

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
WESTERN ZONE, PUNE**

Original Application No. 197 of 2017 (WZ)

IN THE MATTER OF:

Vanshakti & Anr.

Applicant

Versus

Municipal Corporation of Greater Mumbai & Ors.

Respondent(s)

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**Bharat Kumar Sharma
Regional Director, Pune
Central Pollution Control Board**

Date: 04.01.2021

Place: Pune

Status report in the matter of O.A No 197/2017(WZ) before Hon'ble NGT.

1. Background

The Hon'ble NGT vide order dated 14.10.2020 directed CPCB as follows:

".....Where the operational deficiencies of the existing STPs has not been rectified and untreated is being discharged into the water bodies, the environmental compensation at the rate of Rs. 10 lakhs per month per STP be deposited to the CPCB. The CPCB is directed to examine all the STPs, CETPs within the Mumbai Municipal Corporation and calculate the amount of environmental compensation in accordance with law and to proceed to recover the amount and communicate this Tribunal within fortnight....."

2. Compliance to Hon'ble NGT Directions

- In compliance to the directions of Hon'ble NGT, CPCB inspected 08 Sewage Treatment Plant in the jurisdiction of Municipal Corporation of Greater Mumbai and found that 06 STPs are not meeting the prescribed norms. Copy of report is enclosed at Annexure-I.
- Accordingly, Environment Compensation of amount Rs 2,10,00,000/- (Rupees Two Crores ten lacs only) is calculated for the damage caused to environment due to partial treatment of sewage.

3. Action taken by CPCB

- Central Pollution Control Board vide letter A-19014/43/20/UPC-I/14173 dated 10/12/2020 has requested Commissioner, Municipal Corporation of Greater Mumbai to submit Environmental Compensation. Copy enclosed at Annexure-II.

REPORT ON

EXAMINATION OF STPS AND CETPS IN MUMBAI MUNICIPAL CORPORATION AREA AND CALCULATION OF ENVIRONMENTAL COMPENSATION IN COMPLIANCE OF HON'BLE NGT ORDER DATED 14.10.2020 IN OA NO. 197/2017 [VANSHAKTI & ANR. APPLICANT(S) VERSUS MUNICIPAL CORPORATION OF GREATER MUMBAI & ORS. RESPONDENT(S)]

**FOR SUBMISSION
TO
HON'BLE NATIONAL GREEN TRIBUNAL (NGT)
WEST ZONE BENCH (WB)**

PREPARED BY:

CENTRAL POLLUTION CONTROL BOARD

Examination of STPs and CETPs in Mumbai Municipal Corporation area and calculation of amount of environmental compensation in compliance of Hon'ble NGT order dated 14.10.2020 in OA No. 197/2017

[Vanshakti & Anr. Applicant(s) Versus Municipal Corporation of Greater Mumbai & Ors. Respondent(s)]

1.0 Background

M/s Vanshakti and Anr. filed an original application No. 197/2017 (WZ) before Hon'ble National Green Tribunal (NGT). The matter is mainly related to the management of wastewater in Mumbai Municipal Corporation (MMC) area. The Hon'ble NGT (PB) passed an order dated 14.1.2020. Part of the order reads as,

".....Where the operational deficiencies of the existing STPs has not been rectified and untreated is being discharged into the water bodies, the environmental compensation at the rate of Rs. 10 lakhs per month per STP be deposited to the CPCB. The CPCB is directed to examine all the STPs, CETPs within the Mumbai Municipal Corporation and calculate the amount of environmental compensation in accordance with law and to proceed to recover the amount and communicate this Tribunal within fortnight....."

To comply with the order, this office communicated with Maharashtra Pollution Control Board (MPCB) vide email dated 27.10.2020 and reminder is also sent on 05.11.2020. In response, MPCB shared available details of sewage management and analytical results of effluent quality of sewage management facility. Based on the inputs from MPCB, it was understood that a visit and monitoring of sewage treatment facilities is required. Accordingly a team of following two officials from CPCB Regional Directorate, Vadodara visited all the informed Sewage Treatment facility of Mumbai Municipal Corporation during 10.11.2020 to 11.11.2020.

1. Dr. Arvind Kumar Jha, Scientist D
2. Shri Mayank Nimbark, JLA.

The CPCB team alongwith respective MPCB officials of the area, visited all reported 08 sewage treatment facility within MMC area. There is no Common effluent treatment plant within the MMC area and therefore this report is about examination of only sewage treatment facilities of MMC.

1.1 Approach of the team to complete the assigned task

The team decided to collect field data about sewage treatment facilities, consent granted by MPCB, planning of MMC for future improvement in sewage treatment, etc.

The visiting team adopted following approach.

- i. Information/Data collection from MMC and MPCB.
- ii. Discussions with MPCB and MMC officials.
- iii. Visit to all eight (08) Sewage treatment facilities.

- iv. Sampling at all operational outlet and inlet of sewage treatment facilities jointly with MPCB.
- v. Calculation of environmental compensation due to operational deficiencies in sewage treatment facilities.
- vi. Report preparation.

2.0 Brief description of sewage treatment facilities in MMC area

The Mumbai Metropolitan Region (MMR) water management system includes 04 districts, 08 municipal corporations, 09 municipal councils and 1000 villages with a population of 22.2 million (2011, MMR) spread over about 4355 km² area. As per MMC information, total freshwater supply in MMC area is 3750 million litre per day (MLD) and total sewage generation is about 2190 MLD. As per the information available from other sources, the water supply in Mumbai area ranged from 135 Litre per capita per day to 150 litre per capita per day. Nearly 85% of water supply is established as sewage generation in a city whereas the information provided by MMC for the sewage generation is roughly 58% of water supply. The estimate of sewage generation with respect to water supply is apparently conservative and 2190 MLD sewage may be understood as sewage collection rather than sewage generation. Therefore, there is gap between sewage generation and collection in MMC area to the tune of about 31.29%. This 31.29% of gap amounts to about 997.5 MLD. This implies that 997.5MLD untreated sewage is directly discharged in water bodies i.e. creek shore in one way or the other. The direct discharge of untreated sewage may also be inferred from the fact that MMC has a sewage collection network of 2015 kms which serves an approximate area of 82% developed area of Municipal Corporation of Greater Mumbai (MCGM) but the population coverage is only 68.15% of greater Mumbai. This implies that more than 31% human settlements are not covered with terminal sewage treatment facilities and their sewage is by and large directly discharged to water bodies.

To treat the sewage collected in MMC area, the metropolitan area is divided in seven zones. Each zone has separate sewage treatment facility. The indicative locations are given in **Figure-1**.

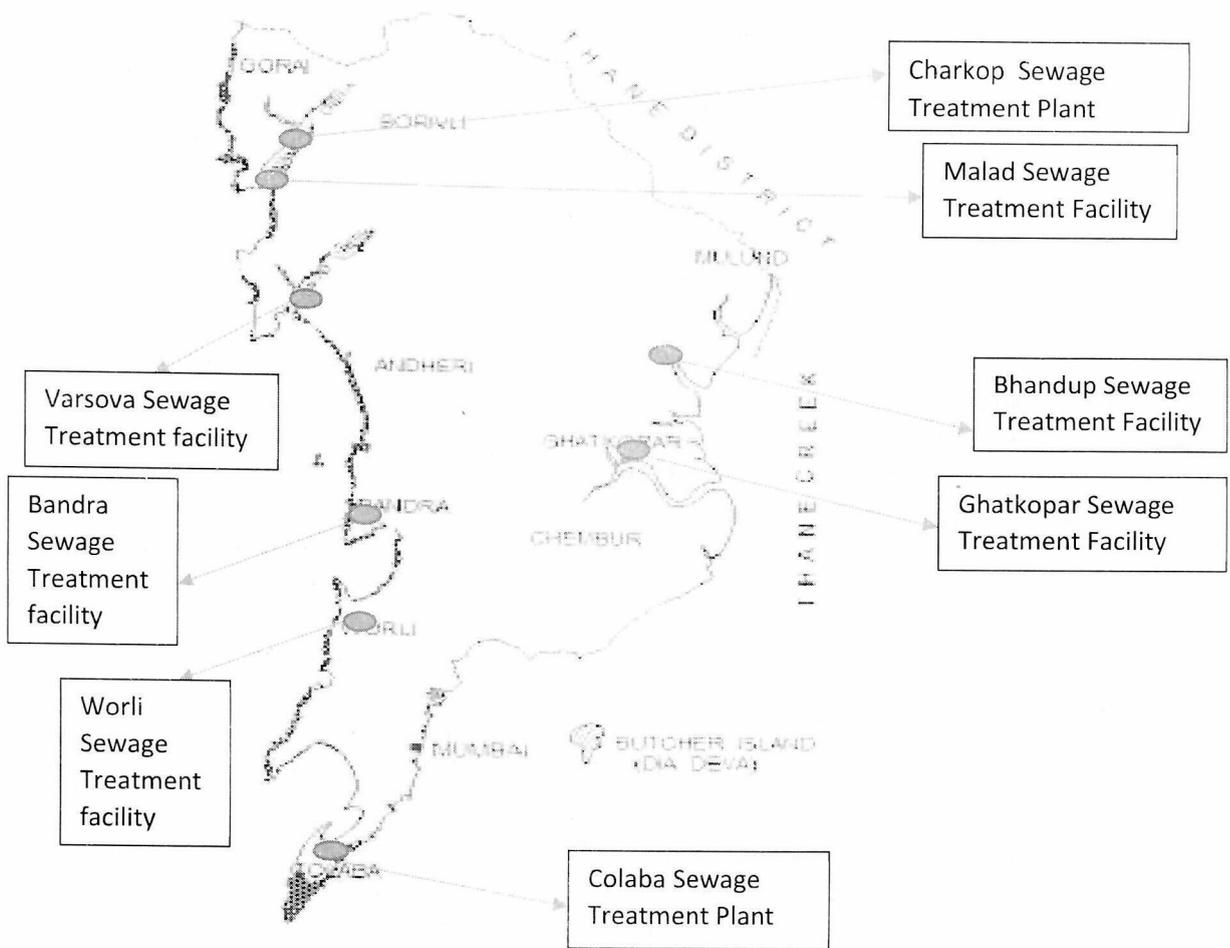


Figure-1. Indicative location of Sewage Treatment Facility in MMC area

2.1.Consents and authorisation

MCGM has been granted Consent and authorisation by Maharashtra Pollution Control Board (MPCB) vide consent order No. Format 1.0/BO/JD(WPC)/CC/-1805001473 dated 28.05.2018 which is valid upto 31.12.2020 (**Annexure-1**). The water requirement for domestic purpose as per consent is given as 2868 MLD. The permitted quantity of treated sewage discharge is cumulatively 2727 Million litre per day (MLD). The sewage treatment facility-wise permitted discharge is given in **Table-1**.

Table 1. Sewage treatment facility in MMC area and its discharge as per Consent of MPCB

Sr. No.	Name of sewage treatment facility	Permitted discharge quantity (MLD)	Disposal pathway
1.	Colaba STP	41	Open sea through marine outfall
2.	Worli STP	757	
3.	Bandra STP	797	
4.	Varsova STP	180	Malad Creek
5.	Malad STP	280	Malad Creek
6.	Charkop STP	6	Gorai Creek
7.	Bhandup STP	280	Thane Creek
8.	Ghatkopar STP	386	Thane Creek
	Total	2727	

As per the consent Condition No. C, all the sewage treatment facilities are consented for disinfection followed by reuse and remaining treated effluent is to be discharged as per the table No.1. The discharge outfall for treated sewage is provided as per the consent condition. The MCGM is mandated through consent for 50% treated effluent reuse.

2.2. Brief description of sewage treatment facilities

The details of wastewater treatment and its covered area is given in subsequent paragraphs.

2.2.1 Sewage treatment facility in Zone -1.

The zone-1 comprised mainly of Colaba area and also known as Colaba zone. The STP caters need of sewage treatment of approximately 6 km² area (from Church Gate to southern end of Mumbai) mainly comprising areas of Robert road, Afghan Church, Kitridge road, Churchgate Station, N.F. road, Merry weather road, etc. (**Figure-2**). Yellowish shadowed area is catchment area of this STP.

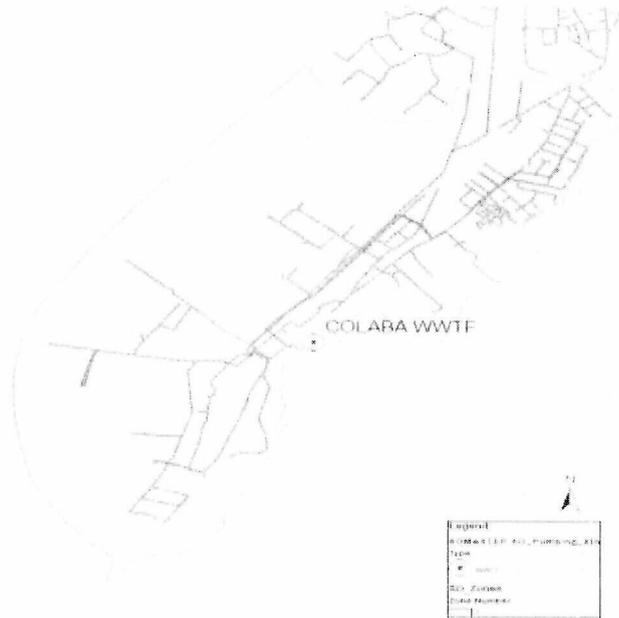


Figure-2. Catchment area of Colaba Sewage treatment plant.

The present sewage treatment plant (STP) is an upgradation of older wastewater treatment facility and is functional since April 2020. The plant capacity is 37 MLD for dry weather flow out of which about 27 MLD effluent is presently received for treatment. The plant can treat 37 MLD using sequential batch reactor (SBR) followed by chlorination and out of which about 10 MLD further upto tertiary level i.e. ultrafiltration (UF) followed by chlorination. The tertiary treatment of effluent is intended for reuse in naval and military establishment for cleaning purposes. The brief treatment scheme is given in **figure-3** with hydraulic load distribution of dry weather flow. The treatment comprised of screening, influent pumping, grit removal, SBR (secondary treatment), ultrafiltration (disc filter), disinfection and discharge through marine outfall.

