JOINT COMMITTEE REPORT

Of

M/s SHRI DUTT INDIA PRIVATE LIMITED VILLAGE VARSAMEDI, TALUKA ANJAR, DISTRICT KUTCH-370110 GUJARAT

[In compliance of order dated 2nd September, 2024 of Hon'ble National Green Tribunal, Principal Bench, New Delhi in OA no. 839 of 2024, Matter registered in West Zone Bench, Pune as O.A. No. 188 of 2024 (Vishnu A. Mori Vs. State of Gujarat)]

SUBMITTED BY

DISTRICT MAGISTRATE, KUTCH,	**GUJARAT POLLUTION CONTROL BOARD**	**CENTRAL POLLUTION CONTROL BOARD**

Joint committee report of M/s Shri Dutt India Private Limited, Village Varsamedi, Taluka Anjar, District Kutchh -370110 Gujarat [In compliance of order dated 2nd September, 2024 of Hon'ble National Green Tribunal, Principal Bench, New Delhi in OA no. 839 of 2024, Matter registered in West Zone Bench, Pune as O.A. No. 188 of 2024 (WZ) (Vishnu A. Mori Vs. State of Gujarat)]

1.0 BACKGROUND

Hon'ble NGT (PB) has passed an order dated 02.09.2024 in a suo-moto matter O.A. No.839 of 2024 (Vishnu A. Mori Versus State of Gujarat). The Matter is registered in West Zone Bench, Pune as O.A. No. 188 of 2024. The matter is related to an industrial unit namely M/s Shri Dutt India Pvt. Limited, Village Varsamedi, Tal. Anjar, District Kutch, Gujarat (hereinafter referred as the unit). The complainant alleged that the industry is violating the environmental laws and discharging wastewater on land behind the premises of the unit towards the main gate of another unit namely M/s Sheel Oil and Fats Pvt. Ltd., which is polluting the lake located at Modwadar Village. Part of the order reads as,

"……..4. *We accordingly constitute a joint committee comprising District Magistrate/ Collector, Kutchh, Gujarat Pollution Control Board and Central Pollution Control Board.*

5. Central Pollution Control Board shall be the Nodal agency for coordination and compliance of this order.

6. "*Above committee shall visit the site, collect relevant information and if finds any violation on the part of proponent in compliance of environmental laws and norms shall take appropriate preventive prohibitive punitive and remedial action in accordance with law within two months and submit a Compliance Report with Registrar Western Zone Bench, Pune within two months. If any further order is required Registrar shall place the matter before appropriate Bench…….."*

In compliance of above order, a Joint Committee comprising of following officials was constituted.

1. Shri Sunil Solanki (IAS), Assistant Collector & Sub Divisional Magistrate, Anjar, District Kutch, Gujarat.
2. Shri Falgun M. Modi, Regional Officer, Gujarat Pollution Control Board, Regional Office Kutch (East), Gujarat.
3. Shri Manoj Kr. Sharma, Scientist B, Central Pollution Control Board, Regional Directorate, Vadodara.

Subsequently, the committee members visited the alleged area and the unit on 08.10.2024 to investigate the allegations made by the complainant.

The unit was operational and Shri Atul Aggrawal, Unit Head-M/s Shree Dutt India Pvt. Ltd. was present during the visit and provided the information about the unit and its processes.

2.0 APPROACH

Applicant in its application dated 07.11.2023 alleged that M/s Shri Dutt India Pvt. Ltd., violating environmental laws and discharging chemical waste water on the land behind its premises towards the main gate of M/s Sheel oil and Fats Pvt. Ltd., accumulation of waste water in the natural well located on the land, discharge of waste water from land to natural drain which further meet to the natural lake of Modwadar village. Considering the area under question, The Committee deliberated the issue and decided following course of action for the compliance:

- Inspection of unit w.r.t. process, management of water and waste water and disposal mechanism of treated effluent adopted by the unit.
- Inspection and sampling of water and waste water from the inlet and outlet of the Effluent treatment plant (ETP) provided by the unit for the treatment of waste water generated from process, MEE Feed, MEE concentrate, MEE condensate, well located on land behind the unit, from natural drain (upstream and downstream to the unit) and from natural lake.
- Inspection and sampling of water from well located on the land behind the unit and natural drain that further meet to the natural lake of Modwadar village.
- Inspection and sampling of soil from the land under allegation.

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3.0 ABOUT THE UNIT M/s SHRI DUTT INDIA PVT. LTD.

M/s Shri Dutt India Private Limited, located at Survey No. 137,144 to 147,149/1,2 & 3, Village Varsamedi, Taluka Anjar, District Kutch, Gujarat is engaged in the manufacturing of refined sugar by utilizing the raw sugar as raw material. Earlier the unit was M/s Uniworld Sugars Limited and it was commissioned in 2011. It has been taken over by M/s Shri Dutt India Private Limited by submitting a resolution plan for its takeover to National Company Law Tribunal(NCLT)and merged into M/s Shri Dutt India Private Limited on 25.03.2023. As per master plan submitted by unit, it has total land area of about 1,78,222.0 sq. meter comprising of plant and building area 19,214 sq. meter, ware house 24,493 sq. meter and 1,34,515 sq. meter open land. The unit has obtained Consolidated Consent & Authorisation (CC&A) from Gujarat Pollution Control Board vide Consent order no. AWH-129759 dated 16.10.2023 (**annexure-1**) for the manufacturing of the following products. The CC&A is valid till 18.03.2025.

Table:1 Details of the product and production capacity as prescribed in CC&A

S.No.	Product	Quantity
1.	Final Molasses	650 MT/month
2.	Refined Sugar	30,000 MT/month
3.	Power Generation	2.4*2= 4.8 MW

As per detail provided by the unit, it has manufactured 18,174 MT refined sugar by consuming 19,302 MT raw sugar during September 2023 to September 2024. Thus, average monthly production of the unit is 1398 MT/month which is well within the consented limit of 30,000 MT /Month as prescribed in CC&A.

Figure:1 Google earth image of the unit and adjoining area.

3.1 BRIEF MANUFACTURING PROCESS

THE PROCESS DESCRIPTION FOR MANUFACTURING OF REFIND SUGAR FROM RAW SUGAR IS GIVEN BELOW:

The primary raw material for the production of refind sugar is raw sugar. Raw sugar is fed to melting station of through mechanised conveyer system from warehouse. Raw sugar is melted in melting station and desired strength of sugar solution is formed. Melted solution is clarified by dosing of the chemicals namely lime, phosphoric acid, flocculants and color precipitant. During clarification impurities are precipitated in the form of scum which is sent to three stages scum de sweetening process to de sugarise the scum. Desugarise scum is sent to filter press for removing any leftover sugar from it. Clarified sugar solution is passed to

multi bed filters to arrest suspended impurities and making the sugar solution clearer. After multi bed filters, sugar solution is passed for further de colorisation through Ion Exchange Resign(IER) process. This process carried out through set of IER columns. The sugar solution obtained after passing through IER column having 80% color removal and it is sent for crystallization process. In crystallization process sugar crystals are developed during evaporation at pan station and the product is termed as Massecuite which comprised of sugar crystals and mother liquor with it. Massecuite is stored in vessels known as crystallizers and passed through high-speed rotating centrifugal machine where it separates mother liquor from sugar crystals. Sugar crystals thus obtained are passed through the process of drying and cooling comprising of rotary and fluidised bed sugar driers. Sugar is stored in sugar silos from where it is packed into the 50 kg and 25 kg bags as per customer requirement. Mother liquor received from centrifugal machine again recycled back to crystallization process and maximum sugar is getting recovered through back boiling till get the desired color of sugar. The remaining Mother liquor is stored in separate tank known as final molasses storage tank. Final molasses is sold to distillery unit.

4.0 FINDINGS AND OBSERVATIONS

4.10 FRESH WATER CONSUMPTION DETAILS

Fresh water used for the process, boiler feed, domestic and other ancillary activities is supplied by Gujarat Water Infrastructure Limited(GWIL). As per Consolidated consent & Authorisation (CC&A) unit is permitted to consume 780 KL/Day fresh water for industrial purpose and 10 KL/Day fresh water for domestic purpose. The unit has provided the details of fresh water supplied by M/s GWIL, Anjar District Kutchh during September 2023 to August 2024. The same is depicted in below table.

Table: 2 Details of fresh water consumption during September 2023 to August 2024

S.No.	Month	Volume of Water in Million Litre(ML) Supplied by GWIL(as per invoices/ water bills issued by GWIL)
1.	September 2023	19.88
2.	October 2023	12.79
3.	November 2023	21.31
4.	December 2023	25.02
5.	January 2024	19.96
6.	February 2024	18.94
7.	March 2024	18.09
8.	April 2024	15.19
9.	May 2024	21.54
10.	June 2024	23.45
11.	July 2024	14.55
12.	August 2024	10.44
	Total Fresh water Consumption	221.16
	Average Fresh Water consumption per month	18.43
	Average fresh water consumption per day	0.614 ML say 614 KLD

As per details provided by the unit, it has reveals that average water consumption by the unit is 614 KL/ day which is well within the consented quantity of 790 KL per day as prescribed in CC&A.

4.20 WASTE WATER MANAGEMENT

The waste water is mainly generated from the various manufacturing process like rinsing and regeneration of ion exchange resign(IER) column, Brine recovery system, floor washing, DM utility/boiler blow down and from RO rejects etc. Ion Exchange Resign Column is used for de colorising the sugar solution. After certain time of use of IER column, it is required to regenerate the column by rinsing with water and brine solution. Unit has provided rinse water recovery system to treat the waste water generated during rinsing of ion exchange column. Unit has provided brine recovery system to treat the spent brine solution generated during regeneration of ion exchange column. The permeate generated from rinse water recovery system(RWRS) and Brine recovery system(BRS) is reused in the process and concentrated/ high TDS waste water generated is fed to multi effect evaporator (MEE). It has provided three stage MEE of 2.2 M^3/Hrs capacity to treat the concentrate generated from RWRS &BRS. Reportedly the condensate water generated from the MEE is reused in the process and concentrated mass is stored in the tank of 25 M^3 capacity and it is transferred /conveyed to the equalization tank of ETP for further treatment.

The waste water generated from floor washing, DM utility/boiler blow down and from RO reject is directly transferred to equalization tank of ETP. During visit the ETP was operational. Unit has provided ETP comprising of following treatment system.

Equalization Tank -→ pH correction Tank→ Coagulant Dosing Tank-→ Poly flocculants dosing Tank-→ Flash Mixture Reaction Tank-→ Primary settling Tank-→ Buffer Tank-→ UASB-→ Aeration Tank→ Secondary Clarifier → HRSC clarifier→ Chlorination Tank→ Multigrade Filters → Activated carbon Filter→ Tertiary Plant Feed Tank→ partly feed to RO & Partly discharge on land.

Reportedly, the part of treated waste water from tertiary plant feed tank is fed to RO system of 10 m^3 per day capacity to use in the process and partly discharged on land for gardening and plantation purpose. RO permeate is reused in the process and reject is transferred to Equalisation Tank of ETP. As per CC&A unit is permitted to generate 150 KL/day waste water from industrial processes and 10 KL/day from domestic uses and after providing required treatment and confirming the prescribed standards is discharged on land for gardening/plantation purpose within the premises.

Unit has provided 08 numbers of sludge drying beds for drying the ETP sludge generated. All the sludge drying beds was observed completely filled with sludge. During visit about 70 to 80 MT ETP sludge was observed stored in the premise of ETP. Unit has not provided adequate space for the storage of ETP sludge.

During inspection of the unit, collected following samples of waste water from the premises of the unit.

A. **MEE Plant:** Samples of MEE Feed, MEE condensate and MEE concentrate to determine the general characteristic of waste water generated from operation of MEE,
B. **From ETP:** Samples collected from Equalization Tank of ETP i.e. Inlet of ETP and Treated effluent from ETP i.e. outlet of ETP for the analysis of parameters as prescribed in CC&A.

