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To,

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Deutsche Gesellschaft für Internationale

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**Natubhai Patel**  
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**Pathik S. Patwari**  
Hon. Secretary

**V. P. Vaishnav**  
Hon. Secretary (R)

**Sachin K. Patel**  
Hon. Treasurer

**Sub:** Viability of concept of Zero Liquid Discharge (ZLD) to Chemical units as Individual Treatment as well as Common Effluent Treatment Plant-Gujarat Scenario

**Ref:** Video Conference held by GIZ (IGEP) Indo-German Environment on 19.11.2020

Respected Sir,

As you are aware, GIZ (IGEP) Indo-German Environment Partnership is actively involved in framing Guidelines, Standards and Legal provisions for Reuse, Recycle and Zero Liquid Discharge (ZLD) for Industries Associations and private sector. It may be noticed that there is limitation of the ZLD concept as it is always associated with various other environmental issue as well as frequent operational and maintenance issues.

ZLD may be one of the optional tools to encourage water conservation and may be a component in cleaner production techniques for which Govt. should provide some incentives to drive the people voluntarily, if viable and should not be made as compulsion. It should be first implemented in all Municipal corporations / Municipalities for sewage management.

The Gujarat Chamber of Commerce and Industries (GCCCI) on behalf of their member associations strongly believe that the concept of ZLD is neither environment friendly nor ultimate solution for the wastewater treatment. A brief note in this regard is attached herewith for your kind consideration and further necessary actions, please.

Thanking you,

Yours faithfully,

  
Natubhai Patel  
President



Copy to:

1. Mr Sundeep (Scientist F – MoEF&CC)  
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: This is for your kind consideration and further necessary action please.
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4. Mr. Chirag Bhimani - (BAT Project Team)  
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: For information please.

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**Note:-**

**Subject: Viability of concept of Zero Liquid Discharge (ZLD) to Chemical units as Individual Treatment as well as Common Effluent Treatment Plant- Gujarat Scenario**

**Ref: Video Conference held by GIZ (IGEP) Indo-German Environment on 19.11.2020**

GIZ (IGEP) Indo-German Environment Partnership is framing Guideline, Standards and Legal provisions for Reuse, Recycle and Zero Liquid Discharge (ZLD) for Industries Associations and private sector. It may be noticed that there is limitation of the ZLD concept as it is always associated with various other environmental issue as well as frequent operational and maintenance issues.

**1. Background**

The presentation made and the conclusions drawn were based on limited study/data related to homogeneous effluent CETPs such as textile and/or leather sectors in Tamilnadu. It cannot be representative study of the country as there are a lot of CETPs in western region for heterogeneous and chemical industries. Therefore, observations or conclusions of the study should not be over-imposed as a whole to all the CETPs and industrial sectors.

The objective or need of the study was reported as industries are not able to meet the discharge norms and therefore ZLD is recommended. It is surprised if someone cannot achieve COD of 250 mg/l how he can meet better quality required for reuse or recycle to achieve ZLD. In the name of ZLD reuse in cooling tower will add VOCs into atmosphere in chemical units or illegal discharge here or there.

**2. Prevailing practice for treatment of liquid stream in Gujarat**

The industrial growth is generally associated with consumption of raw water and generation of either industrial wastewater or domestic wastewater or both. Chemical units like Pesticides and its intermediates, pharmaceuticals and its intermediate, Dyes and Dyes Intermediate, Basic Organic chemical, Textile sector and In-organic Chemicals etc. are generating industrial wastewater.

All chemical and non-chemical categories of industries generating sewage or trade effluent is under the preview of Water act-1974 and EPA-1986. Accordingly, units are granted consent to operate which specifies the applicable conditions w.r.t production capacity, wastewater generation, discharge norms, treatment scheme, discharge point and other related conditions.

Most of units have primary/secondary ETP for treatment of wastewater to achieve discharge norms. In case of Gujarat, almost all chemical units are located in Notified Area and are members of CETP. In fact, units are granted permission only if it is member of CETP in respective area if individual respective member is not able to achieve inlet norms of CETP, it has to identify concentrated streams, segregate it and have to manage for separate treatment either on their own or have to

become member for common facilities like common incinerator, spray dryer, MEE etc. depending upon of nature of effluent.

