

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, NEW DELHI

Original Application No.682 of 2019

In the matter of

Beant Singh Bajwa, President, National Anti-Corruption Council

..... Applicant

V/s

State of Punjab

..... Respondent

Compliance report by way of affidavit of Er. Rajeev Gupta, Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur in compliance of order dated 29.7.2021.

I, the above named deponent, do hereby, solemnly affirm and state as under:

RESPECTFULLY SHOWETH

1. That the deponent is presently working as Environmental Engineer in Punjab Pollution Control Board at Regional Office, Sangrur and as such is conversant with the facts of the present case and is duly authorized and competent to swear this affidavit in his official capacity on behalf of Punjab Pollution Control Board.
2. That the issue for consideration in the subject cited case is the remedial action against violation of Environmental norms by Trident Factory, Dhaula, Mansa Road, Barnala. The Hon'ble Tribunal had constituted a Joint Committee comprising of the Central Pollution Control Board, State Pollution Control Board and District Magistrate, Barnala and the joint committee had submitted a report in the case on 29.2.2020 making



recommendations for remedial action. The recommendations were accepted by the Hon'ble Tribunal and directions were issued vide order dated 24.6.2020 for remedial action which was to be ensured by the State Pollution Control Board.

3. That the Hon'ble Tribunal was pleased to pass an order dated 29.7.2021 in the above mentioned case, that the unit remains deficient in requisite compliances for more than one year and remedial action in terms of the recommendations in the report filed on 29.2.2020 and order of this Tribunal dated 24.6.2020 is not shown to have been taken. The explanation and justification of the Board in this regard may kindly be read in the following paragraphs.

a) It is respectfully submitted that the Punjab Pollution Control Board is having highest regard for the orders and directions issued by the Hon'ble National Green Tribunal in all the cases from time to time and always make sincere efforts to implement the orders and directions of the Hon'ble Tribunal in true letter and spirit. The Board cannot even think for violating the directions given by the Hon'ble Tribunal. However, due to technical and procedural reasons, some delay has occurred in the case.

b) After the passing of the order dated 24.6.2020 by this Hon'ble Tribunal, the case was processed and acting on the recommendations of the Joint Committee, the Board vide letters dated 30.7.2020 had requested four institutions namely Guru Nanak Dev Engineering College, Ludhiana; National Institute of Technology, Jalandhar; Thapar Institute of Engineering and Technology, Patiala; Punjab Engineering College, Chandigarh to share strength/expertise available with the institute and sent the proposal to carry out environment audit of M/S Trident Complex (Paper and Terry Towel Division) Barnala. However, no response was received from these institutes except NIT, Jalandhar.

c) On 01-10-2020, the proposal submitted by NIT Jalandhar for carrying out Environment Audit of Terry Towel Division of M/S Trident Limited (HTD) was forwarded to CPCB



seeking acceptance of the same and Central Pulp and Paper Research Institute, Saharanpur (UP) was requested to send its response for carrying out Environment Audit of Paper Division of M/S Trident Limited (PCD). CPCB conveyed certain observations on the proposal submitted by NIT Jalandhar which were conveyed to NIT Jalandhar on 13.10.2020.

- d) NIT Jalandhar submitted its revised proposal on 05-11-2020 and CPPRI Saharanpur also submitted a proposal for carrying out Environmental Audit of Paper Division of M/s Trident Limited. The proposals were sent to CPCB for acceptance and the acceptance was received from CPCB on 04-12-2020.
- e) Accordingly, Environmental Audit studies in respect of HTD and PCD units of M/s Trident Ltd. were awarded to the National Institute of Technology, Jalandhar and Central Pulp and Paper Research Institute, Saharanpur, respectively on 29-12-2020. As per work order, the final report was to be submitted by the institutes within two months.
- f) Thereafter, the institutes were continuously pursued by the Board to submit the Environmental Audit reports of the above mentioned units. But both the institutes had shown their inability to submit the audit reports within stipulated timelines citing Covid-19 situation.
- g) Accordingly, the Hon'ble NGT was requested vide Board's letter No.2651, dated 16.06.2021 and vide letter No.4378 dated 28-07-2021 to grant more time for the final submission of the report of Joint Committee.
- h) Both the expert agencies namely NIT Jalandhar and CPPRI Saharanpur, submitted draft reports on 15-06-2021 & 19-07-2021 respectively. The draft reports were reviewed by joint Committee in its meeting held on 09-09-2021 and the institutes have submitted the final reports thereafter on 01-10-2021 and 06-10-2021 respectively.



- i) The delay in submission of compliance report to this Hon'ble Tribunal has mainly occurred due to the non-availability of environmental audit report of the industry, which is interlinked to the issues involved in the case. Due to these facts of the case, request was made by the Board to this Hon'ble Tribunal for adjournment of the case.
 - j) The officers of the Board had joined the proceedings of the case on 29.7.2021 through virtual mode only to request this Hon'ble Tribunal for grant of some more time for submission of the compliance report.
 - k) The officers of the Board had otherwise not violated any of the directions of this Hon'ble Tribunal and there was no intention to delay the case in any manner.
 - l) However, in order to make compliance of the directions of the Hon'ble Tribunal given vide order dated 29.7.2021, the Board has deposited the amount of Rs. 1.0 lakh towards cost with the Central Pollution Control Board on 27.08.2021 through RTGS. The Board hereby tender an unconditional apology before this Hon'ble Tribunal in this regard and for the unintentional delay in submission of report.
4. That further it is submitted that even before the submission of report by the Joint Committee on 29.02.2020 in compliance to the directions of Hon'ble Tribunal, the Board has been sincerely pursuing with the HTD division of the industry to achieve Zero Liquid Discharge (ZLD), so as to stop the discharge of effluent into the Dhanula Drain. In the year 2012, the Board had given directions to the HTD division of the industry to install R.O system followed by MEE. The industry in fact has installed the first module of R.O system of 2500 KLD alongwith MEE in April, 2014 at the cost of Rs. 33.0 crores. The industry had made efforts to install remaining modules of RO followed by MEE to make the unit ZLD, but, due to technological challenges and limitations, the industry could not make the unit ZLD with the installation of RO system followed by MEE. Over a period of time, the performance of system declined and ultimately the industry had to abandon the project in 2018. Thereafter, the industry acting on the advice of NEERI had submitted a revised proposal to



upgrade the existing ZLD system of 2500 KLD by adopting MBR Technology at an additional cost of Rs. 12.5 crores. Purchase order was placed to M/s Hydrotech Engineering SRL, Italy. As per the industry, partial equipment has been received and delivery of the remaining equipment is pending. The industry could not install the MBR in stipulated period due to lockdown and other restrictions imposed by international administrations, Central / State Governments due to COVID-19 pandemic.

Now, the industry has given an alternate proposal and made commitment during the personal hearing held on 30.4.2021 to divert its treated trade effluent from drain to the plantation area to stop the 100% discharge into Dhanula Drain by December, 2021. The industry has already purchased additional land of 51.5 acres to develop plantation for utilization of treated trade effluent onto land for plantation. The industry has already done eucalyptus plantation in 32.0 acres of land and remaining 19.5 acres of land is yet to be developed by the industry. The project is expected to be completed by December, 2021 and the industry will start using treated trade effluent onto land for plantation instead of discharging into Dhanaula drain.

It is further brought out that average daily production of the industry (HTD division) for the last five years is 77.3 TPD against the consented quantity of 120 TPD. The industry is presently discharging treated trade effluent @ 2313 KLD into Dhanaula drain against a permitted quantity of 6702 KLD by the Board. The Board vide letter dated 8.11.2021 has directed the industry to apply for revised consents to operate under Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 for a production capacity of 77.5 MTD and corresponding discharge of treated trade effluent @ 5365 KLD onto land for plantation only.

5. That it is pertinent to mention here that the Joint Committee in its report dated 29.02.2020 had given 8 recommendations which were accepted by the Hon'ble Tribunal and directions were given vide order dated 24.06.2020 for remedial action to be ensured by the Punjab Pollution Control Board. In order to make compliance of the recommendations of the Joint Committee, the Punjab Pollution Control Board at the time of grant of consent to operate to the industry vide letter no. 1846 dated 1.7.2020 under the provisions of the Water (Prevention & Control of

Pollution) Act, 1974 has imposed condition that the industry shall comply with the recommendations of the Joint Committee and shall submit the action plan with time lines for implementation of each recommendation of the joint committee and decisions of personal hearing given by the Chairman of the Board and ensure the implementation of the same within two months from the date of order. A copy of the consent letter dated 1.7.2020 wherein the above conditions were imposed is enclosed herewith as **Annexure-A**. The industry vide letter dated 04.07.2020 (received on 27.07.2020) broadly stated that due to lockdown and other restrictions imposed by Central and State Governments to avoid Spread of COVID 19, it would not be able to implement the recommendations immediately and sought extension in timelines. The industry further informed that it has already made payment of Rs. 2.94 Crores for the delivery of said project and has already received the equipment partially. A copy of the reply of the industry is enclosed herewith as **Annexure-B**.

6. That the delay which occurred thereafter in procuring the Environmental Audit report of the industrial unit has already been explained in para no. 3 above and the contents thereof may kindly be read in this regard. After receiving the copy of order dated 29.7.2021 of this Hon'ble Tribunal, the Board has put the industrial unit M/s Trident Ltd., (PCD), Trident Complex, Village Dhaula, Tehsil and District Barnala on notice for violation of the provisions of Water (Prevention & Control of Pollution) Act, 1974 and the Air (Prevention & Control of Pollution) Act, 1981 vide letter no. 3293-94 dated 24.9.2021 and M/s Trident Ltd., (HTD) Trident Complex, Village Dhaula, Tehsil and District Barnala on notice for violation of the provisions of Water (Prevention & Control of Pollution) Act, 1974 vide letter no. 3295-96 dated 24.9.2021 proposing therein the action to be initiated against the industry for its failure to comply with the recommendations of the joint committee and the decisions of various personal hearings held before the Chairman of the Board from time to time as mentioned in the said notices dated 24.9.2021. A copy of the notice dated 24.9.2021 issued to M/s Trident Ltd., (PCD) is placed at **Annexure-C** and to M/s Trident Ltd. (HTD) is placed at **Annexure-D**. The industry has replied to the said notices of the Board vide letters received on 19.10.2021 and has given time lines for compliance of the recommendations of the Joint Committee. The reply of the industry is placed at **Annexure-E**.



7. That in order to understand the legal matrix involved in the case, it would be appropriate to explain and comment upon each of the directions issued by this Hon'ble Tribunal in its order dated 29.7.2021 towards compliance. The directions contained in paragraph 6 and 7 of the order dated 29.7.2021 alongwith comments of the Board towards compliance may kindly be read in the sub paragraphs herein below:

a) The unit remains deficient in requisite compliances for more than one year. Remedial action in terms of the recommendations in the report filed on 29.2.2020 and order of this Tribunal dated 24.6.2020 is not shown to have been taken.

The reply already given in paragraph 3 above is reiterated and the contents thereof are not repeated for the sake of brevity. The said reply may kindly be read as reply to the above direction of this Hon'ble Tribunal.

b) Under EC conditions the standards of 75 mg/Nm³ are to be met whereas, which are not met.

With regard to the above direction, relevant aspects of the case are mentioned herein below:

- i) As per the condition of Environmental clearance granted by MoEF, the industry is required to achieve the stack emission standard of 75 mg/Nm³.
- ii) As per the general emission standards, however, prescribed by CPCB based on the capacity of the boiler, limit of 150 mg/Nm³ is applicable to the industrial units.
- iii) As per the monitoring carried out by the Board, the average value of SPM of samples collected from the stack of boiler Furnace are as under:

| Sr. No. | Sample Identification | Parameters | Results (mg/Nm ³) |
|---------|---|--------------------|-------------------------------|
| 1 | Stack of CRP-I after APCD (20.06.2019, 20.09.2019, 23.01.2021) | Particulate Matter | 111 |
| 2 | Stack of CRP-II after APCD (10.6.2020, 17.9.2020, 10.12.2020, 30.04.2021, 21.09.2021) | Particulate Matter | 93.4 |
| 3 | Stack of boiler of capacity 130 | Particulate | 91.2 |

| | | | |
|--|---------------------------|--------|--|
| TPH (10.6.2020, 10.12.2020, 21.09.2021) | 17.9.2020, 30.04.2021, | Matter | |
|--|---------------------------|--------|--|

- iv) As per the stack emission monitoring carried out by the CPPRI on 26.02.2021, 13.03.2021 and 08.04.2021, the average value of SPM of sample collected from stack of CRP-I, CRP-II and boiler of capacity 130 TPH was found to be 87 mg/Nm³, 75 mg/Nm³ and 116 mg/Nm³, respectively.
- v) The industry had already been directed by the Board to upgrade its existing APCDs so as to achieve the emission standards of 75 mg/Nm³. In this regard the industry had earlier submitted proposal alongwith time lines for the up gradation of existing APCDs as mentioned below:
- a. Recovery 1- 30.09.2021
 - b. Recovery 2- 30.11.2021
 - c. Co-generation plant 2 & 3 – 15.05.2021
- vi) Thereafter, the industry vide letter dated 27.04.2021 had informed that technical offers from three suppliers on Electro Static Precipitator (ESP) up-gradation have been received and the progress has been hampered due to prevailing pandemic scenario. The industry requested to extend the target time lines to September 2022.
- vii) Now, the industry has submitted that the up-gradation of existing APCD of captive boiler of co-generation plant will be completed by 25.11.2021 and the up-gradation of remaining APCDs will be completed by September, 2022.
- c) Dual prescription needs to be checked. SPCB may also clarify on dual mode of disposal system consented – on land and in Dhanaula drain and mechanism for monitoring standards with two different systems of disposal.**
- i) The industry has been granted dual mode of disposal for its treated trade effluent i.e. partly into Dhanaula drain and

partly onto land for plantation by the Board to decrease the pollution load on the drain. However, a uniform standard as prescribed by MoEF & CC vide notification no. GSR 978(E) dated 10.10.2016 (applicable for textile division) and limits for different parameters for discharge of effluent as prescribed in the Environment (Protection) Rules, 1986 have been adopted as applicable in respect of large pulp & paper mills for both the discharges onto land for plantation and into inland surface water for monitoring purposes.

- ii) Both the units of the industry i.e. PCD & HTD are discharging its treated treat effluent partly on to land for plantation and partly into Dhanaula drain within the specified quantity as mention in the letter of consent to operate and has been achieving effluent standards as prescribed for such type of discharges.
- iii) The results of the samples of effluent of M/s Trident Ltd. (HTD) collected by the Punjab Pollution Control Board, Joint Committee constituted by the Hon'ble Tribunal, National Institute of Technology, Jalandhar from the outlet of ETP leading to plantation area and to drain have shown the parameters to be within the prescribed limits. A copy of the analysis results of various effluent samples collected by the various agencies during the period 2019-21 is annexed as **Annexure-F**.
- iv) The results of the samples of effluent of M/s Trident Ltd. (PCD) collected by the Punjab Pollution Control Board, Joint Committee constituted by the Hon'ble Tribunal, CPPRI, Saharanpur from the outlet of ETP leading to plantation area and to drain have shown the parameters to be within the prescribed limits. A copy of the analysis results of various effluent samples collected by the various agencies during the period 2019-21 is annexed as **Annexure-G**.
- v) The industry (HTD) has already purchased additional land and submitted timelines to stop discharge of its treated trade effluent into Dhanaula drain i.e. by December, 2021. The details have already been mentioned in reply to para 3



above.

- vi) The PCD unit is having 165 acres of land to utilize the treated trade effluent for plantation. The industry was granted CTO under water Act by Board to discharge its treated trade effluent @ 8700 KLD onto drain & 12800 KLD onto plantation while the actual effluent discharge into drain is 6214 KLD.
- vii) To further reduce 6214 KLD of effluent into drain, the industry has submitted the action plan & obtained permission from Drain Department to lay the pipe across the drain for the utilization of its treated water by the farmers.

d) In view of long unexplained delay on the part of the State PCB in complying with the orders of this Tribunal, we impose cost of Rs. 1 lakh which may be deposited with CPCB within one month which will be personal responsibility of the Member Secretary, PCB. State PCB is free to recover the same from the erring officers.

- i) The delay in submission of compliance report to this Hon'ble Tribunal has mainly occurred due to the non-availability of environmental audit report of the industry, which is interlinked to the issues involved in the case. The contents of reply already given in paragraph 3 above are reiterated. The contents, however, are not repeated for the sake of brevity.
- ii) Due to these facts of the case, request was made by the Board to this Hon'ble Tribunal for adjournment of the case. The officers of the Board had joined the proceedings of the case on 29.7.2021 through virtual mode only to request this Hon'ble Tribunal for grant of some more time for submission of the compliance report. The officers of the Board had otherwise not violated any of the directions of this Hon'ble Tribunal and there was no intention to delay the case in any manner.
- iii) However, in order to make compliance of the directions of the Hon'ble Tribunal given vide order dated 29.7.2021, the Board has deposited the amount of Rs. 1.0 lakh towards cost with the Central Pollution Control Board on 27.08.2021

through RTGS. The Board hereby tender an unconditional apology before this Hon'ble Tribunal in this regard and for unintentional delay, which has occurred in the case.

- iv) In view of the above facts of the case, the Board prays before this Hon'ble Tribunal to kindly accept the submissions of the Board. The Board humbly prays for the modification of order dated 29.7.2021 to the extent of expunging the adverse remarks and for treating the said amount of Rs. One lakh contribution of the Punjab Pollution Control Board towards the fund maintained by the Central Pollution Control Board for amelioration of environment.

e) The Joint Committee has recommended reduction of water consumption and effluent generation. The industry may achieve suggested water consumption / minimization steps, reduction in generation of effluents, following proper ferti-irrigation plan, to be duly monitored and compliant with emission standards.

- i) The industry is achieving suggestive water consumption norms in respect of both PCD & HTD divisions. With the adoption of cleaner production technologies and increased re-use/ re-cycling of waste water, the PCD unit has been able to reduce fresh water consumption from 60 m³/Ton paper in 2013 to 46 m³/Ton of paper in 2020 against a norms of 50 m³/Ton as stipulated under charter for water re-cycling and pollution prevention. There is a reduction of about 22 % as illustrated in **Annexure-H**.
- ii) In case of HTD, the Industry is already working on adopting cleaner technology, product mix and measures including projects for water conservation which results in reduction of water consumption from 83 m³/T (2016-17) to 67.3 m³/T (2020-21) i.e. 19 % reduction. During last 4 months, the industry has stopped using ground water and has started using canal water, thereby reducing TDS load on untreated trade effluent.
- iii) The industry has submitted Action Plans for utilization of treated water by the farmers, Waste Water

Management Irrigation Plan and Charter for Water Recycling and Pollution Prevention and the said plans are enclosed herewith as under:

- a) For utilization of all treated water by farmers by June 2022 (**Annexure-I**).
 - b) Waste Water Management Irrigation Plan (**Annexure-J**).
 - c) Charter for Water Recycling and Pollution Prevention (**Annexure-K**).
- f) **The PCB may assess compensation for violations till required pollution control devices are set up and ensure that no environmental degradation takes place.**

The industry is achieving the suggestive water consumption norms in respect of both the PCD and HTD divisions. The industry has also developed the plantation area as per Karnal Technology for utilizing part of its trade effluent onto land for plantation and the results of the samples collected by the Punjab Pollution Control Board, Joint Committee and Environment Audit Agencies have been found to be within the prescribed limits. The industry (HTD unit) is yet to comply with the ZLD condition. The industry has submitted revised time lines for achieving the standard of 75 mg/Nm³ in respect of stack attached with captive thermal power plant. The Board based on CPCB regime for calculation of environmental compensation, has assessed Environmental Compensation amounting to Rs. 58.32 Lakh for the period from 01.07.2020 to 30.10.2021 and the industry has been asked to show cause vide notice dated 8.11.2021 within 15 days. A copy of notice dated 8.11.2021 is enclosed herewith as **Annexure-L**. Similarly, HTD unit has been asked to show cause vide notice dated 8.11.2021 within 15 days about the EC amounting to Rs. 58.32 lakh for the period 01.07.2020 to 30.10.2021 due to not achieving ZLD. A copy of notice dated 8.11.2021 is enclosed herewith as **Annexure-M**.



g) The State PCB to put the industrial unit to notice of proceedings before the Tribunal so that it has an opportunity to show cause before the Tribunal as to why the Tribunal should not take coercive measures in the matter for its continuing failure.

The Board has issued a show cause notice for violation of the provisions of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 vide letter no.3293-94 dated 24.9.2021 to Trident Ltd., (PCD), Trident Complex, Village Dhaula, Tehsil and District Barnala and a show cause notice for violation of the provisions of Water (Prevention & Control of Pollution) Act, 1974 vide letter no.3295-96 dated 24.9.2021 to Trident Ltd., (HTD), Trident Complex, Village Dhaula, Tehsil and District Barnala. The industry has also been directed to show cause before the Hon'ble Tribunal.

8. That going by the observations and recommendations given by Central Pulp and Paper Research Institute (CPPRI), Saharanpur, U.P in Environment Audit report of M/s Trident Ltd. (PCD), Village Dhaula, Tehsil and District Barnala, the mill has adopted state of art technologies and equipment's like continuous digester, twin roll press, oxygen delignification and chlorine dioxide bleaching, UASB reactor, chemical recovery systematic etc. There technologies have significantly contributed in reducing the environmental footprint including water footprint of the mill. The quality of treated effluent has been found in compliance with the prescribed discharge norms. The mill has adopted several water conservation strategies to reduce the fresh water consumption, but the CPPRI has recommended that the mill still has a scope to reduce water consumption by further 3-4 m³/t paper and the mill may explore the areas for the same. The industry is achieving the suggestive water consumption norms in both PCD and HTD divisions. The industry is further exploring the possibility of reducing the water consumption in its process.
9. That the above facts are submitted in compliance to the order dated 29.7.2021 for kind perusal, consideration and appropriate orders of this Hon'ble Tribunal. Apart from the above compliance report in respect of the recommendations of the Joint Committee as contained in its report filed on 29.2.2020, the Joint Committee is separately filing the status report in respect of compliance of its recommendations.

It is, therefore, prayed that the Original Application no. 682 of 2019 may kindly be disposed of with appropriate orders.

Date: 10.11.2021

Place: Patiala



DEPONENT

(Rajeev Gupta)

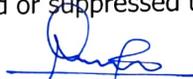
Environmental Engineer,
Punjab Pollution Control Board,
Regional Office, Sangrur

VERIFICATION:

Verified that the contents of paragraphs 1 to 8 of the above affidavit are true and correct to my knowledge as derived from the official record. The contents of paragraph 10 are prayer. No part of the above affidavit is false and nothing material has been kept concealed or suppressed therein.

Date: 10.11.2021

Place: Patiala.



DEPONENT

(Rajeev Gupta)

Environmental Engineer,
Punjab Pollution Control Board,
Regional Office, Sangrur



PUNJAB POLLUTION CONTROL BOARD
 Zonal office-II, Vatavaran Bhawan, Nabha Road, Patiala.
 Website:- www.ppcb.gov.in

Office Dispatch No : 1846 Registered/Speed Post Date: 1-7-2020
 Industry Registration ID: R12BAR22182 Application No : 12537642

To,
 Deepak Nanda
 Trident Complex, Raikot Road, sangehra
 Barnala, Barnala-148101

Subject: Renewal of consent to operate granted vide no. CTOW/Renewal/BAR/2019/9672223 dated 30/03/2019 granted under the provisions of the Water (Prevention & Control of Pollution) Act, 1974 – M/s Trident Ltd (HTD), Trident Complex, Mansa Road, Village Dhaula, Distt. Barnala

1. Particulars of Consent to Operate under Water Act, 1974 granted to the industry

| | |
|------------------------------------|--|
| Consent to Operate Certificate No. | CTOW/Renewal/BAR/2020/12537642 |
| Date of issue : | 30/06/2020 |
| Date of expiry : | 31/03/2021 |
| Certificate Type : | Renewal |
| Previous CTO No. & Validity : | CTOW/Renewal/BAR/2019/9672223 From:30/03/2019 To:31/03/2020 |

2. Particulars of the Industry

| | |
|-------------------------------------|--|
| Name & Designation of the Applicant | Mr. rajat Monga, (President-sustainability Pb) |
| Address of Industrial premises | Trident Ltd (htd), Trident Complex, Mansa-road, Vill-dhaura, Barnala, Barnala-148107 |
| Capital Investment of the Industry | 76158.1 lakhs |
| Category of Industry | Red |
| Type of Industry | Other |
| Scale of the Industry | Large |
| Office District | Barnala |

This is with reference to the request made by the industry for renewal of consent granted by the Board under the Water (Prevention & Control of Pollution) Act, 1974.

The validity of consent to operate granted to the industry vide no. CTOW/Renewal/BAR/2019/9672223 dated 30/03/2019, valid upto 31/03/2020 under the Water (Prevention & Control of Pollution) Act, 1974, is hereby further extended upto 31.03.2021 with the same terms & conditions and following additional conditions:

1. The industry shall comply with the recommendations of Joint Committee.
2. The industry shall submit the action plan within timelines for implementation of each recommendation of the joint committee and decisions of personal hearing given by the Chairman of the Board within 7 days to the Board and ensure the implementations of the same within two months from the date of orders. Further, the industry shall submit the weekly compliance of the recommendations of the joint committee to the Board.

All other contents shall remain unchanged. This letter be appended with the original consent no. CTOW/Renewal/BAR/2019/9672223 dated 30/03/2019 issued to the industry and subsequent extension (s) from time to time under the Water (Prevention & Control of Pollution) Act, 1974.



30/06/2020

(Rajeev Gupta)
Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

Endst. No.: 1847

Dated: 1-7-2020

A copy of the above is forwarded to the following for information and necessary action please:
Environmental Engineer, Regional Office, Sangrur



30/06/2020

(Rajeev Gupta)
Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

1885
 29.7.2020

27.7.20

 Personal
 to RO

 TRIDENT/2020/04
 04.07.2020

To,

 Senior Environmental Engineer
 Punjab Pollution Control Board,
 Zonal Office-2, Nabha Road,
 Patiala.

 ਸਾਹ ਸੁਰੱਖਿਅਕ ਕਮਿਸ਼ਨ ਸੇਵਾ
 ਸੇਵਾ ਕਰਕੇ- II ਖਟਿਆ
 ਸੰ. ਨੰ. 1644
 ਮੁ. 27/7/20

Subject: Personal hearing decision Compliance of conditions of consent to operate under Water (Prevention & Control of pollution) Act, 1974, Air (Prevention & Control of pollution) Act, 1981 & Consent to Establishment under Water (Prevention & Control of pollution) Act, 1974, Air (Prevention & Control of pollution) Act, 1981 & Hazardous waste rule 2016 granted to M/s Trident Ltd.(PCD) & Consent to operate Water (Prevention & Control of pollution) Act, 1974 M/s Trident Limited (HTD), Mansa Road, village Dhaula, Barnala.

Dear Sir,

This is in reference to Consent to operate CTOW/Renewal/BAR/2020/1254045, CTOA/Renewal/BAR/2020/12540409 & CTE/Ext/BAR/2020/12540566 dated 30.06.2020 under Water (Prevention & Control of pollution) Act, 1974, Air ((Prevention & Control of Pollution) Act, 1981 & Consent to Establishment under Water (Prevention & Control of Pollution) Act, 1974, Air ((Prevention & Control of Pollution) Act, 1981 & Hazardous waste rule 2016 granted to M/s Trident Limited (PCD) & Consent to operate no. CTOW/renewal/BAR/2020/12537642 under Water (Prevention & Control of Pollution) Act, 1974 granted to M/s Trident Limited (HTD) Mansa Road, village Dhaula, Barnala, Punjab.

As required in the abovementioned consents, we hereby give the compliance of the additional conditions for your perusal and record.

1 The Industry shall comply with the recommendations of Joint Committee.

The Industry confirms that it will comply with the recommendations of the Joint Committee. Separate joint committee report has been submitted vide letter no. Trident/2020/03 dated 14/07/2020.

2 The Industry shall submit the action plan within timelines for implementation of each recommendations of the decisions of personal hearing given by the Chairman of the Board within 7 days to the Board and ensure the implementations of the same within two months from the date of orders. Further, the Industry shall submit the weekly compliance of the recommendations of personal hearing given by the Chairman of the Board.

It will be difficult for the industry to submit the compliance of personal hearing decisions on weekly basis. The compliance of Decisions of Personal Hearing along with the progress will be submitted to the board on monthly basis.