Table:3 Analysis Results of samples of waste water collected from ETP and MEE plant

Parameters	Unit	Locations					
		MEE FEED	MEE condensate	MEE Concentrate	Inlet of ETP (from Equalization Tank)	Outlet of ETP	Standard of ETP outlet as prescribed in CC&A
pH	--	6.92	7.84	6.20	4.30	**4.64**	6.5 to 8.5
Temp.	(^{0}C)	--	--	--	33	36	40
TSS	mg/l	4476	2.0	12165	9200	**548**	100
TDS	mg/l	84802	63.3	287933	15130	**20756**	2100
COD	mg/l	41206	148	143017	39149	**25624**	100
BOD	mg/l	28800	97	93000	17450	**12680**	30
NH_3-N	mg/l	17.22	3.87	73.76	2.30	1.15	50
Phenols	mg/l	0.36	0.15	3.42	0.080	0.060	1.0
Sulphides	mg/l	--	--	--	1.62	2.69	5.0
Colour	Hazen	--	--	--	450	**700**	100
Sulfate	mg/l	--	--	--	327.90	501	1000
Chloride	mg/l	--	--	--	2978	**3375**	600
% Na	%	--	--	--	86.2	**87.1**	60
SAR	---	--	--	--	40.2	**54.5**	26
O&G	mg/l	--	--	--	10.5	4.6	10.0

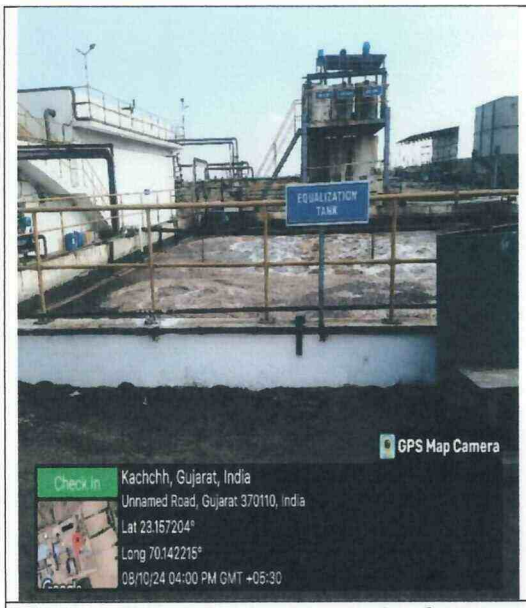
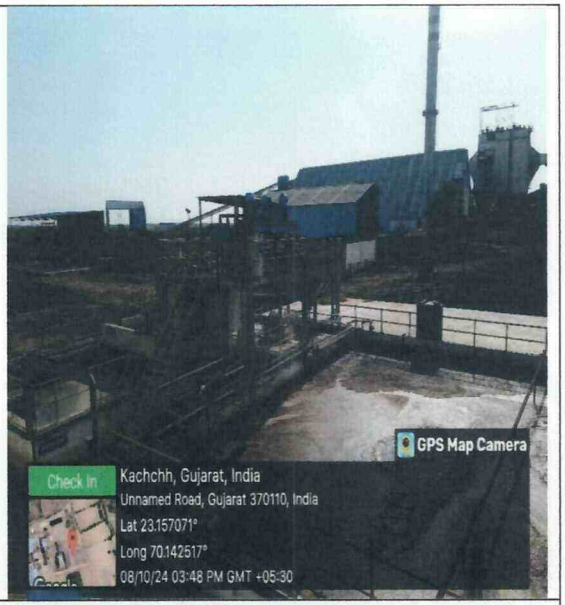
Observations:

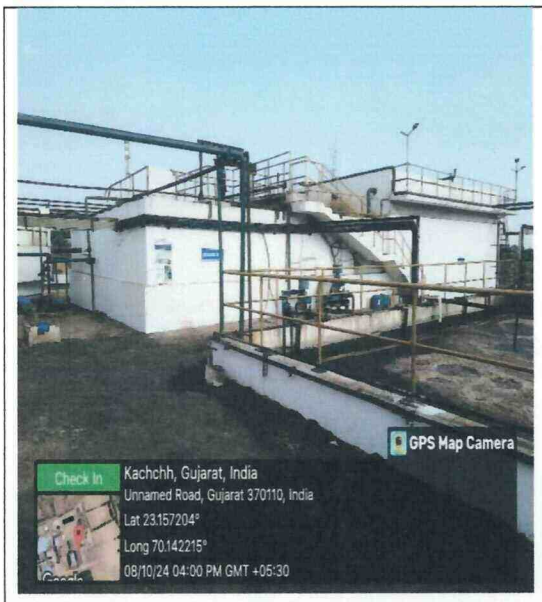
- During visit ETP and Multi Effective Evaporator (MEE) of 2.2 M^3/Hrs capacity was operational.
- Floating scum was observed in Primary settling tank and Buffer tank of ETP and dosing of chemicals was not observed in flash mixer during the visit.
- Secondary clarifier of ETP was observed in idle condition and adequate biomass was not observed in aeration tank of ETP.
- Moreover, it was observed that ETP was not operated in scientific manner.
- The analysis results of the grab samples of treated effluent collected from the outlet of ETP revels that concentration of TSS, TDS, COD, BOD, Color, Chloride, % sodium, SAR & pH grossly exceeding the discharge norms as prescribed in CC&A.
- The analysis results of the grab sample collected from inlet (Equalization Tank) of ETP reveals that concentration of TSS, TDS, COD and BOD is observed very high.
- Unit is not maintaining the record in logbooks of waste water generated from various streams. Also unit has not installed flow measuring devices at the inlet

of ETP and outlet of ETP to assess the exact quantity of waste water generated, treated at ETP and disposed.

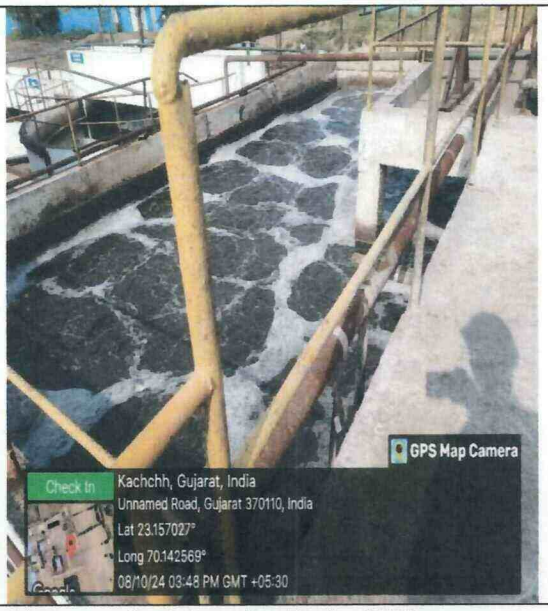
- Unit has installed three stage Multi Effective Evaporator(MEE) of 2.2 M^3/Hrs capacity to treat the concentrate generated from Rinse Water Recovery system & Brine recovery system. However, unit is not maintaining the record in logbook for operation of MEE and quantity of waste water fed to MEE.
- It is gathered that MEE concentrate is stored in Tank and transferred to equalization tank of ETP for further treatment.
- During visit, it was informed by the unit that treated waste water from ETP is fed to RO of capacity 10 M^3/Hr for tertiary treatment to use in the process. However, during visit, it is observed that the network of pipelines was also connected from tertiary feed treated water storage tank of ETP to the discharge line on land for gardening/plantation purpose within the premises of the unit along with the feed to RO system.
- Unit is not maintaining the record of quantity of treated waste water fed to RO system for tertiary treatment and how much quantity of treated waste water is discharge on land for gardening purpose as per CC&A condition.

Photographs taken during visit of ETP units are given in below table

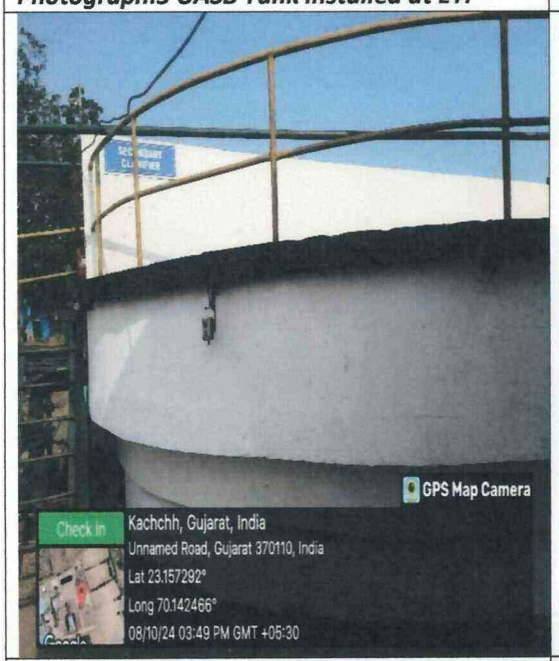
	
Photograph:1 Equalization Tank of ETP and dosing tank	***Photograph: 2 buffer tank at ETP***



Photograph:3 UASB Tank installed at ETP

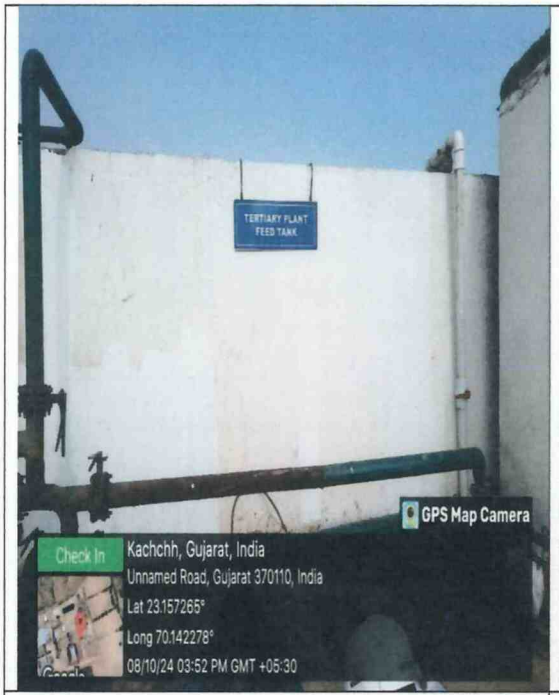


Photograph : 4 Aeration Tank of ETP

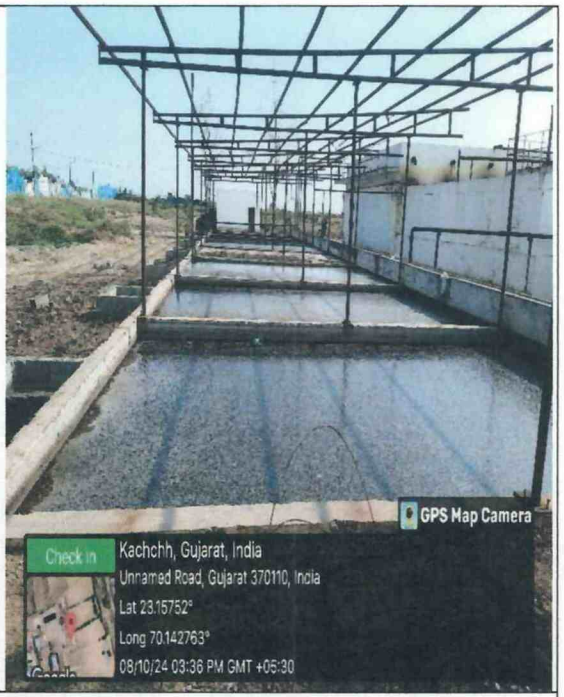


Photograph: 5 Secondary Clarifier

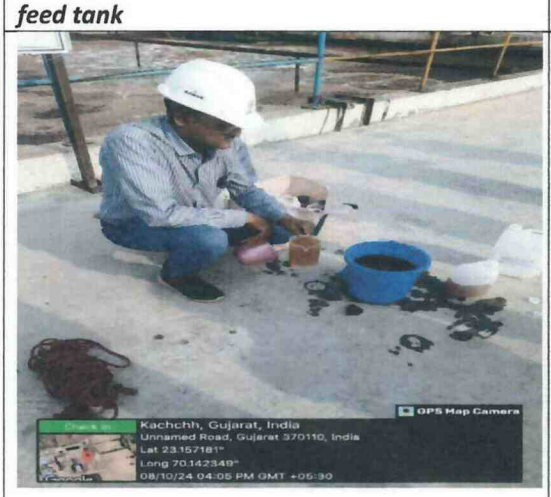
Photograph:6 multigrade filter and activated carbon filter



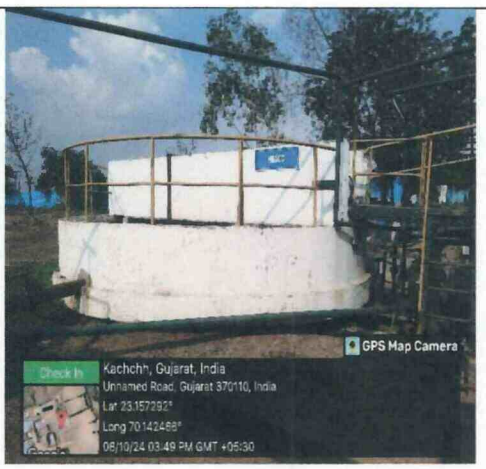
Photograph:7 treated effluent tertiary plant feed tank



Photograph:8 sludge drying beds



Photograph:9 sampling of treated effleunt from ETP



Photograph:10 HRSC unit installed at ETP

4.3 MONITORING OF WELL LOCATED IN SURVEY NO. 148 BEHIND THE UNIT, NATURAL DRAIN AND NATURAL LAKE LOCATED AT MODWADAR VILLAGE

During inspection joint committee collected samples of water from well located at land of survey no 148 behind the unit, natural drain at upstream and downstream to the unit that further meets to natural lake and from natural lake to assess the water quality of these water bodies. The samples of water from natural drain and lake were collected in presence of team of complainant. The analysis results are given in below table.

Table: 4 Analysis results of water samples collected from well located at survey no. 148, Natural drain at upstream and downstream to the unit and lake located at Modwadar Village

Parameters	Unit	Well located near natural drain behind the unit at survey no. 148	Natural Drain at Upstream from the unit	Natural Drain at Downstream from the unit	Natural Pond/Lake at Modwadar Village
pH	--	7.59	7.60	7.76	8.10
Temp.	(^{0}C)	28	29	30	30
TSS	mg/l	26.6	32.0	44.4	22.5
TDS	mg/l	4984	4194	3373	2140
COD	mg/l	43	51	32	22
BOD	mg/l	2.9	4.1	2.5	2.6
NH_3-N	mg/l	3.3	4.14	2.70	0.31
Phenols	mg/l	0.013	0.02	0.07	BDL
Sulphides	mg/l	BDL	BDL	BDL	BDL
Colour	Hazen	05	10	05	05
Sulfate	mg/l	180.53	113	98	86
Chloride	mg/l	2432	1727	1464	831
% Na	%	67.4	58.6	58.0	53.6
SAR	---	14.4	9.9	8.7	6.1
O&G	mg/l	4.6	3.2	3.4	3.5

Observations related to well located at land of survey no. 148:

- The well is located at survey no. 148 behind the unit near natural drain. It's depth about 20.0 meter. Plant leaves and other humas material was observed in the well. At present water of well is not utilised for irrigation purpose as no crop is observed on the land of survey no. 148.
- The analysis results of the sample collected from well showing pH 7.59, TSS 26.6 mg/l, TDS 4984 mg/l., COD 43.0 mg/l, BOD 2.9 mg/l, Ammonical Nitrogen 3.3 mg/l, Chloride 2432 mg/l, % Na 67.4, O&G 4.6 mg/l and SAR value 14.4 mg/l. As per the IS 11624:1986 guidelines (**annexure-2**) for the determination of water quality for irrigation purpose, monitored parameter value of SAR indicates medium quality of water for irrigation purpose.
- During visit discharge of waste water from unit was not observed on the land of survey no. 148.