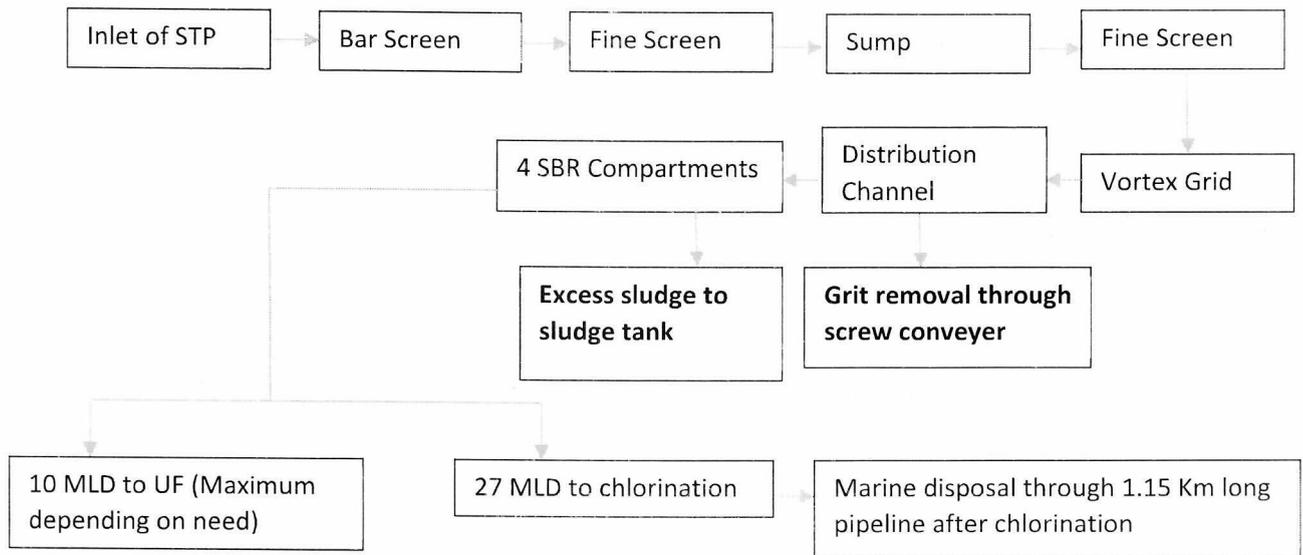


Figure-3. Schematic flow diagram of STP installed at Colaba

At present the STP treats about 27 MLD sewage and in wet flow season, it handles about 37 MLD effluents. The marine outflow pipeline equipped with diffusers were laid down reportedly in the 1985 for which diffusers were replaced recently. During heavy rain, the STP has provision of bypass for excess flow to inlet as well as from Grit Vortex exit. Chlorination is performed using chlorine gas having contact time of about 90 minutes. Generated excess sludge is thickened using centrifuge and disposed as manure for gardening and excess amount as landfilling.

2.2.2 Sewage treatment facility at Zone-2

The zone-2 sewage treatment facility is also known as Worli wastewater treatment facility (WWTF). The facility caters need of sewage treatment from churchgate (southern boundary) to Dadar on north Mumbai harbour (northern boundary), sewari on east to Arabian sea boundary on west covering 44 square kilometre area. The area mainly comprised of Girgaon, Kalba Devi, Malabar Hill, Nagpara, Tardeo, Mahalaxmi, Mazagaon, Worli, etc. The Zone-2 sewage treatment facility is known as Love Grove Complex (LGC). Orange shadowed area is catchment area for this sewage treatment facility (**Figure-4**). The sewage treatment facility receives upto 1000 MLD effluent in monsoon season with average flow of dry season of about 757 MLD. The designed capacity of this facility is 1820 MLD. Existing sewage treatment facility at Love Grove Complex is working since January 1991 and catering need of sewage treatment for about 30 lacs population. The treatment scheme is removal of floating materials (screening) followed by aeration in grit chamber and sedimentation to remove grits along with partial degradation of organic matter by aeration and action of natural microbes followed by marine disposal. Therefore, the establishment has provision for preliminary treatment followed by disposal. The schematic diagram of the sewage treatment scheme is given in **Figure-5**.



Figure-4. Catchment area of Worli Sewage treatment facility.

As informed, the removed grit and floatable matter is disposed through dumping at Deonar dumping site. 3.5 km long underground treated sewage disposal pipeline through marine outfall

is equipped with diffusers for dispersion of treated effluents. As informed, the marine outfall point is about 9 metre below the mean sea level. An arrangement is made for bypassing the grit chamber spill over during monsoon or heavy rain. The MMC has started searching for end user of this partially treated effluent. A proposal is under way for use of 1.5 Million litre treated effluent at Willington club.

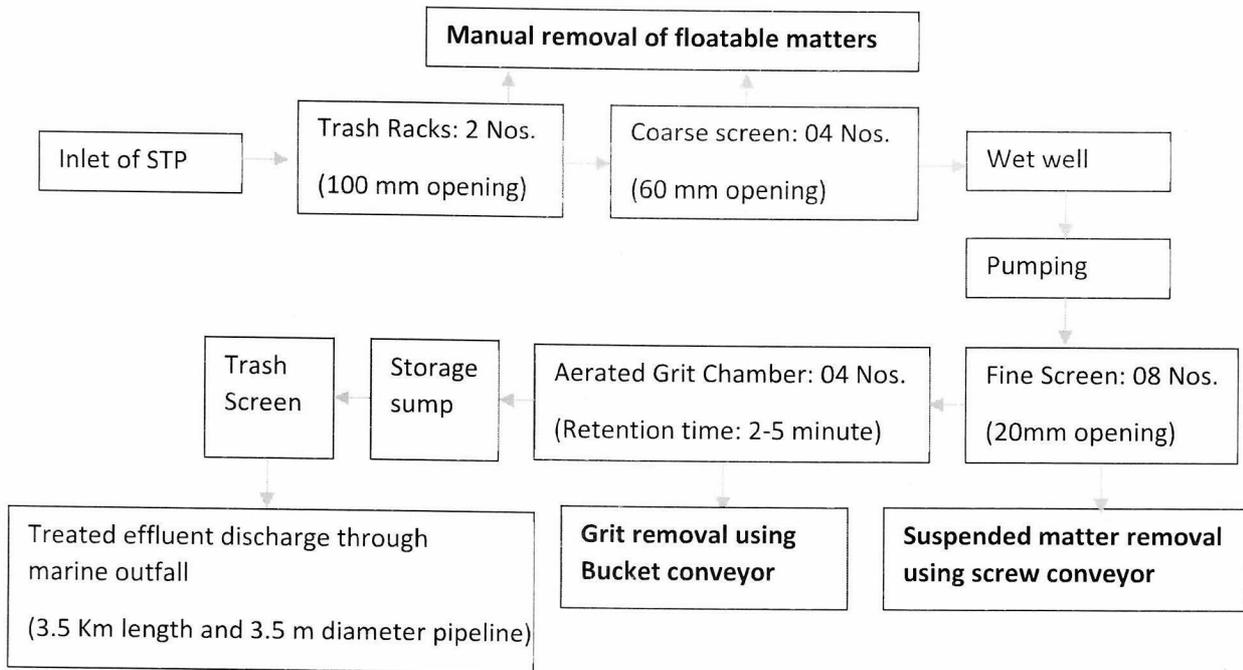


Figure-5. Schematic sewage treatment scheme at Love Grove Complex.

2.2.3 Sewage treatment facility at Zone-3

The zone-3 is also termed as Bandra WWTF. The sewage treatment facility caters need of sewage treatment of areas such as Nehru road, Khar, Kherwadi, part of Girgaon, etc. Yellowish Shaded area is catchment area of this sewage treatment facility (**Figure-6**). The facility receives upto 850 MLD effluent in monsoon season with average dry season flow of about 450 MLD. The sewage treatment facility at is working since January 2003. The treatment scheme is similar to that of love grove complex i.e. removal of floating materials followed by aeration in grit chambers and sedimentation to remove grits and partial degradation of organic matter by aeration and action of natural microbes followed by marine disposal. The treatment scheme is preliminary followed by disposal. Smell from removed grit was very offensive. The effectiveness of grit removal is relatively better than any other preliminary treatment plant within MMC jurisdiction and grit and floatable material removal is mechanised.



Figure-6. Catchment area of Bandra Sewage treatment facility.

As informed, the removed grit and floatable matter is disposed through dumping at Deonar dumping site. 3.7 km long underground pipeline is installed for disposal of treated effluent through marine outfall equipped with diffusers for dispersion of treated effluents. For monsoon season or excess hydraulic flow, an arrangement is made for bypassing the grit chamber spill over. The MMC has started searching for end user of this partially treated effluent. As informed, a proposal is under way for use of 0.5 Million litre treated effluent at Bandra IPS garden.

2.2.4 Sewage treatment facility at Zone-4

The zone-4 is also termed as Varsova WWTF. The sewage treatment facility caters need of sewage treatment from Dahisar to Goregaon area. Light green shadowed area is catchment of this sewage treatment facility (**Figure-7**). Sewage treatment facility receives upto 250 MLD effluent in monsoon season with average dry season flow of about 150 MLD. Present sewage treatment facility is operational since June 1998. The treatment scheme comprised of removal of floating materials followed by aeration and sedimentation to remove grits and partial degradation of organic matter by the action of natural microbes followed by aerated lagoons. The final treated effluent is disposed in Malad creek through natural drain. It is informed that about 20 m³ grit is removed per month which is disposed through landfilling. There are two outlets for two series of three lagoons. The schematic flow diagram is given at **Figure-8**.

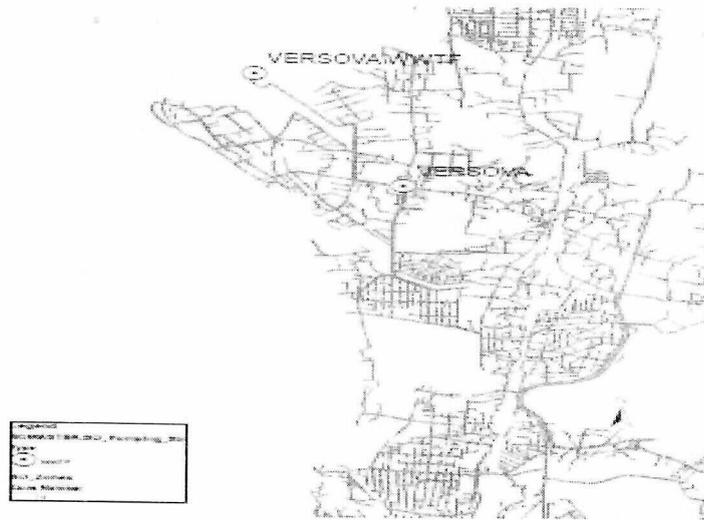


Figure-7. Catchment area of Varsova Sewage treatment facility.

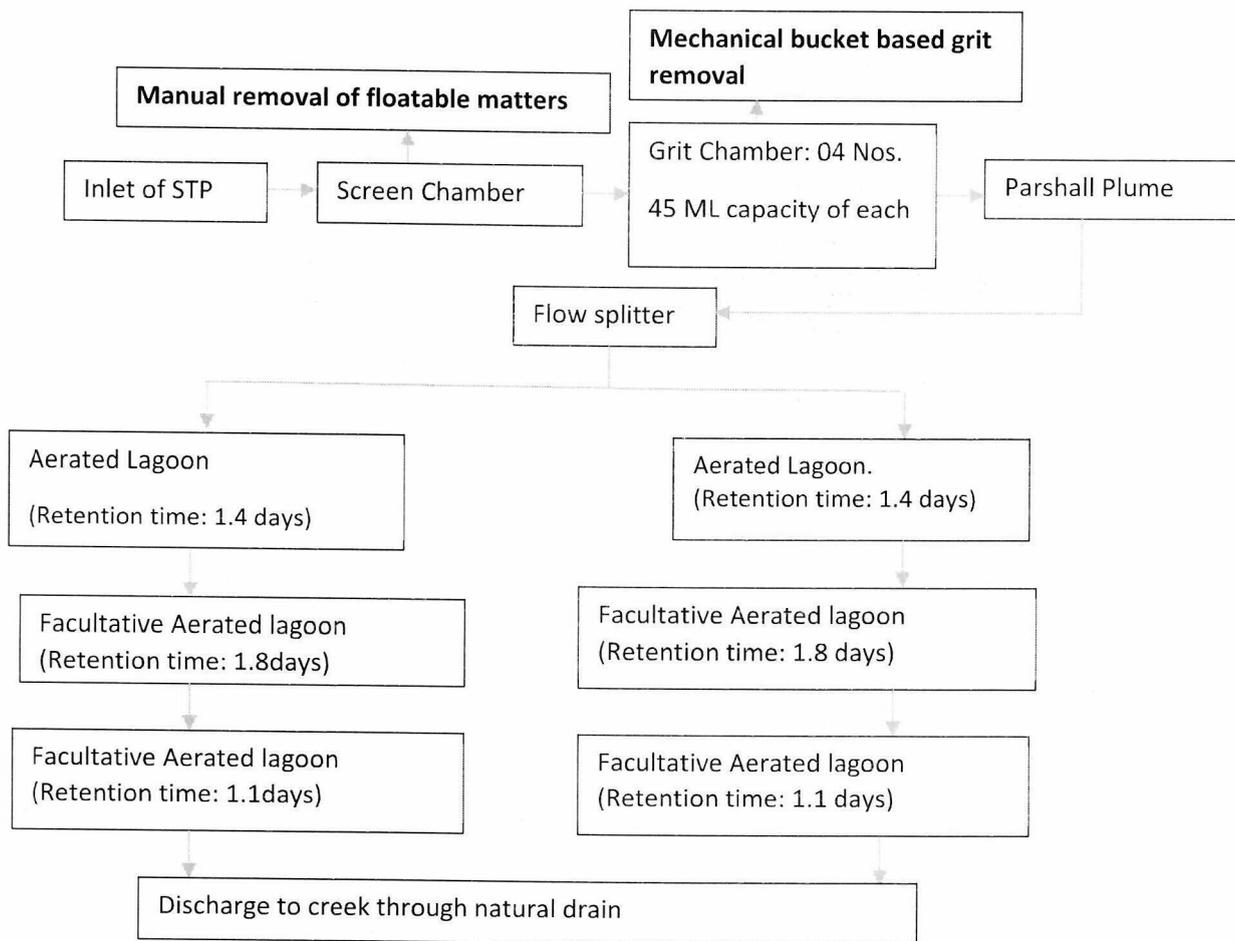


Figure-8. Schematic sewage treatment scheme at Varsova WWTF.

The lagoons in sewage treatment facility is operated in series of three lagoons. The lagoons have provision for surface aeration. 15 numbers of floating aerators are installed in each aerobic lagoon, nine aerators are installed in each second lagoon (facultative aerated lagoons) and two aerators were installed in each of final facultative aerated lagoons totalling to 52 aerators. However, during visit only one aerator was observed operational in each aerobic lagoon and all other aerators were non-operational. There is no defined peiodicity for de-sludging of lagoons. The final treated effluent is disposed in Malad creek at the coast which is about 500 m from the sewage treatment facility. Entire length of natural drain is un-lined. The lagoons were observed having algae on the surface and entire area has smell of sewage.

2.2.5 Sewage treatment facility at Zone-5

The zone-5 is also termed as Malad WWTF. Zone-5 has two sewage treatment facility. One facility similar to Love Grove Complex is operating in Malad and one 6 MLD capacity sewage treatment plant is operational at Charkop. These sewage treatment facilities caters need of sewage treatment from Dahisar to Goregaon area. The facility receives effluent from Charkop, Shmipoli, Vallabhnagar, Borivali, Gorai, Malavani and Dahisar area (**Figure-9**). Yellow shadowed area is catchment area of both the installed sewage treatment provisions in zone-5.

2.2.5.1 Malad Sewage Treatment Facility

The sewage treatment facility is working since June 1998. The average flow of dry season is about 240 MLD. The treatment scheme comprised of removal of floating materials followed by aeration and sedimentation to remove grits and partial degradation of organic matter by the action of natural microbes followed by creek discharge at Malad creek through natural channel. Therefore, the treatment scheme is preliminary treatment followed by disposal. The treatment arrangement is similar to the Love Grove Complex. The only difference is final discharge of this facility in Malad creek. The schematic flow diagram is given at **Figure-10**. The grit removal provision from Grit Chamber is manual. The removed grits were found stored on open ground. During visit, aerators were non-operational. From the visual appearance, this sewage treatment facility may be termed as most unorganized treatment facility due to various reasons.