The Industry gives hereunder the action plan with timelines for implementation of each decisions of the personal hearing given by the Chairman of the Board:

| Sr No | Recommendations | Compliance status |
|-------|---|---|
| 1 | The Industry shall submit the detailed proposal w.r.t upgradation of its existing APCDs to achieve the stack emission standards of 75 mg/Nm ³ within 3 months along with PERT Chart of Installation and Commissioning of the same. | <p>As advised during the personal hearing, the Industry has already started working with Technology Suppliers for finalizing the proposal for upgrading the existing APCDs to achieve the stack emission standards of 75 mg/Nm³</p> <p>As per the directions of the Board, the Industry has submitted the time bound action plan for achieving the emission standards of 75 mg/Nm³ to the Board vide letter no. Trident/PCD/2020/20 dated 25.05.2020. Copy attached as Annexure I.</p> |
| 2 | The Industry shall submit the report of study carried out w.r.t. the quality of ground water in and around the Project by 30.01.2020. | <p>The Industry had got the ground water study conducted by M/s Cholamandalam MS Risk Services Limited in and around the project site. The Industry has collected samples upstream, along the drain, downstream as mentioned on Pg No. 34. The results of the parameters are mentioned on Pg No. 37.</p> <p>The chemical oxygen demand and biological oxygen demand concentrations do not exhibit or insignificant or below the detectable limits from the groundwater samples collected. Hence, it is evident that no direct Ingression of industrial wastewaters or domestic sewages into the groundwater is envisaged.</p> <p>The analytical results of groundwater samples collected and analyzed for Heavy metals concentrations were found to be below the intervention values as per Dutch International Standards. Hence, the groundwater in this</p> |

| | | |
|---|---|--|
| | | <p>region is not contaminated to the level of remediation and no further assessment and delineation of heavy metals contamination in the groundwater are necessarily required.</p> <p>pH in the groundwater samples collected was reported in the range of 7.1 to 8.0 which is within the acceptable range as per drinking water standards published by IS 10500:2012.</p> <p>Minor traces of nutrients and Heavy metal were found in the groundwater and soil samples collected but the impact is totally insignificant.</p> <p>No more action is required at this stage.</p> |
| 3 | The Industry shall submit the report w.r.t the work carried out in five villages under the CSR Activities to the Board within the 7 days and also carry out the work in remaining villages. | The Industry had adopted 10 villages under CSR activities for providing greenery & has completed plantation drive in the 5 villages. The report on the work carried on the five villages under the CSR activities is attached as Annexure 2. |
| 4 | The Industry shall submit the proposal to reduce its fresh water consumption/Waste water generation in the manufacturing process to the Board. | The Industry has continuously worked on reducing its freshwater consumption/waste water generation in the manufacturing process by undertaking several projects. The list of projects for reducing the water consumption/waste water generation is hereunder attached as Annexure 3. |

| | | |
|---|--|--|
| 5 | <p>The Industry shall start giving its treated trade effluent for irrigation purpose in the surrounding area and also expedite the process of laying piping network for the use of remaining treated trade effluent for irrigation purpose and submit the final timelines for the same</p> | <p>The Industry would like to submit that Industry has already executed agreements with farmers of adjoining areas for use of treated trade effluent for irrigation purpose.</p> <p>Further, the Industry has also submitted an application to Drainage department to advise us on the terms and conditions required for laying piping network along the drain to utilize its treated trade effluent for irrigation purpose.</p> |
| 6 | <p>The Industry shall install and commission MBR project to achieve ZLD by 30.06.2020</p> | <p>The Industry has informed to the Board vide Letter No. Trident/2020/24 dated 31.03.2020 that the Industry will not be in a position to complete the project within the given timelines due to the lock down and other restrictions imposed by the Central Government and the state government in order to avoid the societal spread of COVID-19 and sought support of the Board to keep it on hold till the situation return back to normal.</p> <p>Further, the Industry would like to apprise the Board that it has already made payment of Rs.2.94 crores for the delivery of the said project to M/s Hydrotech Engineering s.r.l.</p> <p>The Industry has already received the equipment partially and the balance equipment delivery for completion is pending.</p> <p>It will not be possible for us to take this is project forward looking at the current pandemic scenario</p> |
| 7 | <p>The Industry shall regularly operate and maintain the Effluent Treatment Plant so</p> | <p>The Industry is operating and maintaining its Effluent Treatment Plant so that the treated trade effluents conform to the prescribed</p> |

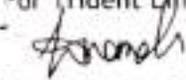
| | | |
|---|--|--|
| | <p>as to achieve effluent standard for such discharge and shall ensure the compliance of conditions of consent at all times</p> | <p>standards laid down by the Board. All the parameters are monitored regularly at the Effluent Treatment Plant of the Industry. Samples of the effluents are drawn and analysed at regular intervals to ensure that they conform to the standards prescribed by the Board.</p> <p>Test Report of the treated effluents issued by the laboratory of Punjab Pollution Control Board also confirms that the parameters of the treated effluent discharged onto the plantation and onto the drain are well within the norms prescribed by Punjab Pollution Control Board.</p> <p>Being a compliance-oriented Industry, we are ourselves concerned and alert for due and timely compliance of all rules and regulations and especially the compliance relating to Environment, Health and Safety</p> |
| 8 | <p>Environmental Engineer, Regional office, Sangrur shall monitor the progress made by the Industry regarding the above decisions from time to time and submit report.</p> | <p>The Environmental Engineer, Regional Office, Sangrur is always welcome to visit the Industry for validating the progress made by the Industry in regard to the above decisions</p> |

Please note that the target dates considered against each compliance is with the assumption that the pandemic situation due to 'COVID 19' gets normalized with immediate effect.

You are requested to kindly take on records the compliances made by the Industry.

Thanking you,

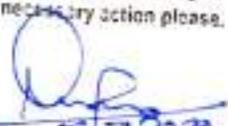
Yours faithfully
For Trident Limited


[Deepak Nanda]
Managing Director

Encl: AS above

CC: Environmental Engineer, Punjab Pollution Control Board,
Sunam Road, Sangrur.

Encl. No. 2200 Dated 28-7-2020
A copy of the above is forwarded to the
Environmental Engineer, Punjab Pollution Control
Board, Regional Office/Sri. Fatehgarh Sahib/Sangrur
for information and further necessary action please.


28-7-2020
Environmental Engineer
Zonal Officer-II, Patiala

TRIDENT/PCD/2020/20

23.05.2020

To,

Senior Environmental Engineer,
Punjab Pollution Control Board,
Zonal Office-2, Nabha Road,
Patiala.

Subject: Proceeding of the personal hearing given on 07.01.2020 by the Chairman of the Board to M/s Trident Limited (Paper & Chemical Division and Home Textile Division), Mansa Road, Village Dhaula, District Barnala before revocation of 'Consent to operate' under Water (Prevention & Control of Pollution) Act, 1974.

Dear Sir,

This is in reference to your letter No.305 dated 21.01.2020 on the subject cited above.

As required, the compliance status of decisions taken during personal hearing given by Chairman of the Board to the industry to review the progress are given hereunder:

1. The Industry shall submit the detailed proposal with respect to up gradation of its existing APCDs to achieve the stack emission standards of 75 mg/Nm³ within 3 months along with PERT Chart of Installation and Commissioning of the same.

The industry would like to submit that industry has already started working with some external vendors to upgrade the existing APCDs to achieve the stack emission standards of 75 mg/Nm³.

However, as per the direction of the State Government and the Central Government due to the Outbreak of COVID-19 and its pace of societal spread across the world and the most recent lock down, imposition of curfew, travel ban and restrictions have led to an unprecedented global crisis in every industry. Thus, as a responsible Corporate Citizen, we did not like to do anything which further aggravates health of our team as well as associates attached with us and accordingly, have allowed majority of our team members to operate from their homes.

Given the current pandemic situation, the Industry was not able to submit the detailed proposal with respect to up gradation of its existing APCDs to achieve the stack emission standards of 75 mg/Nm³ within 3 (three) months of the personal hearing to the Punjab Pollution Control Board.

However, pursuant to the withdrawal of the curfew in the state, the industry has worked upon the details as advised by the Punjab Pollution Control Board and is submitting hereunder the action plan with capital investment and time lines for the up-gradation of the existing APCDs to achieve the stack emission standards of 75 mg/Nm³.

Res
12/6/2020

| Sr. No | Description | Present Value (mg/Nm3) | Target Value (mg/Nm3) | Action Plan | Timelines |
|--------|----------------------------|---------------------------|--------------------------|--|------------|
| 1 | Recovery 1 (20TPH) | <150 | 75 | Up Gradation of ESP of Recovery 1 plant | 30.09.2021 |
| 2 | Recovery 2 (50TPH) | <150 | 75 | Installation of new ESP for Recovery 2 Boiler | 30.11.2021 |
| 3 | Cogen 2 & 3 (130*2 TPH) | <150 | 75 | Installing next generation controller for ESP of Cogen 2 & Cogen 3 | 15.05.2021 |

In addition to the above, the PERT Chart for execution of the project is also attached as Annexure 1.

We request you to kindly take on record the compliances made by the industry in regard to Letter No. 305 dated on 21.01.2020 issued by your good office.

Thanking you

Yours faithfully,

For Trident Limited (PCDP)

Rajal Mongal
Rajal Mongal

President-Sustainability

Encl: As above

CC: Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sunam Road Sangrur

PERT Chart for Recovery 1

| No | Activity | April'20 | July'20 | August'20 | May'21 | Sept.'21 |
|----|--------------------------|------------|------------|------------|------------|------------|
| 1 | Technical proposal | ██████████ | | | | |
| 2 | Commercial Freeze | | ██████████ | | | |
| 3 | Costing approval | | | ██████████ | | |
| 4 | CAPEX-PR/PO | | | ██████████ | | |
| 5 | Material delivery | | | | ██████████ | |
| 6 | Erection & Commissioning | | | | | ██████████ |

Recovery 2

PERT Chart for Recovery 2

| Sr.No | Activity | March'20 | May'20 | June'20 | July'20 | July'21 | Nov.'21 |
|-------|--------------------------|----------|--------|---------|---------|---------|---------|
| 1 | Technical proposal | ■ | | | | | |
| | Commercial Freeze | | ■ | | | | |
| 3 | Costing approval | | | ■ | | | |
| 4 | CAPEX-PR/PO | | | | ■ | | |
| 5 | Material delivery | | | | | ■ | |
| | Erection & Commissioning | | | | | | ■ |

Cogen

| PERT Chart for Cogen 2 & 3 | | | | |
|----------------------------|--------------------------|--------|--------|--------|
| Sr.No | Activity | May'20 | Nov'20 | May'21 |
| 1 | Technical proposal | ■ | | |
| 2 | Material delivery | | ■ | |
| 3 | Erection & Commissioning | | | ■ |

PLANTATION

DRIVE

2018



List of villages for Plantation work

| Sr.no | Village | Block | District |
|-------|--------------------------|---------|----------|
| 1 | Dhaura | Barnala | Barnala |
| 2 | Bilaspur pindi Dhaura | Barnala | Barnala |
| 3 | Fatehpur Pindi Dhaura | Barnala | Barnala |
| 4 | Nanakpura Pindi Dhaura | Barnala | Barnala |
| 5 | Rure ke kalan | Barnala | Barnala |
| 6 | Handiaya | Barnala | Barnala |
| 7 | Fatehgarh channa | Barnala | Barnala |
| 8 | Ghunas | Barnala | Barnala |
| 9 | Dhurkot | Barnala | Barnala |
| 10 | Bhaini jassa/pakho kalan | Barnala | Barnala |

ਬੁਟੇ ਲਾਉਣ ਲਈ ਟਰਾਈਡੈਂਟ ਅਧਿਕਾਰੀਆਂ ਵਲੋਂ 'ਪਿੰਡ ਫਤਹਿਪੁਰ' ਧੌਲਾ ਵਿਖੇ ਜਗ੍ਹਾ ਦਾ ਨਿਰੀਖਣ

ਜੁਥੇਕੇ ਕਲਾ, 8 ਅਗਸਟ (ਗੁਰਪੀੜ ਸਿੰਘ ਬਾਰਨਾਲਾ) - ਟਰਾਈਡੈਂਟ ਉਦਯੋਗ ਧੌਲਾ ਵਲੋਂ ਸਥਾਨਕ ਇਲਾਕੇ ਦੇ ਪਿੰਡਾਂ ਵਿਚ ਬੁਟੇ ਲਗਾ ਕੇ ਸਿਫਾਲ ਕਰਨ ਦੀ ਚਲਾਈ ਮੁਹਿੰਮ ਤਹਿਤ ਟਰਾਈਡੈਂਟ ਉਦਯੋਗ ਧੌਲਾ ਦੇ ਅਧਿਕਾਰੀ ਸ੍ਰੀ ਤੁਪਿੰਦਰ ਗੁਪਤਾ, ਸ. ਜਰਮਨਜੀਤ ਸਿੰਘ ਵਲੋਂ ਬੁਟੇ ਲਗਾਉਣ ਵਾਲੀਆਂ ਜਾਗ੍ਹਾ ਦਾ ਨਿਰੀਖਣ ਕੀਤਾ ਗਿਆ। ਅਧਿਕਾਰੀ ਸ੍ਰੀ ਤੁਪਿੰਦਰ ਗੁਪਤਾ, ਜਰਮਨਜੀਤ ਸਿੰਘ ਨੇ ਦੱਸਿਆ ਕਿ ਟਰਾਈਡੈਂਟ ਗਰੁੱਪ ਦੇ ਅਧਿਕਾਰ ਸ੍ਰੀ ਰਾਜਿੰਦਰ ਗੁਪਤਾ ਦੇ ਇਸ਼ਾ-ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ

ਸਥਾਨਕ ਇਲਾਕੇ ਦੇ ਪਿੰਡਾਂ ਵਿਚ ਵਲੋਂ ਵੱਡੇ ਡਾਂਡਾਰ ਬੁਟੇ ਪਿੰਡਾਂ ਦੀਆਂ ਸਮਾਜ-ਸੇਵਾ ਸਬੰਧੀਆਂ, ਕਲੱਬਾਂ, ਪੰਚਾਇਤਾਂ ਦੇ ਸਹਿਯੋਗ ਨਾਲ ਲਗਾਏ ਜਾ ਰਹੇ ਹਨ। ਅਤੇ ਹੁਣਿਆਂ ਦੀ ਸਿਫਾਲ ਲਈ ਟਰਾਈਡੈਂਟ ਗਰੁੱਪ ਵਲੋਂ ਟੀ-ਗਾਰਡ ਪੁਸ਼ਟ ਚਿੱਠੀ ਜਾਣਕਾਰੀ। ਇਸ ਮੌਕੇ ਜਥੇਦਾਰ ਗੁਰਮੀਤ ਸਿੰਘ, ਸਰਦੀਓ ਬਲਜਿੰਦਰ ਸਿੰਘ, ਪ੍ਰਧਾਨ ਹੀਰਾ ਸਿੰਘ ਕੁਲਦੀਪ, ਪ੍ਰਧਾਨ ਰਾਜਿੰਦਰ ਸਿੰਘ, ਅਕਾਲੀ ਯੁਵ ਦਰਸਨ ਸਿੰਘ, ਲੋਧਾ ਮਾਨ, ਪ੍ਰਧਾਨ ਸਿੰਘੀ ਬਾਵਾ, ਚਰਨਜੀਤ ਸਿੰਘ, ਗੁਰਪੀੜ ਸਿੰਘ ਵੀ ਇਲਾਕਾ ਪਿੰਡ ਵਾਸੀ ਹਾਜ਼ਰ ਸਨ।



ਪਿੰਡ ਫਤਹਿਪੁਰ ਪਿੰਡਾਂ ਧੌਲਾ ਵਿਖੇ ਬੁਟੇ ਲਗਾਉਣ ਲਈ ਜਾ ਦਾ ਨਿਰੀਖਣ ਕਰਦੇ ਹੋਏ ਟਰਾਈਡੈਂਟ ਉਦਯੋਗ ਦੇ ਅਧਿਕਾਰੀ ਤੁਪਿੰਦਰ ਗੁਪਤਾ, ਜਰਮਨਜੀਤ ਸਿੰਘ ਨੇ ਵਲੋਂ ਜਥੇਦਾਰ ਗੁਰਮੀਤ ਸਿੰਘ ਨੇ ਹੋਰ ਮੁਹਿੰਮਕਾਰ।

ਟ੍ਰਾਈਡੈਂਟ ਨੇ ਧੌਲਾ ਮੇਂ ਪੌਠੀਂ ਕੇ ਆਸ-ਪਾਸ ਲਗਾਏ 90 ਗਾਰਡ

ਬਰਨਾਲਾ ਟ੍ਰਾਈਡੈਂਟ ਫੈਕਟਰੀ ਧੌਲਾ ਕੀ ਟਰਫ ਸੇ ਗਾਂਵ ਧੌਲਾ ਮੇਂ ਸਮਾਜਸੇਵੀ ਕਲਬੀਂ ਕੇ ਨੇਤੁਕਵ ਮੇਂ ਪੌਠੀਂ ਕੇ ਆਸ-ਪਾਸ ਲੋਹੇ ਕੇ 96 ਗਾਰਡ ਲਗਾਏ ਗਏ। ਗਰਾਮ ਪੰਚਾਯਤ ਧੌਲਾ ਕੇ ਸਰਪੰਚ ਟਰਸੇਮ ਸਿੰਘ ਸੇਮੀ, ਫਤਹਪੁਰ ਧੌਲਾ ਕੇ ਸਰਪੰਚ ਦਰਸ਼ਨ ਸਿੰਘ, ਕਲਬ ਪ੍ਰਧਾਨ ਮੰਗਲ ਸਿੰਘ, ਪ੍ਰਿੰਸਿਪਲ ਸੁਖਾ ਰਾਨੀ ਆਰ ਵਾਇਸ ਪ੍ਰਿੰਸਿਪਲ ਹਰਬੰਸ ਸਿੰਘ ਬਰਨਾਲਾ ਆਦਿ ਨੇ ਕਹਾ ਕਿ ਯਹ ਟ੍ਰਾਈਡੈਂਟ ਕਾ ਯਹ ਪ੍ਰਸ਼ੰਸਾਯੋਗ ਕਦਮ ਹੈ, ਜੋ ਗਾਂਵ ਅੰਦਰ ਲਗੇ ਕੁਝੀਂ ਕੋ ਗਾਰਡ ਲਗਾਕਰ ਸੁਰਕਿਸ਼ਤ ਕਰ ਰਹੀ ਹੈ। ਇਸ



ਧੌਲਾ ਸਕੂਲ ਸੇ ਪੌਠੀਂ ਕੇ ਆਸ-ਪਾਸ ਲੋਹੇ ਕੇ ਗਾਰਡ ਲਗਾਏ ਹੁਏ।

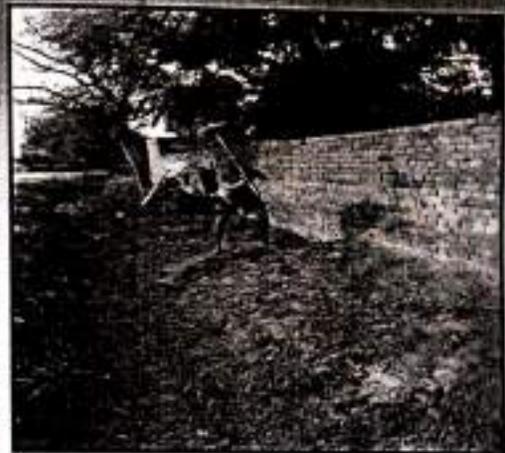
ਮੀਕੇ ਪਰ ਪੰਚ ਕੁਲਦੀਪ ਸਿੰਘ ਰਾਜੂ, ਪੰਚ ਦਰਸ਼ਨ ਸਿੰਘ, ਪੰਚ ਪ੍ਰਿਤੂਪਾਲ ਸਿੰਘ, ਲੇਕਚਰਰ ਸੁਖਦੇਵ ਸਿੰਘ ਬਰਨਾਲਾ,

ਸਕੂਲ ਮੈਨੇਜਮੇਂਟ ਸਮਿਤਿ ਕੇ ਚੇਅਰਮੈਨ ਪਰਮਜੀਤ ਸਿੰਘ ਰਣ ਆਦਿ ਉਪਸਥਿਤ ਥੇ। (ਲਖਣੀ)

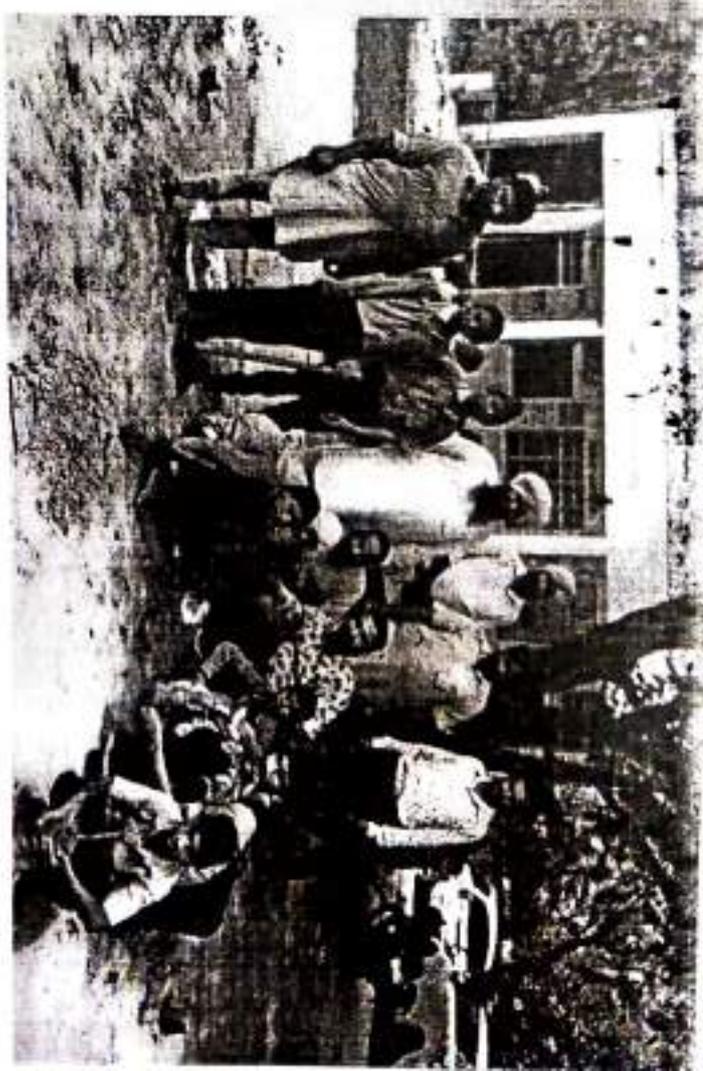
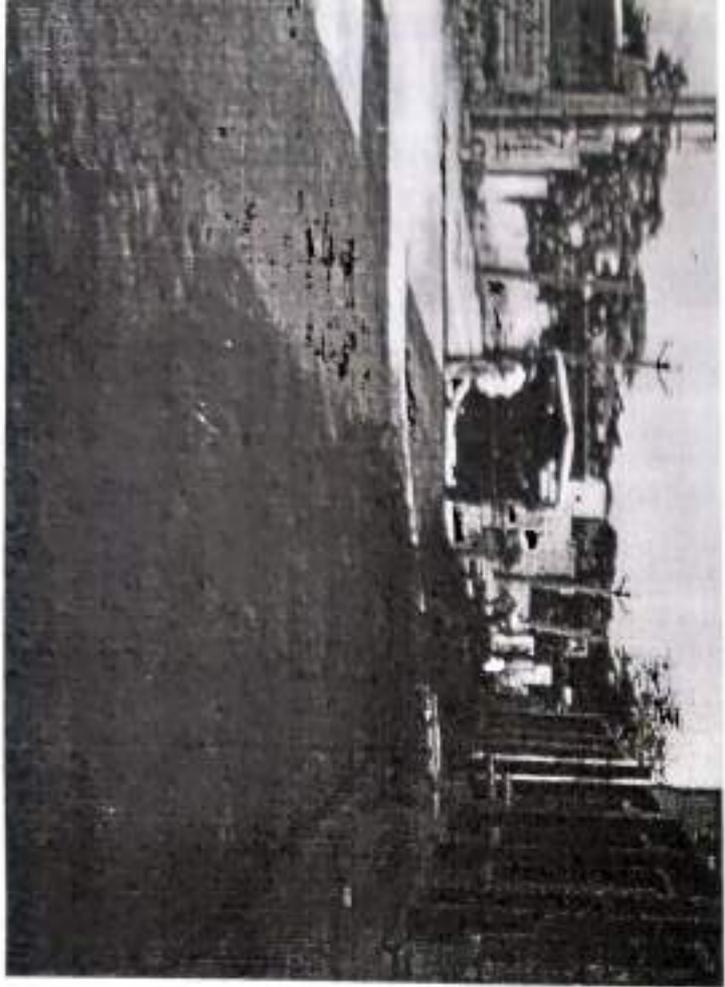


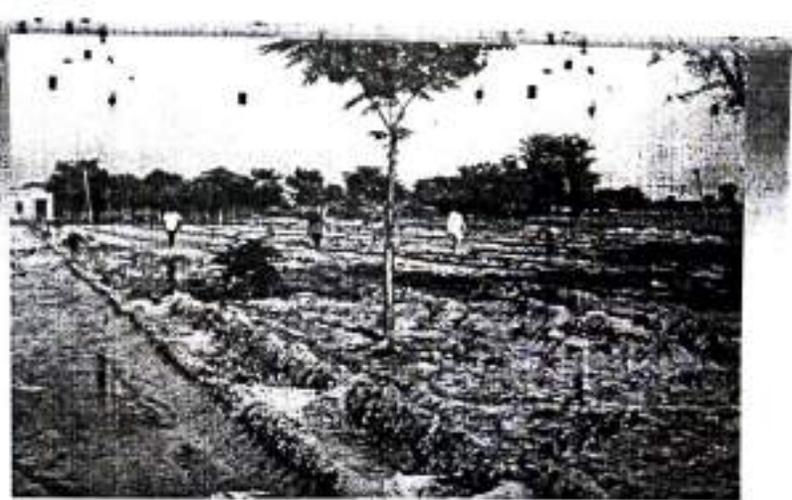
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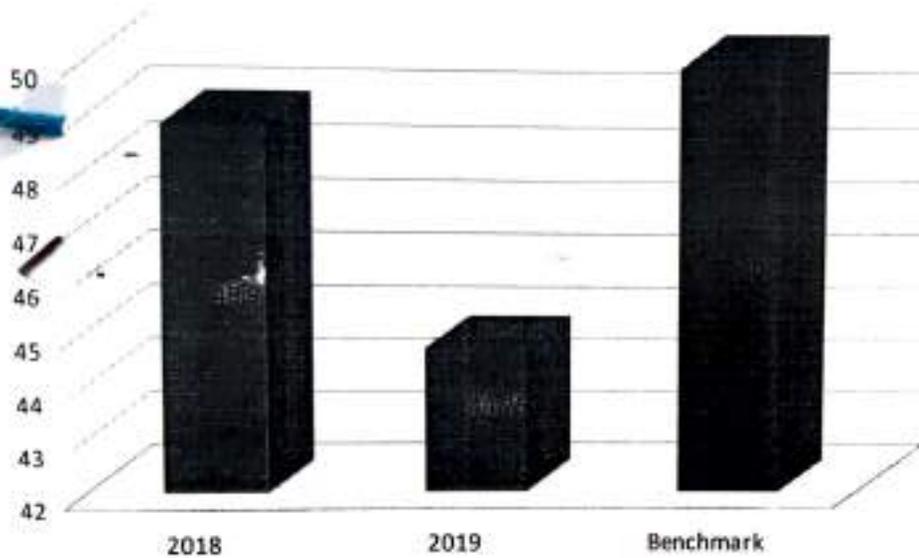


Paper Business

It was also found that the industry has achieved its long term target of specific water consumption in Paper business of 50 m³ /T by executing different projects.

The industry has further taken projects in order to reduce its water consumption which is attached as follows:

| Year | Production | Water Consumption | Specific Water Consumption |
|------|------------|-------------------|----------------------------|
| UoM | MT/Day | KLD | Ltr/Kg |
| 2018 | 415 | 20384 | 49.1 |
| 2019 | 415 | 18569 | 44.74 |



On-Going Projects in Paper Business -

| S.No. | Action | Saving (KLD) | Target date |
|-------|---|--------------|-------------|
| 1 | To reduce water cons from 17.98M ³ /T of Bleached pulp to 16.18M ³ /T of Bleached pulp in SFL | 400 | 15.10.2020 |
| 2 | To reduce water consumption at Paper ETP by 50 KLD by its utilization in lime preparation | 50 | 10.09.2020 |
| 3 | To reduce water cons from 7.6M ³ /T of Bleached pulp to 7.2M ³ /T of Bleached pulp in WFL | 50 | 15.11.2020 |
| 4 | To reduce water consumption in Energy RO plant | 270 | 30.11.2020 |
| 5 | To reduce water consumption in Co-generation cooling tower | 75 | 20.10.2020 |
| Total | | 845 | |

Due to its continuous efforts, the industry was also rewarded in water and waste management company within the Excellence Reward in Paper Business by Confederation of Indian Industry.



2239
1-10-2021

SHOW 1306 0008 08 02 2021 (14/04/2021)

ਪੰਜਾਬ ਪ੍ਰਦੂਸ਼ਣ ਰੋਕਥਾਮ ਬੋਰਡ

PUNJAB POLLUTION CONTROL BOARD

No.

REGISTERED

Dated:

To

M/s Trident Ltd. (PCD),
Trident Complex, Village Dhaula,
Tehsil & Distt. Barnala.

noted
[Signature]

AEE-1
ਨਵੀਂ ਡਰਾਈਵ ਪੁਕਰਾਉਣ ਵਾਲਾ
15 days
[Signature]
20/10/21

Sub: Violation of provisions of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981.

Whereas a complaint was filed in the Hon'ble NGT by Sh. Beant Singh Bajwa, President, National Anti-corruption Council against M/s Trident Unit in which it was mentioned that chemical water is being discharged in the drain by the said unit. The Hon'ble NGT had directed the Board to look into the matter, take appropriate action in accordance with law and furnish a factual and action taken report to this Tribunal.

And whereas, a report was filed by the Board in the Hon'ble NGT. The Hon'ble NGT on 04.12.2019 passed the following orders:

"A report has been furnished by the State PCB finding certain deficiencies and also finding unit compliant in certain respects. There is, however, nothing mentioned about extraction of ground water. We are of the view that a fresh independent and comprehensive inspection is necessary to ascertain the actual situation, as the report furnished is not adequate in all the relevant facts which need to be studied.

Accordingly, we direct fresh inspection by joint Committee of CPCB, State PCB and District Magistrate, Barnala be carried out. The State PCB will be the Nodal Agency for coordination and compliance. The report may be furnished by 31.01.2020, by e-mail. The next date of hearing was fixed 03.03.2020."

