

## **AGENDA ITEM NO. 197.03**

**FIXING THE STANDARDS FOR DISCHARGE OF TREATED GREY WATER THROUGH NATURAL TREATMENT SYSTEM (WASTE STABILIZATION POND, CONSTRUCTED WETLAND ETC.) FOR IRRIGATION AND OTHER NON-POTABLE USAGES AND STANDARDS FOR DISCHARGE OF TREATED WASTEWATER OF STPS FOR VARIOUS USAGE (IRRIGATION, INDUSTRIAL PROCESSES, CONSTRUCTION ACTIVITIES, OTHER NON-POTABLE USAGES AND GROUNDWATER RECHARGE THROUGH LAKES, PONDS, WATER STORAGE AREA, NATURAL OR ARTIFICIAL DEPRESSION).**

03/01

**Fixing the standards for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetland etc.) for irrigation and other non-potable usages and standards for discharge of treated wastewater of STPs for various usage (irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression)**

As per the provisions of section 17 of the Water Act, 1974, one of the functions of the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs), constituted under Water Act, 1974, is to plan a comprehensive programme for prevention, control or abatement of pollution of streams and well in the State and to secure the execution thereof. Other functions of the Board as mentioned under section 17 {sub section (f) to (m)} of the said Act are reproduced as under:

(f) 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 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;

(g) Lay down, modify or annul effluent standards for the sewage and trade effluents and for the quality of receiving waters (not being water in an inter State stream) resulting from the discharge of effluents and to classify waters of the State;

(h) To evolve economical and reliable methods of treatment of sewage and trade effluents, having regard to the peculiar conditions of soils, climate and water resources of different regions and more especially the prevailing flow characteristics of water in streams and wells which render it impossible to attain even the minimum degree of dilution;

(i) To evolve methods of utilization of sewage and suitable trade effluents in agriculture;

(j) To evolve efficient methods of disposal of sewage and trade effluents on land, as are necessary on account of the predominant conditions of scant stream flows that do not provide for major part of the year the minimum degree of dilution;

(k) To lay down standards of treatment of sewage and trade effluents to be discharged into any particular stream taking into account the minimum fair weather dilution available in that stream and the tolerance limits of pollution permissible in the water of the stream, after the discharge of such effluents;

(l) To make, vary or revoke any order --

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(i) For the prevention, control or abatement of discharge of waste into streams or wells;

(ii) Requiring any person concerned to construct new systems for the disposal of sewage and trade effluents or to modify, alter or extend any such existing system or to adopt such remedial measures as are necessary to prevent control or abate water pollution;

(m) To lay down effluent standards to be complied with by persons while causing discharge of sewage or sullage or both and to lay down, modify or annul effluent standards for the sewage and trade effluents;

Further, as per the provisions of sub rule 2 of rule 3 of Environment (Protection) Rule, 1986, a State Board may specify more stringent standards from those provided in (Schedules I to IV) as mentioned in sub rule 1 in respect to any specific industry, operation or process depending upon the quality of the recipient system and after recording reasons, therefore in writing.

The Board in exercise of powers conferred under section of 17 of Water Act, 1974 and rule 3 of E(P) rule, 1986, has notified standards for discharge of treated sewage/effluent from STPs vide order dated 2.7.2020, which are mentioned as per **Table-1** given below:

**Table-1: Effluent discharge standards of STPs**

Sewage/effluent discharge standards for Sewage Treatment Plant		
Sr. No.	Parameters	Parameters limit
1	pH	5.0-9.0
2	BOD, mg/l	10
3	COD, mg/l	50
4	TSS, mg/l	20
5	Total Nitrogen, mg/l	10
6	Total Phosphorus (for discharge into ponds, lakes), mg/l	1
7	Faecal Coliform (MPN/100 ml)	Less than 100

These standards have been notified by the Board vide order dated 2.7.2020 (copy enclosed as per **ANNEXURE-1**).

As per rule 3 of Environment (Protection) Rule, 1986, the State Pollution Control Board can specify more stringent standards from those provided under rule 3 of Environment (Protection) Rule, 1986 depending upon the quality of recipient system

and after recording the reasons, therefore, in writing & there are following grounds/reasons for fixing stringent standards for discharge of treated wastewater of STPs for various usage (irrigation, industrial purposes, construction activities, non potable usages and groundwater recharge through ponds, lakes, water storage area, natural or artificial depression etc.) and discharge of treated grey water (through natural treatment system) for irrigation and other non potable usage.

i). The quality of flow in river Yamuna and River Ghaggar has drastically come down during the recent years and this river have no flow in some stretches in non rainy periods and especially in summer and significant dilution is not available in these rivers. Therefore, the discharge of treated/untreated sewage/grey water in river system is required to be curtailed so as to maintain the quality of water in river system of the State.

ii). The State of Haryana has been categorized as water deficit State particularly regarding surface and groundwater resources. As per the information available with Haryana Water Resources Authority, it has been projected that there is water gap of 14 Lakh Crore liters after taking into account the demand of 30.57 Lakh Crore liters and supply of 44.60 Lakh Crore liters. Thus, there is urgent need to save groundwater and other resources of water, which may be possible if the treated sewage/grey water, conforming to the prescribed standards, is reused/recycled for various usages along with its use for irrigation and other non potable usages.

iii). Hon'ble Chief Minister, Haryana in various forums and especially in Water Conclave organized on 26.4.2023 and 27.4.2023 has given mandate to the departments to save groundwater and utilize the treated sewage of STPs and treated grey water of rural areas for irrigation and reuse/recycled the same for other non potable usages.

Therefore, in order to save groundwater by way of utilization of treated sewage for irrigation and other non potable usages, the Board has made deliberations in various meetings held on 9.2.2023, 25.4.2023, 24.5.2023, 6.7.2023 and 18.7.2023. The minutes of the meeting held on 24.5.2023 and 18.7.2023 are annexed as per **ANNEXURES 2 and 3**. The proposed standards for discharge of treated wastewater of STPs for various usages (irrigation, construction activities, industrial processes, other non potable usages, ground water recharging through ponds, lakes, water storage area, natural or artificial depression etc.) and for discharge of treated grey water through natural treatment (waste stabilization ponds, constructed wetlands etc.) for irrigation and other non potable usages were published in the leading News papers on 13.6.2023 and 5.8.2023, respectively, for inviting objections/suggestions from all the concerned with last date on 28.6.2023 and 20.8.2023, respectively. The suggestions given by four departments

namely MICADA, Public Health Engineering Department, Development and Panchayat Department and Aravali Power Co. Pvt. Ltd., Jhajjar on various parameters and their concentration in treated wastewater of STPs and the Chief Engineer, Department of Irrigation on the value of TDS parameter to keep it as 1500 mg/l same for both the treated wastewater of STPs and treated grey water, were considered by the Board in the meeting of Technical Experts/ Scientists of various organization/ Institutions and officers of concerned departments held on 05.09.2023 and finalized the standards for discharge of treated wastewater of STPs for various usage (irrigation, industrial purposes, construction activities, non potable usages and groundwater recharge through ponds, lakes, water storage area, natural or artificial depression etc.) and standards for discharge of treated grey water (through natural treatment system) for irrigation and other non potable usage. The minutes of the meeting held on 05.09.2023 are annexed as per ANNEXURES-4.

The standards prescribed by Board for discharge of treated wastewater of STPs for various usage (irrigation, industrial purposes, construction activities, non potable usages and ground water recharge through ponds, lakes, water storage area, natural or artificial depression etc.) and standards for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetland etc.) for irrigation and other non potable usage, as deliberated in the meeting held on 5.9.2023, are mentioned as per Table-2 and 3 given below.

**Table-2: Final discharge standards of treated grey water for irrigation and other non potable usage**

Sr. No.	Parameters	Maximum permissible limits
1	pH	6.5-8.5
2	BOD (mg/l)	20
3	COD (mg/l)	100
4	Sodium (mg/l)	75
5	TSS (mg/l)	20
6	TDS (mg/l)	<ul style="list-style-type: none"> <li>• 750 for non potable usages</li> <li>• 1500 for irrigation</li> </ul>
7	Chloride (mg/l)	100
8	Sodium Adsorption Ratio (SAR) (meq/l)	10
9	Residual Sodium Carbonate (RSC) (meq/l)	1.5
10	Electrical Conductivity (EC) ( $\mu$ mhos/cm)	750

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11	Total Nitrogen (mg/l)	20
12	Ammonical Nitrogen (mg/l)	5
13	Nitrate Nitrogen (mg/l)	10
14	Total Phosphorous (mg/l)	5
15	Phosphate P (Dissolved) (mg/l)	1
16	Total Hardness (mg/l)	200
17	Faecal Coliform (MPN/100 ml)	250
18	E.Coli (MPN/100 ml)	ND
19	Ionic detergents (MBAS) (mg/l)	0.2
20	Fluoride (mg/l)	1.0
21	Boron (mg/l)	1.0
22	Sulphate (mg/l)	200
23	Heavy metals	The treated grey water of various ponds and other water bodies may be analyzed for heavy metal once in a year to check their concentration. In case the concentration of heavy metals is found more than the permissible limits in the treated grey water, appropriate treatment may be imparted to the grey water to bring the concentration of various heavy metals within the prescribed limits.

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**Table-3: Maximum permissible limits for discharge of treated wastewater of STPs for irrigation, Industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds and other water storage areas and natural or artificial depression.**

S. No.	Parameters	Current HSPCB discharge standards for STP	Maximum permissible limits for discharge of treated wastewater of STPs for:-		
			Irrigation	Industrial processes, construction activities and other non-potable usage	Groundwater recharge through lakes, ponds, water storage area, natural or artificial depression
1	pH	5.5-9.0	6.5-8.0	6.5-8.0	6.5-8.0
2	BOD (mg/l)	10	10*	10	10
3	COD (mg/l)	50	50*	50	50
4	FOG (mg/l)	-	Nil	Nil	Nil
5	TSS (mg/l)	20	20	10	10
6	TDS (mg/l)	-	1500	750	500
7	Chloride (mg/l)	-	100	100	100
8	HCO <sub>3</sub> (mg/l)	-	300	300	300
9	Sulphate (mg/l)	-	200	200	200
10	Fluoride (mg/l)	-	1	1	1
11	Total Nitrogen (mg/l)	-	20	20	20
12	Ammonical Nitrogen (mg/l)	-	5	5	5
13	Nitrate Nitrogen (mg/l)	-	10	10	10
14	Total Phosphorous (mg/l)	-	5	5	5
15	Phosphate P (Dissolved) (mg/l)	-	1	1	1
16	Total S (Sulphide) (mg/l)	-	0.01	0.01	0.01
17	Phenolic compound (mg/l)	-	0.002	0.002	0.002
18	Sodium (mg/l)	-	100	100	75
19	Magnesium (mg/l)	-	60	60	30
20	Calcium (mg/l)	-	100	100	75