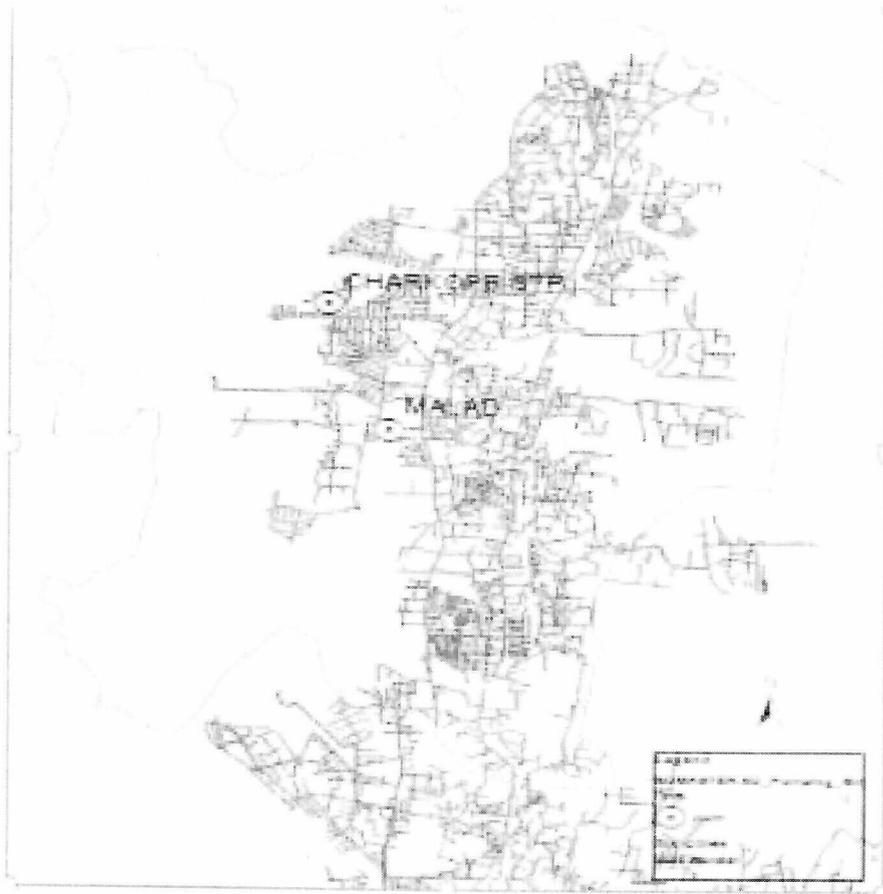


Figure-9. Catchment area of Sewage treatment facilities at Charkop and Malad of MMC.

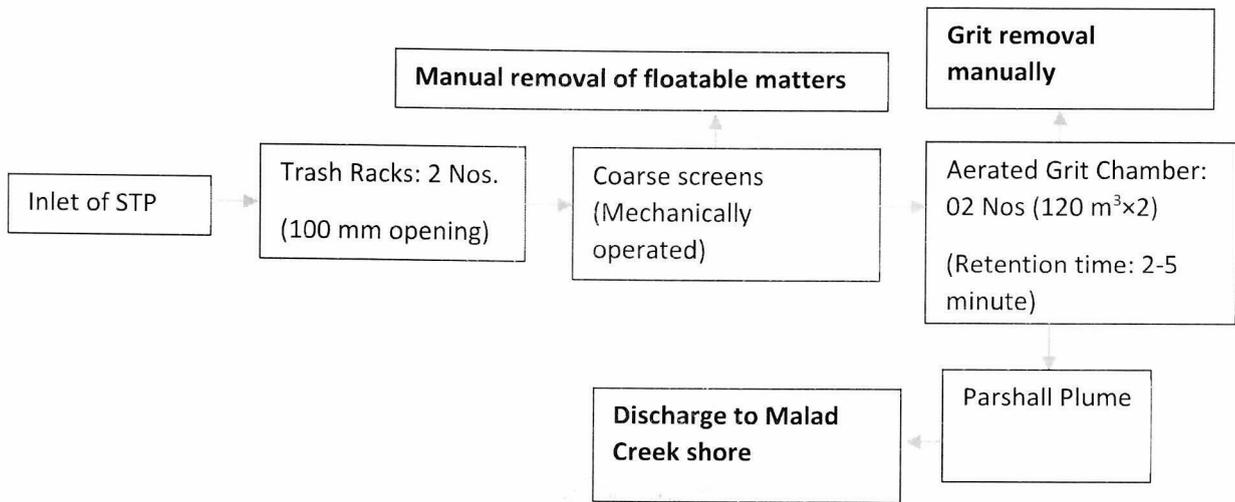


Figure-10. Schematic sewage treatment scheme at Malad WWTF

2.2.5.2 Charkop Sewage Treatment Plant

The present sewage treatment facility is working since April 2018 with capacity to treat 06 MLD sewage. The treatment scheme comprised of removal of floating materials followed by aeration and sedimentation to remove sludge through Vortex chamber. The settled sludge is passed through filter press and effluent is subjected to rotating mixed bed reactor (RMBR). The effluent after treatment in RMBR is subjected to settling tank followed by pressure sand filter and activated carbon filter. The treated wastewater is stored in holding tank and discharged in Goroi creek (**Figure-11**) through natural drain.

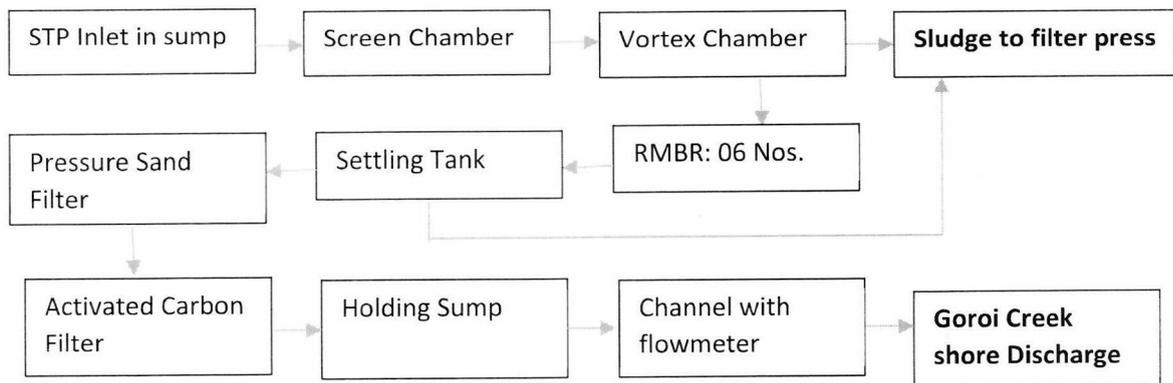


Figure-11. Schematic sewage treatment scheme at Charkop WWTF.

2.2.6 Sewage treatment facility at Zone-6

The zone-6 is also termed as Bhandup WWTF. The sewage treatment facility caters need of sewage treatment for almost 40% of eastern suburb of Mumbai comprising majority area of administrative S- ward and administrative T-ward. The area coverage includes Bhandup, Utkarsh Nagar, Pratap Nagar, Dadar, Mulund, etc. Light blue shadowed area is catchment area of this sewage treatment facility (**Figure-12**). As informed, sewage treatment facility receives upto 350 MLD effluent in monsoon season with average dry season flow of about 230 MLD. The sewage treatment facility is working since January 1997. The treatment scheme comprised of removal of floating materials followed by aeration and sedimentation to remove grits and partial degradation of organic matter by the action of natural microbes followed by aerated lagoons and Thane creek shore discharge through natural drain. There are four outlets for lagoons i.e. all the lagoons have individual outlets. The schematic flow diagram is given at **Figure-13**. The area is ecologically sensitive bird habitat especially for flamingo.



Figure-12. Catchment area of Sewage treatment facilities at Bhandup of MMC.

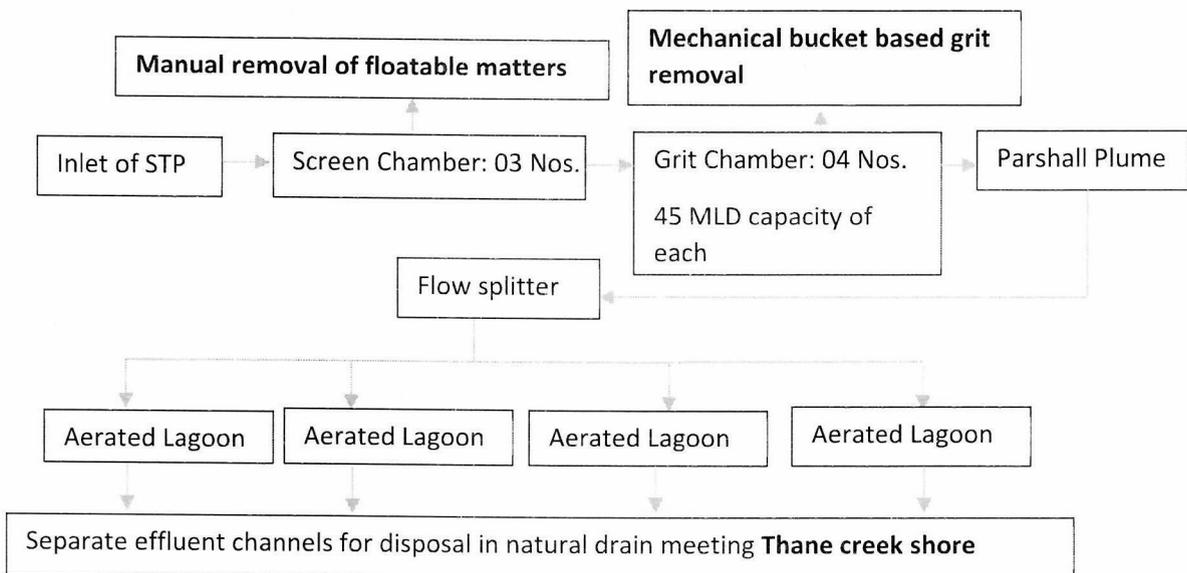


Figure-13. Schematic sewage treatment scheme at Bhandup WWTF

2.2.7 Sewage treatment facility at Zone-7

The zone-7 is also known as Ghatkopar WWTF. It caters need of sewage treatment from almost 60% of eastern suburb of Mumbai. The coverage area includes Ghatkopar, Chandivali, Amrit Nagar, Chirag Nagar, Powai, etc. Light green shadowed area in **figure-12** is catchment area of this sewage treatment facility. As informed, sewage treatment facility receives upto 690 MLD effluent in monsoon season and average dry season flow is about 272 MLD. The sewage treatment facility is working since January 2003. Treatment scheme comprised of removal of floating materials followed by aeration and sedimentation in grit chambers to remove grits. The effluent is further treated in aerated lagoons and treated effluent is discharged in Thane creek through natural drain. There are four outlets for treated effluent i.e. each lagoon has separate outlet. One lagoon was under maintenance. 16 surface aerators are provided in each lagoon totalling to 64 aerators. The schematic flow diagram is same as (**Figure-13**) Bhandup sewage treatment facility.



Figure-14. Catchment area of Sewage treatment facilities at Ghatkopar WWTF.

3.0 Monitoring of Sewage Treatment facilities

Grab samples were collected from all the eight sewage treatment facilities of MMC. Wherever more than one outlet is existing, all the working outlets were monitored. The collected grab samples were analysed by MPCB. MPCB has prescribed separate norms for marine outfall and shore discharge. Accordingly, Colaba-STP, Bandra Sewage Treatment facility and Worli Sewage Treatment Facility has different prescribed standards in consent and all other sewage treatment facilities have separate norms. The sewage treatment facility-wise monitoring report is given in Table-2 and Table-3. All values are given in mg/l except pH and percent sodium (%Na). "--" indicates data is unavailable.

Table -2. Monitoring result of sewage treatment facilities (STF) having marine outfall for treated sewage

Location		Parameters						
		BOD	COD	Mercury	% Na	pH	TSS	TKN
Colaba STP	Inlet	150	248	0.013	74.20	6.9	38	-
	Outlet	16	64	Not detected	80.74	7.1	12	-
Worli STF	Inlet	105	252	0.001	68.26	6.9	42	-
	Outlet	125	236	0.003	72.10	7.1	38	-
Bandra STF	Inlet	90	228	0.002	55.77	6.9	68	
	Outlet	130	252	0.003	57.25	6.9	68	18.5
MPCB Prescribed standard/ General Discharge standard		100	250	0.01	-	6.5-8.5	100	100 (Total Nitrogen)

Table-3. Monitoring result of sewage treatment facilities having shore discharge

Location		Parameters						
		BOD	COD	Mercury	% Na	pH	TSS	TKN
Varsova STF	Inlet	20	80	0.004	67.14	7.1	18.0	-
	Outlet Left side	120	236	0.005	63.64	6.8	40	-
	Outlet right side	36	76	0.008	65.01	7.2	28	25.2
Malad STF	Inlet	140	304	0.002	50.76	6.8	60	-
	Outlet	135	420	0.001	54.96	6.8	110	-
Charkop STP	Inlet	145	404	0.004	76.35	6.8	30	-
	Outlet	16	52	0.004	66.79	7.9	16	3.4
Bhandup STF	Inlet	44	172	0.003	57.88	7.1	12	24.6
	Lagoon-1 Outlet	22	92	0.001	53.84	7	14	29.7
	Lagoon-2 Outlet	28	84	0.001	54.48	6.9	24	26.3
	Lagoon-3 Outlet	21	72	0	53.76	7.3	20	27.4
Ghatkopar STF	Inlet	40	188	0.004	69.74	6.9	30	18.5
	Lagoon-2 Outlet	24	84	0.002	66.93	6.9	16	18.5
	Lagoon-3 Outlet	14	72	0.002	64.88	7	24	17.9
	Lagoon-4 Outlet	16	80	0.001	66.74	7	12	19
MPCB Prescribed standard/ General Discharge standard		-	50	0.01	60	6.5-9.0	50	-

In Varsova sewage treatment facility, it is observed that inlet BOD is very less in comparison to outlet BOD. This may be due to grab sampling and variation of organic load of sewage. From the monitoring results, it can be seen that the Zone-2 (Worli) and Zone-3 (Bandra) sewage treatment facilities are not meeting the norm stipulated for the parameter BOD whereas Colaba sewage treatment plant meets the prescribed standard. Zone-5 (Malad) sewage treatment facility is not meeting the MPCB prescribed norm for BOD and Zone -5 (Charkop) STP is not

meeting the prescribed norm for percent sodium. Zone-4 (Varsova) sewage treatment facility and Zone-7 (Ghatkopar) sewage treatment facility are not meeting norm stipulated by MPCB for percent sodium. Varsova sewage treatment facility is not meeting norm for BOD also in one treatment stream. Though percent sodium is largely a sodicity related parameter which may not have larger detrimental influence on creek. However, it is a compliance parameter as per consent and may have influence in drains during low tide due to high volumetric flow, its non-compliance is definitely a violation of stipulated norm.

4.0 Observations in sewage treatment facilities.

Brief observation on sewage treatment facility is given in subsequent paragraphs. Individual sewage treatment facility-wise observation is followed by overall observation based on all sewage treatment facilities.