And whereas, in compliance to Hon'ble NGT order, the joint committee had undertaken inspection and monitoring of the Complex during 21-23 Feb, 2020 and its report was filed on 29.02.2020 by the joint Committee recording certain recommendations as below:

1. An in-depth study for Environmental Audit may be undertaken particularly in respect for Captive Power Plant, Paper & Towel Division to assess the status for compliance of environment norms/standards. The finding(s) and recommendation (s) of study may be incorporated in the consents issued by PPCB for effectively compliance. This study on Environment Audit be undertaken in consultation with CPCB either by PPCB or through an institute/ consultant having technical expertise in the relevant field.
2. M/s Trident Ltd shall submit a detailed action plan for compliance of condition stipulated by PPCB through its consent orders, dated 10/02/2012 and 30/05/2013, wherein the industry was to install Reverse Osmosis System followed by Multiple Effect Evaporator in its H.T.D. This should be accomplished before 30th June 2020; as mandated by PPCB. The industry shall also submit time bound action plan by 15th March, 2020 for installation of Agitated Thin Film Dryer (ATFD) for the effective handling of MEE reject.

M/s Trident Ltd (PCD) shall also gradually reduce water consumption and thus effluent generation. The entire treated effluent to be properly utilize on land for plantation / irrigation purpose. The industry should adopt scientific method for utilization of its treated water onto land plantation within its premises to maximize the utilization of treated water within the complex. An action plan in this regard shall also be submitted by M/s Trident Ltd. to PPCB on or before June 2020 detailing pipe network, land use, watering depth and type / age of plants etc.

ਵਾਤਾਵਰਣ ਭਵਨ, ਨਾਭਾ ਰੋਡ, ਪਟਿਆਲਾ

VATAVARAN BHAWAN, NABHA ROAD, PATIALA

E-mail : ppcbzon2@gmail.com Web: www.ppcb.gov.in

Having implemented the above, further two years from now i.e. by June 2022, M/s Trident Ltd. shall get its treated water utilized to nearby farmers for irrigations purpose.

3. M/s Trident Ltd shall undertake a performance study of ETPs provided for its PCO. The industry shall undertake necessary project on its raw material washing stream which nearly contributes to 30% of the total ETP Load. The industry shall also submit a time bound action plan to PPCB on or before 15th March 2020 for removal of non-biodegradable COD. The industry will also submit time bound action plan by 30th April, 2020 for removing of colour from its treated effluent going into the drain.
4. The trend analysis of historically data, recorded from OCEMS exhibits that the discharge from M/s Trident Ltd. remains within compliance zone. If such is the case then let M/s Trident Ltd. shall make all efforts to reuse treated effluent back to production process, resulting in conservation of water owing to less withdrawal of ground water or canal water. Besides, the reuse of treated effluent into the production process will affect efficiency of ETP as the treatment system would receive high concentration of BOD and COD. An action plan in order to reuse its treated water not impacting the TDS of the final treated effluent to be shared with PPCB, by 30th June, 2020.
5. The industry has provided pipe network for distribution of treated trade effluent on the plantation area, however, it was observed that certain patches of plantation was flooded with water and some patches were found completely dry because, the industry is uniformly distributing treated trade effluent to all cells of plantation area irrespective of the age of plants in that cell. The industry, therefore, is required to provide proper irrigation network for optimum utilization of treated wastewater. The industry shall also provide electromagnetic flow meter at the outlet of each cell of plantation making more effective utilization of treated effluent.
6. The industry is not achieving the emission standards of 75 mg/Nm³ from the stack of Chemical Recovery Plant (II) and Energy Section. However, the industry was given opportunity of personal hearing before Hon'ble Chairman of PPCB on 07.01.2020, wherein one of the decision of that the industry shall submit the detailed proposal w.r.t. up gradation of its existing APCDs to achieve the stack emission standard of 75 mg/Nm³ within 03 months along with PERT chart for installation and commissioning of the same.
7. The industry (M/s Trident Ltd) will conduct detailed study for monitoring the ground water quality across the Dhanaula Drain in order to evaluate the impact of its treated water discharge onto Drain and submit the report by 30th April, 2020.
8. The concept of 'Zero Liquid Discharge' be considered as minimal discharge of effluent, particularly from the industrial sectors reported upon. According to mechanics of fluids (more precisely thermodynamics) that a continuous operation bound to generate 'rejects', and / or 'blowdown' and / or bleed due to process entropy, despite of whatever technology adopted. Punjab Pollution Control Board, therefore, has to examine what minimal disposal of effluent be permitted to M/s Trident Ltd. considering the production technology, scale of operation and utilization capacity.

And whereas, the Hon'ble NGT vide orders dated 24.06.2020 had directed as under:

"We are of the view that recommendations need to be acted upon, if not already done, as the timelines suggested have already expired and further action is not known. Necessary studies may be got conducted. The State PCB may ensure further remedial action by the industry in the light of the observations quoted above. The Joint Committee may verify compliance by coordinating with such other institution as may be found necessary and further compliance report may be filed in the matter by the joint Committee which may be coordinated by the State PCB within three months from today by e-mail at judicial-ngt@gov.in (preferably in the form of searchable/OCR

PDF and not image PDF. The matter was listed for further consideration on 03.12.2020, which was further adjourned to 08.02.2021."

And whereas, on 29.07.2021 the Hon'ble National Green Tribunal has passed the orders. The operative part of the said orders is reproduced as under:

"Faced with the above, further time is sought for ensuring compliance. In view of long unexplained delay on the part of the State PCB in complying with the orders of this Tribunal, we impose cost of Rs. 1 lakh which may be deposited with CPCB within one month which will be personal responsibility of the Member Secretary, PCB. State PCB is free to recover the same from the erring officers. We further direct the State PCB to now ensure compliance and file compliance report. The industry may achieve suggested water consumption/minimisation steps, reduction in generation of effluents, following proper fert-irrigation plan, to be duly monitored and compliant with emission standards. SPCB may also clarify on dual mode of disposal system consented - on land and in Dhanaula drain and mechanism for monitoring standards with two different systems of disposal. The PCB may assess compensation for violations till required pollution control devices are set up and ensure that no environmental degradation takes place. The State PCB to put the industrial unit to notice of proceedings before the Tribunal so that it has an opportunity to show cause before the Tribunal as to why the Tribunal should not take coercive measures in the matter for its continuing failure. The registry may also send notice by email to the said unit".

And whereas, the industry M/s Trident Ltd. (PCD) was granted Environment Clearance (EC) by MoEF vide letter dated 15.11.2002 and vide dated 07.11.2005 subject to certain conditions as mentioned therein. The perusal of said EC granted to the industry reveals that the industry was granted EC with the condition that the treated effluent shall be used for irrigation purpose. Further, a condition was also imposed by MoEF in the EC granted to the industry vide letter dated 07.11.2005 that the industry shall achieve a particulate emission standard of 75 mg/Nm³ for emissions generated from co-generation power plant and recovery boiler.

And whereas, the Board has continuously pursued the industry M/s Trident Ltd. (PCD) to reduce the discharge of treated trade effluent into Dhanaula Drain. The industry was given personal hearing before the Chairman of the Board on 22.06.2010, wherein, it was decided that the industry will develop total 200 acres of land as per Karnal Technology for discharge of treated waste water onto land for plantation by 31.07.2010.

And whereas, the industry M/s Trident Ltd. (PCD) was pursued from time to time by the Board to develop additional plantation area. As on today, the industry has developed plantation in an area of 165 acres to utilize its treated trade effluent of 12800 KLD onto land for plantation and remaining treated trade effluent of quantity of 8700 KLD is being discharged into Dhanaula Drain. Further, the industry had been pursued by the Board for diversion of its effluent from drain to onto land for irrigation/plantation purpose along with time schedule. The discharge of treated trade effluent into Dhanaula Drain is required to be diverted onto land for plantation purpose as per the status report submitted by the PPCB in the Hon'ble Punjab & Haryana High Court in CWP no. 9858 of 2011.

And whereas, samples of the trade effluent being discharged by the industry M/s Trident Ltd. (PCD) were collected by the Officers of the Board on 25.05.2018 and analysis results of samples from outlet of ETP partly leading to plantation area and partly leading to drain as well as from the outlet into drain beyond the limits as prescribed for such discharges.

And whereas, the Industry M/s Trident Ltd. (PCD) was given hearing before the Chairman of the Board on 27.06.2018, wherein, the industry represented as under:-

The representatives of the industry submitted that the industry has got the environmental clearance for expansion of its production capacity from 135000 TPA to 2,10,000 TPA and increase in

- c) The industry has also taken the services of expert Mr. Silvano Storti to reduce its fresh water consumption / wastewater generation in the manufacturing process.
- d) The industry has adopted 10 villages under CSR activities for providing greenery and has completed plantation dry in 5 villages.

After hearing the officers of the Board, representative of the industry, the Chairman of the Board decided as under:

1. The industry shall submit the detailed proposal w.r.t upgradation of its existing APCDs to achieve the stack emission standard of 75 mg/Nm³ within 3 months alongwith PERT chart for installation and commissioning of the same.
2. The industry shall submit the report of study carried out w.r.t the quality of ground water in and around the project by 30.01.2020.
3. The industry shall submit the report w.r.t the work carried out in five villages under the CSR activities to the Board within 7 days and also carry out the work in remaining villages.
4. The industry shall submit the proposal to reduce its fresh water consumption / wastewater generation in the manufacturing process to the Board.
5. The industry shall start giving its treated trade effluent for irrigation purpose in the surrounded area and also expedite the process of laying piping network for the use of remaining treated trade effluent for irrigation purpose and submit final timelines for the same.

And whereas, due to non-compliances of decisions of personal hearings given to the industry from time to time, M/s Trident Limited (PCD) was issued show cause notice under Water Act, 1974 vide Board's letter no. 1574 dated 12/04/2021 along with opportunity of personal hearing before the Chairman of the Board on 30/04/2021.

The representatives of the industry attended the hearing and submitted written reply, which was taken on record. He further stated that the industry is achieving water consumption @ 46m³/Ton with the implementation of various water conservation initiatives. The production, water consumption and effluent generation is being done fulfilling the norms prescribed by the Board. The industry has achieved water consumption level of 46 m³/Ton of paper by adopting various water conservation projects against the prescribed limit 50 m³/Ton of paper and has already complied the long term objective for water consumption for Pulp & Paper Industry. Regarding upgradation of APCD the representative of the industry informed that the industry has received technical offer from three suppliers but the progress has been hampered due to prevailing Pandemic scenario. The representative requested to extend the target time lines to September, 2022. The industry further assured that it will continuously work on the recommendations of Joint Committee with full commitment for improvement.

Regarding utilization of entire treated wastewater onto land for irrigation, the industry informed that it has already started work to get utilized its treated trade effluent for plantation area. Industry has submitted the letter to Drainage department seeking permission to utilize the treated trade effluent outside the premises on the newly procured land nearly 21 acres. Industry is waiting the confirmation from the drainage department on the same. The industry further submitted that by June, 2022, whole of the treated water will be utilized onto land for plantation and no treated / untreated effluent will be discharged into drain.

After hearing the officers of the Board, representatives of the industry, Chairman of the Board decided that:

- I. Consents to Operate be renewed to the industry for a short period of 6 months (i.e. upto 31.10.2021) subject to following special conditions:
 - a) The CTOs will be reviewed based on the recommendations of the Joint Committee constituted by NGT in the matter of OA No. 682/2019 filed by Sh. Beant Singh Bajwa,

President, National Anti-corruption Council as well as the order passed by the Hon'ble NGT in the said case.

b) The industry shall strictly comply with the decisions of personal hearing taken by the Chairman of the Board held on 17.12.2013 regarding production capacity i.e. the production capacity for manufacturing of paper will be restricted to 415TPD if no purchased bleached pulp is used and additional production of paper @ 35 TPD from the purchased bleached pulp, the requirement of which is about 24 TPD. The record shall be submitted by the industry to the Board on monthly basis.

ii. The industry shall follow the procedure as prescribed in MoEF& CC notification No. S.O.980(E) dated 2.3.2021 regarding no increase in pollution load in case the industry wants to go for change in production of paper beyond the quantities allowed as per environmental clearance granted to the industry by MoEF& CC vide No. J-11011/52/2005 IA-II (I) dated 7.11.2005.

iii. The Environmental Engineer, Regional Office, Sangrur shall carry out monitoring of the industry as per protocol, ensure compliances to be made by the industry and submit monthly progress to the Head Office by the 5th of every following month.

And whereas, regarding undertaking performance study of ETP provided for its PCD, the industry informed that it has already undertaken the performance study of its ETP of PCD from Thapar Institute, Patiala. The industry has also submitted that it has already implemented recommendations of Thapar Institute in its report.

The industry has informed that it has already taken the project on its raw material washing stream which nearly contributes to 30% of the total ETP Load by adopting the latest DAF and screw press technology with the total investment of nearly INR 10.50 crore.

The industry has further informed that it has awarded the project to the Department of Energy and Environment at Thapar Institute to conduct a pilot study for the removal of color. The industry has also submitted that final report w.r.t. removal of colour will be submitted by Thapar Institute by November, 2021 and thereafter, same will be submitted to the Board, immediately.

And whereas, the industry has not submitted any action plan to reuse its treated water not impacting TDS of the final treated effluent which has to be shared with PPCB by 30th June, 2020. The industry submitted that TDS value at this concentration is nearly 2100 ppm which is within the permissible limit for discharge standard. Any recycling of this water back to the process house will increase concentration cycle and will eventually increase the TDS of final treated water. The industry has explored & implemented project for the reducing the water consumption not impacted the TDS. The recovery of RO plant in its energy division has been increased from 76 % to 84.5% thereby reducing water consumption of 300-350 m³/day. The reply submitted by the industry is not accompanied by any study from institute of report and is not satisfactory.

And whereas, the industry has not submitted any action plan detailing pipe network, land use, water depth and types/age of plants etc. which it was required to submit to PPCB on or before June, 2020 for proper and scientific method utilization of its treated waste water onto land plantation within its premises to maximize the utilization of treated waste water within the complex.

And whereas, the industry has not submitted any detailed irrigation network scheme for optimum utilization of treated waste water. The industry has only informed that it has improved distribution of treated trade effluent on the plantation area and provided proper irrigation network for optimum utilization of treated wastewater.

And whereas, the industry has already been directed by the Board to upgrade its existing APCD so as to achieve the norm of 75 mg/Nm³. In this regard, the industry had earlier submitted proposal along with timelines for the up gradation of existing APCDs as tabulated below:

| Sr. No. | Name of the Unit/Section | Proposed timelines |
|---------|--------------------------|--------------------|
| 1. | Recovery I | 30.09.2021 |
| 2. | Recovery II | 30.11.2021 |
| 3. | Cogeneration Plant 2 & 3 | 15.05.2021 |

Shree Lakshmi Paper 08.02.2021 (14021-001)

The industry vide letter dated 27.4.2021 has informed that technical offers from 3 suppliers on the Electro Stating Precipitator (ESP) upgradation have been received and the progress has been hampered due to the prevailing pandemic scenario. The industry has requested to extend the target timelines to September, 2022. The industry has failed to upgrade its APCD to achieve the prescribed emission standards of 75 mg/Nm³.

And whereas, from the above, it is evident that the industry has failed to comply with the decision of the personal hearing given by the Chairman of the Board from time to time w.r.t. utilization of treated trade effluent onto land for plantation by developing additional plantation area, to divert the discharge of treated trade effluent onto land for plantation from Drain as per the status report filed by the Board in the Hon'ble Punjab & Haryana High Court in CWP no. 9858 of 2010, to achieve the stack emission standard of 75 mg/Nm³ as per EC condition, utilization of treated trade effluent for irrigation purpose in the surrounding areas by the farmers by providing piping network and also not complying with all the recommendations of joint committee constituted by the Hon'ble NGT in the matter of O.A. no. 682 of 2019.

And whereas, it has now been proposed to initiate action against the industry due to failure on its part to comply with the recommendations of the Joint Committee and decisions of various personal hearings held before Chairman of the Board from time to time as detailed above.

And whereas, the proposed action to be taken against the industry for non-compliances as detailed above includes imposition of Environmental Compensation for environmental degradation caused due to operations of the industry without making compliances as detailed above and revocation/cancellation of Consents to Operate and restraining the operations of the industry by issuance of directions u/s 33-A of the Water (Prevention & Control of Pollution) Act, 1974 and 31-A of the Air (Prevention & Control of Pollution) Act, 1981.

And whereas, the industry is hereby afforded an opportunity to file reply within 15 days from issuance of this notice either in writing or in person before Chairman of the Board in his office at Vatavaran Bhawan, Nabha Road, Patiala as to why proposed actions may not be taken against the industry for the violations/non compliances as detailed above.

And also whereas, as directed by Hon'ble Green Tribunal vide order dated 29.7.2021, the industry is hereby put to notice of the proceedings before Hon'ble National Green Tribunal affording an opportunity of show cause before the Hon'ble National Green Tribunal as to why the Hon'ble National Green Tribunal should not take coercive measures in the matter for its continuing failure.

Sd/-
Environmental Engineer (ZP-II)
For & on behalf of Chairman

Endst. No. 3294

Dated 24-9-2021

A copy of the above is forwarded to the Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur for information and necessary action.

Sd/-
24/9/2021
Environmental Engineer (ZP-II)
For & on behalf of Chairman



No.

To

M/s Trident Ltd. (HTD),
Trident Complex, Village Dhaura,
Tehsil & Distt. Barnala.

Sub: Violation of provisions of Water (Prevention & Control of Pollution) Act, 1974.

Whereas a complaint was filed in the Hon'ble NGT by Sh. Beant Singh Bajwa, President, National Anti-corruption Council against M/s Trident Unit in which it was mentioned that chemical water is being discharged in the drain by the said unit. The Hon'ble NGT had directed the Board to look into the matter, take appropriate action in accordance with law and furnish a factual and action taken report to this Tribunal.

And whereas, a report was filed by the Board in the Hon'ble NGT. The Hon'ble NGT on 04.12.2019 passed the following orders:

"A report has been furnished by the State PCB finding certain deficiencies and also finding unit compliant in certain respects. There is, however, nothing mentioned about extraction of ground water. We are of the view that a fresh independent and comprehensive inspection is necessary to ascertain the actual situation, as the report furnished is not adequate in all the relevant facts which need to be studied.

Accordingly, we direct fresh inspection by joint Committee of CPCB, State PCB and District Magistrate, Barnala be carried out. The State PCB will be the Nodal Agency for coordination and compliance. The report may be furnished by 31.01.2020, by e-mail. The next date of hearing was fixed 03.03.2020."

And whereas, in compliance to Hon'ble NGT order, the joint committee had undertaken inspection and monitoring of the Complex during 21-23 Feb, 2020 and a report was filed on 29.02.2020 by the joint Committee recording certain recommendations as below:

1. An in-depth study for Environmental Audit may be undertaken particularly in respect for Captive Power Plant, Paper & Towel Division to assess the status for compliance of environment norms/standards. The finding(s) and recommendation (s) of study may be incorporated in the consents issued by PPCB for effectively compliance. This study on Environment Audit be undertaken in consultation with CPCB either by PPCB or through an institute/ consultant having technical expertise in the relevant field.
2. M/s Trident Ltd shall submit a detailed action plan for compliance of condition stipulated by PPCB through its consent orders, dated 10/02/2012 and 30/05/2013, wherein the industry was to install Reverse Osmosis System followed by Multiple Effect Evaporator in its H.T.D. This should be accomplished before 30th June 2020; as mandated by PPCB. The industry shall also submit time bound action plan by 15th March, 2020 for installation of Agitated Thin Film Dryer (ATFD) for the effective handling of MEE reject. M/s Trident Ltd (PCD) shall also gradually reduce water consumption and thus effluent generation. The entire treated effluent to be properly utilize on land for plantation / irrigation purpose. The industry should adopt scientific method for utilization of its treated water onto land plantation within its premises to maximize the utilization of treated water within the complex. An action plan in this regard shall also be submitted by M/s Trident Ltd. to PPCB on or before June 2020 detailing pipe network, land use, watering depth and type / age of plants etc.

ਵਾਤਾਵਰਣ ਭਵਨ, ਨਾਭਾ ਰੋਡ, ਪਟਿਆਲਾ

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Having implemented the above, further two years from now i.e. by June 2022, M/s Trident Ltd. shall get its treated water utilized to nearby farmers for irrigations purpose.

3. M/s Trident Ltd shall undertake a performance study of ETPs provided for its PCD. The industry shall undertake necessary project on its raw material washing stream which nearly contributes to 30% of the total ETP Load. The industry shall also submit a time bound action plan to PPCB on or before 15th March 2020 for removal of non-biodegradable COD. The industry will also submit time bound action plan by 30th April, 2020 for removing of colour from its treated effluent going into the drain.
4. The trend analysis of historically data, recorded from OCEMS exhibits that the discharge from M/s Trident Ltd. remains within compliance zone. If such is the case then let M/s Trident Ltd. shall make all efforts to reuse treated effluent back to production process, resulting in conservation of water owing to less withdrawal of ground water or canal water. Besides, the reuse of treated effluent into the production process will affect efficiency of ETP as the treatment system would receive high concentration of BOD and COD. An action plan in order to reuse its treated water not impacting the TDS of the final treated effluent to be shared with PPCB, by 30th June, 2020.
5. The industry has provided pipe network for distribution of treated trade effluent on the plantation area, however, it was observed that certain patches of plantation was flooded with water and some patches were found completely dry because, the industry is uniformly distributing treated trade effluent to all cells of plantation area irrespective of the age of plants in that cell. The industry, therefore, is required to provide proper irrigation network for optimum utilization of treated wastewater. The industry shall also provide electromagnetic flow meter at the outlet of each cell of plantation making more effective utilization of treated effluent.
6. The industry is not achieving the emission standards of 75 mg/Nm³ from the stack of Chemical Recovery Plant (II) and Energy Section. However, the industry was given opportunity of personal hearing before Hon'ble Chairman of PPCB on 07.01.2020, wherein one of the decision of that the industry shall submit the detailed proposal w.r.t. up gradation of its existing APCDs to achieve the stack emission standard of 75 mg/Nm³ within 03 months along with PERT chart for installation and commissioning of the same.
7. The industry (M/s Trident Ltd) will conduct detailed study for monitoring the ground water quality across the Dhanaula Drain in order to evaluate the impact of its treated water discharge onto Drain and submit the report by 30th April, 2020.
8. The concept of 'Zero Liquid Discharge' be considered as minimal discharge of effluent, particularly from the industrial sectors reported upon. According to mechanics of fluids (more precisely thermodynamics) that a continuous operation bound to generate 'rejects', and / or 'blowdown' and / or bleed due to process entropy, despite of whatever technology adopted. Punjab Pollution Control Board, therefore, has to examine what minimal disposal of effluent be permitted to M/s Trident Ltd. considering the production technology, scale of operation and utilization capacity.

And whereas, the Hon'ble NGT vide orders dated 24.06.2020 had directed as under:

"We are of the view that recommendations need to be acted upon, if not already done, as the timelines suggested have already expired and further action is not known. Necessary studies may be got conducted. The State PCB may ensure further remedial action by the industry in the light of the observations quoted above. The joint Committee may verify compliance by coordinating with such other institution as may be found necessary and further compliance report may be filed in the matter by the joint Committee which may be coordinated by the State PCB within three months from today by e-mail at judicial-ngt@gov.in (preferably in the form of searchable/OCR

PDF and not image PDF. The matter was listed for further consideration on 03.12.2020, which was further adjourned to 08.02.2021."

And whereas, on 29.07.2021 the Hon'ble National Green Tribunal has passed the orders. The operative part of the said orders is reproduced as under:

"Faced with the above, further time is sought for ensuring compliance. In view of long unexplained delay on the part of the State PCB in complying with the orders of this Tribunal, we impose cost of Rs. 1 lakh which may be deposited with CPCB within one month which will be personal responsibility of the Member Secretary, PCB. State PCB is free to recover the same from the erring officers. We further direct the State PCB to now ensure compliance and file compliance report. The industry may achieve suggested water consumption/ minimisation steps, reduction in generation of effluents, following proper ferti-irrigation plan, to be duly monitored and compliant with emission standards. SPCB may also clarify on dual mode of disposal system consented - on land and in Dhonaula drain and mechanism for monitoring standards with two different systems of disposal. The PCB may assess compensation for violations till required pollution control devices are set up and ensure that no environmental degradation takes place. The State PCB to put the industrial unit to notice of proceedings before the Tribunal so that it has an opportunity to show cause before the Tribunal as to why the Tribunal should not take coercive measures in the matter for its continuing failure. The registry may also send notice by email to the said unit".

And whereas, the industry M/s Trident Ltd. (HTD) was constantly pursued by the Board to achieve ZLD and was served notices with opportunities of hearing before Chairman of the Board.

And whereas, the industry M/s Trident Ltd. (HTD) was given hearing before the Chairman of the Board on 27.06.2018, wherein the industry represented as under:-

That since the installation of the first module of RO system of 2500 KLD alongwith MEE in April 2014, the industry is facing technical problem in stabilizing the plant. However, inspite of working continuously with the original equipment manufacturer M/s Euromech, Italy to stabilize the plant, the problem could not be resolved. Further, with the guidance of NEERI, Nagpur, the industry has taken offers from 5 manufacturers for the installation of RO system. The industry has now decided to replace UF technology with MBR technology as pre-treatment of RO. Further, instead of installing 3 modules of 2500 KLD each separately, the industry has now decided to install RO system of total capacity of 7500 KLD in one go and the same shall be installed and commissioned by 30.06.2019. In view of the above, the industry has requested to extend the date for installation of RO system from 30.06.2018 to 30.06.2019. The industry has also requested that the existing ETP and RO system shall be operated and maintained properly till that time, so as to meet with the prescribed standards.

After hearing the representatives of the industry and officer of the Board, it was decided as under:

1. The industry shall install RO system alongwith MEE of the remaining total capacity of 7500 KLD based on MBR technology, instead of installing 3 modules of 2500 KLD each separately, and shall commission the same by 30.06.2019.
2. The industry shall operate and maintain the existing ETP effectively and efficiently, so as to achieve the prescribed standards at all times.
3. The industry will take all necessary steps to ensure that the treated trade effluent discharged onto land for plantation is properly and uniformly distributed in the entire plantation area through proper distribution system.

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4. The industry shall take up 10 villages as CSR activities for providing greenery and improving highgiene with the rehabilitation of village ponds on the model of Seechewal. Sh. Balwinder Singh Lakehwall, plantation expert shall assist them in designing the green plant.
5. Environmental Engineer, Regional Office, Sangrur shall monitor the progress made by the industry regarding the above decisions from time to time and submit report.

And whereas, the industry M/s Trident Ltd. (HTD) was given hearing before the Chairman of the Board on 13.02.2019, wherein the industry represented as under:-

- a) The industry is continuously working on the reduction of fresh water consumption and succeeded in reducing about 25% consumption of fresh water.
- b) The industry has hired Mr. SilanoStorti having expertise in this field and has entered into a contract with M/ Innovation Water Treatment and Recovery Services Pvt. Ltd. for preparation of technical comparative statement of quotation among all the offers received by the industry. He assured that after the installation of above project, no effluent shall be discharged into drain.
- c) The industry is regularly and properly operating its effluent treatment plant and the prescribed parameters are analyzed by it on daily basis and indicating conc. of prescribed parameter is within permissible limits.
- d) The industry has already taken all necessary steps to ensure that treated trade effluent is discharged onto land for plantation uniformly.
- e) The industry has completed plantation in 5 villages as per decision of the hearing.

Industry requested to grant time upto 31.12.2019 for installation of RO plant followed by MEE.

After hearing the officers of the Board and representative of the industry, the Chairman of the Board decided as under:-

1. The industry shall submit PERT Chart regarding proposed RO followed by MEE, within 15 days and install the same by 31.12.2019.
2. The industry shall regularly operate and maintain its effluent treatment plant so as to achieve effluent standards for such discharges and shall ensure the compliance of conditions of consent at all times.
3. Environmental Engineer, Regional Office, Sangur shall regularly submit progress report regarding installation of RO followed by MEE by the industry.

And whereas, the industry M/s Trident Ltd. (HTD) was again given hearing before the Chairman of the Board on 07.01.2020, wherein the industry represented as under:-

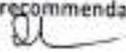
"That it has already placed purchase order to M/s Hydrotech Engineering SRL, CRPVIA DEL LAVORO 8, BASTIA DI ROVOLON 35030, Italy for MBR project, delivery of the all the equipments is expected by 31.03.2020. The said equipments will be erected by 20.05.2020 and commissioning of the plant will be completed by 30.06.2020. During hearing, it was also informed that the operation of existing plant has been made off and this will be started after technology upgradation with some common infrastructure to be used. The Effluent Treatment Plant is being operated regularly and effectively by the industry to achieve the prescribed standards laid down by the Board."

After hearing, the following decisions were taken:-

1. The industry shall install and commission MBR project to achieve ZLD by 30.06.2020.
2. The industry shall operate and maintain its Effluent Treatment Plant so as to achieve effluent standards for such discharges and shall ensure the compliance of conditions of consent all the times.
3. Environmental Engineer, Regional Office, SGR shall regularly submit the progress report regarding installation of MBR project by the industry.

In the meanwhile, the CTO of the industry under Water Act,1974 was renewed subject to following special conditions:-

1. The industry shall comply with the recommendations of Joint Committee.



2. The industry shall submit the action plan within timelines for implementation of each recommendation of the joint committee and decisions of personal hearing given by the Chairman of the Board within 7 days to the Board and ensure the implementations of the same within two months from the date of orders. Further, the industry shall submit the weekly compliance of the recommendations of the joint committee to the Board.

And whereas, the industry wide letter dated 04.07.2020 received on 27.07.2020 represented that due to lockdown and other restrictions imposed by Central and State Governments to avoid Spread of COVID 19 it was not be able to implement the recommendations immediately and sought extension in timelines. The industry further informed that it has already made payment of Rs. 2.94 Crores for the delivery of said project and has already received the equipment partially.

And whereas, due to non-compliances of decisions of personal hearings given to the industry from time to time, M/s Trident Limited (HTD) was issued show cause notice under Water Act, 1974 vide Board's letter no. 1574 dated 12/04/2021 along with opportunity of personal hearing before the Chairman of the Board on 30/04/2021.

