BEFORE THE NATIONAL GREEN TRIBUNAL (SOUTHERN ZONE) CHENNAI
O.A. NO. 64 OF 2020

IN THE MATTER OF:

V. Rajesh …APPLICANT

VERSUS

Union of India & Others …RESPONDENTS

JOINT COMMITTEE REPORT FILED WITH REGARD TO HON'BLE TRIBUNAL ORDER DATED JANUARY 21, 2021

I, H. D. Varalaxmi, D/o Sh. H.S. Devaiah, Hindu, aged about 51 years and having office at the Regional Directorate – Chennai, Central Pollution Control Board, 2nd Floor, 77-A, Ambattur Industrial Estate, Chennai – 600 058, do hereby solemnly affirm and sincerely state as follows:

2. That I am presently working as Scientist 'E' & Regional Director, Regional Directorate - Chennai, Central Pollution Control Board (hereafter called as CPCB) have been authorized to file the joint committee report. I am fully conversant with the facts of the case and hence, competent and authorized to depose and swear the present as under:

3. That the Hon'ble National Green Tribunal, Southern Zone Bench, Chennai vide order dated 21.01.2021 has directed the joint committee to identify the sources of ground water pollution and suggest the remedial measures. The report of the joint committee detailing the discussions and suggestions is enclosed as Annexure.

H.D. Varalaxmi

DEPONENT

H.D. VARALAXMI, M.Tech
Regional Director
CENTRAL POLLUTION CONTROL BOARD
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Ambattur Industrial Estate, Chennai - 600 058

VERIFICATION

It is verified that the content of this report is based on the observations of the joint committee and nothing has been concealed therein.

Signed and verified on this 01st day of February, 2021 at Chennai

H.D. Varalaxmi

DEPONENT

H.D. VARALAXMI, M.Tech
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COUNSEL FOR CPCB

Inspection Report of the Joint Committee
(As per Hon'bleNational Green Tribunal, Southern Zone, Chennai Order dated 21.01.2021 inOA no. 64/2020)

1. Background

The Honourable National Green Tribunal, Southern Zone, Chennai, in the matter of OA no. 64 of 2020 stated and directed the committee on 21.01.2021 as;

"……It is seen from the report that steps will have to be taken to remove the waste management facility from this area to some other safer place as it is likely to affect the Kosasthalaiyar River basin. Further, it is seen from the report that the TDS Level is high in the water collected from the bore wells and TDS, Chlorides and hardness are not in conformity with the standard provided and it is not fit for drinking purpose. If that be the case, the committee is expected to identify the source of the pollution and give remedial measures as to how this can be rectified……"

"……we direct the committee to submit a further action taken report with remedial measures to be taken for restoring the water quality to make it to potable level……"

2. Committee Meeting

A joint committee meeting was conducted on 12.02.2021 and the matter was briefly discussed. The following officials were present;