4.1. Observations on Sewage treatment facilities

4.1.1. STP at Zone-1.

1. This STP is newly commissioned (April 2020) for 37 MLD sewage having provision of partial treatment upto tertiary level. It is an upgradation of plant installed in the year 1986 which was only pre-treatment facility.
2. Centrifugal pumps are installed for suction of odors from grit vortex followed by atmospheric emission at a height for better dispersion.
3. The Sequential Batch reactors (SBR) have cycle of 45 minutes for aeration, settling and decantation totaling to 2 hour and 15 minute cycle at each of four SBR (volume: about 24 ML×4) i.e. the principle of SBR is fill and draw.
4. There are three disc filters installed for tertiary treatment of about 10 MLD effluent.
5. The STP has provision for disinfection using chlorine gas. Approximate contact mixing time is about 90 minute before the treated effluent pass to the discharge channel.
6. The thickened sludge from sludge storage tank is pumped to centrifuge for dewatering followed by sludge disposal in low lying areas. The unit need to adopt a provision for either sludge and grit disinfection before disposal or alternatively the sludge may be converted to manure and contamination free manure can be used for gardening.
7. The STP has bypass arrangement for excess hydraulic load control at the inlet of STP and outlet of grit vortex.

4.1.2 Sewage treatment facility at zone-2.

1. The treatment facility is limited to preliminary treatment followed by marine disposal.
2. To control excess hydraulic flow and handle high tidal situations, a gravity bypass arrangement is made after grit chamber.
3. The purpose of grit chamber is to remove particle with higher gravity by settling (may be particle size more than 0.2 mm diameter and 2.65 or higher specific gravity) and keeping lower

gravity particles (organic matters) in suspension. This facility has four grit chambers. Out of four grit chambers, one was having proper aeration through diffused aerators and second grit chamber was having only one diffuser outlet in operation. One of the grit chamber was having floating matters on the surface which implies that grit removal periodicity is not proper and aeration diffuser maintenance is poor (**Photograph-1 & 2**). In such situation, the entire 27.5 m² area of a grit chamber cannot be properly aerated as the maximum residence time of effluent in grit chamber is only about 5 minutes or less depending on flow.

4. The screens are mechanically operated and the collected floatable materials are kept in a trolley using conveyor belt which is disposed as municipal solid waste. The grit removal provision is based on mechanical crane operated bucket which disposes grits on ground. As informed, on an average about 18 m³ grit is daily removed from grit chamber. There is no odour management for removed grits. The dried grits are sent to Deonar municipal waste dumping site. Thus proper arrangement for temporary storage and disposal of grits are not available.



Photograph-1. View of grit chamber having one operation diffuser.



Photograph-2. View of grit chamber having no operational diffuser.

4.1.3 Sewage treatment facility at zone-3.

1. The treatment facility is preliminary treatment followed by sea disposal. Among all the pre-treatment facility for sewage in MMC, cleanliness is comparatively better at this facility.
2. To control excess hydraulic flow and handle high tide situations, a gravity bypass arrangement is made after grit chambers.
3. The grit storage area was having pungent sulphurous smell. The facility is not having any arrangement for removal of bad odour from collected fresh grits.
4. The screens are mechanically operated and the collected floatable materials are kept in a trolley using conveyor belt which is disposed as municipal solid waste. The grit removal provision is based on mechanical crane operation. As informed, on an average about 18 m³ grit

is daily collected from grit chambers. The dried grits are used either for landfilling or sent to Deonar municipal waste dumping site.

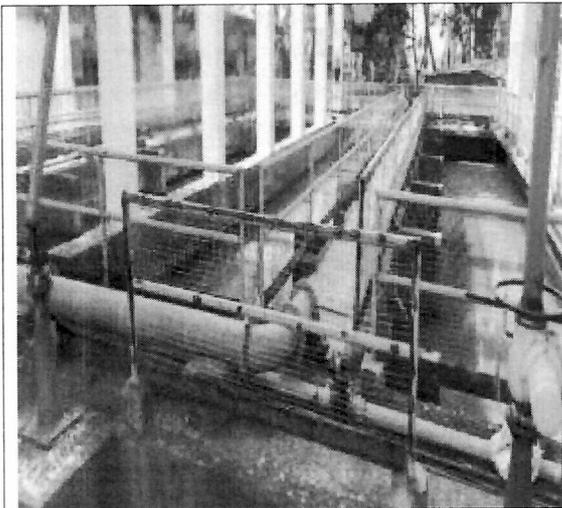
4.1.4 Sewage treatment facility at zone-4.

1. The treatment facility is restricted upto preliminary treatment followed by lagoon treatment and treated effluent is disposed in Malad creek.

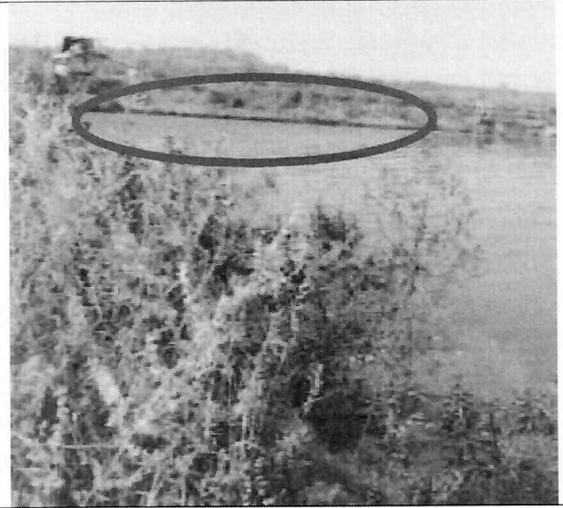
2. Four grit chambers are provided having 45 MLD capacity of each grit chamber. The grit chamber aeration systems were not operational during visit (**Photograph-3**). Scum was observed floating in the surface of grit chamber indicating that the grit chambers are not properly maintained.

3. There are six concreted lagoons. The appearance was deep brownish in colour at aerated lagoons and facultative lagoons on left side indicating poor maintenance and poor sewage treatment efficiency. Only 04 aerator was operational altogether out of 52 surface aerators i.e. one aerator in each lagoon. Scum was observed over the aerated lagoon as well as facultative lagoons near the bank of lagoons (**Photograph-4A and Photograph-4B**).

4. The screens are mechanically operated and the collected floatable materials are kept in a trolley using conveyor belt which is disposed as municipal solid waste. The grit removal provision is based on mechanical crane operation which disposes the grits on ground. The dried grits are used either for landfilling or sent to municipal waste dumping ground. Thus proper arrangement for temporary storage and disposal of grits is not available.



Photograph 3. A view of grit chamber without aeration and floating scum on the surface



Photograph-4A. Brownish colour of water and scum at the surface in aerated lagoon



Photograph-4B. View of a brownish appearance in facultative lagoon of Varsova sewage treatment facility

4.1.5 Sewage treatment facility at zone-5.

4.1.5.1 Malad sewage treatment Facility

1. The treatment facility is preliminary treatment followed by treated effluent disposal in Malad creek.
2. There are two grit chambers ($2 \times 120 \text{ m}^3$). Scum was observed floating on the surface of grit chambers in spite of significant flow indicating that the grit removal from grit chambers and mixing of organic matters are not proper (**Photograph-5**). There was no proper arrangement for grit removal. The grit removal is appeared either manual or through temporarily arranged bucket conveyer.
3. Colour of treated sewage was like fresh sewage indicating that preliminary treatment is not effective (**Photograph-6**).
4. The screens are mechanically operated and the collected floatable materials are kept on ground which is intended for disposal as municipal solid waste. Thus proper arrangement for temporary storage and disposal of grits is not available.
5. There was an open drain flowing adjacent to this sewage treatment facility. From appearance, it can be inferred that open drains is carrying untreated sewage (**Photograph-7**). Therefore, the sewage collection near to this treatment facility is also not proper.



Photograph-5. A view of floating scum in grit chamber



Photograph-6. A view of finally treated sewage discharged to creek



Photograph-7. View of an open drain near the Malad sewage treatment facility.

4.1.5.2. Charkop Sewage Treatment Plant

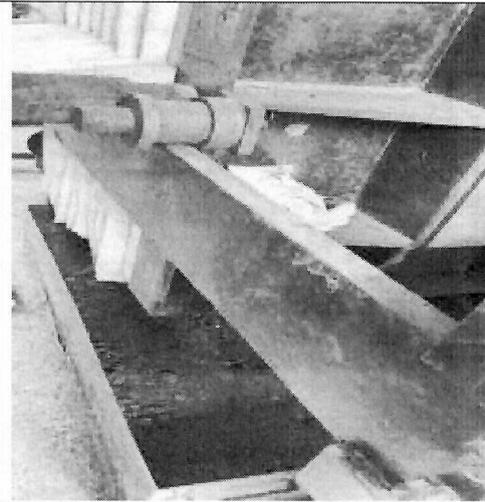
1. The STP operates based on rotating media bioreactor (RMBR). Two RMBR out of six were non-operational during visit.
2. Bypass arrangement exist for raw effluent, RMBR, pressure sand filter and activated carbon filter. Sumps of older sewage treatment facility is used as storm water collection provision.

3. Algal bloom appeared in final treated effluent holding tank (**Photograph-8**). Therefore, it may be inferred that grown green algae may deplete oxygen from the treated wastewater which may be detrimental to the recipient water body i.e. Gorai creek.

4. Reportedly filter press is operated twice a week. However, the appearance of filter press revealed that it has not been operated since long (**Photograph-9**). As informed, the removed sludge is used for gardening and Grits removed from Vortex settling is used for landfilling.



Photograph-8. View of final treated sewage tank with green algae on surface



Photograph-9. A view of long idle filter press.

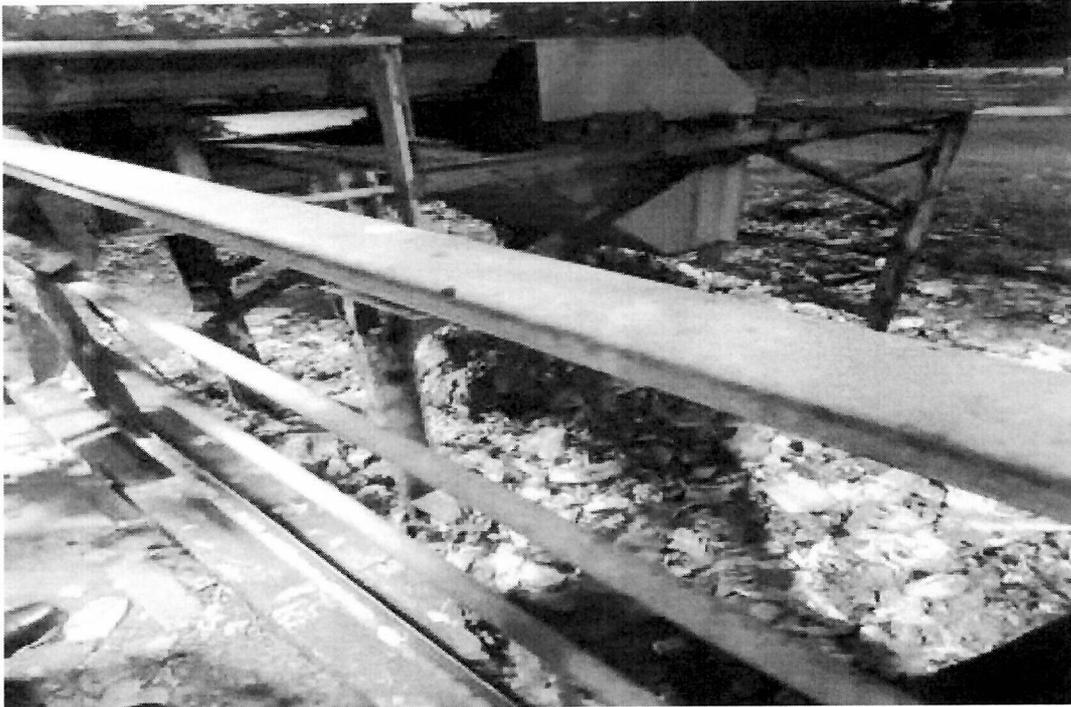
4.1.6 Sewage treatment facility at zone-6.

1. The treatment facility is preliminary treatment followed by lagoon treatment. The treated effluent is disposed in Thane creek.

2. Four grit chambers are available (4×45 MLD). Grit chamber is having about 4-5 minute retention time. Grit was stored on open land.

3. There are 04 concreted lagoons and their appearance were brownish indicating poor maintenance of lagoons. As informed, the lagoons (capacity 70 ML each) are having 48 hour retention time. Total installed surface aerators in lagoon is 58 i.e. 14 aerators in each lagoon. Each lagoon was observed having one aeration system operational except one lagoon where two aerators were operational during visit. All the lagoons have separate outlets for treated effluent to Thane creek using natural drain.

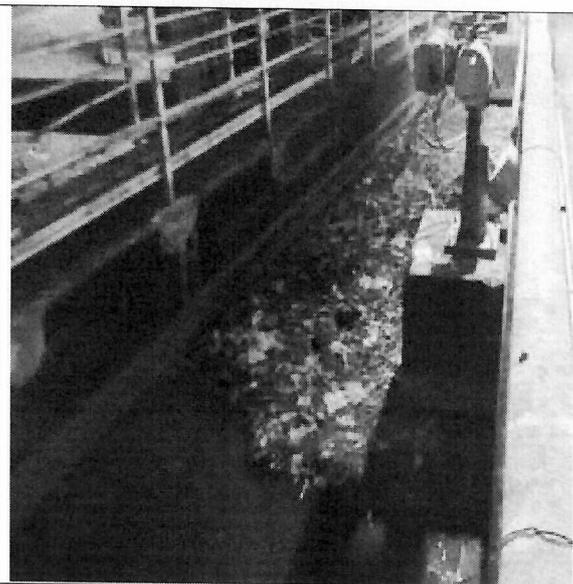
4. The grit removal provision is based on mechanical crane operation which disposes the grits on ground. The dried grits are used either for landfilling or sent to municipal waste dumping site. Thus proper arrangement for temporary storage and disposal of grits are not available. The floating matters from screens are also disposed on ground (**Photograph-10**).



Photograph-10. Materials removed from bar screens are collected on open ground

4.1.7 Sewage treatment facility at zone-7.

1. The treatment facility is preliminary treatment followed by lagoon treatment and treated effluent is disposed in Thane creek. The pumping station have installed capacity of 690 MLD out of which only 272 MLD effluent is received in dry season.
2. Four grit chambers are available having 45 MLD capacity of each grit chamber. Grit chamber is having about 4-5 minute retention time. Grit was stored on open land. Out of four grit chambers, one grit chamber was heavily loaded with floating matters (**Photograph-11**) which implies that grit chambers are not maintained properly. The aeration system was not working in two grit chambers during visit.
3. There are 04 concreted lagoons out of which one lagoon was under maintenance. Appearance of effluent in lagoon was brownish. As informed, the lagoons (capacity 90 ML each) are having 48 hour retention time. Each lagoon was observed having one aeration system operational. All the lagoons have separate outlets for treated effluent to Thane creek through natural drain. Lagoons were not properly maintained as two lagoons were observed having floatable matters near the bank of lagoons may be due to operation of surface aerators which pushes floatable matters towards edge of lagoons.
4. The grit removal provision is based on mechanical crane operation which disposes the grits on ground. The dried grits are used either for landfilling or sent to municipal waste dumping site. Thus proper arrangement for temporary storage and disposal of grits are not available.
5. The weir of lagoons were observed having floatable matters (**Photograph-12**).