The hearing was attended by representative of the industry and stated that the industry has now plan to utilize 100 % of treated waste water onto land for plantation and work will be completed in next 6-9 months. Total discharge from ETP outlet of HTD is 9702 KLD out of which 3000 KLD is being utilized onto land for plantation and remaining 6702 KLD is discharging into Dhanula Drain. The total land requirement for utilizing entire treated trade effluent of 9702 KLD as per the soil study and loading of 91 m3/Acre/day works out to be 106.6 Acres. The industry has already 48.5 Acre developed plantation area, an additional 19.5 Acre has been purchased outside the premises and industry is in process for the procurement of additional 38.6 Acre land. No effluent shall be discharged into Dhanula Drain from the Home Textile Division after completion of work in next 6 months to utilize 100 % of treated waste water onto plantation. The industry further assured that it will continuously work on the recommendations of Joint Committee with full commitment for improvement.

After hearing the officers of the Board, representatives of the industry, Chairman of the Board as decided that:

1. Consent to Operate under Water Act, 1974 be renewed to the industry for a short period of 6 months (i.e upto 31.10.2021) subject to following special condition:

"The CTO will be reviewed based on the recommendations of the Joint Committee constituted by NGT in the matter of OA No. 682/2019 filed by Sh. Beant Singh Bajwa, President, National Anti-corruption Council as well as the order passed by the Hon'ble NGT in the said case."

2. The Environmental Engineer, Regional Office, Sangrur shall carry out monitoring of the industry as per protocol, ensure compliances to be made by the industry and submit monthly progress to the Head Office by the 5th of every following month.

And whereas, from the above, it is evident that the industry has failed to comply with the decision of the personal hearing given by the Chairman of the Board from time to time regarding installation and commissioning of MBR project to achieve ZLD and also not complying with all the recommendations of joint committee constituted by the Hon'ble NGT in the matter of O.A. no. 682 of 2019.

And whereas, it has now been proposed to initiate action against the industry due to failure on its part to comply with the recommendations of the Joint Committee and decisions of various personal hearings held before Chairman of the Board from time to time as detailed above.

And whereas, the proposed action to be taken against the industry for non-compliances as detailed above includes imposition of Environmental Compensation for environmental degradation caused due to operations of the industry without making compliances as detailed above and revocation/cancellation of Consent to Operate and restraining the operations of the industry by issuance of directions/s 33-A of the Water (Prevention & Control of Pollution) Act, 1974.

And whereas, the industry is hereby afforded an opportunity to file reply within 15 days from issuance of this notice either in writing or in person before Chairman of the Board in his office at

VatavaranBhawan, Nabha Road, Patiala as to why proposed actions may not be taken against the industry for the violations/non compliances as detailed above.

And also whereas, as directed by Hon'ble Green Tribunal vide order dated 29.7.2021, the industry is hereby put to notice of the proceedings before Hon'ble National Green Tribunal affording an opportunity of show cause before the Hon'ble National Green Tribunal as to why the Hon'ble National Green Tribunal should not take coercive measures in the matter for its continuing failure.

Sd/
 Environmental Engineer (2P-II)
 For & on behalf of Chairman

Endst. No. 3296

Dated 24-9-2021

A copy of the above is forwarded to the Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur for information and necessary action.

Sd/
 Environmental Engineer (2P-II)
 For & on behalf of Chairman

ਨਵੀਂ ਡਾਕ
ਸੀਨੀਅਰ ਵਾਤ-ਪ੍ਰਦੂਸ਼ਣ ਇੰਜੀਨੀਅਰ
ਜੇ. ਇੰ. ਟੀ. ਓ. ਨਬਾ/ਸਟੇਨੋ
ਜੇਨਰਲ ਦਫਤਰ-II, ਪਟਿਆਲਾ।

ਪੰਜਾਬ ਪ੍ਰਦੂਸ਼ਣ ਕੰਟਰੋਲ ਬੋਰਡ
ਜੇਨਰਲ ਦਫਤਰ-II ਪਟਿਆਲਾ
ਡਾਇਰੀ ਨੰ: 1709
ਮਿਤੀ: 19-10-2021

TRIDENT/2021/06
16.10.2021

To,

The Senior Environmental Engineer,
Punjab Pollution Control Board,
Zonal Office-2, Nabha Road,
Patiala.

Sub response letter
19/10/2021

Subject: Reply to the Show Cause Notice Dated 24 Sep 2021 via Letter No. 3295 regarding the Violation of Provision of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981, received on 30.9.2021.

Respected Sir,

This is in reference to the subject Show Cause Notice dated 24 Sep 2021 via Letter No. 3295 regarding the alleged Violations of Provision of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 which was received by our company/industry on 30.09.2021.

We wish to submit that being a Compliance Oriented Industry, the company has always worked towards a complete adherence to all applicable norms/standards under the Environment Act, the Water/Air Acts, etc. The industry has also continuously worked on the recommendations and the decisions of the personal hearings as well as recommendations/directions of the National Green Tribunal Joint Committee to every extent possible, and is, at this point in time, to justifiably state that the company has been meeting all parameters as prescribed.

The industry hereunder providing the status in respect of the recommendations of the Joint committee and during the Personal Hearing on the points mentioned in the above notice as follows:

| Sr No | Recommendations | Compliance status |
|-------|--|--|
| 1. | Installation & commissioning of MBR project to achieve ZLD . | The industry (HTD) had informed the Board vide Letter No. Trident/2020/24 dated 31.03.2020 that the industry would not be in a position to complete the project to install Reverse Osmosis System followed by Multiple Effect Evaporator in its towel division. within the given timelines due to the lock down and other restraints and restrictions imposed by the |

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| | | <p>Central Government and the State government in order to curtail the spread of COVID-19 and had sought support of the Board to keep the project in abeyance till the situation becomes conducive to the upgradation.</p> <p>Further, the Industry would like to apprise the Board that it has already made a payment of Rs <u>2.94 crores</u> for obtaining the delivery of the equipment from M/s Hydrotech Engineering s.r.l, for the completion of the Project</p> <p>The industry has already received the partial equipment and the delivery of the balance equipment is pending due to the pandemic scenario.</p> <p>It can be assured that since the company has already undertaken the process of procurement and installation of the requisite equipment, <u>the necessary upgradation shall be carried out</u>.</p> <p>As communicated & committed during the personal hearing dated 30 April 2021 and as per proceedings dated 7 May 2021, The industry is in the process for the procurement of additional land to utilize its 100 % treated water onto plantation area at the existing running capacity and will ensure that there may be no discharge of treated water into drain post <u>Dec 2021</u>.</p> |
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The industry has also updated the status of the compliance on the recommendations given by Joint Committee in the matter of O.A no. 682/2019. The point wise status for each recommendation is as follows:

| Sr No | Recommendations | Compliance status |
|-------|--|--|
| 1 | An in-depth study for Environmental Audit may be undertaken particularly in respect for Captive Power Plant, Paper & Towel Division to assess the status for | An in-depth study for Environmental Audit has duly been conducted for the Towel Division of the Company by National Institute of Technology, Jalandhar & in respect of Pulp & Paper Division of the Company by Central Pulp & Paper Institute, |

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| | <p>compliance of environment norms/standards. The finding(s) and recommendation (s) of study may be incorporated in the consents issued by PPCB for effective compliance. This study on Environment Audit be undertaken in consultation with CPCB either by PPCB or through an institute/ consultant having technical expertise in the relevant field.</p> | <p>Saharanpur.</p> <p>The report has since been submitted to the Board, and which fact also finds mention in the order dated 29.7.2021 passed by the Hon'ble NGT, New Delhi.</p> <p>The Industry has already started working on the recommendations of the Audit report and has prepared a time bound action plan for the same which is attached as Annexure 1.</p> |
| 2 | <p>M/s Trident Limited shall submit a detailed action plan for compliance of condition stipulated by PPCB through its consent orders dated 10.02.2012 and 30.05.2013, wherein the industry was to install Reverse Osmosis System followed by Multiple Effect Evaporator in its H.T.D. This should be accomplished before 30th June 2020; as mandated by PPCB. The industry shall also submit time bound action plan by 15th March 2020 for installation of Agitated Thin Film Dryer (ATFD) for the effective handling of MEE reject.</p> | <p>The industry (HTD) had informed the Board vide Letter No. Trident/2020/24 dated 31.03.2020 that the industry would not be in a position to complete the project to install Reverse Osmosis System followed by Multiple Effect Evaporator in its towel division, within the given timelines due to the lock down and other restraints and restrictions imposed by the Central Government and the State government in order to curtail the spread of COVID-19 and had sought support of the Board to keep the project in abeyance till the situation becomes conducive to the upgradation.</p> <p>Further, the Industry would like to apprise the Board that it has already made a payment of Rs 2.94 crores for obtaining the delivery of the equipment from M/s Hydrotech Engineering s.r.l, for the completion of the Project</p> <p>The industry has already received the partial equipment and the delivery of the balance equipment is pending due to the pandemic scenario.</p> <p>It can be assured that since the company has already undertaken the process of procurement and installation of the requisite equipment, the necessary upgradation shall be carried out.</p> <p>As communicated & committed during the personal hearing dated 30 April 2021 and as per proceedings</p> |

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| | <p>M/s Trident Ltd (PCD) shall also gradually reduce water consumption and thus effluent generation. The entire treated effluent to be properly utilized on land for plantation / irrigation purpose. The industry should adopt scientific method for utilization of its treated water onto land plantation within its premises to maximize the utilization of treated water within the complex.</p> <p>An action plan in this regard shall also be submitted by M/s Trident Ltd. to PPCB on or before June 2020 detailing pipe network, land use, watering depth and type / age of plants etc.</p> <p>Having implemented the above, further two years from now i.e. by June 2022. M/s Trident Ltd. shall get its treated water utilized to nearby</p> | <p>dated 7 May 2021, the industry is in the process for the procurement of additional land to utilize its 100 % treated water onto plantation area at the existing running capacity and will ensure that there may be no discharge of treated water into drain post Dec 2021.</p> <p>Irrigation management plan for the complete location is attached as Annexure 2.</p> <p>The industry (PCD) has gradually reduced its water consumption and thus the effluent generation through an improved production system.</p> <p>The Industry has already achieved the water consumption long term objective given by CPCB for Pulp & Paper Industry of 50 m³/T. The Industry is presently running at a water consumption of 46 m³/T by adopting several water conservation measures. Copy of Water Charter Target & List of Measures is attached as Annexure 3 (i) & Annexure 3 (ii).</p> <p>The industry has adopted scientific methods for utilization of its treated water onto plantation within its premises to maximize the utilization of treated water within the complex.</p> <p>The industry is further adopting scientific methods (Karnal Technology) for utilization of its treated water onto land plantation within its premises to maximize the utilization of treated water within the complex.</p> <p>The industry has done the detailed structuring of its complete plantation area. After the assessment, the industry has laid additional pipeline network for utilization of its treated water on its plantation area. The industry has also procured dedicated</p> |
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| | <p>farmers for irrigation purpose.</p> | <p>infrastructure including tractor/ harrow/ Rota water for regular maintenance of its plantation area. The layout plan showing detailed pipe network, land use, watering depth and type / age of plants etc. has been enclosed herewith as Annexure 4.</p> <p>The Industry will further keep exploring additional land and work to get its 100 % treated water utilized for irrigation by June 2022.</p> |
| <p>3</p> | <p>M/s Trident Ltd shall undertake a performance study of ETPs provided for its PCD.</p> <p>The industry shall undertake necessary project on its raw material washing stream which nearly contributes to 30% of the total ETP Load. The industry shall also submit a time bound action plan to PPCB on or before 15th March 2020 for removal of non-biodegradable COD.</p> <p>The industry will also submit</p> | <p>The industry (PCD) has already undertaken the performance study of its ETP of PCD from Thapar Institute. The report has since been submitted to the Board vide letter no. Trident/PCD/2020/66 dated 08.12.2020 along with the timely action plan for all the proposed recommendations.</p> <p>All the recommendations given in the study conducted by Thapar Institute have been duly completed.</p> <p>Copy of the report along with its recommendations and its completion status is attached as Annexure 5.</p> <p>The industry has completed the project on its raw material washing stream which nearly contributed to 30% of the total ETP Load by adopting the latest DAF and screw press technology with the total investment of nearly INR 10.50 crore. Industry has already commissioned the project for the removal of non-biodegradable COD & same is successfully implemented. Pictures of the project area along with the data is attached as Annexure 6.</p> <p>The industry has explored different technologies for the removal of color from its pulp and paper effluent going to drain and has also collaborated with the</p> |

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| | <p>time bound action plan by 30th April 2020 for removing of color from its treated effluent going into the drain.</p> | <p>Department of Energy and Environment at Thapar Institute to conduct a pilot study for the removal of color.</p> <p>The institute has undertaken the project for achieving the purpose and will share the report by Dec 2021. Meanwhile an interim report will be submitted by them shortly, which shall be duly furnished to the Board. Copy of the MOU done and its extension with Thapar Institute is attached as Annexure 7 & Interim report is Attached here as Annexure 8.</p> |
| 4 | <p>The trend analysis of historically data, recorded from OCEMS exhibits that the discharge from M/s Trident Limited remains within compliance zone. If such is the case then M/s Trident Limited shall make all efforts to reuse treated effluent back to production process, resulting in conservation of water owing to less withdrawal of ground water or canal water.</p> <p>Besides, the reuse of treated effluent into the production process will affect efficiency of ETP as the treatment system would receive high concentration of BOD and COD. An action plan in order to reuse its treated water not impacting the TDS of the final treated effluent to be shared with PPCB by 30th June 2020.</p> | <p>The industry has achieved water consumption level lesser than 50 m³/T and further working on this.</p> <p>The industry has explored & implemented a project for reducing the water consumption which will not impact the TDS.</p> <p>The recovery of energy RO plant has been increased from 76% to 84.5% thereby reducing water consumption to an extent of 300-350 M³/day. Copy of the Membranes Order is attached as Annexure 9.</p> |
| 5 | <p>The industry has provided pipe</p> | <p>The industry has improved distribution of treated</p> |

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| | <p>network for distribution of treated trade effluent on the plantation area; however, it was observed that certain patches of plantation was flooded with water and some patches were found completely dry because the industry is uniformly distributing treated trade effluent to all cells of plantation area irrespective of the age of plants in that cell. The industry, therefore, is required to provide proper irrigation network for optimum utilization of treated wastewater. The industry shall also provide electromagnetic flow meter at the outlet of each cell of plantation making more effective utilization of treated effluent.</p> | <p>trade effluent on the plantation area and provided proper irrigation network for optimum utilization of treated wastewater.</p> <p>Further Industry would like to submit that industry has already installed the Electromagnetic flow meter at the outlet of each cell of plantation. Pictures of the additional Meters installed for the submetering along with its PO Copy is attached as Annexure 10</p> |
| 6 | <p>The industry is not achieving the emission standards of 75 mg/Nm³ from the stack of Chemical Recovery Plant (II) and Energy Section. However, the industry was given opportunity of personal hearing before Hon'ble Chairman of PPCB on 07.01.2020, wherein one of the decisions of that the industry shall submit the detailed proposal w.r.t. upgradation of its existing APCDs to achieve the stack emission standard of 75</p> | <p>The Industry (PCD) has consistently been achieving the existing PCB prescribed standards of 150 mg/Nm³ the per the latest test reports dated 11.05.2021. Copy of the latest test report done by PCB is attached as Annexure 11. The latest sampling was conducted on 21 Sep 2021, the report of which is awaited. These standards of emission conform to the prescribed standards specified and stipulated in the consents granted to the industry from time to time. The latest consent dated 24 May 2021 also specifies the prescribed maximum limit of SPM to the extent of 150 mg/Nm³.</p> <p>However, since a recommendation has been made to reduce the said emission to the max. limit of 75 mg/Nm³, the Industry had submitted the action plan for the achievement of stack emission standard of</p> |

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| | <p>mg/Nm³ within 3 months along with PERT chart for installation and commissioning of the same.</p> | <p>75 mg/Nm³ by Sep 2021.</p> <p>The Industry has now sought time till Sep 2022 for the achieving the revised standards, as the finalization of ESP project has been unavoidably delayed on account of pandemic scenario in year 2020-21 resulting in a complete shut down and slowing of all industry during this period.</p> <p>The Industry has already placed the order for HF Controller to reduce the emissions of its thermal power plant stack to achieve the new recommended value of 75 mg/Nm³. The commissioning of the same will be completed by 25 Nov 2021. Order Copy of the HF Controller is attached as Annexure 12.</p> <p>The Industry is in the final stages of commercial negotiation for its new ESP for Recovery Boiler and conducting industrial visit to evaluate and validate the technical performance of the new ESP suppliers. Technical Comparison of the new ESP is attached as Annexure 13.</p> <p>The new delivery period of the ESP for installation and commission is about 10 months.</p> |
| <p>7</p> | <p>The Industry (M/s Trident Ltd) will conduct detailed study for monitoring the ground water quality across the Dhanaula Drain in order to evaluate the impact of its treated water discharge onto Drain and submit the report by 30th April, 2020.</p> | <p>Industry has conducted the ground water study & the outcome of the study has been submitted to the Board vide letter dated 27 April 2020.</p> <p>Copy of the report is attached as Annexure 14.</p> |
| <p>8</p> | <p>The concept of 'Zero Liquid Discharged' be considered as minimal discharge of effluent, particularly from the industrial sectors reported upon.</p> | <p>The Industry is continuously working for minimum discharge of effluent and is continuously reducing its discharge.</p> <p>The Industry is also working on maximum utilization of its treated water onto plantation area and</p> |

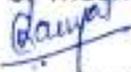
| | |
|--|--|
| <p>According to mechanics of fluids (more precisely thermodynamics) that a continuous operation bound to generate 'rejects', and / or 'blowdown' and / or bleed due to process entropy, despite of whatever technology adopted. Punjab Pollution Control Board, therefore, has to examine what minimal disposal of effluent be permitted to M/s Trident Limited considering the production technology, scale of operation and utilization capacity."</p> | <p>reducing its effluent disposal through alternate routes of ZLD also as suggested by CPCB.</p> <p>Guidelines of CPCB for alternate routes other than ZLD through utilization onto plantation/irrigation is attached as Annexure 15.</p> |
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The Industry further submit that the efforts being done were appreciated by the National Institutes. Further, the industry has noted and started working on all the recommendations given in Environment Audit conducted by CPPRI, Saharanpur.

The Industry can assure a complete and effective compliance of all the recommendations, as per the experts and to the extent feasible, that it shall comply with any other suggestions for further improvement.

You are requested to kindly withdraw the subject show cause notice in the light of the sincere efforts and ongoing upgradation, as submitted above, and the compliances already made by the industry.

Thanking you,
Yours faithfully
For Trident Limited



[Lovelish Goyal]
Factory Manager

Encl: AS above

RECOMMENDATIONS OF NIT AFTER ENVIRONMENT AUDIT – TOWEL DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE |
|-------|---|---|------------------|
| 1 | <p>Despite the fact that the treated effluent is complying the regulations of the statutory body, the discharge of the coloured effluent may cause aesthetical unpleasantness. Moreover, it is highly objectionable to the general public. So, in the current scenario, the emphasis should be given to develop more efficient microbial mass for de-colorization of effluent in the activated sludge process. A further study may be conducted from the Central/State government institutes of national importance such as IITS, NITS etc. to assess the application of microbial consortia/dedicated pure culture/tertiary treatment for de-colorization of the effluent.</p> | <p>The collaboration with national institute for the color study will be done before 31 Oct 2021</p> | <p>31 Oct'21</p> |
| 2 | <p>The raw water requirement of the HTD is mainly met from the withdrawal of groundwater. As per test reports of the groundwater, it contains a high level of TDS(900-1000 mg/l). The high level of TDS in raw water would ultimately lead to higher TDS in the treated effluent affecting its quality for plantation and drainage. The replacement of the source of water from groundwater to other source with better quality of water (such as surface water) could help in further reduction of pollutant load of the treated effluent.</p> | <p>Industry will develop the infrastructure for utilization of canal water in home textile & make an action plan along with irrigation department to get the additional canal water</p> | <p>15-Jun-22</p> |

RECOMMENDATIONS OF NIT AFTER ENVIRONMENT AUDIT – TOWEL DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE |
|-------|--|---|-----------|
| 3 | <p>In the absence of RO & MEE system, the other safe ways of disposal of effluent should be explored. The HTD is currently disposing only 3000 KLD of its treated effluent onto 48.5 acres of land for plantation. The industry should look into the possibility of enhancement of the plantation area (land requirement, type of plant, piping network, watering depth etc.) for more utilization of the treated effluent for plantation in an effective manner to eventually achieve zero liquid discharge (ZLD) to the drain. The option of providing some portion of the treated effluent to nearby farmers for irrigation of the cash crops should also be given a thought. Further, a detailed hydrogeological study of the area around the industry should be conducted from the Central/State government institutes of national importance such as IITS, NITS and NIH etc. on yearly basis to know the impact and footprints of the industrial effluent (used for plantation) onto the groundwater and soil of the locality. The hydrogeological study would also suggest effective remedial measures to meet any adverse impact of the use of the industrial effluent on the aquifers and soil, if any.</p> | <p>The Industry is in process for procurement of additional land & 100 % utilization of treated water onto plantation will be completed by Dec'21 at the present plant utilization capacity .</p> <p>The industry has already conducted hydrogeological study to access the impact and footprints of industrial effluent.</p> | 31-Dec-21 |

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE | CAPEX (Rs cr) |
|-------|---|--|-----------|------------------|
| 1 | The mill has adopted several water conservation strategies to reduce the freshwater consumption. The level of mill's freshwater consumption is similar to contemporary agro based writing and printing paper mills. However, looking into the reported freshwater consumption benchmarks, the mill has still a scope to reduce freshwater consumption by further 3-4 m ³ /t paper and mill may explore areas for the same, for example 100% utilization of foul condensate in pulp mill can help in reducing water consumption by 1m ³ /t paper while installation of disc filter at PM1 can facilitate reduction in freshwater consumption by 1.5 -2.0 m ³ /t paper | Utilization of foul condensate in Pulp Mill & more back water in Pulp Mill . | 28-Dec-21 | |
| 2 | The mill is advised to have sub monitoring of its treated effluent being utilized in its plantation area to have proper water balance. | Completed | Completed | |
| 3 | The mill may explore installation of appropriate technology for the recovery of white rejects (centri cleaner rejects) coming from paper machine for further improving performance of the ETP. | Installation of 2 No. Disc Filters against existing Vibratory Screens to increase the capture Suspended Solids efficiency from existing 40 % to > 80 % | 10-Nov-21 | |

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE | CAPEX (Rs cr) |
|-------|--|---|-----------|---------------|
| 4 | The mill needs to immediately upgrade / retrofit the existing UASB reactor as the mill is not able to utilize the biogas generated as the gas collection and distribution system have corroded developing leakages. This is resulting in an estimated loss of Rs 60-70 lakhs/ annum. | Purchase order will be placed by 20 Dec 21 .The new system will be made functional by 28 Aug 2022 | 28-Aug-22 | 4.7 |
| 5 | The mill may should reduce the suspended soild level in primary clarifier overflow through use of coagulants and flocculants to further improve the performance of existing ETP. | Usage of cogulants and flocculants | 20-Oct-21 | |
| 6 | The mill may install a coagulation and flocculation system before primary clarifier to improve its performance. | Installation of Coagulation-flocculation Project | 15-Dec-21 | 0.68 |

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE | Capex (Rs Cr) |
|-------|--|---|-----------------------|----------------|
| 7 | The mill is advised to make a proper boundary of existing equalization tank and make provision of air supply for homogenizing the effluent. | The industry will take necessary steps for proper boundary by 20 Feb 22 and provision of air supply system in equalization tank by 20 Jun 2022. | 20-Feb-22 & 20 Jun-22 | 0.1 |
| 8 | The mill is advised to install poly disc filter (PDF) at Paper Machine 1 also for increased fibre recovery and reuse/ recycled of paper machine backwater. | The industry will explore the recycling technology for the paper machine -1 effluent for the recovery and reuse of paper machine backwater this will be completed by 30 Oct'22. | 30-Oct-22 | 3.0 |
| 9 | The treated effluent quality meets the stipulated norms. However, the mill needs to adopt appropriate technology to reduce the colour. | Collaboration with Thapar has been done . Study will be completed in Dec 21. | 30 Dec 21 | |
| 10 | The mill is advised to get the OCEMS at final discharge and ESP outlet calibrated on periodical basis. | Same will be implemented on immediate basis and report will be shared by 30 Oct 2021 | Completed | |

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE | Capex (Rs Cr) |
|-------|--|---|------------------------|--------------------|
| 11 | The SPM level in the stack emissions are lower than stipulated norms of 150 mg/Nm ³ . However, in context of the EC norms of 75 mg / Nm ³ for SPM, the mill need to look into optimization of its boiler operation / ESP operation or Upgrade ESPs to comply with the new norms. | Commercial negotiation is under progress. New ESP will be installed for Rec 2 by 30 Sept 2022. Delivery Period of New ESP is 10 months . For energy ESP, we will install HF controller to reduce its SPM levels to 75 mg/Nm ³ by 30 Nov 2021. | 30-Nov-21 30-Sep-22 | 12 |
| 12 | Though the mill has appropriate facilities and trained & experienced manpower for environmental monitoring and analysis the mill may get quarterly / half yearly/ yearly environmental monitoring done from a third party / independent institution. | Yearly monitoring will be implemented before 30 Nov'21 | 30 Nov'21 | |

| | | | | | |
|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

WASTE WATER MANAGEMENT IRRIGATION PLAN



TRIDENT GROUP
BARNALA

| | | |
|--|-----------------------|------------------------------------|
| PREPARED BY | DOCUMENT NO | PAGE 1 OF 20 |
| AJAY KUMAR | SUS/PB/IRRIGATION -01 | |
| APPROVED BY | ISSUE DATE | REVISION NO./ REVISION DATE |
| RAJAT MONGA | 10/03/2021 | - |
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|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

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|--|-----------------------|------------------------------------|
| PREPARED BY | DOCUMENT NO | PAGE 2 OF 20 |
| AJAY KUMAR | SUS/PB/IRRIGATION -01 | |
| APPROVED BY | ISSUE DATE | REVISION NO./ REVISION DATE |
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STANDARD OPERATING PROCEDURE

| | | | | | |
|---------------------------|----------------------------|-----------------|--------|--------------------------------------|------------------------|
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

EFFLUENT GENERATION DATA**PRESENT SCENARIO**

| S NO | DESCRIPTION | UOM | HTD | PCD | TOTAL |
|------|--|---------|--------|-------|---------|
| 1 | TOTAL EFFLUENT GENERATION | KLD | 5146.5 | 19000 | 25146.5 |
| 2 | TREATED WATER INTO PLANTATION | KLD | 3395 | 13200 | 16595.0 |
| 3 | TOTAL AREA OF PLANTATION | ACRE | 48.5 | 105 | 213.5 |
| 4 | EFFLUENT CONSUMPTION | KL/ACRE | 70.00 | 60.00 | 75.00 |
| 5 | UTILIZATION OF TREATED WATER ONTO PLANTATION | % | 55.2 | 69.5 | 62.0 |

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|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

PLANTATION LAYOUT



| | | |
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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ZONE WISE PLANTATION AREA

PAPER PLANTATION AREA (ACRES)

TOWEL PLANTATION AREA (ACRES)

| ZONE | TOTAL | ZONE | TOTAL |
|-------------------|------------|-------------------|-------------|
| ZONE 1 | 5 | ZONE 1 | 4 |
| ZONE 2 | 40 | ZONE 2 | 14 |
| ZONE 3 | 16 | ZONE 3 | 3 |
| ZONE 4 | 5 | ZONE 4 | 1.5 |
| ZONE 5 | 10 | ZONE 5 | 3 |
| ZONE 6 | 15 | ZONE 6 | 12 |
| ZONE 7 | 8 | ZONE 7 | 2.5 |
| ZONE 8 | 14 | ZONE 8 | 2.5 |
| ZONE 9 | 6 | ZONE 9 | 6 |
| ZONE 10 | 2 | TOTAL AREA | 48.5 |
| ZONE 11 | 2 | | |
| ZONE 12 | 10 | | |
| ZONE 13 | 2 | | |
| ZONE 14 | 4 | | |
| ZONE 15 | 2 | | |
| ZONE 16 | 2 | | |
| ZONE 17 | 3 | | |
| ZONE 18 | 2 | | |
| ZONE 19 | 3 | | |
| ZONE 20 | 5 | | |
| ZONE 21 | 9 | | |
| TOTAL AREA | 165 | | |

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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ZONE WISE PLANTATION AGE

PAPER PLANTATION AREA (YEAR)

| ZONE | TOTAL | AGE (YEARS) |
|---------|-------|-------------|
| ZONE 1 | 2020 | 1 |
| ZONE 2 | 2019 | 2 |
| ZONE 3 | 2010 | 11 |
| ZONE 4 | 2008 | 13 |
| ZONE 5 | 2021 | 0.9 |
| ZONE 6 | 2010 | 11 |
| ZONE 7 | 2019 | 2 |
| ZONE 8 | 2021 | 0 |
| ZONE 9 | 2020 | 1 |
| ZONE 10 | 2010 | 11 |
| ZONE 11 | 2021 | 0.9 |
| ZONE 12 | 2020 | 1 |
| ZONE 13 | 2010 | 11 |
| ZONE 14 | 2009 | 12 |
| ZONE 15 | 2014 | 7 |
| ZONE 16 | 2010 | 11 |
| ZONE 17 | 2010 | 11 |
| ZONE 18 | 2010 | 11 |
| ZONE 19 | 2012 | 9 |
| ZONE 20 | 2021 | 0.9 |
| ZONE 21 | 2019 | 2 |

TOWEL PLANTATION AREA (YEAR)

| ZONE | TOTAL | AGE (YEARS) |
|--------|-------|-------------|
| ZONE 1 | 2021 | 0.8 |
| ZONE 2 | 2010 | 11 |
| ZONE 3 | 2021 | 0.8 |
| ZONE 4 | 2021 | 0.8 |
| ZONE 5 | 2020 | 1 |
| ZONE 6 | 2019 | 2 |
| ZONE 7 | 2009 | 12 |
| ZONE 8 | 2020 | 1 |
| ZONE 9 | 2021 | 0.8 |