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21	Ionic detergents (MBAS) (mg/l)	-	<1	<1	0.2
22	Residual Chlorine (mg/l)	-	0.2	0.2	0.2
23	Total Alkalinity as CaCO <sub>3</sub> (mg/l)	-	200	200	200
24	Total Hardness (mg/l)	-	200	200	200
25	Faecal Coliform (MPN/100 ml)	<100	100	100	100
26	E.Coli (MPN/100 ml)	-	ND	ND	ND
27	Intestinal helminth eggs (MPN/100ml)	-	ND	ND	ND
28	Sodium Adsorption Ratio (SAR) (meq/l)	-	10	10	3.0
29	Residual Sodium Carbonate (RSC) (meq/l)	-	2.5	2.5	1.5
30	Electrical Conductivity (EC) (µmhos/cm)	-	2000	1200	750
31	Boron (mg/l)	-	1.0	1.0	0.5
32	Cu (Copper) (mg/l)	-	1.5	1.5	0.2
33	Fe (Iron) (mg/l)	-	5.0	5.0	0.3
34	Mn (Manganese) (mg/l)	-	0.5	0.5	0.3
35	Cr (Chromium) (mg/l)	-	0.2	0.2	0.1
36	Ni (Nickel) (mg/l)	-	0.20	0.20	0.02
37	Pb (Lead) (mg/l)	-	0.01	0.01	0.01
38	As (Arsenic) (mg/l)	-	0.01	0.01	0.01
39	Cd (Cadmium) (mg/l)	-	0.01	0.01	0.003
40	Co (Cobalt) (mg/l)	-	0.05	0.05	0.05
41	Li (Lithium) (mg/l)	-	2.5	2.5	2.5

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42	Zn (Zinc) (mg/l)	-	2.0	2.0	2.0
43	Hg (Mercury) (mg/l)	-	0.001	0.001	0.001
44	Al (Aluminium) (mg/l)	-	1.0	1.0	0.03
45	Be (Beryllium) (mg/l)	-	0.1	0.1	0.1
46	CN (Cyanide) (mg/l)	-	ND	ND	ND
47	Mo (Molybdenum) (mg/l)	-	0.01	0.01	0.01
48	Se (Selenium) (mg/l)	-	0.02	0.02	0.01
49	V (Vanadium) (mg/l)	-	0.1	0.1	0.1
50	Ba (Barium) (mg/l)	-	1.0	1.0	0.7
51	Ag (Silver) (mg/l)	-	0.1	0.1	0.1

Note:-

- i. If the operating agency uses the treated wastewater of STPs entirely for irrigation purposes than BOD of 30 mg/l and COD of 150 mg/l will be permissible provided the treated wastewater is not discharged into Drain/Nallah/River/any other surface water, under any circumstance.
- ii. The maximum permissible limits for discharge of treated wastewater of STPs for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression as prescribed by the Board shall be valid initially for 03 years, well before which, detailed study with reference to effect of heavy metal and other parameters on the quality of soil, crop, horticulture, human and animal species shall be carried out jointly by Haryana Agriculture University (HAU), Hisar and Indian Agricultural Research Institute (IARI), New Delhi. The expenditure to be incurred on the said study shall be borne by Haryana State Pollution Control Board for which prior sanction of the project shall be obtained by the said organizations from the Board. For this purpose, HAU will be coordinating agency.
- iii. No indiscriminate disposal of treated or untreated sewage/effluent shall be allowed.

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- iv. During groundwater recharging with treated wastewater, recharging shall be allowed through ponds, lakes, water storage area and natural or artificial depression but no direct injection of treated wastewater in underground strata will be permitted.
- v. HSPCB shall carryout close monitoring of usages of treated wastewater of STPs and shall ensure that treated sewage of STPs is only used for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression and no direct injection of treated wastewater in underground strata will be permitted.
- vi. With the adoption of the above standards for utilization of treated sewage for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression, the earlier discharge standards of treated sewage of STPs, as prescribed by HSPCB vide its order dated 2.7.2020, shall be superseded.

The matter regarding fixing the standards for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetland etc.) for irrigation and other non-potable usages and standards for discharge of treated wastewater of STPs for various usage (irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression) is placed before the Board for consideration and approval.

*D*



03/10  
Annexure-1

**HARYANA STATE POLLUTION CONTROL BOARD**  
**C-11, SECTOR-6, PANCHKULA**  
**Website - [www.hspcb.gov.in](http://www.hspcb.gov.in)**  
**E-Mail: [hspcbho@gmail.com](mailto:hspcbho@gmail.com), Ph:0172-2577870-873**

**Sub:- Fixing of effluent discharge standards for Sewage Treatment Plants (STPs).**

Whereas, amongst others, under section 17 of the Water (Prevention & Control of Pollution) Act, 1974, one of the functions of the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs), constituted under the Water (Prevention & Control of Pollution) Act, 1974 is to plan a comprehensive programme for prevention, control or abatement of pollution of streams and wells in the State and to secure the execution thereof;

Whereas, this Board is regularly monitoring the water quality of Water Bodies in the State of Haryana and the water quality monitoring results of rivers has indicated that water quality has been affected because of disposal of untreated or partially treated sewage into the water bodies and as a result, there is high concentration of pollutants making the water body unfit for human consumption or for other uses;

Whereas, Haryana State Pollution Control Board has adopted the standard for emission or discharge of Environmental Pollutants as prescribed under Section 3 of Environment (Protection) Rules, 1986 but the standards for discharge of Faecal Coliform in sewage effluent discharging from sewage treatment plants (STPs) has not been prescribed therein;

Whereas, the State Pollution Control Board under section 17 of the Water Act has been mandated with the following functions which inter-alia include;

- (f) 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 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;
- (g) lay down, modify or annul effluent standards for the sewage and trade effluents and for the quality of receiving waters (not being water in an inter-State stream) resulting from the discharge of effluents and to classify waters of the State;
- (h) to evolve economical and reliable methods of treatment of sewage and trade effluents, having regard to the peculiar conditions of soils, climate and water resource of different regions and more especially the prevailing flow characteristics of water in streams and wells which render it impossible to attain even the minimum degree of dilution;
- (i) to evolve methods of utilization of sewage and suitable trade effluents in agriculture;
- (j) to evolve efficient methods of disposal of sewage and trade effluents on land, as are necessary on account of the predominant conditions of scant stream flows that do not provide for major part of the year the minimum degree of dilution;
- (k) to lay down standards of treatment of sewage and trade effluents to be discharged in to any particular stream taking into account the minimum fair weather dilution available in that stream and the tolerance limits of pollution permissible in the water or the stream, after the discharge of such effluents;

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03/11

(m) to lay down effluent standards to be complied with by persons while causing discharge of sewage or sullage or both and to lay down, modify or annul effluent standards for the sewage and trade effluents;

Whereas, as per section 3 of the Environment (Protection) Rules, 1986, the State Pollution Control Board can specify more stringent standards from those provided under Section 3 of Environment (Protection) Rules, 1986, depending upon the quality of recipient system and after recording the reasons, therefore, in writing & there are following grounds/reasons for fixing stringent standards for discharge of faecal coliform in sewerage effluent from the STPs:

1. The quantity of flow in River Yamuna and River Ghaggar has drastically come down during the recent years and these rivers have no flow in some stretches in non rainy periods and especially in summer. The State Pollution Control Board has been given mandate under section- 17(k) of the Water Act, 1974 to lay down standards of treatment of sewage to be discharge into any stream taking into account the minimum dilution available to maintain the quality of recipient Water Bodies & Rivers as per prescribed standards and accordingly, the revised standard are required for STPs which are discharging sewage.
2. The Hon'ble NGT has already issued various directions and state has to maintain the water quality standards in the rivers.
3. The State Govt. has already submitted Yamuna Action Plan and Ghaggar Action Plan before the Hon'ble NGT in OA No. 673 of 2018 "More River Stretches are Critically Polluted now: CPCB", wherein, as per objective of the Action Plans, to achieve standards for faecal coliform in sewage discharged less than 500 MPN / 100 ml.;

Whereas, in matter of OA No. 138 of 2016 titled as "Stench Grips Mansa's Sacred River Ghaggar", vide order dated 15.06.2020, Hon'ble NGT has fixed standards for Faecal Coliform as "less than 100 MPN/ 100 ml" and accordingly, this standard for faecal coliform has to be complied with.

Whereas, a public notice was published in Newspaper on 29.05.2020 for inviting objections / suggestions for proposed standards for discharge from STPs and no objections/ suggestions have been received from any quarter.

Therefore, considering all the aspects and under the powers conferred as per Section 3 of the Environment (Protection) Rules, 1986 & Section 17 of Water (Prevention and Control of Pollution) Act, 1974, the standard for discharge of treated sewage/ effluent from the STPs are fixed as given below:-

Sewage/ Effluent Discharge Standards For Sewage Treatment Plant		
Sr. No.	Parameters	Parameters Limit
1	pH	5.5 - 9.0
2	BOD (mg/l)	10
3	COD (mg/l)	50
4	TSS (mg/l)	20
5	Total Nitrogen (mg/l)	10
6	Total Phosphorus (for discharge into Ponds, Lakes) (mg/l)	1
7	Faecal Coliform (MPN/100 ml)	Less than 100

03/12

Further, with the power conferred under Section 33 A of the Water (Prevention & Control of Pollution) Act, 1974, the Haryana State Pollution Control Board issues following directions to all the Government Departments/ Agencies/ Units responsible for management & treatment of sewage effluents with regard to achieve the stringent standards for discharge of effluent as fixed by HSPCB:-

1. All the existing / under construction STPs/ under upgradation and modification which have been designed and executed for above parameters shall achieve above discharge standards immediately. The sewerage treatment plants to be installed in future, will be designed and constructed to achieve the above proposed discharge standards.
2. STPs which have not been designed for above standards so far shall achieve above discharge standards within 1 years in case of standards at Sr. No. 1 to 6.
3. The above faecal coliform standards shall to applicable to all STPs including existing STPs.

Dated the  
2<sup>nd</sup> July, 2020

Sh. Ashok Kheterpal,  
Chairman

No. HSPCB/ WC-2 / 2162-2169

Dated:-02.07.2020

A copy of the above is forwarded to the following for information and further necessary action please:-

1. Chief Secretary, Haryana, Chandigarh.
2. Chief Executive Officer, GMDA, Gurugram.
3. Additional Chief Secretary, PHED, Haryana, Chandigarh.
4. Additional Chief Secretary, Irrigation Department, Haryana, Chandigarh.
5. Additional Chief Secretary, ULBD, Haryana, Chandigarh.
6. Principal Secretary, Industries Department, Haryana, Chandigarh.
7. Principal Secretary, Town & Country Planning Department, Haryana, Chandigarh.
8. Principal Secretary, D & P Department, Haryana, Chandigarh.

-sd-  
Sr. Env. Engineer (WC),  
For Chairman.

Endst. No. HSPCB/ WC-2 / 2170-2199

Dated:-02.07.2020

A copy of the above is forwarded to the following for information and further necessary action please:-

1. All Branch Incharges.
2. All Regional Officers in field.
3. All Lab Incharges.

-sd-  
Sr. Env. Engineer (WC),  
For Chairman.

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Annexure-2



HARYANA STATE POLLUTION CONTROL BOARD  
C-11, SECTOR-6, PANCHKULA

Website - [www.hspcb.org.in](http://www.hspcb.org.in) E-Mail: [hspcbscientific@gmail.com](mailto:hspcbscientific@gmail.com)  
Ph: 0172-2577870-873

To

HSPCB/SSC/5336-5344

Dated- 02/06/2023

1. Director, Horticulture Department, Govt. of Haryana, Panchkula
2. Chief Administrator, HSVP, Panchkula
3. Director, Development & Panchayat Department, Govt. of Haryana
4. Director, Urban Local Bodies Department, Govt. of Haryana, Panchkula
5. Director, Agriculture Department, Govt. of Haryana, Panchkula
6. Dean, College of Agriculture, HAU, Hisar
7. Engineer-in- Chief, PHED, Govt. of Haryana
8. Engineer-in- Chief, Irrigation Department, Govt. of Haryana
9. Director, ICCSRI, Karnal

**Sub:-** Proceedings of the meeting held under the Chairmanship of Sh. P. Raghavendra Rao, Chairman in the HSPCB, Conference Room, C-11, Sec-06, Panchkula at 11:00 AM on 24.05.2023 regarding fixing of discharge norms for STPs for Irrigation, Industrial processes, construction activities, other non potable usage and groundwater recharging.