Photograph-11. A view of floating matters in grit chamber



Photograph12. A view of scum and floating matter on the surface of lagoon near weir discharging treated effluent to drain.

4.2. Overall Observations

These observations are by and large based on factors namely adequacy in operation of sewage treatment facility, physical appearance during visit, grit and sludge management and disinfection practices adopted by MCGM which are discussed earlier in this report.

1. MCGM has informed that there is 3750 MD water supply in MCGM area. Out of which sewage generation is reported as 2190 MLD. However, considering 85% water supply as sewage generation, 3187.5 MLD sewage generation is envisaged. Therefore, gap in estimation of sewage generation of MCGM is about 997.5 MLD or about 31.29 % of generated sewage. It may be said that nearly half of the human settlement in Mumbai is in slum areas. Thus major gap in sewage generation estimation would be in slum areas as 250 well identified slum clusters located along municipal roads. As per the MPCB consent condition, MCGM has capacity to treat about 2727 MLD sewage.
2. As informed by MCGM, it is estimated that about 285 MLD dry weather flow is being discharged to Mithi river from various drains. This 285 ML would be majorly sewage which may be considered within the 31.29% gap in estimates of sewage generation.
3. Though there is no precise definition for sewage treatment plants based on the sewage treatment schemes/ technique adopted, the ultimate objective is to treat the sewage to the desired quality and dispose properly. Except Charkop STP and Colaba STP, other sewage treatment facilities donot have proper treatment capacity to comply with notified STP standards. Floatable particle removal and grit removal from the aerated effluent is not sufficient to remove organic load upto the desired quality. The effluent

form aerated lagoons bound to have suspended matters which escaped either from grit chamber or from a sedimentation sump without clarification. In such a situation, treatment can only be partial. Therefore, it may be said that MMC needs to augment its treatment capacity as well as efficiency. It may also be said that the wastewater treatment facilities provided with onshore disposal of treated sewage in creek presently do not have capability to meet the notified STP standards [GSR 1265 (E) dated 13.10.2017].

4. Except the lagoon based sewage treatment facility, all the facilities have bypass arrangement for monsoon or higher hydraulic load control. In such a situation partially treated and untreated sewage discharge to water bodies cannot be ruled out.
5. In all the STPs and sewage treatment facilities, it was observed that sludge, settled grit and floatable matters are disposed either through solid waste management site or by filling up the low lying areas. There is no treatment mechanism for sludge or grit at any sewage treatment facility (except Colaba STP). Mumbai being surrounded by creeks and sea, the net result is separation of sludge and grit at sewage treatment facility and ultimately polluting water bodies through potential seepage and leachate from grit disposal location keeping in view of rainfall in Mumbai. As per information, precise accounting of sludge/ grit and its defined disposal location is not recorded. Thus overall grit and sludge management is poor and has all probability and potential for water pollution. Needless to say that grit chambers in sewage treatment facility are majorly aerated system and removed grits bound to have pathogens as well as organic load either as grit coating or independent particle. This fact can be easily experienced at sewage treatment facilities of Mumbai as the grits had bad smells. In general about 10 kg to 20 kg grits per million litre may be available in sewage which needs proper treatment.
6. Except Colaba STP (Zone-1), no other STP practices disinfection for treated sewage or sludge. Thus existing practice has all potential for contamination of water bodies especially in area where the onshore disposal of treated sewage is practiced without disinfection. Besides augmentation of treatment efficiency, the treated sewage disinfection practice need to be adopted at all Sewage treatment facilities.
7. Wherever the lagoon based treatment is adopted (Varsova, Ghatkopar, Bhandup), the aeration system for lagoon was not fully operational in treatment facilities e.g. one surface aerator at each aerobic lagoon was working. The flow of partially aerated grit removed wastewater is generally continuously flowing to the lagoons. In such a situation short-circuiting of effluent (untreated effluent) to the creeks cannot be controlled.
8. There is no defined periodicity of de-sludging/dredging of the lagoons. In such condition, anaerobic condition at bottom of lagoons may be prevalent. As a result, lagoon can become a source of odour nuisance, breeding ground for mosquitoes, pathogenic

bacterial passing to the creeks, etc. Not only this, the settled sludge at the bottom of lagoon reduces the designed retention time and hence the treatment efficiency of lagoon is bound to reduce over the period of time.

9. The lagoons inherently have issues like low DO, algal overgrowth, partial nitrification, etc. which need to be taken care as the colour of effluent in lagoon can describe the prevalent situation. It is desirable that a lagoon should appear slight/sparkling bluish in colour or light greenish with no abundance of scum or algae on the surface. However in almost all lagoons, appearance were brownish having smell as well as sludge and floatable materials (scum/algae/ others) at the edge of lagoons. The pushing of these floating materials to the bank of lagoon would have been mainly due to operation of surface aerators of lagoons. Such brownish colour is also an indication of high sludge at the bottom, low DO, overloaded lagoon and anaerobic activities at the bottom portion of lagoons.
10. From the point of view of climatic condition (temperature variation in a year) of Mumbai, the lagoon based treatment can be a suggested measure for sewage treatment. But looking into high population density, poorly managed lagoons, shore discharge provisions and high rainfall in Mumbai (leading to either short-circuit of effluent or bypass), it may be said that lagoon based treatment is not suitable for sewage treatment in Mumbai.
11. MMC has identified potential reuse of treated effluent to the tune of about 467.3 MLD comprising of end users as army and navy area, Willington Club, Rajbhawan, Gardens (Bandra IPS garden and Pramod Mahajan Udyan) but actual execution is still not finalized. For any reuse, tertiary treatment with disinfection of treated sewage is required.
12. The precise inventory of contaminated natural drains carrying sewage/ wastewater is unavailable with MMC.

4.3 Future planning of MMC for improvement in sewage collection and treatment

4.3.1. Action plan for improvement in wastewater collection along Mithi river

The wastewater collection system augmentation in MCGM area is divided in different segments and phases termed as packages. The phase wise planning and achievements informed by MCGM officials related to work for diversion of dry weather flow from Mithi river to Municipal sewage network is briefly described as under:

A. Package-1:

Mithi river receives about 285 MLD dry weather flow which is under process of diversion to municipal sewer system. This package includes about 1.65 km long sewer network along bank of Mithi river from Filter Pada to Powai, installation of 24 MLD

influent pumping station, installation of one 08 MLD capacity STP at WSSD Garage and construction of a service road along the bank of Mithi river. As informed, out of these planned activities, about 1.04 km long sewer line is constructed and 08 MLD STP and 24 MLD pumping station installation is under progress. It was claimed by MCGM that nearly 70% work is completed.

B. Package -2:

The area under consideration of this package is from WSSD Garage to CST Bridge. This package consists of construction of 8.07 km long sewer line along Mithi river and diversion of 102 Numbers of interceptors to divert dry weather flow of natural drains to municipal sewer. Besides this, construction of retaining walls of 3.325 km and service road of 9.375 km is also proposed. The entire work is under process of tendering.

C. Package-3:

The coverage area of package-3 is from CST bridge to Mahim Causeway and at Vakola nalla. Vakola nalla, Ashok Lyland Nalla and Kalpana Kamran nalla is flowing in this area. This package includes installation of 02 pumping stations and interceptions, 6.51 Km sewer line construction and 26 numbers of flood gates construction as the area is under tidal influence. This work is under bid scrutiny stage.

D. Package-4:

The area coverage is from Bapat nalla to Safed nalla. This proposal is covering about 6.5 km long sewer tunnel. Tunnel diameter will be about 2.8 m. The entire collected wastewater is planned to be treated in proposed wastewater treatment plant at Dharavi. Bidding is yet to be done for the proposed work.

4.3.2 Proposal for sewer network in other areas

As informed, MCGM has prepared action plan to cover entire city and suburb area to achieve 100% sewer connectivity. The proposal comprised of 93.68 km sewer line on unencumbered DP road and 143 km long sewer line on encumbered proposed D.P. road. The proposal of these sewer lines have been planned as four separate components. These are:

A. Component-1:

The pipeline of this component is planned on existing DP road having width of 06m or more. This component has five segments. 9.08 km long sewer line is already developed and work is under progress on 58.54 km length. Out of remaining 26.11 km length, 7.51 km length of proposed sewer installation is under tendering process and 18.56 km length is still under planning stage.

B. Component-2:

This component covers all those areas encumbered by slum occupants. MCGM has identified 143 k m length of road where slum encumberment exists. Sewer network in these

areas are planned under Slum Rehabilitation Scheme. The timelines for completion of these sewer line network is yet not fixed. However, permissions are granted to development authorities for laying down of pipeline alongwith development of D.P. roads.

C. Component-3:

This component mainly targets interception of dry weather wastewater flow in Mithi river, Dahisar river, Poisar river, Walbhat river and Oshiwara river. Mithi river part is described in earlier. The other river-wise progress in execution of work is as under:

- (i) **Dahisar river:** Under the rejuvenation project, 4.42 km long sewer network, 1.16 km long service road and 1.22 km long roadside drain are proposed along the length of river with 10 numbers of interceptors to divert dry weather flow from river to sewer network. Two STPs is also panned for construction namely 1.5 MLD Sukurwad STP and 05 MLD Indira Nagar STP. The sewer line work is under tendering at present.
- (ii) **Poisar river:** Under the rejuvenation project, 8.67 km long sewer network, 3.15 km long service road and 9.2 km long roadside drain are proposed along the length of river. 10 STPs are also panned for construction at various places namely Kranti Nagar, Gokul Nagar, Durga nagar, Mahindra green gate, Thakur parking plant, Gaondevi Bihari Tekri, Tulaskarwadi, Iraniwadi and sanjay nagar. The combined capacity for treatment would be about 35 MLD. The work is under tendering at present.
- (iii) **Walbhat/ Oshiwada river:** Under the rejuvenation project, 4.72 km long sewer network, 5.1 km long service road, 4.69 km long roadside drain, 1.8 km long retaining wall, 06 interceptors and 05 STPs are proposed along the length of river to divert dry weather flow to sewer network. The combined treatment capacity of planned STP would be 20.5 MLD. The work is under tendering at present.
- (iv) **Other work proposed under component-3:** The diversion of effluent from Powai lake to Municipal drain is under progress and sewer line for Kannamvar Nagar for divert effluent to Bhandup Sewage treatment facility is under planning stage.

D. Component-4.

The component-4 mainly rely on implementation of projects sanctioned under Swachha Bharat Mission and will target slum areas and small roads. The compiled details were not readily available as the work execution is through respective wards and solid waste management departments on scattered basis.

4.3.3 STP planned by MCGM

MCGM has invited tenders for upgradation of STPs as well as new STPs. The details are given in Table-4.

Table-4. Tendered proposal of upgradation of existing waste water treatment facilities.

Sr. No	Name of facility	Plant capacity (MLD)	Tertiary treatment capacity (MLD)	Expected date of award of tender	Expected date of completion
1.	Worli	500	250	01.04.2021	31.03.2026
2.	Bandra	360	180	01.04.2021	31.03.2026
3.	Dharavi	418	209	01.04.2021	31.03.2026
4.	Varsova	180	90	01.04.2021	31.03.2025
5.	Malad	454	227	01.04.2021	31.03.2027
6.	Bhandup	215	108	01.04.2021	31.03.2025
7.	Ghatkopar	337	170	01.04.2021	31.03.2025

The technology for sewage treatment plant upgradation is not finalised and it is open for bidders to suggest the treatment technology in their bids.

5.0 Calculation of environmental compensation

5.1 environmental compensation period

To arrive at the month of start of violation, the order dated 14.10.2020 of Hon'ble NGT in this matter [OA NO. 197/2017 (WZ)] is referred. Part of the order at page No. 17 reads as,

".....Recovery of compensation on 'Polluter Pays' principle is a part of enforcement strategy but not a substitute for compliance. It is thus necessary to issue directions to all the States/UTs to enforce the compensation regime, latest with effect from 01.04.2020. We may not be taken to be condoning any past violations. The States/UTs have to enforce recovery of compensation from 01.04.2020 from the defaulting local bodies. On failure of the States/UTs, the States/UTs themselves have to pay the requisite amount of compensation to be deposited with the CPCB for restoration of environment....."

Accordingly, month for starting computation of environmental compensation is taken as April 2020.

5.2. Sewage treatment standards for identifying violation

As per GSR 1265 (E) dated 13.10.2017, all the STP having marine outfall is mandated to discharge treated effluent conforming to the general discharge standard and other STP having any other mode of disposal has to dispose the treated sewage conforming to GSR 1265 (E) dated 13.10.2017. The GSR 1265 (E) dated 13.10.2017 stipulates that,

"These Standards shall apply to all STPs to be commissioned on or after the 1st June, 2019 and the old/existing STPs shall achieve these standards within a period of five years from date of publication of this notification in the Official Gazette."

Therefore, as per the GSR 1265 (E) dated 13.10.2017 notification, the notified standards is at present applicable to only Colaba STP as it is commissioned in April 2020. However this STP has marine outfall and hence general discharge standard is applicable. Therefore, the prescribed standard stipulated in Consent order issued by MPCB as well as general discharge is taken as standard to examine the performance of STP and sewage treatment facility based on available data.

5.2. Sewage treatment plant monitoring results for computation of Environmental compensation

MPCB and MCGM monitors all sewage treatment facilities. The data of MPCB and MCGM are compiled from April 2020 to October 2020. The analytical results of monitoring carried out by the visiting team during 10.11.2020 to 11.11.2020 is considered as data for the month of November 2020. The Based on the available data (MPCB monitored data, MCGM monitored data, CPCB Team sampling data), it was observed that treated sewage quality exceeded MPCB prescribed standards at various facilities. Therefore, those analytical data are considered for calculation of environmental compensation which is establishing the violation. The available analytical results from April 20120 to November 2020 is given in **Annexure-II**.

5.3. Environmental compensation calculation method

Order No. 38(ii) of the order dated 14.10.2020 of Hon`ble NGT in this matter [OA NO. 197/2017 (WZ)] at page 101 reads as,

“.....Where the operational deficiencies of the existing STPs has not been rectified and untreated is being discharged into the water bodies, the environmental compensation at the rate of Rs. 10 lakhs per month per STP be deposited to the CPCB. The CPCB is directed to examine all the STPs, CETPs within the Mumbai Municipal Corporation and calculate the amount of environmental compensation in accordance with law and to proceed to recover the amount and communicate this Tribunal within fortnight.....”

Accordingly, the environmental compensation is calculated based on available data from April April 2020 to November 2020. The standard to achieve for marine outfall is taken from MPCB consent and General Discharge standard to arrive at the month of violation based on available analytical results.

5.3.1. Environmental compensation for violation

Analytical data of Zone-1 (Colaba) STP reveals that it has not violated the MPCB prescribed norm. The Zone-5 (Charkop) STP violated percentage sodium norm in November 2020. Therefore the total environmental compensation with respect to STP is Rs. 10, 00000/- (Rupees Ten lacs only) i.e. one month period of damage to environment by Charkop STP.