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|-------------------------------------|----------------------------|-----------------|--------|---|------------------------|
| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

| ZONE WISE IRRIGATION PLAN | | | | |
|--|--------------|---------------------|--------------|---|
| PAPER PLANTATION AREA (AREA-WISE) | | | | |
| ZONE | TOTAL | AREA (ACRES) | TOTAL | MAX. WATER FLOW @ 80m³/acre |
| AREA 1 | ZONE 2A | 20 | 46 | 3680 |
| | ZONE 4 | 5 | | |
| | ZONE 10 | 2 | | |
| | ZONE 13 | 2 | | |
| | ZONE 19 | 3 | | |
| | ZONE 20 | 5 | | |
| AREA 2 | ZONE 21 | 9 | 13 | 1040 |
| | ZONE 1 | 5 | | |
| | ZONE 9 | 6 | | |
| AREA 3 | ZONE 18 | 2 | 3 | 240 |
| | ZONE 17 | 3 | | |
| AREA 4 | ZONE 2B | 20 | 87 | 6960 |
| | ZONE 12 | 10 | | |
| | ZONE 3 | 16 | | |
| | ZONE 6 | 15 | | |
| | ZONE 7 | 8 | | |
| | ZONE 8 | 14 | | |
| | ZONE 15 | 2 | | |
| AREA 5 | ZONE 16 | 2 | 4 | 320 |
| | ZONE 14 | 4 | | |
| AREA 6 | ZONE 5 | 10 | 12 | 960 |
| | ZONE 11 | 2 | | |
| TOTAL | | | 165 | 13200 |

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|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ZONE WISE IRRIGATION PLAN

TOWEL PLANTATION AREA (AREA-WISE)

| ZONE | TOTAL | AREA (ACRES) | TOTAL | MAX. WATER FLOW @ 70m ³ /acre |
|--------------|--------|--------------|-------------|--|
| AREA 1 | ZONE 1 | 4 | 31 | 2170 |
| | ZONE 2 | 14 | | |
| | ZONE 3 | 3 | | |
| | ZONE 4 | 1.5 | | |
| | ZONE 7 | 2.5 | | |
| AREA 2 | ZONE 9 | 8 | 15 | 1050 |
| | ZONE 5 | 3 | | |
| AREA 3 | ZONE 6 | 12 | | |
| | ZONE 5 | 2.5 | 2.5 | 175 |
| TOTAL | | 48.5 | 48.5 | 3395 |

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STANDARD OPERATING PROCEDURE



| | | | | | |
|-----------------------|----------------------------|-----------------|--------|----------------------------------|------------------------|
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ELECTROMAGNETIC FLOW METER RECORD -PLANTATION-PAPER ZONE

| Date | Main Meter | | | Meter 1 (Area-1) | | | Meter 2 (Area-2) | | | Meter 3 (Area-3) | | | Meter 4 (Area-4) | | | Area-5 | | | Meter 5 (Area-6) | | |
|--------|-----------------|---------------|------------|------------------|---------------|------------|------------------|---------------|------------|------------------|---------------|------------|------------------|---------------|------------|-----------------|---------------|------------|------------------|---------------|------------|
| | Initial Reading | Final Reading | Flow (MLD) | Initial Reading | Final Reading | Flow (KLC) | Initial Reading | Final Reading | Flow (KLC) | Initial Reading | Final Reading | Flow (MLD) | Initial Reading | Final Reading | Flow (MLD) | Initial Reading | Final Reading | Flow (KLC) | Initial Reading | Final Reading | Flow (KLC) |
| Target | | | 1700 | | | 360 | | | 55 | | | 25 | | | 655 | | | 30 | | | 34 |
| 18-Sep | 129571 | 129584 | 1276 | 259 | 270 | 300 | 100 | 60 | 50 | 10 | 100 | 100 | 50 | 50 | 580 | 10 | 30 | 20 | 70 | 100 | 50 |
| 19-Sep | 129580 | 129593 | 1284 | 260 | 260 | 260 | 100 | 110 | 60 | 50 | 90 | 90 | 50 | 50 | 660 | 30 | 150 | 120 | 100 | 100 | 150 |
| 20-Sep | 129592 | 129605 | 1270 | 260 | 170 | 180 | 200 | 160 | 50 | 10 | 100 | 100 | 100 | 90 | 90 | 90 | 50 | 100 | 100 | 100 | 100 |
| 21-Sep | 129604 | 129617 | 1260 | 170 | 170 | 170 | 100 | 140 | 60 | 10 | 10 | 10 | 100 | 100 | 800 | 90 | 10 | 30 | 100 | 100 | 100 |
| 22-Sep | 129616 | 129629 | 1250 | 100 | 100 | 100 | 100 | 100 | 50 | 10 | 10 | 10 | 100 | 100 | 860 | 10 | 10 | 10 | 100 | 100 | 100 |
| 23-Sep | 129628 | 129641 | 1240 | 100 | 100 | 100 | 100 | 100 | 40 | 10 | 10 | 10 | 100 | 100 | 800 | 10 | 10 | 10 | 100 | 100 | 100 |
| 24-Sep | 129650 | 129663 | 1230 | 100 | 100 | 100 | 100 | 100 | 30 | 10 | 10 | 10 | 100 | 100 | 740 | 10 | 10 | 10 | 100 | 100 | 100 |
| 25-Sep | 129662 | 129675 | 1220 | 100 | 100 | 100 | 100 | 100 | 20 | 10 | 10 | 10 | 100 | 100 | 680 | 10 | 10 | 10 | 100 | 100 | 100 |
| 26-Sep | 129674 | 129687 | 1210 | 100 | 100 | 100 | 100 | 100 | 10 | 10 | 10 | 10 | 100 | 100 | 620 | 10 | 10 | 10 | 100 | 100 | 100 |
| 27-Sep | 129686 | 129699 | 1200 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 560 | 10 | 10 | 10 | 100 | 100 | 100 |
| 28-Sep | 129700 | 129713 | 1190 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 500 | 10 | 10 | 10 | 100 | 100 | 100 |
| 29-Sep | 129714 | 129727 | 1180 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 440 | 10 | 10 | 10 | 100 | 100 | 100 |
| 30-Sep | 129728 | 129741 | 1170 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 380 | 10 | 10 | 10 | 100 | 100 | 100 |
| 01-Oct | 129742 | 129755 | 1160 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 320 | 10 | 10 | 10 | 100 | 100 | 100 |
| 02-Oct | 129756 | 129769 | 1150 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 260 | 10 | 10 | 10 | 100 | 100 | 100 |
| 03-Oct | 129770 | 129783 | 1140 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 200 | 10 | 10 | 10 | 100 | 100 | 100 |
| 04-Oct | 129784 | 129797 | 1130 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 140 | 10 | 10 | 10 | 100 | 100 | 100 |
| 05-Oct | 129798 | 129811 | 1120 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 80 | 10 | 10 | 10 | 100 | 100 | 100 |
| 06-Oct | 129812 | 129825 | 1110 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 20 | 10 | 10 | 10 | 100 | 100 | 100 |
| 07-Oct | 129826 | 129839 | 1100 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 08-Oct | 129840 | 129853 | 1090 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 09-Oct | 129854 | 129867 | 1080 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 10-Oct | 129868 | 129881 | 1070 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 11-Oct | 129882 | 129895 | 1060 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 12-Oct | 129896 | 129909 | 1050 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 13-Oct | 129910 | 129923 | 1040 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 14-Oct | 129924 | 129937 | 1030 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 15-Oct | 129938 | 129951 | 1020 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 16-Oct | 129952 | 129965 | 1010 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 17-Oct | 129966 | 129979 | 1000 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 18-Oct | 129980 | 129993 | 990 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 19-Oct | 130004 | 130017 | 980 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 20-Oct | 130028 | 130041 | 970 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 21-Oct | 130052 | 130065 | 960 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 22-Oct | 130066 | 130079 | 950 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 23-Oct | 130080 | 130093 | 940 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 24-Oct | 130094 | 130107 | 930 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 25-Oct | 130108 | 130121 | 920 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 26-Oct | 130122 | 130135 | 910 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 27-Oct | 130136 | 130149 | 900 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 28-Oct | 130150 | 130163 | 890 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 29-Oct | 130164 | 130177 | 880 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 30-Oct | 130178 | 130191 | 870 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |
| 31-Oct | 130192 | 130205 | 860 | 100 | 100 | 100 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 0 | 10 | 10 | 10 | 100 | 100 | 100 |



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STANDARD OPERATING PROCEDURE



| | | | | | |
|-----------------------|----------------------------|-----------------|--------|----------------------------------|------------------------|
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

HTD PLANTATION WATER DISTRIBUTION

| DATE | ELECTROMAGNETIC FLOW METER-1 (AREA-1) | | | ELECTROMAGNETIC FLOW METER-2 (AREA-2) | | | ELECTROMAGNETIC FLOW METER-3 (AREA-3) | | | TOTAL FLOW TO PLANTATION |
|------------|---------------------------------------|---------------|------------------|---------------------------------------|---------------|------------------|---------------------------------------|---------------|------------------|--------------------------|
| | INITIAL READING | FINAL READING | TOTAL FLOW (KLD) | INITIAL READING | FINAL READING | TOTAL FLOW (KLD) | INITIAL READING | FINAL READING | TOTAL FLOW (KLD) | KLD |
| 01-09-2021 | 71267 | 72706 | 1439 | 55788 | 57615 | 1827 | 5968 | 7002 | 34 | 3311 |
| 02-09-2021 | 72706 | 74167 | 1462 | 57615 | 59218 | 1603 | 7002 | 7047 | 45 | 3110 |
| 03-09-2021 | 74167 | 75679 | 1512 | 59218 | 60906 | 1688 | 7047 | 7145 | 98 | 3295 |
| 04-09-2021 | 75679 | 77164 | 1485 | 60906 | 62520 | 1614 | 7145 | 7211 | 66 | 3155 |
| 05-09-2021 | 77164 | 78685 | 1485 | 62520 | 64225 | 1705 | 7211 | 7304 | 22 | 3133 |
| 06-09-2021 | 78685 | 80220 | 1451 | 64225 | 65978 | 1753 | 7304 | 7322 | 48 | 3192 |
| 07-09-2021 | 80220 | 81252 | 1073 | 65978 | 67733 | 1755 | 7322 | 7403 | 21 | 3209 |
| 08-09-2021 | 81252 | 82439 | 1148 | 67733 | 69748 | 2015 | 7403 | 7454 | 51 | 3212 |
| 09-09-2021 | 82439 | 83854 | 1415 | 69748 | 71453 | 1705 | 7454 | 7542 | 88 | 3209 |
| 10-09-2021 | 83854 | 85152 | 1339 | 71453 | 73238 | 1785 | 7542 | 7593 | 51 | 3175 |
| 11-09-2021 | 85152 | 86487 | 1294 | 73238 | 74974 | 1736 | 7593 | 7661 | 68 | 3119 |
| 12-09-2021 | 86487 | 87829 | 1429 | 74974 | 76616 | 1642 | 7661 | 7772 | 91 | 3193 |



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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

PCD Plantation Zone Wise Roster

| Description | Zone No | Area (Acres) | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---------------|---------|--------------|--------|---------|-----------|----------|--------|----------|--------|
| AREA 1 | ZONE 2A | 20 | | | | | | | |
| | ZONE 4 | 5 | | | | | | | |
| | ZONE 10 | 2 | | | | | | | |
| | ZONE 13 | 2 | | | | | | | |
| | ZONE 19 | 3 | | | | | | | |
| | ZONE 20 | 5 | | | | | | | |
| | ZONE 21 | 9 | | | | | | | |
| AREA 2 | ZONE 1 | 5 | | | | | | | |
| | ZONE 9 | 6 | | | | | | | |
| AREA 3 | ZONE 18 | 2 | | | | | | | |
| | ZONE 17 | 3 | | | | | | | |
| AREA 4 | ZONE 2B | 20 | | | | | | | |
| | ZONE 12 | 10 | | | | | | | |
| | ZONE 3 | 16 | | | | | | | |
| | ZONE 6 | 15 | | | | | | | |
| AREA 5 | ZONE 7 | 8 | | | | | | | |
| | ZONE 8 | 14 | | | | | | | |
| | ZONE 15 | 2 | | | | | | | |
| | ZONE 16 | 2 | | | | | | | |
| AREA 6 | ZONE 14 | 4 | | | | | | | |
| | ZONE 5 | 10 | | | | | | | |
| AREA 6 | ZONE 11 | 2 | | | | | | | |
| | | | | | | | | | |

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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

HTD Plantation Zone Wise Roster

| Description | Zone No. | Area (Acres) | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|-------------|----------|--------------|--------|---------|-----------|----------|--------|----------|--------|
| AREA 1 | ZONE 1 | 4 | █ | | | | | | |
| | ZONE 2 | 14 | | █ | █ | | | | |
| | ZONE 3 | 3 | █ | | | | | | |
| | ZONE 4 | 14 | | | | █ | | | |
| | ZONE 5 | 2.5 | | | | █ | █ | | |
| AREA 2 | ZONE 6 | 3 | | | | █ | █ | | |
| | ZONE 7 | 12 | | | | | | █ | █ |
| AREA 3 | ZONE 8 | 2.5 | | | | | █ | | |

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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

INFRASTRUCTURE AVAILABLE

| S.NO. | DESCRIPTION | UOM | QUANTITY |
|-------|--------------|-----|----------|
| 1 | TRACTOR | NOS | 2 |
| 2 | TROLLEY | NOS | 1 |
| 3 | HARROW | NOS | 2 |
| 4 | ROTAVATOR | NOS | 1 |
| 5 | TOOLKIT | NOS | 10 |
| 6 | SPRAYER PUMP | NOS | 4 |

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| | | | | | |
|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

Name:

Salary Code:

IRRIGATION CHECKLIST

Deptt

Month:

POINTS OF CONCERN/ACTIVITIES

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|

ZONE WISE INSPECTION FOR PLANTATION

ZONE WISE WATER DISTRIBUTION

MANPOWER DEPLOYED AS PER ROSTER

MILD GROWTH/GRASS REMOVAL

CHECKING FOR THE FLOODING/WATER ACCUMULATION

CHECKING FOR THE MACHINERY

TOOL KIT AVAILABILITY

SUPERVISOR SIGNATURE

POINTS OF CONCERN/ACTIVITIES

| | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

ZONE WISE INSPECTION FOR PLANTATION

ZONE WISE WATER DISTRIBUTION

MANPOWER DEPLOYED AS PER ROSTER

MILD GROWTH/GRASS REMOVAL

CHECKING FOR THE FLOODING/WATER ACCUMULATION

CHECKING FOR THE MACHINERY

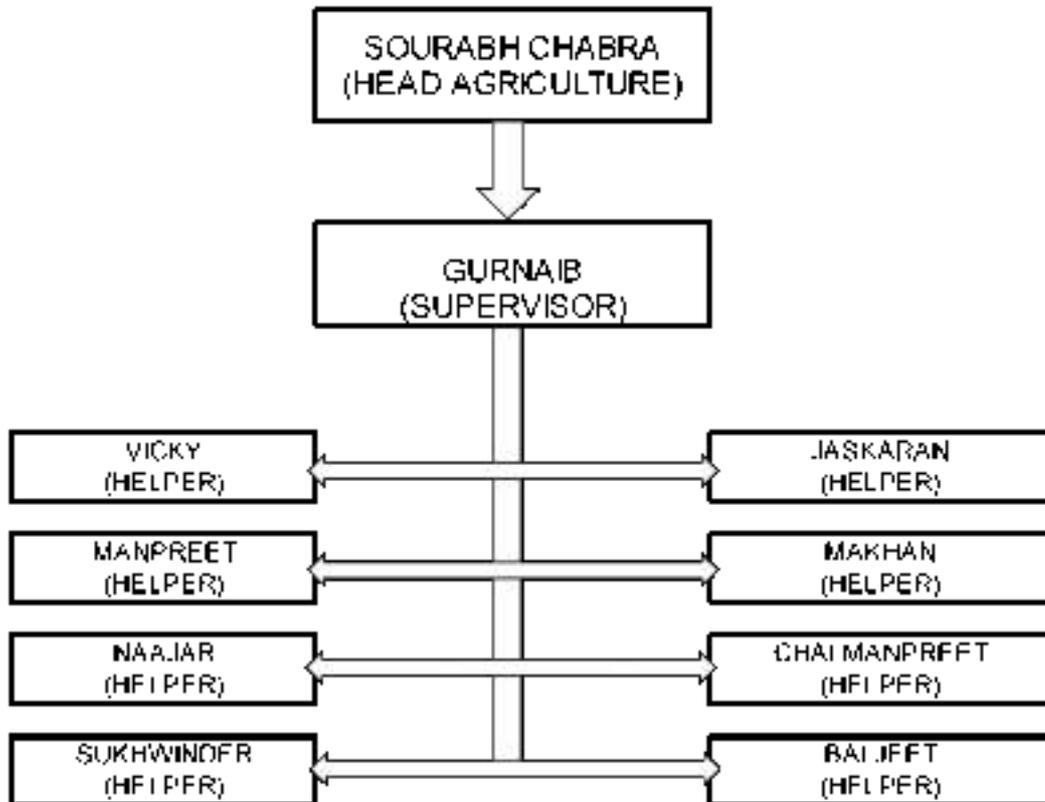
TOOL KIT AVAILABILITY

SUPERVISOR SIGNATURE

| | | |
|--|-----------------------|------------------------------------|
| PREPARED BY | DOCUMENT NO | PAGE 14 OF 20 |
| AJAY KUMAR | SUS/PB/IRRIGATION -01 | |
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|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

TEAM MATRIX



| | | |
|--------------------|-----------------------|------------------------------------|
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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

GLIMPSE OF PLANTATION AREA



| | | |
|--|-----------------------|------------------------------------|
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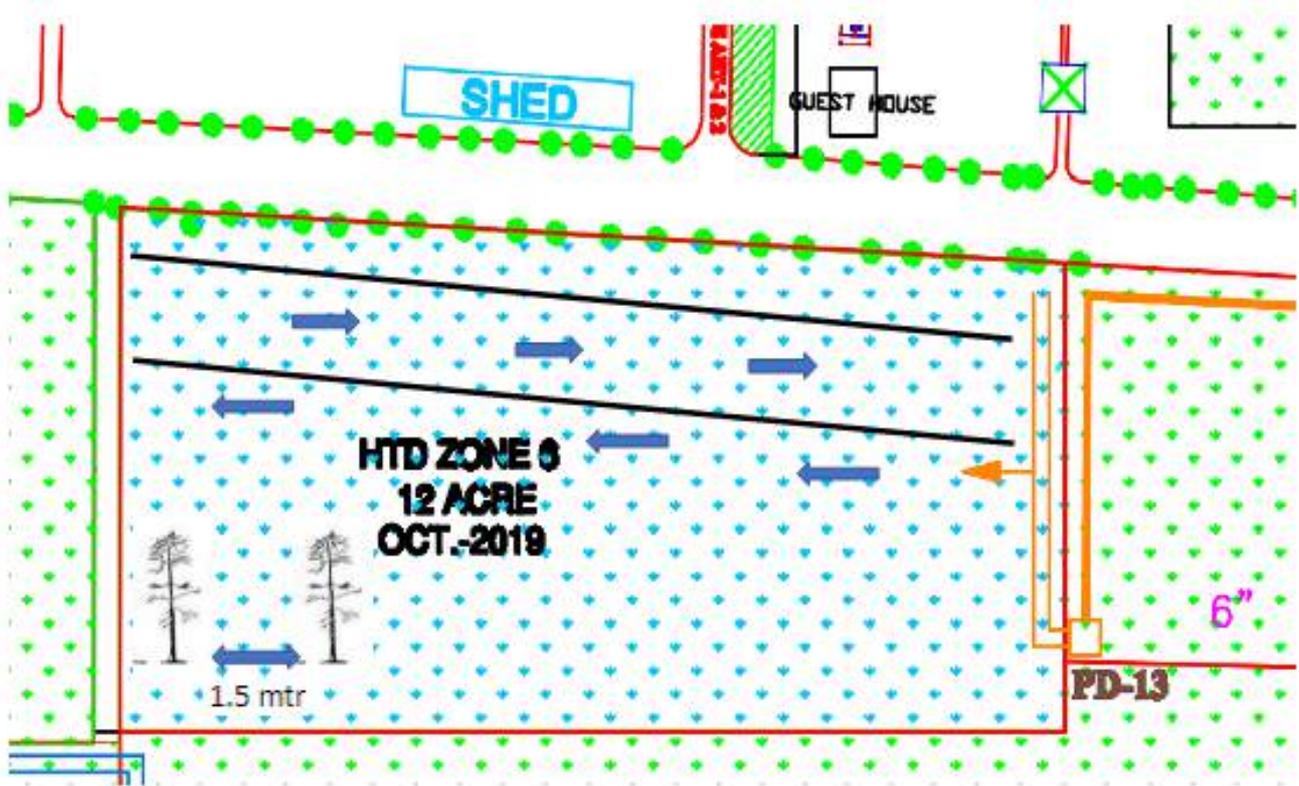
| | | | | | |
|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |



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|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

IRRIGATION PROCESS



| Ridges | |
|--------|---------|
| Wide | 1 meter |
| High | 50 cm |

| Furrow | |
|--------|---------|
| Wide | 2 meter |

| | | |
|--------------------|-----------------------|------------------------------------|
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STANDARD OPERATING PROCEDURE

| | | | | | |
|-----------------------|----------------------------|-----------------|--------|----------------------------------|------------------------|
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

EFFLUENT GENERATION & PROPOSED CONSUMPTION PLAN

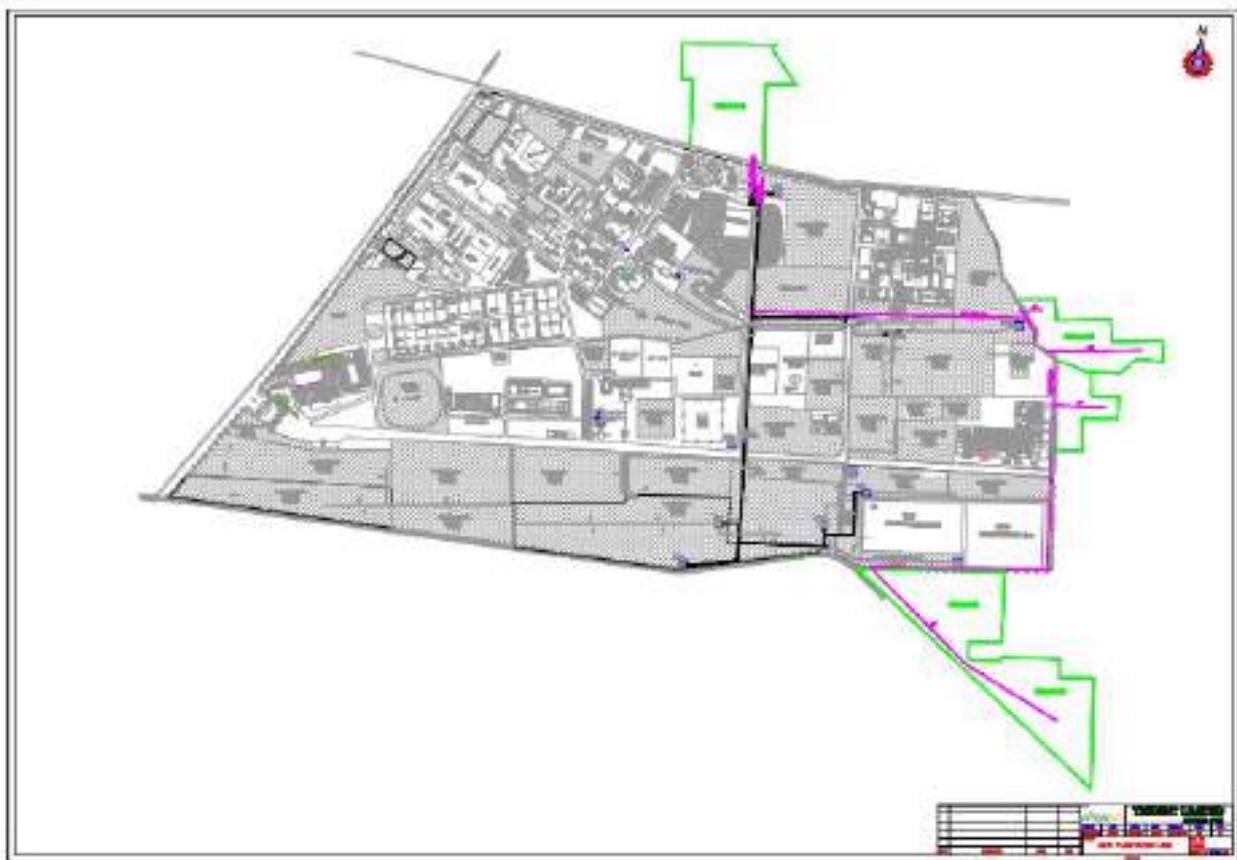
PROPOSED SCENARIO

| S NO. | DESCRIPTION | UOM | HTD | PCD | TOTAL |
|-------|--|---------|-------|-------|-------|
| 1 | TOTAL EFFLUENT GENERATION | KLD | 6500 | 19000 | 25500 |
| 2 | TREATED WATER INTO PLANTATION | KLD | 6500 | 19000 | 25500 |
| 3 | TOTAL AREA OF PLANTATION REQUIRED | ACRE | 93 | 237.5 | 330 |
| 4 | EXISTING LAND | ACRE | 48.5 | 165 | 214 |
| 5 | NEW LAND REQUIRED | ACRE | 44 | 72.5 | 117 |
| 6 | EFFLUENT CONSUMPTION | KL/ACRE | 70 | 80 | 80 |
| 5 | UTILIZATION OF TREATED WATER ONTO PLANTATION | % | 100.0 | 100.0 | 100.0 |

| | | |
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|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ADDITIONAL LAND LAYOUT AND PIPING



| | | |
|--|-----------------------|------------------------------------|
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Charter for Water Recycling & Pollution Prevention in Pulp & Paper Industries (Specific to Ganga River Basin States)



A.K.Vidyarthi
Additional Director
Central Pollution Control Board
Delhi

April, 2015

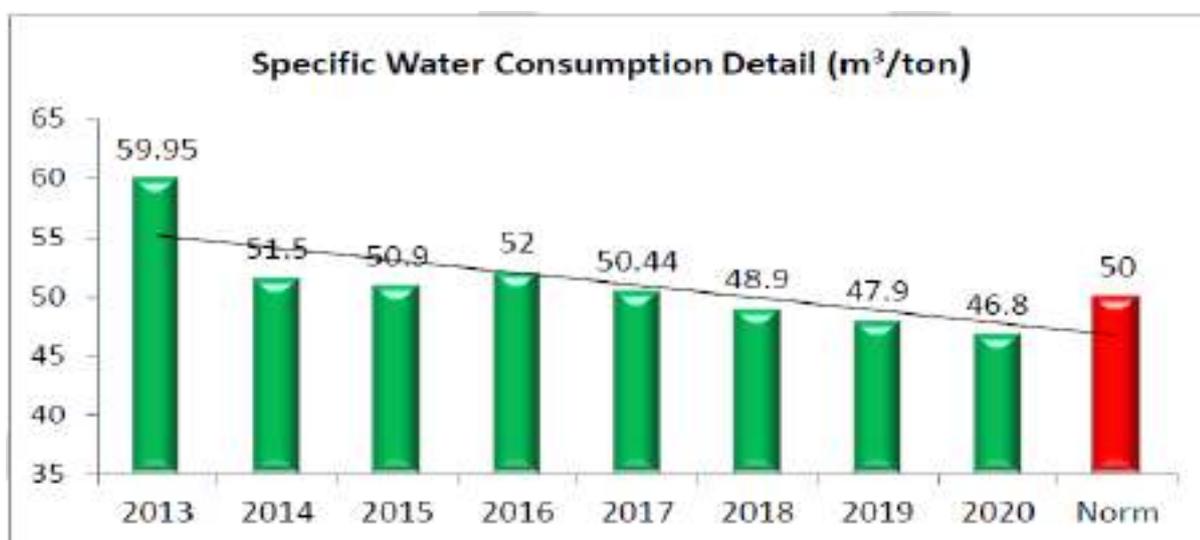
Fresh Water Consumption Norms (m³/t of product)

| Category | Short Term Objectives | Long Term Goals |
|---|-----------------------|-----------------|
| A1: Wood Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint | 60 | 50 |
| A2: Wood Based Pulp & Paper Mills producing unbleached grades of chemical pulps, papers and paperboards | 40 | 25 |
| B1: Agro Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint | 60 | 50 |
| B2: Agro Based Pulp & Paper Mills producing unbleached grades of papers and paperboards | 40 | 25 |
| C1: RCF & Market Pulp Based Paper Mills producing bleached grades of papers, paperboards & newsprint | 20 | 15 |
| C2: RCF & Market Pulp Based Paper Mills producing unbleached grades of papers and paperboards | 15 | 10 |
| D : RCF & Market Pulp Based Specialty Paper Mills[#] | 60 | 50 |
| <p>Notes:</p> <ol style="list-style-type: none"> 1. Short and Long Term norms become applicable 1yr, and 2 yrs respectively, from the date of notification of Charter. Long Term norms will be reviewed after 18 months. 2. “#” applies to mills that manufacture only specialty papers 3. "tpd" refers to Air-Dry (ADt) for pulp; Saleable weight for paper. 4. Not applicable to mills at ZLD | | |

| | | | | | |
|-------------------------------------|-----------------------------------|-----------------|--------|---|-------------------|
| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | PAPER CHEMICAL DIVISION | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WATER CONSUMPTION |
| PROCESS : | WATER REDUCTION MEASURES AND DATA | | | | |