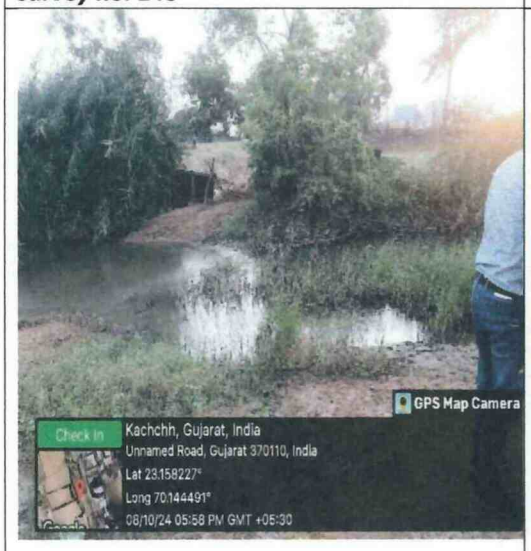
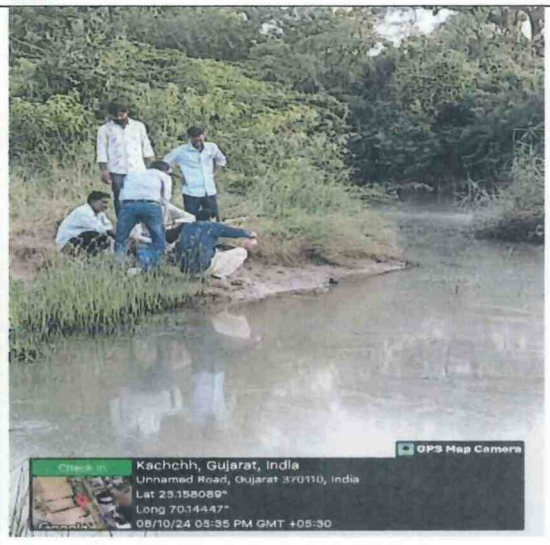
Observations related to natural drain flowing behind the unit M/s Shri Dutt India Pvt. Ltd. and in front of gate of M/s Sheel Oil & Fats Pvt. Ltd.

- The joint committee visited the drain and collected water samples from upstream and downstream to the unit. During visit flow was not observed in the drain and it was like a stagnant water body.
- The analysis results mentioned in the table above shows that samples of upstream and downstream of the drain is not showing significant difference in its characteristic which indicates that industrial discharge is not happening in the said drain.

- During visit waste water discharge from the unit was not observed in the drain.

Observations related to Natural Lake located at Modwadar village

- The joint committee collected sample from natural lake located at Modwadar Village. The analysis results reveals that the concentration of monitored parameters TDS and chloride shows higher concentrations as compared with the acceptable limit of drinking water standards of IS 10500:2012 which make it unfit for drinking purpose though the monitored parameters namely pH, color, sulfate, sulphide, phenolic compound and ammonical nitrogen are meeting the acceptable limit of IS standard 10500:2012 for drinking water(**annexure-3**).
- During visit discharge of waste water was not observed from the unit in natural lake.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photograph:11 well located on land of survey no. 148</td><td>Photographs:12 samples taken during visit from well</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photograph:13 upstream to the unit of natural drain</td><td>Photograph:14 sample taken from downstream of the drain</td></tr>
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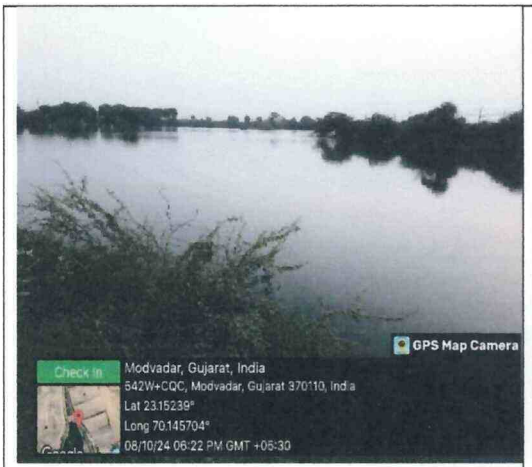


Photograph:15 natural lake at Modwadar Vill. Full of water

Photograph:16 water sample taken during visit from lake

4.4 SOIL MONITORING

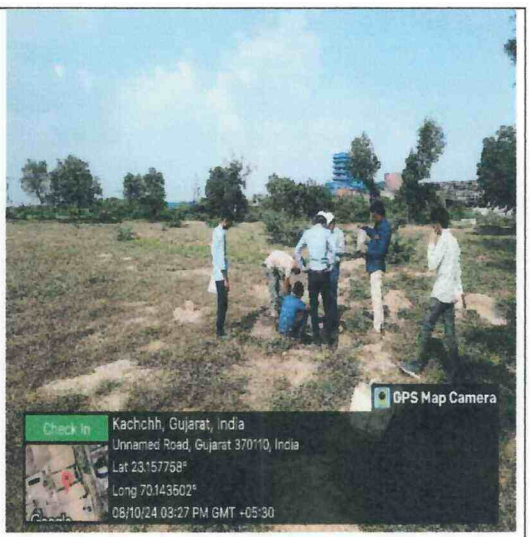
The joint committee collected 08 soil samples from 04 locations i.e. two soil samples from each location (two locations selected at land of survey no. 148 located behind the premises of unit and towards the main gate of M/s Sheel Oil & Fats Pvt. Ltd., one location at survey no. 150 located outside the premises of unit and one location about one & half kilometre away from area under question for reference purpose) following standard sampling procedure for collection of top soil and samples at 01 feet deep soil. During visit complainant were stated that now unit discharging its waste water on the land located at Survey no.150. The committee member visited the said land and no waste water accumulation/ discharge was observed on the land and entire area of the said survey no. was observed dry and bushes are grown on land. The details of the soil sample location are given in below table.

Table 1: List of Soil Sampling Locations

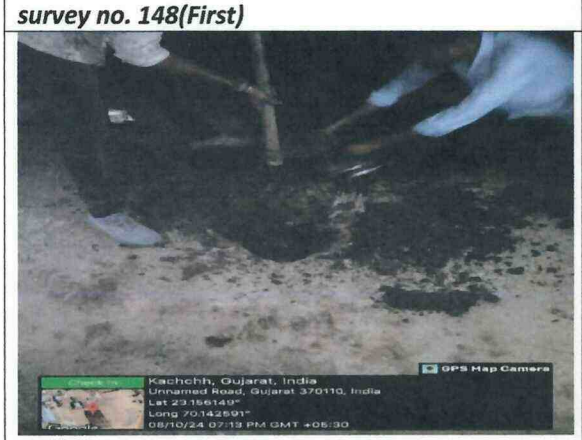
Sample Code	Location	Description	Remark
S1& S2	Lat. 23.157727^0 Long. 70.143512^0	Soil collected from top surface and from 1 feet deep from the top surface at Survey no. 148 near the well (south west side of land)	No crop was observed on the land. Small bushes are naturally growing on the land
S3& S4	Lat. 23.157777^0 Long. 70.143498^0	Soil collected from top surface and from 1 feet deep from the top surface at Survey no.148 (North west side of land)	No crop was observed on the land. Small bushes are naturally growing on the land

Sample Code	Location	Description	Remark
S5& S6	Lat. 23.156149 Long. 70.142591	Soil collected from top surface and from 1 feet deep from the top surface from Survey no. 150	No crop was observed on the land. Big bushes are naturally growing on the land
S7&S8	Lat. 23.156932^0 Long. 70.139532^0	Soil collected from top surface and from 1 feet deep from the top surface for reference	Sample collected for Reference purpose

Photograph:17 the soil sample taken from survey no. 148(First)



Photograph:18 the soil sample taken from survey no. 148 (second)



Photograph:19 showing the soil sample taken from survey no. 150

Photograph:20 showing the soil sample taken Reference purpose

The analysis results of the soil samples are given in the below table:

Table: 6 Analysis results of soil samples collected from survey no. 148 (S-1&S-2 South west side of land & S-3 &S-4 North west side of land), 150 (S-5 & S-6) and reference sample (S-7&S-8)

S. No.	Parameters	Locations							
		S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8
1.	pH	8.06	9.23	7.85	9.05	8.48	8.92	8.37	8.50
2.	Electrical conductivity (µS/cm)	**568**	197	**1053**	223	**914**	**551**	144	137
3.	TWSS (gm/Kg)	1.47	1.36	2.04	0.74	3.85	3.04	3.57	2.65
4.	Total Organic Carbon Carbon(gm/Kg)	**8.1**	3.8	**9.2**	4.0	**12.7**	5.5	1.8	3.4
5.	Organic matter(gm/Kg)	**14.0**	6.5	**15.80**	6.9	**21.9**	9.5	3.0	5.8
6.	Available Nitrogen(gm/Kg)	0.27	0.12	0.18	0.10	0.20	0.26	0.19	0.28
7.	Phosphate(gm/Kg)	0.008	0.001	0.003	0.003	0.006	0.001	0.001	0.001
8.	Potassium(gm/Kg)	0.32	0.15	0.33	0.07	0.40	0.40	0.26	0.24
9.	% Sodium	34.32	34.48	25.06	16.21	44.51	44.04	52.52	47.31

Observations:

- During visit total 08 soil samples were collected by the committee. Two samples (one from top surface and another from one feet deep from top surface) were collected from each location. Sample no. S-7 & S-8 were collected for reference purpose about 1.50 Km away from the land under question.
- The analysis results of the samples of top layer soil collected from survey no. 148 and survey no. 150 showing higher electrical conductivity (568 µS/cm, 1053 µS/cm and 914 µS/cm) and higher concentration of total organic carbon (8.1 gm/kg, 9.2 gm/kg & 12.7 gm/kg) and organic matter (14.0 gm/kg, 15.80 gm/kg & 21.9 gm/kg) as compared to the values observed in reference sample (144 µS/cm, 1.8 gm/kg &3.0 gm/kg). It indicates that waste water discharge may have happened in the past on the land.
- During visit no industrial waste water was observed to be discharged on the land of survey no. 148 & 150.

5.0 ACTION TAKEN BY GPCB

During visit, it is gathered that various complaints have been submitted to GPCB regarding pollution caused by the said unit and GPCB has issued showcause notices, Notice of Directions, closure directions and subsequently temporary time bound revocation orders from time to time under section 33(A) of the water Act 1974. Recently, GPCB Regional Office visited the unit on 04.09.2024 and 13.09.2024. Based on the inspection by GPCB team and noncompliance observed, GPCB has re-implemented the closure directions vide order number 822549 dated 24.09.2024 under section 33(A) of the water Act 1974 and forfeited

the bank guaranty of Rs. 7.50 Lakh submitted by the unit in compliance of earlier visits. Details of action taken by Gujarat Pollution Control Board against the above unit is enclosed as **annexure-4** for reference.

6.0 CONCLUSION AND RECOMMENDATIONS:

The matter is related to discharge of waste water on the land behind the premises of unit towards the main gate of another industrial unit namely M/s Sheel Oil and Fats Pvt. Ltd. The violating industry is located on the border of Varsamedi Village in taluka Anjar, District Kutch.

In accordance of the order, the committee visited the site on 08.10.2024 w.r.t. verification of status of management of water and waste water and disposal mechanism of the waste water adopted by the unit. During visit, joint committee collected the information regarding production details, management of water, waste water and disposal mechanism of treated effluent. The committee surveyed the area under allegation and collected water/ waste water samples from well located on the land behind the unit, from natural drain and from lake located in Modwadar Village.

As per Consolidated Consent & Authorisation (CC&A) vide order dated 16.10.2023 unit is permitted to generate 150 KLD waste water from industrial operations and 10 KLD waste water from domestic uses. Unit is allowed to discharge the treated effluent on land for gardening/plantation purpose within premises after providing required treatment as prescribed in CC&A. Unit has provided Effluent treatment plant for the treatment of waste water generated from various process. During visit, samples of waste water from MEE concentrate, MEE feed, MEE condensate, inlet to ETP and treated effluent from ETP were collected. It is observed from the analysis results that ETP is not adequate for the treatment of waste water as the concentration of analysed parameters namely TSS, TDS, COD, BOD, Color, Chloride, % sodium and SAR grossly exceeds the discharge norms as prescribed in CC&A. Unit has not provided flow measuring devices at the inlet and outlet of the ETP to assess the exact quantity of waste water generated, treated in ETP and discharge on land as per conditions laid down in CC&A.

Unit has installed three stage MEE of 2.2 M3/ hr capacity and RO system for tertiary treatment to use in the process. However, unit is not maintaining the record of operation of MEE and RO system in log books.

Joint committee collected water samples from well, natural drain and lake located at Modwadar village. The analysis results of samples collected from well reveals higher concentration of salts in the samples and indicates the medium quality of water for irrigation purpose as per standard IS guidelines for irrigation water. It is gathered that at present the well water is not used for irrigation purpose and no crop was observed on the land of survey no. 148. The analysis results of the sample collected from the lake located at Modwadar village reveals that monitored parameters TDS and chloride shows higher concentrations as

compared with the acceptable limit of drinking water standards of IS 10500:2012 which make it unfit for drinking purpose though the monitored parameters namely pH, color, sulfate, sulphide, phenolic compound and ammonical nitrogen are meeting the acceptable limit of IS standard 10500:2012 for drinking water. During visit discharge of waste water was not observed in the lake. The soil samples were collected at 03 locations from the land of survey no. 148 and 150 and one sample was collected for reference purpose. In all three locations Electrical conductivity, Total organic carbon and Organic matter were observed higher as compared to reference sample collected during the visit which indicates that waste water discharge may have happened in the past on the land. During visit discharge of waste water was not observed in area under allegation.

