report of the 02 water samples collected from 'Effluent Treatment Plant (ETP) Outlet' and 'Treated wastewater before going outside the factory premise' has shown that the concentration of Heavy metals viz. Copper (Cu), Lead (Pb), Nickel (Ni), Cadmium (Cd), Arsenic (As), Zinc (Zn), Manganese (Mn), Iron (Fe), Chromium (Cr) are well within the prescribed limit of 'GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL



POLLUTANTS PART-A : EFFLUENTS' for Inland surface water as per Schedule-VI of Environmental Protection Rules, 1986 w.r.t Copper (3 mg/l), Lead (0.1 mg/l), Nickel (3 mg/l), Cadmium (2 mg/l), Arsenic (0.2 mg/l), Zinc (5 mg/l), Manganese (2 mg/l), Iron (3 mg/l) & Chromium (0.1 mg/l). Copy of the GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A: EFFLUENTS is enclosed as **Annexure- R- 4/III**.

Further, the concentration of heavy metals (Copper, Lead, Nickel, Cadmium, Barium & Arsenic) in pond water was found under within the acceptable limits of drinking water standards (IS 10500:2012).

The heavy metal concentration of Pb (lead) in 02 groundwater samples collected on 5.11.2024 i.e. (i) Borewell water inside premise of Kendriya Vidyalaya, and (ii) Borewell No. II near factory main gate, was found 0.06mg/l and 0.05 mg/l respectively which is above the acceptable limit of drinking water standards (IS 10500:2012) w.r.t Lead (Pb) i.e. 0.01 mg/l. Copy of the DRINKING WATER — SPECIFICATION (IS 10500: 2012) is attached as **Annexure- R- 4/IV**. The following is recommended in this regard:

- a. M/s Ordnance Factory shall immediately stop the use of water of these borewell for direct drinking water purposes.
- b. Madhya Pradesh Pollution Control Board (MPPCB) shall carry out a detailed site investigation through a reputed agency/Institute regarding the elevated concentration of lead in the groundwater in and around the premises of the unit. In case of contamination, a subsequent remediation plan should be formulated based on the findings of this investigation. For assessment of site, CPCB/MoEF&CC guidelines i.e. Guidance document "Assessment and Remediation of contaminated sites in India " may be referred.



The Total Dissolved Solids (TDS) was observed as 1814mg/l at the nalla (drain) before going outside the factory premise. In order to control the increasing value of TDS, the ETP of the unit may be upgraded, so that entire treated effluent shall be recycled and in no case treated effluent shall be discharged outside of industry/unit premises, as per the Consent to operate (CTO) conditions given by MPPCB. Zero liquid discharge (ZLD) condition shall be practiced by the unit.

Further it is submitted that recommendations related to domestic wastewater, surveillance on any discharge of untreated effluent, electromagnetic flow meter, installation of lime bed quenching system & others were made by the Joint committee and the same may be implemented through MPPCB through the Unit viz.

- i. *To clean the unwanted shrubs, grasses in and around the oxidation pond to ensure effective management of the domestic wastewater. Along with this occupier need to upgrade the domestic wastewater treatment to SBR/MBBR based Sewage Treatment Plant.*
- ii. *To upgrade the ETP upto tertiary treatment i.e. Reverse Osmosis (RO) in light of the increasing values of Total Dissolved Solids (TDS).*
- iii. *To ensure that no untreated/treated wastewater goes outside the premises after mixing with the natural rain-fed drain for this occupier need to plug all the points from where the treated/untreated wastewater meets the natural drains. The occupier needs to establish Pan-Tilt Zoom (PTZ) camera & pH sensor on each of the 06 major drains which are going outside the premise & on ETP outlet to ensure & vigil that no effluent goes outside the premise and meets natural drain. The occupier needs to provide the connectivity to MPPCB surveillance centre.*



- iv. *The occupier needs to install electromagnetic flow meter at different locations to measure the quantity of daily water consumption and waste water generation.*
 - v. *Occupier need to immediately repair the ultrasonic flow meter install at the outlet of treated water collection tank and provide the connectivity to MPPCB surveillance centre.*
 - vi. *Occupier need to install lime bed quenching system for control of SO₂ from boiler house till the shift to cleaner fuel in place of Furnace Oil (FO). The occupier also submits the time bound action plan to shift from FO to cleaner fuel.*
 - vii. *Occupier shall ensure that the treated effluent shall not be used for water harvesting structures without obtaining permission of MPPCB.*
 - viii. *Occupier need to provide fencing around the ponds to avoid any accident.*
3. The answering respondent No. 4 craves leave of this Hon'ble Tribunal for filing additional reply, if required, in future.
 4. That, in light of the above submission, it is respectfully submitted that this Answering respondent i.e. CPCB, shall abide by any order(s) or direction(s) passed by this Hon'ble tribunal in the instant OA and render justice.



A handwritten signature in blue ink, appearing to be "Dinabandhu Gouda", with a small number "1" written below it.

(Dinabandhu Gouda)
Scientist 'F'
Central Pollution Control Board



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PRINCIPAL BENCH AT NEW DELHI
ORIGINAL APPLICATION NO. 930/2024**

IN THE MATTER OF:

Mahesh Patel

Applicant

Versus

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Respondents

AFFIDAVIT

I, Dinabandhu Gouda, working as Scientist 'F' in Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi, the Respondent No. 4, in the above matter, do hereby solemnly affirm, declare on oath and state as under:-

1. That I, the deponent herein is the authorized representative to represent the Respondent CPCB in the present case, and as such, I am well conversant with the facts and circumstances of the present case on the basis of the information derived from the official records, and hence, I am competent to verify, sign and swear this affidavit on behalf of the Respondent CPCB.
2. That the accompanying reply may be read part and parcel of the present affidavit.
3. That the accompanying reply has been drafted and filed under my instructions and authority the contents thereof are true and correct on the basis of the records maintained during ordinary course of business of CPCB and available records and documents and the contents of the same are read over and explained to me and are not repeated herein for the sake of brevity.



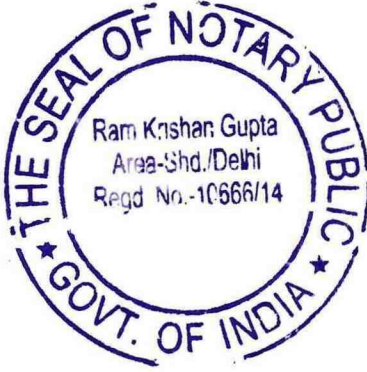
DEPONENT

दीनबन्धु गोडा /Dinabandhu Gouda
प्रभागीय प्रमुख, आई.पी.सी.-I/Divisional Head, IPC-I
केन्द्रीय प्रदूषण नियंत्रण बोर्ड
Central Pollution Control Board
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
M/o Env't. Forest & Climate Change, Govt. of India
परिवेश भवन, पूर्वी अर्जुन नगर, दिल्ली-110032
Parivesh Bhawan, East Arjun Nagar, Delhi-110032

VERIFICATION

2.7 NOV 2024

Verified at Delhi on this day of _____ 2024 that the contents of the above reply are correct and true on the basis of the record of the cases as mentioned in the day to day affairs of the CPCB. Nothing has been concealed therefrom or mis-stated.



DEPONENT

दीनबन्धु गौडा /Dinabandhu Gouda
 प्रभागीय प्रमुख, आर्.पी.सी.-1/Divisional Head, IPC-1
 केन्द्रीय प्रदूषण नियंत्रण बोर्ड
 Central Pollution Control Board
 पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
 M/o Env't. Forest & Climate Change, Govt. of India
 परिवेश भवन, पूर्वी अर्जुन नगर, दिल्ली-110032
 Parivesh Bhawan, East Arjun Nagar, Delhi-110032

ATTESTED

NOTARY
 DELHI (INDIA)

2.7 NOV 2024



केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
(पर्यावरण एवं वन मंत्रालय, भारत सरकार)
(MINISTRY OF ENVIRONMENT & FORESTS, GOVT. OF INDIA)

No.B-29012/ESS(CPA)/2015-16/

March 07, 2016

To

The Chairman
All the State Pollution Control Boards / Pollution Control Committees
(List Attached)

SUB: MODIFIED DIRECTIONS UNDER SECTION 18(1)(b) OF THE WATER (PREVENTION & CONTROL OF POLLUTION) ACT, 1974 and THE AIR (PREVENTION & CONTROL OF POLLUTION) ACT, 1981 REGARDING HARMONIZATION OF CLASSIFICATION OF INDUSTRIAL SECTORS UNDER RED / ORANGE / GREEN / WHITE CATEGORIES.

WHEREAS, under section 16 (2)(b) of the Water (Prevention and Control of Pollution) Act, 1974 and under Section 16 (2)(c) of the Air (Prevention & Control of Pollution) Act, 1981, one of the functions of the Central Pollution Control Board (CPCB), constituted under the Water (Prevention and Control of Pollution) Act, 1974, is to coordinate activities of the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs); and

WHEREAS, under section 16 (2)(c) of the Water (Prevention and Control of Pollution) Act, 1974 and under Section 16 (2)(d) of the Air (Prevention & Control of Pollution) Act, 1981, one of the functions of the CPCB is to provide technical assistance and guidance to SPCBs and PCCs; and

WHEREAS, it was brought to the notice of CPCB, that different SPCBs /PCCs were following different criteria for classification of industrial sectors under Red/Orange/ Green category and that classification was being used by the SPCBs/PCCs for grant of consents to industries and for Inventorization / surveillance of industries.

WHEREAS, the issue regarding classification of industries was deliberated upon in the 56th Conference of Chairmen & Member Secretaries of CPCB & SPCBs/PCCs held on August 31, 2010 and a working group comprising of representatives from SPCBs & CPCB was constituted to prepare a consolidated list of industrial sectors falling under Red/Orange/Green category to bring uniformity in classification of industrial sectors across the country;

'परिवेश भवन' पूर्वी अर्जुन नगर, दिल्ली-110032

'Parivesh Bhawan', East Arjun Nagar, Delhi - 110032

दूरभाष/Tel. : 43102030, फ़ैक्स/Fax : 22305793, 22307078, 22307079, 22301932, 22304948

ई-मेल/e-mail : cpcb@nic.in वेबसाइट/Website : www.cpcb.nic.in

WHEREAS, the report prepared by the Working Group was discussed in the 57th Conference of Chairmen & Member Secretaries of CPCB & SPCBs/PCCs held in Delhi on September 15, 2011, wherein some modifications were proposed;

WHEREAS, the final report of the working group was prepared, incorporating the suggestions/observations made in the 57th Conference of Chairmen and Member Secretaries of CPCB & SPCBs/PCCs and in exercise of the powers delegated to the Chairman, CPCB under Section 18(1)(b) of the Water Act, 1974, following directions were issued for compliance to all SPCBs/PCCs to maintain uniformity in categorization of industries as red, orange and green as per list finalized by CPCB, which identified 85 types of industrial sectors as 'Red', 73 industrial sectors as 'Orange' and 86 sectors as 'Green':

a). To maintain uniformity in categorization of industries under Red/ Orange/Green category, the SPCBs /PCCs shall adopt the list as finalized by CPCB based on the recommendations of that Working Group for grant of Consent, inventorization of industries under Red, Orange and Green categories and other related activities.

(b). The SPCBs/PCCs shall revise the list of Red, Orange and Green categories of industries operating in their jurisdiction based on the criteria specified in the final report of that Working Group and submit the same to CPCB within 90 days in hard copy as well as soft copy;

WHEREAS, later-on, it was observed that the process of categorization thus far was primarily based on the size of the industries and consumption of resources and pollution due to discharge of emissions and effluents and its likely impact on health was not considered as primary criteria;

WHEREAS, there have been proposals from the SPCBs / PCCs and industrial associations for categorization of the industrial sectors in a more pragmatic manner. The issue was discussed during the national level conference of the Environment Ministers of the States, held in New Delhi during April 06-07, 2015 and also during the Conference of the Chairmen and Member Secretaries of CPCB and SPCBs/PCCs held in New Delhi on April 08, 2015. Accordingly, a 'Working Group' comprising of the Members from Central Pollution Control Board and State Pollution Control Boards representing the States of Andhra Pradesh, Punjab, Tamilnadu, West Bengal, Madhya Pradesh and Maharashtra, was constituted to revisit the criteria of categorization of industries and suggest rationale based on pollution potential for categorization of industrial sectors and adopting it for implementation of pollution control plan;

WHEREAS, the Working Group has developed the criteria of categorization of industrial sectors based on the concept of Pollution Index which is a function of the emissions (air pollutants), effluents (water pollutants), hazardous wastes generated and consumption of resources. For this purpose the references are taken from the the Water (Prevention and Control

of Pollution) Cess (Amendment) Act, 2003, Standards so far prescribed for various pollutants under Environment (Protection) Act , 1986 and Doon Valley Notification, 1989 issued by MoEFCC. The Pollution Index (PI) of any industrial sector is a number from 0 to 100 and the increasing value of PI denotes the increasing degree of pollution load from the industrial sector;

WHEREAS , based on the series of consultations with SPCBs, different Government / Non-government Institutions including industries and MoEFCC , the following criteria on 'Range of Pollution Index 'for the purpose of categorization of industrial sectors has been finalized:

- Industrial Sectors having Pollution Index score of 60 and above - Red category
- Industrial Sectors having Pollution Index score of 41 to 59 -Orange category
- Industrial Sectors having Pollution Index score of 21 to 40 -Green category
- Industrial Sectors having Pollution Index score incl. & upto 20 -White category

WHEREAS, based on the revised criteria, the 'Final Report on Revised Categorization of Industrial Sectors under Red/Orange/Green/White' has been evolved. The 'Categorization' is based on the relative pollution potential of the industrial sectors and grouping of the industrial sectors based on the use of raw materials, manufacturing process adopted and pollutants likely to be generated;

WHEREAS, based on relative Pollution Index, the number of industries in various categories are as under :

- i. The Red category of industrial sectors: 60
- ii. The Orange category of industrial sectors: 83
- iii. The Green category of industrial sectors: 63 and
- iv. The Newly introduced White category: 36

WHEREAS, there shall be no necessity of obtaining the Consent to Operate" for White category of industries and an intimation to concerned SPCB / PCC shall suffice;

WHEREAS, the purpose of categorization is to ensure that the industry is established in a manner consistent with the environmental objectives and to prompt industrial sectors to adopt cleaner technologies, ultimately resulting in generation of no or minimum pollutants.

WHEREAS the new categorization system shall also facilitate in self-assessment by industries;

Now, therefore, in exercise of the powers delegated to the Chairman, CPCB under Section 18(1)(b) of the Water (Prevention & Control of Pollution) Act, 1974 and Section 18(1)(b) of the Air (Prevention & Control of Pollution), Act , 1981 the earlier Directions issued in June 2012 in the context of categorisation of industries as Red, Orange & Green are withdrawn with immediate effect and following '**Directions**' are hereby issued for compliance by all SPCBs and PCCs :

1. That the SPCBs and PCCs shall adopt the Revised Criteria of categorization of industrial sectors as detailed in table nos. F1, F2, F3 and F4 and Revised Lists of Red, Orange, Green and White categories of industrial sectors, presented at table no. G2, G3, G4 and G5 respectively, in the 'Final Report' as attached herewith immediately.
2. That all pending applications for consideration of 'Consent to Establish' and 'Consent to Operate' and future such applications shall be processed as per revised criteria.
3. That the SPCBs and PCCs will provide the list of industries identified in each category existing in the State which have been considered for grant of consents. SPCBs/PCCs will forward the list of such industries before 31.05.2016 and the same will be uploaded on the websites of respective SPCB/PCC.
4. That the 'Revised Lists of Red, Orange, Green and White category of industrial sectors' shall be used by the SPCBs and PCCs for Consent Management and inventorization of industries under Red, Orange, Green and White categories. Siting of industries shall be only in conforming areas. SPCBs / PCCs shall evolve sector specific plans for control of pollution and industrial surveillance for verifying compliance.
5. That the SPCBs and PCCs shall revise /prepare the inventory of Red, Orange, Green and White categories of industries operating in their jurisdiction based on the revised criteria specified in the Final Report and submit the same to CPCB within 90 days i.e., before 30.05.2016 in hard copy as well as soft copy.
6. That the listed category of industries or those identified later-on under different categories shall not be linked to sanction of loan /finance or bank proceedings.
7. That any further addition of any new or left-over industrial sector and their categorization which is not listed in the revised list of Red, Orange, Green and White industrial sectors, shall be done at the level of concerned SPCB /PCC following revised criteria & guidelines as detailed in the attached document and no concurrence of CPCB shall normally be required. It is further clarified that while categorizing the industries, fractional numbers shall be rounded off to nearest integer.

The SPCBs/PCCs shall acknowledge the receipt of directions and submit the 'Action Taken Report' in compliance with these directions to CPCB before 15.04.2016.

(Arun Kumar Mehta)
Chairman
7/3/16

Copy to:

1. The Chief Secretary of all the States and UTs
2. The Secretary ,
Ministry of Micro, Small and Medium Entrepreneurs
Udyog Bhawan, Rafi Marg, New Delhi - 110 011
3. The Secretary ,
Ministry of Heavy Industries
Udyog Bhawan, Rafi Marg, New Delhi - 110 011
4. The Secretary,
Ministry of New and Renewable Energy
Block-14, CGO Complex,
Lodhi Road, New Delhi-110 003,
5. The Advisor(CP Division)
Ministry of Environment ,Forests and Climate Change
Indira Paryavaran Bhawan
Jor Bagh Road, New Delhi - 110 003
6. All Zonal Offices of CPCB

(A. B. Akolkar) 7.3.16
Member Secretary

Final Document
on
Revised
Classification
of
Industrial Sectors
Under

Red, Orange, Green and White Categories
(February 29, 2016)



Central Pollution Control Board
Delhi

Executive Summary

Categorization of Industrial Sectors under Red, Orange, Green and White Category

The Ministry of Environment, Forest and Climate Change (MoEFCC) had brought out notifications in 1989, with the purpose of prohibition/ restriction of operations of certain industries to protect ecologically sensitive Doon Valley. The notification introduced the concept of categorization of industries as " Red", "Orange "and "Green" with the purpose of facilitating decisions related to location of these industries. Subsequently, the application of this concept was extended in other parts of the country not only for the purpose of location of industries, but also for the purpose of Consent management and formulation of norms related to surveillance / inspection of industries.

The concept of categorization of industries continued to evolve and as different State Pollution Control Boards interpreted it differently, a need arose to bring about necessary uniformity in its application across the country. In order to harmonize the 'Criteria of categorization', Directions were issued by CPCB under Section 18(1)(b) of the Water (Prevention & Control of Pollution) , Act, 1974 to all SPCBs/PCCs to maintain uniformity in categorization of industries as red, green and orange as per list finalized by CPCB, which identified 85 types of industrial sectors as 'Red', 73 industrial sectors as 'Orange' and 86 sectors as 'Green'.

The process of categorization thus far was primarily based on the size of the industries and consumption of resources. The pollution due to discharge of emissions & effluents and its likely impact on health was not considered as primary criteria. There was demand from the SPCBs / PCCs and industrial associations for categorization of the industrial sectors in a more transparent manner. Accordingly, the issue was discussed thoroughly during the national level conference of the Environment Ministers of the States, held in New Delhi during April 06-07, 2015 and a 'Working Group' comprising of the members from CPCB, APPCB, TNPCB, WBPCB, PPCB, MPPCB and Maharashtra PCB is constituted to revisit the criteria of categorization of industries and recommend measures for making the system transparent and rational.

The Working Group has developed the criteria of categorization of industrial sectors based on the Pollution Index which is a function of the emissions (air pollutants), effluents (water pollutants), hazardous wastes generated and consumption of resources. For this purpose the references are taken from the the Water (Prevention and Control of Pollution) Cess (Amendment) Act, 2003, Standards so far prescribed for various pollutants under Environment (Protection) Act , 1986 and Doon Valley Notification, 1989 issued by MoEFCC. The Pollution Index PI of any industrial sector is a number from 0 to 100 and the increasing value of PI denotes the increasing degree of pollution load from the industrial sector. Based on the series of brain storming sessions among CPCB, SPCBs and MoEFCC , the following criteria on 'Range of Pollution Index 'for the purpose of categorization of industrial sectors is finalized.

- Industrial Sectors having Pollution Index score of 60 and above - Red category
- Industrial Sectors having Pollution Index score of 41 to 59 -Orange category
- Industrial Sectors having Pollution Index score of 21 to 40 -Green category
- Industrial Sectors having Pollution Index score incl.&upto 20 -White category

The newly introduced White category of industries pertains to those industrial sectors which are practically non-polluting such as Biscuit trays etc. from rolled PVC sheet (using automatic vacuum forming machines), Cotton and woolen hosiers making (Dry process only without any dying/washing operation), Electric lamp (bulb) and CFL manufacturing by assembling only, Scientific and mathematical instrument manufacturing, Solar power generation through photovoltaic cell, wind power and mini hydel power (less than 25 MW).

The salient features of the 'Re-categorization' Exercise are as follows :

- Due importance has been given to relative pollution potential of the industrial sectors based on scientific criteria . Further, wherever possible, splitting of the industrial sectors is also considered based on the use of raw materials, manufacturing process adopted and in-turn pollutants expected to be generated.
- The Red category of industrial sectors would be 60.
- The Orange category of industrial sectors would be 83.
- The Green category of industrial sectors would be 63.
- Newly introduced White category contains 36 industrial sectors which are practically non-polluting.
- There shall be no necessity of obtaining the Consent to Operate'' for White category of industries. An intimation to concerned SPCB / PCC shall suffice.
- No Red category of industries shall normally be permitted in the ecologically fragile area / protected area.

The purpose of categorization is to ensure that the industry is established in a manner which is consistent with the environmental objectives. The new criteria will prompt industrial sectors willing to adopt cleaner technologies, ultimately resulting in generation of fewer pollutants. Another feature of the new categorization system lies in facilitating self-assessment by industries as the subjectivity of earlier assessment has been eliminated. This 'Re-categorization' is a part of the efforts, policies and objective of present government to create a clean & transparent working environment in the country and promote the Ease of Doing Business.

Other similar efforts include installation of Continuous Online Emissions/ Effluent Monitoring Systems in the polluting industries, Revisiting of the CEPI (Comprehensive Environment Pollution Index) concept for assessment of polluted industrial clusters, Revision of existing industrial Emission/Effluent discharge standards, initiation of special drive on pollution control activities in Ganga River basin and many more in coming future.