Paper Business

Trident Paper division has already achieved its long-term target of specific water consumption in Paper business of 50 m³ /T by executing different projects.



| Sr. No. | Year | Water Consumption | Paper Production | Specific Water Consumption |
|---------|---------|-------------------|------------------|----------------------------|
| | UOM | KLD | TPD | Ltr/Kg |
| 1 | CY-2017 | 21054 | 417 | 50.4 |
| 2 | CY-2018 | 20384 | 417 | 48.9 |
| 3 | CY-2019 | 19963 | 417 | 47.9 |
| 4 | CY-2020 | 16942 | 362 | 46.8 |

The industry has further taken projects to reduce its water consumption which is attached follow The mill has adopted certain water conservation measures namely:

| | | |
|--|--------------------|-----------------------------------|
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|-------------------------------------|-----------------------------------|-----------------|--------|---|-------------------|
| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | PAPER CHEMICAL DIVISION | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WATER CONSUMPTION |
| PROCESS : | WATER REDUCTION MEASURES AND DATA | | | | |

- **Automation of water treatment plant for optimum water consumption in various process operations.**
- **Installation of flow meter in various distribution pipelines as well as secondary clarifier outlet.**
- **Installation of Wet Wash Clarifier to reuse the clarified wet washings to maximum extent.**
- **Carrying out of straw fibre line operations at high consistency (less water consumption)**
- **Adoption of twin roll press for reduced water consumption in pulp washing.**
- **Adoption of poly disc filter for reuse / recycling of paper machine back water into paper machine.**
- **Optimisation of shower nozzle diameter on paper machine.**
- **Utilisation of black liquor secondary condensate from chemical recovery in raw material washing in SFL and lime mud washing.**
- **Utilisation of treated effluent for irrigation / land application.**

The plant has implemented additional measures for water conservation during 2020-21 which has further reduced the freshwater consumption.

| | | |
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| RAM ASHISH | SUS/PB/SW -02 | |
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STANDARD OPERATING PROCEDURE



| | | | | | |
|---------------------------|-----------------------------------|-----------------|--------|--------------------------------------|-------------------|
| BUSINESS/ UNIT | PAPER CHEMICAL DIVISION | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WATER CONSUMPTION |
| PROCESS : | WATER REDUCTION MEASURES AND DATA | | | | |

| S. No. | Water Conservation Measures | Impact on Fresh water Consumption |
|--------|--|--|
| 1 | Reuse of sealing water in wet wash in SFL | Reduction in fresh water consumption from 17.98 m ³ /t of bleached pulp to 16.18m ³ /t of bleached pulp in SFL Total Saving : 400 m ³ /day |
| 2 | Reduction of number of water showers in press section | |
| 3 | Use of Treated Effluent for preparation of Lime Slurry at ETP | Total Saving : 50 m ³ /day |
| 4 | Reuse of sealing water for bleaching, digester and washing area in WFL | Reduction in fresh water consumption from 7.6 m ³ /t of bleached pulp to 7.2 m ³ /t of bleached pulp in WFL Total Saving : 50 m ³ /day |
| 5 | Replacement of RO Membranes in Power House | Total Saving : 270 m ³ /day |
| 6 | Increase in Cycle of Concentration (CoC) based upon hardness values. | Reduction in fresh water consumption by 75 m ³ /day in cooling tower of cogeneration plant |
| | Total Fresh Water Saving | 875 m³ / day |

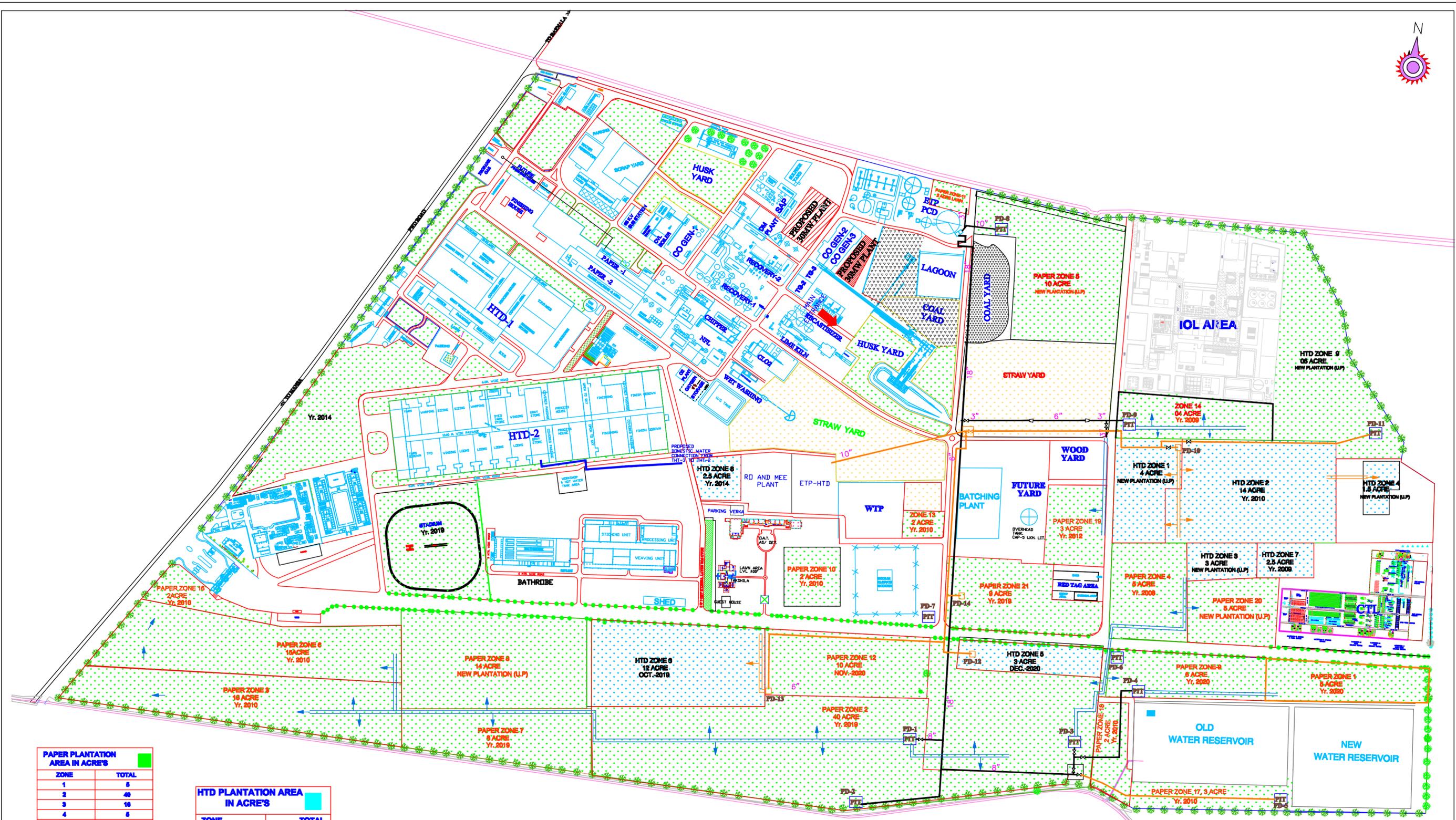
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|-------------------------------------|-----------------------------------|-----------------|--------|---|-------------------|
| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | PAPER CHEMICAL DIVISION | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WATER CONSUMPTION |
| PROCESS : | WATER REDUCTION MEASURES AND DATA | | | | |



Due to its continuous efforts, the industry was also rewarded in water and waste management company within the Excellence Reward in Paper Business by Confederation of Indian Industry.

| | | |
|--|--------------------|-----------------------------------|
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| PAPER PLANTATION AREA IN ACRES | |
|--------------------------------|------------|
| ZONE | TOTAL |
| 1 | 5 |
| 2 | 40 |
| 3 | 10 |
| 4 | 5 |
| 5 | 10 |
| 6 | 10 |
| 7 | 8 |
| 8 | 14 |
| 9 | 6 |
| 10 | 2 |
| 11 | 2 |
| 12 | 10 |
| 13 | 2 |
| 14 | 4 |
| 15 | 2 |
| 16 | 2 |
| 17 | 3 |
| 18 | 2 |
| 19 | 3 |
| 20 | 5 |
| 21 | 9 |
| TOTAL | 108 |

| HTD PLANTATION AREA IN ACRES | |
|------------------------------|-------------|
| ZONE | TOTAL |
| 1 | 4 |
| 2 | 14 |
| 3 | 3 |
| 4 | 1.5 |
| 5 | 3 |
| 6 | 12 |
| 7 | 2.5 |
| 8 | 2.5 |
| 9 | 6 |
| TOTAL AREA | 48.5 |

| | |
|-----------------------|------------------|
| COAL YARD AREA | 10970 SQM |
| COAL YARD AREA | 14825 SQM |
| TOTAL AREA | 33795 SQM |

LEGEND

- PAPER PLANTATION
- HTD PLANTATION
- PAPER PIPE LINE
- HTD PIPELINE
- PAPER WATER CHANNEL

GROUND WATER LEVEL = 39.5 - 40.8 MTR.

| REV. | DESCRIPTION | APPD. | DATE | REV. | DESCRIPTION | APPD. | DATE |
|------|-------------------------------|--------------|----------|------|-------------------------------|--------------|----------|
| 1 | ADDED THE PROPOSED LAND | KULVINDER | 14/05/12 | 1 | UPDATED AS PER SITE | RAJAT MONGA | 17/07/17 |
| 2 | PROPOSED AREA FOR DEVELOPMENT | R.K. THAKRAL | 12/01/13 | 2 | 03 FRESH WATER PONTS ADDED | RAJAT MONGA | 21/11/14 |
| 3 | ADDED THE PROPOSED LAND | KULVINDER | 14/05/12 | 3 | 05 ACRE ADDED NEAR CTL | D.P. SINGH | 13/02/14 |
| 4 | 03 FRESH WATER PONTS ADDED | RAJAT MONGA | 21/11/14 | 4 | 06 ACRE ADDED NEAR CTL | D.P. SINGH | 13/02/14 |
| 5 | UPDATED AS PER SITE | RAJAT MONGA | 17/07/17 | 5 | PROPOSED AREA FOR DEVELOPMENT | R.K. THAKRAL | 12/01/13 |

TRIDENT LIMITED
SANGHERA - 140101

DATE: 12/01/13
CAD: VIFAN
CKD: ASHISH
APP: RAJAT
SCALE: 1MM=50MTR

DHAULA COMPLEX PLANTATION
SHEET-1 OF 1 REV. 06



Sophisticated Analytical Instruments Laboratories Society
 (Registered as Society with Registrar of Firms & Societies, Punjab, Chandigarh)
 Thapar Technology Campus, Bhadson Road, Patiala-147 004 (India)



Performance Study of ETP Plant of Paper
 Chemical Division (PCD)
 Trident Limited, Barnala, Punjab

Prepared by:
 Dr. Raj Kumar Gupta
 Professor, Department of Chemical Engineering, TIET, Patiala
 On behalf of:
 Sophisticated Analytical Instrument Laboratories
 Thapar Institute of Engineering & Technology

Recommendations

Based on the above study the following action point are recommended to be undertaken to improve the performance of the waste water treatment plant:

1. BOD to COD ratio at USBR inlet is 0.2, which is on lower side. This ratio may be improved by reducing the COD, i.e., the COD caused by suspended particles. It is recommended to install a suitable unit operation for the removal of this COD. This will help in improving the efficiency of the USBR. Also, the sludge that will be generated in the separation system may be sold or burned as boiler fuel.
2. Food to Biomass (F/M) ratio in the aeration tank 1 (AT1) is 0.56, which is on the higher side. It should be kept less than 0.4. It is recommended that the total inlet flow be split into two parts. One part of the flow should be sent to AT1 and the other part be sent to AT2.
3. Oxygen being supplied in AT1 based on the current F/M ratio is less. After the flow diversion to AT2, the quantity of oxygen supplied will become adequate.
4. Food to Biomass (F/M) ratio in the aeration tank 2 (AT2) is 0.06, which is on the lower side. For better performance of the system, it is recommended to keep this ratio above 0.1. The action suggested at point no. 3, would also help in improving the F/M ratio of AT2.
5. The recommendation for action point 4 would lead to higher demand of oxygen in AT2. A suitable system for the increased oxygen demand should be put in place in AT2.
6. It is further recommended that a suitable arrangement for the online measurement of the dissolved oxygen (DO) should be installed for continuous monitoring of oxygen levels in AT1 and AT2.

R.K. Gupta
 15/12/2020
 Dr. R. K. GUPTA
 Professor
 Department of Chemical Engineering
 Thapar Institute of Engineering & Technology
 (Deemed to be University)
 Patiala - 147004, Punjab (INDIA)

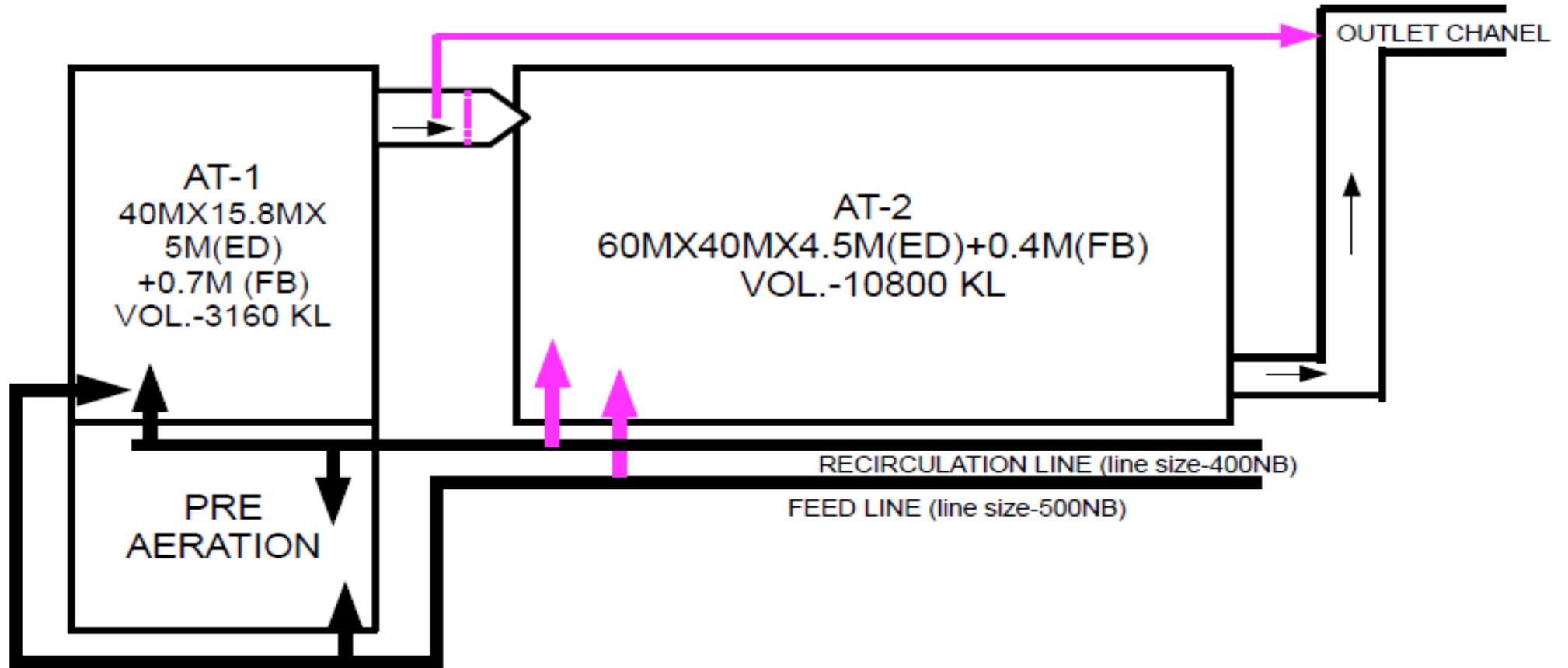
| S No. | Recommendations of Thapar Study to improve ETP performance | Action Point | Status |
|-------|--|---|---|
| 1. | BOD to COD Ratio at USBR inlet is 0.2 , which is on lower side . This ratio may be improved by reducing the COD, i.e., the COD caused by suspended particles. It is recommended to install a suitable unit operation for the removal of this COD. This will help in improving the efficiency of the USBR. Also, the sludge that will be generated in the separation system may be sold or burned as boiler fuel. | The industry has just recently installed and commissioned suitable technology including DAF and Screw Press for the removal of COD caused by suspended particles to improve the efficiency of USBR. This was also a joint committee recommendation point which has been completed . The biomass generated from this system is being utilized in boiler as a biomass fuel also resulting in carbon foot print reduction . | Complied |
| 2 | Food to Biomass (F/M) ratio in the aeration tank 1 (AT1) is 0.56, which is on the higher side. It should be kept less than 0.4. It is recommended that the total inlet flow be split into two parts. One part of the flow should be sent to AT1 and the other part be sent to AT2. | The industry will install a pipeline along with valves to divert the inlet flow into Aeration Tank 2 to reduce the ratio from 0.56 to < 0.4 . This will be completed by 5 Feb 2021. | Complied |
| 3 | Oxygen being supplied in AT1 based on the current F/M ratio is less. After the flow diversion to AT2, the quantity of oxygen supply will become adequate. | This point will be closed after the completion of action of S No. 2 | Complied |
| 4 | Food to Biomass (F/M) ratio in the aeration tank 2 (AT2) is 0.06, which is on the lower side. For better performance of the system, it is recommended to keep the ratio above 0.1. The action suggested at point no. 3, would also help in improving the F/M ratio of AT2. | This point will be closed after the completion of action of S No. 2 | Complied |
| 5 | The recommendation of action point 4 would lead to higher demand of oxygen in AT2. A suitable system for the increased oxygen demand should be put in place in AT2. | The industry will install new advanced aerators with high oxygen transfer efficiency (2.2 Kg/kwh from existing 1.0 Kg/Kwh) . The total investment of the project is 248 Lacs and this will be installed , commissioned and stabilized by 20 Feb . | Complied. Advanced aerators has been installed after making an project investment of 209 lacs. Vendor Scope 110 Lacs. |

TECHNOLOGY UPGRADATION TO INCREASE OXYGEN HANDLING CAPACITY FROM 100 KG/HR TO 264 KG/HR (AERATION TANK 2 – PAPER ETP)

HIGH EFFICIENCY ADVANCED AERATORS – 2.2 Kg/KWH (Oxygen Transfer Efficiency)
Earlier Efficiency – 1.0 Kg/KWH



PIPE LINE DIVERSION COMPLETED TO REDUCE LOADING ON AERATION TANK 1



EXISTING



MODIFICATION

STORY OF INNOVATIVE PROJECTS AT ETP

In the journey of innovative projects we recently did the projects in area of ETP with the below main objectives:

- ❖ To reduce the ETP inlet load by recovery of biomass from washing effluent through adoption of DAF & Screw Press technology.

The above projects were implemented in collaboration with Krofta India, Bellmer Germany.

The projects were completed by the hard efforts of all respective team members including civil, process, electrical, mechanical, instrumentation and administration.

The implementations of projects have given following advantages:

- a) Reduction in load to ETP.
- b) Recovery of Biomass and usage as co incineration fuel.
- c) Reduction in GHG Emissions (Carbon foot print).

The implantation of above projects has motivated the team.



DAF



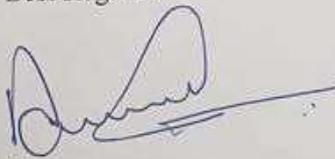
Screw Press

| Wet Wash load reduction details By Installation of DAF | | | | |
|---|-----------------------|--|---------|---|
| Sr. No. | Month | UASB inlet COD (Before Installation of DAF) (in PPM) | Month | UASB inlet COD (After Installation of DAF) (in PPM) |
| 1 | May-20 | 5087 | Nov-20 | 3627 |
| 2 | Jun-20 | 5604 | Dec-20 | 3846 |
| 3 | Jul-20 | 5769 | Jan-21 | 3876 |
| 4 | Aug-20 | 6065 | Feb-21 | 3914 |
| 5 | Sep-20 | 5896 | Mar-21 | 4539 |
| 6 | Average | 5684 | Average | 3960.4 |
| 7 | Reduction of COD load | | % | 30.3 |

This is in reference to our institute collaboration with your organization for color removal project from the effluent stream. We really thank you for showing faith in our organization for carrying out the this feasibility study. We would like to mention here that we had been in discussion with your organization since February 2021 and collected the samples accordingly as per the project allocated to us. However due to pandemic, work could not be started as our institute was closed. Research scholars were not allowed to work in the labs. Now as per the instructions from the government, institutes are open and research activities have started. We have initiated the preliminary trails for color removal using some advanced techniques and hopefully complete the project with 2-3 months.

We are really looking forward to have more promising results in next trials.

Best Regards



Dr. Anoop Verma
Associate Professor and Head
School of Energy and Environment
Thapar Institute of Engineering and Technology, Patiala-147004
email: anoop.kumar@thapar.edu
Ph: 09815654776(M)

RICHESH SAMANTARAY

From: RAJAT MONGA
Sent: 09 October 2021 16:27
To: RICHESH SAMANTARAY
Subject: FW: Regarding the extension of the Allotted project_Thapar Institute

Thanks & Regards



Rajat Monga
DC | Sustainability Pb
Sustainability Pb
Dhaura

Corporate Address:



E-212 Kitchlu Nagar, Ludhiana - 141001 , Fax : +91 161 5039900
Mob. +91-+919878997508 | Toll Free No.1800-180-2999 (Extn. 2708)
| rajatmonga@tridentindia.com
Visit us at <http://www.tridentindia.com>  _ _ _ _

From: Anoop Kumar <anoop.kumar@thapar.edu>
Sent: 28 September 2021 11:20
To: RAJAT MONGA <rajatmonga@tridentindia.com>; SOURAV CHOUDHARY <SouravChoudhary@tridentindia.com>
Subject: Regarding the extension of the Allotted project_Thapar Institute

*****EXTERNAL EMAIL: Treat hyperlinks and attachments in this email with caution*****

Dear Mr. RAJAT and SOURAV

Hope you are doing well. As mentioned in subject matter, you are kindly requested to extend the allotted project for colour removal which was allotted to Thapar Institute. **The project was allotted in April 2021 and was supposed to end on September 30, 2021.**

Actually the project started late due to COVID restrictions and the first 2-3 months didn't contribute much to our targets.

Now we are on track and getting very good results in terms of colour and COD reduction. We will soon submit the interim report for your reference.

In this context, you are kindly requested to extend the project for **another two months** so that we can really optimize the process.

Note: No financial liability is involved in this extension.

Submitted for your kind consideration,

Best Regards

Dr. Anoop Verma
Associate Professor and Head
School of Energy and Environment
Thapar Institute of Engineering and Technology, Patiala-147004

*Affiliate Faculty—Virginia Tech- TIET
Center of Excellence in Emerging Materials
Thapar Trinity Fellow*

email: anoop.kumar@thapar.edu, anoop_tiet@yahoo.co.in
Ph: 09815654776(M)

<http://scholar.google.co.in/citations?user=HZHZGVUAAAAJ&hl=en>

<https://orcid.org/0000-0003-2818-6348>

Click [here](#) to report this email as spam.

Feasibility of using Advanced Oxidation Processes (AOPs) as pre or post treatment option for treating industry waste water: An approach towards reuse of treated trade effluent for the industry



Submitted by:

Dr. Anoop Verma

Associate Professor and Head

School of Energy and Environment

Thapar Institute of Engineering and Technology, Patiala.



1. Scope of work:

There is wider demand and scope for industries to approach Zero Liquid Discharge (ZLD) using appropriate technologies. Accordingly, ZLD industries will need to develop a technology which can treat their own wastewater so as to recycle and reuse the same. Especially when we talk about Pulp and Paper (P&P) industry a fastest growing sector around the world which highly demands freshwater utilization for their processes. P&P industry using best technologies for treating their waste water but presence of colour in their wastewater even after secondary treatment restrict any further applications. The methods used for colour removal, as per the technology available so far, are quite expensive and less efficient. Hence certain technological interventions need to be successfully implemented in different stages of industrial treatment system for colour removal.

2. Proposed technology:

With deliberation to the industry, Thapar team proposes the technology to remove the colour from various possible sections of the industry.

To cover the former mentioned drawbacks our study will try to incorporate two processes i.e. advance treatment techniques as dual technology to efficiently overcome the problem of industry, and the plus point of our technology is zero sludge or waste generation as it converts the organic contaminants to simple water and carbon dioxide. Best efforts would be made to integrate the in-situ dual effect (photocatalysis and photo-Fenton) at various stages of the selected pulp and paper making industry. Photocatalysis is considered an effective system for the mineralization of many organics through the generation of HO• and O₂•⁻ radical, reducing the organic load of effluents as this technology converts the harmful substances to water and carbon dioxide which are non-toxic. The principle of photocatalysis involves the initial absorption of photons with energy equal to or greater than the bandgap energy of the semiconductor, leading to the formation of electrons and holes (Sujatha et. al., 2020). In photo-Fenton when the system is irradiated with UV or visible light, the photo-reduction of ferric to ferrous ions is promoted concomitantly with the generation of additional HO• (Romero et. al., 2016). These two technologies have shown their proficiency in removing colour or treating wastewater of the P&P (Kumar et. al., 2011) industry as well as the textile industry (Tian et. al., 2020). The proposed study attempts to incorporate the in-situ dual processes (Photocatalysis and photo-Fenton) in fixed-mode to visualize its feasibility to

treat different streams of P&P industry. The study also incorporates the idea of circular economy by using waste materials in fabrication of composite to make it more cost effective.

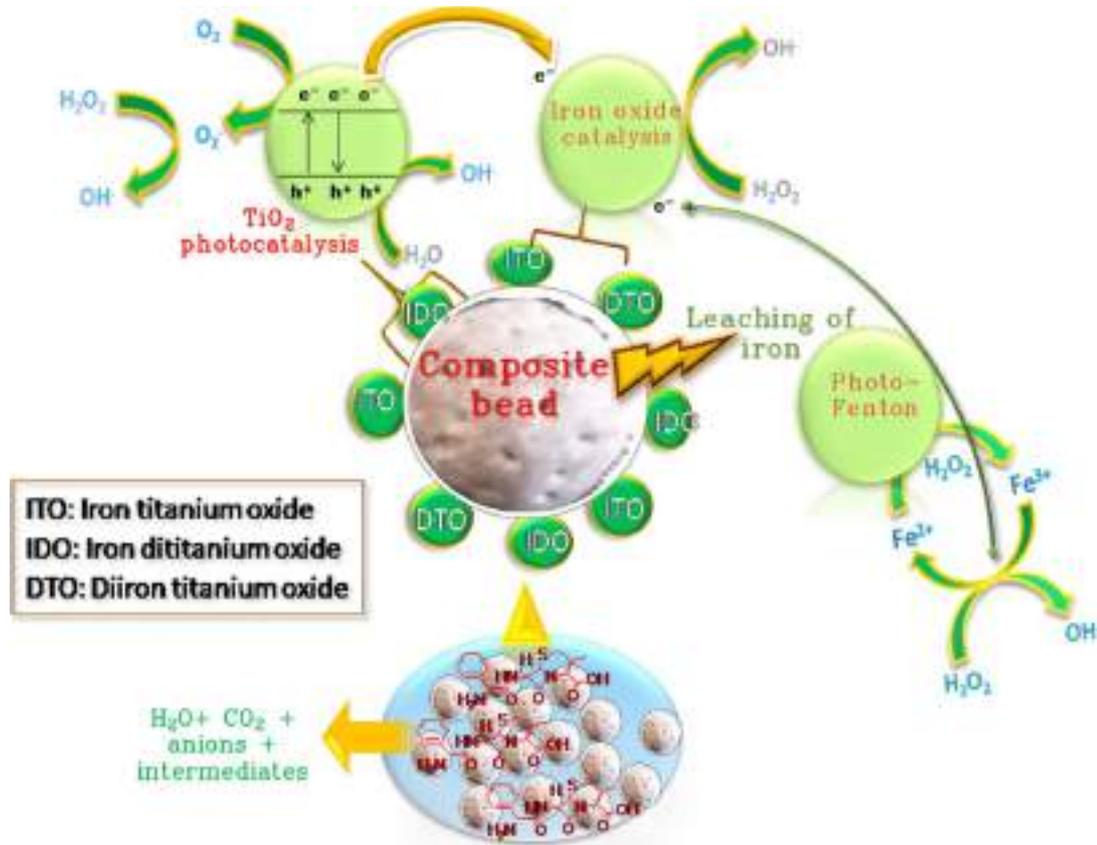


Fig. 1 Concept of in-situ dual effect of both photocatalysis and photo-Fenton.

Fig. 2 shows targeted streams to be worked upon. To start with, we have worked on the final stream i.e. O/L. Presently we have optimized the batch scale study and came up with some delightful outcome as results of colour removal. Fig. 3 depicts the graph of % colour from the selected stream. Fig. 4 shows initial and final absorbance of the untreated and treated sample using UV-vis spectrophotometer. The decrement in UV region of final sample shows the effective removal of the colour of final stream which is also clearly visible in the solutions in testubes.