Kindly refer to the subject noted above.

In this connection, I have been directed to enclose herewith the proceedings of the meeting held under the Chairmanship of Sh. P. Raghavendra Rao, Chairman in the HSPCB, Conference Room, C-11, Sec-06, Panchkula at 11:00 AM on 24.05.2023 regarding fixing of discharge norms for STPs for Irrigation, Industrial processes, construction activities, other non potable usage and groundwater recharging for your information and necessary action please.

DA/As above

*[Signature]*  
Sr. Env. Engineer (HQ)  
For Chairman

Endst. No. HSPCB/SSC/5345-5351 Dated: 02/06/2023

A copy of the above is forwarded to the following for information, please -

1. Chief Executive Officer, HWRA
2. Dr. KC Bangar, Advisor, Environment and Climate Change Department, Haryana
3. Dr. Babu Ram, Technical Expert, HSPCB
4. Sh. Adrash Akolkar, Ex, MS, HSPCB
5. Prof. CR Babu, IIT Delhi.
6. Dr. Rakesh Kumar, Agriculture University, Hisar
7. Dr. Ravinder Kaur, Indian Agriculture Research Institute, Delhi

*[Signature]*  
Sr. Env. Engineer (HQ)  
For Chairman

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Proceedings of the meeting held under the Chairmanship of Sh. P. Raghavendra Rao, Chairman, HSPCB on 24.5.2023 at 11:00 AM in the Conference Room, C-11, Panchkula to review the proposed discharge norms of treated wastewater of STPs for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression.

List of the participants is attached at Annexure-1.

At the outset of meeting, the Chairman, HSPCB welcomed all the technical experts/scientists of various organizations and officers of the various departments. It was apprised that discharge standards of STPs were proposed for reuse of treated wastewater of STPs for irrigation, industrial processes, construction activities and other non-potable usages by the technical experts/scientists in the earlier two meetings held on 9.2.2023 and 25.4.2023. The minutes of the 2nd meeting held on 25.4.2023 were conveyed to officers of all the departments vide no. HSPCB/2023/7835-7842 dated 25.4.2023. The standards proposed for utilization of treated sewage of STPs for various usages were published in the leading Newspapers on 5.5.2023 for inviting objections/suggestions from all the stakeholders within 15 days. However, no comments/suggestions/objections have been received from any stakeholder.

The technical experts/scientists of various organizations held detailed deliberation on each parameter as mentioned in Table-1 to 17 of the agenda (Annexure-2) and proposed modification/amendments in the parameters, as under:

i. **Nitrogen**

It was proposed that upper limit for Nitrogen may be prescribed as under:

- Total Nitrogen: **20 mg/l**
- Ammonical Nitrogen: **5 mg/l**
- Nitrate Nitrogen: **10 mg/l**

The values of said parameters may be prescribed for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.

ii. **Phosphorous**

It may be written as under:

- Total Phosphorous: **5 mg/l**
- Phosphate P (Dissolved): **1 mg/l**

The values of the said parameters may be prescribed for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.

iii. **Cyanide (CN)**

It may be prescribed as **ND** for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.

iv. **Lead (pb)**

It may be prescribed as **0.01 mg/l** for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.

v. **Lithium**

It may be prescribed as **2.5 mg/l** for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.

vi. **Mercury (Hg)**

It may be prescribed as **0.001 mg/l** for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.

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vii. **Molybdenum (MO)**

It may be prescribed as **0.01 mg/l** for usage of treated wastewater of STPs for irrigation and other purposes, including for groundwater recharge.

viii. **Selenium**

It may be prescribed as **0.02 mg/l** for usage of treated wastewater of STPs for irrigation and other purposes.

ix. **Parameters, Tin, Thallium and Vanadium may be deleted**

x. **TSS**

It may be prescribed as **20 mg/l** for usage of treated wastewater of STPs for irrigation and for other purposes and for groundwater recharge, it may be prescribed as **<10 mg/l**.

xi. **Table-7 of agenda (Annexure-2) may be deleted**

xii. **In Table-8, the value of BOD, COD and TSS for utilization of treated wastewater of STPs for groundwater recharge may be prescribed as <10 mg/l, <50 mg/l and <10 mg/l, respectively.**

xiii. **F.coli parameter may be prescribed as maximum 100 MPN/100 ml for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.**

xiv. **E.coli**

It may be mentioned as **ND** for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.

xv. **Intestinal helminth eggs**

It may be prescribed as **ND** for all usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.

xvi. **DO**

It was suggested that said parameter may be **deleted** as it is related to BOD parameter.

xvii. **Turbidity**

It may be **deleted** as the relevant parameter TSS has been considered.

xix. **FOG**

It may be prescribed as **NIL** for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.

xx. **MBAS**

It may be prescribed as **<1 mg/l** for usage of treated wastewater of STPs for irrigation and all other purposes.

xxi. **Phenolic compound**

It may be prescribed as **0.002 mg/l** for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.



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**xxii. Bicarbonate (HCO<sub>3</sub>)**

It may be prescribed as **300 mg/l** for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.

**xxiii. Lithium**

It may be prescribed as **2.5 mg/l** for usage of treated wastewater of STPs for irrigation and all other purposes, including for groundwater recharge.

**xxiv. Total Kjeldahl Nitrogen, Hydrocarbons and Floatables mentioned in Table-12 of agenda may be deleted.**

**xxv. Antimony (Sb)**

It may be **deleted**.

**xxvi. TTCC (MPN/100 ml)**

It was suggested that instead of mentioning the value of TTCC, the value of **F.coli** parameter may be prescribed as max. **100 MPN/100 ml**.

Based on the suggestions/inputs given by the technical experts/scientists of various organizations and officers of various departments as mentioned above and after detailed deliberation made on each parameter, consolidated **Table-1**, mentioning the proposed treated wastewater discharge standards of STPs for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, other water storage areas and natural or artificial depression, has been prepared, which is mentioned as under:

**Table-1: Proposed treated wastewater discharge standards of STPs for irrigation, Industrial processes, construction activities, other non-potable usages and groundwater recharging through lakes, ponds and other water storage areas and natural or artificial depression.**

S. No.	Parameters	Current HSPCB discharge standards for STP	Proposed discharge standards for		
			Irrigation	Industrial processes, construction activities and other non-potable usage	Groundwater recharge through lakes, ponds, water storage area, natural or artificial depression
1	pH	5.5-9.0	6.5-8.5	6.5-8.5	6.5-8.5
2	BOD (mg/l)	10	10*	10	<10
3	COD (mg/l)	50	50*	50	<50
4	FOG (mg/l)	-	Nil	Nil	Nil
5	TSS (mg/l)	20	20	10	<10
6	TDS (mg/l)	-	1500	750	<500
7	Chloride (mg/l)	-	100	100	100
8	HCO <sub>3</sub> (mg/l)	-	300	300	300
9	Sulphate (mg/l)	-	200	200	200
10	Fluoride (mg/l)	-	1	1	1
11	Total Nitrogen (mg/l)	-	20	20	20
12	Ammonical Nitrogen (mg/l)	-	5	5	5
13	Nitrate Nitrogen	-	10	10	10

*R*

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S. No.	Parameters	Current HSPCB discharge standards for STP	Proposed discharge standards for		
			Irrigation	Industrial processes, construction activities and other non-potable usage	Groundwater recharge through lakes, ponds, water storage area, natural or artificial depression
	(mg/l)				
14	Total Phosphorous (mg/l)	-	5	5	5
15	Phosphate P [Dissolved] (mg/l)	-	1	1	1
16	S (Sulphide) (mg/l)	-	0.01	0.01	0.01
17	Phenolic compound (mg/l)	-	0.002	0.002	0.002
18	Sodium (mg/l)	-	100	100	75
19	Magnesium (mg/l)	-	60	60	30
20	Calcium (mg/l)	-	100	100	75
21	Ionic detergents (MBAS) (mg/l)	-	<1	<1	0.2
22	Residual Chlorine (mg/l)	-	0.2	0.2	0.2
23	Total Alkalinity as CaCO <sub>3</sub> (mg/l)	-	200	200	200
24	Total Hardness (mg/l)	-	200	200	200
25	Faecal Coliform (MPN/100 ml)	<100	<100	<100	<100
26	E. Coli (MPN/100 ml)	-	ND	ND	ND
27	Intestinal helminth eggs (MPN/100ml)	-	ND	ND	ND
28	Sodium Adsorption Ratio (SAR) (meq/l)	-	<10	<10	<3.0
29	Residual Sodium Carbonate (RSC) (meq/l)	-	<2.5	<2.5	<1.5
30	Electrical Conductivity (EC) (µmhos/cm)	-	<2000	<1200	<750
31	Boron (mg/l)	-	1.0	1.0	0.5
32	Cu (Copper) (mg/l)	-	0.2	0.2	0.05
33	Fe (Iron) (mg/l)	-	5.0	5.0	0.3
34	Mn (Manganese) (mg/l)	-	0.2	0.2	0.1
35	Cr (Chromium) (mg/l)	-	0.10	0.10	0.05
36	Ni (Nickel) (mg/l)	-	0.20	0.20	0.02
37	Pb (Lead) (mg/l)	-	0.01	0.01	0.01
38	As (Arsenic) (mg/l)	-	0.01	0.01	0.01
39	Cd (Cadmium)	-	0.01	0.01	0.003

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S. No.	Parameters	Current HSPCB discharge standards for STP	Proposed discharge standards for		
			Irrigation	Industrial processes, construction activities and other non-potable usage	Groundwater recharge through lakes, ponds, water storage area, natural or artificial depression
	(mg/l)				
40	Co (Cobalt) (mg/l)	-	0.05	0.05	0.05
41	Li (Lithium) (mg/l)	-	2.5	2.5	2.5
42	Zn (Zinc) (mg/l)	-	2.0	2.0	2.0
43	Hg (Mercury) (mg/l)	-	0.001	0.001	0.001
44	Al (Aluminium) (mg/l)	-	1.0	1.0	0.03
45	Be (Beryllium) (mg/l)	-	0.1	0.1	0.1
46	CN (Cyanide) (mg/l)	-	ND	ND	ND
47	Mo (Molybdenum) (mg/l)	-	0.01	0.01	0.01
48	Se (Selenium) (mg/l)	-	0.02	0.02	0.01
49	V (Vanadium) (mg/l)	-	0.1	0.1	0.1
50	Ba (Barium) (mg/l)	-	1.0	1.0	0.7
51	Ag (Silver) (mg/l)	-	0.1	0.1	0.1

\* If the operating agency usage the treated wastewater of STPs entirely for irrigation purposes than BOD of 30 mg/l and COD of 150 mg/l will be permissible provided the treated wastewater is not discharged into drain/nallah/river/any other surface water, under any circumstance.

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The meeting ended with a vote of thanks to the chair and all the participants.

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## Annexure-1

List of participants of meeting held under the Chairmanship of Sh. P. Raghavendra Rao, Chairman in the HSPCB, Conference Room, C-11, Sec-06, Panchkula at 11:00 AM on 24.05.2023 regarding fixing of discharge norms for STPs for Irrigation, Industrial processes, construction activities, other non potable usage and groundwater recharging.