Revised Criteria of Categorization of Industries

“Securing industrial pollution control in accordance with the Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 by linking with categorization of industries, consent management and vigilance – ‘In context of Red, Orange, Green and White categories of industries’”

A: Genesis of Categorization:

- The Ministry of Environment, Forest and Climate Change (MoEFCC) had brought out notifications, which inter-alia refers to Prohibition/ Restriction on operation of industries to protect ecologically sensitive areas or areas of specific importance. This has for the first time brought the concept of categorization of industries to “Red”, “Orange” and “Green” and restrict their operation in certain areas of importance. Therefore, it is at-once interpreted that Red, Orange and Green categorization is linked with location specific needs.
- The notification of MoEF was first brought on 2nd February, 1989 in case of “Restriction on location of industries, mining operations and other developmental activities in Doon Valley in “Uttarakhand” and thereafter another notification on 24th February 1999 regarding restriction on the setting up of industries in Dahanu Taluka in Maharashtra. The categorization had been made mainly on the basis of size of the industries, man power and consumption of resources.
- However, in other parts of the country, there have been variations in context to the classification of industries under Red, Orange and Green categories. SPCBs / PCCs were following their own criteria in different States thereby creating confusion.
- In order to harmonize the ‘Criteria of categorization’, a ‘Working Group’ was formed as per resolution passed during the 57th Conference of the Chairmen & Member Secretaries of CPCB and SPCBs. Based on the recommendations of the Working Group, Directions dated 4/6/2012 under Section 18(1)(b) of the Water

(Prevention & Control of Pollution), Act, 1974 were issued to all SPCBs/PCCs with the effects to maintain uniformity in categorization of industries as red, green and orange as per list finalized by the Working Group. This indicative list included 85 types of industrial sectors as 'Red', 73 industrial sectors as 'Orange' and 86 sectors as 'Green'. However, these identified categories have not been assigned with scores as per existing criteria/ or any new criteria

B: Categorization criteria used by SPCBs/PCCs:

SPCBs and PCCs use the criteria of Red, Orange and Green categories for consent management and vigilance purposes for carrying out inspections to verify compliance to the stipulated standards. However the above categorization do not emphasize on sector-specific plan for control of pollution in accordance with priority based on pollution index.

C: Gap in the process:

1. The categorization has been made mainly on the basis of size of the industries and consumption of resources. The pollution due to discharge of emissions & effluents and its impact on health was not considered as primary criteria.
2. Categorization was on random basis, no scoring system was adopted.

D: Resolutions made during National Level Conferences

The issue was discussed thoroughly during the following national level conferences held in New Delhi:

- Conference of the Environment Ministers of Central Government and State Governments during April 06-07, 2015
- 59th Conference of Chairmen & Member Secretaries of Pollution Control Boards / Pollution Control Committees held on April 08, 2015

Accordingly following resolutions were made during the Conferences:

1. A 'Working Group' comprising of the members from CPCB, APPCB, TNPCB, WBPCB, PPCB, MPPCB and Maharashtra PCB is constituted.
2. This WG shall revisit the categorization of industries that is based on pollution index criteria & environmental issues such as generation of emission, effluent and hazardous wastes.
3. The categorization will be done on the basis of composite score (0-100 marks) of Pollution Index given in accordance with the following weightage.

Air Pollution Score based on parameters namely PM, CO, NO _x , SO _x , HMs, Benzene, Ammonia and other toxic parameters relevant to the industry.	40 Marks
Water Pollution Score based on parameters namely pH, TSS, NH ₃ -N, BOD, Phenol and other toxic pollutants relevant to the industry.	40 Marks
Hazardous wastes (land fillable, incinerable, recyclable) as generated by the industry.	20 Marks
<p>Note :</p> <ul style="list-style-type: none"> • Parameters to be decided on the basis of the nature of the wastes generating from the industrial sector. • Industries having only either water pollution or air pollution, the score will be normalized wrt 100. 	

4. Based on the score of the Pollution Index, following categorization be made :
 - Type of industries, if scores 60 and above be categorized as Red
 - Type of industries, if scores from 30 to 59 be categorized as Orange
 - Type of industries, if scores from 15 to 29 be categorized as Green
 - Type of industries, if less than 15 be categorized as White or non-polluting industry.
5. SPCBs/PCCs may issue consent to the industries
 - Red category of industries for 5 years.
 - Orange category of industries for 10 years.
 - Green category of industries for 15 years.
 - No necessity of consent for non-polluting industries.
6. No red categories of industries will be permitted to establish in eco-sensitive areas and protected areas.

E: Follow-up Actions made on the Resolutions :-

- Accordingly, a Committee comprising the Chairmen of CPCB, APPCB, TNPCB, MPPCB, MPCB, PPCB, WBPCB and MS, CPCB was constituted vide CPCB OM dated

23.04.2015 to review & classify industrial sectors into different categories based on criteria of respective pollution potential.

- The categorization is made on the basis of following:
 - Quality of emissions (air pollutants) generated
 - Quality of effluents (water pollutants) generated
 - Types of hazardous wastes generated
 - Consumption of resources

- Reference is taken from the following :
 - The Water (Prevention and Control of Pollution) Cess Act, 1977
 - Standards so far prescribed for various pollutants under the Environment (Protection) Act , 1986
 - Doon Valley Notification, 1989 issued by MoEF.

F : Scoring Methodology :

The details on the scoring methodology in respect of the aforesaid 3 components is presented in the following tables F-1 to F-4 .

Table F-1 : Water Pollution Scoring Methodology

Sl. No.	Activity / Types of Discharges	Score
Part A : Score W1 : Score based on types of expected criteria water-pollutants present in industrial processes waste waters. Maximum of the following seven categories is to be taken.		
W11	Waste-water which is polluted and the pollutants are - <ul style="list-style-type: none"> • not easily biodegradable (very high strength waste waters having BOD > 5000 mg/l); or • toxic; or • both toxic and not easily biodegradable. (Presence of criteria water pollutants having prescribed standard limits up-to 10 mg/l or having BOD > 5000 mg/l). For details appendix 1 may be referred)	30
W12	Non-toxic high strength polluted waste-water having BOD in the range of 1000-5000 mg/l and the pollutants are biodegradable. <p>(Presence of criteria water pollutants having prescribed standard limits from 11 mg/l to 250 mg/l and having BOD strength in the range of 1000-5000 mg/l) . For details appendix 1 may be referred)</p>	25
W13	Non toxic- polluted waste-water having BOD below 1000 mg/l and the pollutants are easily biodegradable. <p>(Presence of criteria water pollutants having prescribed standard limits from 11mg/l to 250 mg/l and having BOD strength below 1000 mg/l) . For details appendix 1 may be referred)</p>	20
W14	Waste-water generated from the chemical processes and which is polluted due to presence of high TDS (total dissolved solids) of inorganic nature. <p>(Presence of criteria water pollutants having prescribed standard limits more than 250 mg/l. For details appendix 1 may be referred)</p>	15
W15	Waste-water generated from the physical unit operations / processes and which is polluted due to presence of TDS (total dissolved solids) of inorganic nature and of natural origin like fresh-water RO rejects, boiler blow-downs, brine solution rejects etc. <p>(Presence of criteria water pollutants having prescribed standard limits more than 250 mg/l. For details appendix 1 may be referred)</p>	12
W16	Non-toxic polluted waste-water from those units which are: <ul style="list-style-type: none"> • Having the overall waste-water generation less than 10 KLD and • The pollutants are easily bio-degradable having BOD below 200 mg/l which can be easily treated in a single stage ASP (activated 	12

	sludge process) based Effluent Treatment Plant. Note : This is a special category and is applicable to only those units having over-all liquid waste generation less than 10 KLD with low strength organic load.	
W17	Waste-water from cooling towers and cooling-re-circulation processes	10
Part B : Score W2 : Score based on huge discharges of any kind (Penalty Clause)		
W2	Industry having overall liquid waste generation of 100 KLD or more including industrial & domestic waste-water.	10
Overall Water Pollution Score $W = W1+W2$		

Appendix 1

- **Water Pollutants covered under Group W11:**
 - ✓ Free available Chlorine , Total residual chlorine, Fluoride (as F), Sulphide (as S), Free Ammonical Nitrogen, Dissolved phosphates (as P), Free ammonia (as NH₃), Nitrate Nitrogen, Mercury (As Hg), Selenium (as Se), Hexa-valent chromium (as Cr + 6), Lead (as Pb), Tin , Vanadium (as V), Cadmium (as Cd), Manganese (as Mn), Total chromium (as Cr), Copper (as Cu), Iron (as Fe), Nickel (as Ni), Zinc (as Zn), Benzene, Arsenic (as As), Benzo-a-pyrene, Cyanide (as CN), Phenolic compounds (as C₆H₅OH) , Adsorbable Organic Halogens (AOX), Boron and /or
 - ✓ BOD strength of waste water > 5000 mg/l
- **Water Pollutants covered under Group W12:**
 - ✓ Sodium Absorption Ratio (SAR) , Biochemical oxygen demand (3 days at 27°C), Total Kjeldahl nitrogen (TKN), Ammonical nitrogen (as N), Suspended solids, Total nitrogen (as N), Chemical oxygen demand, Oils & grease and
 - ✓ BOD strength of waste water is in the range of 1000-5000 mg/l
- **Water Pollutants covered under Group W13:**
 - ✓ Sodium Absorption Ratio (SAR), Biochemical oxygen demand (3 days at 27°C), Total Kjeldahl nitrogen (TKN), Ammonical nitrogen (as N), Suspended solids, Total nitrogen (as N), Chemical oxygen demand and
 - ✓ BOD strength of waste water is below 1000 mg/l
- **Water Pollutants covered under Group W14 and W15:**

Chlorides as Cl, Colour , Total dissolved solids (TDS - Inorganic)
- **Water Pollutants covered under Group W16**
 - ✓ BOD strength of waste water is below 200 mg/l and overall discharge is less than 10 KLD.

Table F-2 : Air Pollution Score

Sl. No.	Air Pollutants Group	'Range of Prescribed Standard' of criteria pollutants	Marks
Part 1 : Score A1 = Score based on types of expected criteria Air Pollutants present in the emissions . Maximum of the following seven categories is to be taken. For details appendix 2 may be referred.			
1	Group A1A	Presence of criteria air pollutants having prescribed standard limits up - to 2 mg/Nm ³	30
2	Group A1B	Presence of criteria air pollutants having prescribed standard from 3 to 10 mg/Nm ³	25
3	Group A1C	Presence of criteria air pollutants having prescribed standard from 11 to 50 mg/Nm ³	20
4	Group A1D	Presence of criteria air pollutants having prescribed standard from 51 to 250 mg/Nm ³	15
5	Group A1E	Presence of criteria air pollutants having prescribed standard from 251 mg/Nm ³ & above.	10
6	Group A1F	<ul style="list-style-type: none"> • Generation of fugitive emissions of Particulate Matters which are: <ul style="list-style-type: none"> ○ Not generated as a result of combustion of any kind of fossil-fuel. ○ Generated due to handling / processing of materials without involving the use of any kind of chemicals. ○ Which can be easily contained /controlled with simple conventional methods 	10
7	Group A1G	<ul style="list-style-type: none"> • Generation of Odours which are : <ul style="list-style-type: none"> ○ Generated due to application of binding gums / cements /adhesives /enamels ○ Which can be easily contained /controlled with simple conventional methods 	10
Part 2 : Score A2 = Score based on consumption of fuels and technologies required for air pollution control :			
6	Group A2F1	<ul style="list-style-type: none"> • All such industries in which the daily consumption of coal/fuel is more than 24 MT/day and the particular (Particulate/gaseous/process) emissions from which can be controlled only with high level equipments / technology like ESPs, Bag House Filters, High Efficiency chemical wet scrubbers etc. 	10
7	Group A2F2	<ul style="list-style-type: none"> • All such industries in which the daily consumption of coal/fuel is from 12 MT/day to 24 MT/day and the particular (Particulate/gaseous/process) emissions from which can be controlled with suitable proven technology. 	5
Overall Air Pollution Score -A = A1 + A2			

- Air pollutants covered under Group A1A:
Cd+Th, Dioxins & Furans, Mercury, Asbestos
- Air Pollutants covered under Group A1B:
HF, Nickel+ Vanadium, HBr, Manganese, Lead, H₂S, P₂O₅ as H₃PO₄
- Air Pollutants covered under Group A1C:
Chlorine, Pesticide compounds, CH₃Cl, TOC, Total Fluoride, Hydrocarbons, NH₃, HCL vapour & Mist, H₂SO₄ Mist, SO₂
- Air Pollutants covered under Group A1D:
CO, PM, CO, NO_x
- Air Pollutants covered under Group A1E:
NO_x with liquid-fuel, SO₂ with liquid-fuel

Table F-3: Hazardous Waste Generation Score

Sl.No.	Types of Hazardous Waste Generated as per Schedule 1 / Schedule 2 of Hazardous Waste (Management, Handling & Trans-boundary Movement) Rules , 2008 . Maximum of the following four categories is to be taken	Score
HW1	<ul style="list-style-type: none"> • Land disposable HW which require special care & treatment for stabilization before disposal. 	20
HW2	<ul style="list-style-type: none"> • Incinerable HW 	15
HW3	<ul style="list-style-type: none"> • Land disposable HW which doesn't require treatment & stabilization before disposal. • High volume low effect wastes such as fly-ash, phspho-gypsum, red-mud, slags from pyro-metallurgical operations, mine tailings and ore beneficiation rejects) 	10
HW4	<ul style="list-style-type: none"> • Recyclable HW, which are easily recyclable with proven technologies. 	10

Table F-4 : Calculation Sheet
Industrial Sector -

1. Water Pollution Score (W)			
Scores	Waste Water Category	Value	
Score on W1			
Score on W2			
Water Pollution Score = W1+W2			
2. Air Pollution Score (A)			
Scores	Air Pollutant Category	Value	
Score on A1			
Score on A2	-	-	
Air Pollution Score = A1+A2			
3. Hazardous Waste Score (HW)			
Score	HW Category	Value	
HW			
Grand Total = W + A + HW			

Note :

1. Any of the industrial sector having only either air pollution (A) or water pollution (W) , the score will be normalized to 100 as per the following formula -

$$\text{Normalized Score} = \{100 \times W \text{ (or A)}\} / 40$$

2. Any of the industrial sector having air pollution (A) and water pollution (W) both but no hazardous waste generation (H) , the joint score of air & water pollution will be normalized to 100 as per the following formula -

$$\text{Normalized Score} = \{100 \times (W+A)\} / 80$$

3. Any of the industrial sector having air pollution (A) & hazardous waste generation (H) but no water pollution (W), the joint score of air pollution & hazardous waste generation will be normalized to 100 as per the following formula -

$$\text{Normalized Score} = \{100 \times (A+H)\} / 60$$

4. Any of the industrial sector having water pollution (W) and hazardous waste generation (H) but no air pollution (A), the joint score of water pollution & hazardous waste generation will be normalized to 100 as per the following formula -

$$\text{Normalized Score} = \{100 \times (W+H)\} / 60$$

G : Developments :

- i. The existing Red (85 sectors) , Orange (73 sectors) and Green (86 sectors) i.e a total of 244 industrial sectors have been assessed as per the proposed formula by the Working Group. For this purpose, concerned Engineers / Scientists from the Member SPCBs were also involved & consulted during May 28-29, 2015.
- ii. After careful examination and consideration of the suggestions of concerned stake-holders the “Draft Document on Revised Concept of Categorization of Industrial Sectors “ was prepared by the Committee and circulated to all the SPCBs, PCCs and concerned Ministries for their information & comments. The ‘ Draft Document ’ was uploaded on the website of CPCB also for information & comments of one & all.
- iii. The matter was discussed during the 170th Board Meeting also and issues raised by the Board Members pertaining to some of the industrial sectors were clarified.
- iv. Responses were received from various concerned Ministries, SPCBs, Industrial Associations including individuals.
- v. Based on the above, final meeting was convened by the Secretary , MoEFCC with CPCB and senior officers of MoEFCC on January 06, 2016 to resolve the issues appropriately and finalize the ‘Re-categorization’. Accordingly , following modifications in the ‘Range of Pollution Index ‘for the purpose of categorization of industrial sectors were suggested :
 - Industrial Sectors having Pollution Index score of 60 and above – Red category
 - Industrial Sectors having Pollution Index score of 41 to 59 –Orange category
 - Industrial Sectors having Pollution Index score of 21 to 40 –Green category
 - Industrial Sectors having Pollution Index score incl.& upto 20 –White category
- vi. Based on the final criteria as described in v above , the final categorization is as follows :

Category of Industrial Sector	Existing Categorization	Proposed (New) categorization
Red	85	60
Orange	73	83
Green	86	63
White	---	36
Total	244	242

- vii. In the proposed categorization, some of the industrial sectors have been either deleted due to duplication or merged with similar type of sectors on account of same

characteristics of pollution generation. In a similar way, some of the industrial sectors are split into more sectors on account of variation in the raw materials / manufacturing process. As a result final totals of the existing and proposed categorization are different.

- viii. The industrial sector which doesn't fall under any of the above four categories (Red, Orange, Green and White) , decision with regard to its categorization will be taken at the level of concerned SPCB/PCC by a committee headed by the Member Secretary , SPCB/PCC and comprising of two senior cadre Engineers / Scientists of the SPCB / PCC in accordance with the scoring-criteria specified in this document.
- ix. The summary is presented in the following Table G-1 and final lists of Red, Orange, Green and White categories of industries are presented in Tables G-2, G-3, G-4 and G-5 respectively, which are self explanatory.

Table G-1: Final Summary Table Red , Orange, Green and White Categories of Industries (16-01-16)

Sl No.	Original Categorization	Initial Nos.	Addition by Splitting into further classes	Deletion/ Shifting to foot-note due to vague term / Merger / other reasons	Re-categorization to Red	Re-categorization to Orange	Re-categorization to Green	Re-categorization to White	Check
1	Red	85	2	3	4	5	6	7	(1+2) = (3 to 7)
2	Orange	73	2	3	Nil	51	19	2	96=96
3	Green	86	Nil	3+2=5	Nil	6	41	34	75=75
	Final Categorization	244	13	15	60 (Red)	83 (Orange)	63 (Green)	36 (White)	257 =257 (Total categories including in foot-note)

Table G-2 : Final List of Red Category of Industrial Sectors

Sl No.	Orgnl Sl.No	Industry Sector	W1	W2	W	A1	A2	A	H	W+A+H	Revised Category	REMARKS
1.	38	Isolated storage of hazardous chemicals (as per schedule of manufacturing, storage of hazardous chemicals rules ,1989 as amended)									R-R	As per provisions of Rules, to be kept under Red category especially for safety purposes.
2.	4	Automobile Manufacturing (integrated facilities)	30	-	30	20	-	20	10	60	R-R	i. Such types of plants are having either one or combinations of polluting activities viz. washing, metal surface finishing operations, pickling, plating, electro-plating , phosphating, painting , heat treatment etc. ii. Some of such plants may outsource some /all of the polluting activities. In such cases, after thorough inspection of such units by concerned SPCB, re-categorization of the industry shall be made accordingly.
3.	34	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Spent cleared metal catalyst containing copper,, Spent cleared metal catalyst containing zinc,,	30	-	30	20	-	20	10	60	R-R	All the three types of pollutants are expected.
4.	44	Manufacturing of lubricating oils ,grease and petroleum based products	20	-	20	20	-	20	20	60	R-R	Generates all sorts of pollution.
5.	66 E	DG Set of capacity > 5 MVA	-	-	-	20	5	25	-	62.5	R-R	i. Mainly air polluting. ii. DG sets consume the diesel @ 0.21 litres/hr/KVA at full load. iii. Average running is taken @ 12 hrs / day although many of the DG sets run for more than this period.
6.	31	Industrial carbon including electrodes and graphite blocks, activated carbon, carbon black	10	-	-	20	5	25	10	62.5	R-R	Mainly air polluting. Air pollution score is normalized to 100.

7.	39	Lead acid battery manufacturing(excluding assembling and charging of lead-acid battery in micro scale)	10	-	10	25	-	25	10	62.5	R-R	<p>i. Mainly air polluting. Air pollution scores are normalized to 100.</p> <p>ii. Lead Acid Battery manufacturing consists of various stages which broadly involve (after producing or receiving lead oxide): Paste Mixing , Grid Casting , Grid Pasting & Curing , Hydro-setting, parting & enveloping , Stacking, grouping & inter-cell welding, Formation.</p> <p>iii. Exposure of workmen to lead during all or any of the processes outlined above exceeds the prescribed standards if appropriate equipment in this respect is not installed at any Battery Manufacturing Unit.</p> <p>iv. All of the above processes, some more than others, involve release of lead particles or fumes into the environment. Pollution from the above processes can be grouped into two possible types, viz: (a) Lead Oxide becomes airborne and there is Particulate Pollution (b) Fumes are generated and there is Gaseous Pollution</p>
8.	62	Phosphate rock processing plant	30	-	30	20	-	20	-	62.5	R-R	<p>i. The separation of phosphate rock from impurities and non-phosphate materials for use in fertilizer manufacture consists of beneficiation, drying or calcining at some operations, and grinding. Phosphate rock from the mines is first sent to beneficiation units to separate sand and clay and to remove impurities. Steps used in beneficiation depend on the type of rock.</p> <p>ii. The water & air pollution scores are normalized to 100.</p>

9.	66	Power generation plant [except Wind and Solar renewable power plants of all capacities and Mini Hydel power plant of capacity <25MW]	10	-	10	15	10	25	10	62.5	R-R	1. Mainly air polluting. It uses a mixture of biomass (agro based) and coal (< 10 %) as a fuel. Almost, round the year operation. 2. In case of DG sets of 5 MVA & more and emissions of SO ₂ will take place due to use of liquid fuel. Air pollution score will be =20 + 10 = 30, Normalized score will be 75. 3. In case of 'Waste to Energy Plants', water will be used for cooling and air score will be - 30+10 = 40.
10.	34	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Spent catalyst containing nickel, cadmium, Zinc, copper, arsenic, vanadium and cobalt,	30	-	30	25	-	25	10	65	R-R	All the three types of pollutants are expected.
11.	67	Processes involving chlorinated hydrocarbons	30	-	30	20	-	20	15	65	R-R	Chlorinated hydrocarbons are used in the manufacture of insecticides, pesticides and organo chloro pesticides. Effluents & emissions are toxic in nature.
12.	74	Sugar (excluding Khandasari)	20	10	30	15	10	25	10	65	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. Sugar mills generate all sorts of pollution problems.
13.	22	Fibre glass production and processing (excluding moulding)	-	-	-	20	-	20	20	67	R-R	i. The use of styrene in most methods of fiberglass production causes hazardous air pollution that is harmful to breathe at excessive levels. ii. It is mainly air polluting & HW generating industry. The air pollution & HW scores are normalized to 100. iii. In case of lead containing glass, the score of A1 will be 25 and final normalized score will be 75 and shall be categorized as Red.
14.	23	Fire crackers manufacturing and bulk storage facilities	-	-	-	20	-	20	20	67	R-R	i. This is the normalized score based on air pollution & HW generation. ii. Various hazardous chemicals are used in the manufacturing process. iii. These chemicals are namely Potassium Nitrate, Potassium per-chlorate, Barium Nitrate, Aluminium compounds, Copper Chloride etc.

