



## **KERALASTATE POLLUTION CONTROL BOARD**

**കേരള സംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡ്**

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### **SOP- Pollution control in saline sand washing plants**

The Hon'ble High Court of Kerala in its judgement dated 04.03.2022 in WP(C) No. 41341/2017 ordered the Kerala State Pollution Control Board to issue directions to the sand washing units located on the banks of estuary areas of Valapattanam river in Mattol Grama Panchayat, Azhikkode Grama Panchayat and Valapattanam Grama Panchayat in Kannur District for abating nuisance and pollution caused by the washing units. The sand in this context refers to that dredged from Valappattanam River in Azhikkal port and is saline in nature. Sand thus dredged from the Valappattanam River is washed in the saline water taken from the river and the allegations are that the waste water is intruded into the potable ground water rendering the wells in the area saline.

The Hon'ble High Court has clearly mentioned in its judgment that Environment Impact Assessment Study is mandatory requirement before carrying out even manual dredging operations in the port area and that the State Maritime Board needs to conduct EIA study. The Court further clarifies that activities of sand mining; dredging and washing of sand are matters to be dealt with by the Kerala State Pollution Control Board as per the circular dated 09/07/2019.

As there are restrictions on sand mining in rivers, the sand in the rivers gets carried away by the river into the estuarine areas resulting in the sand getting accumulated in the estuary or in areas adjacent to the river mouth (where it joins the sea). The Kerala State Maritime Board carries out manual dredging in the ports to clear navigation channels. The work of manual dredging is entrusted with the local self government departments and the sale of the purified/washed sand is done by the Kerala State Maritime Board. These projects are aimed to produce high quality construction sand from dredged material using state of the art technology with minimal environment damage.

There are two types of sand washing plants functioning in Kerala, viz, full fledged plants & temporary plants. One full fledged plant is located at Kuttipuram in Malappuram

District. It caters to the needs of washing of sand mined from Bharatapuzha River for clearing channels attached to the Ponnani Port. Temporary plants are located on the banks of the Valapattanam River, Beypore (mouth of Chaliyar river in Kozhikode District), Kodungallor (estuary area of Periyar River in Thrissur District) & in Kasargode Districts. In other ports, the dredged sand is usually disposed into the sea

## **Permanent (Full fledged) plants**



Aerial view of saline sand washing plant of M/s Rajadhani Minerals Pvt Ltd (formerly, M/s Global Trading Company) at Kuttipuram, in Malappuram District. It is the only full fledged saline sand washing plant in Kerala.

In such plants, there is provision for storing of dredged material in surge hopper so that continuous operation of the plant can be ensured. From the hopper, the material is fed into the attrition drum using belt conveyors in which the primary washing is done. Such primary washing removes dirt and salt which then feeds the material into the rinser screen (inclined screens). The rinser screen has two meshes of aperture size 6mm & 4mm (as per IS 460 standard). In rinser screen both washing & screening takes place. The oversized particles consisting of gravel, sea shells etc. are removed in the 6mm mesh. The remaining material then passed through the 4mm mesh and is fed into the hydro cyclone in which the centrifugal force forces the sand particles to move downwards into the cone while finer particles silt and clay along with water is forced upwards as slurry into the

overflow box. The second stage washing of sand occurs in the hydro cyclone. Material recovered (sand) is sent to the dewatering screen where further washing with fresh water and further removal of salinity occur. The final washing happens in up flow classifier where the salinity is fully removed, dewatered and conveyed to the stock yard using 180 degree tilting conveyor. The sand thus obtained is high quality construction grade sand available for both concrete and plastering application.

Meanwhile, the slurry generated from hydro cyclone is treated in sludge thickener and filter press for making the slurry into a dried cake. The waste water generated is treated in settling tanks, Ultra Filtration and Sea Water Reverse Osmosis Plant (the usual RO plant is not suitable as high chloride water exerts high osmotic pressure) for removal of chloride.

## Temporary plants

Such plants are usually located on the banks of the estuary areas of the river and utilize saline water from the river.



Photo showing sand washing plant on the banks of Valapattanam River

The dredged sand is dumped into a tank (constructed below ground level and in many cases these are mere earthen pits) into which the river water enters by natural flow. The

sand with water is pumped using the sand pump. The pumping action results in the washing of the sand which is then sieved in 10mm & 3mm wire mesh. The oversized particles consisting of gravel, sea shells etc are removed in the 10mm mesh. Sand with water coming out of the 3mm mesh is transferred into the washed sand tank, from where it is dumped in heaps on the ground using excavator and allowed for natural draining out of the water.