Sr.No.	Name/ Department
1.	Sh. P. Raghavendra Rao, Chairman, HSPCB.....in Chair
2.	Sh. Pardeep Kumar, IAS, Member Secretary, HSPCB, Panchkula
3.	Dr. Babu Ram , Ex Member Secretary, PSPCB, Patiala
4.	Sh. Rakesh Kumar, CE, PHED, Panchkula
5.	Sh. SK Yadav, CE, MICADA, Irrigation Department, Panchkula
6.	Sh. JP Singh, SEE, HSPCB, Panchkula
7.	Sh. Yashpal Singh, XEN, I&WRD, Panchkula
8.	Sh. Ranbir Singh, XEN, DULB, Panchkula
9.	Sh. Amit Rathee, XEN, HSVP, Panchkula
10.	Sh. Gulshan Kumar, Sr. Manager, HSIIDC, Panchkula
11.	Sh. Jasvinder Singh, AE, Agriculture Department, Panchkula
12.	Sh. Rajiv Kr Goyal, AAE, Agriculture Department, Panchkula
13.	Sh. Sangeet Kumar, PO, Horticulture Department, Panchkula
14.	Sh. Narender, Agriculture Department, Panchkula
	<b>Through VC</b>
1.	Dr. KC Banger, Advisor, Environment and Climate Change Department, Haryana, Chandigarh
2.	Dr. Ravinder Kaur, Former Project Director, IARI, New Delhi
3.	Dr. Rakesh Sehrawat, HAU, Hisar

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## Annexure-2

**Agenda for fixation of effluent discharge norms of STPs for irrigation, industrial processes, construction activities, other non potable usage and groundwater recharging**

1) Having two meetings with Technical Experts/Scientists of various departments/organizations on 9.2.2023 and 25.4.2023, Haryana State Pollution Control Board has proposed standards for reuse of treated sewage from STPs for irrigation, industrial processes, construction activities and other non potable usages and objections/suggestions from all the stakeholder were sought through newspaper (The Tribune dated 5.5.2023) within 15 days. These proposed standards are mentioned as under:

**Proposed treated wastewater discharge standards of STPs for irrigation, industrial processes, construction activities and other non-potable usages**

S. No.	Parameters	Prescribed standards for		
		Discharge standards for STP	Irrigation	Industrial processes, construction activities and other non-potable usage
1	pH	5.5-9.0	6.5-8.5	6.5-8.5
2	BOD (mg/l)	10	10*	10
3	COD (mg/l)	50	50*	50
4	TSS (mg/l)	20	20	10
5	TDS (mg/l)		1500	750
6	Chloride (mg/l)		100	100
7	Sulphate (mg/l)		200	200
8	Fluoride (mg/l)		1.0	1.0
9	Total Nitrogen (mg/l)	10	10	10
10	Total Phosphorus (for discharge into Ponds, Lakes) (mg/l)	1	1	1
11	Faecal Coliform (MPN/100 ml)	<100	<100	< 100
12	Sodium Adsorption Ratio (SAR) (meq/l)		<10	<10
13	Residual Sodium Carbonate (RSC) (meq/l)		< 2.5	< 2.5
14	Electrical Conductivity (EC) ( $\mu$ mhos/cm)		<2000	<1200
15	Boron (mg/l)		1.0	1.0
16	Cu (Copper) (mg/l)		0.2	0.2
17	Fe (Iron) (mg/l)		5.0	5.0
18	Mn (Manganese) (mg/l)		0.2	0.2
19	Cr (Chromium) (mg/l)		0.10	0.10
20	Ni (Nickel) (mg/l)		0.20	0.20

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Cr (Chromium) (mg/l)	0.05	0.1	0.1	0.1	0.1	0.1	0.1
Co (Cobalt) (mg/l)	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Cu (Copper) (mg/l)	0.2	0.2	0.2	0.2	0.2	0.2	1.0
CN (Cyanide) (mg/l)	ND <sup>(b)</sup>	-	-	-	-	0.1	0.05
F (Fluoride) (mg/l)	-	1.0	1.0	-	1.0	2.0	1.5
Fe (Iron) (mg/l)	-	5.0	5.0	5.0	3.0	2.0	2.0
Pb (Lead) (mg/l)	0.1	5.0	5.0	5.0	0.1	0.1	0.1
Li (Lithium) (mg/l)	2.5	2.5	2.5	2.5	2.5	2.5	-
Mn (Manganese) (mg/l)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Hg (Mercury) (mg/l)	0.001	-	-	-	0.002	0.002	0.001
Mo (Molybdenum) (mg/l)	-	0.01	0.01	0.01	0.01	0.01	-
Ni (Nickel) (mg/l)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Se (Selenium) (mg/l)	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Sn (Tin) (mg/l)	-	-	-	-	-	-	3.0
Tl (Thallium) (mg/l)	-	-	-	-	-	-	0.001
V (Vanadium) (mg/l)	-	0.1	0.2	2.0	0.1	0.1	0.1
Zn (Zinc) (mg/l)	2.0	2.0	2.0	0.005	2.0	2.0	0.5

(a) No recommendation; (b) Not detected

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**Table-3: Effluent discharge standards for sewage treatment plant as recommended by CPCB (www.cpcb.nic.in).**

Sr. no.	Parameters	Parameters limits (Standard for new STPs design after notification)
1	pH	6.0-9.0
2	BOD, mg/l	Not more than 10
3	COD, mg/l	Not more than 50
4	TSS, mg/l	Not more than 20
5	NH <sub>4</sub> -N, mg/l	Not more than 5
6	N-total, mg/l	Not more than 10
7	Faecal Coliform, MPN/100ml	< 100

Note:

- i) These standards will be applicable for discharge in water resources as well as for land disposal. The standards for Faecal Coliform may not be applied for use of treated sewage in industrial purposes.
- ii) \*Achievement of Standards for existing STPs within 05 years from the date of notification.

**Table-4: Effluent discharge standards for sewage treatment plant as per the National Green Tribunal verdict. (available at <https://images.assettype.com/barandbench/import/2019/01/NS-Deshpande-v-UOI-NGT-order-Dec-21-2018.pdf>).**

Sr. no.	Parameters	Parameters limits (Standard for new STPs design after notification)
1	pH	6.5-9.0
2	BOD, mg/l	Not more than 10
3	COD, mg/l	Not more than 50
4	TSS, mg/l	Not more than 20
5	NH <sub>4</sub> -N, mg/l	Not more than 5
6	N-total, mg/l	Not more than 10
7	Faecal Coliform, MPN/100ml	< 100



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Table 5: Indian STP discharge standards evolved with time (Schellenberg et al. 2020).

Sr. no.	Parameters	General Norms 1986				Draft Norms Nov. 2015**	MoEF & CC notification, Oct 2017**	NGT order 2019**
		Inland Surface Water	Public Sewers	Land Irrigation	Marine coastal areas			
1	BOD (mg/l)	30	350	100	100	10	30 20 (metro cities)	10
2	COD (mg/l)	250	-	-	250	50	-	50
3	TSS (mg/l)	100	600	200	100 (process water)	20	100 50 (metro cities)	20
4	pH	5.5-9.0	5.5-9.0	5.5-9.0	5.5-9.0	6.5-9.0	6.5-9.0	5.5-9.0
5	TN (mg/l)	100	-	-	100	10	-	10
6	Ammonical Nitrogen as N (mg/l)	50	-	-	50	5*	-	-
7	Free NH <sub>3</sub> (mg/l)	5	-	-	5	-	-	-
8	Nitrate mg/l)	10	-	-	20	-	-	-
9	Diss. PO <sub>4</sub> as P (mg/l)	5	-	-	-	-	-	1
10	Faecal Coloform	-	-	-	-	<100	<1000	<230

Table 6: Treated sewage quality for different uses recommended by CPHEE) 2013 (Schellenberg et al. 2020).

Parameter	Toilet Flushing	Fire Protection	Vehicle exterior washing	Non-contact impoundments	Landscaping, horticulture & agriculture			
					Horticulture golf courses	Crops		
						Non-edible crops	Edible crops	
						Raw	Cooked	
Turbidity (NTU)	<2	<2	<2	<2	<2	AA	<2	AA
SS (mg/l)	nil	nil	nil	nil	nil	30	nil	30
TDS (mg/l)	-	-	-	2100	-	-	-	-
pH	-	-	-	6.5-8.3	-	-	-	-
Temp. (°C)	-	-	-	Ambient	-	-	-	-
Oil & grease (mg/l)	10	nil	nil	nil	10	10	nil	nil
Minimum Residual Chlorine (mg/l)	1	1	1	0.5	1	nil	nil	nil
Total Kjeldal Nitrogen (mg/l)	10	10	10	10	10	10	10	10
BOD (mg/l)	10	10	10	10	10	20	10	20

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COD (mg/l)	AA	AA	AA	AA	AA	30	AA	30
Dissolved Phosphorus P (mg/l)	1	1	1	1	2	2	5	5
Nitrate (mg/l)	10	10	10	5	10	10	10	10
Faecal Coliform/(MPN/100 ml)	nil	nil	nil	nil	nil	230	nil	230
Helminthic eggs/litre	AA <sup>m</sup>	AA	AA	AA	AA	<1	<1	<1
Color	Colorless	Colorless	Colorless	Colorless	Colorless	Colorless	Colorless	Colorless
Odor	Aseptic (Not septic and no foul odor)							

**Table 7: Recommended Guidelines for Treated Sewage if Discharged into Surface Water to be used as source of Drinking Water (available at [https://scbp.niua.org/sites/default/files/NGT\\_Order\\_30.04.2019\\_Sewage\\_Disposal\\_Norms.pdf](https://scbp.niua.org/sites/default/files/NGT_Order_30.04.2019_Sewage_Disposal_Norms.pdf)).**

Parameter	MoEF Standards (A)	Recommended Values
BOD, mg/l	30	Less than 10
SS, mg/l	100	Less than 10
TN, mg/l	100	Less than 10
Dissolved P, mg/l	5	Less than 2
Faecal Coliforms, MPN/100ml	Not specified	Less than 230

Parameter	Values
pH	6.0-8.5
BOD	< 10 mg/l
Suspended Solids	< 2 mg/l
COD	< 60 mg/l
Oil and Grease	< 5 mg/l
E.Coli	nil

3) Technical Expert, HSPCB has also consulted literature available at various sources and discharge standards for treated sewage for recharge of groundwater are mentioned as under.