15.	34	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Dismantlers Recycling Plants -- Components of waste electrical and electronic assemblies comprising accumulators and other batteries included on list A, mercury-switches, activated glass cullets from cathode-ray tubes and other activated glass and PCB-capacitors, or any other component contaminated with Schedule 2 constituents (e.g. cadmium, mercury, lead, polychlorinated biphenyl) to an extent that they exhibit hazard characteristics indicated in part C of this Schedule.	-	-	-	30	0	30	10	67	R-R	iv. These chemicals are highly hazardous and cause serious diseases among the workers. especially ability of blood to carry oxygen leading to headaches, methemoglobinemia and kidney problems , skin problems, thyroid metal fume etc. Mainly air polluting and hazardous waste generating. Air & HW pollution scores are jointly normalized to 100.
16.	47	Milk processes and dairy products(integrated project)	20	10	30	20	5	25	-	68.75	R-R	i. Water as well as air polluting due to use of boilers. ii. Water & air pollution scores are normalized to 100.
17.	63	Phosphorous and its compounds	30	-	30	25	-	25	-	68.75	R-R	Water pollution & air pollution containing compounds of phosphorous are expected
18.	61	Pulp & Paper (waste paper based without bleaching process to manufacture Kraft paper)	20	10	30	15	10	25	0	68.75	R-R	Mainly water & air polluting . Water & air pollution scores are normalized to 100.
19.	13	Coke making , liquefaction, coal tar distillation or fuel gas making	30	-	30	20	-	20	20	70	R-R	It is a kind of petrochemical industry.

20.	41	Manufacturing of explosives, detonators, fuses including management and handling activities	30	-	30	20	-	20	20	70	R-R	<p>i. Explosives manufacture and use contribute some measure of hazardous waste to the environment.</p> <p>ii. Nitroglycerin produces several toxic byproducts such as acids, caustics, and oils contaminated with heavy metals. These must be disposed of properly by neutralization or stabilization and transported to a hazardous waste landfill.</p> <p>iii. The use of explosives creates large amounts of dust and particulate from the explosion, and, in some cases, releases asbestos, lead, and other hazardous materials into the atmosphere.</p>
21.	45	Manufacturing of paints varnishes, pigments and intermediate (excluding blending/mixing)	30	-	30	25	-	25	15	70	R-R	<p>i. The process may cause considerable emissions of volatile organic compounds (VOC). VOC contribute to the creation of ozone in the lower layers of the atmosphere (photochemical air pollution) and can present danger to health.</p> <p>ii. Dust and odour may also be a problem.</p> <p>iii. Washing of vessels will contribute waste-waters.</p> <p>iv. Large quantity of HWs are also produced.</p>
22.	56	Organic Chemicals manufacturing	30	-	30	20	-	50	20	70	R-R	Such types of industrial sectors generate all sorts of pollution.
23.	1	Airports and Commercial Air Strips	20	10	30	-	-	-	10	75	R-R	<p>i. The Airports are generating mainly the waste-waters.</p> <p>ii. This is the water pollution normalized score for airports having discharge more than 100 KLD.</p> <p>iii. The airports / strips having discharge less than 100 KLD will have score of 50 and hence orange category.</p> <p>iv. If the score is normalized wrt water + HW both, then all the airports will come under Orange category (score - 58.33).</p>
24.	3	Asbestos and asbestos based industries	-	-	-	30	-	30	10	75	R-R	<p>i. This is mainly air polluting industry.</p> <p>ii. Final score is based on air pollution score only.</p> <p>iii. Asbestos is carcinogenic and banned in many countries.</p>
25.	5	Basic chemicals and electro chemicals and its derivatives including manufacturing of acid	30	-	30	-	-	-	10	75	R-R	<p>i. Standards prescribed for Inorganic Chemicals are adopted.</p> <p>ii. It is mainly water polluting industry having effluents which are toxic and not easily biodegradable.</p>

26.	7	Cement	-	-	20	10	30	-	75	R-R	<p>iii. Water pollution score normalized to 100 is undertaken.</p> <p>iv. The earlier Red category industrial sector namely "Hydrocyanic acid and its derivatives" is also merged under this industrial sector.</p> <p>This is mainly air polluting industry & hence normalized air pollution score.</p>
27.	9	Chlorates, per-chlorates & peroxides	30	-	-	-	-	-	75	R-R	<p>i. It is mainly water polluting industry having effluents which are toxic and not easily biodegradable.</p> <p>ii. Water pollution score normalized to 100 is undertaken.</p>
28.	10	Chlorine, fluorine, bromine, iodine and their compounds	30	-	-	-	-	-	75	R-R	<p>i. It is mainly water polluting industry having effluents which are toxic and not easily biodegradable.</p> <p>ii. Water pollution score normalized to 100 is undertaken.</p>
29.	16	Dyes and Dye- Intermediates	30	-	20	5	25	20	75	R-R	<p>i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'.</p> <p>ii. Such types of industrial sectors generate all sorts of pollution.</p>
30.	26	Health-care Establishment (as defined in BMW Rules)	20	10	-	-	-	-	75	R-R	<p>i. Mainly water polluting.</p> <p>ii. The water pollution score is normalized to 100 & valid for Hospitals having total waste-water generation > 100 KLD.</p> <p>iii. The hospitals with incinerator will be categorized as Red irrespective of the quantity of the waste-water generation.</p> <p>iv. The hospitals having total waste-water generation less than 100 KLD and without incinerator, the normalized water pollution score will be 50 and will be categorized as Orange category.</p>
31.	29	Hotels having overall waste-water generation @ 100 KLD and more.	20	10	15	-	15	-	75	R-R	<p>i. Mainly water polluting. Small boiler may be installed.</p> <p>ii. The water pollution score is normalized to 100 & valid for Hotels having waste-water generation > 100 KLD.</p> <p>iii. The hotels having more than 20 rooms and waste-water generation less than 100 KLD and having a coal / oil fired boiler, the pollution score will be 35/40 & are categorized as Orange.</p> <p>iv. The hotels having more than 20 rooms and waste-water generation less than 10 KLD and</p>

32.	34	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Lead acid battery plates and other lead scrap/ashes/residues not covered under Batteries (Management and Handling) Rules, 2001. [* Battery scrap, namely: Lead battery plates covered by ISRI, Code word "Rails" Battery lugs covered by ISRI, Code word "Rakes". Scrap drained/dry while intact, lead batteries covered by ISRI, Code word "rains".	30	-	30	25	-	25	20	75	R-R	All the three types of pollutants are generated.	having no-boiler & no hazardous waste generation, the pollution score will be 20 & are categorized as Green.
33.	34	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Integrated Recycling Plants -- Components of waste electrical and electronic assemblies comprising accumulators and other batteries included on list A, mercury-switches, activated glass cullets from cathode-ray tubes and other activated glass and PCB-capacitors, or any other component contaminated with Schedule 2 constituents (e.g. cadmium, mercury, lead, polychlorinated biphenyl) to an extent that they exhibit hazard characteristics indicated in part C of this Schedule.	30	-	30	25	-	25	20	75	R-R	All the three types of pollutants are expected.	
34.	43	Manufacturing of glue and gelatin	30	10	40	20	-	20	-	75	R-R	Highly water polluting & obnoxious air polluting.	
35.	49	Mining and ore beneficiation	30	10	40	15	5	20	-	75	R-R	Both air and water polluting. Score is normalized with air & water pollution.	

36.	52	Nuclear power plant	10	-	10	30	-	30	15	75	R-R	i. Mainly air polluting due to indinerator. Others - cooling water. ii. Air pollution score is normalized to 100.
37.	58	Pesticides (technical) (excluding formulation)	30	-	30	25	-	25	20	75	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. Such types of industrial sectors generate all sorts of pollution.
38.	64	Photographic film and its chemicals	30	-	30	-	-	-	-	75	R-R	i. Silver salts and other chemicals are used in preparation. Slight quantity of effluents is generated. ii. Water pollution scores are normalized to 100.
39.	68	Railway locomotive work shop/Integrated road transport workshop/Authorized service centers	20	10	30	-	-	-	10	75	R-R	i. Mainly water polluting industry. Water is used in the washing of locomotives, road transport vehicles during servicing. ii. This score is valid for those Centers having discharge more than 100 KLD. iii. Service Centers having waste-water generation < 100 KLD, the normalized score will be $= (100*20)/40= 50$.
40.	84	Yarn / Textile processing involving any effluent/emission generating processes including bleaching, dyeing, printing and colouring	30	10	40	15	-	15	20	75	R-R	In this sector all sorts of pollution are generated.
41.	8	Chlor Alkali	30	10	40	20	10	30	10	80	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. Chlor-alkali units are having different section like NaOH, Cl ₂ , SBP etc which are having toxic effluents. Additionally, fuel consumption is also on higher-side.
42.	70	Ship Breaking Industries	30	-	30	30	-	30	20	80	R-R	i. The ship-breaking industry creates numerous hazards for the coastal and marine environment. ii. Ship-breaking releases a large number of dangerous pollutants, including toxic waste, oil, poly-chlorinated biphenyls, and heavy metals, into the waters and sea bed. iii. While most of the oil is removed before a ship is scrapped, sand used to mop up the remaining oil is thrown into the sea. High concentrations of oil and grease are then found in the coastal waters, choking marine life.

43.	53	Oil and gas extraction including CBM (offshore & on-shore extraction through drilling wells)	30	-	30	-	-	-	20	83	R-R	iv. Solid waste strewn on the shore, 45 tonnes on any given day according to a study by the Central Pollution Control Board, also finds its way into the sea. v. Adding to the stress on coastal waters, the organic load from the thousands of workers living in cramped conditions with little or no sanitary facilities results in unacceptably high levels of BOD. i. Mainly water polluting & hazardous waste generating. ii. The water pollution & HW generation scores are normalized to 100.
44.	36	Industry or process involving metal surface treatment or process such as pickling/ electroplating/paint stripping/ heat treatment using cyanide bath/ phosphating or finishing and anodizing / enamellings/ galvanizing	30	-	30	-	-	-	20	83	R-R	Mainly water polluting & toxic hazardous waste generating industry. Scores are normalized to 100.
45.	80	Tanneries	30	-	30	-	-	-	20	83	R-R	Mainly water polluting & hazardous waste generating industry. Scores are normalized to 100.
46.	65	Ports and harbour, jetties and dredging operations	30	10	40	15	10	25	20	85	R-R	This category contain all sorts of pollution.
47.	77	Synthetic fibers including rayon tyre cord, polyester filament yarn	30	10	40	25	10	35	10	85	R-R	This sector generates all sorts of pollution problems.
48.	81	Thermal Power Plants	30	10	40	20	10	30	15	85	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. TPP generate all sorts of pollution problems.
49.	71	Slaughter house (as per notification S.O.270(E)dated 26.03.2001)and meat processing industries, bone mill, processing of animal horn, hoofs and other body parts	25	10	35	-	-	-	-	87.5	R-R	Mainly water polluting and obnoxious odour generating industry. The water pollution score is normalized to 100
50.	2	Aluminium Smelter	30	10	40	20	10	30	20	90	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. This sector is generating all sorts of pollution i.e. air, water and HW.
51.	12	Copper Smelter	30	10	40	20	10	30	20	90	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. Integrated Copper Smelters contain all sorts of

52.	20	Fertilizer (basic) (excluding formulation)	30	10	40	20	10	30	20	90	R-R	pollution. i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. Generates all sorts of pollution.
53.	37	Iron & Steel (involving processing from ore/ integrated steel plants) and or Sponge Iron units	30	10	40	20	10	30	20	90	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. Such types of industrial sectors generate all sorts of pollution.
54.	61	Pulp & Paper (waste paper based units with bleaching process to manufacture writing & printing paper)	25	10	35	25	10	35	20	90	R-R	Waste paper based Pulp & Paper mills with bleaching process generate all sorts of pollution.
55.	85	Zinc Smelter	30	10	40	20	10	30	20	90	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. Integrated Zinc smelter generates all sorts of pollution problems.
56.	55	Oil Refinery (mineral Oil or Petro Refineries)	30	10	40	25	10	35	20	95	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. Such types of industrial sectors generate all sorts of pollution.
57.	59	Petrochemicals Manufacturing (including processing of Emulsions of oil and water)	30	10	40	25	10	35	20	95	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. Such types of industrial sectors generate all sorts of pollution. iii. The earlier red category industrial sector namely 'Processing of Emulsions of Oil & Water " is merged with this industrial sector.
58.	60	Pharmaceuticals	30	10	40	30	5	35	20	95	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. Such types of industrial sectors generate all sorts of pollution.
59.	61	Pulp & Paper (Large-Agro + Small Pulp & Paper (agro based-wheat straw/rice husk)	30	10	40	25	10	35	20	95	R-R	i. This industrial sector is the one among the '17 categories of Highly Polluting Industries'. ii. Large /Small Agro based Pulp & Paper mills contribute all sorts of pollution problems.
60.	15	Distillery (molasses / grain / yeast based)	30	10	40	-	-	-	-	100	R-R	Mainly water polluting industry. Final score is the normalized water pollution score.

Note :

i. Under the column Revised Category, the full forms of the abbreviations are as follows :

- a. R-R means original category was Red and revised category is also Red
- b. R-O means original category was Red and revised category is Orange
- c. O-O means original category was Orange and revised category is also Orange
- d. O-G means original category was Orange and revised category is Green
- e. O-W means original category was Orange and revised category is White
- f. G-O means original category was Green and revised category is Orange
- g. G-G means original category was Green and revised category is also Green
- h. G-W means original category was Green and revised category is White

ii. There are specific remarks in respect of some of the industrial sectors. These sectors are either merged with other relevant sectors or deleted due to duplication. The overall details are as follows :

Sl No.	Original Sl No.	Industry Sector	Original Category	Remarks
1	14	Common treatment and disposal facilities (CETP, TSDF, E-waste recycling, CBMWTF, effluent conveyance project, incinerator, solvent/acid recovery plant, MSW sanitary land fill site)	R	i. All such facilities are classified as Red but special category projects as these are parts of pollution control facilities. ii. In case of CETP, the categorization will depend upon the category of member industries being served.
2	18	Processing of Emulsions of Oil & Water		It is a part of Petrochemical industries. Transferred and merged with the industrial sector namely 'Petrochemicals' at Sl. No. 54.
3	27	Heavy engineering including ship building (with investment on Plant & Machineries more than Rs 10 crores)	R	Most of the pollution generating processes / operations under this category are similar to the industry category namely "Automobile Manufacturing (integrated facilities)" at Sl. No. 1 and may be referred accordingly.
4	30	Hydrocyanic acid and its derivatives	R	Have been merged with the red category industrial sector namely "Basic chemicals and electro chemicals and its derivatives including manufacturing of acid" at Sl. No. 24
5	32	Industrial estates/parks / complexes/ areas/ export processing zones/ SEZs/ Biotech parks/ leather complex	R	The classification will depend upon the category(ies) of the industries operating / proposed to be permitted in the area. In this context, guidelines prescribed in EIA Notification, 2006 shall be followed.
6	33	Industrial inorganic gases namely- a) Chemical gas- Acetylene, hydrogen, chlorine, fluorine, ammonia, sulphur dioxide, ethylene, hydrogen-sulphide, phosphine b) Hydrocarbon gases- Methane, ethane, propane	R	These gases are generally secondary products and produced alongwith other main products. To be classified as per the main parent plant.
7	69	Reprocessing of used oils & waste oils	R	i. The industry generates mainly the air pollution and oil bearing hazardous wastes. The normalized (air pollution & HW generation score is 58.33). ii. To be deleted as already covered under HW Recyclers / Re-processors (Used oils / Waste Oils) under Orange Category

Table G-3 : Final List of Orange Category of Industrial Sectors

Final Sl. No.	Orgnl S.No	Industry Sector	W1	W2	W	A1	A2	A	H	W+A+H	Revised category	Remarks
1.	20	Dismantling of rolling stocks (wagons/ coaches)	--	--	--	15	--	15	10	41.67	O-O	Emissions of dust and generation of waste oils take place during dismantling. Air pollution & HW generation scores (15+10=25) are normalized to 100.
2.	5	Bakery and confectionery units with production capacity > 1 TPD. (With ovens / furnaces)	20	--	20	15	--	15	--	43.75	O-O	
3.	10	Chanachur and laddoo from puffed and beaten rice(muri and shira) using husk fired oven	20	--	20	15	--	15	--	43.75	O-O	Normal water and air polluting.
4.	23	Coated electrode manufacturing	15	0	15	20	0	20	0	43.75	G-O	Preparation of core wire / rod, preparation of dry mix, preparation of wet mix, application of coating by extrusion, baking of coated electrodes
5.	24	Compact disc computer floppy and cassette manufacturing / Reel manufacturing	15	0	15	20	0	20	0	43.75	G-O	Generates waste-water and process emissions.
6.	24	Flakes from rejected PET bottle	20	-	20	15	-	15	-	43.75	R-O	Normal water & air pollutions are generated.
7.	30	Food and food processing including fruits and vegetable processing	20	--	20	15	--	15	--	43.75	O-O	Normal water and air polluting.
8.	40	Jute processing without dyeing	20	--	20	15	--	15	--	43.75	O-O	CPCB has notified standards for this category. Both air and water pollutions are generated.
9.	56	Manufacturing of silica gel	15	0	15	20	0	20	0	43.75	G-O	Waste-waters containing TDS and emissions of H ₂ SO ₄ are generated.

10.	45	Manufacturing of tooth powder, toothpaste, talcum powder and other cosmetic items	20	--	20	15	20	15	--	15	--	15	--	43.75	O-O	Both air and water pollution are generated.
11.	55	Printing or etching of glass sheet using hydrofluoric acid	15	--	15	20	15	20	--	20	--	20	--	43.75	O-O	Both air and water pollution are generated.
12.	65	Silk screen printing, sari printing by wooden blocks	20	--	20	15	20	15	--	20	--	20	--	43.75	O-O	Wash-water and PM emissions from boilers .
13.	76	Synthetic detergents and soaps(excluding formulation)	20	-	20	15	20	15	-	20	-	15	-	43.75	R-O	i. This is the score for units having generation of waste-waters less than 100 KLD. ii. The units having waste-water generation more than 100 KLD will become mainly water polluting and accordingly normalized water pollution score will be 75 and be categorized as Red.
14.	71	Thermometer manufacturing	15	--	15	20	15	20	--	20	--	20	--	43.75	O-O	Process - making glass bulb, forming reservoir in the glass tube for fluid, inserting fluid, scale marking. Use of fuel to heat the glass tubes and hydrofluoric acid to seal the spents acids are generated.
15.	14	Cotton spinning and weaving (medium and large scale)	--	--	--	15	--	15	--	37.5	10	47.5	O-O	47.5	O-O	Mainly air polluting industry. Sources of air pollution (PM) are the fine particles of cotton from spinning process. Air pollution score is normalized to 100.
16.	1	Almirah, Grill Manufacturing (Dry Mechanical Process)	--	--	--	20	--	20	--	20	--	50	O-O	50	O-O	Air pollution due to spray painting (emissions of VOCs). Units without painting operations shall be categorized as White.

17.	2	Aluminium & copper extraction from scrap using oil fired furnace (dry process only)	--	--	--	20	--	20	--	20	10	50	O-O	i. Normalized Air pollution score. ii. Significant air pollution due to melting (emissions of SO ₂ , PM).
18.	3	Automobile servicing, repairing and painting (excluding only fuel dispensing)	20	--	20	20	--	20	20	20	10	50	O-O	Normal water & air polluting and recyclable waste oil generating. If the waste water generation is more than 100 KLD, it will become mainly water polluting and Red category unit.
19.	4	Ayurvedic and homeopathic medicine	20	--	20	15	--	15	15	50	O-O			
20.	7	Brickfields (excluding fly ash brick manufacturing using lime process)	--	--	--	20	--	20	20	50	O-O			Significantly air polluting.
21.	8	Building and construction project more than 20,000 sq. m built up area	20	--	20	20	--	20	20	50	O-O			1. In the pre-construction stage, it is mainly air polluting due to generation of dust (PM) emissions. 2. After construction, it is mainly water polluting. If the discharge is more than 100 KLD, it will be having the normalized score of 75 and be categorized as Red.
22.	6	Ceramics and Refractories	-	-	-	20	-	20	-	50	R-O			i. Mainly air polluting industry. ii. This score is for the units having coal consumption < than 12 MT/day. iii. For the units having coal consumption > 12 MT /day, the normalized air pollution score will be 62.5 and shall be categorized as Red.