### **Disadvantages of the temporary process**

In full fledged plants, the saline content of washed sand is within permissible limits because of various stages of washing using fresh water. Hence such plants are located in areas where potable water is available, usually away from the estuary area. However, the temporary plants are located adjacent to the river banks and use saline water from the river for washing and hence the saline content in the sand is high and thereby the quality is lower. Moreover, waste water generated after washing is highly saline in nature and hence there are chances of contamination of nearby water bodies.

The clay generated is also saline in nature. The binding property of such type of clay is low and hence not useful for manufacture of clay related products. However, the clay obtained from full fledged plants is usually utilized for manufacture of tiles/pottery, wherein the proportion of original clay to slurry clay varies and is usually 8:2. However, the clay generated from the temporary plants does not have much use.

### **Norms for saline sand washing units**

The following matters may be followed while dealing with sand mining, dredging & washing of sand.

1. The sand washing falls under the consent purview of the Board.
2. The permanent plants shall comply the following:
  - a. There shall be no residences/public buildings/place of worship within 50m of the proposed unit for ICE applications. The minimum setback shall be 10m in all directions.
  - b. It shall have waste water treatment system consisting of coagulation (with polyelectrolyte & alum dosing), clarifier, ultra-filtration and sea water reverse osmosis system or other equivalent systems. It needs to be ensured that the pH,

suspended solids, chloride & BOD of the discharge water is within the standards prescribed.

- c. It shall have sludge treatment facility comprising of sludge thickener and filter press or other equivalent system. The sludge shall be disposed in authorized secured land fill.
  - d. The treated water shall be reused to the maximum possible extent.
  - e. The reject water from RO Plant may be discharged to the source estuarine area using pipes after obtaining permission from the concerned. Separate storage tanks shall be provided for storage of RO rejects. Water meters shall also be installed for recording the quantity of rejects discharged. Correct record shall be kept of the quantity of water discharged into the estuary. In case such transfer is using tanker lorries or similar vehicle, such vehicles shall be GPS tagged. Correct records shall be kept of such transfer and the records be made available to the Board officials for verification on demand. Other modes of disposal like soaking, gardening etc. are not permitted in order to prevent the entry of saline water in to ground water.
  - f. The clay obtained, from the filter press needs to be utilized in tile factories or for pottery works. Sea shell shall be utilized in lime industries and pebbles for ornamental gardening. The applicant shall submit all the details regarding the utilization of such items along with application for consent of the Board.
3. The temporary plants need be permitted only if there are no full fledged plants available. Such plants shall comply the following:
- a. The temporary plants shall not be established within 30m of the maximum flood line of the river. It shall not be within 30m of wells/natural drains/water bodies. There shall be no residences/public buildings/place of worship within 10m of the proposed unit for ICE applications. The minimum setback shall be as per the orange category norms.
  - b. No earthen pits shall be used. Instead, leak proof tanks shall be used. This is essential to prevent percolation of ground water into the soil. Also, the filtered sand (with high moisture content) shall not be dumped on land; instead it shall be on a concrete platform, with facilities to collect the dripping water.
  - c. It shall have waste water treatment system consisting of settling tanks (coagulation preferred). The minimum detention time shall be 2.5 to 3 hours. Facilities shall

also be provided for collection of overflowing water. The treated water may be discharged back into the river using pipes. Other modes of disposal like soaking, gardening etc are not permitted in order to prevent the entry of saline water into ground water. It also needs to be ensured that the pH, suspended solids & BOD of the discharge water is within the standards prescribed.

- d. Facilities for drying of the slurry generated shall be provided.
- e. The applicant shall submit all the details of disposal of clay, pebble, sea shell etc. in this regard along with application for consent of the Board. Saline clay can be utilized only for secured land filling (after providing HDPE covering in the entire land fill area).
- f. Washing of dredged sand falls under orange category.
- g. Application for consent may be submitted by either the contractor or the concerned local body. Consent may be issued for a period of one year only. For the already existing unit 1.5 + 1 year fee may be collected as consent fee of which 1.5 year fee is the fee for ICE with fine.

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CHAIRMAN**

**Approved for issue**

**Senior Environmental Engineer**