**Table-8: Characteristics of treated wastewater for its utilization for groundwater recharge**

**Source:** Indian journal of Science and Technology, Vol 8(11) DOI: 10.17485/ijst/2015/v8i11/71806, June 2015- inducing recharge of groundwater by treated wastewater- A pilot study in Southern Chennai Metropolitan area by S.Packialakshmi, S.Balaji and T.Kumaresan

**Table-9: Jordanian Standard (JS: 893/2002) for discharge to streams, storage**

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Parameter	Unit	Discharge to streams, wadis and water storage areas	Ground water recharge
<b>Group A</b>			
BOD <sub>5</sub>	mg/L	60.0 <sup>a</sup>	15.0
COD	mg/L	150.0 <sup>b</sup>	50.0
DO	mg/L	> 1.0	> 2.0
TSS	mg/L	60.0 <sup>b</sup>	50.0
pH	unit	6.0-9.0	6.0-9.0
Turbidity	NTU	—	2.0
NO <sub>3</sub>	mg/L	45.0	30.0
NH <sub>4</sub>	mg/L	-	5.0
T-N	mg/L	70.0	45.0
<i>E. coli</i>	MPN/100 ml	1000.0	< 2.2
Intestinal helminth eggs	egg/L	≤ 1.0	≤ 1.0
FOG	mg/L	8.0	—
<b>Group B</b>			
Phenol	mg/L	< 0.002	< 0.002
MBAS	mg/L	25.0	25.0
TDS	mg/L	1500.0	1500.0
Total PO <sub>4</sub>	mg/L	15.0	15.0
Cl	mg/L	350.0	350.0
SO <sub>4</sub>	mg/L	300.0	300.0
HCO <sub>3</sub>	mg/L	400.0	400.0
Na	mg/L	200.0	200.0
Mg	mg/L	60.0	60.0
Ca	mg/L	200.0	200.0
SAR	mg/L	6.0	6.0
Al	mg/L	2.0	2.0
As	mg/L	0.05	0.05
Be	mg/L	0.1	0.1
Cu	mg/L	0.2	0.2
F	mg/L	1.5	1.5
Fe	mg/L	5.0	5.0
Li	mg/L	2.5	2.5
Mn	mg/L	0.2	0.2
Mo	mg/L	0.01	0.01
Ni	mg/L	0.2	0.2
Pb	mg/L	0.2	0.2
Se	mg/L	0.05	0.05
Cd	mg/L	0.01	0.01
Zn	mg/L	5.0	5.0
Cr	mg/L	0.02	0.02
Hg	mg/L	0.002	0.002
V	mg/L	0.1	0.1
Co	mg/L	0.05	0.05

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B	mg/L	1.0	1.0
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a: BOD<sub>5</sub> measured as soluble for waste stabilization ponds effluents and those with polishing ponds and as total for all others.

b: Twice this value may be allowed for effluents of waste stabilization ponds and those with polishing ponds.

**Table-10: Jordanian Standard (JS: 893/2002) for effluent reuse for agriculture irrigation, 1**

Parameter	Unit	Cooked vegetables, parking areas, playgrounds and side of roads inside cities	Plenteous trees and green areas, side of roads outside cities	Field crops, industrial crops and forestry
Group		A	B	C
BOD <sub>5</sub>	mg/L	30.0	200	300
COD	mg/L	100	500	500
DO	mg/L	> 2.0	—	—
TSS	mg/L	50.0	150	150
pH	unit	6.0–9.0	6.0–9.0	6.0–9.0
Turbidity	NTU	10.0	—	—
NO <sub>3</sub>	mg/L	30.0	45.0	45.0
T-N	mg/L	45.0	70.0	70.0
<i>E. coli</i>	MPN/100ml	100	1000	—
Intestinal helminth eggs	egg/L	≤ 1.0	≤ 1.0	≤ 1.0

**Table-11: Jordanian Standard (JS: 893/2002) for effluent reuse for agricultural irrigation, 2**

Parameter (mg/l)	Guideline values (maximum permissible)
FOG	8.0
Phenol	< 0.002
MBAS	100.0
TDS	1500.0
Total PO <sub>4</sub>	30.0
Cl	400.0
SO <sub>4</sub>	500.0
HCO <sub>3</sub>	400.0
Na	230.0

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Mg	100.0
Ca	230.0
SAR	9.0
Al	5.0
As	0.1
Be	0.1
Cu	0.2
F	1.5
Fe	5.0
Li	2.5 (0.075 for citrus crop)
Mn	0.2
Mo	0.01
Ni	0.2
Pb	5.0
Se	0.05
Cd	0.01
Zn	5.0
Cr	0.1
Hg	0.002
V	0.1
Co	0.05
B	1.0

**Kuwait****Table 12. Treated wastewater criteria for reuse in Kuwait**

Parameter	Maximum allowable
pH	6.5–8.5
BOD <sub>5</sub> (5 days, 20 °C)	20.0
COD (dichromate)	100.0
FOG	5.0
TSS	15.0
TDS	1500.0
PO <sub>4</sub>	30.0
NH <sub>3</sub> -N	15.0
Total Kjeldahl nitrogen	35.0
Total recoverable phenol	1.0

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F	25.0
S	0.1
Cl <sub>2</sub>	0.5-1.0
DO	> 2.0
Hydrocarbons	5.0
Floatables	Nil
Al	5.0
As	0.1
Ba	2.0
B	2.0
Cd	0.01
Cr	0.15
Ni	0.2
Hg	0.002
Co	0.2
Fe	5.0
Sb	—
Cu	0.2
Mn	0.2
Zn	2.0
Pb	0.5
Most probable number of total coliforms	400.0
Most probable number of faecal coliforms (MPN/100 mL)	20.0
Egg parasites (no/litre)	< 1.0
Worm parasites	Absent

Source: Annex No. (15), Decree No. (210), 2001.  
All units are in mg/l except where noted otherwise.

### Oman

**Table-13: Regulations for wastewater reuse and discharge (145/193, 1993), oman**

Parameters (mg/l)	Standards	
	A	B
BOD (5 days at 20 °C)	15.0	20.0
COD	150.0	200.0
TSS	15.0	30.0
TDS	1500.0	2000.0
EC (micro S/cm)	2000.0	2700.0
SAR <sup>a</sup>	10.0	10.0
pH (within range)	6.0-9.0	6.0-9.0
Al	5.0	5.0
As	0.1	0.1

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Ba	1.0	2.0
Be	0.100	0.300
B	0.500	1.0
Cd	0.010	0.010
Cl	650.0	650.0
Cr	0.050	0.050
Co	0.050	0.050
Cu	0.050	1.0
CN	0.05	0.100
F	1.0	2.0
Fe	1.0	5.0
Pb	0.100	0.200
Li	0.070	0.070
Mg	150.0	150.0
Mn	0.100	0.500
Hg	0.001	0.001
Mo	0.01	0.05
Ni	0.100	0.100
Ammonical (as N)	5.0	10.0
Nitrate (as NO <sub>3</sub> )	50.0	50.0
Organic (Kjeldahl) (as N)	5.0	10.0
FOG (total extractable)	0.500	0.500
Phenols (total)	0.001	0.002
P	30.0	30.0
Se	0.02	0.02
Ag	0.010	0.010
Na	200.0	300.0
SO <sub>4</sub>	400.0	400.0
S	0.01	0.01
V	0.10	0.10
Zn	5.0	5.0
Faecal coliform bacteria (MPN/100 ml)	200.0	1000.0
Viable nematode ova (No. per litre)	< 1.0	< 1.0

a: The effect of sodium as soil absorption  
All units are in mg/l excepted where noted otherwise.

#### Saudi Arabia

Table-14: Reclaimed water standards for unrestricted irrigation in Saudi Arabia

Parameter	Maximum concentration
<b>Physical characteristics</b>	
Floating material	Nil
TSS	10.0
pH (SU)	6.0-8.5
<b>Chemical characteristics-organic</b>	
BOD <sub>5</sub>	10.0
Turbidity (NTU)	5.0

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FOG	Nil
Phenol	0.002
<b>Chemical characteristics</b>	
Al	5.00
As	0.1
Be	0.1
B	0.5
Ba	1.0
Cd	0.01
Cl <sub>2</sub>	0.2
Cr	0.1
Co	0.05
Cu	0.4
CN	0.05
F	1.0
Fe	2.0
Pb	0.1
Ag	0.5
Li	0.07
Mn	0.2
Hg	0.001
Mo	0.01
Ni	0.2
Se	0.02
Va	0.1
Zn	2.0
NO <sub>3</sub>	10.0
Cl	100.0
SO <sub>4</sub>	600.0
NH <sub>3</sub>	5.0
<b>Microbiological characteristics</b>	
TTCC (MPN/100 mL)	2.2
Living intestinal nematodes (no/litre)	1.0

Source: treated wastewater and reuse bylaw no. 42,2000.  
All units are in mg/l unless indicated otherwise

**Table-15: Reclaimed water standards for restricted irrigation in Saudi Arabia**

Parameter (mg/l except TLCC)	Maximum concentration
BOD <sub>5</sub>	40.0
TSS	40.0
TDS	2000
TTCC (MPN/100 ml)	1000



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Living intestinal nematodes (no/liter)	1.0
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Tunisian

Table-16: Tunisian Standards, NT 106-03 (1989)

Parameter	Maximum allowable
PH	6.5 to 8.5
Conductivity	7000 ( $\mu\text{s}/\text{cm}$ )
COD	90.0 <sup>a</sup>
BOD <sub>5</sub>	30.0 <sup>a</sup>
TSS	30.0
Cl	2000
Fluorides	3.0
Organic chlorine	0.001
As	0.1
B	3.0
Cd	0.01
Co	0.1
Cr	0.1
Cu	0.5
Fe	0.5
Mg	0.5
Hg	0.001
Ni	0.2
Pb	1.0
Se	0.05
Zn	5.0

Source: Tunisian Standard NT 106.03 (1989).

<sup>a</sup>: 24- hour composite sample.

All units are in mg/L unless indicated otherwise.

Table-17: The permitted limit for grey water reuse according to the use type

Test			
	(A) Irrigation of	(B) Irrigation of	(c) Toilet

P

	ornamental fruit trees and fodder crops	vegetables likely to be eaten uncooked	flushing
BOD <sub>5</sub> (mg/L)	≤ 40	≤ 20	≤ 10
TSS (mg/l)	≤ 140	≤ 20	≤ 10
Thermotolerant coliforms (cfu/100ml)	≤ 1000	≤ 200	≤ 10

Source: Report on the WHO/AFESD regional consultation to review national priorities and action plans for wastewater reuse and management (WHO- EM/CEH/106/E).

#### 4) Proposed treated wastewater standards for various usages

Based on the standards earlier proposed by HSPCB, wherein objections/suggestions were invited from the stakeholders on 5.5.2023, literature study on treated wastewater usages for various purposes, sent by advisor to Hon'ble Chief Minister, Haryana and the literature study conducted by Technical Expert, HSPCB, the following standards for treated wastewater utilization for various usages have been proposed and same are mentioned in Table-18 given below.