23.	11	Coal washeries	15	10	25	15	-	15	-	50	R-O	i. Wet washeries are mainly water polluting industry generating effluents which are having inorganic SS & TDS. Additionally, air pollution due to PM emissions is also generated. ii. Water & air pollution scores are jointly normalized to 100.
24.	16	Dairy and dairy products (small scale)	20	--	20	20	--	20	--	50	O-O	Water and air polluting both.
25.	18	DG set of capacity >1MVA but < 5MVA	--	--	--	20	--	20	--	50	O-O	Mainly air polluting . air pollution score is normalized to 100.
26.	17	Dry coal processing, mineral processing, industries involving ore sintering, pelletisating, grinding & pulverization	-	-	-	20	-	20	-	50	R-O	Mainly air polluting industry. Final score is the normalized air pollution score.
27.	19	Fermentation industry including manufacture of yeast, beer, distillation of alcohol (Extra Neutral Alcohol)	20	-	20	-	-	-	-	50	R-O	i. Mainly water polluting industry. This is the normalized water pollution score for units having discharge < 100 KLD. ii. For the units having discharge > 100 KLD, the normalized water pollution score will be 75 and shall be accordingly categorized as Red.
28.	21	Ferrous and Non-ferrous metal extraction involving different furnaces through melting, refining, re-processing, casting and alloy-making	-	-	-	15	5	20	10	50	R-O	i. Mainly air polluting. ii. This score is applicable to secondary production of ferrous & non-ferrous metals (excluding lead) up-to 1 MT/hour production.

												iii.	For lead, the normalized air pollution score will be $= (100*25)/40= 62.5$ and is categorized as Red.
												iv.	For Induction Furnace clubbed with AOD furnace - separate calculation shall be made based on the capacity of the furnaces. In such industries, the molten metal from induction furnace is transferred to AOD furnace where other metals like manganese and nickel are added to get the metal of desired constituents. The lime and silicon are also added for reduction of the metal oxides to the base metal. the normalized air pollution score will be $= (100*25)/40= 62.5$ and is categorized as Red.
29.	26	Fertilizer (granulation / formulation / blending only)	--	--	20	--	--	20	--	50	O-O		Air polluting.
30.	27	Fish feed, poultry feed and cattle feed	--	--	20	--	--	20	--	50	O-O		Obnoxious odour , H2S etc. AP score is normalized to 100
31.	28	Fish processing and packing (excluding chilling of fishes)	20	--	--	20	--	--	--	50	O-O		Mainly water polluting. W/P score is normalized to 100.

32.	31	Forging of ferrous and non-ferrous metals (using oil and gas fired furnaces)	--	--	--	20	--	20	--	50	O-O	Heating furnace. Mainly air polluting.
33.	32	Formulation/pelletization of camphor tablets, naphthalene balls from camphor/ naphthalene powders.	--	--	20	20	--	20	20	50	O-O	Mainly air polluting. Emissions of Benzene, HC are expected.
34.	33	Glass ceramics, earthen potteries and tile manufacturing using oil and gas fired kilns, coating on glasses using cerium fluorides and magnesium fluoride etc.	--	--	20	20	--	20	20	50	O-O	Mainly air polluting. Emissions of SO2 are expected.
35.	35	Gravure printing, digital printing on flex, vinyl	20	--	20	20	--	20	20	50	O-O	Waste waters , emissions of VOCs
36.	36	Heat treatment using oil fired furnace (without cyaniding)	--	--	20	20	--	20	20	50	O-O	Mainly air polluting and noise generating. AP Score is normalized to 100.
37.	28	Hot mix plants	-	-	20	20	-	20	20	50	R-O	Mainly air polluting. Air pollution scores are normalized to 100.
38.	37	Hotels (< 3 star) or hotels having > 20 rooms and less than 100 rooms.	20	--	20	20	--	20	20	50	O-O	Mainly water polluting. WP score is normalized to 100.
39.	38	Ice cream	20	--	20	20	--	20	20	50	O-O	Wash-water and boilers / oven for pasteurization.
40.	34	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Paint and ink Sludge/residues	-	-	20	20	0	20	20	50	R-O	Mainly air polluting. Air pollution score is normalized to 100
41.	34	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Brass Dross " Copper Dross" " Copper Oxide Mill Scale" " Copper Reverts, Cake & Residues" " Waste Copper and copper alloys in	10	-	10	20	-	20	20	50	R-O	Mainly air polluting.

45.	42	Manufacturing of glass	10	-	-	20	-	20	-	20	-	50	R-O	<p>i. Mainly air polluting (melting at 1500°C and refining .</p> <p>ii. In case of lead glass , the score of A1 will be 25 and accordingly the normalized scores will be 62.5 i.e. Red .</p>
46.	43	Manufacturing of iodized salt from crude/ raw salt	12	--	12	20	--	20	20	20	--	50	O-O	Boiling in Evaporators (multiple effect evaporators), centrifuging, iodization with KIO3 mixing . Mainly air polluting. Air pollution score is normalized to 100.
47.	42	Manufacturing of mirror from sheet glass	--	--	--	20	--	20	20	20	--	50	O-O	Evaporator & furnace for heating the metal to be applied as reflector on mirror. Mainly air polluting.
48.	44	Manufacturing of mosquito repellent coil	--	--	--	20	--	20	20	20	--	50	O-O	Mainly air polluting. Toxic fumes are expected.
49.	46	Manufacturing of Starch/Sago	25	-	25	15	-	15	15	15	-	50	R-O	<p>i. Water and air polluting industry. Boiler is used for steam generation.</p> <p>ii. Water & air pollution scores are normalized to 100</p>
50.	46	Mechanized laundry using oil fired boiler	20	--	20	20	--	20	20	20	--	50	O-O	Both air and water pollution are generated.
51.	47	Modular wooden furniture from particle board, MDF<swan timber etc, Ceiling tiles/ partition board from saw dust, wood chips etc., and other agricultural waste using synthetic adhesive resin, wooden box making (With boiler)	--	--	--	20	--	20	20	20	--	50	O-O	1. Mainly air polluting. Boiler as well as VOCs from use of adhesives. 2. Without boiler, it will be a Green category industry.
52.	50	New highway construction project	-	-	-	20	-	20	20	20	-	50	R-O	Mainly air polluting project.

53.	51	Non-alcoholic beverages(soft drink) & bottling of alcohol/non alcoholic products	20	-	20	15	5	20	-	50	R-O	i. Both air and water polluting. Score is normalized with air & water pollution. This score is valid for industries having waste-water generation <100 KLD. ii. For the units having waste-water generation > 100 KLD the , normalized score would be 62.5 and categorized as Red.
54.	49	Paint blending and mixing (Ball mill)	20	--	20	20	--	20	10	50	O-O	Both air and water pollution are generated.
55.	62	Paints and varnishes (mixing and blending)	20	0	0	20	0	20	0	50	G-O	Waste-waters as well as fumes of VOCs due to solvents, pigments, varnishes.
56.	51	Ply-board manufacturing(including Veneer and laminate) with oil fired boiler/ thermic fluid heater(without resin plant)	0	--	0	20	--	20	--	50	O-O	Mainly air polluting because of use of boiler. AP score is normalized to 100
57.	52	Potable alcohol (IMFL) by blending, bottling of alcohol products	20	--	20	--	--	--	--	50	O-O	Mainly water polluting. WP score is normalized to 100.
58.	54	Printing ink manufacturing	20	--	20	20	--	20	--	50	O-O	1. Pigments, binders and solvents are used. 2. Boiler is also used. 3. Emissions of VOCs take place.
59.	70	Printing press	20	0	20	20	0	20	0	50	G-O	Colored waste-waters containing dyes and VOC emissions are generated.
60.	59	Reprocessing of waste plastic including PVC	20	--	20	20	--	20	--	50	O-O	Large quantities of wash-water and fugitive emissions are generated.
61.	61	Rolling mill (oil or coal fired) and cold rolling mill	10	--	10	20	--	20	--	50	O-O	Mainly air polluting. Air pollution score is normalized to 100. Others - cooling water and recyclable waste oils etc. are generated.
62.	67	Spray painting, paint baking, paint shipping	--	--	--	20	--	20	10	50	O-O	Mainly air polluting. Emissions of VOCs and HC are generated.

63.	72	Steel and steel products using various furnaces like blast furnace /open hearth furnace/induction furnace/arc furnace/submerged arc furnace / basic oxygen furnace /hot rolling reheated furnace	10	-	10	20	-	20	0	20	0	20	10	50	R-O	i. Mainly air polluting. In the emissions, oxides of manganese, nickel etc. are also present. ii. Air pollution score is normalized to 100.
64.	73	Stone crushers	-	-	20	20	-	20	0	20	0	20	-	50	R-O	Mainly air polluting. Air pollution score is normalized to 100.
65.	75	Surgical and medical products including prophylactics and latex	20	-	20	20	-	20	0	20	0	20	-	50	R-O	Both air as well as water polluting. Air and water pollution scores are normalized to 100.
66.	85	Tephlon based products	0	0	0	20	0	20	0	20	0	20	0	50	G-O	Due to spraying applications, emissions (HC) are generated
67.	70	Thermocol manufacturing (with boiler)	--	--	20	20	--	20	--	20	--	20	--	50	O-O	Polystyrene is heated. Mainly air polluting with boiler.
68.	82	Tobacco products including cigarettes and tobacco/opium processes	20	-	20	20	-	20	-	20	-	20	-	50	R-O	Such industries generate both air as well as water pollution. These scores are normalized to 100.
69.	72	Transformer repairing/ manufacturing (dry process only)	--	--	20	20	--	20	--	20	--	20	10	50	O-O	Mainly air polluting because of ovens, shot-blasting etc.
70.	73	Tyres and tubes vulcanization/ hot retreating	10	--	10	20	--	20	--	20	--	20	--	50	O-O	Mainly air polluting. Emissions of PM, VOCs and obnoxious odour are generated.
71.	83	Vegetable oil manufacturing including solvent extraction and refinery/hydrogenated oils	20	-	20	15	5	20	10	20	10	20	10	50	R-O	i. All sorts of pollution are generated. ii. This score is valid for plants having waste-water generation < 100 KLD. iii. If the waste-water generation is more than 100 KLD, the unit shall be classified as Red.
72.	74	Wire drawing and wire netting	20	--	20	--	--	--	--	--	--	--	--	50	O-O	Mainly water polluting. WP score is normalized to 100.

73.	21	Dry cell battery (excluding manufacturing of electrodes) and assembling & charging of a lead battery on micro scale	30	--	30	15	--	15	10	55	O-O	Water and air polluting both.
74.	50	Pharmaceutical formulation and for R & D purpose (For sustained release/ extended release of drugs only and not for commercial purpose)	20	--	20	20	--	20	15	55	O-O	i. All sorts of pollution are generated. ii. R&D activities are to be shifted to Red category.
75.	78	Synthetic resins	20	-	20	20	-	20	15	55	R-O	All sorts of pollution are generated.
76.	79	Synthetic rubber excluding molding	20	-	20	20	-	20	15	55	R-O	i. Most synthetic rubber is created from two materials, styrene and butadiene. Both are currently obtained from petroleum. ii. Process is similar to a part of Petrochemical plants.
77.	9	Cashew nut processing	25	--	25	20	--	20	--	56	O-O	Normal water and air polluting.
78.	12	Coffee seed processing	25	--	25	20	--	20	--	56	O-O	Normal water & air polluting industry.
79.	57	Parboiled Rice Mills	25	-	25	20	-	20	-	56	R-O	i. Rice Mills are generating both air and water pollution. Wastewaters are having high strength in respect of BOD. ii. This is the normalized air & water pollution score for units having waste-water generation < 100 KLD and fuel consumption less than 12 MTD. iii. For units having waste-water generation > 100 KLD or fuel consumption > 12 MTD or both, the unit shall be classified as Red.

80.	29	Foam manufacturing	--	--	20	--	20	15	58	O-O	i. Raw material is polyurethane, latex etc. ii. Emissions of VOCs and HAPs. CH3Cl2 and similar compounds as blowing agents. iii. Outdated raw materials and spoiled slots are discarded as HW.
81.	34	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Used Oil - As per specifications prescribed from time to time.	10	0	20	10	20	15	58.33	R-O	Mainly air polluting and hazardous waste generating industry. Air pollution & HW scores are normalized to 100
82.	34	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste under schedule iv of HW(M, H& TBM) rules, 2008 - Items namely - Waste Oil ---As per specifications prescribed from time to time.	-	-	20	-	20	15	58.33	R-O	Mainly air polluting and hazardous waste generating industry. Air pollution & HW scores are normalized to 100.
83.	56	Producer gas plant using conventional up drift coal gasification (linked to rolling mills glass and ceramic industry refectories for dedicated fuel supply)	--	--	20	--	20	15	58.33	O-O	Mainly air polluting & tar (HW) generating. SO2, CO, NOx are generated. Tar is the by-product and utilized by other industries in co-processing.

Note :

i. Under the column Revised Category, the full forms of the abbreviations are as follows :

- R-R means original category was Red and revised category is also Red
- R-O means original category was Red and revised category is Orange
- O-O means original category was Orange and revised category is also Orange
- O-G means original category was Orange and revised category is Green
- O-W means original category was Orange and revised category is White
- G-O means original category was Green and revised category is Orange
- G-G means original category was Green and revised category is also Green
- G-W means original category was Green and revised category is White

- ii. There are specific remarks in respect of some of the industrial sectors. These sectors are either merged with other relevant sectors or deleted due to duplication / vague category. The overall details are as follows:

Sl No.	Original SI No.	Industry Sector	Original Category	Remarks
1	24	Excavation of sand from the river bed (excluding manual excavation)	0	Since such types of activities cause ecological disturbances, the instructions issued by the government from time to time be followed. To be categorized by MoEF&CC.
2	39	Infrastructure Development Project	0	Vast variety of such projects come under such category. This is to be decided by the concerned SPCB in line of EIA Notification, 2006.
3	53	Power press	0	Very vague term hence deleted. Such types of general engineering units have already been covered.

Table G-4 : Final List of Green Category of Industrial Sectors

Sl. No.	Orgnl Sl.No.	Industry Sector	W1	W2	W	A1	A2	A	H	W+A+H	Revised Category	Remarks
1.	2	Aluminium utensils from aluminium circles by pressing only (dry mechanical operation)	-	-	--	10	--	10	--	25	G-G	Minor air pollution due to some fugitive PM emissions from buffing operations.
2.	6	Ayurvedic and homeopathic medicines (without boiler)	10	-	10	--	--	-	--	25	G-G	Small quantities of waste-waters are generated from washing operations.
3.	8	Bakery /confectionery /sweets products (with production capacity <1tpd (with gas or electrical oven)	10	-	10	--	--	-	--	25	G-G	Small quantities of waste-waters are generated from washing operations.
4.	6	Bi-axially oriented PP film along with metalizing operations	10	-	10	--	--	-	--	25	O-G	Mainly extrusion process involving water recirculation
5.	10	Biomass briquettes (sun drying) without using toxic hazardous wastes	-	-	--	10	--	10	--	25	G-G	Minor air pollution due to some fugitive PM emissions from pulverization / mixing operations.
6.	13	Blending of melamine resins & different powder, additives by physical mixing	-	-	--	10	--	10	--	25	G-G	Minor air pollution due to some fugitive PM emissions from pulverization / mixing operations.
7.	15	Brass and bell metal utensils from mechanical operation without re-rolling facility)	-	-	--	10	--	10	--	25	G-G	Minor air pollution due to some fugitive PM emissions from buffing operations.
8.	16	Candy	10	-	10	--	--	10	--	25	G-G	Small quantities of waste-water and minor

9.	17	Cardboard or corrugated box and paper products (excluding paper or pulp manufacturing and without using boilers)	-	-	-	-	10	--	10	--	25	G-G	PM emissions are generated. This score is valid with Small gas / electricity operated oven / furnace for making glue.
10.	18	Carpentry & wooden furniture manufacturing (excluding saw mill) with the help of electrical (motorized) machines such as electrical wood planner, steel saw cutting circular blade, etc.	-	-	-	10	10	--	10	--	25	G-G	Minor air pollution due to some fugitive PM emissions from cutting operations.
11.	19	Cement products (without using asbestos / boiler / steam curing) like pipe ,pillar, jafri, well ring, block/tiles etc.(should be done in closed covered shed to control fugitive emissions)	-	-	-	10	10	--	10	--	25	G-G	Minor air pollution due to some fugitive PM emissions from mixing operations.
12.	20	Ceramic colour manufacturing by mixing & blending only (not using boiler and wastewater recycling process)	-	-	-	10	10	--	10	--	25	G-G	Minor air pollution due to some fugitive PM emissions.
13.	11	Chilling plant, cold storage and ice making	10	-	-	10	--	--	-	--	25	O-G	Cooling water recirculation only.
14.	13	Coke briquetting (sun drying)	-	-	-	10	10	--	10	--	25	O-G	Mainly air polluting industry. Sources of air pollution (PM) are pulverizes and mixers. Air pollution score is normalized to 100.
15.	28	Cotton spinning and weaving (small scale)	-	-	-	10	10	--	10	--	25	G-G	Minor PM emissions from spinning process.
16.	17	Dal Mills	-	-	-	10	10	--	10	--	25	O-G	Some fugitive emissions of PM.

17.	29	Decoration of ceramic cups and plates by electric furnace	-	-	-	-	10	--	10	--	25	G-G	Fumes of enamels. Minor air pollution.
18.	19	Digital printing on PVC clothes	-	-	-	10	10	--	10	--	25	O-G	Minor emissions / odour generations are expected.
19.	25	Facility of handling, storage and transportation of food grains in bulk	-	-	-	10	10	--	10	--	25	O-G	Some fugitive emissions of PM during handling of grains.
20.	36	Flour mills (dry process)	-	-	-	10	10	--	10	--	25	G-G	Fugitive dust emissions.
21.	41	Glass , ceramic, earthen potteries, tile and tile manufacturing using electrical kiln or not involving fossil fuel kiln	-	-	-	10	10	--	10	--	25	G-G	Minor fugitive emissions only.
22.	34	Glue from starch (physical mixing) with gas / electrically operated oven /boiler.	-	-	-	10	10	--	10	--	25	O-G	Some fugitive emissions of PM during mixing of raw materials.
23.	42	Gold and silver smithy (purification with acid smelting operation and sulphuric acid polishing operation) (using less or equal to 1 litre of sulphuric acid/ nitric acid per month)	-	-	-	10	10	--	10	--	25	G-G	Minor fumes from cleaning process.
24.	36	Heat treatment with any of the new technology like ultrasound probe , induction hardening , ionization beam, gas carburizing etc.	10	-	-	10	10	10	10	--	25	O-G	<ul style="list-style-type: none"> Cooling waters and minor heat fumes. Finalization of categorization subject to field verification.
25.	46	Insulation and other coated papers (excluding paper or pipe manufacturing)	-	-	-	10	10	--	10	--	25	G-G	Minor fumes due to application of polyurethane
26.	49	Leather foot wear and leather products (excluding tanning and hide processing except cottage scale)	-	-	-	10	10	--	10	--	25	G-G	Minor fumes due to use of adhesives / gums.

27.	50	Lubricating oil, greases or petroleum based products (only blending at normal temperature)	-	-	-	-	10	--	10	--	10	10	--	25	G-G	Minor fumes at the time of transfers from one container to other.
28.	54	Manufacturing of pasted veneers using gas fired boiler or thermic fluid heater and by sun drying	-	-	-	-	10	--	10	--	10	10	--	25	G-G	1. Minor fumes due to application of gums / adhesives / pastes etc. 2. This score is valid only for gas fired boiler.3. The units having coal fired boilers shall be categorized as Orange.
29.	59	Oil mill Ghani and extraction (no hydrogenation / refining)	10	-	-	10	--	--	--	--	--	--	25	G-G	Small quantities of floor washings & equipments washings are generated.	
30.	48	Packing materials manufacturing from non asbestos fibre, vegetable fibre yarn	-	-	-	-	10	--	10	--	10	10	--	25	O-G	Some fugitive emissions of PM are expected.
31.	65	Phenyl/toilet cleaner formulation and bottling	-	-	-	-	10	--	10	--	10	10	--	25	G-G	Minor fumes of VOCs in the work zone
32.	67	Polythene and plastic processed products manufacturing (virgin plastic)	10	-	-	10	--	10	10	--	10	10	--	25	G-G	Cooling water & emissions due to mixing of raw materials.
33.	68	Poultry, Hatchery and Piggery	-	-	-	-	10	--	10	--	10	10	--	25	G-G	Obnoxious odour containing H ₂ S, CH ₄ etc. and fugitive PM emissions
34.	69	Power looms (without dye and bleaching)	-	-	-	-	10	--	10	--	10	10	--	25	G-G	Minor emissions of PM.
35.	71	Puffed rice (muri) (using gas or electrical heating system)	-	-	-	-	10	--	10	--	10	10	--	25	G-G	Minor emissions of PM.
36.	57	Pulverization of bamboo and scrap wood	-	-	-	-	10	--	10	--	10	10	--	25	O-G	Some fugitive emissions of PM are expected.
37.	72	Ready mix cement concrete	-	-	-	-	10	--	10	--	10	10	--	25	G-G	PM emissions.
38.	73	Reprocessing of waste cotton	-	-	-	-	10	--	10	--	10	10	--	25	G-G	PM emissions.
39.	60	Rice mill (Rice hullers only)	-	-	-	-	10	--	10	--	10	10	--	25	O-G	PM emissions are generated. Mainly air

52.	45	Hotels (up to 20 rooms and without boilers)	12	-	12	--	--	--	--	30	G-G	This score is valid for hotels having overall waste-water generation less than 10 KLD.
53.	53	Manufacturing of optical lenses (using electrical furnace)	12	-	12	--	--	--	--	30	G-G	Small quantities of waste-waters containing TDS,SS are generated.
54.	58	Mineralized water	12	-	12	--	--	--	--	30	G-G	RO Rejects.
55.	68	Tamarind powder manufacturing	12	--	12	15	--	15	15	33.75	O-G	<ul style="list-style-type: none"> Dried tamarind fruits - cleaned and after soaking them in water they are boiled in steam jacketed kettle for about 40-45 minutes. Then pulp is extracted in pulper and dried in drum type drier and on cooling, the final product is packed. Generates small quantities of waste waters and air emissions. Joint score is normalized to 100.
56.	15	Cutting, sizing and polishing of marble stone	15	--	15	--	--	--	--	37.5	O-G	Mainly water polluting . Water pollution score is normalized to 100.
57.	22	Emery powder (fine dust of sand) manufacturing	--	--	--	15	--	--	15	37.5	O-G	Air polluting. PM emissions take place during various stages of grindings of naturally occurring minerals.
58.	25	Flyash export, transport & disposal facilities	-	-	-	15	-	-	15	37.5	R-G	<ul style="list-style-type: none"> This is mainly air polluting activity. This is the normalized score based on air pollution.
59.	48	Mineral stack yard / Railway sidings	15	-	15	15	-	-	15	37.5	R-G	Mainly air pollution due to loading, unloading, storage and transportation of the minerals.