Summarily, the unit was found to be in gross violation of norms prescribed for treated waste water. Further, the unit failed to provide and maintain suitable mechanism for complete water budget by the way of provision of flow meters and maintenance of their logbooks at critical water, waste water and treated waste water streams. It is also found that concentration of certain parameters in the soil of area under question are more than the sample of reference location. Therefore, impact of application of treated/partially treated /untreated waste water in past cannot be ruled out though there was no direct discharge on land under question observed by the joint committee during visit.

Based on the above observations following remedial actions are required to be taken by the unit-

- Submit the detailed time bound action plan for upgrade the ETP so that treated effluent can meet the discharge norms as prescribed in CC&A.
- Segregate the stream of waste water of high COD and high TDS from general waste water stream to give specific treatment process for different streams.
- Install flow measurement devices at strategic locations of waste water generation like waste water streams generated from the process and at inlet of ETP and final out let of ETP to assess the exact quantity of waste water generated, treated and disposed and maintain the record in logbook for the same.
- Maintain the record of operation of MEE in logbook and explore the mechanism for treatment of MEE concentrate generated during the operation of MEE.
- Dispose the ETP sludge stored in the ETP premises scientifically.
- Provision of adequate land area to cater the requirement of discharge of treated effluent for gardening/ plantation purpose as prescribed in CC&A.
- Install piezo wells as per water gradient in the area for assessing the ground water quality as the unit is permitted to discharge the treated effluent on land after providing required treatment as prescribed in CC&A. A study for assessing the impact of discharge of treated industrial waste water on land considering saline zone impact on the quality of ground water and soil may be carried out in time bound manner by institute of repute(IOR). Accordingly, condition of discharge of treated waste water on

land considering the land availability, impact on ground water quality and adequacy of ETP may also be relooked by GPCB w.r.t. CC&A.

Subsequent to the detailed inspection and assessment of non-compliance, status and measures required to be taken by the unit as stated above, the committee further examined the punitive actions, measures/ steps taken and due to be taken in the matter which are deliberated in subsequent paragraphs.

As a punitive measure, Gujarat Pollution Control Board(GPCB) re-implemented the closure directions under section 33(A) of Water (prevention and control of pollution) Act-1974 vide order no. PC/CCA-KUTCH-836(3)/GPCB-ID-29438/828549 dated 24.09.2024 with effect from 15th day from the date of issue of order w.r.t. to noncompliance observed during the inspection on 04.09.2024 & 13.09.2024 by the team of GPCB and also forefeited Bank Guarantee of Rs. 7.50 Lakh. It is gathered from GPCB that operation of the unit was closed for the period from 09.10.2024 to 15.11.2024. The GPCB has again taken bank guaranty of Rs. 15.0 Lakh valid upto 24.09.2025 to ensure compliance. The GPCB has also recovered interim environmental compensation of Rs. 19,20,000/- from the Unit.

It is appraised by the member of the committee from GPCB that for the purpose of upgradation of ETP with change of disposal mode for treated effluent from application on open land for plantation/gardening to ZLD & change in industrial water consumption and waste water generation, the unit has obtained CTE amendment. The unit submitted compliance report w.r.t. to noncompliance observed by GPCB team during visit on 04.09.2024 and 13.09.2024. Subsequently, GPCB team visited the unit on 13.11.2024 and based on compliance status GPCB revoked the closure direction vide order no. PC/CCA-KUTCH-836(4)/GPCB-ID-29438/826936 dated 16.11.2024 (**annexure-5**) subject to the following conditions:

- Unit shall strictly adhere to ZLD & in no case effluent shall be disposed off outside the premises.
- Unit shall operate ETP regularly and efficiently for treatment of effluent and maintain its record.
- Unit shall abide with orders/directions issued by Hon'ble NGT in the matter O.A. no. 839 of 2024.

Further in light of observations and remedial measures suggested by the joint committee, Central Pollution Control Board issued a letter dated 26.12.2024 to the Gujarat pollution Control Board (GPCB) regarding latest updated status of action/measures taken/ initiated by GPCB. Copy of the letter is attached at **annexure-6**. In reply to the said letter, GPCB has submitted latest point-wise status of remedial measures suggested/opined by the joint committee. Copy of the latest status of measures taken/initiated as submitted by GPCB is attached at **annexure-7** and summarised as below:

1. Subsequent to the visit of joint committee, GPCB inspected the unit on 13.11.2024 and 16.12.2024.
2. It is observed from the latest status report submitted by GPCB that waste water treatment related issues like upgradation of effluent treatment plant (ETP) for ZLD, segregation of high TDS/high COD waste water streams, installations of flow measuring devices at strategic locations of waste water generation and treatment system and maintaining the records of the same in logbooks etc. have been addressed by the unit.
3. Issue of provision of adequate land area to cater the requirement of treated wastewater discharge on land for gardening/plantation purpose as prescribed in CC&A has been addressed as the unit has now converted to ZLD (copy of CTE amendment for the same is enclosed at **annexure-8** for reference) and stopped the discharge of treated waste water on land.
4. Issue of disposal of stored ETP sludge (about 70 MT to the common hazardous waste treatment stabilization & disposal facility (CHWTSDF) is yet to be fully complied and needs to be done in expeditious manner.
5. For installation of piezo well, it is submitted that industry has converted to ZLD unit and stopped discharging the treated waste water on land. However, GPCB will carry out a study of ground water and soil quality for assessing the impact of discharge of treated/partially treated waste water on land in past and take suitable actions.

The disposal of stored ETP sludge in the premises of the unit in expeditious manner and study of ground water and soil quality required to be ensured by GPCB with continuation of regular surveillance activity from time to time for compliance verification and further measures whenever and wherever required.

Thus, the committee concluded the report with findings/recommendations based on inspection & information collected, measures/punitive actions taken and updated status of actions/measures taken.

Sunil Solanki(IAS),	Falgun M. Modi,	Manoj Kr. Sharma,
Asst. Collector &	Regional Officer,	Scientist. B,
Sub Divisional Magistrate,	GPCB Kutch(East)	CPCB, RD Vadodara
Anjar, District Kutch		

Annexure-1

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN, SECTOR 10-A,
GANDHINAGAR - 382010,
(T) 079-23232152

GPCB

By R.P.A.D

In exercise of the power conferred under section-25 of the Water (Prevention and Control of Pollution) Act-1974, under section-21 of the Air (Prevention and Control of Pollution)-1981 and Authorization under rule 6(2) of the Hazardous and Other Waste (Management and Transboundary) Rules, 2016 framed under the Environmental (Protection) Act-1986.

And whereas Board has received consolidated consent application **inward No.278691** dated **22/06/2023** for the **Renewal of Consolidated Consent and Authorization (CC&A)** of this Board under the provisions / rules of the aforesaid Acts. Consents & Authorization are hereby granted as under:

CONSENTS AND AUTHORISATION:
(Under the provisions /rules of the aforesaid environmental acts)

To,
M/s. Shri Dutt India Private Limited (New Name), (ID-29438)
M/s. Uniworld Sugers Limited (Old Name),
Survey No.137, 144 to 147,149/1, 2 & 3,
Village: - Varsamedi, Tal: Anjar,
Dist: Kutch - 370 110.

1. **Consent Order No. AWH-129759 Date of issue: 16/10/2023.**
2. The consents shall be **valid upto 18/03/2025** for the use of outlet for the discharge of trade effluent and emission due to operation of industrial plant for manufacturing of the following items/ products:

Sr. No	Product	Quantity
1	Final Molasses	650 MT/Month
2	Refined Sugar	30,000 MT/Month
3	Power Generation	2.4*2= 4.8 MW

Subject to specific condition:

1. Industry shall not carry out any activity which may attract the applicability of EIA notification-2006 & its amendment.
2. Industry shall renew Public Liability Insurance Policy time to time & submit a copy of the same to this office.
3. Industry shall comply with PESO permission issued by competent authority and renew PESO permission time to time & submit a copy of the same to this office.
4. Industry shall comply with Manufacturing, Storage and Import of Hazardous Chemicals Rules – 1989 framed under the Environment (Protection) Act-1989 including site notification of competent authority for isolated storage & submit acknowledge copy of onsite emergency plan & third party safety audit report time to time.
5. Industry shall not withdrawal ground water without prior NOC of CGWA as per order of Hon. National Green Tribunal.

6. Unit shall obtain fresh water from valid source have permission of the complete authority.
7. Industry shall strictly comply with the coal handling guideline of the Board.
8. Industry shall provide dedicated storage silo for storage of fly ash & ash shall be dispose off as per fly ash notification 1999 & as amended from time to time.
9. Industry shall dispose of fly ash as per CPCB guideline dated 28/08/2019 maintain complete records of fly ash generation and its disposal.
10. Industry shall take adequate measures to control fugitive emission due to storage, handling & transportation of coal, fly ash & solid waste etc.
11. Industry shall manage Solid Wastes generated from industrial activities as per Solid Waste Management Rules-2016 (solid waste as defined in Rule-3(46)).
12. As per Provisions of Rule 18 of Solid Waste Management Rules-2016 you are directed to make an arrangement in Utilities to replace at least five percent (5%) of your solid fuel requirement by 'refused derived fuel'.

3. **CONDITIONS UNDER THE WATER ACT:**

3.1 Source of Water: - GWIL.

3.2 The quantity of the fresh water consumption for industrial purpose shall not exceed 780 KL/Day.

3.3 The quantity of the fresh water consumption for domestic purpose shall not exceed 10 KL/Day.

3.4 The quantity of the industrial effluent to be generated from the industrial plant and other ancillary industrial operations shall not exceed 150 KL/Day.

3.5 The quantity of domestic waste water shall not exceed 10 KL/Day.

3.6 Industry shall operate Effluent Treatment Plant (ETP) adequately so that treated industrial effluent shall comply with following norms:

PARAMETERS	PRESCRIBED LIMITS
pH	6.5 to 8.5
Temperature	40°C
Colour (Pt.Co. scale) in units	100 units
Total Suspended Solids	100 mg/L
Oil and Grease	10 mg/L
Ammonical Nitrogen	50 mg/L
BOD (3 days at 27o C)	30 mg/L
COD	100 mg/L
Chlorides	600 mg/L
Sulphates	1000 mg/L
Total dissolved solids	2100 mg/L
Percent Sodium	60 %
Phenolic Compounds	1 mg/L
Sulphides	5.0 mg/L
Sodium Absorption Ratio	26

GUJARAT POLLUTION CONTROL BOARD
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GANDHINAGAR - 382010,
(T) 079-23232152

3.7 Treated effluent confirming to above standards shall be discharged on land for gardening / plantation purpose within premises.

3.8 Industry shall provide fixed pipeline network with flow meter for even distribution of treated effluent and maintain its record.

3.9 Domestic effluent shall be disposed off through septic tank/soak pit system.

3.10 Disposal system for storm water shall be provided separately. In no case storm water & sewage from port facility shall not be discharge into surface water.

4. Conditions under the Air Act-1981:

4.1. The following shall be used as a fuel in AFBC Boiler:

Sr. No.	Utility	Name of Fuel	Quantity
1.	AFBC Boiler	Lignite/ Coal	276 MTD

4.2. The applicant shall install & operate air pollution control system efficiently in order to achieve prescribed norms.

4.3. The flue gas emission through stack attached to AFBC Boiler shall conform to the following standards;

Sr. No.	Stack attached to	Stack height	APCM	Parameter	Permissible Limit
1	AFBC Boiler (70 TPH)	60 m	ESP + Scrubber	PM SO_2 NO_X	150 mg/NM^3 100 ppm 50 ppm

4.4. There shall be no process gas emission from manufacturing process and other ancillary operations.

4.5. The concentration of the following parameters in the ambient air within the premises of the industry shall not exceed the limits specified hereunder as per National Ambient Air Quality Standards issued by MoEF & CC dated 18th November-2009.In addition to following parameters Industry shall also carry out AAQ monitoring of all other applicable parameter as per MoEF notification dated 18/11/2009 and submit the report to the Board.

Sr. No.	Pollutant	Time Weighted Average	Concentration in Ambient air in µg/M^3
1.	Sulphur Dioxide (SO_2)	Annual 24 Hours	50 80
2.	Nitrogen Dioxide (NO_2)	Annual 24 Hours	40 80
3.	Particulate Matter (Size less than 10 µm) or PM_{10}	Annual 24 Hours	60 100
4.	Particulate Matter (Size less than 2.5 µm) or $PM_{2.5}$	Annual 24 Hours	40 60

4.6. The applicant shall provide portholes, ladder, platform etc. at chimney(s) for monitoring the air emissions and the same shall be open for inspection to/and for use of Board's staff. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.

4.7. The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standards in respect of noise to less than 75dB(A) during day time and70 dB (A) during night time. Daytime is reckoned in between 6a.m. and10 p.m. and nighttime is reckoned between 10 p.m. and 6 a.m.

5. AUTHORIZATION as per HAZARDOUS AND OTHER WASTE (MANAGEMENT AND TRANSBOUNDARY) RULES, 2016 Form-2 [See rule 6 (2)]

Form for grant of authorization for occupier or operator handling Hazardous waste

5.1 Authorization order no:-**AWH-129759** Date of issue: 16/10/2023.

5.2 **M/s. Shri Dutt India Private Limited,** is hereby granted an authorization based on the enclosed signed inspection report for generation, collection, treatment, storage, transport of hazardous waste on the premises situated at survey no : 137, 144 to 147,149/1, 2 & 3, Village: - Varsamedi, Tal: Anjar, Dist: Kutch.