5.3.2. Environmental compensation for violation in sewage Treatment Facilities other than STP.

The environmental compensation is calculated in view of treatment and discharge by these facility without achieving the norm for one or other parameter in a month. The Month of violation is given in Table-5 based on Annexure-II. The environmental compensation in is calculated by the following formula:

Environmental compensation per STP= Rs. 10,00000 × Number of month of violation

Table-5. Month in which the Sewage Treatment Facility violated the MPCB/ General Discharge Standard

Sr. No.	Name of sewage treatment facility	Month in which exceedance of environmental norm recorded (April 2020 to November 2020)	Total Number of Month of violation	Environmental Compensation/ month/ STP (Rs.)	Total Compensation
1.	Zone-2 (Worli)	May, August, November	3	10,00000	30,00000
2.	Zone-3 (Bandra)	November	1	10,00000	10,00000
3.	Zone-4 (Varsova)	May, September, November	3	10,00000	30,00000
4.	Zone-5 (Malad)	April 2020 to November 2020	8	10,00000	80,00000
5.	Zone-6 (Bhandup)	May, October	2	10,00000	20,00000
6.	Zone-7 (Ghatkopar)	May, September, November	3	10,00000	30,00000
Total Environmental Compensation in Rs.					200,00000

Therefore a total of Rs. 210, 00000/- (Rupees Two Crore ten lacs only) may be recovered as environmental compensation for damage to the environment i.e. ten lacs for charkop STP and 02 Crores as estimated in Table-5.

6. Conclusion

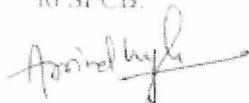
The examination carried out in light of Hon'ble NGT order dated 14.10.2020 reflects that overall sewage treatment efficiency of MMC area is not satisfactory and it needs strengthening in terms of collection and treatment of sewage. The findings in this regard is as under:

1. There is gap of about 31.29 % between sewage generation and sewage collection by MCGM and it can be said that about 997.5 MLD untreated sewage is ultimately discharged in creeks

(not marine outfall). The MMC has consented provision for treatment of about 2727 MLD

sewage. But it may be said that these facilities are not used at full capacity mainly due to poor sewage collection infrastructure.

2. Out of 08 sewage treatment facilities of Mumbai, 03 facilities discharges their effluent through marine outfall and rest 05 facilities discharges their effluent through shore discharge in creeks.
3. For the treatment of collected sewage (2190 MLD), there are eight sewage treatment facilities in MMC area. Out of 08 sewage treatment facility, 02 are STP. Rest 06 sewage treatment facilities especially having creek shore discharge donot have capacity to meet the notified standard of sewage treatment even after the grace period of 05 year i.e. year 2022 as per GSR 1265 (E) dated 13.10.2017 notification. Therefore full-fledged STP are required.
4. Grit treatment before disposal is required otherwise it will be a potential source of pathogenic contamination and pollution at the location where it is dumped.
5. MMC has prepared action plan for upgradation of STPs. It is estimated that about 2464 MLD sewage treatment upto secondary level and tertiary treatment upto 1234 MLD is proposed but the targeted completion year would be the year 2026.
6. Precise inventory of natural drains and its use as raw wastewater discharge should be prepared by MMC and accordingly action plan in this regard should also be prepared for diversion of wastewater from natural drains to proposed sewage treatment plant. Several unorganized human settlement can be observed along bank of creeks and natural drains which are potential direct source of sewage discharge to creeks. Such area should also be made part of sewer network and sewage conveyance to STP for treatment.
7. Based on the available information, it is calculated that MCGM should deposit Rs. 210,00000/- (Rupees Two crore ten lacs only) as environmental compensation for the damage caused to the environment due to partial treatment of sewage.
8. Faecal coliform is required to be regularly monitored in all the sewage treatment facility having shore discharge facility.
9. Time bound action plan with key performance indicators for review of the progress may be devised by MCGM for self-assessment from time to time as well as submission of progress to SPCB.



(Arvind Kumar Jha)
Scientist D

MAHARASHTRA POLLUTION CONTROL BOARD

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Kalpataru Point, 2nd - 4th Floor,
Opp. Cine Planet Cinema,
Near Sion Circle, Sion (E)

Mumbai - 400 022

Consent order No: - format 1.0 / BO/JD (WPC)/CC/ - 1805001473

Date: 28/03/2018

To,

M/s. Municipal Corporation of Greater Mumbai,
Mahapalika Marg, Fort, Mumbai 400001.

Sub: Renewal of Consent for STPs at Ghatkopar, Bhandup, Varsova, Malad, Charkop, Colaba, Worli, Bandra.

Ref: 1. Board Consent granted vide No. BO/JD (WPC)/ CC/1703001394 dated 21/03/2017

2. Your Applid. for Renewal of Consent vide No. UAN No. 38515 dated 22.01.2017

3. Minutes of Consent Committee Meeting held on 23/03/18 and 24/03/2018

For: Consent to Operate Renewal for STPs at Ghatkopar, Bhandup, Varsova, Malad, Charkop, Colaba, Worli, Bandra (386.0, 280.0, 180.0, 280.0, 6.0, 41.0, 757.0 & 797.0 MLD) under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II & III annexed to this order:

1. The Consent to operate for Renewal is granted Period from 1.01.2018 to 31.12.2020.
2. The Consent is granted for collection, treatment and disposal of domestic effluent generated from your local body.
3. Conditions under Water (P&CP), 1974 Act for discharge of effluent:

Sr. No.	Description	Permitted quantity of discharge (MLD)	Standards to be achieved	Disposal	
A(i)	Total Domestic effluent	2727.0	As per schedule - I	Thane Creek	
	STPs		As per schedule - I		
1	Ghatkopar STP	386.0	As per schedule - I		
2	Bhandup STP	280.0	As per schedule - I		
3	Varsova STP	180.0	As per schedule - I		Malad Creek
4	Malad STP	280	As per schedule - I		Malad Creek
5	Charkop STP	6.0	As per schedule - I	Goral Creek	
A(ii)	STPs			Open sea through marine Outfall	
1	Colaba STP	41.0	As per schedule - I		
2	Worli STP	757.0	As per schedule - I		
3	Bandra STP	797.0	As per schedule - I		

5. The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
6. Mumbai Municipal Corporation shall comply with the provisions of CRZ Notifications.
7. Corporation shall try and reuse maximum quantity of treated sewage for secondary purposes such as irrigation, plantation, industrial - Cooling, construction activity etc.
8. This consent should not be construed as exemption from obtaining proper NOC/Permissions from any other Government authorities.

For and on behalf of the
Maharashtra Pollution Control Board

(Dr. P. Anbalsinghi, IAS)
Member Secretary

Received Consent fee of -

Sr. No.	Amount (Rs)	NEFT/RTGS/DD No.	Date	Drawn On
1.	3,00,000/-	2000441833	27.12.2017	SBI Bank

Copy to:

1. Regional Officer, Mumbai and Sub-Regional Officer- I, II, III & IV, MPCB. They are directed to ensure the compliance of the consent conditions.
2. Chief Accounts Officer, MPCB, Sion, Mumbai.
3. CC desk - for record & website updation purposes.

capacity is as under:-

STPs

Sr. No.	Name of STP	Quantity of effluent MLD	Coment Validity	
A(i)	STPs			
1	Chhatrapati STP	386.0	31.12.2020	
2	Bhandup STP	280.0		
3	Vandev STP	180.0		
4	Malad STP	280		
5	Charkop STP	6.0		
A(ii)	STPs			
1	Colaba STP	41.0		
2	Worli STP	757.0		
3	Handra STP	797.0		
	Total	2727.0		

B) The Applicant shall operate the Sewage treatment plant (STP) at point No. 1) A (i) to treat the effluent so as to achieve the following standards prescribed by the Board or under EP Act, 1986 and Rules made there under from time to time, whichever is stringent.

Sr. No.	Parameters	Standards prescribed by Board
	Compulsory Parameters	Limiting Concentration in mg/l, except for pH
1.	pH	6.5 to 9.0
	Suspended solids	Not to exceed 50
3	BOD (3 days 27 oc)	Not to exceed 50
4	Oil & grease	Not to exceed 50
5	% sodium	Not to exceed 60 %
6	Mercury	Not to exceed 0.01
7.	lead	Not to exceed 2
8	Copper	Not to exceed 3
9	Zinc	Not to exceed 15
10	Nickel	Not to exceed 50
11	Total chromium (as Cr)	Not to exceed 50
12	Bioassay test on fish	90% survival of fish after first 96 hrs in 100% effluent.

Municipal corporation shall achieve following discharge standards within five years from the date of issuance of notification dated 13.10.2017. These Standards shall apply to all STPs to be commissioned on or after the 1st June, 2019 and the old/existing STPs shall achieve these standards within a period of five years from date of publication of this notification in the Official Gazette

Sr. No.	Parameters	Standards prescribed by Board
1.	pH	6.5 to 9.0
2.	BOD (3 days 27 oc)	Not to exceed 20
3.	TSS	Not to exceed 50
4.	Fecal coliform	<1000

[Handwritten Signature]

No.	Parameters	Standards
	Compulsory Parameters	Limiting Concentration in mg/l, except for pH
1.	pH	6.5 to 8.5
2.	Colour and odour	No noticeable and effective odour
3.	Turbidity	Not to exceed 30 NTU (Nephelometric turbidity unit)
4.	BOD (3 days 27°C)	Not to exceed 100
5.	Mercury	Not to exceed 0.01
6.	Lead	Not to exceed 2.0
7.	Copper	Not to exceed 3.0
8.	Zinc	Not to exceed 15
9.	Nickel	Not to exceed 15
10.	Dissolved Oxygen	Not less than 4
11.	Faecal Coliform	Not to exceed FC/100 /100 ml (MPN)
12.	Total Chromium (as Cr)	Not to exceed 2.0
13.	Floating matter	Nothing objectionable or detrimental for use purpose
14.	Bioassay test on fish	90% survival of fish after first 96 hrs in 100% effluent

Mumbai Municipal Corporation of Greater Mumbai, should monitor water quality in Mumbai area at following locations

1. Nariman Point
2. Gate of India
3. Malabar Hill
4. Hajiali
5. Worli sea face
6. Shivaji park
7. Mithi river
8. Mahim creek
9. Manori Creek,
10. Mudh creek
11. Ulhas Creek at Versova
12. Gorn Creek

C) The treated effluent shall be disposed

After proper disinfection, Corporation shall reuse maximum quantity of treated sewage for secondary purpose such as irrigation, road side plantation, curing water for construction, MSW facility for spraying purpose, and all other non potable, non tangible water uses. The remaining treated effluent shall be discharge into Thane, Malad, Gorai creek & open sea through marine outfall

1) If the local body is admitting any effluent arising from the industries located in their jurisdiction, arrangement shall be made by the local body to see that such admittance :-

1. Will not cause the deterioration of sewers/drains.
2. Will not cause any toxicity either at treatment works or enroot.
3. Will not cause harmful effect on people working at treatment work or enroot.

The local body shall fully treat such industrial effluent to meet the above standards

[Handwritten Signature]

the unit or establish any treatment and disposal system or and extension or addition thereto.

- 3) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.
- 4) The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Cess Act, 1977 and as amended, by installing water meters, filing water cess returns in Form-I and other provisions as contained in the said act.

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Sr. no	Purpose for water consumed	Water consumption quantity (MLD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	Nil
2.	Domestic purpose existing	2868.0
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	Nil
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	Nil

- 5) The Applicant shall provide Specific Water Pollution Control System as per the conditions of EP Act, 1986 and rule made there under from time to time.

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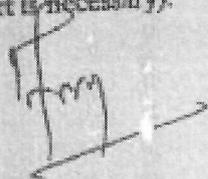
As per your application, you have provided the Air pollution control (APC) system and also to erect following stack (s) and to observe the following fuel pattern-

Sr. No.	Stack Attached To	APC System	Height in Mts.	Type of Fuel	Quantity & UoM	S %	SO ₂ Kg/Day
-	-	-	-	-	-	-	-

- The Applicant shall provide Specific Air Pollution control equipments as per the conditions of EP Act, 1986 and rule made there under.
- The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards:

Particulate matter	Not to exceed	150 mg/Nm ³
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- The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement/alteration well before its life come to an end or erection of new pollution control equipment.
- The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

AIR POLLUTION CONTROL BOARD


local bodies

Code	Compliance	Municipal Corporation & A Class Municipal Council (BG in Lakhs ₹)	Time for Compliance	Compliance report with remarks by BRO
Performance issues				
1	Providing Closed sewer pipeline network for carrying total sewage specified jurisdiction to that particular STP so that no sewage is discharged without treatment.	25	1 year	
2	Criteria - To achieve full capacity of sewage treatment If sewage treatment available is			
a	< 25 % or less	25	1 year	
b	> 25% to 50 %			
c	> 50% to 75 %			
d	> 75 % and above			
3	Providing arrangement for treated sewage recycle and reuse atleast 50% for gardening, road side plantation, curing for building construction, MSW facility for spraying purpose, and all other non potable, non tangible water uses. (per STP)	10	1 year	
4	Providing adequate system for treatment / disposal of waste i.e. sludge to convert into manure. (per STP)	5.0	1 year	
5	To provide online flow meter with data logger at the inlet and at outlet of STP (per STP)	2.0	Six months	
Operation and Maintenance issues				
6	Disposal of all solid waste like Grit etc. other than sludge generated from the STP at MSW site. (per STP)	2.0	Continuous	Monthly
7	Towards Operation & Maintenance of the Sewage Treatment Plant to achieve disposal standards. (per STP)	5.0	Continuous	Monthly
8	Obtaining approval from National Institute of Oceanography for fixing the treated sewage disposal point. (per STP)	10	2 years	
9	Record Issue Maintaining Records (per STP)	1.0	Continuous	Monthly
The local bodies operating in coastal regions and disposing its treated sewage in sea or creek shall obtain approval from National Institute of Oceanography for fixing the treated sewage disposal point for each STPs shall comply with same.				
All above Bank Guarantees have submitted by MCOM & shall be valid for four months more than validity of the contract.				

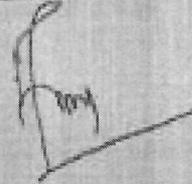
30th September every year and no. of trees planted by September end.

- 2) The Municipal Corporation should provide for an alternate electric power source sufficient to operate all pollution control facilities installed by the applicant and operate the same in case of power failure to maintain compliance with the terms and conditions of the consent.
- 3) The Municipal Corporation should submit MPCB, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as per the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992 before 30th September every year.
- 4) The Municipal Corporation should install a separate meter showing the consumption of energy for operation of domestic treatment plants and air pollution control system if any. A register showing consumption of chemicals used for treatment should be maintained. The applicant should also submit a comparative statement of designed power and chemical consumptions vis-a-vis actual power and chemical consumption along with Environmental statement.
- 5) Separate drainage system should be provided for collection of trade and sewage effluents. Terminal manholes should be provided at the end of collection system with arrangement for measuring the flow. No effluent should be admitted in the pipes/sewers down-stream of the terminal manholes. No effluent should find its way other than in designed and provided collection system. Neither storm water nor discharge from other premises should be allowed to mix with the effluents from the factory.
- 6) The Municipal Corporation should ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.
- 7) The Municipal Corporation should maintain good housekeeping and take adequate measures for control of pollution from all sources so as not to cause nuisance to surrounding area / inhabitants.
- 8) The Municipal Corporation shall follow the directions issued by the Board dated 14.8.2010.
- 9) The Municipal Corporation shall follow the direction issued by the Board vide No. BO/P&L Div/B-1334 dated 12.3.2013.
- 10) The Municipal Corporation shall comply with the Provisions of Bio-Medical Wastes (M & H) Rules, 1998 (as amended).
- 11) This consent is issued without prejudice or being prejudice of the order passed by the Hon'ble High Court in PPL No. 176/2012.

flow measurement devices shall be provided in each STP and record of the same shall be maintained. No effluent shall find its way other than in designed and provided collection system.