**Table-18: Proposed treated wastewater discharge standards of STPs for irrigation, Industrial processes, construction activities, other non-potable usages and groundwater recharging through lakes, ponds and other water storage areas and natural or artificial depression.**

S. No	Parameters	Prescribed standards for			
		Discharge standards for STP	Irrigation	Industrial processes, construction activities and other non-potable usage	Groundwater recharge through lakes, ponds, water storage area, natural or artificial depression
1	pH	5.5-9.0	6.5-8.5	6.5-8.5	6.5-8.5
2	Turbidity (mg/l)	-	<5	<5	<1
3	BOD (mg/l)	10	10*	10	<1
4	COD (mg/l)	50	50*	50	<5
5	TSS (mg/l)	20	20	10	<1
6	TDS (mg/l)	-	1500	750	<500
7	Chloride (mg/l)	-	100	100	100
8	Sulphate (mg/l)	-	200	200	200
9	Fluoride (mg/l)	-	1	1	1
10	Total Nitrogen (mg/l)	10	10	10	10
11	Total Phosphorus (for discharge into Ponds, Lakes) (mg/l)	1	1	1	1
12	S (Sulphide) (mg/l)		0.01	0.01	0.01
13	Phenolic compound		0.002	0.002	0.001

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	(mg/l)				
14	Sodium (mg/l)		100	100	75
15	Magnesium (mg/l)		60	60	30
16	Calcium (mg/l)		100	100	75
17	Ionic detergents (MBAS) (mg/l)		1	1	0.2
18	Residual Chlorine (mg/l)		0.2	0.2	0.2
19	Total Alkalinity as CaCO <sub>3</sub> (mg/l)		200	200	200
20	Total Hardness		200	200	200
21	Faecal Coliform (MPN/100 ml)	<100	<100	< 20	ND
22	Egg Parasite (MPN/100ml)		<1	<1	ND
23	Sodium Adsorption Ratio (SAR) (meq/l)		<10	<10	< 3.0
24	Residual Sodium Carbonate (RSC) (meq/l)		< 2.5	< 2.5	< 1.5
25	Electrical Conductivity (EC) (µmhos/cm)		<2000	<1200	< 750
26	Boron (mg/l)		1.0	1.0	0.5
27	Cu (Copper) (mg/l)		0.2	0.2	0.05
28	Fe (Iron) (mg/l)		5.0 (2.0)	5.0 (2.0)	0.3
29	Mn (Manganese) (mg/l)		0.2	0.2	0.1
30	Cr (Chromium) (mg/l)		0.10	0.10	0.05
31	Ni (Nickel) (mg/l)		0.20	0.20	0.02
32	Pb (Lead) (mg/l)		0.01	0.01	0.01
33	As (Arsenic) (mg/l)		0.01	0.01	0.01
34	Cd (Cadmium) (mg/l)		0.01	0.01	0.003
35	Co (Cobalt) (mg/l)		0.05	0.05	0.05
36	Li (Lithium) (mg/l)		2.5	2.5 (0.07)	0.07
37	Zn (Zinc) (mg/l)		2.0	2.0	2.0
38	Hg (Mercury) (mg/l)		0.01 (0.001)	0.01 (0.001)	0.001
39	Al (Aluminium) (mg/l)		1.0	1.0	0.03
40	Be (Beryllium) (mg/l)		0.1	0.1	0.1
41	CN (Cyanide) (mg/l)		0.05	0.05	0.05
42	Mo (Molybdenum) (mg/l)		0.01	0.01	0.07

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43	Se (Selenium) (mg/l)		0.02	0.02	0.01
44	V (Vanadium) (mg/l)		0.1	0.1	0.1
45	Ba (Barium) (mg/l)		1.0	1.0	0.7
46	Ag (Silver) (mg/l)		0.1	0.1	0.1

The above agenda is submitted for discussion and deliberation among the technical experts/scientists of various departments/organizations/agencies and fixing the proposed standards.



HARYANA STATE POLLUTION CONTROL BOARD  
C-11, SECTOR-6, PANCHKULA  
Ph-0172-577870-73, Fax No. 2581201

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Annexure - 3

No.HSPCB /2023/5038-5043

Dated:19.07.2023

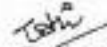
To

1. Dr. K.C Bangar, Advisor, Environment & Climate Change Department, Haryana
2. Dr. Babu Ram, Technical Expert, HSPCB
3. Sh. Avinash Aklkar, Ex. MS, CPCB
4. Prof. C.R Babu, IIT Delhi
5. Dr. Rakesh Kumar, Agriculture University, Hisar
6. Dr. Ravinder Kaur, Indian Agriculture Research Institute, Delhi

Sub:- Minutes of the meeting regarding finalization of standards for discharge of treated grey water (through natural treatment system) on 18.7.2023 at 11:00 AM under the chairmanship of Sh. Raghavendra Rao, Chairman, HSPCB in the Conference Hall, HSPCB, Sector-6, Panchkula - proposal sent by Haryana Pond and Wastewater Management Authority (HPWWMA)

Please refer to the subject noted above.

In this connection, I have been directed to enclose herewith the minutes of the meeting regarding finalization of standards for discharge of treated grey water (through natural treatment system) on 18.7.2023 at 11:00 AM under the chairmanship of Sh. Raghavendra Rao, Chairman, HSPCB in the Conference Hall, HSPCB, Sector-6, Panchkula - proposal sent by Haryana Pond and Wastewater Management Authority (HPWWMA) for your information and necessary action please.  
DA/As Above


  
Sr. Env. Engineer (HQ)  
For Chairman

Endst. No. 5044-5045

Dated:19.07.2023

A copy of the above is forwarded to the following for information and necessary action please.

1. Executive Vice-Chairman, HPWWMA, Panchkula.
2. Administrative Secretary, Development and Panchayat Department, Haryana.


  
Sr. Env. Engineer (HQ)  
For Chairman

Endst. No. 5046-5049

Dated:19.07.2023

A copy of the above is forwarded to the following for information please:-

1. PS to Advisor to CM, Govt. of Haryana
2. PS to ACS Environment & Climate Change Department, Govt. of Haryana
3. PS to Chairman, HSPCB
4. PS to Member Secretary, HSPCB

  
Sr. Env. Engineer (HQ)  
For Chairman

R

**Minutes of the meeting held under the Chairmanship of Sh. P. Raghavendra Rao, Chairman, HSPCB on 18.7.2023 at 11:00 AM in the Conference Room, C-11, Panchkula to finalize the standards proposed for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetland etc.) for irrigation and other non-potable usages.**

**List of the participants is attached at Annexure-1.**

At the outset of meeting, the Chairman, HSPCB welcomed all the technical experts/scientists of various organizations, institutions and officers of the various departments. It was apprised that treated sewage discharge standards of STPs were earlier proposed for reuse of treated wastewater of STPs for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression by the technical experts/scientists in three meetings held on 9.2.2023, 25.4.2023 and 24.5.2023. The standards proposed for utilization of treated sewage of STPs for various usages were published in the leading Newspapers on 13.6.2023 for inviting objections/suggestions from all the stakeholder departments within 15 days. The comments/suggestions received from 04 departments namely MICADA, Development and Panchayat Department, Public Health Engineering Department and Aravali Power Company Ltd., Jhajjar were considered in the last meeting held on 6.7.2023, wherein, the following decisions were taken.

- i. 'pH' value for discharge of treated sewage for various usages may be prescribed as 6.5-8.0.
- ii. The value of 'Total Alkalinity' as calcium carbonate (parameter at serial no.23) may be prescribed as 120-180 mg/l for all usages as mentioned above.
- iii. The concentration of 'Total Hardness' (parameter at serial no. 24 ) may be prescribed as 75-150 mg/l for all usages as mentioned above.
- iv. Public Health Engineering Department (PHED) shall analyze the concentration of all 20 heavy metals (Sr.no. 32 to 51) in atleast 25% of STPs and the analysis reports may be submitted to the HSPCB within 01 month.
- v. PHED shall also analyze the concentration of residual Chlorine in the treated sewage after using Chlorine dosing as 5 mg/l, 4 mg/l, 3 mg/l and 2 mg/l and the analysis reports may be submitted to the HSPCB within 01 month.

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- vi. The Research study analysis on the characteristics of grey water generated in rural areas and treatment efficiency of low cost treatment technology available for treatment of such wastewater may be submitted by Dr. K.C Bangar within 07 days so that appropriate decision regarding applicability of discharge standards on such wastewater may be taken.
- vii. It was observed that the desired quality of treated wastewater with stringent values of parameters as proposed by Indira Gandhi Super Thermal Plant, Jharli, Jhajjar is difficult to be achieved by the present STPs. Therefore, it was decided that the APCPL be advised to treat the water made available to them to achieve the desired quality.

It was further informed that the Haryana Pond Wastewater Management Authority (HWWMA) vide its letter no. HPA/2023/ADMIN/0041/65478 dated 7.7.2023 and subsequent letter no. 65504 dated 10.7.2023 has now submitted proposed standards for discharge of treated grey water through pond rejuvenation, with natural treatment system. These proposed standards are mentioned as per **Table-1** given below.

**Table-1: Proposed standards by Haryana Pond Wastewater Management Authority (HWWMA) for discharge of treated grey water through pond rejuvenation with natural treatment system**

Sr. no.	Parameters	Proposed standards
1	pH	6.5-8.5
2	BOD (mg/l)	<20
3	COD (mg/l)	<100
4	Sodium (mg/l)	75
5	TSS (mg/l)	<20
6	TDS (mg/l)	<750
7	Chloride (mg/l)	100
8	Sodium Adsorption Ratio (SAR) (meq/l)	<10
9	Residual Sodium Carbonate (RSC) (meq/l)	<1.5
10	Electrical Conductivity (EC) ( $\mu$ mhos/cm)	<750
11	Total Nitrogen (mg/l)	20
12	Ammonical Nitrogen (mg/l)	5

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13	Nitrate Nitrogen (mg/l)	10
14	Total Phosphorous (mg/l)	5
15	Phosphate P (Dissolved) (mg/l)	1
16	S (Sulphide) (mg/l)	1.0
17	Total Hardness (mg/l)	200
18	Faecal Coliform (MPN/100 ml)	<250
19	E.Coli (MPN/100 ml)	ND
20	Ionic detergents (MBAS) (mg/l)	0.2
21	Residual Chlorine (mg/l)	0.2

- Grey water treated through natural treatment having BOD upto 40 mg/l and COD upto 200 mg/l should be directly used for irrigation and should not be discharged through lakes, canals and rivers.
- The standard mentioned above are recommended only for treated grey water.
- Proposed standards by HSPCB from sr.no. 32 to 51 should be made applicable for mixed sewage and industrial effluent.

Thereafter, Dr. Babu Ram, Technical Expert, HSPCB gave a detailed presentation on the standards proposed by the HPWWMA for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetland etc.) for irrigation and other non-potable usages.

After detailed deliberation on each proposed parameter as mentioned in **Table-1** given above, it was decided that the concentration of proposed parameters may be fixed as mentioned in Table-2 given below.

**Table-2: Standards for discharge of treated grey water through pond rejuvenation with natural treatment system (waste stabilization pond, constructed wet land etc.)**

Sr. no.	Parameters	Proposed standards
1	pH	6.5-8.5



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2	BOD (mg/l)	<20
3	COD (mg/l)	<100
4	Sodium (mg/l)	75
5	TSS (mg/l)	<20
6	TDS (mg/l)	<750
7	Chloride (mg/l)	100
8	Sodium Adsorption Ratio (SAR) (meq/l)	<10
9	Residual Sodium Carbonate (RSC) (meq/l)	<2.5
10	Electrical Conductivity (EC) ( $\mu$ mhos/cm)	<2000
11	Total Nitrogen (mg/l)	20
12	Ammonical Nitrogen (mg/l)	5
13	Nitrate Nitrogen (mg/l)	10
14	Total Phosphorous (mg/l)	5
15	Phosphate P (Dissolved) (mg/l)	1
16	S (Sulphide) (mg/l)	1.0
17	Total Hardness (mg/l)	<200
18	Faecal Coliform (MPN/100 ml)	<100
19	E.Coli (MPN/100 ml)	ND
20	Ionic detergents (MBAS) (mg/l)	0.2
21	Residual Chlorine (mg/l)	0.2

Besides, Technical Experts/ Scientists considered the left out 10 parameters (FOG,  $\text{HCO}_3$ , Sulphate, Fluoride, Phenolic compounds, Magnesium, Calcium, Total Alkalinity, Intestinal Helminth and Boron) and heavy metals (sr. no. 32 to 51) from the proposed discharge norms prescribed by HSPCB (published in the newspaper on 13.6.2023) by the HPWWMA. Detailed discussion on these left out parameters was held and it was decided that the parameters, namely, FOG,  $\text{HCO}_3$ , Sulphate, Phenolic compounds, Magnesium, Calcium, Total Alkalinity, Intestinal Helminth may not be considered as these parameters have direct/indirect relation with the parameters as mentioned in the **Table-2** given above and only parameters namely Fluoride, Boron and heavy metals (Sr. no. 32 to 51) may be considered and their values may be fixed as mentioned in **Table-3** given below.