60.	54	Oil and gas transportation pipeline	-	-	10	5	15	-	37.5	R-G	<ul style="list-style-type: none"> Waste-water generation mainly during rains only. Contains small gas based power plants up-to 5 MWs. Air pollution score is normalized to 100. In case , if these power plants are bigger / liquid fuel / oil based, scores will be calculated accordingly.
61.	64	Seasoning of wood in steam heated chamber	--	--	15	--	15	--	37.5	O-G	<p>Air pollution due to use boiler for supply of steam. Air pollution score is normalized to 100.</p>
62.	84	Synthetic detergent formulation	--	--	15	--	15	--	37.5	G-G	<ul style="list-style-type: none"> This score is valid for the industries which are not manufacturing LABSA. It is procured from outside. Small quantities of emissions are generated from mini boiler. Air pollution score is normalized to 100.
63.	69	Tea processing (with boiler)	--	--	15	--	15	--	37.5	O-G	<p>With boiler, it is an orange category industry. Without boiler, it will be green category industry.</p>

Note :

- i. Under the column Revised Category, the full forms of the abbreviations are as follows :
- R-R means original category was Red and revised category is also Red
 - R-O means original category was Red and revised category is Orange
 - O-O means original category was Orange and revised category is also Orange
 - O-G means original category was Orange and revised category is Green
 - O-W means original category was Orange and revised category is White
 - G-O means original category was Green and revised category is Orange
 - G-G means original category was Green and revised category is also Green
 - G-W means original category was Green and revised category is White
- ii. There are specific remarks in respect of some of the industrial sectors. These sectors are either merged with other relevant sectors or deleted due to duplication. The overall details are as follows :

Sl No.	Original Sl No.	Industry Sector	Original Category	Remarks
1	47	Jobbing and Machining	G	Vague category to be deleted, as such activities have already been covered in other categories.
2	66	Reel manufacturing	G	Already covered in other categories. Hence, deleted
3	1	Assembling of acid lead batteries (up to 10 batteries per day excluding lead plate casting)	G	Already covered in Orange category. Hence, deleted
4	5	Automobile fuel outlets (only dispensing)	G	Minor air pollution due to some fugitive emissions during fuel filling operations. May be exempted from the purview of Consent management.
5	30	Diesel generator sets (15 KVA to 1 MVA)	G	<ul style="list-style-type: none"> Normal operation – 12 hrs a day. Consumption of diesel = 1680 litres for 1 MVA DG set at full load @ 0.21 litres / KVA / hr. Stand-alone DG Sets having total capacity 1 MVA or less and equipped with acoustic enclosures along with adequate stack height may be exempted from the purview of Consent management. Higher capacity DG sets have already been covered under Red / Orange categories .

Table G-5: Final List of White Category of Industries

Sl. No.	Orgnl Sl. No.	Industry Sector	W1	W2	W	A1	A2	A	H	W+A+H	Revised Category
1.	3	Assembly of air coolers /conditioners ,repairing and servicing	--	--	--	--	--	--	--	--	G-W
2.	4	Assembly of bicycles ,baby carriages and other small non motorizing vehicles	--	--	--	--	--	--	--	--	G-W
3.	7	Bailing (hydraulic press)of waste papers	--	--	--	--	--	--	--	--	G-W
4.	9	Bio fertilizer and bio-pesticides without using inorganic chemicals	--	--	--	--	--	--	--	--	G-W
5.	11	Biscuits trays etc from rolled PVC sheet (using automatic vacuum forming machines)	--	--	--	--	--	--	--	--	G-W
6.	12	Blending and packing of tea	--	--	--	--	--	--	--	--	G-W
7.	14	Block making of printing without foundry (excluding wooden block making)	--	--	--	--	--	--	--	--	G-W
8.	21	Chalk making from plaster of Paris (only casting without boilers etc. (sun drying / electrical oven)	--	--	--	--	--	--	--	--	G-W
9.	25	Compressed oxygen gas from crude liquid oxygen (without use of any solvents and by maintaining pressure & temperature only for separation of other gases)	--	--	--	--	--	--	--	--	G-W
10.	27	Cotton and woolen hosiers making (Dry process only without any dyeing / washing operation)	--	--	--	--	--	--	--	--	G-W
11.	31	Diesel pump repairing and servicing (complete mechanical dry process)	--	--	--	--	--	--	--	--	G-W
12.	33	Electric lamp (bulb) and CFL manufacturing by assembling only	--	--	--	--	--	--	--	--	G-W

13.	34	Electrical and electronic item assembling (completely dry process)	--	--	--	--	--	--	--	--	--	G-W
14.	23	Engineering and fabrication units (dry process without any heat treatment / metal surface finishing operations / painting)	--	--	--	--	--	--	--	--	--	O-W
15.	35	Flavoured betel nuts production/ grinding (completely dry mechanical operations)	--	--	--	--	--	--	--	--	--	G-W
16.	37	Fly ash bricks/ block manufacturing	--	--	--	--	--	--	--	--	--	G-W
17.	38	Fountain pen manufacturing by assembling only	--	--	--	--	--	--	--	--	--	G-W
18.	39	Glass ampoules and vials making from glass tubes	--	--	--	--	--	--	--	--	--	G-W
19.	40	Glass putty and sealant (by mixing with machine only)	--	--	--	--	--	--	--	--	--	G-W
20.	43	Ground nut decortating	--	--	--	--	--	--	--	--	--	G-W
21.	44	Handloom/ carpet weaving (without dyeing and bleaching operation)	--	--	--	--	--	--	--	--	--	G-W
22.	48	Leather cutting and stitching (more than 10 machine and using motor)	--	--	--	--	--	--	--	--	--	G-W
23.	51	Manufacturing of coir items from coconut husks	--	--	--	--	--	--	--	--	--	G-W
24.	52	Manufacturing of metal caps containers etc	--	--	--	--	--	--	--	--	--	G-W
25.	55	Manufacturing of shoe brush and wire brush	--	--	--	--	--	--	--	--	--	G-W
26.	57	Medical oxygen	--	--	--	--	--	--	--	--	--	G-W
27.	60	Organic and inorganic nutrients (by physical mixing)	--	--	--	--	--	--	--	--	--	G-W
28.	61	Organic manure (manual mixing)	--	--	--	--	--	--	--	--	--	G-W
29.	63	Packing of powdered milk	--	--	--	--	--	--	--	--	--	G-W
30.	64	Paper pins and u clips	--	--	--	--	--	--	--	--	--	G-W
31.	58	Repairing of electric motors and generators (dry mechanical process)	--	--	--	--	--	--	--	--	--	O-W
32.	74	Rope (plastic and cotton)	--	--	--	--	--	--	--	--	--	G-W

33.	76	Scientific and mathematical instrument manufacturing	--	--	--	--	--	--	--	--	--	G-W
34.	78	Solar module non conventional energy apparatus manufacturing unit	--	--	--	--	--	--	--	--	--	G-W
35.	79	Solar power generation through solar photovoltaic cell, wind power and mini hydel power (less than 25 MW)	--	--	--	--	--	--	--	--	--	G-W
36.	83	Surgical and medical products assembling only (not involving effluent / emission generating processes)	--	--	--	--	--	--	--	--	--	G-W

Note : Under the column Revised Category, the full forms of the abbreviations are as follows :

- a. R-R means original category was Red and revised category is also Red
- b. R-O means original category was Red and revised category is Orange
- c. O-O means original category was Orange and revised category is also Orange
- d. O-G means original category was Orange and revised category is Green
- e. O-W means original category was Orange and revised category is White
- f. G-O means original category was Green and revised category is Orange
- g. G-G means original category was Green and revised category is also Green
- h. G-W means original category was Green and revised category is White





केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
(पर्यावरण एवं वन मंत्रालय, भारत सरकार)
(MINISTRY OF ENVIRONMENT & FORESTS, GOVT. OF INDIA)

No. B-29012/ESS/CPA/2015-16

19.08.2015

Sub: "Harmonization of Classification of industries under Red / Orange / Green / White Categories".

During the Conference of the Environment Ministers of States held in New Delhi during April 06-07, 2015, it was resolved to adopt pollution potential criteria for categorization of Red, Orange & Green categories of industries and that a Committee be constituted with State representatives. Further, in the 59th Conference of Chairmen & Member Secretaries of Pollution Control Boards/PCCs held in New Delhi on April 08, 2015, it was agreed to constitute a Committee to look into categorization system of industries based on their respective pollution potential index.

2. Accordingly, a Committee comprising the Chairmen of CPCB, APPCB, TNPCB, MPPCB, MPCB, PPCB, WBPCB and MS, CPCB was constituted vide CPCB OM dated 23.04.2015 to review & classify industrial sectors into different categories based on criteria of respective pollution potential indices.
3. The existing Red (85 sectors) , Orange (73 sectors) and Green (86 sectors) industrial sectors have been assessed as per the proposed formula by a group of Scientists from CPCB . For this purpose , concerned Engineers / Scientists from the Member SPCBs of the Committee were also involved & consulted during May28-29, 2015.
4. After careful examination and consideration of the suggestions of concerned stake-holders the "Draft Document on Revised Concept of Categorization of Industrial Sectors " is prepared by the Committee .

In this context, the Undersigned is directed to forward a copy of the " Draft Document on Revised Concept of Categorization of Industrial Sectors to all the SPCBs, PCCs and concerned Ministries for their comments. Accordingly, the same is enclosed herewith and all the SPCBs, PCCs and concerned Ministries are, hereby requested to provide their comments by 04.09.2015. The comments may kindly be sent through hard copy as well as soft copy at e-mail: nkgupta.cpcb@nic.in , nkgpcb@hotmail.com .

Encl : As above

[N.K. Gupta]
Incharge - ESS

To:

1. All the State Pollution Control Boards / Pollution Control Committees
2. The Secretary, Ministry of Micro Small and Medium Enterprises, New Delhi
3. The Secretary, Ministry of Heavy Industries & Public Enterprises, New Delhi
4. The Advisor & Incharge , CP Division, MoEFCC, New Delhi
5. CPCB Website

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Test Report

Report No. 177/1-7

Issue Date 10/10/2024

Sample from:

Regional Office, M.P. Pollution Control Board, Mandideep.

Reference No:

Letter No.2459, Dated 04/10/2024

Sample Description:

Water Samples

1. M/s. Ordnance factory Itarsi Treated water at outlet of ETP
2. M/s. Ordnance factory Itarsi Treated waste water before going outside of factory premises
3. Pond water near Kendriya Vidhyalay, Itarsi
4. Bore well water inside premise of Kendriya Vidhyalay, Itarsi
5. Upstream of natural water (Rainy water) passing through township, Itarsi
6. Downstream of natural water (Rainy water) passing through township, Itarsi
7. Bore well No. 2 near factory main gate, Itarsi.

Sample Container:

Polyethylene bottle.

Sample Volume:

7 x 100 ml.

Sampling by CL/ Customer:

Regional Office, M.P. Pollution Control Board, Mandideep.

Sampling date:

03/10/2024 & 04/10/2024

Received on:

04/10/2024

Date of Start Analysis:

09/10/2024

Date of End Analysis:

09/10/2024

Sampling Method/Plan:

APHA, 23rd Edition, 2017 Method 1060

Environmental Condition:


Not mentioned

Preservation status:

Preserved as per Protocol

S. N.	Analyte Tested	Unit	Test Method Number	Result 1	Result 2	Result 3	Result 4	Result 5	Result 6	Result 7
1.	Copper 65	mg/l	3215-B APHA, 23 rd Edition, 2017	0.076	0.861	0.031	0.015	0.012	0.014	0.016
2.	Lead 208	mg/l		BDL	BDL	0.004	0.027	BDL	BDL	0.004
3.	Nickel 60	mg/l		0.149	0.905	0.010	0.010	0.007	0.007	0.010
4.	Cadmium 114	mg/l		0.007	BDL	BDL	BDL	BDL	BDL	BDL
5.	Barium 137	mg/l		0.264	0.484	0.193	0.307	0.398	0.394	0.222
6.	Arsenic (As)	µg/l	3113 B APHA, 23 rd Edition, 2017	BDL	BDL	BDL	BDL	BDL	BDL	BDL

- Remark:**
1. No statutory liability accepted for samples not collected by M.P.P.C.B
 2. The results relate only to the items tested
 3. The report shall not be reproduced except in full without permission of Incharge Central Laboratory, MP, Pollution Control Board, Bhopal.
 4. BDL- Below Detection Limit. Cu – LOQ 0.0008 mg/l,
Pb - LOQ 0.0024 mg/l, Cr – LOQ- 0.0053 mg/l, As- LOQ -(0.005 ppb)
Cd- LOQ 0.002 mg/l., Co - LOQ – 0.002 mg/l. Ba- LOQ- 0.001 mg/l.


(Dr. Alok Saxena)
 Authorized Signatory
 Chief Chemist
 Central Laboratory MPPCB Bhopal
 Page 1 of 1

End of Report



Central Laboratory
M.P. Pollution Control Board, Bhopal [M.P.]
 E/5, Arera Colony, Paryawaran Parisar, Bhopal - 462016
 Ph. NO. 0755-2466191, email: cl_mppcb@rediffmail.com



Test Report

Issue No 474
Issue Date 18/11/2024

Report No. 2231-6
Sample from
Reference No
Sample Description

Regional Office, M.P. Pollution Control Board, Mandideep.
Letter No.2651, Dated 06/11/2024
Water Samples

1. M/s. Ordnance factory Itarsi Treated water at outlet of ETP
2. M/s. Ordnance factory Itarsi Treated waste water before going outside of factory premises
3. Borewell water inside premise of Kendriya Vidhyalay, Itarsi
4. Upstream of natural water (Rainy water) passing through township, Itarsi
5. Downstream of natural Nalla (Rainy water) passing through township, Itarsi
6. Bore well No. 2 near factory main gate, Itarsi

Sample Container
Sample Volume
Sampling by Customer
Sampling date
Received on
Date of Start Analysis
Date of End Analysis
Sampling Method/Plan
Environmental Condition
Preservation status:

Polyethylene bottle
6x 100 ml
Regional Office, M.P. Pollution Control Board, Mandideep.
05/11/2024
06/11/2024
08/11/2024
11/11/2024
APHA, 23rd Edition, 2017 Method-1064
Not mentioned
Preserved as per Protocol

S. N	Analyte Tested	Unit	Test Method Number	Result 1	Result 2	Result 3	Result 4	Result 5	Result 6
1	Copper	mg/l	3111 B APHA, 23 rd Edition, 2017	BDL	BDL	BDL	BDL	BDL	BDL
2	Zinc	mg/l		BDL	0.11	0.217	BDL	BDL	BDL
3	Manganese	mg/l		0.34	0.211	0.06	0.06	0.05	0.05
4	Iron	mg/l		0.43	0.57	BDL	BDL	BDL	BDL
5	Lead	mg/l		0.03	0.04	0.06	0.050	0.05	0.05
6	Chromium	mg/l		0.08	0.10	BDL	0.05	BDL	BDL
7	Cobalt	mg/l		BDL	BDL	BDL	BDL	BDL	BDL
8	Cadmium	mg/l		BDL	BDL	BDL	BDL	BDL	BDL
9	Nickel	mg/l		BDL	BDL	BDL	BDL	BDL	BDL
10	Arsenic	-		-	*	*	*	*	*
11	Barium 137	-	-	*	*	*	*	*	*

Remark: 1 No statutory liability accepted for samples not collected by M.P.P.C.B
 2 The results relate only to the items tested
 3 The report shall not be reproduced except in full without permission of Incharge Central Laboratory, MP, Pollution Control Board, Bhopal.
 4 BDL- Below Detection Limit, MDL- Minimum Detection Limit, Cu - MDL 0.018 mg/l, Zn - MDL 0.008 mg/l,
 Mn- MDL 0.02 mg/l, Fe-MDL 0.119 mg/l, Pb - MDL 0.031mg/l, Ni - MDL 0.26 mg/l, Cr - MDL 0.03mg/l, Cd- MDL 0.05 mg/l,
 Co - MDL - 0.004 mg/l, As & Ba - *Analysis Under Process.

(Dr. Alok Saxena)
 Authorized Signatory
 Chief Chemist
 Central Laboratory MPPCB Bhopal

End of Report

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AE
18/11/24





Central Laboratory
M.P. Pollution Control Board, Bhopal [M.P.]
 E/5, Arera Colony, Paryawaran Parisar, Bhopal – 462016
 Ph. NO. 0755-2466191, email: cl_mppcb@rediffmail.com

Test Report

Report No. 223/1-6
 Sample from:
 Reference No:
 Sample Description:


Issue No. **483**
 Issue Date 21/11/2024

Sample Container: Polyethylene bottle.
 Sample Volume: 6x 100 ml.
 Sampling by ~~CB~~/Customer: Regional Office, M.P. Pollution Control Board, Mandideep.
 Sampling date: 05/11/2024
 Received on: 06/11/2024
 Date of Start Analysis: 19/11/2024 & 21/11/2024
 Date of End Analysis: 19/11/2024 & 21/11/2024
 Sampling Method/Plan: ~~APHA, 23rd Edition, 2017 Method 1060~~
 Environmental Condition: Not mentioned
 Preservation status: Preserved as per Protocol

Regional Office, M.P. Pollution Control Board, Mandideep.
 Letter No.2651, Dated 06/11/2024
 Water Samples
 1. M/s. Ordnance factory Itarsi Treated water at outlet of ETP
 2. M/s. Ordnance factory Itarsi Treated waste water before going outside of factory premises
 3. Borewell water inside premise of Kendriya Vidhyalay, Itarsi
 4. Upstream of natural water (Rainy water) passing through township, Itarsi
 5. Downstream of natural Nalla (Rainy water) passing through township, Itarsi
 6. Bore well No. 2 near factory main gate, Itarsi.

S. N.	Analyte Tested	Unit	Test Method Number	Result 1	Result 2	Result 3	Result 4	Result 5	Result 6
1.	Arsenic	µg/l	3113 B APHA, 23 rd Edition, 2017	BDL	BDL	BDL	BDL	BDL	BDL
2.	Barium 137	µg/l	3215-B APHA, 23 rd Edition, 2017	BDL	BDL	BDL	BDL	BDL	BDL

Remark: 1. No statutory liability accepted for samples not collected by M.P.P.C.B
 2. The results relate only to the items tested
 3. The report shall not be reproduced except in full without permission of Incharge Central Laboratory, MP. Pollution Control Board, Bhopal.
 4. BDL- Below Detection Limit, MDL- Minimum Detection Limit, As- MDL 0.05 ppb. Ba-LOQ-3.8585 ppb


 (Dr. Alok Saxena)
 Authorized Signatory
 Chief Chemist

Central Laboratory MPPCB Bhopal

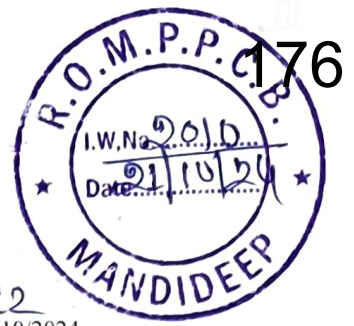
End of Report

Page 1 of 1





Central Laboratory
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 E/5, Arera Colony, Paryawaran Parisar, Bhopal – 462016
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Test Report


Issue No. 912
 Issue Date 10/10/2024

✓ Report No 81/1-3
 Sample from: Regional Office, M.P. Pollution Control Board, Mandideep.
 Reference No. Letter No.2479, Dated 08/10/2024
 Sample Description: Air Samples of M/s. Ordnance Factory Itarsi Distt- Narmadapuram
 1. Ambient Air Monitoring Near Guest House (1) IB
 2. Ambient Air Monitoring Near P.M. Shree Kendriya Vidhyalaya
 3. Ambient Air Monitoring Near Back Side of N.C.Office

Sample Container: Polyethylene bottle.
 Sample Volume: 3x 40 ml (Approx)
 Sampling by ~~CL~~/Customer: Regional Office, M.P. Pollution Control Board, Mandideep.
 Sampling date: 03-04/10/2024
 Received on: 08/10/2024
 Date of Start Analysis: 09/10/2024
 Date of End Analysis: 09/10/2024
 Sampling Method/Plan: ~~APHA, 23rd Edition, 2017 Method 1060~~
 Environmental Condition: Not mentioned
 Preservation status: Preserved as per protocol


S. No.	Analyse Component	Unit	Test Method No.	Result 1	Result 2	Result 3
1.	Lead (Pb)	mg/l	3111 B APHA, 23 rd Edition, 2017	BDL	BDL	BDL
2.	Nickel (Ni)	mg/l		BDL	BDL	BDL
3.	Arsenic (As)	µg/l	3113 B APHA, 23 rd Edition, 2017	BDL	BDL	BDL

- Remark:** 1. No statutory liability accepted for samples not collected by M.P.P.C.B.
 2. The results relate only to the items tested
 3. The report shall not be reproduced except in full without permission of Incharge Central Laboratory, MP Pollution Control Board, Bhopal.
 4. BDL- Below Detectable Limit, MDL-Minimum Detection Limit - Pb (0.031 mg/l); Ni (0.26 mg/l) As- (0.005 ppb)
 # .Final result is to be calculated on the basis of volume of gas passed and reported data.


 (Dr. Alok Saxena)
 Authorized Signatory
 Chief Chemist
 Central Laboratory MPPCB Bhopal

End of report

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AE

 18/10/24



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WATER ANALYSIS REPORT

Report No.857/24

Sample From – M/s Ordnance Factory, Itarsi
Sample Description- (i) Pond water near Kendriya Vidyalaya
Sample collected by – CPCB, MPPCB team
Date of Collection – 03/10/2024
Date of Receipt – 04/10/2024
Date of Analysis – 04/10/2024

Analysed by- P. kothari, Jr.Sc

S.No	Parameter	Unit	Result (i)	Remark:
1	Turbidity	NTU	7.60	Water Quality as per IS2296-1982 found to be of category B-Outdoor Bathing
2	Colour	-	CL	
3	Odour	-	OL	
4	Spec. Conductivity	µmhos/cm	217	
5	PH	-	8.26	
6	Total Alkalinity	mg/L	104	
7	Total Hardness	mg/L	88	
8	Calcium Hardness	mg/L	74	
9	Magnesium Hardness	mg/L	14	
10	Chloride	mg/L	15.76	
11	Total Solids	mg/L	174	
12	Total Dissolved Solids	mg/L	146	
13	Total Suspended Solids	mg/L	28	
14	Nitrate Nitrogen	mg/L	0.20	
15	DO	mg/L	5.8	
16	BOD (3 days at 27°C)	mg/L	1.0	
17	COD	mg/L	9.8	
18	Calcium	mg/L	29.6	
19	Magnesium	mg/L	3.41	

Jonarner
Analyst

P. Kothari
Lab Incharge
M.P.C.B. Mandideep.



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WATER ANALYSIS REPORT

Report No-933/ 2024

Sample From :- M/s Ordnance Factory Itarsi.
 Narmadapuram.