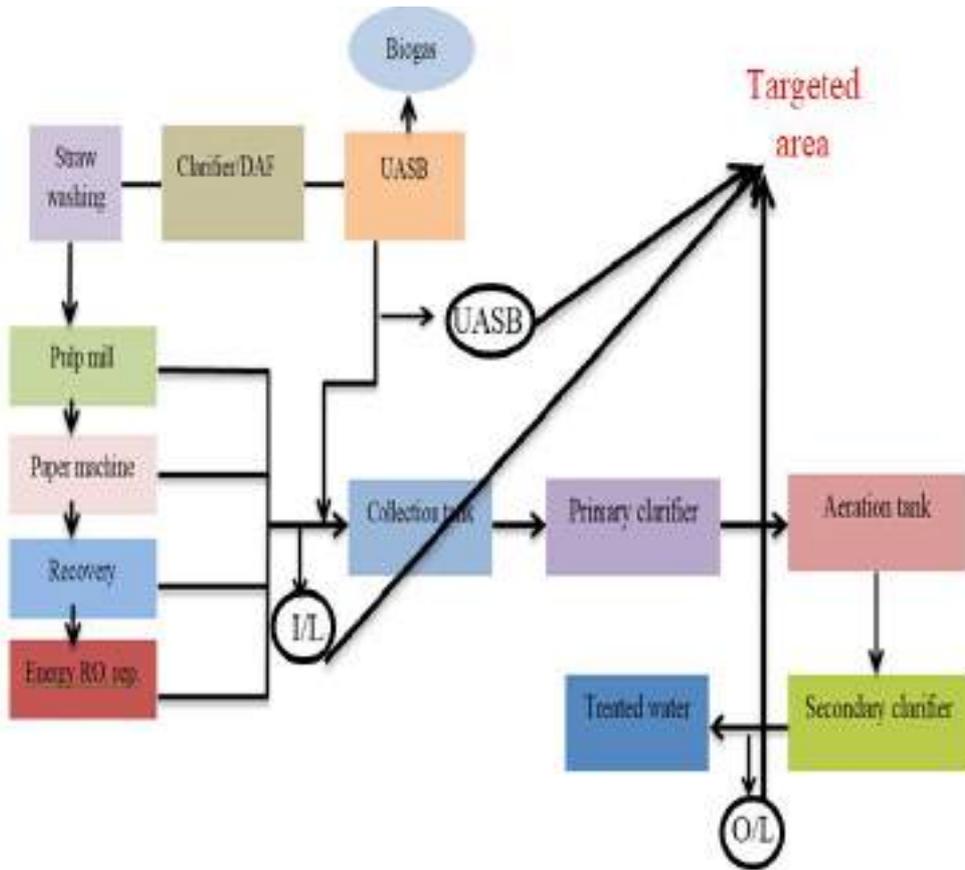


Fig. 2: Targeted streams of industry

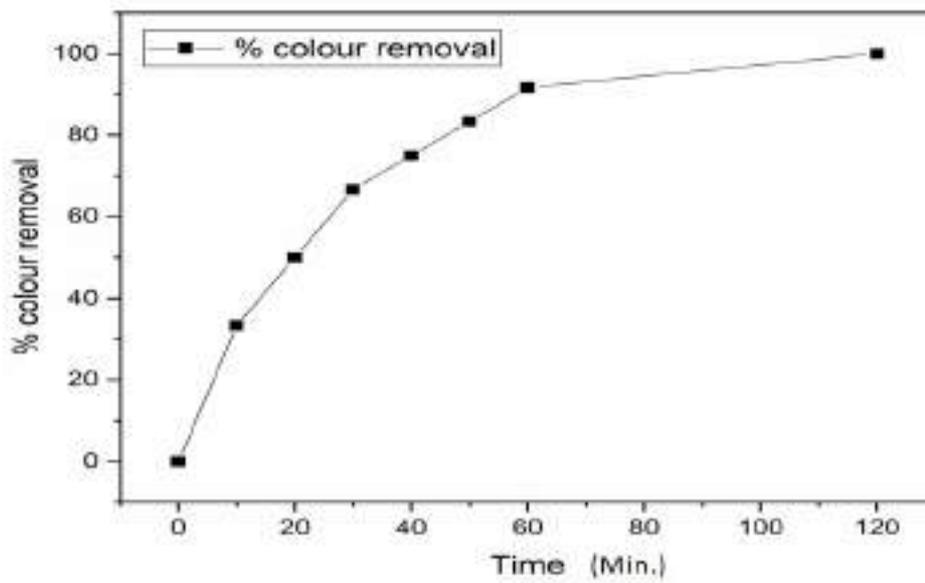


Fig.3: Graph of % colour removal with respect to time of treatment.

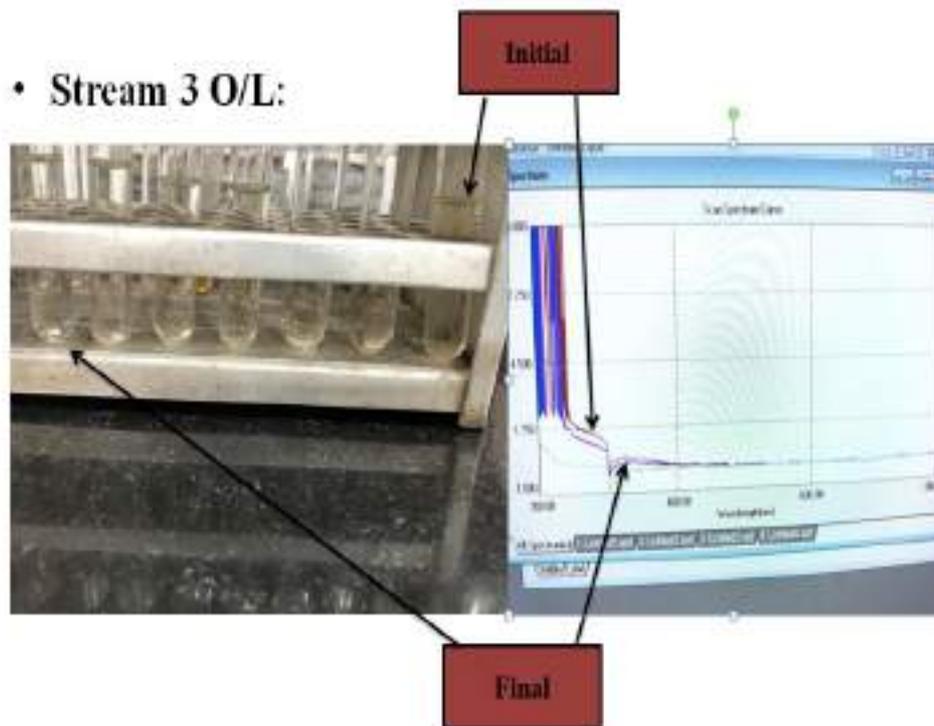


Fig.4: Spectroscopic analysis of O/L after treatment.

3. Future plans:

- Currently we are working on final effluent but in near future we will start optimization studies and hit and trials on other streams i.e. UASB and I/L as well.
- Further testing and process optimization will be done by varying factors like catalyst dose, time, oxidant dose, pH etc.
- Best efforts would also be made to study dual effect in once through process using fixed bed reactors. Furthermore, this study will try to increase the process economics and will suggest the suitable steps to be taken to the concerned industry for further applications.

Dear Sir/ Madam ,

We are pleased to place the Purchase Order no. 7600006838 on your esteemed organization as per the terms & conditions agreed upon.

Any discrepancy regarding the acceptance of Purchase order including the terms and conditions mentioned therein is to be intimated to the Company within 24 hours of its receipt.

In case, no communication intimating any discrepancy is received by the Company in writing with in 24 hours of the receipt of Purchase Order, the Purchase Order shall be considered to have been accepted by you.

We would also request you to kindly share the progress of the said order on weekly / monthly basis with the under mentioned Email Id

Thanking You

For Trident Limited



E-212, KITCHLU NAGAR, LUDHIANA 141001

Contact No. : 9878999481

Email : jasbirpurchase@tridentindia.com

Purchase Team .



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | | | | | | | |
|---|--|--|--|--|--|--|------------------|------------|-----------------|------------|
| Vendor 850275 JAY WATER MANAGEMENT PVT LTD 239,GROUND FLOOR,PATPARGANJ INDUSTR DELHI 110092 Country India Vendor GSTIN No. 07AABCJ6770C1ZP | Ship To | | | Bill To | | | PO Number | 7600006838 | Dated | 30.10.2020 |
| | TL - Dhaura Energy 2 P&C Division,Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 | | | Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 | | | Our Ref. | 13760 | Currency | INR |
| | Mobile 9878999481 jasbirpurchase@tridentindia.com | | | Mobile 9878999481 jasbirpurchase@tridentindia.com | | | Your Ref. | offer | | |
| | PO Status :- Valid/Approved Quality Certificate :- Required | | | | | | | | | |

| S.No. | Item Code | UOM/ Brand | Order Qty. | Basic Rate | Discount | PKG-FWD | HSN/SAC | CGST/SGST/IGST/ C.Cess | Coal Cess | Item Value | Cancellation Date | Plant |
|-----------|--|---------------|---------------|------------|----------|---------|------------|---------------------------|--------------|--------------|----------------------|----------------------|
| 0000 1 | 811010280 MEMBRN FILTR-POLYAMD-0.001MIC-40"-8"-ROU TORAY MEMBRANES TM720D-400 | NOS/ TORAY | 72.000 | 26,500.00 | 0.00 | 0.00 | 8421.99.00 | 0.00 /0.00 /18.00 | 0.00 | 2,251,440.00 | 25.11.2020 | TE02 ENERGY-2 |
| | | | | INR/ 1 NOS | 0.00 | 0.00 | | 343,440.00 | | | | |

Total Value 2,251,440.00 INR

Total Value:INR TWENTY TWO LAKH FIFTY ONE THOUSAND FOUR HUNDRED FORTY Rupees



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

Vendor 850275
JAY WATER MANAGEMENT PVT LTD
239,GROUND FLOOR,PATPARGANJ INDUSTR
DELHI
110092
Country India
Vendor GSTIN No. 07AABCJ6770C1ZP

Ship To
TL - Dhaura Energy 2
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - (Paper & Chemical Division)
Mansa Road, Dhaura
BARANALA (PUNJAB)
148101
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006838 | Dated | 30.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

Price Basis: EXW DELHI

Freight : F

Special Instruction

Payment Terms: Due Net in 30 Days **Octroi:** As per Documentary Evidence

Transportation Mode: By AIR /RAIL /SEA /COURIER /ROAD **Transit Insurance** TO BE ARRANGED BY US.

The consignment shall be accepted only if accompanied by Original Invoice for Buyer and Duplicate for Transporter failing which the consignment shall be returned at your risk and cost .

Terms and Conditions As mentioned overleaf

Cancellation Date As above

Our Banker: State Bank of India, Industrial Finance Branch, Golden tower, Dholewal Chowk, Ludhiana

GSTIN No.. 03AABCA4139J1Z0

This is computer generated Purchase Order.Hence requires no signature.



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

Vendor 850275
JAY WATER MANAGEMENT PVT LTD
239,GROUND FLOOR,PATPARGANJ INDUSTR
DELHI
110092
Country India
Vendor GSTIN No. 07AABCJ6770C1ZP

Ship To
TL - Dhaura Energy 2
P&C Division,Mansa Road
Dhaura, Barnala (Punjab)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - (Paper & Chemical Division)
Mansa Road, Dhaura
BARANALA (PUNJAB)
148101
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006838 | Dated | 30.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Master Inspection Characteristics(MIC) | Upper Specification Limit | UOM | Target Specification Limit |
|-------|-------------------------------|---|---------------------------|-----|----------------------------|
|-------|-------------------------------|---|---------------------------|-----|----------------------------|



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

Vendor 850275
JAY WATER MANAGEMENT PVT LTD
239,GROUND FLOOR,PATPARGANJ INDUSTR
DELHI
110092
Country India
Vendor GSTIN No. 07AABCJ6770C1ZP

Ship To
TL - Dhaura Energy 2
P&C Division,Mansa Road
Dhaura, Barnala (Punjab)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - (Paper & Chemical Division)
Mansa Road, Dhaura
BARANALA (PUNJAB)
148101
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006838 | Dated | 30.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Mat. Classification | PO Material Text |
|-------|---|---------------------|------------------|
| 00001 | 811010280 MEMBRN FILTR-POLYAMD-0.001MIC-40"-8"-ROU | Standard | |



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

Vendor 850275
JAY WATER MANAGEMENT PVT LTD
239,GROUND FLOOR,PATPARGANJ INDUSTRIAL
DELHI
110092
Country India
Vendor GSTIN No. 07AABCJ6770C1ZP

Ship To
TL - Dhaura Energy 2
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
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Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006838 | Dated | 30.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

DELIVERY SCHEDULE

| S.NO | Item Code Item Description | UOM | PO Qty | Scheduled Date | Sch Qty | Delivered Qty | Open Qty as on 09.10.2021 | Contract No | Remaining Contract Value/Qty |
|-------|---|-----|--------|-------------------|---------|---------------|------------------------------|-------------|---------------------------------|
| 00001 | 811010280 MEMBRN FILTR-POLYAMD-0.001MIC-40"-8"-ROU | NOS | 72.000 | 25.11.2020 | 72.000 | 72.000 | 0.000 | | 0.00 |

Terms and Conditions

This Purchase Order is subject to all terms, conditions and specifications hereinafter set forth and acceptance of order by the Seller shall be deemed to be an agreement that the order is subject to all of said terms, conditions and specifications.

General

Non Acceptance of Purchase order with its terms and conditions is to be intimated to the Purchaser within 24 hours of its receipt, else the same shall be assumed to be accepted at the discretion of the Purchaser. No deviation to this order shall be honoured unless authorized in writing.

Purchase Order number, material code and GST IN of the Purchaser should be mentioned on each and every invoice. An invoice should not have more than 8 line items in it. Different Invoice should be raised for different Purchase Orders issued by the Purchaser.

The Seller shall be responsible for mentioning the correct details in the invoice, including HSN and GST rate of goods supplied to the Purchaser.

The Seller represents and warrants that it shall comply with the Laws pertaining to GST and other applicable indirect taxes and the requirements therein. The Seller shall be liable for all losses and damages suffered by the Purchaser due to any action or omission or mistake of the Seller.

The Seller shall unconditionally submit its account statement on Quarterly basis for reconciliation.

Weights / quantities as recorded by the Purchaser shall be final and binding on the Seller.

This Purchase Order shall not be amended, modified, altered or changed in any way except by writing executed by a duly authorized representative of the Purchaser.

Any other terms & conditions of the Seller mentioned on its Bills,Invoices, e-mails or any other documents shall not be binding on the Purchaser unless accepted in writing by the Authorized Representative of the Purchaser.

The Seller shall not disclose any confidential information pertaining to the Purchaser's business to any third party.

Neither party shall be entitled to assign the rights, interests and obligations without the previous written consent of the other Party.

The Seller shall not offer, solicit or accept an advantage in connection with the procurement of this Purchase Order. Failure to comply with this clause or any act of offering, soliciting or accepting advantage committed by the Seller shall, without affecting the liability of Seller for such failure and act, result in this Purchase Order being invalidated. For the purpose of this clause, Seller shall include its directors, partners, relatives, agents, associates, employees, servants and sub-consultants.

'Advantage' for this purpose shall mean any gift, loan, fee, reward or commission, any valuable security, office, employment, agreement, loan payment/waiver/discharge, bribe of any kind to Government/other officials, any other service or favour or any offer, undertaking or promise, whether conditional or unconditional, of such advantage.

The Seller or its directors, partners, relatives, associates, employees, agents and/ or sub-consultants shall not trade, directly or indirectly, in the shares of the Company during the currency and six months post expiry of this Purchase Order.

Delivery

The material shall be carefully and properly packed for movement by sea/rail/road transport to withstand damages on account of inclement weather, rough handling etc.

The material shall have to be delivered on the date of delivery specified in this Purchase Order. Decision for acceptance/rejection of material on the dates other than that specified in the Purchase Order along with the liquidated damages shall be at the sole discretion of the Purchaser.

The Seller shall not have any right to terminate the Purchase Order. However, the Purchaser reserves the right to cancel any unshipped portion at any time without assigning any reason.

All costs incurred in procurement of material from other source in the event of failure to supply the material on the scheduled date / rejection as per the terms of Purchase Order shall be to Seller's account and at the sole discretion of the Purchaser.

The price mentioned in the Purchase Order is inclusive of packing and handling charges unless otherwise stated therein.

Seller shall share the progress of the order on weekly basis in writing.

If delivery of the material mentioned in the Order occurs later than time specified and provided such delay is neither the result of force majeure nor the result of circumstances for which the Purchaser is responsible, the Purchaser shall be entitled to damages of 0.5% per week or part thereof subject to the maximum of 5% of the Contract price. For purpose of computing damages in the event of delay in delivery of the material, mere despatch of the material within the agreed date of delivery which are not in accordance with the specifications/standards, or found unacceptable by Purchaser would not amount to delivery within the agreed delivery date.

Inspection and Testing

Complete Test / Inspection reports from an approved source / as generated and certified by the Seller should be submitted along with the supply of material. Test reports generated by the Purchaser shall be binding on the Seller and no disputes whatsoever shall be entertained in this regard. Charges for testing, if any, shall be to the Seller's account and the decision to get the same inspected by any third party shall be at the sole discretion of the Purchaser.

Material must conform to all the specifications as specified in the Purchase Order. Any non-conformity identified during any later stage shall be treated as breach of contract and the Seller shall be liable to any penalties imposed at the sole discretion of the Purchaser.

Terms of payment

Original GST invoice should invariably accompany the material failing which the material may be rejected at the sole discretion of the Purchaser.

In the event of denial of input tax credit to the Purchaser on account of any negligence, erroneous or incorrect reporting, non payment of taxes or any other non-compliance made by the Seller in relation to the GST Law, the Purchaser shall be entitled to recover such loss from the Seller along with Interest @18% per annum.

Advances shall be released against submission of Advance Bank Guarantee of equivalent amount. All Advance and Performance Bank guarantee(s) shall be accepted only if they are in Purchaser's format and issued by the Banks recommended by the Purchaser unless otherwise agreed in writing.

Payment other than advances shall be made as specified in the terms and conditions of the Purchase Order and submission of all required documents.

Forms / Permits / Declarations shall be submitted as per the applicable laws/statute.

The prices under this Order shall remain firm until completion of the Contract

Intellectual property/Warranty, Inspection and Liability

Material supplied by the Seller pursuant to this Purchase Order should not infringe any third party intellectual property rights and the Seller further undertakes to indemnify the Purchaser against all claims for infringements of third party patents and/or other intellectual property rights by material supplied under this Purchase Order.

Material supplied by the Seller pursuant to the Purchase Order should have clean title in favour of the Seller before shipment to the Purchaser. Should there be any dispute to the ownership of the material, the Seller would be liable to make good for the costs incurred by the Purchaser to defend the title and the loss of profits due to its inability to use the subjected material, over and above the costs already paid to the Seller.

In the event of any breach of obligations mentioned in the Purchase Order by the Seller, the Purchaser shall be entitled to incidental and consequential damages including loss of profit. The Seller agrees to indemnify and hold the Purchaser, its customers and users of its products, harmless against any suits, damage or claim or any other expense resulting from a breach or alleged breach of the Seller's obligations including warranty, pursuant hereto. The Purchaser shall have the right to invoke the Performance Bank Guarantee submitted by the Seller for recovering the Liquidated damages.

All goods supplied shall be under an unconditional guarantee of 12 months from the date of commissioning / 18 months from the date of receipt (whichever is earlier) unless specified differently in the Purchase Order.

The Purchaser shall have the right for shop floor rejections even if the material has been accepted on delivery.

All costs (inclusive of taxes & duties) incurred by the Purchaser on account of rejections, despatch/warranty failures of material supplied under this Purchase Order shall be to Supplier's account.

Applicable law and Jurisdiction of Courts

Any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof shall be referred for arbitration to be governed in accordance with the Arbitration and Conciliation Act, 1996.

Accordingly, the purchaser will nominate sole Arbitrator to settle any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof. The place of arbitration shall be in Barnala, Punjab, India and language of proceedings shall be English. Expenses of the arbitration proceeding shall be jointly shared by the parties. This Purchase order shall be governed by and construed in accordance with the laws of India, and the parties agree to submit themselves to the exclusive jurisdiction of the Courts at Barnala, India only. Further, where any material is imported under this Purchase Order, the laws applicable under the Indian statute would govern the resolution of conflicts.

This Purchase Order supersedes any and/or all other oral or written communications or other commitments between the parties with respect to its subject matter except the agreement executed between the parties and contains all of the covenants, terms and conditions agreed between the parties with respect thereto. Wherein an agreement is also executed between the parties on the same subject matter thereto with the terms, conditions and specifications, the Purchase Order shall become the part of the agreement. However, in case of any conflict in the terms, conditions, specifications mentioned in the agreement and the Purchase Order, the terms, conditions, specifications mentioned in the agreement shall prevail.

Each party hereto acknowledges that, except as set forth herein, neither party nor any one on behalf of either party has made any representations, inducements, promises or agreements, orally or otherwise, respecting the subject matter of this Agreement and/or Purchase Order.

Documents required to be attached with invoice.

1. Tax Invoice in original
2. Tax Invoice (Duplicate) in original
3. Quality certificate,

Dear Sir/ Madam ,

We are pleased to place the Purchase Order no. 7600006816 on your esteemed organization as per the terms & conditions agreed upon.

Any discrepancy regarding the acceptance of Purchase order including the terms and conditions mentioned therein is to be intimated to the Company within 24 hours of its receipt.

In case, no communication intimating any discrepancy is received by the Company in writing with in 24 hours of the receipt of Purchase Order, the Purchase Order shall be considered to have been accepted by you.

We would also request you to kindly share the progress of the said order on weekly / monthly basis with the under mentioned Email Id

Thanking You

For Trident Limited



E-212, KITCHLU NAGAR, LUDHIANA 141001

Contact No. : 9878999481

Email : jasbirpurchase@tridentindia.com

Purchase Team .



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 740022
 ALPHA ENGINEERING & SYSTEMS
 A - 2, 2ND FLOOR, RAJOURI GARDEN
 NEW DELHI
 110027
Country India
Vendor GSTIN No. 07AAEPA1177G1Z5

Ship To
 Trident-Dhaura (Utility)
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 BARNALA
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

Bill To
 Trident Limited - P&C
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006816 | Dated | 23.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved | | | |
| Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description Sale Order PO Number/ Week Code | UOM/ Brand | Order Qty. | Basic Rate | Discount | PKG-FWD | HSN/SAC | CGST/SGST/IGST/ C.Cess | Coal Cess | Item Value | Cancellation Date | Plant |
|-----------|---|---------------|---------------|------------|------------|---------|------------|---------------------------|--------------|------------|----------------------|-----------------|
| 0000 2 | 701010146 MAGNETIC FLOWMETER,6",MODEL:6410,ADEPT | NOS/ ADEPT | 1.000 | 71,800.00 | 25.00- | 0.00 | 9026.80.90 | 0.00 /0.00 /18.00 | 0.00 | 63,543.00 | 25.12.2020 | TP15 UTILITY |
| | | | | INR/ 1 NOS | 17,950.00 | 0.00 | | 9,693.00 | | | | |
| 0000 1 | 701010147 MAGNETIC FLOWMETER,8",MODEL:6410,ADEPT | NOS/ ADEPT | 4.000 | 109,600.00 | 25.00- | 0.00 | 9031.49.90 | 0.00 /0.00 /18.00 | 0.00 | 387,984.00 | 25.12.2020 | TP15 UTILITY |
| | | | | INR/ 1 NOS | 109,600.00 | 0.00 | | 59,184.00 | | | | |

Total Value 451,527.00 INR

Total Value:INR FOUR LAKH FIFTY ONE THOUSAND FIVE HUNDRED TWENTY SEVEN Rupees



**Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER**

Vendor 740022
ALPHA ENGINEERING & SYSTEMS
A - 2, 2ND FLOOR, RAJOURI GARDEN
NEW DELHI
110027
Country India
Vendor GSTIN No. 07AAEPA1177G1Z5

Ship To
Trident-Dhaura (Utility)
Mansa Road,Dhaura
BARNALA, (PUNJAB)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006816 | Dated | 23.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

Price Basis: EXW DELHI

Freight : F

Special Instruction Magflow Meter with Integral Display

Payment Terms: Due Net in 45 Days **Octroi:** As per Documentary Evidence

Transportation Mode: By AIR /RAIL /SEA /COURIER /ROAD **Transit Insurance** TO BE ARRANGED BY US.

The consignment shall be accepted only if accompanied by Original Invoice for Buyer and Duplicate for Transporter failing which the consignment shall be returned at your risk and cost .

Terms and Conditions As mentioned overleaf

Cancellation Date As above

Our Banker: State Bank of India, Industrial Finance Branch,Golden tower, Dholewal Chowk, Ludhiana

GSTIN No.. 03AABCA4139J1Z0

This is computer generated Purchase Order.Hence requires no signature.



Trident Limited - P&C
Mansa Road,Dhaulta
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 740022
ALPHA ENGINEERING & SYSTEMS
A - 2, 2ND FLOOR, RAJOURI GARDEN
NEW DELHI
110027
Country India
Vendor GSTIN No. 07AAEPA1177G1Z5

Ship To
Trident-Dhaulta (Utility)
Mansa Road,Dhaulta
BARNALA, (PUNJAB)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - P&C
Mansa Road,Dhaulta
BARNALA, (PUNJAB)
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006816 | Dated | 23.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Master Inspection Characteristics(MIC) | Upper Specification Limit | UOM | Target Specification Limit |
|-------|-------------------------------|---|---------------------------|-----|----------------------------|
|-------|-------------------------------|---|---------------------------|-----|----------------------------|



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 740022
ALPHA ENGINEERING & SYSTEMS
A - 2, 2ND FLOOR, RAJOURI GARDEN
NEW DELHI
110027
Country India
Vendor GSTIN No. 07AAEPA1177G1Z5

Ship To
Trident-Dhaura (Utility)
Mansa Road,Dhaura
BARNALA, (PUNJAB)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006816 | Dated | 23.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Mat. Classification | PO Material Text |
|-------|---|---------------------|------------------|
| 00002 | 701010146 MAGNETIC FLOWMETER,6",MODEL:6410,ADEPT | Standard | |
| 00001 | 701010147 MAGNETIC FLOWMETER,8",MODEL:6410,ADEPT | Standard | |



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 740022
 ALPHA ENGINEERING & SYSTEMS
 A - 2, 2ND FLOOR, RAJOURI GARDEN
 NEW DELHI
 110027
Country India
Vendor GSTIN No. 07AAEPA1177G1Z5

Ship To
 Trident-Dhaura (Utility)
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 BARNALA
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

Bill To
 Trident Limited - P&C
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006816 | Dated | 23.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

DELIVERY SCHEDULE

| S.NO | Item Code Item Description | UOM | PO Qty | Scheduled Date | Sch Qty | Delivered Qty | Open Qty as on 08.10.2021 | Contract No | Remaining Contract Value/Qty |
|-------|---|-----|--------|----------------|---------|---------------|------------------------------|-------------|------------------------------|
| 00002 | 701010146 MAGNETIC FLOWMETER,6",MODEL:6410,ADEPT | NOS | 1.000 | 25.12.2020 | 1.000 | 1.000 | 0.000 | | 0.00 |
| 00001 | 701010147 MAGNETIC FLOWMETER,8",MODEL:6410,ADEPT | NOS | 4.000 | 25.12.2020 | 4.000 | 4.000 | 0.000 | | 0.00 |

Terms and Conditions

This Purchase Order is subject to all terms, conditions and specifications hereinafter set forth and acceptance of order by the Seller shall be deemed to be an agreement that the order is subject to all of said terms, conditions and specifications.

General

Non Acceptance of Purchase order with its terms and conditions is to be intimated to the Purchaser within 24 hours of its receipt, else the same shall be assumed to be accepted at the discretion of the Purchaser. No deviation to this order shall be honoured unless authorized in writing.

Purchase Order number, material code and GST IN of the Purchaser should be mentioned on each and every invoice. An invoice should not have more than 8 line items in it. Different Invoice should be raised for different Purchase Orders issued by the Purchaser.

The Seller shall be responsible for mentioning the correct details in the invoice, including HSN and GST rate of goods supplied to the Purchaser.

The Seller represents and warrants that it shall comply with the Laws pertaining to GST and other applicable indirect taxes and the requirements therein. The Seller shall be liable for all losses and damages suffered by the Purchaser due to any action or omission or mistake of the Seller.

The Seller shall unconditionally submit its account statement on Quarterly basis for reconciliation.

Weights / quantities as recorded by the Purchaser shall be final and binding on the Seller.

This Purchase Order shall not be amended, modified, altered or changed in any way except by writing executed by a duly authorized representative of the Purchaser.

Any other terms & conditions of the Seller mentioned on its Bills,Invoices, e-mails or any other documents shall not be binding on the Purchaser unless accepted in writing by the Authorized Representative of the Purchaser.

The Seller shall not disclose any confidential information pertaining to the Purchaser's business to any third party.

Neither party shall be entitled to assign the rights, interests and obligations without the previous written consent of the other Party.

The Seller shall not offer, solicit or accept an advantage in connection with the procurement of this Purchase Order. Failure to comply with this clause or any act of offering, soliciting or accepting advantage committed by the Seller shall, without affecting the liability of Seller for such failure and act, result in this Purchase Order being invalidated. For the purpose of this clause, Seller shall include its directors, partners, relatives, agents, associates, employees, servants and sub-consultants.

'Advantage' for this purpose shall mean any gift, loan, fee, reward or commission, any valuable security, office, employment, agreement, loan payment/waiver/discharge, bribe of any kind to Government/other officials, any other service or favour or any offer, undertaking or promise, whether conditional or unconditional, of such advantage.

The Seller or its directors, partners, relatives, associates, employees, agents and/ or sub-consultants shall not trade, directly or indirectly, in the shares of the Company during the currency and six months post expiry of this Purchase Order.

Delivery

The material shall be carefully and properly packed for movement by sea/rail/road transport to withstand damages on account of inclement weather, rough handling etc.

The material shall have to be delivered on the date of delivery specified in this Purchase Order. Decision for acceptance/rejection of material on the dates other than that specified in the Purchase Order along with the liquidated damages shall be at the sole discretion of the Purchaser.

The Seller shall not have any right to terminate the Purchase Order. However, the Purchaser reserves the right to cancel any unshipped portion at any time without assigning any reason.

All costs incurred in procurement of material from other source in the event of failure to supply the material on the scheduled date / rejection as per the terms of Purchase Order shall be to Seller's account and at the sole discretion of the Purchaser.