Sr. No.	Waste	Quantity per Annum	Schedule & Category	Facility
1.	Used / Spent Oil	0.5 MT	I-5.1	Collection, storage, Transportation, and disposal by selling out to registered recycler.
2.	Discarded Drums & Containers	3 MT	I-33.3	Collection, storage, Transportation, and disposal by selling out to registered recycler.
3.	Concentrate d Brine Salt	750 MT	I-33.2	Collection, storage, Transportation, and disposal by selling out to registered recycler.
4.	ETP Sludge	500 MT	I-34.3	Collection, storage, Transportation, and disposal by selling out to registered recycler.
5.	Spent Ion Exchange Resin	30 MT	I-34.2	Collection, storage, Transportation, and disposal by selling out to registered recycler.

5.3 The authorization shall be valid up to **18/03/2025.**

5.4 The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act-1986.

5.5 The authorization is granted to operate a facility for collection, storage within factory premises transportation and ultimate disposal of Hazardous wastes as per condition no 5.2 to the industry having valid CCA of this Board.

5.6 **TERMS AND CONDITIONS OF AUTHORISATION**

1. The applicant shall comply with the provisions of the Environment (Protection) Act-1986 and the rules made there under.
2. The authorization or its renewal shall be produced for inspection at the request of an officer authorized by the Gujarat Pollution Control Board.

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PARYAVARAN BHAVAN, SECTOR 10-A,
GANDHINAGAR - 382010,
(T) 079-23232152

3. The persons authorized shall not rent, lend, sell, and transfer or otherwise transport the hazardous wastes without obtaining prior permission of the Gujarat Pollution Control Board.
4. Any unauthorized change in personnel, equipment or working conditions as mentioned in the authorization order by the persons authorized shall constitute a beach of this authorization.
5. The person authorized shall implement Emergency Response Procedure (ERP) for which this authorization is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time;
6. The person authorized shall comply with the provisions outlined in the Central Pollution Control Board guidelines on "Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Wastes and Penalty"
7. It is the duty of the authorized person to take prior permission of the Gujarat Pollution Control Board to close down the facility.
8. An application for the renewal of an authorization shall be made as laid down in rules 6(2) under Hazardous and Other Waste Rules, 2016.
9. The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.
10. The record of consumption and fate of the imported hazardous and other wastes shall be maintained.
11. The hazardous and other wastes which gets generated during recycling or reuse or recovery or pre-processing or utilization of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorization.
12. The importer or exporter shall bear the cost of import or export and mitigation of damages if any.
13. Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.
14. The waste generator shall be totally responsible for (i.e. collection, storage, transportation and ultimate disposal) the wastes generated.
15. Records of waste generation, its management and annual return shall be submitted to Gujarat Pollution Control Board in Form-4 by 30th day of June of every year for the preceding period April to March.
16. In case of any accident, details of the same shall be submitted on Form-11 to Gujarat Pollution Control Board.
17. As per "Public Liability Insurance Act-91" company shall get Insurance Policy, if applicable.
18. Empty drums and containers of toxic and hazard material shall be treated as per guideline published for "Management & Handling of discarded containers". Records of the same shall be maintained and forwarded to Gujarat Pollution Control Board regularly.
19. In case of transport of hazardous wastes to a facility for (i.e. treatment, storage and disposal) existing in a State other than the State where hazardous wastes are generated, the occupier shall obtain 'No Objection Certificate' from the State Pollution Control Board or Committee of the concerned State of Union Territory Administration where the facility exists.

20. Unit shall take all concrete measures to show tangible results in waste generation, reduction, avoidance, reuse and recycle. Actions taken in this regard shall be submitted within three months and also along with Form-4.
21. Industry shall have to display the relevant information with regards to hazardous waste as indicated in the Hon. Supreme Court's Order in W.P. No.657 of 1995 dated 14th October, 2003.
22. Industry shall have to display on-line data outside the main factory gate with regard to quantity and nature of hazardous chemicals being handled in the plant, including wastewater and air emissions and solid hazardous wastes generated within the factory premises.

6. **SPECIFIC CONDITIONS:-**

6.1 The authorized actual user of hazardous and other wastes shall maintain records of hazardous and other wastes purchased in a passbook issued by the State Pollution Control Board along with the authorization.
6.2 Handling over of the hazardous and other wastes to the authorized actual user shall be only after making the entry in the passbook of the actual user.
6.3 In case of renewal of authorization, a self-certified compliance report in respect of effluent, emission standards and the conditions specified in the authorization for hazardous and other wastes shall be submitted to SPCB.
6.4 The occupier of the facility shall comply Standard operating procedure/guidelines published by MOEF&CC or CPCB or GPCB from time to time.
6.5 Unit shall comply provisions of E-Waste Management Rules-2016.
6.6 The disposal of Hazardous Waste shall be carried out as per the waste Management hierarchy.
6.7 The occupiers of facilities shall not store the hazardous and other wastes for a period not exceeding **ninety days**. Prior permission of the Board shall be obtained for extension of the storage period.
6.8 The occupier shall maintain the records of generation, sale, storage, transport, recycling, co processing and disposal of hazardous waste and make available during the inspection.
6.9 The transportation of the hazardous waste shall be carried out in GPS mounted dedicated vehicles.

7. **GENERAL CONDITIONS: -**

7.1 Any change in personnel, equipment or working conditions as mentioned in the consents form/order should immediately be intimated to this Board.
7.2 Applicant shall also comply with the general conditions given in annexure I.
7.3 Whenever due to accident or other unforeseen act or ever, such emissions occur or is apprehended to occur in excess of standards laid down such information shall be forthwith reported to Board, concerned Police Station Office of Directorate of Health Service, Department of Explosives, Inspectorate of Factories and local body.
7.4 In case of failure of pollution control equipments, the production process connected to it shall be stopped. Remedial actions/measures shall be implemented immediately to bring entire situation normal.
7.5 The Environmental Management Unit/Cell shall be setup to ensure implementation on and monitoring of environmental safeguards and other conditions stipulated by statutory authorities. The Environmental Management Cell/Unit shall directly report to the Chief Executive of the organization and shall work as a focal point for

GPCB

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN, SECTOR 10-A,
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(T) 079-23232152

internalizing environmental issues. These cells/units also coordinate the exercise of environmental audit and preparation of environmental statements.

7.6 The Environmental audit shall be carried out yearly and the environmental statements pertaining to the previous year shall be submitting to this State Board latest by 30th September every year.

7.7 The Board reserves the right to review and/or revoke the consent and/or make variations in the conditions, which the Board deems, fit in accordance with Section 27 of the Act.

7.8 In case of change of ownership/management the name and address of the new owners/ partners/directors/proprietor should immediately be intimated to the Board.

7.9 Industry shall have to display the relevant information with regard to hazardous waste as indicated in the Hon. Supreme order in w.p. no. 657 of 1995 dated 14th October 2003.

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

(T.C. Patel)
Unit Head

NO: PC/CCA-Kutch-836(2)/ GPCB ID-29438/ **Date:-17/10/2023**

Issued to:
M/s. Shri Dutt India Private Limited (New Name),
M/s. Unlworld Sugers Limited (Old Name),
Survey No.137, 144 to 147,149/1, 2 & 3,
Village: - Varsamedi, Tal: Anjar,
Dist: Kutch - 370 110.

इंटरनेट मानक

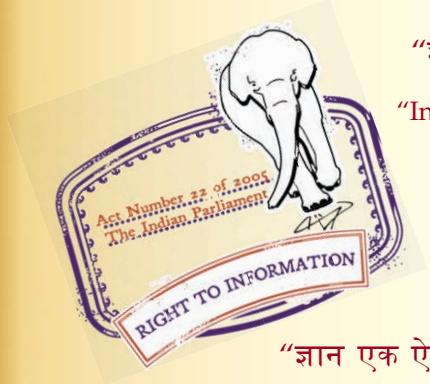
Disclosure to Promote the Right To Information

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

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 11624 (1986): Guidelines for the quality of irrigation water [FAD 17: Farm Irrigation and Drainage Systems]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS : 11624 - 1986
(Reaffirmed 2001)

Indian Standard

GUIDELINES FOR THE QUALITY OF IRRIGATION WATER

UDC 631·671·03 : 626·810 (026)

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

Gr 2

September 1987

Indian Standard

GUIDELINES FOR THE QUALITY OF IRRIGATION WATER

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(*Continued on page* 2)

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IS : 11624 - 1986

Indian Standard
GUIDELINES FOR THE QUALITY OF IRRIGATION WATER

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 27 March 1986, after the draft finalized by the Irrigation Equipment and Systems Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 The quality of irrigation water is to be evaluated in terms of degree of harmful effects on soil properties with respect to the soluble salts it contains in different concentrations and crop yield. To evaluate the quality of irrigation water, this standard has been prepared as a guideline for advisory purposes.

0.3 In the preparation of this standard, considerable assistance has been derived from the Central Soil Salinity Research Institute, Karnal and Water Technology Centre, Indian Agricultural Research Institute, New Delhi.

0.4 In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

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1. SCOPE

1.1 This standard prescribes the guidelines for assessing the quality of irrigation water.

2. TERMINOLOGY

2.1 For the purpose of this standard the definitions given in IS : 7022-1973† and IS : 11077-1984‡ shall apply.

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*Rules for rounding off numerical values (*revised*).

†Glossary of terms relating to water, sewage, industrial effluents.

‡Glossary of terms on soil and water.

3. SUITABILITY CRITERIA

3.1 The suitability of an irrigation water depends upon several factors, such as, water quality, soil type, plant characteristics, irrigation method, drainage, climate and the local conditions. The integrated effect of these factors on the suitability of irrigation water (*SI*) can be expressed by the relationship given below:

$$SI = \int QSPCD$$

where

Q = quality of irrigation water, that is, total salt concentration, relative proportion of cations, etc;

S = soil type, texture, structure, permeability, fertility, calcium carbonate content, type of clay minerals and initial level of salinity and alkalinity before irrigation;

P = salt tolerance characteristics of the crop to be grown, its variety and growth stage;

C = climate, that is, total rainfall, its distribution and evaporation characteristics; and

D = drainage conditions, depth of water table, nature of soil profile, presence of hard pan or lime concentration and management practices.

3.1.1 These factors act interactively such that a single suitable criteria is hard to be adopted for widely varying conditions. However, a general broad guideline has been developed here.

3.2 Besides these factors, the presence of potassium and nitrate ions in water, is favourable for crop growth, as water of more salinity can be used in presence of these ions. In a particular climate, all the factors enumerated in **3.1**, are likely to vary and interact either positively or negatively in relation to salt accumulation and degree of harmful effect on soil properties and crop growth.

4. WATER QUALITY CRITERIA FOR IRRIGATION

4.1 The following chemical properties shall be considered for developing water quality criteria for irrigation:

a) Total salt concentration,

b) Sodium adsorption ratio,

c) Residual sodium carbonate or bicarbonate ion concentration, and

d) Boron content.

4.1.1 *Total Salt Concentration* — It is expressed as the electrical conductivity (EC). In relation to hazardous effects of the total salt concentration, the irrigation water can be classified into four major groups as given in Table 1.

TABLE 1 WATER QUALITY RATING BASED ON THE TOTAL SALT CONCENTRATION

Sl No.	Class	Range of EC (Micromhos/cm)
(1)	(2)	(3)
i)	Low	Below 1 500
ii)	Medium	1 500-3 000
iii)	High	3 000-6 000
iv)	Very high	Above 6 000

4.1.2 *Sodium Adsorption Ratio (SAR)* — shall be calculated from the following formula:

$$SAR = \frac{Na^{+}}{\sqrt{\left(\frac{Ca^{2+}+Mg^{2+}}{2}\right)}}$$

where

SAR = sodium adsorption ratio $\sqrt{(\text{millimole/litre})}$

Na = sodium ion concentration, me/l

Ca = calcium ion concentration, me/l

Mg = magnesium ion concentration, me/l

Note — me/l = milliequivalent/litre.

In relation to the hazardous effects of sodium adsorption ratio, the irrigation water quality rating is given in Table 2.

TABLE 2 WATER QUALITY RATING BASED ON SODIUM ADSORPTION RATIO

Sl No.	Class	SAR Range $\sqrt{(\text{millimole/litre})}$
(1)	(2)	(3)
i)	Low	Below 10
ii)	Medium	10-18
iii)	High	18-26
iv)	Very high	Above 26

4.1.3 Residual sodium carbonate (RSC) shall be determined by the equation:

$$RSC = (CO_3^{2-} + HCO_3^-) - (Ca^{2+} + Mg^{2+})$$

where

RSC = residual sodium carbonate (me/l),

CO^{2-} = carbonate ion concentration (me/l),

HCO_3^- = bicarbonate ion concentration (me/l),

Ca^{2+} = calcium ion concentration (me/l), and

Mg^{2+} = magnesium ion concentration (me/l).

NOTE — me/l = milliequivalent/litre.

In relation to the hazardous effects of high bicarbonate ion concentration expressed as residual sodium carbonate, the irrigation water quality rating is given in Table 3.

TABLE 3 WATER QUALITY RATING BASED ON RESIDUAL SODIUM CARBONATE

SL NO.	CLASS	RSC RANGE (me/l)
(1)	(2)	(3)
i)	Low	Below 1·5
ii)	Medium	1·5-3·0
iii)	High	3·0-6·0
iv)	Very high	Above 6·0

4.1.4 *Boron Content* — Boron, though a nutrient, becomes toxic if present in water beyond a particular level. In relation to boron toxicity, the irrigation water quality rating is given in Table 4.