- 13) The Municipal Corporation shall obtain authorization and comply with the provisions of Municipal Solid Wastes (Management & Handling) Rules, 2000 and amendments thereto and the Bio-Medical Waste (Management & Handling) rules, 1998 and amendments thereto, notified by Ministry of Environment & Forest, Government of India vide notification dt. 25.09.2000 which is related to Collection, Segregation, Storage, Transportation, Processing and Disposal as per schedule.
- 14) The Municipal Corporation shall at its own cost get the samples of untreated and treated effluent collected and analysed every three months and shall submit the report thereof to the Regional Officer, Nagpur/Sub Regional Officer, Nagpur -I, Maharashtra Pollution Control Board, with a copy to the Board Office.
- 15) A Yearly progress report in the prescribed pro forma shall be submitted to the Sub Regional Office and the Regional Office, stating therein the progress made in respect of execution of treatment and proposal of works under this consent. These reports shall be submitted by the 10th April.
- 16) The Municipal Corporation shall not change or alter the quantity, the rate of discharge temperature and the mode of disposal of the effluent without previous written permission of the Board Office.
- 17) The Municipal Corporation shall obtain Consent to Operate before putting the STP in Operation.
- 18) The Board reserves the right to revoke, change or alter the terms and conditions of consent by giving one month's notice to the Municipal Corporation.
- 19) The Municipal Corporation shall provide facility for collection of samples to the Board staff at the terminal manhole.
- 20) An inspection Book shall be opened and made available to the Board Officers during their visit to the Municipal Corporation.

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Annexure-II

Past data available from MCGM and MPCB for outlet quality of sewage treatment facilities (All values are expressed in mg/l except pH and % Na. "-" indicates data is not available.

Table-1A. Result of treated sewage quality at Zone-1 (Colaba STP) by MCGM

Date	pH	BOD	TSS	NH ₃ -N	DO	COD	Chlorides(Outlet)
15-04-2020	7.29	2	2	BDL	7.5	-	550
17-04-2020	7.32	4	3	BDL	7.2	-	430
27-04-2020	7.32	<1	1	BDL	7.6	<10	383
11-05-2020	7.30	2	2	BDL	7.1	4	156
14-05-2020	7.29	1.05	1.8	BDL	7.9	-	312
18-05-2020	7.35	<1	<1	BDL	8.1	<10	135
22-05-2020	7.29	<1	<1	BDL	7.9	3	284
26-05-2020	7.31	<1	<1	BDL	7.8	-	703
01-06-2020	7.31	<1	<1	BDL	7.3	<10	419
03-06-2020	7.34	<1	<1	BDL	7.6	-	284
06-06-2020	7.30	<1	<1	BDL	7.6	<10	1150
15-06-2020	7.58	1	<1	BDL	7.3	33	263
19-06-2020	7.38	2	2	BDL	7.2	2	227
22-06-2020	7.74	3	1	BDL	7.5	<10	227
26-06-2020	7.38	<1	4	BDL	7.3	<10	625
29-06-2020	7.88	2	5	BDL	7.4	<10	525
03-07-2020	7.79	<5	<5	BDL	7.3	<10	135
06-07-2020	7.98	<5	7	1.12	5.6	16	170
10-07-2020	7.85	<5	<5	BDL	7.1	<10	185

13-07-2020	7.66	<5	<5	BDL	6.8	37	121
17-07-2020	7.85	<5	<5	1.4	6.6	<10	107
20-07-2020	7.02	12	<5	BDL	5.2	33	149
24-07-2020	7.73	<5	<5	BDL	6.7	11	490
28-07-2020	7.77	<5	<5	BDL	6.6	<10	156
31-07-2020	8.07	<5	<5	BDL	6.8	18	107
07-08-2020	8.07	<5	<5	BDL	7.2	25	64
10-08-2020	8.04	<5	5	BDL	5.9	33	107
11-08-2020	7.88	<5	<5	BDL	7.2	14	142
14-08-2020	7.51	<5	<5	BDL	6.4	<10	114
18-08-2020	7.63	<5	<5	BDL	6.3	15	163
20-08-2020	7.61	<5	<5	BDL	7.3	<10	369
25-08-2020	7.56	<5	5	BDL	6.4	14	405
27-08-2020	7.42	<5	<5	0.28	6	<10	227
28-08-2020	7.48	<5	<5	BDL	6.4	<10	234
02-09-2020	7.69	<5	<5	BDL	6.1	17	156
08-09-2020	7.49	<5	<5	0.56	6.8	15	220
11-09-2020	7.73	<5	<5	BDL	6.6	17	298
15-09-2020	7.57	<5	<5	BDL	6.5	<10	305
18-09-2020	7.43	<5	5	BDL	6.4	34	1065
22-09-2020	7.40	<5	7	BDL	6.5	26	1825
25-09-2020	7.62	<5	<5	BDL	6.5	<10	192
29-09-2020	7.24	<5	<5	BDL	7.1	20	284
01-10-2020	7.34	6	5	2.52	2.9	23	639

06-10-2020	7.60	<5	<1	BDL	6.4	21	1214
09-10-2020	7.37	16	<5	1.68	7	30	1058
13-10-2020	7.24	<5	<5	BDL	6.7	27	888
16-10-2020	7.46	<5	<5	0.56	7.6	10	256
20-10-2020	7.36	<5	17	BDL	6.2	-	4970

Table-1B. Result of treated sewage quality at Zone-1 (Colaba STP) by MPCB

Parameter	BOD	COD	pH	TSS	Copper	Lead (Pb)	Nickel	Mercury	Zinc
Consented Standard/ General Discharge Standard	100	250	5.5-9.0	100	3	2	5	0.01	15
17.4.2020	3.8	40	7	12	0.03	0.01	BDL	BDL	0.11
13.05.2020	4	40	7.4	12	..	..	..	..	..
30.06.2020	35	80	6.4	22	0.04	BDL	BDL	BDL	0.08
15.07.2020	4	20	7.4	12	0.17	BDL	0.04	0.001	0.24
26.08.2020	5	36	7.5	14	0.07	BDL	BDL	0.002	BDL
18.09.2020	10	36	7	10	0.03	0.01	0.09	0.005	0.03
11.11.2020(CPCB team sampling)	16	64	7.1	12	-	-	-	-	-

Remarks: As per the GSR 1265(E) dated 13.10.2017, in case of discharge of treated effluent into sea, it shall be through proper marine outfall and the existing shore discharge shall be converted to marine outfalls, and in cases where the marine outfall provides a minimum initial dilution of 150 times at the point of discharge and a minimum dilution of 1500 times at a point 100 meters away from discharge point, then, the existing norms shall apply as specified in the general discharge standards. Therefore, the standard for compliance is BOD=100 mg/l, COD=250 mg/l, TSS =100 mg/l and pH=5.5-9.0, etc. Based on the available data, it may be said that, the sewage treatment plant has not exceeded the prescribed standards of MPCB.

Table-2. Result of treated sewage quality at Zone-2 (Worli Sewage Treatment Facility) by MPCB

Parameter	BOD	COD	pH	TSS	Copper	Lead (Pb)	Nickel	Mercury	Zinc
Consented Standard	100	250	5.5 to 9.0	100	3	2	5	0.01	15
17.4.2020	94	200	6.8	34	0.03	0.05	BDL	BDL	0.07
13.05.2020	145	280	6.7	42	..	..	..	..	..
30.06.2020	36	80	6.2	28	0.04	BDL	BDL	BDL	0.17
15.07.2020	38	80	7.1	30	0.04	BDL	0.21	0.001	0.06
26.08.2020	60	124	7.4	102	0.08	0.02	BDL	0.001	BDL
18.09.2020	48	168	6.9	36	0.03	BDL	0.04	0.002	0.1
11.11.2020 (CPCB team sampling)	125	236	7.1	38	-	-	-	-	-

Remarks: MCGM monitoring data from April 2020 to October 2020 is not available. As per the GSR 1265(E) dated 13.10.2017, in case of discharge of treated effluent into sea, it shall be through proper marine outfall and the existing shore discharge shall be converted to marine outfalls, and in cases where the marine outfall provides a minimum initial dilution of 150 times at the point of discharge and a minimum dilution of 1500 times at a point 100 meters away from discharge point, then, the existing norms shall apply as specified in the general discharge standards. Therefore, the standard for compliance is BOD=100 mg/l, COD=250 mg/l, TSS =100 mg/l and pH=5.5-9.0, etc. Based on the available data, it may be said that, the sewage treatment facility exceeded the prescribed standards of MPCB in the month of May 2020, August 2020 and November 2020. Therefore total number of month of violation is three (03).

Table-3A. Result of treated sewage quality at Zone-3 (Bandra Sewage Treatment Facility) by MPCB

Parameter	BOD	COD	pH	TSS	Copper	Lead (Pb)	Nickel	Mercury	Zinc
Consented Standard	100	250	5.5 to 9.0	100	3	2	5	0.01	15
11.11.2020 (CPCB team sampling)	130	252	6.9	68	-	-	-	-	-

Remarks: MCGM and MPCB monitoring data from April 2020 to October 2020 is not available. As per the GSR 1265(E) dated 13.10.2017, in case of discharge of treated effluent into sea, it shall be through proper marine outfall and the existing shore discharge shall be converted to marine outfalls, and in cases where the marine outfall provides a minimum initial dilution of 150 times at the point of discharge and a minimum dilution of 1500 times at a point 100 meters away from discharge point, then, the existing norms shall apply as specified in the general discharge standards. Therefore, the standard for compliance is BOD=100 mg/l, COD=250 mg/l, TSS =100 mg/l and pH=5.5-9.0, etc. In absence of data availability from April 2020 to October 2020, it is concluded that the violation period would be only for the month of November 2020 when the sewage treatment facility exceeded the prescribed standards of MPCB. Therefore total number of month of violation is one (01).

Table-4A. Result of treated sewage quality at Zone-4 (Varsova sewage treatment facility) monitored by MCGM

Date	pH	BOD	TSS	NH ₃ -N	DO	COD	Chlorides(Outlet)
27-04-2020	7.22	25	14	16.32	BDL	-	305
18-05-2020	7.26	55	28	15.12	BDL	-	327
18-06-2020	7.26	11	10	3.36	BDL	38	327
09-07-2020	7.41	35	19	6.72	1.5	51	150
22-07-2020	7.47	<5	9	5.32	<1	33	199
03-08-2020	7.27	30	23	5.04	<5	40	234
28-09-2020	7.36	34	6	8.12	BDL	70	227
12-10-2020	7.22	22	17	12.32	<1	66	241
19-10-2020	7.37	25	13	9.8	BDL	60	334

Table-4B. Result of treated sewage quality at Zone-4 (Varsova sewage treatment facility) monitored by MPCB

Parameter	BOD	COD	pH	TSS	Copper	%Na	Lead (Pb)	Nickel	Mercury	Zinc
Consented Standard	50	NA	5.5 - 9.0	50	3	60	2	50	0.01	15
07.06.2020	4.8	40	6.3		0.03	40.3	BDL	0.18	BDL	0.12
30.06.2020	50	120	6.4		0.05	52.04	BDL	BDL	BDL	0.07
30.09.2020	6		7.3	16	0.03	72.29	BDL	0.02	0.001	BDL
10.11.2020- Right lagoon outlet (CPCB team sampling)	36	76	-	28	-		-	-	-	-
10.11.2020- Left lagoon outlet (CPCB team sampling)	120	236	6.8	40						

Remarks: As per the GSR 1265I dated 13.10.2017, the standards shall apply to all STPs to be commissioned on or after the 1st June, 2019 and the old/existing STPs shall achieve these standards within a period of five years from date of publication of this notification in the Official Gazette. The standard for compliance in metro cities is BOD=20mg/l and TSS =50 mg/l, pH=5.5-9.0 and Faecal coliform =<1000MPN per ml). As per the MPCB stipulated standards, the sewage treatment facility exceeded the prescribed norm in the month of May 2020, September 2020 and November 2020. The total number of month of violation is three (03).

Table-5A. Result of treated sewage quality at Zone-5 (Malad Sewage Treatment Facility) by MCGM

Date	pH	BOD	TSS	Free NH ₃	DO	COD	Chlorides
27-04-2020	6.98	103	126	7.84	BDL	-	99
21-05-2020	6.99	133	161	8.4	-	-	99
22-06-2020	7.69	68	90	2.8	-	114	85
22-07-2020	7.40	53	92	5.32	-	108	135
03-08-2020	7.26	64	91	5.88	-	146	78
26-08-2020	7.25	102	113	7	-	157	78
10-09-2020	7.40	105	100	11.76	-	282	114
14-10-2020	7.35	160	272	16.24	-	368	114
19-10-2020	7.39	120	112	12.04	-	265	135

Table-5B. Result of treated sewage quality at Malad Sewage Treatment Facility by MPCB

Parameters	PH	TSS	BOD	% sodium	Mercury	lead	Copper	Zinc	Nickel	Total Chromium
MPCB Limits	6.5 to 9.0	50	50	60	0.01	2	3	15	50	50
03-03-2020	7.3	14	4	4.3	0.001	BDL	BDL	BDL	2.42	0.23
17/04/2020	6.9	40	50	---	BDL	BDL	---	0.05	---	0.3
13/05/2020	6.8	32	---	70.85	0.001	0.06	0.03	0.05	BDL	----
30/06/2020	7.2	14	3.4	-----	0.001	BDL	0.03	0.4	BDL	0.08
23/7/2020	7.1	12	4	14.8	0.001	BDL	0.04	0.48	BDL	0.02
08-12-2020	7	18	6	56.6	0.001	BDL	0.05	0.03	0.03	0.24
29/09/2020	6.8	30	18	64.5	0.001	BDL	0.09	0.11	0.1	0.14
10.11.2020(CPCB team sampling)	6.8	110	135	-	-	-	-	-	-	-

Remarks: As per the GSR 1265(E) dated 13.10.2017, the standards shall apply to all STPs to be commissioned on or after the 1st June, 2019 and the old/existing STPs shall achieve these standards within a period of five years from date of publication of this notification in the Official Gazette. The standard for compliance in metro cities is BOD=20mg/l and TSS =50 mg/l, pH=5.5-9.0 and Faecal coliform =<1000MPN per ml). Considering all the available results, sewage treatment facility exceeded the MPCB prescribed standard in all month from April 2020 to November 2020 for one or other parameters. Total number of month of violation is eight (08).