**Table-3: Concentration of parameters left out by HPWWMA**

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Sr. No.	Parameter	Concentration (mg/l)
1	Fluoride	1.0
2	Boron	1.0
3	Sulphate	<200
4	Heavy metals	The concentration of heavy metals (Sr. no. 32 to 51) shall be made applicable only in those treatment systems, where mixed sewage and industrial wastewater are found entering into the treatment system.

After considering all the cumulative parameters and their values as mentioned in **Table-2** and **Table-3** above, it was decided that the standards for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetlands etc.) for irrigation and other non potable usages may be fixed as mentioned in **Table-4** given below.

**Table-4: Standards for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetlands etc.) for irrigation and other non potable usages**

Sr. no.	Parameters	Proposed standards
1	pH	6.5-8.5
2	BOD (mg/l)	<20
3	COD (mg/l)	<100
4	Sodium (mg/l)	75
5	TSS (mg/l)	<20
6	TDS (mg/l)	<750
7	Chloride (mg/l)	100
8	Sodium Adsorption Ratio (SAR) (meq/l)	<10
9	Residual Sodium Carbonate (RSC) (meq/l)	<2.5
10	Electrical Conductivity (EC) (µmhos/cm)	<2000
11	Total Nitrogen (mg/l)	20
12	Ammonical Nitrogen (mg/l)	5
13	Nitrate Nitrogen (mg/l)	10
14	Total Phosphorous (mg/l)	5
15	Phosphate P (Dissolved) (mg/l)	1
16	S (Sulphide) (mg/l)	1.0

*[Handwritten signature]*

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17	Total Hardness (mg/l)	<200
18	Faecal Coliform (MPN/100 ml)	<100
19	E.Coli (MPN/100 ml)	ND
20	Ionic detergents (MBAS) (mg/l)	0.2
21	Residual Chlorine (mg/l)	0.2
22	Fluoride (mg/l)	1.0
23	Boron (mg/l)	1.0
24	Sulphate (mg/l)	<200
25	Heavy metals	The concentration of heavy metals (Sr. no. 32 to 51) shall be made applicable only in those treatment systems, where mixed sewage and industrial wastewater are found entering into the treatment system.

The meeting ended with vote of thanks to the chair and all the participants.

## Annexure-1

List of participants of the meeting held under the Chairmanship of Sh. P. Raghavendra Rao, Chairman, HSPCB on 18.7.2023 at 11:00 AM in the Conference Room, C-11, Panchkula to finalize the standards proposed for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetland etc.) for irrigation and other non-potable usages.

Sr. No.	Name and Designation
1.	Sh. P. Raghavendra Rao, Chairman, HSPCB.....in the chair.
2.	Sh. Prabhakar Kr. Verma, Executive Vice Chairperson, Haryana Pond Authority, Panchkula
3.	Dr. Babu Ram, Technical Expert, HSPCB, Panchkula
4.	Sh. JP Singh, SEE, HSPCB, Panchkula
5.	Sh. Ramesh Kumar, DSCO, Agriculture Department, Panchkula
6.	Sh. Narender Kumar, TA (ST)
7.	Dr. Rakesh Kumar, Agriculture University, Hisar
8.	Dr. Ravinder Kaur, Indian Agriculture Research Institute, Delhi
9.	Sh. AK Sharda, Scientist, Haryana Pond Authority, Panchkula

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Annexure-4



HARYANA STATE POLLUTION CONTROL BOARD  
C-11, SECTOR-6, PANCHKULA  
Website - [www.hspcb.org.in](http://www.hspcb.org.in) E-Mail: [hspcbscientific@gmail.com](mailto:hspcbscientific@gmail.com)  
Ph: 0172-2577870-873

Endst. No. HSPCB/SSC/2023/8191-8197

Dated:- 06.09.2023

To

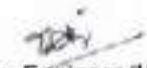
1. Director, Development & Panchayat Department, Govt. of Haryana
2. Director, Urban Local Bodies Department, Govt. of Haryana, Panchkula
3. Director, Agriculture Department, Govt. of Haryana, Panchkula
4. Director, Horticulture Department, Govt. of Haryana, Panchkula
5. Engineer-in-Chief, PHED, Govt. of Haryana
6. Engineer-in-Chief, Irrigation Department, Govt. of Haryana
7. Dean, College of Agriculture, HAU, Hisar

Sub:- Minutes of the meeting held under the Chairmanship of Sh. P. Raghavendra Rao, Chairman, HSPCB on 5.9.2023 in the Conference Room, C-11, Sector 6, Panchkula to finalize the standards proposed for discharge of treated wastewater of STPs for various usages (irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression) and standards for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetland etc.) for irrigation and other non-potable usages.

Kindly refer to the subject noted above

In this connection, I have been directed to enclose herewith the proceedings of the meeting held under the Chairmanship of Sh. P. Raghavendra Rao, Chairman in the HSPCB, Conference Room, C-11, Sec-06, Panchkula at 2.00 PM on 5.09.2023 regarding finalize the standards proposed for discharge of treated wastewater of STPs for various usages (irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression) and standards for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetland etc.) for irrigation and other non-potable usages for your information and necessary action please.

DA/As above


  
Sr. Env. Engineer (HQ)  
For Chairman

Endst. No. HSPCB/SSC/2023/8198-8200

Dated:- 06.09.2023

A copy of the above is forwarded to the following for information, please:-

1. Chief Executive Officer, HWRA.
2. Dr. KC Bangar, Advisor, Environment and Climate Change Department, Haryana
3. Dr. Ravinder Kaur, Indian Agriculture Research Institute, Delhi

  
Sr. Env. Engineer (HQ)  
For Chairman

03/45

Minutes of the meeting held under the Chairmanship of Sh. P. Raghavendra Rao, Chairman, HSPCB on 5.9.2023 in the Conference Room, C-11, Sector 6, Panchkula to finalize the standards proposed for discharge of treated wastewater of STPs for various usages (irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression) and standards for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetland etc.) for irrigation and other non-potable usages.

List of the participants is attached at Annexure-1.

At the outset, the Chairman, HSPCB welcomed all the technical experts/scientists of various organizations, institutions and officers of the various departments. It was apprised that treated sewage discharge standards of STPs were earlier proposed for reuse of treated wastewater of STPs for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression by the technical experts/scientists in three meetings held on 9.2.2023, 25.4.2023 and 24.5.2023. The standards proposed for utilization of treated sewage of STPs for various usages were published in the leading Newspapers on 13.6.2023 for inviting objections/suggestions from all the stakeholder departments within 15 days. The comments/suggestions received from 04 departments namely MICADA, Development and Panchayat Department, Public Health Engineering Department and Aravali Power Company Ltd., Jhajjar were considered in the meeting held on 6.7.2023, wherein, the following decisions were taken.

- i. 'pH' value for discharge of treated sewage for various usages may be prescribed as 6.5-8.0.
- ii. The value of 'Total Alkalinity' as calcium carbonate (parameter at serial no.23) may be prescribed as 120-180 mg/l for all usages as mentioned above.
- iii. The concentration of 'Total Hardness' (parameter at serial no. 24 ) may be prescribed as 75-150 mg/l for all usages as mentioned above.
- iv. Public Health Engineering Department (PHED) shall analyze the concentration of all 20 heavy metals (Sr.no. 32 to 51) in atleast 25% of STPs and the analysis reports may be submitted to the HSPCB within 01 month.
- v. PHED shall also analyze the concentration of residual Chlorine in the treated sewage after using chlorine dosing as 5 mg/l, 4 mg/l, 3 mg/l and 2 mg/l and the analysis reports may be submitted to the HSPCB within 01 month.
- vi. The Research study analysis on the characteristics of grey water generated in rural areas and treatment efficiency of low cost treatment technology available for treatment of such wastewater may be submitted by Dr. K.C Bangar within 07 days so that appropriate decision regarding applicability of discharge standards on such wastewater may be taken.
- vii. It was observed that the desired quality of treated wastewater with stringent values of parameters as proposed by Indira Gandhi Super Thermal Plant, Jharli, Jhajjar is difficult to be achieved by the present STPs. Therefore, it was decided that the APCPL be advised to treat the water made available to them to achieve the desired quality.

It was further apprised that the Haryana Pond and Wastewater Management Authority (HPWWMA) vide its letter no. HPA/2023/ADMIN/0041/65478 dated 7.7.2023 and subsequent letter no. 65504 dated 10.7.2023 submitted proposed standards for discharge of treated grey water through pond rejuvenation with natural treatment system. The proposed standards by the HPWWMA were considered by the Technical Experts/Scientists of various



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organizations/institutions and officers of the stakeholder departments in the meeting held on 18.7.2023 and the following standards for discharge of treated grey water for irrigation and other non-potable usages were proposed, which are mentioned in **Table-1** given below.

**Table-1: Proposed discharge standards of treated grey water for irrigation and other non potable usage**

Sr. no.	Parameters	Prescribed standards
1	pH	6.5-8.5
2	BOD (mg/l)	<20
3	COD (mg/l)	<100
4	Sodium (mg/l)	75
5	TSS (mg/l)	<20
6	TDS (mg/l)	<750
7	Chloride (mg/l)	100
8	Sodium Adsorption Ratio (SAR) (meq/l)	<10
9	Residual Sodium Carbonate (RSC) (meq/l)	<1.5
10	Electrical Conductivity (EC) ( $\mu$ mhos/cm)	<750
11	Total Nitrogen (mg/l)	20
12	Ammonical Nitrogen (mg/l)	5
13	Nitrate Nitrogen (mg/l)	10
14	Total Phosphorous (mg/l)	5
15	Phosphate P (Dissolved) (mg/l)	1
16	S (Sulphide) (mg/l)	1.0
17	Total Hardness (mg/l)	200
18	Faecal Coliform (MPN/100 ml)	<250
19	E.Coli (MPN/100 ml)	ND
20	Ionic detergents (MBAS) (mg/l)	0.2
21	Residual Chlorine (mg/l)	0.2

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22	Fluoride (mg/l)	1.0
23	Boron (mg/l)	1.0
24	Sulphate (mg/l)	<200
25	Heavy metals	The concentration of heavy metals (Sr. no. 32 to 51) shall be made applicable only in those treatment systems, where mixed sewage and industrial wastewater are found entering into the treatment system.

The proposed standards for discharge of treated grey water through natural treatment system, as mentioned in **Table-1** given above, were published in the leading newspaper on 5.8.2023, with last date as 20.8.2023. No suggestions/objections of stakeholder departments were received/raised except verbal suggestion by the Chief Engineer, Department of Irrigation to keep same value of TDS parameter (1500 mg/l instead of 750 mg/l) for discharge of treated grey water as well as discharge of treated sewage of STPs for irrigation.

Dr. Babu Ram, Technical Expert, HSPCB gave detailed presentation on finalization of standards for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetland, etc.) for irrigation and other non-potable usages and standards for discharge of treated wastewater of STPs for various usages (irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression).