TABLE 4 WATER QUALITY RATING BASED ON BORON CONTENT

SL NO.	CLASS	BORON (ppm)
(1)	(2)	(3)
i)	Low	Below 1·0
ii)	Medium	1·0-2·0
iii)	High	2·0-4·0
iv)	Very high	Above 4·0

4.2 Though all the chemical characteristics have been classified separately, they are present in each irrigation water, and the chemical characteristics

of a particular class of water is independent of the chemical characteristics of different classes of water. For example, a water of high EC may or may not have high SAR or RSC or boron. These chemical characteristics interact with each other and cause hazardous effects on soil properties and crop growth.

5. WATER QUALITY RATING IN RELATION TO SOIL TYPE AND CROP TOLERANCE TO SALTS

5.1 Keeping in view the soil types and quality of ground water, the upper permissible limit of electrical conductivity (EC), sodium adsorption ratio (SAR), residual sodium carbonate (RSC) and boron content for the semi-tolerant and tolerant crops are given in Table 5, while tolerance of crops to salinity, sodicity and boron are given in Table 6.

TABLE 5 SUITABILITY OF IRRIGATION WATER FOR SEMI-TOLERANT AND TOLERANT CROPS IN DIFFERENT SOIL TYPES

Sl No.	Soil Textural Group	Upper Permissible Limit of							
		Salinity EC (micromhos/cm)		Sodicity SAR $\sqrt{(\text{milli mole/l})}$		Boron RSC (me/l)		B (ppm)	
		S. T.*	T.†	S.T.*	T.†	S.T.*	T.†	S.T.*	T.†
i)	*Above 30 Percent Clay* Sandy clay clay loam, silty clay loam, silty clay, clay	1 500	2 000	10	15	2	3	2	3
ii)	*20-30 Percent Clay* Sandy clay loam, loam, silty loam	4 000	6 000	15	20	3	4	2	3
iii)	*10-20 Percent Clay* Sandy loam, loam, silty loam	6 000	8 000	20	25	4	5	2	3
iv)	*Below 10 Percent Clay* Sand, loamy sand, sandy loam, silty loam, silt	8 000	10 000	25	30	5	6	1	2

NOTE — The use of waters of 4 000 micromhos/cm EC and above be confined to winter season crops only. They should not be used during the summer season. Even during emergencies not more than one or two protective irrigations be given to the Kharif season crops.

*Semi-tolerant crops.
†Tolerant crops.

5.1.1 These limits are for specific conditions where the rainfall is below 600 mm/annum, no other source of water is available, drainage and water table is not a serious limitation. Presence of nitrate in water and gypsum in soil is favourable. Similarly, sulphate : chloride and calcium : magnesium ratio above 2·0 in water is also beneficial.

TABLE 6 TOLERANCE OF FIELD AND VEGETABLE CROPS TO SALINITY, SODICITY AND BORON

(*Clause* 5.1)

Crops	Salinity		Sodicity		Boron	
	S. T.*	T.†	S.T.*	T.†	S.T.*	T.†
Wheat	X		X		X	
Barley		X	X		X	
Cotton	X		X		X	
Oil seed crops	X		X		X	
Maize	X		X		X	
Jowar	X		X		X	
Bajra	X		X		X	
Rice	X		X		X	
Sugarcane	X		X		X	
Sugar beet		X		X		X
Tomato	X		X		X	
Cauliflower	X		X			X
Cabbage	X		X			X
Onion	X		X			X
Carrot	X		X			X
Radish	X		X		X	
Grasses	X			X		X
Berseem	X		X		X	

*Semi-tolerant.
†Tolerant.

Annexure-3

IS 10500 : 2012

भारतीय मानक

पीने का पानी — विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

ICS 13.060.20

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

May 2012

Price Group 6

AMENDMENT NO. 1 JUNE 2015
TO
IS 10500 : 2012 DRINKING WATER — SPECIFICATION

(Second Revision)

[*Page* 2, *Table* 2, *Sl No.* xii), *col* 3] — Substitute '1.0' *for* '0.3'.

[*Page* 3, *Table* 3, *Sl No.* x) , *col* 4] — Substitute 'No relaxation' *for* '0.05'.

(FAD 14)

Publication Unit, BIS, New Delhi, India

FOREWORD

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

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

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

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

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

a) EU Directives relating to the quality of water intended for human consumption (80/778/EEC) and Council Directive 98/83/EC.

b) USEPA standard — National Primary Drinking Water Standard. EPA 816-F-02-013 dated July, 2002.

c) WHO Guidelines for Drinking Water Quality. 3rd Edition Vol. 1 Recommendations, 2008.

d) Manual on Water Supply and Treatment, third edition — revised and updated May 1999, Ministry of Urban Development, New Delhi.

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

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

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

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

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

Indian Standard

DRINKING WATER — SPECIFICATION

(Second Revision)

1 SCOPE

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

2 REFERENCES

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

3 TERMINOLOGY

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

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

4 REQUIREMENTS

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

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

4.1 Bacteriological Requirements

4.1.1 *Water in Distribution System*

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

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

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

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

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

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

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, *Max*	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, *Max*	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, *Max*	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, *Max*	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, *Max*	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, *Max*	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl_2), mg/l, *Max*	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, *Max*	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, *Max*	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, *Max*	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, *Min*	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, *Max*	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, *Max*	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, *Max*	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, *Max*	0.5	No relaxation	Clause **6** of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO_3), mg/l, *Max*	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, *Max*	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, *Max*	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO_4) mg/l, *Max*	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H_2S), mg/l, *Max*	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, *Max*	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as $CaCO_3$), mg/l, *Max*	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, *Max*	5	15	IS 3025 (Part 49)	—

NOTES

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

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

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

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

NOTES

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

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

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

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

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

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

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

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

Table 6 Bacteriological Quality of Drinking Water[1)]
(*Clause* 4.1.1)

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

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

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

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

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

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

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

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

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

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

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

4.3 Biological Requirements

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

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

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

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

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

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

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

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

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

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

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

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

5 SAMPLING

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

ANNEX A
(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

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

ANNEX B

(*Clause* 4.2.7)

POLYMERASE CHAIN REACTION (PCR) METHOD

B-1 GENERAL

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

B-2 CONCENTRATION OF DRINKING WATER

B-2.1 Apparatus

B-2.1.1 *Pressure Pump*

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

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

B-2.1.4 *Inter-connecting Pressure Tubes*

B-2.2 Reagents

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

B-2.2.1 *Aluminium Chloride*

B-2.2.2 *HCl/NaOH Urea (Extra Pure)*

B-2.2.3 *Disodium Hydrogen Phosphate* ($Na_2HPO_4.2H_2O$) — 0.2 M, filter sterilized.

B-2.2.4 *Sodium Dihydrogen Phosphate* ($NaH_2PO_4.2H_2O$) — 0.2 M, filter sterilized.

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

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

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

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

B-2.2.9 *McII Vaines Buffer* (*p*H *5.0*) — Mix 9.7 ml of 0.1 M citric acid with 10.3 ml of 0.2 M $Na_2HPO_4.2H_2O$ under sterile conditions.

B-2.3 Procedure

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

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

B-3 RNA EXTRACTION

B-3.1 Apparatus

B-3.1.1 *Cooling Centrifuge*

B-3.1.2 *Deep Freezer (–20°C)*

B-3.1.3 *Vortex Mixer*

B-3.1.4 *Pipette Man*

B-3.2 Reagents

B-3.2.1 *Cetyl Trimethyl Ammonium Bromide (CTAB) Buffer*

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

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

B-3.2.3 *Ethanol*

B-3.2.4 *TE Buffer (p*H *8.0)*

Tris base	:	1 M
EDTA	:	0.5 M

B-3.2.5 *Sodium Acetate* — 3 M.

B-3.3 Procedure

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

B-4 COMPLEMENTARY DNA (c DNA) SYNTHESIS

B-4.1 Apparatus

B-4.1.1 *PCR Machine*

B-4.1.2 *Deep Freezer (–20°C)*

B-4.2 Reagents

B-4.2.1 *cDNA Synthesis Kit*

B-4.3 Procedure

Suspend the extracted RNA in 20 µl of cDNA reaction mixture, which consists of 4 µl of 5X reverse transcriptase reaction buffer [250 mM TRIS–HCl (*p*H 8.5), 40 mM KCl, 150 mM $MgCl_2$, 5 mM dithiothreitol (DTT)], 0.5 µl of 10 mM deoxynucleotide phosphate (dNTP), 2 µl of hexa nucleotide mixture, 1 µl of 25 U of Maloney Murine Leukaemia Virus (M-MuLV) reverse transcriptase, 0.5 µl of 20 U of human placental RNase inhibitor. Heat the reaction mixture to 95°C for 5 min and rapidly chill on ice, this is followed by the addition of 1 µl (25 U/µl) of M-MuLV reverse transcriptase. Incubate the reaction mixture as given by the manufacturer of the kit and quickly chill the reaction tube on ice.

B-5 PCR AMPLIFICATION

B-5.1 Apparatus

B-5.1.1 *PCR Machine*

B-5.1.2 *Deep Freezer (–20°C)*

B-5.1.3 *Micropippette*

B-5.2 Reagents

B-5.2.1 *Primers for EV and HAV*

EV sense primer, 5' — TCC TCC GGC CCC TGA ATG CG — 3'

antisense primer, 5' — ATT GTC ACC ATA AGC AGC CA — 3'

HAV sense primer, 5' — GTTTT GCTCC TCTTT ATCAT GCTAT G-3'

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

B-5.2.2 *PCR Master Mix*

B-5.2.3 *Mineral Oil*

B-5.3 Procedure

B-5.3.1 *PCR Amplification for Hepatitis A Virus (HAV)*

In 5 µl of cDNA, add 95 µl of a PCR Master Mix (10 mM TRIS–HCl (*p*H 8.3), 50 mM KCl, 2.5 mM $MgCl_2$, 0.01 percent gelatin (1× PCR buffer), 200 µM of each dNTP, 1.5 U of *Thermus aquaticus* polymerase). Add 25 pico moles of sense and antisense oligonucleotide primers of HAV and overlay with mineral oil. Appropriate positive and negative controls shall be included with each run. Set the following reaction at thermo cycler:

Denaturation at 94°C for 2 min

Denaturation for	1.0 min	at 94°C	} 35 cycles
Annealing for	1.0 min	at 57°C	
Extension for	1.3 min	at 72°C	

Final extension at 72°C for 7 min.

B-5.3.2 *PCR Amplification for Enterovirus (EV)*

In 5 µl of cDNA, add 95 µl of a PCR Master Mix (10 mM TRIS–HCl (*p*H 8.3), 50 mM KCl, 2.5 mM $MgCl_2$, 0.01 percent gelatin (1X PCR buffer), 200 µM of each dNTP, 1.5 U of *Thermus aquaticus* polymerase). Add 25 pico moles of sense and antisense oligonucleotide primers of EV and overlay with mineral oil. Appropriate positive and negative controls shall be included with each run. Set the following reaction at thermo cycler:

Denaturation at 94°C for 2 min

Denaturation for	1.0 min	at 94°C	} 35 cycles
Annealing for	1.0 min	at 42°C	
Extension for	2.0 min	at 72°C	

Final extension at 72°C for 7 min.

B-6 AGAROSE GEL ELECTROPHORESIS

B-6.1 Apparatus

B-6.1.1 *Micropippette*

B-6.1.2 *Electrophoresis Apparatus*

B-6.1.3 *Gel Documentation System*

B-6.2 Reagents

B-6.2.1 *Running Buffer* — 50X TAE buffer

Tris base/Tris buffer : 121.00 g

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

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

B-6.2.2 *Tracking Dye* — 6X bromophenol blue.

B-6.2.3 *Ethidium Bromide* — 0.5 µg/ml.

B-6.3 Procedure

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

ANNEX C

(*Clause* 4.3.10)

ILLUSTRATIVE LIST OF MICROSCOPIC ORGANISMS PRESENT IN WATER

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

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

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

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Annexure-4

GUJARAT POLLUTION CONTROL BOARD

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RPAD

REIMPLEMENTATION OF DIRECTIONS UNDER SECTION 33(A) OF THE WATER (PREVENTION AND CONTROL OF POLLUTION) ACT-1974 [HEREINAFTER REFERRED TO AS THE "WATER ACT"] AS AMENDED FROM TIME TO TIME.

WHEREAS you are having an industrial plant located at Plot no. 137, 144 to 147, 149/1, 2 & 3, Vill: Varsamedi, Tal: Anjar, Dist: Kutch for the manufacturing of Final Molasses, Refined Sugar & Power Generation.

AND WHEREAS Board had granted you consolidated consents & authorization (CCA) under the provision of environmental laws vide order no. AWH-129759 dated 18/10/2023 which is valid up to 18/03/2025 for manufacture items / products mentioned there in subject to the conditions specified therein.

AND WHEREAS, earlier the Board issued Closure directions under Water Act 1974 on 25/09/2023 and subsequently revocation was issued on 16/10/2023 with trial run of three months & closure direction was re-implemented on 21/07/2024 & subsequently revocation was issued 14/08/2024 with trial run granted for three months.

AND WHEREAS, Earlier the Board had issued Notice of Direction u/s 33(A) of Water Act on 20/02/2024 & 21/06/2024 and directed to comply with the same. However, looking facts mentioned in latest inspection reports, it seems that till date, you have not complied with the same.