Table-5C. Result of treated sewage quality at Zone-5 (Charkop Sewage Treatment Plant) by MPCB

Parameters	PH	TSS	BOD	% sodium	Mercury	lead	Copper	Zinc	Nickel	Total Chromium
MPCB Limits	6.5 to 9.0	50	50	60	0.01	2	3	15	50	50
17.04.2020	7.4	12	3.4	---	---	---	---	0.14	---	0.29
13.05.2020	7.2	14	6	13.93	0.001	0.04	0.03	0.06	BDL	0.06
30.06.2020	6.8	20	4.4	13.28	0.006	0.25	0.07	0.35	0.25	0.32
23.07.2020	7	14	5	15.34	0.001	BDL	0.04	0.22	BDL	0.06
08.12.2020	6.7	14	5	15.12	---	BDL	---	0.03	0.05	0.2
29.09.2020	7.3	10	16	3.9	BDL	BDL	0.04	0.09	0.02	0.18
10.11.2020 (CPCB team sampling)	7.9	16	16	66.79						

Remarks: MCGM analytical data for STP is not available. As per the GSR 1265(E) dated 13.10.2017, the standards shall apply to all STPs to be commissioned on or after the 1st June, 2019 and the old/existing STPs shall achieve these standards within a period of five years from date of publication of this notification in the Official Gazette. The standard for compliance in metro cities is BOD=20mg/l and TSS =50 mg/l, pH=5.5-9.0 and Faecal coliform =<1000MPN per ml. Considering the available results, number of month of violation is one (01).

Table-6A. Result of treated sewage quality at Zone-6. (Bhandup Sewage Treatment Facility) by MCGM

	pH	B.O.D.	T.S.S.	NH ₃ -N	D.O.	C.O.D.	Chlorides
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18-04-2020	7.12	34	40	10.92	BDL	-	110
20-04-2020	7.26	31	16	11.63	2.9	-	220
06-05-2020	6.99	39	28	7.84	6.7	-	114
11-06-2020	7.17	46	44	7	4.5	-	291
01-07-2020	7.28	36	21	7	4.9	89	99
13-07-2020	7.44	24	17	3.08	3.3	42	85
23-07-2020	7.56	23	26	4.76	4.5	44	99
06-08-2020	7.55	5	<5	0.84	5.8	34	64
17-08-2020	7.65	26	17	4.2	3.1	89	85
09-09-2020	7.76	23	33	6.44	3.1	80	107
16-09-2020	7.67	18	8	5.04	3.1	44	78
15-10-2020	7.33	15	18	6.44	<1	58	78

Table-6B. Result of treated sewage quality at Zone-6 (Bhandup Sewage Treatment Facility) by MPCB

Parameter	BOD	COD	pH	TSS	% Sodium
MPCB Standard	50	NA	5.5-9.0	50	60
02-05-2020	22	-	6.9	32	107.2
14/05/2020	4.8	28	6.9	14	--
01-07-2020	50	108	6.7	44	--
16/07/2020	5	20	7.4	14	--
31/08/2020	4.4	36	7.4	24	--
12-10-2020	28	-	7.1	26	87.3
10.11.2020 –Lagoon 1(CPCB team sampling)	22	92	7	14	53.84
10.11.2020 –Lagoon 2(CPCB team sampling)	28	84	-	24	54.48
10.11.2020 –Lagoon 3 (CPCB team sampling)	21	72	-	20	53.76

Remarks: As per the GSR 1265(E) dated 13.10.2017, the standards shall apply to all STPs to be commissioned on or after the 1st June, 2019 and the old/existing STPs shall achieve these standards within a period of five years from date of publication of this notification in the Official Gazette. The standard for compliance in metro cities is BOD=20mg/l and TSS =50 mg/l, pH=5.5-9.0 and Faecal coliform =<1000MPN per ml. Considering all the available results, sewage treatment facility exceeded the prescribed standard for percent sodium in May 2020 and October 2020. Total number of month of violation is two (02).

Table-7A. Result of treated sewage quality at Zone-7 (Ghatkopar Sewage Treatment Facility) by MCGM

Date	pH	BOD	TSS	Free NH3-N	DO	COD	Chlorides
23-04-2020	7.24	15	30	10.11	BDL	-	206
06-05-2020	7.01	37	28	12.88	1.5	-	170
01-06-2020	7.18	40	20	14.28	1.3	-	163
13-07-2020	7.16	13	7	5.32	2.1	38	92
23-07-2020	7.24	15	16	BDL	<1	40	135
06-08-2020	7.42	<5	<5	BDL	2.9	31	57
09-09-2020	7.34	91	143	8.96	-	271	192
16-09-2020	7.10	34	78	7.28	1	205	178

Table-7B. Result of treated sewage quality at Zone-7 (Ghatkopar Sewage Treatment Facility) by MPCB

Parameter	BOD	COD	pH	TSS	% Na
MPCB Standard	50	NA	5.5-9.0	50	60
02.05.2020	54	-	7.2	74	157.9
14.05.2020	15	48	7	12	-
16.07.2020	4	24	8.1	12	-
31.08.2020	3.8	20	7.7	14	-
10.11.2020 –Lagoon 4 (CPCB team sampling)	16	80	7	12	66.74
10.11.2020 –Lagoon 3 (CPCB team sampling)	14	72	7	24	64.88
10.11.2020 –Lagoon 2 (CPCB team sampling)	24	84	6.9	16	66.93

Remarks: As per the GSR 1265(E) dated 13.10.2017, the standards shall apply to all STPs to be commissioned on or after the 1st June, 2019 and the old/existing STPs shall achieve these standards within a period of five years from date of publication of this notification in the Official Gazette. The standard for compliance in metro cities is BOD=20mg/l and TSS =50 mg/l, pH=5.5-9.0 and Faecal coliform =<1000MPN per ml. Considering all the available results, number of month of violation is three (03). However, looking into the past 2019 results of MPCB analysis reports, the facility has constantly violated MPCB prescribed norm for percentage sodium. However, in absence of analytical results, other months are not accounted in environmental compensation. It is also pertinent to mention that the grab monitoring results of inlet of sewage treatment facility during examination visit reveals that inlet BOD was 40 mg/l and inlet percent Sodium was 69.74%. Hence the achieved results are not due to proper treatment but due to significant diluted streams of sewage received at this facility.

Date: 10/12/2020

No. A-19014/43/20/UPC-I/14173

To,

The Commissioner,
Municipal Corporation of Greater Mumbai,
Head Quarter,
Mumbai C.S.T. 400001

Subject: Environmental Compensation in Compliance of Hon'ble NGT order dated 14.10.2010 in OA No. 197/2017 Titled Vanshakti & ANR Vs Municipal Corporation of Greater Mumbai & Ors.

Sir,

The Hon'ble NGT (PB) in above said matter passed an order dated 14.1.2020. Part of the order reads as,

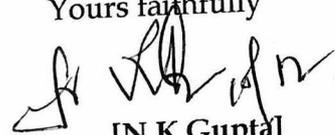
".....Where the operational deficiencies of the existing STPs has not been rectified and untreated is being discharged into the water bodies, the environmental compensation at the rate of Rs. 10 lakhs per month per STP be deposited to the CPCB. The CPCB is directed to examine all the STPs, CETPs within the Mumbai Municipal Corporation and calculate the amount of environmental compensation in accordance with law and to proceed to recover the amount and communicate this Tribunal within fortnight....."

In compliance to the directions of Hon'ble NGT, CPCB inspected 08 Sewage Treatment Plant in the jurisdiction of Municipal Corporation of Greater Mumbai and found that 06 STPs are not meeting the prescribed norms. Copy of report is enclosed. Accordingly, Environment Compensation of amount Rs 2,10,00,000/- (Rupees Two Crores ten lacs only) is calculated for the damage caused to environment due to partial treatment of sewage.

In this regard, it is requested to submit the Environment Compensation of amount Rs 2,10,00,000/- (Rupees Two Crores ten lacs only) to CPCB Account no.: 532702010009078, IFSC Code: UBIN0553271, UBI, I.P Extension Branch, Delhi.

Encl.: As above

Yours faithfully


[N.K Gupta]
Divisional Head UPC-I

केंद्रीय प्रदूषण नियंत्रण बोर्ड

मिशन.....

दिनांक..... 10/12/2020

3858/UPC-I
10/12/20

infrastructure, may be assigned the task of classification of coastal areas in Priority-I to V considering the toxic nature of the effluent being discharged into the sea waters by the States/UTs.

- *Also, Clause 4 of the CRZ Notification, 1991, under the sub heading "Procedure for monitoring and enforcement", stated: "The Ministry of Environment & Forests and the Government of State or Union Territory and such other authorities at the State or Union Territory levels, as maybe designated for this purpose, shall be responsible for monitoring and enforcement of the provisions of this notification within their respective Jurisdictions.". National and State Coastal Zone Management Authority shall have the power to take measures for protection and improving the quality of the coastal environment and preventing, abating and controlling environment pollution in coastal areas.*
- *Further, The National Centre for Sustainable Coastal Management (NCSCM), under Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India is set up for better protection, conservation, rehabilitation, management and policy design for the coast. It would promote integrated and sustainable management of coastal and marine areas in India and advise the Union and States/Union Territory Government and other associated stakeholders on policy and scientific matters relating to Integrated Coastal Zone Management (ICZM).*
- ***Considering coastal length of country about 7,516.6 km and the present scenario with regard to the coastal or marine pollution and with a view to have an implementable approach for Integrated Coastal Management plans in the country, expert organization such as NCSCM under MoEF&CC, Central and State Coastal Zone Management Authorities may be assigned the task of integrated coastal management including preservation and maintenance of sea water quality designed in each coastal Zone."***

38. The authorities are directed to strictly observe the guidelines issued from Principal Bench of this Tribunal from time to time in above Original Application. After summarizing and discussion as above we direct as follows:

- i. Bioremediation and/or phytoremediation or any other remediation measures for treatment of sewage water if not taken by the Municipal Corporation, compensation at the rate of Rs. 5 lakhs per

month per drain is to be deposited with the CPCB by the Municipal Corporation. This, however, is not to be taken as an excuse to delay the installation of STP or not doing anything and discharging the untreated water into the water bodies.

- ii. Where the operational deficiencies of the existing STPs has not been rectified and untreated is being discharged into the water bodies, the environmental compensation at the rate of Rs. 10 lakhs per month per STP be deposited to the CPCB. The CPCB is directed to examine all the STPs, CETPs within the Mumbai Municipal Corporation and calculate the amount of environmental compensation in accordance with law and to proceed to recover the amount and communicate this Tribunal within fortnight.
- iii. With regard to the situation where works with regard to STP, sewerage network and its connectivity not yet started, the Mumbai Municipal Corporation has to pay an environmental compensation at the rate of Rs. 10 lakhs per month per STP, sewerage network and its connectivity after 31.12.2020 for the delay in setting up of the same. It will be open to the Municipal Corporation to recover the said amount from the erring officers/contractors.
- iv. Guidelines issued in *O.A. No. 426/2018* with regard to the *Musi River* and *O.A. No. 829/2019 (supra)* dealing with the coastal pollution, the directions issued from the Principal Bench of this Tribunal must be strictly complied with and in case of violation, the State PCB is directed to proceed in accordance with law for realization of environmental compensation.
- v. 100% treatment of sewage may be ensured as directed by the Principal Bench of this Tribunal vide order dated 28.08.2019 in *O.A. No. 593/2017, Paryavaran Suraksha Samiti & Anr. Vs. Union*

of India & Ors. and time line for completing all steps of action plans including completion of setting up STPs and their commissioning till 31st March, 2021, in terms of order dated 08.04.2019 and in case of default compensation laid down in the order of the Principal Bench of this Tribunal dated 22.08.2019 in the case of River Ganga i.e. Rs.10 lakhs per month per STP.

- vi. The Chief Secretary of Maharashtra may set up appropriate monitoring mechanism at State Level specifying accountability of nodal authorities not below the Secretary level and ensuring appropriate adverse entries in the ACRs of erring officers. Monitoring at State level must take place on fortnightly basis and record of progress maintained. The Chief Secretary may have an accountable person attached in his office for this purpose.
- vii. Remedial measures submitted by Divisional Forest Officer of Maharashtra PCB is accepted and Municipal Corporation of Greater Mumbai is directed to ensure the compliance and execution of the report submitted by the Joint Committee”
 - a. Municipal Corporation of Greater Mumbai should ensure the mangrove area is kept to plastic free zone. It is recommended to install Trash Boom or Trash Trap for collection of floating plastic and other wastes & its disposal.
 - b. All sewage should be treated at the source and then release into Creek via streams. This will be taken up by Municipal Corporation of Greater Mumbai for implementation. It will be the responsibility of Municipal Corporation of Greater Mumbai to ensure proper functioning of treatment plants & release treated sewage water to the Creek.

- c. Natural streams used as sewage canals should be stopped immediately and restoration should be carried out to recover the beauty of mangroves of Mumbai and adjoining Thane District.
 - d. Monitoring of the pollution level should be carried out as per the guideline laid down in the Environment (Protection) Act, 1986 by the Maharashtra Pollution Control Board.
- viii. The report submitted by IIT Mumbai for MTHL project regarding pollution level is accepted. The respondent and the Municipal Corporation are directed strictly to comply and execute it and a time bound action plan be implemented. The technology which has been suggested by IIT Mumbai should be implemented by Municipal Corporation of Greater Mumbai, Navi Mumbai Municipal Corporation on priority basis. For the protection of mangroves, the direction issued from the Bombay High Court in *Writ Petition No. 87 of 2016* as mentioned above must be strictly followed. The provision as contained in the Wetland (Conservation and Management) Rules, 2017 must be complied with.
- ix. Respondent no. 1 is directed to implement the Maharashtra Non-biodegradable Garbage (Control) Act, 2006 and to install nets in sewage storm water discharge drains to stop sewage solid waste from entering the sea along with the solid waste and to ensure that no untreated water being discharged into the sea level. Respondent no. 1 is also directed to install mobile public toilets after identifying the areas close to beaches where open defecation is rampant.

- x. The pipelines which are directly releasing domestic sewage in the water bodies, creeks and wet land without treatment must be removed or connected to the STP.
- ✓ xi. The guidelines and directions issued as mentioned above must be complied with and the authorities- CPCB/MSPCB is directed to execute and comply the orders.
- xii. The Registrar, Western Zonal Bench, Pune is directed to open a Miscellaneous Application file in which the compliance report submitted by the CPCB/MSPCB be attached and the progress report be monitored and placed at the interval of 3 months before this Tribunal.
- xiii. According to the parameter laid down and calculation as mentioned above, the BMC is liable to pay environmental damage for discharge of untreated sewage water into the water bodies at the rate of Rs. 4.25 crores per month and arrears of Rs. 29.75 crores. The BMC is directed to pay the amount of Rs. 29.75 crores to the account of CPCB within 30 days from today and ensure to regularly pay Rs. 4.25 crores per month till the bio-remediation or phytoremediation measures are taken by the authorities concerned. If remediation or treatment of the water of sewage water is taken, it will be reduced at the rate of Rs. 5 lakhs per month per drain systematically. The State PCB is directed to calculate and do the needful according to law from time to time.
- ✗ xiv. The amount so paid by the BMC as environmental compensation/ environmental damage, be deposited in accordance with Section 7A(3) of the Public Liability Insurance Act, 1991 read with Section 24 of the NGT Act, 2010.

- xv. The CPCB is directed to proceed in accordance with Section 7A of Public Liability Insurance Act, 1991 read with Section 24(1) of the NGT Act, 2010.
- xvi. The BMC is further directed to ensure that there should not be any water logging during the rainy seasons and the sewage line or water connection which are discharging the water from the city must be regularly monitored so that there should not be any blockage in the flow of the water.
39. The Original Application No. 197/2017 (WZ) is disposed of accordingly.

Sheo Kumar Singh, JM

Dr. Satyawan Singh Garbyal, EM

October 14, 2020
Original Application No. 197/2017 (WZ)
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