After detailed deliberations on various parameters as mentioned in the treated grey water discharge standards for irrigation and other non-potable usage as earlier proposed in the meeting held on 18.7.2023, it was decided as under:

- i. The value of TDS parameter may be prescribed as <1500 mg/l in place of earlier proposed value as <750 mg/l for use of treated grey water for irrigation.
- ii. Sulphide parameter mentioned at sr. no. 16 may be deleted as it is a part of sulphate parameter.
- iii. Residual Chlorine parameter mentioned at sr.no. 21 may be deleted as chlorine is not used during the treatment of grey water.
- iv. In case of heavy metal as mentioned at sr.no. 26, the word already written in the minutes of the meeting held on 18.7.2023 as "***The concentration of heavy metals (Sr. no. 32 to 51) shall be made applicable only in those treatment systems, where mixed sewage and industrial wastewater are found entering into the treatment system***" may be replaced with the words "***the treated grey water of various ponds and other water bodies may be analyzed for heavy metal once in a year to check their concentration***". ***In case the concentration of heavy metals is found more than the permissible limits in the treated grey water, appropriate treatment may be imparted to the grey water to bring the concentration of various heavy metals within the prescribed limits.***

After detailed deliberation on the values of the various parameters as mentioned above, the standards for discharge of treated grey water for irrigation and other non-potable usages are finalized and the same are mentioned in **Table-2** given below.

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**Table-2: Final discharge standards of treated grey water for irrigation and other non potable usage**

Sr. no.	Parameters	Prescribed standards
1	pH	6.5-8.5
2	BOD (mg/l)	<20
3	COD (mg/l)	<100
4	Sodium (mg/l)	75
5	TSS (mg/l)	<20
6	TDS (mg/l)	<ul style="list-style-type: none"> <li>• &lt;750 for non potable usages</li> <li>• &lt;1500 for irrigation</li> </ul>
7	Chloride (mg/l)	100
8	Sodium Adsorption Ratio (SAR) (meq/l)	<10
9	Residual Sodium Carbonate (RSC) (meq/l)	<1.5
10	Electrical Conductivity (EC) ( $\mu$ mhos/cm)	<750
11	Total Nitrogen (mg/l)	20
12	Ammonical Nitrogen (mg/l)	5
13	Nitrate Nitrogen (mg/l)	10
14	Total Phosphorous (mg/l)	5
15	Phosphate P (Dissolved) (mg/l)	1
16	Total Hardness (mg/l)	200
17	Faecal Coliform (MPN/100 ml)	<250
18	E.Coli (MPN/100 ml)	ND
19	Ionic detergents (MBAS) (mg/l)	0.2
20	Fluoride (mg/l)	1.0
21	Boron (mg/l)	1.0
22	Sulphate (mg/l)	<200

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23	Heavy metals	The treated grey water of various ponds and other water bodies may be analyzed for heavy metal once in a year to check their concentration. In case the concentration of heavy metals is found more than the permissible limits in the treated grey water, appropriate treatment may be imparted to the grey water to bring the concentration of various heavy metals within the prescribed limits.
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Regarding finalization of discharge standards of STPs for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression, the Chief Engineer, Public Health Engineering Department informed that out of total 120 STPs, treated effluent samples of 32 STPs have been analyzed for heavy metals, out of which analysis results of effluent samples of 16 STPs have been received. Out of the 16 STPs, 08 STPs, 05 STPs and 06 STPs have been found failed in parameters namely copper, manganese and chromium, respectively.

Detailed deliberations on all the 51 parameters, as mentioned in the minutes of the meeting held on 24.5.2023, were made and it was decided as under:

- i. **The prescribed discharge standards** may be replaced by the words **Maximum permissible discharge limits** for use of treated wastewater of STPs for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds and other water storage areas and natural or artificial depression.
- ii. The value of copper for irrigation; industrial processes, construction activities, other non-potable usages; groundwater recharge through lakes, ponds, water storage area, natural or artificial depression may be fixed as 1.5 mg/l, 1.5 mg/l and 0.2 mg/l, respectively.
- iii. The value of manganese for irrigation; industrial processes, construction activities, other non-potable usages; groundwater recharge through lakes, ponds, water storage area, natural or artificial depression may be fixed as 0.5 mg/l, 0.5 mg/l and 0.3 mg/l, respectively.
- iv. The value of Chromium for irrigation; industrial processes, construction activities, other non-potable usages; groundwater recharge through lakes, ponds, water storage area, natural or artificial depression may be fixed as 0.2 mg/l, 0.2 mg/l and 0.1 mg/l, respectively.

After detailed deliberations on the values of the various parameters as mentioned above, the maximum permissible limits for discharge of treated wastewater of STPs for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression were finalized and the same are mentioned as in **Table-3** given below.

**Table-3: Maximum permissible limits for discharge of treated wastewater of STPs for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds and other water storage areas and natural or artificial depression.**

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S. No.	Parameters	Current HSPCB discharge standards for STP	Maximum permissible limits for discharge of treated wastewater of STPs for		
			Irrigation	Industrial processes, construction activities and other non-potable usage	Groundwater recharge through lakes, ponds, water storage area, natural or artificial depression
1	pH	5.5-9.0	6.5-8.0	6.5-8.0	6.5-8.0
2	BOD (mg/l)	10	10*	10	10
3	COD (mg/l)	50	50*	50	50
4	FOG (mg/l)	-	Nil	Nil	Nil
5	TSS (mg/l)	20	20	10	10
6	TDS (mg/l)	-	1500	750	500
7	Chloride (mg/l)	-	100	100	100
8	HCO <sub>3</sub> (mg/l)	-	300	300	300
9	Sulphate (mg/l)	-	200	200	200
10	Fluoride (mg/l)	-	1	1	1
11	Total Nitrogen (mg/l)	-	20	20	20
12	Ammonical Nitrogen (mg/l)	-	5	5	5
13	Nitrate Nitrogen (mg/l)	-	10	10	10
14	Total Phosphorous (mg/l)	-	5	5	5
15	Phosphate P (Dissolved) (mg/l)	-	1	1	1
16	Total S (Sulphide) (mg/l)	-	0.01	0.01	0.01
17	Phenolic compound (mg/l)	-	0.002	0.002	0.002
18	Sodium (mg/l)	-	100	100	75
19	Magnesium (mg/l)	-	60	60	30
20	Calcium (mg/l)	-	100	100	75

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21	Ionic detergents (MBAS) (mg/l)	-	<1	<1	0.2
22	Residual Chlorine (mg/l)	-	0.2	0.2	0.2
23	Total Alkalinity as CaCO <sub>3</sub> (mg/l)	-	200	200	200
24	Total Hardness (mg/l)	-	200	200	200
25	Faecal Coliform (MPN/100 ml)	<100	100	100	100
26	E.Coli (MPN/100 ml)	-	ND	ND	ND
27	Intestinal helminth eggs (MPN/100ml)	-	ND	ND	ND
28	Sodium Adsorption Ratio (SAR) (meq/l)	-	10	10	3.0
29	Residual Sodium Carbonate (RSC) (meq/l)	-	2.5	2.5	1.5
30	Electrical Conductivity (EC) (µmhos/cm)	-	2000	1200	750
31	Boron (mg/l)	-	1.0	1.0	0.5
32	Cu (Copper) (mg/l)	-	1.5	1.5	0.2
33	Fe (Iron) (mg/l)	-	5.0	5.0	0.3
34	Mn (Manganese) (mg/l)	-	0.5	0.5	0.3
35	Cr (Chromium) (mg/l)	-	0.2	0.2	0.1
36	Ni (Nickel) (mg/l)	-	0.20	0.20	0.02
37	Pb (Lead) (mg/l)	-	0.01	0.01	0.01
38	As (Arsenic) (mg/l)	-	0.01	0.01	0.01
39	Cd (Cadmium) (mg/l)	-	0.01	0.01	0.003
40	Co (Cobalt) (mg/l)	-	0.05	0.05	0.05
41	Li (Lithium) (mg/l)	-	2.5	2.5	2.5
42	Zn (Zinc) (mg/l)	-	2.0	2.0	2.0
43	Hg (Mercury) (mg/l)	-	0.001	0.001	0.001
44	Al (Aluminium) (mg/l)	-	1.0	1.0	0.03
45	Be (Beryllium) (mg/l)	-	0.1	0.1	0.1
46	CN (Cyanide) (mg/l)	-	ND	ND	ND

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47	Mo (Molybdenum) (mg/l)	-	0.01	0.01	0.01
48	Se (Selenium) (mg/l)	-	0.02	0.02	0.01
49	V (Vanadium) (mg/l)	-	0.1	0.1	0.1
50	Ba (Barium) (mg/l)	-	1.0	1.0	0.7
51	Ag (Silver) (mg/l)	-	0.1	0.1	0.1

Note:-

- i. If the operating agency uses the treated wastewater of STPs entirely for irrigation purposes then BOD of 30 mg/l and COD of 150 mg/l will be permissible provided the treated wastewater is not discharged into drain/nallah/river/any other surface water, under any circumstances.
- ii. The maximum permissible limits for discharge of treated wastewater of STPs for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression shall be valid initially for 03 years, well before which detailed study with reference to the effect of heavy metals and other parameters on the quality of soil, crop, horticulture, human and animal species shall be carried out jointly by the Haryana Agriculture University (HAU), Hisar and Indian Agricultural Research Institute (IARI), New Delhi. The expenditure to be incurred on the said study shall be borne by the Haryana State Pollution Control Board, for which prior sanction of the project shall be obtained by the said organizations from the Board. For this purpose, HAU will be the coordinating agency.
- iii. No indiscriminate disposal of treated or untreated sewage/effluent shall be allowed.
- iv. During groundwater recharging with treated wastewater, recharging shall be allowed through ponds, lakes, water storage area and natural or artificial depression but no direct injection of treated wastewater into the underground strata will be permitted.
- v. HSPCB shall carryout close monitoring of usages of treated wastewater of STPs and shall ensure that treated sewage of STPs is only used for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression and no direct injection of treated wastewater in underground strata will be permitted.
- vi. With the adoption of the above standards for utilization of treated sewage for irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression, the earlier standards prescribed by HSPCB vide its order dated 2.7.2020 shall be superseded.

The meeting ended with vote of thanks.

## Annexure-I

List of participants for the meeting held under the Chairmanship of Sh. P. Raghavendra Rao, Chairman, HSPCB on 5.9.2023 at 2:00 PM in the Conference Room, C-11, Sector 6, Panchkula to finalize the standards proposed for discharge of treated wastewater of STPs for various usages (irrigation, industrial processes, construction activities, other non-potable usages and groundwater recharge through lakes, ponds, water storage area, natural or artificial depression) and standards for discharge of treated grey water through natural treatment system (waste stabilization pond, constructed wetland etc.) for irrigation and other non-potable usages.

Sr. No.	Name and Designation
1.	Sh. P. Raghavendra Rao, Chairman, HSPCB.....in the chair.
2.	Dr. Babu Ram, Technical Expert, HSPCB, Panchkula
3.	Prof. CR Babu, IIT, Delhi through VC
4.	Dr. Ravinder Kaur, Indian Agriculture Research Institute, Delhi through VC
5.	Sh. Shailender Singh, Chief Engineer, PHED, Panchkula
6.	Sh. JP Singh, SEE, HSPCB, Panchkula
7.	Sh. Dinesh Kumar Saini, SEE, PHED, Panchkula
8.	Sh. Ranbir Singh, XEN, ULBD, Panchkula
9.	Sh. Narender Kumar, ADO, Agriculture Department, Panchkula
10.	Sh. SK Yadav, MICADA, Panchkula
11.	Sh. Nitin Atray, XEN, I&WR, Irrigation Department, Panchkula
12.	Dr. Vivek Bhanwala, Horticulture Department, Panchkula
13.	Sh. Yashpal Singh, XEN, I&WRD, Irrigation Department, Panchkula