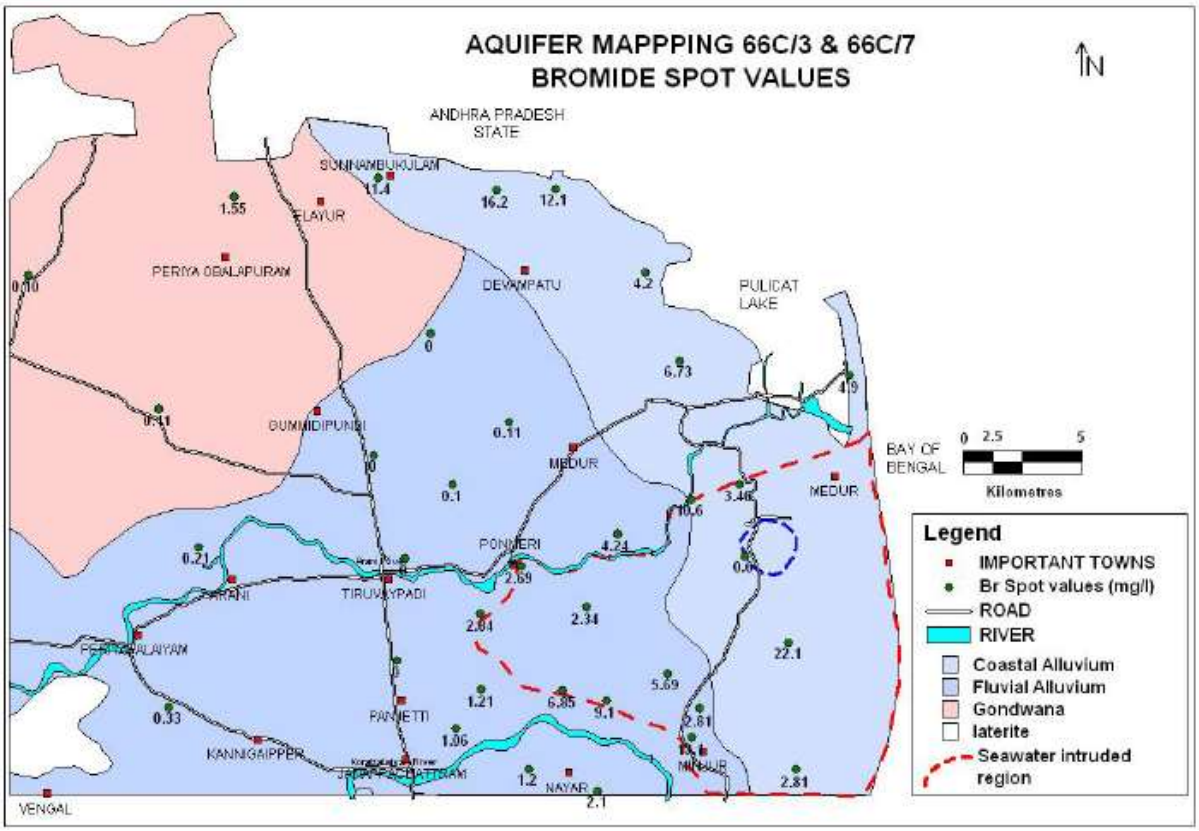
1. Sh.P. Selvam, RDO, Tiruvallur District (rep. District Collector)
2. Sh. M. Malayandi, JCEE, TNPCB, Chennai
3. Sh. R. Rajkumar, Scientist 'D', CPCB, RD (S), Bengaluru
4. Dr. S. Viswanathan, Environmental Specialist, CRRT, Chennai
5. Sh. N. Vetriarasu, EO, Minjur Town Panchayat, Thiruvallur District
6. Smt. A. Jayakumari, EE, WRD-PWD,Araniyar Basin Division, Chennai
7. S. Murugan, AEE, WRD-PWD, Araniyar Basin Division, Ponneri
8. K. Kannan, AE, WRD-PWD, Irrigation Section, Minjur

In the meeting, the Order of Hon'ble NGT dated 21.1.2021 was discussed in detail particularly on the high values of TDS and other parameters such as Chlorides and Hardness which is not in conformity with the drinking standards. The Executive Officer, Minjur Town Panchayat informed that there are no such industries in the vicinity of Minjur where it influences the increase of TDS and other mentioned parameters in ground water. After detailed discussion, the Committee Members concluded that since Minjur Town Panchayat is a coastal Town and the high value of TDS in the ground water is of natural phenomenon (sea water intrusion) and thus the quality of water is not affected by any industrial activity. The review of reports was undertaken to understand the groundwater profile and the soil characteristics of Tiruvallur District particularly in Minjur area. Thereafter, Central Ground Water Board was contacted and obtain the report. The details of discussion in the published report from Central Ground Water Board, Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India, South Eastern Coastal Region, Chennai is reproduced below;

(i) Chapter 6: Ground Water Related Issues in the Report on Aquifer Mapping and Ground Water Management, Chennai Aquifer System, Tamil Nadu, March 2017

Sea water has intruded upto 16 – 16.5 km inland in Minjur - Panjetty area due to the over exploitation of groundwater to meet the Chennai City water supply needs. The following measures can be taken up in the coastal region:

- *Stopping of heavy pumping of GW in the seawater intruded area.*
- *Construction of percolation tanks in the affected area to make fresh water ridge.*
- *Coconut and saline resistance crops are grown in areas having TDS 1500– 2500 mg/l)*
- *Mounds on the upstream side of ponds shows groundwater with low EC even in premonsoon period there are positive indications of recharge. More ponds can be constructed parallel to the coast and this can create huge mounds of freshwater.*
- *Artificial recharge structure in the Korattalaiyar river shows improvement in GW Level and GW quality.*



(ii) Chapter 6: Ground Water Related Issues and problems in the Report on District Ground Water Brochure Tiruvallur District, 2007 (http://cgwb.gov.in/District_Profile/TamilNadu/TIRUVALLUR.pdf)

The heavy pumping of ground water for drinking water supply to Chennai city since 1970s from the well field at Minjur has been primarily responsible for the reversal of hydraulic gradient and consequent saline water intrusion in the eastern part of Minjur block. Recharge of saline water from the Buckingham canal and the presence of a few salt pans along the coast have also contributed to the salinisation of ground water in the area.

The phenomenon of sea water intrusion in Minjur area was first studied during 1966 – 69 by the Ground Water Division of Public Works Dept., Government of Tamil Nadu in collaboration with United Nations Development Project (UNDP). The sea water – fresh water interface in the area was first demarcated during 1969, about 3 km. from the coast. During the study conducted by Metrowater in collaboration with UNDP during 1983, the interface was observed to have moved further west, to a distance of about 8 km. from the

coast. Again, the interface was noticed to have moved landwards to a distance of about 9 km during 1987 and is currently located at about 13 km. form the coast."

Conclusion:

From the above discussion, the Committee concluded that the higher TDS, Chlorides & hardness in the ground water samples collected by the Committee is due to natural phenomena i.e., sea water intrusion. As per the CGWB reports sea water has intruded upto 16 – 16.5 km inland in Minjur – Panjetty and thus no external sources of pollution contribution are reported in Minjur Town Panchayat area.

Suggestion for Remediation:

The method used to control sea water intrusion shall be carried out as per the Report of CGWB Ground Water Recharge of Coastal Areas. The methods suggested are as follows;

- **Modification of ground water pumping and extraction pattern**

  The pumping pattern disturbs the hydraulic gradient whereby it causes landward migration of sea water. It therefore necessitates that the location of pumping wells be changed/shifted. Such wells are required to be dispersed inland to re-establish the ground water flow gradient seawards. Simultaneously it would also have supposed to reduce the quantity of pumped water from such wells to produce positive and sweet water effect in fresh water aquifer.

- **Artificial recharge**

  The efforts here should be to raise the levels of ground water table through appropriate method. The area where unconfined ground water occurs along coastal plain, a surface water spreading method alone should be tried whereas for confined aquifer area, the well recharging method should be employed.

- **Injection barrier**

  The intention in this case is to recharge confined aquifer through injection well method whereby water is injected into deep confined aquifer at predetermined pressure through a battery/or line of recharging wells along the coast. The water injected thus under pressure would form pressure ridge along the coast whereby the water shall flow seaward. This would however need very high quality water which if not available nearby should be imported for well injection recharge. A large number

of such wells are needed, the number depending up the requirement of a desirable pressure ridge to push ground water seaward.

- **Sub-surface barrier**

  In this method, impermeable sub-surface barrier is constructed parallel to the coast but through the extent of fresh water aquifer. This barrier will combat & prevent the inflow to aquifer of sea water. Local method such as clay, asphalt, cement, bentonite etc. can be used to construct barriers.

- **Tidal regulators**

  Tidal regulators are required to be constructed to control the discharge of sweet water of river/stream into the sea. Such structures shall have provision to store fresh water for injection and also arrest flow of saline water into river. This will provision fresh water on the other side saline water area along the crest & shall also raise water table in the vicinity of structures. Ground water monitoring around such recharging and salinity ingress structures is always necessary to keep watch on availability of fresh water/ground water as well as ground water build up for agricultural and drinking water needs. For tidal regulators, check dams & tanks/ponds, it is advisable to collect detailed information about hydrology, run-off, reservoir level, likely submergence area, command area, geology, geography, soil, drainage network etc. before a suitable design is proposed.

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