### **3. Present mode of effluent disposal in Gujarat**

Generally, industries are discharging treated wastewater as per CTO granted which may be as below:

- i. Individual discharge on land for plantation, in case of land-lock area and CETP is not available.
- ii. Discharge into CETP wherever it is available.
- iii. Individual direct discharge (majorly large scale units) into estuary or deep sea.
- iv. Zero liquid discharge in case of land-lock area.
- v. ZLD as a special condition depending upon the nature of effluent.

In most of the cases, ultimate discharge of CETP is either leading to estuary or deep-sea.

### **4. How the Concept of ZLD Emerged in Gujarat!!**

In early 90's, industries were treating wastewater in their own way and discharging the same wherever disposal was available either in natural drain, river, on-land, estuary or sea discharge. But due to various environmental issues and involvement of Judiciaries the concept of CETP emerged. But again, due to cocktail type of effluent, non-availability of viable technology and under-capacities of CETP and many other reasons; most of the CETPs in the country were not achieving the desired norms. The main drawback was non-biodegradable effluent, refractory COD, high organic load both in terms of quantity and quality.

To overcome this, GPCB forced the CETP authorities and its members to segregate concentrated streams of effluent adapting the concept of ZLD. The ZLD concept was also applied in case of land-locked area where there was no disposal available and stagnant wastewater was observed creating the contamination of the underground strata.

In year 2007-2008, CPCB issued a direction under section 18(1) b of Water Act to all CETPs of the country that if CETP is not achieving the norms and no spare capacity is available, no new industries/expansion of existing industries were allowed having wastewater generation/ discharge.

Also, some areas were declared as Critically Polluted Area in year 2010 and moratorium was imposed for new industries or expansion in the existing industries.

Due to the stringent actions, the industrial development was badly affected causing other employment issues and loss of revenue. In Gujarat, the expansion of existing industries as well as new industries was stopped in area like Ahmedabad, (Vatva, Naroda, Narol) Ankleshwar cluster, Vapi, Vadodara (Nandesari) etc. Due to this, some monopoly products were shifted to other states in many categories of products.

To overcome this issue, the concept of ZLD was applied to all industrial effluent streams (Dilute as well as Concentrated) and many industries were permitted with ZLD, even though CETP was

available with proper discharge facilities. The project proponents were not having any other options and accepted ZLD without going into the viability of the project.

Meanwhile, during operation of ZLD scheme, many industries faced lot of technical and operational issues, very high costing compared to local/global market where ZLD was not applicable. Also, irregularities in terms of illegal discharge were observed by GPCB.

### **5. Threat against ZLD**

It is learnt that in the name of NGT, authorities are insisting for total ZLD for both the concentrated as well as dilute streams which is not advisable at all. It was realized that the concept of ZLD is non-sustainable, non-viable and non-feasible solution w.r.t following:

- It is always associated with environmental issues like generation of hazardous wastes, air pollution, (Greenhouse gases) O&M issues and high treatment costs which finally impacts on cost of finished product in the market.
- Stipulating/forcing ZLD is not advisable wherever common facilities (CETP) along with ultimate discharge into estuary/sea are available. In fact, this will lead to a lot of national loss of resources.
- However, ZLD may be an option where there is no CETP and/or land locked area.

To achieve ZLD, Incinerator, Spray dryer, Multiple Effect Evaporator plant with Reverse Osmosis etc. is required which has following issues:

- High Energy Requirement (Steam) which needs huge amount of coal/natural gas resulting into air emission.
- Depletion of natural resources like coal/natural gas due to its consumption.
- Huge amount of hazardous solid waste generation which is disposed to TSDF which results into leachate generation, which is again required and difficult to treat in ETP which is endless cycle.
- Transportation of hazardous waste will require fuel which will again contribute to air emission.
- Limitations to reuse/recycle treated wastewater in boilers, cooling tower as well as process.
- The TSDF facilities available are inadequate in the state and public are not allowing new sites for TSDF.

### **6. Costing Aspect**

The cost for Environment Management System, specifically wastewater treatment is considered as one of the most important factors for viability of the project.