AND WHEREAS your industry was monitored by the Board officials on 04/09/2024 & 13/09/2024 under Section-23 of the Water Act-1974 with reference to complain. During the inspection plant was in operation & following non-compliances were observed:

1. No CCTV footage was available from 06:00 AM on 01/09/2024 to 09:08 AM on 04/09/2024.
2. A black-colored contaminated water was seen flowing between the open land for residential block of 'Khet-Bhagiyas' & boundary wall of this unit made of cement partition having pH between 7 and 8 on the pH strip & a smell of sugar-molasses.
3. Near the left side of the unit's warehouse and partition boundary wall, an open ponding about 50 feet long, 2.5 feet wide, and 2 feet deep (approximately containing 7,000 liters) filled with black-colored water smelling like sugar-molasses.
4. The contaminated water from this ponding was seen flowing outside the unit's premises through the bottom of the boundary wall.
5. Near the boundary wall, black colored wastewater spraying and black patches were observed on some areas.
6. The unit has claimed that black water has been entering this area from upstream along with the rainwater. However, upon inspection, no any black water or traces of it coming from upstream were found & the rainwater coming from upstream outside the unit and the flow of contaminated water coming from the unit's boundary wall showed significant differences in color and odor, which suggests that the contaminated water might be discharged through an underground line.

7. Black-colored water was flowing outside the unit's premises through the bottom of the boundary wall and merging with the rainwater flow from upstream, eventually flowing into the nearby Nala. Hence, the unit has violated condition number one of the revocation order dated 14/08/2024.
8. Analysis report of sample collected from blackish water flowing between residential block & units boundary wall, NALA, near Varsamedi-Modvadar road & Kacha pit within premises & AR shows results of parameter Colour- 125, 100 & 125, TDS- 3694 mg/L, 3654 mg/L & 3248 mg/L, SS- 128 mg/L, 136 mg/L & 142 mg/L, COD - 1403 mg/L, 1437 mg/L & 1387 mg/L respectively, which are higher than GPCB norms.

AND WHEREAS considering above on-site written remarks were given during inspection & directed to comply within stipulated time period. However you have submitted reply of onsite written remarks vide your letter dated 06/09/2024 & 13/09/2024. However, the same are not fully acceptable.

UNDER THE CIRCUMSTANCES, I, T.C. Patel, Unit Head of the Gujarat Pollution Control Board as directed to re-implement the closure direction under Section 33(A) of The Water (Prevention and Control of Pollution) Act-1974 as under:

1. To close down the operation of your industrial plant on the above mentioned site with 15th days effect.
2. To direct the concerned authority to stop supply of electricity & water with 15th days effect.
3. Immediately stop disposal of any kind of contaminated storm water/ wastewater outside the premises.
4. To lift / collect the contaminated storm water / wastewater within the premises as well as outside the premises and treat the same in ETP.
5. To lift / collect the wastewater from the ponding (50 feet long, 2.5 feet wide, and 2 feet deep) observed at warehouse and partition boundary wall and treat the same in ETP.
6. To remove and clear the traces of black colored wastewater observed within premises.
7. To take adequate measures to prevent contamination of rainwater and to ensure that no contaminated storm water / wastewater is disposed outside the premises.
8. To operate ETP regularly & efficiently for treatment of effluent to achieve the prescribed norms at the outlet.
9. To submit Bank Guarantee of Rs. 15 Lakhs of Nationalized Bank valid for one year duration.
10. You are liable to pay Interim Environment Damage Compensation as may be decided by the Board.

If the above directions are not complied, you are liable for prosecution under Section 41(2) of The Water (Prevention and Control of Pollution) Act-1974 which provides punishment with imprisonment for a term not less than one year and six months and may extend to six years and with fine.

GUJARAT POLLUTION CONTROL BOARD

Paryavaran Bhavan
Sector-10-A, Gandhinagar-382 010.
Phone : (079) 23226295
Fax : (079) 23232156
Website : www.gpcb. gov. in

If any person aggrieved by the aforesaid direction, you may file an appeal under section 33 B of the Water (Prevention and Control of Pollution) Act-1974 before National Green Tribunal within thirty days from the date of this order.

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

-sd-
(T. C. Patel)
Unit Head

NO: PC/CCA-KUTCH-836(3)/ GPCB ID-29438/ **Date:-**

To,

M/s. Shri Dutt India Pvt. Ltd.,
(Old name: M/s. Uniworld Sugars Limited),
Plot no. 137, 144 to 147, 149/1, 2 & 3,
Vill: Varsamedi,
Tal: Anjar, Dist: Kutch- 370 110.

Copy To:

1) **The Superintendent Engineer (SE)**
Paschim Gujarat Vij Company Limited (PGVCL),
Circle Office, Nr Bus Station
Tal-Anjar, Dist-Kutch--370110.....I am directed to request you to **disconnect the supply of electricity (except single phase) with effect from 15th days** to industrial Plant of **M/s. Shri Dutt India Pvt. Limited** at Plot no. 137, 144 to 147, 149/1,2 & 3, Vill: Varsamedi, Tal: Anjar, Dist. Kutch from date of issue of this order.

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

(T. C. Patel)
Unit Head

Annexure-5

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN, SECTOR 10-A,
GANDHINAGAR - 382010,
(T) 079-23232152

GPCB

REVOCATION ORDER OF CLOSURE ORDER ISSUED UNDER SECTION-33(A) OF THE WATER (PREVENTION AND CONTROL OF POLLUTION) ACT-1974 AS AMENDED FROM TIME TO TIME

WHEREAS you are having an industrial plant located at Plot no. 137, 144 to 147, 149/1, 2 & 3, Vill: Varsamedi, Tal: Anjar, Dist: Kutch for the manufacturing of Final Molasses, Refined Sugar & Power Generation.

AND WHEREAS Board had granted you consolidated consents & authorization (CCA) under the provision of environmental laws vide order no. AWH-129759 dated 18/10/2023 which is valid up to 18/03/2025 for manufacture items / products mentioned there in subject to the conditions specified therein.

AND WHEREAS, earlier the Board issued Closure directions under Water Act 1974 on 25/09/2023 and subsequently revocation was issued on 16/10/2023 with trial run of three months.

AND WHEREAS, the Board had re-implemented the Closure direction again under Section 33 (A) Water (Prevention and Control of Pollution) Act-1974 vide order dated 21/07/2024 and subsequently trial revocation was issued on 14/08/2024 with trial run of three months.

AND WHEREAS, the Board had re-implemented the Closure direction under Section 33 (A) Water (Prevention and Control of Pollution) Act-1974 vide order no. PC/CCA-KUTCH-836(3)/ GPCB ID-29438/822549 dated 24/09/2024 with effect of 15th days from the date of issue of the order.

AND WHEREAS, Board has forfeited Bank Guarantee of Rs. 7,50,000 valid up to 21/07/2025 to violation of Environment Act/Lows.

AND WHEREAS, you have requested for revocation vide your letter dated 01/10/24 along with compliance report with respect to compliance of closure directions with supporting documents.

AND WHEREAS, you have submitted Bank Guarantee of Rs. 15,00,000 valid up to 24/09/2025 to assure compliance of Environment Act.

AND WHEREAS, subsequently based on your submission, your industry was monitored by Board officers on 13/11/2024 under the Water Act, 1974. During inspection observed that;

1. Unit is observed not in operation and no production activity is observed.
2. No contaminated storm water/wastewater disposal outside the factory premises is observed.
3. As per verification of ETP logbook record, industry has lifted @ 8.5 KL wastewater from ponding to ETP for the treatment.
4. Storm water drain observed found dry.
5. No wastewater ponding observed at warehouse and cement partition boundary wall area within the unit. As per verification of ETP logbook record, they have lifted @ 8.5 KL wastewater from ponding to ETP for the treatment.

6. Unit has removed and cleared the traces of black-coloured wastewater within premises. During inspection, no black-coloured wastewater traces is observed nearby cement partition boundary wall area.
7. Unit has newly installed tube settler, Multi Grade Filter, Activated carbon filter, UF, UF permeate water tank, RO filtration unit (2 stage), RO permeate water tank, RDRO filtration system, Reject water tank.
8. Unit has done nomenclature of each treatment unit of ETP. In ETP, protein scrum is not found in PST & buffer tank, secondary clarifier is found in operative condition, biomass observed developed in aeration tank, septic condition not found in aeration tank, Biogas generated from UASB reactor is being flared in atmosphere through flare stack, bypass line provided for bypassing of biogas has been removed, fix pipeline for transferring the treated effluent from ETP tertiary plant feed tank to RO,
9. Unit has removed treated w/w discharge line from ETP tertiary plant feed tank to plantation/gardening area. Line for tanker loading from MEE conc. w/w holding tank has been removed.

AND WHEREAS, unit has obtained CTE-amendment for upgradation of ETP with change of disposal mode for treated effluent on open land for plantation/gardening to ZLD & change in industrial water consumption & wastewater generation.

AND WHEREAS, unit has submitted to commission the ATFD system with documentary evidence.

AND WHEREAS, you have paid interim Environment Compensation of Rs. 19,20,000/- to the Board on 16/11/2024.

Under the circumstances, I, **T. C. Patel, Unit Head,** Gujarat Pollution Control Board **revoke the closure direction for three months from the date of issue of order** with following conditions:

1. Industry shall strictly adhere to ZLD & in no case effluent shall be disposed off outside the premises.
2. Industry shall operate ETP regularly & efficiently for treatment of effluent & maintain its record.
3. Unit shall abide with orders/directions issued by Hon'ble NGT in the matter of O.A. no. 839/2024.

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

Sd/-

(T. C. Patel)
Unit Head

NO: PC/CCA-KUTCH-836(4)/ GPCB ID-29438/ **Date:- /11/2024**

ISSUED TO:
M/s. Shri Dutt India Pvt. Ltd.,
(Old name: M/s. Uniworld Sugars Limited),
Plot no. 137, 144 to 147, 149/1, 2 & 3,
Vill: Varsamedi,
Tal: Anjar, Dist: Kutch- 370 110.

GPCB

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN, SECTOR 10-A,
GANDHINAGAR - 382010,
(T) 079-23232152

Copy To:

1) The superintendent Engineer (SE)
Paschim Gujarat Vij Company Limited (PGVCL),
Circle Office, Nr Bus Station,
Ta – Anjar, Dist – Kutch – 370110.....You are requested to continue supply of electricity for **three months** from date of issue of this order to industrial plant of **M/s. Shri Dutt India Pvt. Limited** at Plot no. 137, 144 to 147, 149/1,2 & 3, Vill: Varsamedi, Tal: Anjar, Dist. Kutch and intimate to us accordingly.

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

(T. C. Patel)
Unit Head

Annexure-6

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार)
(MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, GOVT. OF INDIA)

MOST URGENT/Hon'ble NGT MATTER

By Email/Speed Post

CM-13011/3/2024-LAW-RD-VADODARA-RD (Vadodara)/I/12626/2024/574 December 26, 2024

To
The Member Secretary,
Gujarat Pollution Control Board (GPCB)
Paryavaran Bhavan,
Sector 10/A, Gandhinagar, Gujarat

Subject: **Action taken against M/s Shri Dutt India Pvt. Ltd., Village Varsamedi, Taluka Anjar District Kutch with reference to the noncompliance observed during the joint committee visit on 08.10.2024. reg.**

Ref: (i) Hon'ble NGT order dated 02.09.2024 in OA No. 839 of 2024 ((Vishnu A. Mori Versus State of Gujarat).
(ii) Joint Committee visit in compliance of Hon'ble NGT order dated 02.09.2024.

Sir,

With reference to the subject cited above, in compliance of Hon'ble NGT order dated 02.09.2024 in a Suo-moto matter O.A. No. 839 of 2024 (Vishnu A. Mori Versus State of Gujarat), related to the unauthorised discharge of wastewater by M/s Shri Dutt India Pvt. Ltd., a joint committee comprising of District Magistrate/Collector, Kutch, Gujarat Pollution Control Board (GPCB) and Central Pollution Control Board (CPCB) visited the site on 08.10.2024.

The Joint Committee concluded that the unit was found to be in gross violation of norms prescribed for treated wastewater. Further, the unit failed to provide and maintain suitable mechanism for complete water budget by the way of provision of flow meters and maintenance of their logbooks at critical water, wastewater and treated wastewater streams. It was also found that concentration of certain parameters in the soil of area under question are more than the sample of reference location. Therefore, impact of application of treated/partially treated /untreated waste water in past cannot be ruled out. The Committee has reviewed the actions taken by GPCB against the unit such as issuance of closure direction, levy of interim environmental damage compensation, bank guarantee etc. but opined for following remedial actions to be taken by the unit:

- Submit the detailed time bound action plan to upgrade the ETP so that treated effluent can meet the discharge norms as prescribed in CC&A.
- Segregate the stream of wastewater of high COD and high TDS from general wastewater stream to give specific treatment process for different streams.
- Install flow measurement devices at strategic locations of wastewater generation like waste water streams generated from the process and at inlet of ETP and final out let of ETP to assess

P.T.O.

the exact quantity of waste water generated, treated and disposed and maintain the record in logbook for the same.

- Maintain the record of operation of MEE in logbook and explore the mechanism for treatment of MEE concentrate generated during the operation of MEE.
- Dispose the ETP sludge stored in the ETP premises scientifically.
- Provision of adequate land area to cater the requirement of discharge of treated effluent for gardening/ plantation purpose as prescribed in CC&A.
- Install piezo wells as per water gradient in the area for assessing the ground water quality as the unit is permitted to discharge the treated effluent on land after providing required treatment as prescribed in CC&A.

The joint Committee also opined that a study for assessing the impact of discharge of treated industrial wastewater on land considering saline zone impact on the quality of ground water and soil may be carried out in time bound manner by institute of repute (IOR). Accordingly, condition of discharge of treated wastewater on land considering the land availability, impact on ground water quality and adequacy of ETP may also be relooked by GPCB in CC&A.

With respect to the above suggested remedial actions/measures, it is required to immediately submit the point wise status of further actions taken and due to be taken by GPCB. So that the same can be appraised to Hon'ble NGT with submission of report of the Joint Committee.

The matter is listed for hearing on **07.01.2025**. This may be treated as **Most Urgent**.