Sample Details :- 1.Up stream of water (Rainy Water) passing through
 Township, Itarsi.

Sample collected by :- R.S.Bharti (Jr. Scientist)

Date of Collection :- 05/11/2024

Date of Receipt :- 06/11/2024

Date of Analysis :- 06/11/2024

Analysed by- R.S.Bharti (Jr. Scientist)

S. No.	Parameters	Unit	Results	Remark
1	Appearance	-	Sl. Turbid	Water Quality as per IS2296-1982 found to be of category B- Outdoor Bathing
2.	Temperature	°C	--	
3.	Colour	-	Dirty	
4.	Odour	-	Odourless	
5.	pH	pH Unit	7.57	
6.	Total Solids	mg/l	188	
7.	Total Dissolved Solids	mg/l	162	
8.	Suspended Solids	mg/l	26	
9.	Chloride	mg/l	21.68	
10.	D. Oxygen	mg/l	5.6	
11.	BOD (3 days at 27°C)	mg/l	1.7	
12.	COD	mg/l	20.0	


 Jr. Scientist


 Lab Incharge

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WATER ANALYSIS REPORT

Report No. 934/24

Sample From – M/s Ordnance Factory, Itarsi

Sample Description- D/s of Natural water (Rainy water) passing through township

Sample collected by – Shri Ravi Bharti, Jr.Sc

Date of Collection – 05/11/2024

Date of Receipt - 06/11/2024

Date of Analysis - 06/11/2024

Analysed by-P. kothari, Jr.Sc

S.No	Parameter	Unit	Result (ii)	Remark
1	Colour	-	Dirty	Water Quality as per IS2296-1982 found to be of category B- Outdoor Bathing
2	Odour	-	OL	
3	PH	-	7.45	
4	Chloride	mg/L	35.47	
5	Total Solids	mg/L	270	
6	Total Dissolved Solids	mg/L	224	
7	Total Suspended Solids	mg/L	46	
8	DO	mg/L	5.4	
9	BOD (3 days at 27 ⁰ C)	mg/L	2.2	
10	COD	mg/L	28.80	


Analyst


Lab Incharge

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WATER ANALYSIS REPORT


Report No.858,861/24

Sample From – M/s Ordnance Factory, Itarsi
 Sample Description- (i) Borewell water inside premise of Kendriya Vidyalaya
 (ii) Borewell water No 2 near main gate.
 Sample collected by – CPCB, MPPCB team
 Date of Collection – 03/10/2024
 Date of Receipt - 04/10/2024
 Date of Analysis - 04/10/2024

Analysed by- P. kothari, Jr.Sc

S.No	Parameter	Unit	Result (ii)	Result (iii)	Acceptable Limit [As per IS:10500:2012]
1	Turbidity	NTU	0.30	0.80	1
2	Colour	-	CL	CL	-
3	Odour	-	OL	OL	-
4	Spec. Conductivity	µmhos/cm	514	575	-
5	PH	-	7.16	6.61	6.5-8.5
6	Total Alkalinity	mg/l	156	178	200
7	Total Hardness	mg/l	148	172	200
8	Calcium Hardness	mg/l	96	102	-
9	Magnesium Hardness	mg/l	52	70	-
10	Chloride	mg/l	83.76	114.31	250
11	Total Solids	mg/l	354	402	-
12	Total Dissolved Solids	mg/l	342	384	500
13	Total Suspended Solids	mg/l	12	18	-
14	Nitrate Nitrogen	mg/l	0.10	0.35	45
15	BOD (3 days at 27°C)	mg/l	0.9	1.0	-
16	COD	mg/l	9.8	9.8	-
17	Calcium	mg/l	38.4	40.8	75
18	Magnesium	mg/l	12.68	17.07	30




Lab Incharge

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WATER ANALYSIS REPORT

Report No.932/24

Sample From – M/s Ordnance Factory, Itarsi

Sample Description- Borewell water inside premise of Kendriya Vidyalaya

Sample collected by – Shri Ravi Bharti, Jr.Sc.

Date of Collection – 05/11/2024

Date of Receipt - 06/11/2024

Date of Analysis - 06/11/2024

Analysed by- P. kothari, Jr.Sc

S.No	Parameter	Unit	Result	Acceptable Limit [As per IS:10500:2012]
1	Turbidity	NTU	0.4	1
2	PH	-	7.42	6.5-8.5
3	Total Alkalinity	mg/L	182	200
4	Total Hardness	mg/L	164	200
5	Chloride	mg/L	93.62	250
6	Total Dissolved Solids	mg/L	384	500
7	Nitrate Nitrogen	mg/L	0.150	45
8	Calcium	mg/L	43.2	75
9	Magnisium	mg/L	13.65	30


Analyst


Lab Incharge



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WATER ANALYSIS REPORT

Report No-935/2024

Sample From :- M/s Ordnance Factory Itarsi.
 Narmadapuram.
 Sample Details :- 1.Bore well no.02 Factory main gate, Itarsi.
 Sample collected by :- R.S.Bharti (Jr. Scientist)
 Date of Collection :- 05/11/2024
 Date of Receipt :- 06/11/2024
 Date of Analysis :- 06/11/2024

Analysed by- R.S.Bharti (Jr. Scientist)

S. No.	Parameters	Unit	Result	Acceptable Limit (As per IS:10500:2012)
1.	Turbidity	NTU	0.68	1
2.	pH	pH Unit	6.81	6.5-8.5
3.	Total Dissolved Solids	mg/l	392	500
4.	Chloride	mg/l	106.43	250
5.	Total Alkalinity	mg/l	170	200
6.	Total Hardness	mg/l	182	200
7.	Nitrate	mg/l	0.52	45
8.	Calcium	mg/l	47.25	75
9.	Magnesium	mg/l	15.54	30


 Jr. Scientist


 Lab Incharge

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WATER ANALYSIS REPORT

Report No. 855-856/24

Sample From – M/s Ordnance Factory, Itarsi

Sample Description- (i) Treated water at outlet of ETP

(ii) Treated waste water before going outside of factory premises.

Sample collected by – CPCB, MPPCB team

Date of Collection – 03/10/2024

Date of Receipt – 04/10/2024

Date of Analysis – 04/10/2024

Analysed by-P. kothari, Jr.Sc

S.No	Parameter	Unit	Result (i)	Result (ii)	Acceptable Limit as per water consent
1	Colour	-	Dirty	Dirty	-
2	Odour	-	Sl.unpl.	Sl.unpl.	-
3	PH	-	8.54	7.19	5.5-9.0
4	Chloride	mg/l	260.17	571.59	1000 mg/L
5	Total Solids	mg/l	914	1930	-
6	Total Dissolved Solids	mg/l	836	1814	2100 mg/L
7	Total Suspended Solids	mg/l	78	116	100 mg/L
8	BOD (3 days at 27°C)	mg/l	22	26	30 mg/L
9	COD	mg/l	176.4	196	250 mg/L

[Signature]
Analyst

[Signature]
Lab Incharge



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WATER ANALYSIS REPORT

Report No-931/2024

Sample From :- M/s Ordnance Factory Itarsi.
 Narmadapuram.
Sample Details :- 1.Treated Waste Water before going outside of factory
 premises.
Sample collected by :- R.S.Bharti (Jr. Scientist)
Date of Collection :- 05/11/2024
Date of Receipt :- 06/11/2024
Date of Analysis :- 06/11/2024

Analysed by- R.S.Bharti (Jr. Scientist)

S.No	Parameter	Unit	Result	Acceptable Limit as per water consent
1.	PH	-	7.34	5.5-9.0
2.	Chloride	mg/l	532.17	1000 mg/l
3.	Total Dissolved Solids	mg/l	1786	2100 mg/l
4.	Total Suspended Solids	mg/l	128	100 mg/l
5.	BOD (3 days at 27 °C)	mg/l	24.0	30 mg/l
6.	COD	mg/l	172.8	250 mg/l


 Jr. Scientist


 Lab Incharge

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WATER ANALYSIS REPORT

Report No. 930/24

Sample From – M/s Ordnance Factory, Itarsi

Sample Description- Treated water at outlet of ETP

Sample collected by – Shri Ravi Bharti, Jr.Sc.

Date of Collection – 05/11/2024

Date of Receipt – 06/11/2024

Date of Analysis – 06/11/2024

Analysed by-P. kothari, Jr.Sc

S.No	Parameter	Unit	Result	Acceptable Limit as per water consent
1	PH	-	7.71	5.5-9.0
2	Chloride	mg/l	297.62	1000 mg/L
3	Total Dissolved Solids	mg/l	956	2100 mg/L
4	Total Suspended Solids	mg/l	88	100 mg/L
5	BOD (3 days at 27 ⁰ C)	mg/l	26	30 mg/L
6	COD	mg/l	192.0	250 mg/L


Analyst


Lab Incharge

¹[SCHEDULE – VI]
(See rule 3A)

**GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL
POLLUTANTS PART-A : EFFLUENTS**

S. No.	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2	3			
		(a)	(b)	(c)	(d)
1.	Colour and odour	See 6 of Annexure-I	--	See 6 of Annexure -I	See 6 of Annexure-I
2.	Suspended solids mg/l, Max.	100	600	200	(a) For process waste water-100 (b) For cooling water effluent 10 percent above total suspended matter of influent.
3.	Particulate size of suspended solids	Shall pass 850 micron IS Sieve	--	--	(a) Floatable solids, max. 3 mm. (b) Settleable solids, max. 850 microns.
² 4.	***	*	--	***	--
5.	pH Value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
6.	Temperature	shall not exceed 5°C above the receiving water temperature	--	--	shall not exceed 5°C above the receiving water temperature

¹ Schedule VI inserted by Rule 2(d) of the Environment (Protection) Second Amendment Rules, 1993 notified vide G.S.R. 422(E) dated 19.05.1993, published in the Gazette No. 174 dated 19.05.1993.

² Omitted by Rule 2(d)(i) of the Environment (Protection) Third Amendment Rules, 1993 vide Notification No.G.S.R.801(E), dated 31.12.1993.

S. No.	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2	3			
		(a)	(b)	(c)	(d)
7.	Oil and grease mg/l Max.	10	20	10	20
8.	Total residual chlorin mg/l Max.	1.0	--	--	1.0
9.	Ammonical nitrogen (as N), mg/l Max.	50	50	--	50
10.	Total Kjeldahl Nitrogen (as NH ₃) mg/l, Max.	100	--	--	100
11.	Free ammonia (as NH ₃) mg/l, Max.	5.0	--	--	5.0
12.	Biochemical Oxygen demand ¹ [3 days at 27°C] mg/l max.	30	350	100	100
13.	Chemical Oxygen Demand, mg/l, max.	250	--	--	250
14.	Arsenic (as As), mg/l, max.	0.2	0.2	0.2	0.2
15.	Mercury (as Hg), mg/l, Max.	0.01	0.01	--	0.01
16.	Lead (as Pb) mg/l, Max.	0.1	1.0	--	2.0
17.	Cadmium (as Cd) mg/l, Max.	2.0	1.0	--	2.0
18.	Hexavalent Chromium (as Cr+6), mg/l max.	0.1	2.0	--	1.0

¹ Substituted by Rule 2 of the Environment (Protection) Amendment Rules, 1996 notified by G.S.R.176, dated 2.4.1996 may be read as BOD (3 days at 27°C) wherever BOD 5 days 20°C occurred.

S. No.	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2	3			
		(a)	(b)	(c)	(d)
19.	Total chromium (as Cr.) mg/l, Max.	2.0	2.0	--	2.0
20.	Copper (as Cu) mg/l, Max.	3.0	3.0	--	3.0
21.	Zinc (As Zn.) mg/l, Max.	5.0	15	--	15
22.	Selenium (as Se.) mg/l, Max.	0.05	0.05	--	0.05
23.	Nickel (as Ni) mg/l, Max.	3.0	3.0	--	5.0
¹ 24.	***	*	*	*	*
¹ 25.	***	*	*	*	*
¹ 26.	***	*	*	*	*
27.	Cyanide (as CN) mg/l Max.	0.2	2.0	0.2	0.2
¹ 28.	***	*	*	*	*
29.	Fluoride (as F) mg/l Max.	2.0	15	--	15
30.	Dissolved Phosphates (as P), mg/l Max.	5.0	--	--	--
² 31.	***	*	*	*	*
32.	Sulphide (as S) mg/l Max.	2.0	--	--	5.0
33.	Phenoile compounds (as C ₆ H ₅ OH) mg/l, Max.	1.0	5.0	--	5.0

¹ Omitted by Rule 2(d)(i) of the Environment (Protection) Third Amendment Rules, 1993 vide Notification No.G.S.R.801(E), dated 31.12.1993.

S. No.	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2	3			
		(a)	(b)	(c)	(d)
34.	Radioactive materials :				
	(a) Alpha emitter micro curie/ml.	10^{-7}	10^{-7}	10^{-8}	10^{-7}
	(b) Beta emitter micro curie/ml.	10^{-6}	10^{-6}	10^{-7}	10^{-6}
35.	Bio-assay test	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
36.	Manganese (as Mn)	2 mg/l	2 mg/l	--	2 mg/l
37.	Iron (as Fe)	3 mg/l	3 mg/l	--	3 mg/l
38.	Vanadium (as V)	0.2 mg/l	0.2 mg/l	--	0.2 mg/l
39.	Nitrate Nitrogen	10 mg/l	--	--	20 mg/l
¹ 40.	* * *	*	*	*	*

¹ Omitted by Rule 2(d)(i) of the Environment (Protection) Third Amendment Rules, 1993 vide Notification No. G.S.R. 801(E) dated 31.12.1993

इंटरनेट

Annexure - IV

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

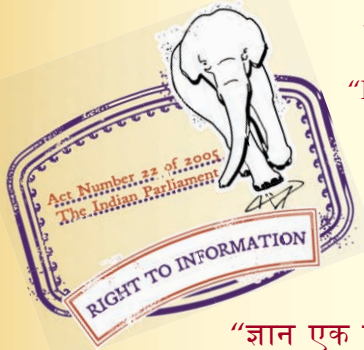
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 10500 (2012): Drinking water [FAD 25: Drinking Water]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक
पीने का पानी — विशिष्टि
(दूसरा पुनरीक्षण)

Indian Standard
DRINKING WATER — SPECIFICATION
(*Second Revision*)

ICS 13.060.20

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Drinking Water Sectional Committee had been approved by the Food and Agriculture Division Council.

This standard was originally published in 1983. A report prepared by the World Health Organization in cooperation with the World Bank showed that in 1975, some 1 230 million people were without safe water supplies. These appalling facts were central to the United Nations decision to declare an International Drinking Water Supply and Sanitation decade, beginning in 1981. Further, the VI Five-Year Plan of India had made a special provision for availability of safe drinking water for the masses. Therefore, the standard was formulated with the objective of assessing the quality of water resources, and to check the effectiveness of water treatment and supply by the concerned authorities.

The first revision was undertaken to take into account the up-to-date information available about the nature and effect of various contaminants as also the new techniques for identifying and determining their concentration. Based on experience gained additional requirements for alkalinity; aluminium and boron were incorporated and the permissible limits for dissolved solids, nitrate and pesticides residues modified.

As per the eleventh five year plan document of India (2007-12), there are about 2.17 lakh quality affected habitations in the country with more than half affected with excess iron, followed by fluoride, salinity, nitrate and arsenic in that order. Further, approximately, 10 million cases of diarrhoea, more than 7.2 lakh typhoid cases and 1.5 lakh viral hepatitis cases occur every year a majority of which are contributed by unclean water supply and poor sanitation. The eleventh five year plan document of India (2007-2012) recognizes dealing with the issue of water quality as a major challenge and aims at addressing water quality problems in all quality affected habitations with emphasis on community participation and awareness campaigns as well as on top most priority to water quality surveillance and monitoring by setting up of water quality testing laboratories strengthened with qualified manpower, equipments and chemicals.

The second revision was undertaken to upgrade the requirements of the standard and align with the internationally available specifications on drinking water. In this revision assistance has been derived from the following:

- a) EU Directives relating to the quality of water intended for human consumption (80/778/EEC) and Council Directive 98/83/EC.
- b) USEPA standard — National Primary Drinking Water Standard. EPA 816-F-02-013 dated July, 2002.
- c) WHO Guidelines for Drinking Water Quality. 3rd Edition Vol. 1 Recommendations, 2008.
- d) Manual on Water Supply and Treatment, third edition — revised and updated May 1999, Ministry of Urban Development, New Delhi.

This standard specifies the acceptable limits and the permissible limits in the absence of alternate source. It is recommended that the acceptable limit is to be implemented as values in excess of those mentioned under 'Acceptable' render the water not suitable. Such a value may, however, be tolerated in the absence of an alternative source. However, if the value exceeds the limits indicated under 'permissible limit in the absence of alternate source' in col 4 of Tables 1 to 4, the sources will have to be rejected.

Pesticide residues limits and test methods given in Table 5 are based on consumption pattern, persistence and available manufacturing data. The limits have been specified based on WHO guidelines, wherever available. In cases where WHO guidelines are not available, the standards available from other countries have been examined and incorporated, taking in view the Indian conditions.

In this revision, additional requirements for ammonia, chloramines, barium, molybdenum, silver, sulphide, nickel, polychlorinated biphenyls and trihalomethanes have been incorporated while the requirements for colour, turbidity, total hardness, free residual chlorine, iron, magnesium, mineral oil, boron, cadmium, total arsenic, lead, polynuclear aromatic hydrocarbons, pesticides and bacteriological requirements have been modified.

In this revision, requirement and test method for virological examination have been included. Further, requirements and test methods for cryptosporidium and giardia have also been specified.

Routine surveillance of drinking water supplies should be carried out by the relevant authorities to understand the risk of specific pathogens and to define proper control procedures. The WHO Guidelines for Drinking Water Quality, 3rd Edition, Vol. 1 may be referred for specific recommendations on using a water safety approach incorporating risk identification. Precautions/Care should be taken to prevent contamination of drinking water from chlorine resistant parasites such as cryptosporidium species and giardia.

Indian Standard

DRINKING WATER — SPECIFICATION

*(Second Revision)***1 SCOPE**

This standard prescribes the requirements and the methods of sampling and test for drinking water.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard the following definition shall apply.

3.1 Drinking Water — Drinking water is water intended for human consumption for drinking and cooking purposes from any source. It includes water (treated or untreated) supplied by any means for human consumption.

4 REQUIREMENTS

Drinking water shall comply with the requirements given in Tables 1 to 4. The analysis of pesticide residues given in Table 3 shall be conducted by a recognized laboratory using internationally established test method meeting the residue limits as given in Table 5.

Drinking water shall also comply with bacteriological requirements (*see 4.1*), virological requirements (*see 4.2*) and biological requirements (*see 4.3*).

4.1 Bacteriological Requirements**4.1.1 Water in Distribution System**

Ideally, all samples taken from the distribution system including consumers' premises, should be free from coliform organisms and the following bacteriological quality of drinking water collected in the distribution system, as given in Table 6 is, therefore specified when tested in accordance with IS 1622.

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

Table 1 Organoleptic and Physical Parameters*(Foreword and Clause 4)*

SI No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, <i>Max</i>	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	pH value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, <i>Max</i>	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, <i>Max</i>	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

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Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts
(Foreword and Clause 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, <i>Max</i>	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, <i>Max</i>	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, <i>Max</i>	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, <i>Max</i>	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, <i>Max</i>	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, <i>Max</i>	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl ₂), mg/l, <i>Max</i>	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, <i>Max</i>	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, <i>Max</i>	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, <i>Max</i>	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, <i>Min</i>	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, <i>Max</i>	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, <i>Max</i>	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, <i>Max</i>	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, <i>Max</i>	0.5	No relaxation	Clause 6 of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO ₃), mg/l, <i>Max</i>	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C ₆ H ₅ OH), mg/l, <i>Max</i>	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, <i>Max</i>	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, <i>Max</i>	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO ₄) mg/l, <i>Max</i>	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H ₂ S), mg/l, <i>Max</i>	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, <i>Max</i>	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as CaCO ₃), mg/l, <i>Max</i>	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, <i>Max</i>	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 3 Parameters Concerning Toxic Substances
(Foreword and Clause 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Cadmium (as Cd), mg/l, <i>Max</i>	0.003	No relaxation	IS 3025 (Part 41)	—
ii)	Cyanide (as CN), mg/l, <i>Max</i>	0.05	No relaxation	IS 3025 (Part 27)	—
iii)	Lead (as Pb), mg/l, <i>Max</i>	0.01	No relaxation	IS 3025 (Part 47)	—
iv)	Mercury (as Hg), mg/l, <i>Max</i>	0.001	No relaxation	IS 3025 (Part 48)/ Mercury analyser	—
v)	Molybdenum (as Mo), mg/l, <i>Max</i>	0.07	No relaxation	IS 3025 (Part 2)	—
vi)	Nickel (as Ni), mg/l, <i>Max</i>	0.02	No relaxation	IS 3025 (Part 54)	—
vii)	Pesticides, µg/l, <i>Max</i>	See Table 5	No relaxation	See Table 5	—
viii)	Polychlorinated biphenyls, mg/l, <i>Max</i>	0.000 5	No relaxation	ASTM 5175*	—
ix)	Polynuclear aromatic hydrocarbons (as PAH), mg/l, <i>Max</i>	0.000 1	No relaxation	APHA 6440	or APHA 6630 —
x)	Total arsenic (as As), mg/l, <i>Max</i>	0.01	0.05	IS 3025 (Part 37)	—
xi)	Total chromium (as Cr), mg/l, <i>Max</i>	0.05	No relaxation	IS 3025 (Part 52)	—
xii)	Trihalomethanes:				
a)	Bromoform, mg/l, <i>Max</i>	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
b)	Dibromochloromethane, mg/l, <i>Max</i>	0.1	No relaxation	ASTM D 3973-85* or APHA 6232	—
c)	Bromodichloromethane, mg/l, <i>Max</i>	0.06	No relaxation	ASTM D 3973-85* or APHA 6232	—
d)	Chloroform, mg/l, <i>Max</i>	0.2	No relaxation	ASTM D 3973-85* or APHA 6232	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Table 4 Parameters Concerning Radioactive Substances
(Foreword and Clause 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 14194	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Radioactive materials:				
a)	Alpha emitters Bq/l, <i>Max</i>	0.1	No relaxation	Part 2	—
b)	Beta emitters Bq/l, <i>Max</i>	1.0	No relaxation	Part 1	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

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Table 5 Pesticide Residues Limits and Test Method
(Foreword and Table 3)

Sl No.	Pesticide	Limit µg/l	Method of Test, Ref to	
			USEPA (4)	AOAC/ ISO (5)
(1)	(2)	(3)	(4)	(5)
i)	Alachlor	20	525.2, 507	—
ii)	Atrazine	2	525.2, 8141 A	—
iii)	Aldrin/ Dieldrin	0.03	508	—
iv)	Alpha HCH	0.01	508	—
v)	Beta HCH	0.04	508	—
vi)	Butachlor	125	525.2, 8141 A	—
vii)	Chlorpyrifos	30	525.2, 8141 A	—
viii)	Delta HCH	0.04	508	—
ix)	2,4- Dichlorophenoxyacetic acid	30	515.1	—
x)	DDT (<i>o, p</i> and <i>p, p</i> – Isomers of DDT, DDE and DDD)	1	508	AOAC 990.06
xi)	Endosulfan (alpha, beta, and sulphate)	0.4	508	AOAC 990.06
xii)	Ethion	3	1657 A	—
xiii)	Gamma — HCH (Lindane)	2	508	AOAC 990.06
xiv)	Isoproturon	9	532	—
xv)	Malathion	190	8141 A	—
xvi)	Methyl parathion	0.3	8141 A	ISO 10695
xvii)	Monocrotophos	1	8141 A	—
xviii)	Phorate	2	8141 A	—

NOTE — Test methods are for guidance and reference for testing laboratory. In case of two methods, USEPA method shall be the reference method.