Following are the costing aspects for ZLD and CETP:

- a) Cost with ZLD- Rs 2000 or more per m<sup>3</sup>
- b) Cost with CETP- Rs 100 to Rs. 150 per m<sup>3</sup>

## 7. Proposal

We strongly believe that the concept of ZLD is neither environment friendly nor ultimate solution for the wastewater treatment. Following points may be considered for this purpose:

- In Gujarat, the concept of ZLD is already in place in case wherever ZLD is required for treatment of concentrated stream. It is already having a legal background in terms of Environmental clearance and CTE/CC&A under environment laws.
- Specifying absolute adoption of ZLD with quantification has no technical background.
- Wherever (CETP) along with ultimate discharge leading to estuary/sea is available, ZLD should not be insisted.
- In case, wherever CETP is in place, the individual units are stipulated inlet norms, which may be more than 1000 of COD to 11000 of COD. To specify any quantity for recycle/ Re-use of such quality of waste water will never be viable.
- ZLD concept will raise issue of survival of CETP.
- Concentrated stream not achieving the inlet norms of respective CETPs may be sent to authorized common facilities wherever available for further treatment and disposal.
- ZLD may be insisted where there is landlocked area and proper disposal facility is not available.
- Certain stream with very high COD or very high TDS or non-biodegradable may be treated by Advance wastewater treatment, and may be insisted for ZLD as last option.
- Concentrated high calorific value stream should be sent for pre-processing/co-processing facilities as per criteria.
- However, if project proponent proposes ZLD for its own interest (It may be viable or recovering useful by-products or condensate or water) ZLD may be allowed with condition to manage for the Hazardous waste and Air pollution, if any.
- Even stipulating ZLD for any specific sector is not advisable as various products under same sector have different nature of effluent. Hence no specific sector should be imposed for ZLD and it should be based on case to case basis.
- It may be noticed that the concept of 4R's is well adopted by the industries in Gujarat due to prevailing water scarcities. Imposing un-realistic norms will lead to other environmental issues/ illegal discharge.
- The Gov. of Gujarat has taken a big initiative to curb the water pollution from industries in the state situated in chemical industrial estates of Ahmedabad, Vadodara, Bharuch, Ankleshwar, Surat and Vapi by constructing a pipeline to convey the treated effluent safely and finally into the sea at a point identified by the NIO, the budget allocation is already done and this project will start soon. All the industries are contributing financially in this project. Going for ZLD will be fatal; both for this Govt. project as well as industries and CETPs.
- ZLD is required where there is a scarcity of water, the wastewater volume is less and no safe disposal facility is available.
- Subjecting treatable the industrial effluent to ZLD will be very costly and there will be a big problem of disposal of huge quantities of salts. The salt disposal to TSDF sites will occupy a huge space and the life of the site will be shortened.

- No demand of salts for use due to its heterogeneous generated from a CETP or from a chemical industry
- There are no adequate numbers of TSDF sites in the state of Gujarat, many industries are required to send their hazardous waste at Kutch which is costly due to the distance. Transportation is causing air pollution. Further many problems are encountered by project proponents to set up new TSDF sites in the state.
- The ZLD system needs skilled managers and workers to run the system which increases the cost of production in the industrial sector and it becomes economically unviable to compete in national and international markets.
- The ZLD system consumes huge power and thus increases the cost of production and air pollution.
- The membrane in the ZLD system is required to be replaced frequently and this again increases production cost this will lead to the non-survival of the industry.
- We appreciate the concept of Recycle & Reuse of treated domestic waste water of corporation and municipalities for industrial purpose and extend over co-operation for the same.
- We request GIZ to identify the appropriate viable advance waste water treatment scheme for high COD/ TDS and refractory COD instead of working for ZLD.
- There is no need of any legislation for ZLD as it is already dealt by authorities on case to case basis.

## **8. Conclusion**

ZLD may be one of the optional tools to encourage water conservation and may be a component in cleaner production techniques for which Govt. should provide some incentives to drive the people voluntarily, if viable and should not be made as compulsion.

It should be first implemented in all corporations for sewage management.