Yours faithfully,

Enc: As above

(Prasoon Gargava)
Regional Director

Copy to:
The Regional Officer
Gujarat Pollution Control Board, Kutch East
Room No. 215-216-217,
Deendayal Port Authority Administrative Building,
Sector 8, Gandhidham-370205, Kutch-Gujarat.

(Prasoon Gargava)

Annexure-7

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN, SECTOR 10-A,
GANDHINAGAR - 382010,
(T) 079-23232152

R.P.A.D

No. GPCB/CCA-Kutch-836(5)/ID-29438/ 850112 / Dt. 1 JAN 2025

To,

The Regional Director

Central Pollution Control Board,

'Parivesh Bhavan, Near Ward Office No. 10,

Subhanpura, Vadodara – 390 023

Sub. Action taken against M/s Shri Dutt India Pvt. Ltd., Village Varsamedi, Tal. Anjar, Dist. Kutch with reference to the non-compliance observed during the Joint Committee visit on 08.10.2024, reg.

Ref: Your letter no. CM-13011/3/2024/LAW-RD-VADODARA-RD(Vadodara)/I/12626/2024/574 dated 26/12/2024

Respected Sir,

With reference to above, it may kindly be noted that after the Joint Committee visit on 08/10/2024, M/s Shri Dutt India Pvt. Ltd. obtained CTE Amendment order no. 138199 on 11/11/2024, which is valid up to 24/10/2031, for changes in industrial water consumption & wastewater generation, for up gradation of ETP with change of disposal mode for treated effluent from open land for plantation/gardening to ZLD (Annexure-1). Subsequently, the industry has applied for CCA-amendment for the same on 04/11/2024, which is presently under process with the Board.

It may also be kindly noted that the impugned industry has been inspected by Board officials on 13/11/2024 and 16/12/2024. Copies of the Inspection Reports dated 13/11/2024 & 16/12/2024 are enclosed herewith as Annexure-2 & Annexure-3 respectively. Compliance status of the remedial actions opined by the Joint Committee, based on Board's Inspection Reports dated 13/11/2024 & 16/12/2024 is tabulated hereunder:

Sr. No.	Points of Joint committee	Actions Taken by the Industry / Compliance Status as per the IR dated 13/11/2024 & 16/12/2024
1	Submit the detailed time bound action plan to upgrade the ETP so that treated effluent can meet the discharge norms as prescribed in CC&A.	Industry has now upgraded ETP to achieve ZLD. ETP is consisting of Screen Chamber, Equalization Tank, Flash Mixer, Primary Clarifier with Tube dek/Settler, Buffer Tank, UASB (Upflow Anaerobic Sludge Blanket) Reactor, Aeration Tank, Secondary Clarifier, Sludge Drying Bed, HRSCC (High Rate Solids Contact Clarifier), MGF (Multi Grade Filter), ACF (Activated Carbon Filter), Tertiary Treated Water Tank, UF (Ultra Filtration Unit), UF Permeate Water Tank, RO (Reverse Osmosis) Filtration Unit (2 stage), RO Permeate Water Tank, RDRO (Round Disc Reverse Osmosis) Filtration System, Reject Water Tank, MEE (Multi Effect Evaporator) followed by ATFD (Agitated Thin Film Dryer). During inspection on 16/12/2024, provided all the treatment units with MEE & ATFD were observed in operation. During the inspection, contaminated storm water/wastewater disposal was not observed within & outside the factory premises. During inspection, storm water drain was observed in completely dry condition. Now the industry has converted to ZLD and stopped utilization of treated wastewater in plantation / gardening.
2	Segregate the stream of wastewater of high COD and high TDS from general wastewater stream to give specific treatment process for different stream.	According to the CTE Amendment order no. 138199 dated 11.11.2024, out of total 122 KLD of industrial wastewater: • 80 KLD will be subjected to ETP, followed by two stage RO, RDRO, MEE & ATFD. • Remaining 42 KLD including reject from RO & wash recovery system will be directly subjected to RDRO system which will be treated along with effluent from ETP. • 120.8 KLD of RO permeate & MEE condensate will be reused back in process. • Reject from MEE shall be subjected to ATFD, to achieve ZLD. During inspection on 16/12/2024, it was observed that the industry has provided separate collection & recycle

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN, SECTOR 10-A,
GANDHINAGAR - 382010,
(T) 079-23232152

Sr. No.	Points of Joint committee	Actions Taken by the Industry / Compliance Status as per the IR dated 13/11/2024 & 16/12/2024
		system for the cooling tower blowdown water. Wastewater generated from the DM Utility Reject / Boiler Blowdown / Washing Wastewater / Refinery wastewater are treated into the ETP (P+S+T) followed by ZLD. Unit is reusing RO permeate, RDRO permeate, MEE condensate and ATFD condensate into the process.
3	Instali flow measurement devices at strategic location of wastewater generation like waste water stream generated form the process and it inlet of ETP and Final out let ETP to assess the exact quantity of waste water generated, treated and disposed and maintain the record in logbook for the same.	During inspection on 16/12/2024, it was observed that the unit has provided flowmeters at ETP inlet, outlet, RO feeding line & outlet line, RDRO feeding line, ATFD feeding line & unit is maintaining logbook of the same. Unit has not provided flow meter to RDRO reject to MEE feeding, hence unit was instructed during the inspection to provide the same. Subsequently, industry has replied vide their letter dated 20/12/2024 that they have installed the flow meter at the RDRO reject to MEE feed tank along with the photograph of the same. Copy of industry's reply letter dated 20/12/2024 is attached herewith as Annexure-4.
4	Maintain the record of operation of MEE in logbook and explore the mechanism for treatment of MEE concentrate generated during the operation of MEE.	During inspection on 16/12/2024, it was observed that the unit is maintaining the logbook for ETP inlet, outlet, RO feeding line & outlet line, RDRO feeding line, ATFD feeding line. The unit is maintaining the logbook of the MEE operation with operating hours; however, the unit has not provided flow meter to the RDRO Reject to MEE feeding line. Industry has provided ATFD (Cap: 7.3 KLD) for treatment of MEE concentrate. Subsequently, industry has replied vide their letter dated 20/12/2024 that they have installed the flow meter at the RDRO reject to MEE feed tank along with the photograph of the same. Copy of industry's reply letter dated 20/12/2024 is attached herewith as Annexure-4
5	Dispose the ETP sludge stored in the ETP premises scientifically.	During inspection on 16/12/2024, it was observed that the unit has stored ETP sludge approx.70 MT into the hazardous waste storage room. Industry has obtained provisional memberships of integrated common hazardous waste facilities of (1) M/s. Safe Enviro Pvt. Ltd. (SEPL), Vill. Magnad, Tal. Jambusar, Dist.

Sr. No.	Points of Joint committee	Actions Taken by the Industry / Compliance Status as per the IR dated 13/11/2024 & 16/12/2024
		Bharuch, and (2) Saurashtra Enviro Projects Pvt. Ltd. (SEPPL), Vill. Juna Katariya, Tal. Bhachau, Dist. Kutch. ETP sludge will be disposed at common TSDFs after receipt of final membership certificates by the industry. Copies of the provisional membership certificates industry's reply letter dated 20/12/2024 is attached herewith as Annexure-5.
6	Provision of adequate land area to cater the requirement of discharge of treated effluent for gardening / plantation purpose as prescribe in CC&A.	Now that the industry has converted to ZLD and stopped utilization of treated wastewater in plantation / gardening, provision of adequate land for the same is out of question now.
7	Install piezo wells as per water gradient in the area of assessing the ground water quality as the unit is permitted to discharge the treated effluent on land after providing required treatment as prescribed in CC&A.	During inspection of the industry on 13/11/2024, it was observed that the industry had lifted @ 8.5 KL wastewater from ponding and transferred to ETP for treatment. Unit has removed and cleared the traces of black-colored wastewater observed earlier within the premises. Now the industry has converted to ZLD and stopped utilization of treated wastewater in plantation / gardening. However, in view of on-land disposal of effluent in past, Board will collect and analyze ground water and soil samples from the strategic locations and necessary directions will be issued to the industry if contamination is found.

We hope the above information is in line with your requirements. Should you require any further information, kindly let us know.

This letter is issued after obtaining approval of competent authority.

Thanking you,

Yours sincerely,

(T. C. Patel)
Unit Head – Kutch (East)

Encl: As above.

Annexure-8

GUJARAT POLLUTION CONTROL BOARD

Paryavaran Bhavan
Sector-10-A, Gandhinagar-382 010.
Phone : (079) 23226295
Fax : (079) 23232156
Website : www.gpcb. gov. in

"Consent to Establish-Amendment"
(CTE- 138199)

BY R.P.A.D.
Date:- /11/2024

NO: PC/CCA-Kutch-836(4)/ GPCB ID-29438/

To,
M/s. Shri Dutt India Private Limited,
(Old name: Uniworld Sugars Limited),
Survey no. 137,144 to 147, 149/1, 2 & 3,
Vill: Varsamedi,
Tal: Anjar, Dist: Kutch - 370 110.

Sub: Consent to Establish (NOC)-Amendment under Section 25 of Water Act 1974 and Section 21 of Air Act 1981
Ref: Your application for CTE-Amendment **Inward no. 322145 received** dated **25/10/2024.**

Without prejudice to the powers of this Board under the Water (Prevention and Control of Pollution) Act-1974, the Air Act-1981 and the Environment (Protection) Act-1986 and without reducing your responsibilities under the said Acts in any way, this is to inform you that this Board grants **Consent to Establish CTE-Amendment for change in mode of disposal of industrial effluent** in existing plant located at Survey no. 137,144 to 147/1,2 & 3, Vill: Varsamedi, Tal: Anjar, Dist: Kutch.

SUBJECT TO THE FOLLOWING CONDITIONS:

1. The validity of this order will be up to 24/10/2031.
2. There shall be no change in existing products and its capacity, raw material consumption, water consumption & waste water generation, fuel consumption, flue gases and process gases emission and Hazardous waste generation, due to CTE- amendment.

3. **CONDITIONS UNDER WATER ACT 1974:**
   3.1 Water Source: - GWIL.
   3.2 The quantity of total water consumption for industrial purpose shall be increased from 780 KL/Day to 932.8 KL/Day, due to CTE-Amendment [Fresh: 590 KL/Day + Reuse: 342.8 KL/Day (164 KL/Day Permeate from wash Recovery RO System + 58 KL/Day Permeate from BRS plant + 120.8 KL/Day RO Permeate & MEE condensate from ETP)].
   3.3 The quantity of industrial wastewater to be treated in the ETP shall be decreased from 150 KLD to 122 KLD, due to CTE-Amendment.
   3.4 Out of total industrial effluent 122 KLD, about 80 KLD shall be subjected to ETP, followed by two stage RO, RDRO, MEE & ATFD. Remaining 42 KLD including reject from RO & wash recovery system shall be directly subjected to RDRO system. RO permeate & MEE condensate (120.8 KLD) shall be reused back in process. Reject from MEE shall be subjected to ATFD, to achieve Zero Liquid Discharge.

3.5 There shall be no change in existing quantity of domestic water consumption (10 KL/Day) and domestic waste water (sewage) (10 KL/Day), due to CTE Amendment.

3.6 Domestic effluent shall be disposed off through septic tank/soak pit system.

3.7 Disposal system for storm water shall be provided separately, in no circumstances storm water shall be mixed with the industrial effluent in any case

4. CONDITIONS UNDER HAZARDOUS WASTE:

4.1 The applicant shall have to comply with provisions of Hazardous and other Waste (Management and Trans Boundary Movement) Rules 2016.

4.2 The applicant shall obtain membership of common TSDF site for disposal of Hazardous waste as categorized in Hazardous and other Waste (Management and Trans Boundary Movement) Rules 2016.

4.3 The applicant shall obtain membership of common Hazardous Waste incinerator for disposal of incinerable waste.

4.4 The applicant shall provide temporary storage facilities for each type of Hazardous Waste as per Hazardous and other Waste (Management and Trans Boundary Movement) Rules 2016.

4.5 The applicant shall obtain registration/authorization for recycling/reprocessing any hazardous waste before procuring material/starting production as per HW Rules 2016.

4.6 The applicant shall obtain authorization for recovery/reuses of any hazardous waste material as per HW Rules 2016.

5. GENERAL CONDITIONS

5.1 Adequate plantation shall be carried out all along the periphery of the industrial premises in such a way that the density of plantation is at least 1000 trees per acre of land and a green belt of 03 meters' width is developed.

5.2 The applicant shall have to submit the returns in prescribed form regarding water consumption and shall have to make payment of water cess to the Board under the Water Cess Act- 1977.

5.3 In case of change of ownership/management the name and address of the new owners /partners/ directors/ proprietor should immediately be intimated to the Board.

5.4 The applicant shall however, not without the prior consent of the Board bring into use any new or altered outlet for the discharge of effluent or gaseous emission or sewage waste from the proposed industrial plant. The applicant is required to make applications to this Board for this purpose in the prescribed forms under the provisions of the Water Act-1974, the Air Act-1981 and the Environment (Protection) Act-1986.

5.5 The concentration of Noise in ambient air within the premises of industrial unit shall not exceed following levels:

Between 6 A.M. and 10 P.M.: 75 dB (A)
Between 10 P.M. and 6 A.M.: 70 dB (A)

GUJARAT POLLUTION CONTROL BOARD
Paryavaran Bhavan
Sector-10-A, Gandhinagar-382 010.
Phone : (079) 23226295
Fax : (079) 23232156
Website : www.gpcb. gov. in

5.6 Applicant is required to comply with the manufacturing, Storage and Import of Hazardous Chemicals Rules-1989 framed under the Environment (Protection) Act-1986.

5.7 If it is established by any competent authority that the damage is caused due to their industrial activities to any person or his property .in that case, they are obliged to pay the compensation as determined by the competent authority.

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

(T.C. Patel)
Unit Head