Table 6 Bacteriological Quality of Drinking Water¹⁾
(Clause 4.1.1)

Sl No.	Organisms	Requirements
(1)	(2)	(3)
i)	<i>All water intended for drinking:</i>	
a)	<i>E. coli</i> or thermotolerant coliform bacteria ^{2), 3)}	Shall not be detectable in any 100 ml sample
ii)	<i>Treated water entering the distribution system:</i>	
a)	<i>E. coli</i> or thermotolerant coliform bacteria ²⁾	Shall not be detectable in any 100 ml sample
b)	Total coliform bacteria	Shall not be detectable in any 100 ml sample
iii)	<i>Treated water in the distribution system:</i>	
a)	<i>E. coli</i> or thermotolerant coliform bacteria	Shall not be detectable in any 100 ml sample
b)	Total coliform bacteria	Shall not be detectable in any 100 ml sample

¹⁾Immediate investigative action shall be taken if either *E.coli* or total coliform bacteria are detected. The minimum action in the case of total coliform bacteria is repeat sampling; if these bacteria are detected in the repeat sample, the cause shall be determined by immediate further investigation.

²⁾Although, *E. coli* is the more precise indicator of faecal pollution, the count of thermotolerant coliform bacteria is an acceptable alternative. If necessary, proper confirmatory tests shall be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality of rural water supplies, particularly in tropical areas where many bacteria of no sanitary significance occur in almost all untreated supplies.

³⁾It is recognized that, in the great majority of rural water supplies in developing countries, faecal contamination is widespread. Under these conditions, the national surveillance agency should set medium-term targets for progressive improvement of water supplies.

system including consumers' premises, should be free from virus.

4.2.2 None of the generally accepted sewage treatment methods yield virus-free effluent. Although a number of investigators have found activated sludge treatment to be superior to trickling filters from this point of view, it seems possible that chemical precipitation methods will prove to be the most effective.

4.2.3 Virus can be isolated from raw water and from springs, enterovirus, reovirus, and adenovirus have been found in water, the first named being the most resistant to chlorination. If enterovirus are absent from chlorinated water, it can be assumed that the water is safe to drink. Some uncertainty still remains about the virus of infectious hepatitis, since it has not so far been isolated but in view of the morphology and resistance of enterovirus it is likely that, if they have been inactivated hepatitis virus will have been inactivated also.

4.2.4 An exponential relationship exists between the rate of virus inactivation and the redox potential. A redox potential of 650 mV (measured between platinum and calomel electrodes) will cause almost instantaneous inactivation of even high concentrations of virus. Such a potential can be obtained with even a low concentration of free chlorine, but only with an extremely high concentration of combined chlorine. This oxidative inactivation may be achieved with a number of other oxidants also, for example, iodine, ozone and potassium permanganate, but the effect of the oxidants will always be counteracted, if reducing components, which are mainly organic, are present. As a consequence, the sensitivity of virus towards disinfectants will depend on the *milieu* just as much as on the particular disinfectant used.

4.2.5 Viruses are generally resistant to disinfectants as well as get protected on account of presence of particulate and organic matter in water. Because the difference between the resistance of coliform organisms and of virus to disinfection by oxidants increases with increasing concentration of reducing components, for example, organic matter, it cannot be assumed that the absence of available coliform organisms implies freedom from active virus under circumstances where a free chlorine residual cannot be maintained. Sedimentation and slow sand filtration in themselves may contribute to the removal of virus from water.

4.2.6 In practice, >0.5 mg/l of free chlorine for 1 h is sufficient to inactivate virus, even in water that was originally polluted provided the water is free from particulates and organic matter.

4.2.7 MS2 phage are indicator of viral contamination in drinking water. MS2 phage shall be absent in 1 litre of water when tested in accordance with USEPA method 1602. If MS2 phage are detected in the drinking water, virological examination shall be done by the Polymerase Chain Reaction (PCR) method for virological examination as given in Annex B. USEPA method in Manual of Method for Virology Chapter 16, June 2001 shall be the alternate method. If viruses are detected, the cause shall be determined by immediate further investigation.

4.3 Biological Requirements

4.3.1 Ideally, all samples taken including consumers premises should be free from biological organisms. Biological examination is of value in determining the causes of objectionable tastes and odours in water and controlling remedial treatments, in helping to interpret the results of various chemical analysis, and in explaining the causes of clogging in distribution pipes and filters. In some instances, it may be of use in demonstrating that water from one source has been mixed with that from another.

4.3.2 The biological qualities of water are of greater importance when the supply has not undergone the conventional flocculation and filtration processes, since increased growth of methane-utilizing bacteria on biological slimes in pipes may then be expected, and the development of bryozoal growths such as *Plumatella* may cause operational difficulties.

4.3.3 Some of the animalcules found in water mains may be free-living in the water, but others such as *Dreissena* and *Asellus* are more or less firmly attached to the inside of the mains. Although these animalcules are not themselves pathogenic, they may harbour pathogenic organisms or virus in their intestines, thus protecting these pathogens from destruction by chlorine.

4.3.4 Chlorination, at the dosages normally employed in waterworks, is ineffective against certain parasites, including amoebic cysts; they can be excluded only by effective filtration or by higher chlorine doses than can be tolerated without subsequent dechlorination. *Amoebiasis* can be conveyed by water completely free from enteric bacteria; microscopic examination after concentration is, therefore, the only safe method of identification.

4.3.5 Strict precautions against back-syphonage and cross-connections are required, if amoebic cysts are found in a distribution system containing tested water.

4.3.6 The *cercariae of schistosomiasis* can be detected by similar microscopic examination, but there is, in

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any case, no evidence to suggest that this disease is normally spread through piped water supplies.

4.3.7 The cyclops vector of the embryos of *Dracunculus medinensis* which causes dracontiasis or Guinea-worm disease can be found in open wells in a number of tropical areas. They are identifiable by microscopic examination. Such well supplies are frequently used untreated, but the parasite can be relatively easily excluded by simple physical improvements in the form of curbs, drainage, and apron surrounds and other measures which prevent physical contact with the water source.

4.3.8 Cryptosporidium shall be absent in 10 liter of water when tested in accordance with USEPA method 1622 or USEPA method 1623* or ISO 15553 : 2006.

4.3.9 Giardia shall be absent in 10 liter of water when tested in accordance with USEPA method 1623* or ISO 15553 : 2006.

4.3.10 The drinking water shall be free from microscopic organisms such as algae, zooplanktons, flagellates, parasites and toxin producing organisms. An illustrative (and not exhaustive) list is given in Annex C for guidance.

NOTE — In case of dispute, the method indicated by '*' in **4.3.8** and **4.3.9** shall be referee method.

5 SAMPLING

Representative samples of water shall be drawn as prescribed in IS 1622 and IS 3025 (Part 1).

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title
1622 : 1981	Methods of sampling and microbiological examination of water (<i>first revision</i>)	(Part 41) : 1992	Cadmium (<i>first revision</i>)
3025	Methods of sampling and test (physical and chemical) for water and waste water:	(Part 42) : 1992	Copper (<i>first revision</i>)
(Part 1) : 1987	Sampling (<i>first revision</i>)	(Part 43) : 1992	Phenols (<i>first revision</i>)
(Part 2) : 2002	Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy	(Part 46) : 1994	Magnesium
(Part 4) : 1983	Colour (<i>first revision</i>)	(Part 47) : 1994	Lead
(Part 5) : 1983	Odour (<i>first revision</i>)	(Part 48) : 1994	Mercury
(Part 7) : 1984	Taste threshold (<i>first revision</i>)	(Part 49) : 1994	Zinc
(Part 8) : 1984	Tasting rate (<i>first revision</i>)	(Part 52) : 2003	Chromium
(Part 10) : 1984	Turbidity (<i>first revision</i>)	(Part 53) : 2003	Iron
(Part 11) : 1983	pH value (<i>first revision</i>)	(Part 54) : 2003	Nickel
(Part 16) : 1984	Filterable residue (total dissolved solids) (<i>first revision</i>)	(Part 55) : 2003	Aluminium
(Part 21) : 1983	Total hardness (<i>first revision</i>)	(Part 56) : 2003	Selenium
(Part 23) : 1983	Alkalinity (<i>first revision</i>)	(Part 57) : 2005	Boron
(Part 24) : 1986	Sulphates (<i>first revision</i>)	(Part 59) : 2006	Manganese
(Part 26) : 1986	Chlorine residual (<i>first revision</i>)	(Part 60) : 2008	Fluoride
(Part 27) : 1986	Cyanide (<i>first revision</i>)	13428 : 2003	Packaged natural mineral water — Specification (<i>first revision</i>)
(Part 29) : 1986	Sulphide (<i>first revision</i>)	14194	Radionuclides in environmental samples — Method of estimation:
(Part 32) : 1988	Chloride (<i>first revision</i>)	(Part 1) : 1994	Gross beta activity measurement
(Part 34) : 1988	Nitrogen (<i>first revision</i>)	(Part 2) : 1994	Gross alpha activity measurement
(Part 37) : 1988	Arsenic (<i>first revision</i>)	15302 : 2002	Determination of aluminium and barium in water by direct nitrous oxide-acetylene flame atomic absorption spectrometry
(Part 39) : 1989	Oil and grease	15303 : 2002	Determination of antimony, iron and selenium in water by electrothermal atomic absorption spectrometry
(Part 40) : 1991	Calcium		

ANNEX B

(Clause 4.2.7)

POLYMERASE CHAIN REACTION (PCR) METHOD

B-1 GENERAL

The method involves the concentration of viruses from 100 litre of drinking water to 1 ml by membrane filter technique. The concentrate is subjected to amplification using polymerase chain reaction (PCR) and primers based on highly conserved regions of viral genomes. This method can detect as low as 10 genome copies. Stringent precautions are needed to avoid contamination with amplified DNA products leading to false positive reactions. Detection of hepatitis A virus (HAV) RNA and enterovirus (EV) RNA is considered as an indication of presence of viruses in water. Steps involved include concentration of water, RNA extraction, complementary DNA (cDNA) synthesis and PCR.

B-2 CONCENTRATION OF DRINKING WATER

B-2.1 Apparatus

B-2.1.1 Pressure Pump

B-2.1.2 Membrane Filter Assembly with 144 mm Diameter with Tripod Stand

B-2.1.3 Pressure Vessel (50 litre capacity) with Pressure Gauge

B-2.1.4 Inter-connecting Pressure Tubes

B-2.2 Reagents

Autoclaved double distilled water shall be used for the preparation of reagents/buffers in this study.

B-2.2.1 Aluminium Chloride

B-2.2.2 HCl/NaOH Urea (Extra Pure)

B-2.2.3 Disodium Hydrogen Phosphate ($\text{Na}_2\text{HPO}_4 \cdot 2\text{H}_2\text{O}$) — 0.2 M, filter sterilized.

B-2.2.4 Sodium Dihydrogen Phosphate ($\text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O}$) — 0.2 M, filter sterilized.

B-2.2.5 Citric Acid — 0.1 M, filter sterilized.

B-2.2.6 L-Arginine — 0.5 M, filter sterilized.

B-2.2.7 Urea-Arginine Phosphate Buffer (U-APB) — Mix 4.5 g of urea with 2 ml of 0.2 M NaH_2PO_4 and 2 ml of 0.5 M L - Arginine and make up the volume to 50 ml with sterile distilled water. The pH of the eluent shall be 9.0.

B-2.2.8 Magnesium Chloride (MgCl_2) — 1 M.

B-2.2.9 McII Vaines Buffer (pH 5.0) — Mix 9.7 ml of

0.1 M citric acid with 10.3 ml of 0.2 M $\text{Na}_2\text{HPO}_4 \cdot 2\text{H}_2\text{O}$ under sterile conditions.

B-2.3 Procedure

Filter 100 litre of drinking water sample through membrane filter assembly using either positively charged membrane of 144 mm diameter or 0.22 micron diameter pore size nitrocellulose membrane. For positively charged membrane the test water pH need not be adjusted. But for the 0.22 micron nitrocellulose membrane adjust the pH to 3.5 after adding the aluminium chloride as a coagulant to a final concentration of 0.000 5 M.

At lower pH pass the water through the membrane. The flow rate shall be 40 litre/h approximately. After the completion of the filtration, elute the adsorbed particles using 100 ml of urea-arginine phosphate buffer (U-APB). Precipitate the suspended particles using 1 ml of magnesium chloride (1 M). Dissolve the resultant precipitate centrifuged out of the sample in 800-1.0 ml of McII vaines buffer. The processed sample can be stored at refrigerator until required.

B-3 RNA EXTRACTION

B-3.1 Apparatus

B-3.1.1 Cooling Centrifuge

B-3.1.2 Deep Freezer (-20°C)

B-3.1.3 Vortex Mixer

B-3.1.4 Pipette Man

B-3.2 Reagents

B-3.2.1 Cetyl Trimethyl Ammonium Bromide (CTAB) Buffer

CTAB	:	1 percent
Sodium Dodecyl Sulphate (SDS)	:	1 percent
EDTA	:	20 mM
Sodium Chloride	:	1 M

B-3.2.2 Phenol, Chloroform and Isoamylalcohol in the ratio of 25:24:1 (PCI)

B-3.2.3 Ethanol

B-3.2.4 TE Buffer (pH 8.0)

Tris base	:	1 M
EDTA	:	0.5 M

B-3.2.5 Sodium Acetate — 3 M.

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B-3.3 Procedure

Treat 300 µl of concentrated water sample with equal volume of CTAB and 1/10th volume of PCI. Vortex and centrifuge at 5 000 × g for 30 min at 4°C. Add 1/10th volume of 3 M sodium acetate and double the volume of cold ethanol to the aqueous layer. Keep the mixture at either at -20°C for overnight or in liquid nitrogen for 2-5 min. Centrifuge at 10 000 × g, for 30 min at 4°C. Discard the supernatant and air dry the pellet and dissolve it in 20 µl TE buffer.

B-4 COMPLEMENTARY DNA (c DNA) SYNTHESIS**B-4.1 Apparatus****B-4.1.1 PCR Machine****B-4.1.2 Deep Freezer (-20°C)****B-4.2 Reagents****B-4.2.1 cDNA Synthesis Kit****B-4.3 Procedure**

Suspend the extracted RNA in 20 µl of cDNA reaction mixture, which consists of 4 µl of 5X reverse transcriptase reaction buffer [250 mM TRIS-HCl (pH 8.5), 40 mM KCl, 150 mM MgCl₂, 5 mM dithiothreitol (DTT)], 0.5 µl of 10 mM deoxynucleotide phosphate (dNTP), 2 µl of hexa nucleotide mixture, 1 µl of 25 U of Maloney Murine Leukaemia Virus (M-MuLV) reverse transcriptase, 0.5 µl of 20 U of human placental RNase inhibitor. Heat the reaction mixture to 95°C for 5 min and rapidly chill on ice, this is followed by the addition of 1 µl (25 U/µl) of M-MuLV reverse transcriptase. Incubate the reaction mixture as given by the manufacturer of the kit and quickly chill the reaction tube on ice.

B-5 PCR AMPLIFICATION**B-5.1 Apparatus****B-5.1.1 PCR Machine****B-5.1.2 Deep Freezer (-20°C)****B-5.1.3 Micropipette****B-5.2 Reagents****B-5.2.1 Primers for EV and HAV**

EV sense primer, 5' — TCC TCC GGC CCC TGA ATG CG — 3'
 antisense primer, 5' — ATT GTC ACC ATA AGC AGC CA — 3'
 HAV sense primer, 5' — GTTTT GCTCC TCTTT ATCAT GCTAT G-3'

antisense primer, 5' — GGAAA TGTCT CAGGT ACTTT CTTTG-3'

B-5.2.2 PCR Master Mix**B-5.2.3 Mineral Oil****B-5.3 Procedure****B-5.3.1 PCR Amplification for Hepatitis A Virus (HAV)**

In 5 µl of cDNA, add 95 µl of a PCR Master Mix (10 mM TRIS-HCl (pH 8.3), 50 mM KCl, 2.5 mM MgCl₂, 0.01 percent gelatin (1× PCR buffer), 200 µM of each dNTP, 1.5 U of *Thermus aquaticus* polymerase). Add 25 pico moles of sense and antisense oligonucleotide primers of HAV and overlay with mineral oil. Appropriate positive and negative controls shall be included with each run. Set the following reaction at thermo cycler:

Denaturation at 94°C for 2 min	} 35 cycles
Denaturation for 1.0 min at 94°C	
Annealing for 1.0 min at 57°C	
Extension for 1.3 min at 72°C	
Final extension at 72°C for 7 min.	

B-5.3.2 PCR Amplification for Enterovirus (EV)

In 5 µl of cDNA, add 95 µl of a PCR Master Mix (10 mM TRIS-HCl (pH 8.3), 50 mM KCl, 2.5 mM MgCl₂, 0.01 percent gelatin (1X PCR buffer), 200 µM of each dNTP, 1.5 U of *Thermus aquaticus* polymerase). Add 25 pico moles of sense and antisense oligonucleotide primers of EV and overlay with mineral oil. Appropriate positive and negative controls shall be included with each run. Set the following reaction at thermo cycler:

Denaturation at 94°C for 2 min	} 35 cycles
Denaturation for 1.0 min at 94°C	
Annealing for 1.0 min at 42°C	
Extension for 2.0 min at 72°C	
Final extension at 72°C for 7 min.	

B-6 AGAROSE GEL ELECTROPHORESIS**B-6.1 Apparatus****B-6.1.1 Micropipette****B-6.1.2 Electrophoresis Apparatus****B-6.1.3 Gel Documentation System****B-6.2 Reagents****B-6.2.1 Running Buffer — 50X TAE buffer**

Tris base/Tris buffer : 121.00 g

Glacial acetic acid : 28.55 ml
 0.5 M EDTA : 50 .00 ml
 Distilled water : 300.45 ml
 (autoclaved)

Make the final volume upto 1 000 ml with deionised distilled water, sterilize and store at 4°C. The final concentration for the preparation of agarose gel and to run the gel shall be 1X.

B-6.2.2 Tracking Dye — 6X bromophenol blue.

B-6.2.3 Ethidium Bromide — 0.5 µg/ml.

B-6.3 Procedure

Run the PCR amplified product of EV and HAV on 1.5 percent agarose gel using 1X TAE buffer. Load 10 µl of amplified product after mixing it with 1 µl 10X loading dye. Run the molecular weight marker along with the samples. Run the electrophoresis at 100 V for 30 min. Stain the gel with ethidium bromide (0.5 µl/ml) for 20 min. Wash it with distilled water and view under UV transilluminator and photograph the gel to analyse the band pattern. EV gives the band as 155 base pair and the HAV gives band as 225 base pair.

ANNEX C (Clause 4.3.10)

ILLUSTRATIVE LIST OF MICROSCOPIC ORGANISMS PRESENT IN WATER

Sl No.	Classification of Microscopic Organism	Group and Name of the Organism	Habitat	Effect of the Organisms and Significance
(1)	(2)	(3)	(4)	(5)
i)	Algae	a) Chlorophyceae:		
		1) <i>Species of</i> Coelastrum, Gomphospherium, Micractinium, Mougeotia, Oocystis, Euastrum, Scenedesmus, Actinastrum, Gonium, Eudorina Pandorina, Pediastrum, Zygnema, Chlamydomonas, Careteria, Chlorella, Chroococcus, Spirogyra, Tetraedron, Chlorogonium, Stigeoclonium	Polluted water, impounded sources	Impart colouration
		2) <i>Species of</i> Pandorina, Volvox, Gomphospherium, Staurastrum, Hydrodictyon, Nitella	Polluted waters	Produce taste and odour
		3) <i>Species of</i> Rhizoclonium, Cladotrix, Ankistrodesmus, Ulothrix, Micrasterias, Chromulina	Clean water	Indicate clean condition
		4) <i>Species of</i> Chlorella, Tribonema, Clostrium, Spirogyra, Palmella	Polluted waters, impounded sources	Clog filters and create impounded difficulties
		b) Cyanophyceae:		
		1) <i>Species of</i> Anacystis and Cylindrospermum	Polluted waters	Cause water bloom and impart colour
		2) <i>Species of</i> Anabena, Phormidium, Lyngbya, Arthrospira, Oscillatoria	Polluted waters	Impart colour
		3) <i>Species of</i> Anabena, Anacystis, Aphanizomenon	Polluted waters, impounded sources	Produce taste and odour
		4) <i>Species of</i> Anacystis, Anabena, Coelospherium, Cleotrichina, Aphanizomenon	Polluted waters	Toxin producing
		5) <i>Species of</i> Anacystis, Rivularia, Oscillatoria, Anabena	Polluted waters	Clog filters

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<i>Sl No.</i>	<i>Classification of Microscopic Organism</i>	<i>Group and Name of the Organism</i>	<i>Habitat</i>	<i>Effect of the Organisms and Significance</i>
(1)	(2)	(3)	(4)	(5)
		6) <i>Species of Rivularia</i>	Calcareous waters and also rocks	Bores rocks and calcareous strata and causes matted growth
		7) <i>Species of Lemanea</i>	Agmenellum, Microcoleus, Clean waters	Indicators of purification
		c) Diatoms (Bacillareophyceae):		
		1) <i>Species of Stauroneis</i>	Fragillaria, Stephanodiscus, —	Cause discoloration
		2) <i>Species of Asterionella</i>	Tabellaria	Hill streams high altitude, torrential and temperate waters
		3) <i>Species of Synedra</i>	and Fragillaria	Polluted waters
		4) <i>Species of Nitzchia</i>	Gomphonema	Moderately polluted waters
		5) <i>Species of Cymbela</i>	Synedra, Melosira, Navicula, Cyclotella, Fragillaria, Diatoma, Pleurosigma	Rivers and streams impounded sources
		6) <i>Species of Pinnularia</i>	Surinella, Cyclotella, Meridion, Cocconeis	Clean waters
		d) Xanthophyceae:		
		<i>Species of Botryococcus</i>	Hill streams, high altitude and temperate waters	Produces coloration
ii)	Zooplankton	a) Protozoa:		
		1) Amoeba, Giardia, Lamblia, Arcella, Diffugia, Actinophrys	Polluted waters	Pollution indicators
		2) Endamoeba, Histolytica	Sewage and activated sludge	Parasitic and pathogenic
		b) Ciliates:		
		Paramoecium, Vorticella, Carchesium, Stentor, Colpidium, Coleps, Euplotes, Colopoda, Bodo	Highly polluted waters, sewage and activated sludge	Bacteria eaters
		c) Crustacea:		
		1) Bosmina, Daphnia	Stagnant polluted waters	Indicators of pollution
		2) Cyclops	Step wells in tropical climate	Carrier host of guinea worm
iii)	Rotifers	a) Rotifers:		
		Anurea, Rotaria, Philodina	Polluted and Algae laden waters	Feed on algae
		b) Flagellates:		
		1) Ceratium, Glenodinium, Dinobryon	Peridinium	Rocky strata, iron bearing and acidic waters
		2) Euglena, Phacus	Polluted waters	Impart colour

<i>Sl No.</i>	<i>Classification of Microscopic Organism</i>	<i>Group and Name of the Organism</i>	<i>Habitat</i>	<i>Effect of the Organisms and Significance</i>
(1)	(2)	(3)	(4)	(5)
iv)	Miscellaneous Organisms	a) Sponges, Hydra	Fresh water	Clog filters and affect purification systems
		b) Tubifex, Eristalls, Chironomids	Highly polluted waters, sewage and activated sludge and bottom deposits	Clog filters and render water unaesthetic
		c) Plumatella	Polluted waters	Produces biological slimes and causes filter operational difficulties
		c) Dreissena, Asellus	Polluted waters	Harbour pathogenic organisms

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Item No. 09

Court No. 2

**BEFORE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

Original Application No.930/2024

Mahesh Patel

Applicant

Versus

State of MP

Respondent(s)

Date of hearing: 24.10.2024

**CORAM: HON'BLE MR. JUSTICE SUDHIR AGARWAL JUDICIAL MEMBER
HON'BLE DR. AFROZ AHMAD, EXPERT MEMBER**

Applicant: None

Respondents: Ms. Soumya Priyadarshini and Mr. Jatin Dhamija, Proxy Counsel for Ms. Rukmini Bobde, Advocates for State of M.P. (through VC)
Mr. Raghav Sharma, Mr. Pranjal Pandey and Mr. Jaskirat Pal Singh, Advocate for MPPCB (through VC)

ORDER

1. Mahesh Patel, President, Ayudh Nirmani Majdoor Sangh, had sent a letter petition dated 15.09.2023 which has been registered as Original Application under Sections 14 and 15 of National Green Tribunal Act, 2010 (hereinafter referred to as '**NGT Act, 2010**') in exercise of *suo-moto* jurisdiction in view of law laid down by Supreme Court in ***Municipal Corporation of Greater Mumbai Vs. Ankita Singha and others, (2022) 13 SCC 401.***

2. Complainant has said that there is an Ordnance factory at Itarsi which is producing defence products i.e., ammunition for small weapons to missiles. The said industrial unit is discharging industrial effluent containing toxic elements and heavy metals in a water body located near

Kendriya Vidyalaya No.1, Ordnance factory Itarsi. Untreated industrial effluent discharged by Ordnance factory is causing damage to environment by adversely affecting aquatic life, plants and also contaminating ground water which ultimately meets Narmada River and pollutes. Authorities responsible for maintenance and management are not looking into the problem and continuously going ahead with their illegal activities causing damage to environment.

3. Tribunal examined the matter on 05.09.2024 and after being *prime facie* satisfied that a substantial question relating to environment had arisen due to implementation of enactments mentioned in Schedule 1 of NGT Act, 2010, found it appropriate to obtain a factual report by constituting a Joint Committee comprising Madhya Pradesh State Pollution Control Board (hereinafter referred to as '**MPPCB**'); Central Pollution Control Board (hereinafter referred to as '**CPCB**') and; District Magistrate, Hoshangaba.

4. Pursuant to above order, Joint Committee report has been submitted vide email dated 17.10.2024. Report gives background of Ordnance Factory, water requirement, treatment and utilization and general observations during visit, conclusions and recommendations, as under:-

"2.0 Background of the Ordnance factory, Itarsi:

Ordnance Factory, Itarsi was established in 1979 at Kesala block, Tehsil - Itarsi, District - Narmadapuram (M.P.). This unit is engaged in manufacturing of explosive/propellant for the Indian Defence Force and Civil Trade. As per the information provided by the representative of the Factory Sh V K Singh, Joint GM, that total factory area is 2,72,75,812 SQ Meter (2727.6 Hectare), out of which 2494.42 Ha is green belt. Initially about 4000 employees were

working there but present strength reduced to approx. 1300 only. The factory is established on the lower elevation due to which many rain-fed natural drains either passes the premises or go along the boundary of the factory premises. On field survey, 06 drains were observed coming out of the plant premises, these drains majorly has flow during rainy season.

Presently, Nitro Guanidine plant, Nitro Glycerin plant, Ball powder plant and gun & artillery propellant plant are in operation. Nitrocellulose plant is under shutdown from last 03 years.

Water requirement, treatment & utilization:

The water requirement is fulfilled through Tawa river. The details of the water consumption and waste water generation are as given tabulated below:

S. No.	Purpose	Fresh water consumption (KLD)	Waste water generation (KLD)	Source of wastewater generation
1.	Boiler Feed	752.43	20.00	Boiler blowdown
2.	Cooling Purpose	20566.42	1120.00	Cooling tower blowdown
3.	Manufacturing Process	750.12	710.00	Process effluent
4.	Domestic	3009.72	840	Domestic

The daily water requirement in operation is 22MLD excluding the 3MLD requirement of the water for domestic purpose. The daily generation of process effluent is 710KLD. To treat the same an ETP of 50KL/hr i.e. 1000KLD capacity is established having treatment of pH neutralization and clarification. The treated wastewater is being utilized for in-house gardening purpose. Factory has also constructed a pucca collection tank of 800 m³ capacity and from this tank, treated effluent is pumped for plantation purpose. Cooling tower blow down & boiler blow down water is about 1140 KLD being utilized in gardening, fire-fighting and wetting of traverse situated around explosive manufacturing unit, wetting floor and surrounding. Domestic effluent is being treated through oxidation pond.

Presently unit is using furnace oil as a fuel in the boiler houses and action for furnace oil replacement by LPG initiated by the ordnance factory Itarsi.

All the information incorporated above is as per the Ordnance factory Itarsi letter no. 4032 dated 07/10/2024 copy of letter is enclosed as **Annexure-IV**.

3.0 Observations made during the visit:

- i. The geo-graphical location of the Ordnance factory is 22.5797N, 77.8551E. Field photographs taken during visit are enclosed as **Annexure-V**. The factory has valid Consent to Operate (CTO) with validity till 31.08.2025 for the manufacturing of explosives for defence purpose. The quantity of the annual production was not disclosed being defence installation. Copy of the CTO is enclosed as **Annexure-VI**.
- ii. The committee member visited the natural rain-fed drains which are passing through the factory premises, the ponds constructed near the Kendriya Vidhyalay No. 01, the oxidation ponds constructed for treatment of domestic effluent, the process area of the factory, the effluent treatment plant and the treated effluent collection ponds to observe & assess the factual status of the issues raised in the applicant.
- iii. During visit, it was found that there are 02 main seasonal rain-fed drains, ultimately joins into a single drain and passes through the factory premises. Fishes were found in both the rain-fed drains. Water sample was collected from the upstream and downstream of this drain to assess any change in the water quality. The water quality was found to be of Category B - Outdoor Bathing. The analysis report is enclosed as **Annexure-VII**. The results are as tabulated below:

S.No	Parameter	Unit	Sampling Location		Remark
			rain fed drain	natural rain fed	
1	Colour	-	Dirty	Dirty	

2	Odour	-	Odourless	Odourless	Water Quality as per IS2296-1982 found to be
3	pH	-	7.42	7.66	
4	Chloride	mg/l	24.63	38.43	
5	Total Solids	mg/l	198	302	
6	Total Dissolved	mg/l	166	248	
7	Total Suspended Solids	mg/l	32	54	
8	DO	Mg/l	5.4	5.2	
9	BOD (3 days at	mg/l	1.9	2.4	
10	COD	mg/l	19.6	29.4	

There are 02 ponds of approx. 7200 SQ MT & 3300 SQ MT area located near to Kendriya Vidyalaya No. 01 and are established in year 2016-17. These ponds were constructed for water harvesting purpose. As informed, in year 2021-22, one of the ponds was filled with the treated wastewater for utilizing it in the gardening/horticulture/plantation purpose. But the same was discontinued next year as the distance from the treatment plant to the pond was more than 1.5KMs and was not feasible. The same was verified through available satellite imaginaries. During the visit one pond that is shown with complaint was found empty and other pond was having shallow water level, majorly of rain as there was no source of other effluent/wastewater to meet this pond. Water sample was collected from the pond. The analysis report state that the water quality meets the Category B- Outdoor Bathing standard as per the IS2296-1982. The results are as tabulated below:

S.No	Parameter	Unit	Locatio	Remark
			Pond water	
	Turbidity	NTU	7.6	Water Quality as per IS2296 1982 found to be
1	Colour	-	Colorless	
2	Odour	-	Odourless	
3	pH	-	8.26	
4	Chloride	mg/l	15.76	
5	Total Solids	mg/l	174	
6	Total Dissolved Solids	mg/l	146	
7	Total Suspended	mg/l	28	
8	DO	mg/l	5.8	
9	BOD (3 days at 27°C)	mg/l	1.0	
10	COD	mg/l	9.8	

Copy of the analysis report is enclosed as **Annexure-VIII**.

vi. The committee visited the Kendriya Vidhyalay No. 1 school to ascertain any reported health related issues. The committee met Principal of the School & discussed about any health issue arises after the pond construction near the school. It was informed that on regular basis the health check-up is being carried out of students

and records were maintained. The committee gone through the available health records of the students and observed that no major water borne disease was reported. The Chief Medical Officer, 'tarsi was invited to inform the committee about the health issues. It was informed that there is no reported major water-borne disease was observed among the students and in the residents of the estate premises. The Annual health report of year 2023-24 was also furnished for the same. Copy of the Annual health report is enclosed as **Annexure-IX**.

vii. During the committee's visit to the domestic wastewater treatment facility, it was observed that the factory had established four oxidation ponds with a total capacity of 840 KLD for treating wastewater from the factory premises and colony. However, all the oxidation ponds were found to be mismanaged. The entire area was overgrown with unwanted shrubs and grasses. Additionally, no wastewater was visible due to the extensive shrub growth and the reduced volume of wastewater generated after a decrease in the number of employees (from 4000 to 1300). The factory management must take immediate steps to properly manage the oxidation ponds.

viii. During the committee's visit to the Nitro Guanidine plant, it was noted that the plant was not operational. However, the ETP, with a capacity of 1000 KL/day, was in operation. The daily maximum effluent quantity was approximately 710 KL/day. The ETP components included an effluent collection tank, neutralization tank, caustic soda lye tank, clarifier tank, sump, O2 settling tanks, an online pH monitor, and a treated water collection tank at the perimeter. The drain which carries the treated acidic effluent after the clarifier was found damaged at few areas. The factory occupier needs to repair the drain immediately to stop any seepage/leakages of the treated effluent. Also, the treated effluent is channelized through acid proof tiled pucca drain to collection tanks from where the treated water is used in plantation. The committee observed that in absence of any stopper (Gate) there are chances that the treated effluent discharged outside the premises. Also to have vigil over such discharge points, factory occupier need to establish Pan-Tilt-Zoom (PTZ) camaras to

supervise and provide connectivity on the MPPCB server. Water samples were collected from the ETP outlet and from the nalla (drain) at the factory's end point before going outside the premises. The analysis report is as tabulated below:

ix.

S.NO	Parameter	Unit	Sampling		Acceptable limit as per the Consent to Operate
			ETP Outlet	Treated wastewater before going	
1.	pH	-	8.54	7.19	5.5-9.0
2.	Chloride	mg/ l	260.17	571.59	1000
3.	TSS	mg/ l	78	116	100
4.	TDS	mg/ l	836	1814	2100
5.	BOD (3 days)	mg/ l	22	26	30
6.	COD	mg/ l	176.4	196	250

Copy of the analysis report is enclosed as **Annexure-X**.

ix. The water supply for the Ordnance factory, residential colony, and Kendriya Vidyalaya is sourced from the Tawa River. The factory has a water treatment plant at the Tawa River intake. Additionally, there is one bore well on the factory premises, which is reserved for emergency use. The bore well on the school premises is exclusively used for gardening and plantation purposes. Water samples of the bore wells were collected and the analysis report state that the borewell water quality is in the acceptable limits stipulated under IS: 10500:2012. The results are as tabulated below:

S.NO.	Parameter	Unit	Sampling location		Acceptable limit as per the [IS:
			Borewell inside the Kendriya	Borewell near main gate	
	Turbidity	NTU	0.3	0.8	1
1.	pH	-	7.16	6.61	6.5-8.5
2.	Total Alkalinity	mg/ l	156	178	200
3.	Total hardness	mg/ l	148	172	200
4.	Chloride	mg/ l	83.76	114.31	250
5.	TDS	mg/ l	342	384	500
6.	NO ₃ -N	mg/ l	0.1	0.35	45
7.	Calcium	mg/ l	38.4	40.8	75
8.	Magnesium	mg/ l	12.68	17.07	30

Copy of the analysis report is enclosed as **Annexure- XI**.

The ambient air quality was also monitored at 03 locations viz. Near Guest house-1 (IB), Kendriya Vidyalaya and Back side of N.C. Office. The monitoring was carried out for Particulate matter

(PM10 & PM2.5), Sulfur Di Oxide & Oxides of Nitrogen. The results are as tabulated below:

S.NO	Parameters	Unit	Monitoring Location			NAAQS,2009 (24 hourly) $\mu\text{g}/\text{ms}$
			Guest house -1 (IB)	Kendri ya Vidyalya	Back side of N.C. Office	
1.	PM ₁₀	$\mu\text{g}/\text{m}^3$	73.36	85.57	140.29	100
2.	SO ₂	$\mu\text{g}/\text{m}^3$	BDL	BDL	16.65	80
3.	NO _x	$\mu\text{g}/\text{m}^3$	10.06	13.97	27.94	80
4.	PM _{2.5}	$\mu\text{g}/\text{m}^3$	22.25	29.87	46.12	60

Except at the Back side of N.C. Office location where PM₁₀ concentration was found exceeding the prescribed standard; at all the locations the pollutant concentration was well within the limit. Copy of the monitoring report is enclosed as **Annexure-XII**.

xi. The committee invited Mr. Mahesh Patel to discuss the issue raised in the letter petition. Mr. Patel stated that he was unaware of any application made to the Hon'ble NGT and had not lodged any such complaint. He also clarified that the letterhead used for the complaint/application was not authentic and did not belong to their INTUC union. Mr. Mahesh Patel currently holds the position of Chairman in this union. The copy of the statement made by the Applicant Sh Mahesh Patel and the copy of the original letter head is enclosed as **Annexure-XIII**. Despite the applicant's denial of making the application, the committee deemed it prudent to assess environmental quality and verify the factual status of the issues raised in the said application.

4.0 Conclusion:

Despite the applicant's denial of making the application, the committee deemed it prudent to assess environmental quality and verify the factual status of the issues raised in the said application. The observation made during the visit states that the factory is

situated on lower elevation and there are many rain-fed natural drain which either passed through the premises or along the periphery. The water is sources from Tawa River and the water utilized in the process is treated through the ETP of 1000KLD capacity having neutralization, clarification and settling system.

The treated effluent has shown the treatment as per the consent condition. However, the increasing values of TDS in the water going outside the premises reveals that the ETP need to be upgraded to Reverse Osmosis process to cater the increasing values of the TDS and to minimize the chances of direct discharge of the treated effluent outside the premises. The condition of oxidation ponds constructed for domestic waste treatment was not good and require proper management. The borewell water quality of factory premises and the Kendriya Vidhyalay was within the acceptable limits of IS: 10500:2012. The ponds which were constructed in year 2016-17 for water harvesting were visited and observed that one was filled at shallow depth with rain water however another was empty. Currently there was no pipeline observed that was used to fill up the ponds with the effluent. Factory occupier needs to ensure that no such collection system of treated wastewater is to be practiced in the name of water harvesting till it is not approved by MPPCB. The Ambient air quality was monitored at 03 locations. Except at back side of the N.C. Office where PM10 values were exceeding the prescribe norms, all other locations Air quality was under the prescribed limits. The submission of the Chief Medical Officer, Itarsi revealed that there is no major water borne disease cases reported in the students of the Kendriya Vidhyalay and resident of the estate.

5.0 Recommendation:

- i. To clean the unwanted shrubs, grasses in and around the oxidation pond to ensure effective management of the domestic wastewater. Along with this occupier need to upgrade the domestic wastewater treatment to SBR/MBBR based Sewage Treatment Plant.*
- ii. To upgrade the ETP upto tertiary treatment i.e. Reverse Osmosis (RO) in*

light of the increasing values of Total Dissolved Solids (TDS).

- iii. To ensure that no untreated/treated wastewater goes outside the premises after mixing with the natural rain-fed drain for this occupier need to plug all the points from where the treated/untreated wastewater meets the natural drains. The occupier needs to establish Pan-Tilt-Zoom (PTZ) camera & pH sensor on each of the 06*

major drains which are going outside the premise & on ETP outlet to ensure & vigil that no effluent goes outside the premise and meets natural drain. The occupier needs to provide the connectivity to MPPCB surveillance centre.

iv. The occupier needs to install electromagnetic flow meter at different locations to measure the quantity of daily water consumption and waste water generation.

v. Occupier need to immediately repair the ultrasonic flow meter install at the outlet of treated water collection tank and provide the connectivity to MPPCB surveillance centre.

vi. Occupier need to install lime bed quenching system for control of SO₂ from boiler house till the shift to cleaner fuel in place of Furnace Oil (FO). The occupier also submit the time bound action plan to shift from FO to cleaner fuel.

vii. Occupier shall ensure that the treated effluent shall not be used for water harvesting structures without obtaining permission of MPPCB.

viii. Occupier need to provide fencing around the ponds to avoid any accident.”

5. From the report we find that ordnance factory is manufacturing defense ammunition, including, explosives but effluent has not been tested with regard to presence of heavy metals. On these aspects, report submitted by MPPCB is absolutely incomplete and inadequate. We fail to understand as to how experts of MPPCB were not aware that the project in question is a defense establishment where obviously nature of raw material used may result in discharge of heavy metals in effluent, still, testing on this aspect has not been conducted. Further, on account of some aspects like total solids/total dissolved solids, etc., there is non-compliance.

6. Hence, we find it appropriate to implead following as respondents:-

1. State of Madhya Pradesh through Principal Secretary/
Additional Chief Secretary, Environment Forest and Climate

Change, Vallabh Bhawan, Bhopal, Madhya Pradesh, Pin Code:
462004 Phone: 0755-2441085

2. Madhya Pradesh Pollution Control Board through its Member Secretary E-5, Paryavaran Parisar, Arera Colony, Bhopal, Madhya Pradesh, Pin Code: 462016,
3. District Magistrate, Hoshangabad, Collectorate, Hoshangabad, Narmadapuram, Madhya Pradesh, Pin Code: 461001
4. Central Pollution Control Board through Member Secretary, Parivesh Bhawan, East Arjun Nagar, Delhi, Pin Code: 110032
5. Ordnance factory, Itarsi, District, Narmadapuram, M.P through its General Manager, Ordnance Factory Itarsi, Itarsi, Narmadapuram, Madhya Pradesh, Pin Code: 461122
7. On behalf of State of Madhya Pradesh and District Magistrate, Hoshangabad, notice has been accepted by Ms. Soumya Priyadarshini, Advocate. Hence, no formal notice need be issued to them.
8. Sh. Raghav Sharma, Advocate has accepted notice on behalf of MPPCB.
9. Registry may issue notice to Ordnance factory, Itarsi, District, Narmadapuram, M.P, and CPCB
10. Respondents may file their responses within three weeks.

11. List on 29.11.2024.

Sudhir Agarwal, JM

Dr. Afroz Ahmad, EM

October 24, 2024
Original Application No.930/2024
AB