The price mentioned in the Purchase Order is inclusive of packing and handling charges unless otherwise stated therein.

Seller shall share the progress of the order on weekly basis in writing.

If delivery of the material mentioned in the Order occurs later than time specified and provided such delay is neither the result of force majeure nor the result of circumstances for which the Purchaser is responsible, the Purchaser shall be entitled to damages of 0.5% per week or part thereof subject to the maximum of 5% of the Contract price. For purpose of computing damages in the event of delay in delivery of the material, mere despatch of the material within the agreed date of delivery which are not in accordance with the specifications/standards, or found unacceptable by Purchaser would not amount to delivery within the agreed delivery date.

Inspection and Testing

Complete Test / Inspection reports from an approved source / as generated and certified by the Seller should be submitted along with the supply of material. Test reports generated by the Purchaser shall be binding on the Seller and no disputes whatsoever shall be entertained in this regard. Charges for testing, if any, shall be to the Seller's account and the decision to get the same inspected by any third party shall be at the sole discretion of the Purchaser.

Material must conform to all the specifications as specified in the Purchase Order. Any non-conformity identified during any later stage shall be treated as breach of contract and the Seller shall be liable to any penalties imposed at the sole discretion of the Purchaser.

Terms of payment

Original GST invoice should invariably accompany the material failing which the material may be rejected at the sole discretion of the Purchaser.

In the event of denial of input tax credit to the Purchaser on account of any negligence, erroneous or incorrect reporting, non payment of taxes or any other non-compliance made by the Seller in relation to the GST Law, the Purchaser shall be entitled to recover such loss from the Seller along with Interest @18% per annum.

Advances shall be released against submission of Advance Bank Guarantee of equivalent amount. All Advance and Performance Bank guarantee(s) shall be accepted only if they are in Purchaser's format and issued by the Banks recommended by the Purchaser unless otherwise agreed in writing.

Payment other than advances shall be made as specified in the terms and conditions of the Purchase Order and submission of all required documents.

Forms / Permits / Declarations shall be submitted as per the applicable laws/statute.

The prices under this Order shall remain firm until completion of the Contract

Intellectual property/Warranty, Inspection and Liability

Material supplied by the Seller pursuant to this Purchase Order should not infringe any third party intellectual property rights and the Seller further undertakes to indemnify the Purchaser against all claims for infringements of third party patents and/or other intellectual property rights by material supplied under this Purchase Order.

Material supplied by the Seller pursuant to the Purchase Order should have clean title in favour of the Seller before shipment to the Purchaser. Should there be any dispute to the ownership of the material, the Seller would be liable to make good for the costs incurred by the Purchaser to defend the title and the loss of profits due to its inability to use the subjected material, over and above the costs already paid to the Seller.

In the event of any breach of obligations mentioned in the Purchase Order by the Seller, the Purchaser shall be entitled to incidental and consequential damages including loss of profit. The Seller agrees to indemnify and hold the Purchaser, its customers and users of its products, harmless against any suits, damage or claim or any other expense resulting from a breach or alleged breach of the Seller's obligations including warranty, pursuant hereto. The Purchaser shall have the right to invoke the Performance Bank Guarantee submitted by the Seller for recovering the Liquidated damages.

All goods supplied shall be under an unconditional guarantee of 12 months from the date of commissioning / 18 months from the date of receipt (whichever is earlier) unless specified differently in the Purchase Order.

The Purchaser shall have the right for shop floor rejections even if the material has been accepted on delivery.

All costs (inclusive of taxes & duties) incurred by the Purchaser on account of rejections, despatch/warranty failures of material supplied under this Purchase Order shall be to Supplier's account.

Applicable law and Jurisdiction of Courts

Any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof shall be referred for arbitration to be governed in accordance with the Arbitration and Conciliation Act, 1996.

Accordingly, the purchaser will nominate sole Arbitrator to settle any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof. The place of arbitration shall be in Barnala, Punjab, India and language of proceedings shall be English. Expenses of the arbitration proceeding shall be jointly shared by the parties. This Purchase order shall be governed by and construed in accordance with the laws of India, and the parties agree to submit themselves to the exclusive jurisdiction of the Courts at Barnala, India only. Further, where any material is imported under this Purchase Order, the laws applicable under the Indian statute would govern the resolution of conflicts.

This Purchase Order supersedes any and/or all other oral or written communications or other commitments between the parties with respect to its subject matter except the agreement executed between the parties and contains all of the covenants, terms and conditions agreed between the parties with respect thereto. Wherein an agreement is also executed between the parties on the same subject matter thereto with the terms, conditions and specifications, the Purchase Order shall become the part of the agreement. However, in case of any conflict in the terms, conditions, specifications mentioned in the agreement and the Purchase Order, the terms, conditions, specifications mentioned in the agreement shall prevail.

Each party hereto acknowledges that, except as set forth herein, neither party nor any one on behalf of either party has made any representations, inducements, promises or agreements, orally or otherwise, respecting the subject matter of this Agreement and/or Purchase Order.

Documents required to be attached with invoice.

1. Tax Invoice in original
2. Tax Invoice (Duplicate) in original
3. Quality certificate,

MagFlow 6410



| | | | |
|------------|----------------------------|-------------------------------|-----------------------|
| SR. NO. | 2004489 | DN SIZE | 150 |
| FLANGE | ANSI 150 | ELECTRODE | SS 316L |
| LINER | PTFE | OPERATING PRESSURE | 10 kg/cm ² |
| FLOW RANGE | 0 - 200 m ³ /hr | OPERATING TEMPERATURE | 80 °C |
| SERVICE | WATER | METER CONSTANT K _i | 0.835853 |



01/09/2021 15:25





PUNJAB POLLUTION CONTROL BOARD
HEAD OFFICE AIR LAB. VATAVARAN BHAWAN, PATIALA

Ph:- 0175-2302392

Web: www.ppcb.gov.in
 E-mail: - ppcbairlab@gmail.com

- | | |
|--|---|
| 1. Laboratory Sample No. | 93-94/ H.O.Lab./Air/Monitoring/2020-21 |
| 2. Name of Industry | M/s Trident Ltd. (PCD), Mansa Road, Dhaula, Distt. Barnala. |
| 3. Name of Sample collecting Officer | Er. Vipin Kumar AEE and Dr. Sonam Dogra, SA |
| 4. Designation of authorizing Test | EE, RO, Sangrur |
| 5. Type of Sample | Stack Emission |
| 6. Date & Time of Sample collection | 30.04.2021 |
| 7. Date & Time of Sample receipt in Lab. | 03.05.2021 |
| 8. Point of Sample collection | Details as Given Below |

Results

| Point of sample Collection | Parameter | Results | Prescribed Standards |
|--|--------------------|--|---|
| Port Hole on stack after APCD of Chemical recovery plant-II | Particulate Matter | 83 mg/Nm ³ | 150 mg/Nm ³ |
| Port Hole on stack after APCD of 2 no Boilers of Cap. 130 TPH each | Particulate Matter | 86 mg/Nm ³ at 12% CO ₂ | 150 mg/Nm ³ at 12% CO ₂ |

Note: If any, stringent limits/specific standard has been prescribed time to time by MoEF&CC, CPCB and PPCB, then stringent limits/specific standard would prevail subject to clarification from the concerned Regional office

B. S. Prakash
 5/5/2021
 for Scientific Officer

Endst. No: 1128385

Dt. 11/5/2021

A copy of the above is forwarded to the following for information and necessary action:-

1. The Chief Environmental Engineer, Punjab Pollution Control Board (Air), Jalandhar
2. The Senior Environmental Engineer, Punjab Pollution Control Board, Zonal Office-II Patiala
3. The Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur

B. S. Prakash
 5/5/2021
 for Scientific Officer

Dear Sir/ Madam ,

We are pleased to place the Purchase Order no. 7600007938 on your esteemed organization as per the terms & conditions agreed upon.

Any discrepancy regarding the acceptance of Purchase order including the terms and conditions mentioned therein is to be intimated to the Company within 24 hours of its receipt.

In case, no communication intimating any discrepancy is received by the Company in writing with in 24 hours of the receipt of Purchase Order, the Purchase Order shall be considered to have been accepted by you.

We would also request you to kindly share the progress of the said order on weekly / monthly basis with the under mentioned Email Id

Thanking You

For Trident Limited



E-212, KITCHLU NAGAR, LUDHIANA 141001

Contact No. : 9878999481

Email : jasbirpurchase@tridentindia.com

Purchase Team .



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | | | |
|---|--|---|------------------|------------|-----------------|------------|
| Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA | Ship To TL - Dhaura Energy 2 P&C Division, Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number | 7600007938 | Dated | 25.08.2021 |
| | | | Our Ref. | 13760 | Currency | INR |
| | | | Your Ref. | offer | | |
| PO Status :- Invalid/Unapproved Quality Certificate :- Required | | | | | | |

| S.No. | Item Code Item Description Sale Order PO Number/ Week Code | UOM/ Brand | Order Qty. | Basic Rate | Discount | PKG-FWD | HSN/SAC | CGST/SGST/IGST/ C.Cess | Coal Cess | Item Value | Cancellation Date | Plant |
|-----------|---|---------------|---------------|----------------------------|--------------|--------------|------------|---------------------------------|--------------|--------------|----------------------|------------------|
| 0000 1 | 877015678 CONVENTIONAL PANEL PRECICON R CONT. ADOR | NOS/ ADOR | 1.000 | 303,000.00 INR/ 1 NOS | 0.00 0.00 | 0.00 0.00 | 8541.40.90 | 0.00 /0.00 /18.00 54,540.00 | 0.00 | 357,540.00 | 25.12.2021 | TE02 ENERGY-2 |
| 0000 2 | 877015618 IGBT BASED HFPS CONTROL PANEL ESP | NOS/ ADOR | 2.000 | 1,262,500.00 INR/ 1 NOS | 0.00 0.00 | 0.00 0.00 | 8548.10.90 | 0.00 /0.00 /18.00 454,500.00 | 0.00 | 2,979,500.00 | 25.12.2021 | TE02 ENERGY-2 |

Total Value 3,337,040.00 INR

Total Value: INR THIRTY THREE LAKH THIRTY SEVEN THOUSAND FORTY Rupees



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | |
|---|--|---|--|-------------------------|
| Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA | Ship To TL - Dhaura Energy 2 P&C Division, Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number 7600007938 | Dated 25.08.2021 |
| | | | Our Ref. 13760 | Currency INR |
| | | | Your Ref. offer | |
| | | | PO Status :- Invalid/Unapproved Quality Certificate :- Required | |

Price Basis: EXW PUNE

Freight : F

Special Instruction 1) 90% against COD with 100% GST. 2) 10% PBG valid for 1 year 3) PBG will release subject to minimum emission reduction of more than 40% from current level.

Payment Terms: Payable in 2 partial amounts **Octroi:** As per Documentary Evidence

Transportation Mode: By AIR /RAIL /SEA /COURIER /ROAD **Transit Insurance** TO BE ARRANGED BY US.

The consignment shall be accepted only if accompanied by Original Invoice for Buyer and Duplicate for Transporter failing which the consignment shall be returned at your risk and cost .

Terms and Conditions As mentioned overleaf

Cancellation Date As above

Our Banker: State Bank of India, Industrial Finance Branch, Golden tower, Dholewal Chowk, Ludhiana

GSTIN No.: 03AABCA4139J1Z0

This is computer generated Purchase Order. Hence requires no signature.



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | |
|---|--|---|--|-------------------------|
| Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA | Ship To TL - Dhaura Energy 2 P&C Division, Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number 7600007938 | Dated 25.08.2021 |
| | | | Our Ref. 13760 | Currency INR |
| | | | Your Ref. offer | |
| | | | PO Status :- Invalid/Unapproved Quality Certificate :- Required | |

| S.No. | Item Code Item Description | Master Inspection Characteristics(MIC) | Upper Specification Limit | UOM | Target Specification Limit |
|-------|-------------------------------|---|---------------------------|-----|----------------------------|
|-------|-------------------------------|---|---------------------------|-----|----------------------------|



Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER

| | | | | |
|---|--|---|--|-------------------------|
| Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA | Ship To TL - Dhaura Energy 2 P&C Division, Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number 7600007938 | Dated 25.08.2021 |
| | | | Our Ref. 13760 | Currency INR |
| | | | Your Ref. offer | |
| | | | PO Status :- Invalid/Unapproved Quality Certificate :- Required | |

| S.No. | Item Code Item Description | Mat. Classification | PO Material Text |
|-------|---|---------------------|------------------|
| 00001 | 877015676 CONVENTIONAL PANEL PRECICON R CONT. ADOR | Standard | |
| 00002 | 877015618 IGBT BASED HFPS CONTROL PANEL ESP | Customize | |



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | | | |
|---|--|---|--|------------|-----------------|------------|
| Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA | Ship To TL - Dhaura Energy 2 P&C Division, Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number | 7600007938 | Dated | 25.08.2021 |
| | | | Our Ref. | 13760 | Currency | INR |
| | | | Your Ref. | offer | | |
| | | | PO Status :- Invalid/Unapproved Quality Certificate :- Required | | | |

DELIVERY SCHEDULE

| S.NO | Item Code Item Description | UOM | PO Qty | Scheduled Date | Sch Qty | Delivered Qty | Open Qty as on 25.08.2021 | Contract No | Remaining Contract Value/Qty |
|-------|---|-----|--------|-------------------|---------|---------------|------------------------------|-------------|---------------------------------|
| 00001 | 877015676 CONVENTIONAL PANEL PRECICON R CONT. ADOR | NOS | 1.000 | 25.12.2021 | 1.000 | 0.000 | 1.000 | | 0.00 |
| 00002 | 877015618 IGBT BASED HFPS CONTROL PANEL ESP | NOS | 2.000 | 25.12.2021 | 2.000 | 0.000 | 2.000 | | 0.00 |

Terms and Conditions

This Purchase Order is subject to all terms, conditions and specifications hereinafter set forth and acceptance of order by the Seller shall be deemed to be an agreement that the order is subject to all of said terms, conditions and specifications.

General

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Purchase Order number, material code and GST IN of the Purchaser should be mentioned on each and every invoice. An invoice should not have more than 8 line items in it. Different Invoice should be raised for different Purchase Orders issued by the Purchaser.

The Seller shall be responsible for mentioning the correct details in the invoice, including HSN and GST rate of goods supplied to the Purchaser.

The Seller represents and warrants that it shall comply with the Laws pertaining to GST and other applicable indirect taxes and the requirements therein. The Seller shall be liable for all losses and damages suffered by the Purchaser due to any action or omission or mistake of the Seller.

The Seller shall unconditionally submit its account statement on Quarterly basis for reconciliation.

Weights / quantities as recorded by the Purchaser shall be final and binding on the Seller.

This Purchase Order shall not be amended, modified, altered or changed in any way except by writing executed by a duly authorized representative of the Purchaser.

Any other terms & conditions of the Seller mentioned on its Bills,Invoices, e-mails or any other documents shall not be binding on the Purchaser unless accepted in writing by the Authorized Representative of the Purchaser.

The Seller shall not disclose any confidential information pertaining to the Purchaser's business to any third party.

Neither party shall be entitled to assign the rights, interests and obligations without the previous written consent of the other Party.

The Seller shall not offer, solicit or accept an advantage in connection with the procurement of this Purchase Order. Failure to comply with this clause or any act of offering, soliciting or accepting advantage committed by the Seller shall, without affecting the liability of Seller for such failure and act, result in this Purchase Order being invalidated. For the purpose of this clause, Seller shall include its directors, partners, relatives, agents, associates, employees, servants and sub-consultants.

'Advantage' for this purpose shall mean any gift, loan, fee, reward or commission, any valuable security, office, employment, agreement, loan payment/waiver/discharge, bribe of any kind to Government/other officials, any other service or favour or any offer, undertaking or promise, whether conditional or unconditional, of such advantage.

The Seller or its directors, partners, relatives, associates, employees, agents and/ or sub-consultants shall not trade, directly or indirectly, in the shares of the Company during the currency and six months post expiry of this Purchase Order.

Delivery

The material shall be carefully and properly packed for movement by sea/rail/road transport to withstand damages on account of inclement weather, rough handling etc.

The material shall have to be delivered on the date of delivery specified in this Purchase Order. Decision for acceptance/rejection of material on the dates other than that specified in the Purchase Order along with the liquidated damages shall be at the sole discretion of the Purchaser.

The Seller shall not have any right to terminate the Purchase Order. However, the Purchaser reserves the right to cancel any unshipped portion at any time without assigning any reason.

All costs incurred in procurement of material from other source in the event of failure to supply the material on the scheduled date / rejection as per the terms of Purchase Order shall be to Seller's account and at the sole discretion of the Purchaser.

The price mentioned in the Purchase Order is inclusive of packing and handling charges unless otherwise stated therein.

Seller shall share the progress of the order on weekly basis in writing.

If delivery of the material mentioned in the Order occurs later than time specified and provided such delay is neither the result of force majeure nor the result of circumstances for which the Purchaser is responsible, the Purchaser shall be entitled to damages of 0.5% per week or part thereof subject to the maximum of 5% of the Contract price. For purpose of computing damages in the event of delay in delivery of the material, mere despatch of the material within the agreed date of delivery which are not in accordance with the specifications/standards, or found unacceptable by Purchaser would not amount to delivery within the agreed delivery date.

Inspection and Testing

Complete Test / Inspection reports from an approved source / as generated and certified by the Seller should be submitted along with the supply of material. Test reports generated by the Purchaser shall be binding on the Seller and no disputes whatsoever shall be entertained in this regard. Charges for testing, if any, shall be to the Seller's account and the decision to get the same inspected by any third party shall be at the sole discretion of the Purchaser.

Material must conform to all the specifications as specified in the Purchase Order. Any non-conformity identified during any later stage shall be treated as breach of contract and the Seller shall be liable to any penalties imposed at the sole discretion of the Purchaser.

Terms of payment

Original GST invoice should invariably accompany the material failing which the material may be rejected at the sole discretion of the Purchaser.

In the event of denial of input tax credit to the Purchaser on account of any negligence, erroneous or incorrect reporting, non payment of taxes or any other non-compliance made by the Seller in relation to the GST Law, the Purchaser shall be entitled to recover such loss from the Seller along with Interest @18% per annum.

Advances shall be released against submission of Advance Bank Guarantee of equivalent amount. All Advance and Performance Bank guarantee(s) shall be accepted only if they are in Purchaser's format and issued by the Banks recommended by the Purchaser unless otherwise agreed in writing.

Payment other than advances shall be made as specified in the terms and conditions of the Purchase Order and submission of all required documents.

Forms / Permits / Declarations shall be submitted as per the applicable laws/statute.

The prices under this Order shall remain firm until completion of the Contract

Intellectual property/Warranty, Inspection and Liability

Material supplied by the Seller pursuant to this Purchase Order should not infringe any third party intellectual property rights and the Seller further undertakes to indemnify the Purchaser against all claims for infringements of third party patents and/or other intellectual property rights by material supplied under this Purchase Order.

Material supplied by the Seller pursuant to the Purchase Order should have clean title in favour of the Seller before shipment to the Purchaser. Should there be any dispute to the ownership of the material, the Seller would be liable to make good for the costs incurred by the Purchaser to defend the title and the loss of profits due to its inability to use the subjected material, over and above the costs already paid to the Seller.

In the event of any breach of obligations mentioned in the Purchase Order by the Seller, the Purchaser shall be entitled to incidental and consequential damages including loss of profit. The Seller agrees to indemnify and hold the Purchaser, its customers and users of its products, harmless against any suits, damage or claim or any other expense resulting from a breach or alleged breach of the Seller's obligations including warranty, pursuant hereto. The Purchaser shall have the right to invoke the Performance Bank Guarantee submitted by the Seller for recovering the Liquidated damages.

All goods supplied shall be under an unconditional guarantee of 12 months from the date of commissioning / 18 months from the date of receipt (whichever is earlier) unless specified differently in the Purchase Order.

The Purchaser shall have the right for shop floor rejections even if the material has been accepted on delivery.

All costs (inclusive of taxes & duties) incurred by the Purchaser on account of rejections, despatch/warranty failures of material supplied under this Purchase Order shall be to Supplier's account.

Applicable law and Jurisdiction of Courts

Any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof shall be referred for arbitration to be governed in accordance with the Arbitration and Conciliation Act, 1996.

Accordingly, the purchaser will nominate sole Arbitrator to settle any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof. The place of arbitration shall be in Barnala, Punjab, India and language of proceedings shall be English. Expenses of the arbitration proceeding shall be jointly shared by the parties. This Purchase order shall be governed by and construed in accordance with the laws of India, and the parties agree to submit themselves to the exclusive jurisdiction of the Courts at Barnala, India only. Further, where any material is imported under this Purchase Order, the laws applicable under the Indian statute would govern the resolution of conflicts.

This Purchase Order supersedes any/all other oral or written communications or other commitments between the parties with respect to its subject matter except the agreement executed between the parties and contains all of the covenants, terms and conditions agreed between the parties with respect thereto. Wherein an agreement is also executed between the parties on the same subject matter thereto with the terms, conditions and specifications, the Purchase Order shall become the part of the agreement. However, in case of any conflict in the terms, conditions, specifications mentioned in the agreement and the Purchase Order, the terms, conditions, specifications mentioned in the agreement shall prevail.

Each party hereto acknowledges that, except as set forth herein, neither party nor any one on behalf of either party has made any representations, inducements, promises or agreements, orally or otherwise, respecting the subject matter of this Agreement and/or Purchase Order.

Documents required to be attached with invoice.

1. Tax Invoice in original
2. Tax Invoice (Duplicate) in original
3. Quality certificate,

| <i>TECHNICAL PARTICULARS</i> | <i>UOM</i> | <i>M/s FLS Smidth 70% MCR -DESIGN Proposal: 9814168-1-ver.2a</i> | <i>M/s GE Power 70% MCR- DESIGN Offer Ref.: 1401113</i> | <i>M/s Hamon 70% MCR- DESIGN Proposal ref : P1943334 Revision : 02</i> |
|---|-------------------------------------|--|---|--|
| OPERATING CONDITIONS | | | | |
| No. of chambers | Pcs | 1 | 1 | 1 |
| Bus sections in operation | | All | | 4 |
| Bus sections in operation, total | | 5 | 3 | 4 |
| Gas volume to precipitator @ 3 % O2 dry | Nm ³ /s | 16.2 | 16.18 | 16.18 |
| Gas volume to precipitator @ 3 % O2 dry | m ³ /Hr | 103855 | | 148300 |
| Operating temperature | Deg C | 190 | 190 | 180-190 |
| Operating pressure | Pa | -2157 | -2156 | -2157.463 |
| Operating pressure | mm of WC | -220 | -220 | -220 |
| Water content | % | 27.6 | | 26.7 |
| Dew Point (water) | Deg C | 66 | | Estimated 20 Deg C Above flue gas temperature Later |
| Raw gas dust loading @ 3 vol%O2 | g/Nm ³ ,D | 25 | | 25 |
| Altitude above sea level | Mtr | 224 | | 224 |
| Atmospheric pressure | mm Hg | 739 | | 739 |
| | | | | |
| PRECIPITATOR DESIGN DATA | | | | |
| | | | | |
| Effective cross section | m ² | 38.3 | | 45.12 |
| Gas velocity | m/s | 0.75 | Operating : 0.45 Design : 0.63 | 0.64 |
| Retention time | sec. | 23.2 | Operating : 23.2 Design : 16.6 | 21.39 |
| Total specific collecting area | m ² /m ³ /sec | 152.34 | Operating : 110.5 Design : 154.9 | 142 |
| W - Deutsch particle migration velocity | cm/s | 4.23 | | 4.52 |
| | | | | |
| ESTIMATED PERFORMANCE | | | | |
| Dust Emission @ 3 vol%O2 | mg/Nm ³ ,D | 40 | ≤40 | 40 |

| | | | | |
|---|---------------------------------|---------------------------------|-------------------------------------|------------------------------|
| Efficiency. | % | 99.84 | Operating : 99.88 Design : 99.84 | 99.84 |
| Emitted dust in outlet of filter | Kg/h | 2 | | 2 |
| Collected dust in hopper | Kg/h | 1050 | | 1065 |
| Power consumption of High Voltage supply (at guaranteed conditions) | kW | 80 | | |
| Pressure drop over the precipitator (guaranteed) | Pa | 250 | | 245 |
| MECHANICAL DESIGN DATA | | | | |
| Casing design temperature. | Deg C | 250 | | 200 |
| Casing design pressure, max. static | mm of WC | -300 | | -300 |
| Specific Weight of Dust in Hopper | t/m3 | 0.4 | 150 kg/m3 for dead load | 0.15 |
| Specific Weight of Dust for transport calculation | t/m3 | 0.2 | | 0.4 |
| Wind load calculated according to: | | | | |
| wind velocity pressure | kN/m2 | 1.5 | 47 m/Sec | 2.007 |
| Snow load | kN/m2 | 0.8 | N.A. | 2 |
| Live load, roof | kN/m2 | 2 | 3500 Pa | 500 |
| Live load, access facilities | kN/m2 | 3 | 250 kg/m2 | 1000 |
| Earthquake zone | UBC | 2b | Zone-IV | Zone - IV |
| Standards for Steel profiles | EN, GB, JIS, ASTM or equivalent | EN, GB, JIS, ASTM or equivalent | IS:808 | ASTM A36 / IS 2062 |
| Strength calculation of casing | | FLS Standard | | IS:800 |
| Strength calculation of supporting structure | | FLS Standard | | ANSI 13th Ed |
| Mechanical Design | | FLS Standard | | IS:800 / IS 875 / Equivalent |
| ELECTRICAL DESIGN DATA | | | | |
| Mains voltageV | VAC | 400-660 | 415 | 415 |
| Mains voltage tolerance% | % | ± 5% | ± 10% | 0.05 |
| Mains frequencyHz | Hz | 50/60 | 50 Hz ± 5% | 50 |
| Control voltage in control cubicles, VAC | VAC | 230 | 230 | 230 |
| Ambient temperature, max/min °C | Deg C | 40/0 | 50 | 45°C /10°C |
| Electrical Design | | FLS Standard | | As per IEC |
| Electrical components - according to | | FLS Standard | | As per IEC |

| | | | | |
|--|------|----------------------|---|--|
| | | | | |
| | | | | |
| PRECIPITATOR DATA | | | | |
| Chambers offered | PCS | 1 | 1 | 1 |
| Serial fields per chamber | PCS | 5 | 3 | 4 |
| Bus sections per chamber, field no: 1 / 2 / 3 / 4 / 5 | PCS | 1/1/1/1/1 | 1/1/,1 | 1 |
| Number of ducts per chamber, field no: 1 / 2 / 3 / 4 / 5 | PCS | 17/17/17/17/17 | One chamber | 1 |
| Effective length of field no: 1 / 2 / 3 / 4 / | Mtr | 3.5/3.5/3.5/3.5/3.5 | 3.5/3.5/3.5 | 3.4 |
| Width of fields per chamber, field no: 1 / 2 / 3 / 4 / 5 | Mtr | 5.1 | 5.7/5.7/5.7 | 4.8/4.8/4.8/4.8 |
| Effective height | Mtr | 7.5 | 8 | 9.4 |
| Aspect ratio (effective length / effective height) | | 2.33 | 3 | 1.45 |
| Total Projected Collecting area per Chamber | m2 | 4388 | Not used in GE design | 4107.72 |
| Total Active Collecting area per Chamber | m2 | 5748 | 3192 | 4107.72 |
| | | | | |
| ESP CASING (one chamber) | | | | |
| Structural frames, Concrete | Type | E | Concrete | Concrete |
| Bottom hoppers | Type | Flat bottom concrete | Flat bottom | Trough Arrangement with conveyor |
| Inlet transition piece | Type | Upper | | |
| /rapping of inlet transition bottom | | Yes | Yes | 2 Nos (Common for both conr and GD screen) |
| / adjustable gas distribution screens, inlet | Pcs | 2 | Fixed GD screen with adjustable baffles | 2 |
| /rapping of inlet gas distribution screens | | Yes | Yes | 2 Nos (Common for both conr and GD screen) |
| Outlet transition piece | Type | Bottom | | |
| /rapping of outlet transition bottom | | Yes | No | 1 Nos (Common for both conr and GD screen) |
| /adjustable gas distribution screens, outlet | Pcs | 1 | Fixed | 1 |
| /rapping of outlet gas distribution screens | | Yes | No | 1 Nos (Common for both conr and GD screen) |
| platework In & Outlet; mild steel, plate thickness | mm | 5 | Funnel 6 mm, IS:2062, Grade-A | 5 |

| | | | | |
|--|--------|---------------------|------------------------------------|---------------------------------------|
| Set of insulator and connection boxes, supp. for T/R | Type | FLS | | 8 sets per ESP |
| Inspection doors | Type | FLS | | Manual |
| | | | | |
| | | | | |
| SUPPORTING STRUCTURE (one chamber) | | | | |
| Support for precipitator | Type | Slide bearing | | Slide bearing |
| | | | | |
| | | | | |
| ACCESS FACILITIES | | | | |
| Set of standard access facilities | Design | FLS/DIN | | 1 Set with RCC and Steel construction |
| /Stairs from ground to platform, height | Mtr | 0 | | Yes considered |
| /Platform for inspection doors in casing, length | Mtr | 21.5 | | Yes considered |
| /Stairs from platform to roof, height | Mtr | 8.4 | | Yes considered |
| /Railing around roof, length | Mtr | 55.5 | | Yes considered |
| | | | | |
| INSULATION AND CLADDING | | | | |
| Thermal insulation material consisting of : | | | | LRB Mineral wool with cladding sheet |
| mineral wool, fittings and cover plate | m2 | 1220 | | Yes considered |
| Cladding: 19mm corrugated alu/galvanized Steel plate - thickness | mm | 0.7 | | 0.6 mm aluminium cladding |
| or plane alu/galvanized steel plate - thickness | mm | 0.9/1 | | 0.6 mm aluminium cladding |
| Insulation for Casing (exclusive roof), thickness | mm | 100 | | Yes considered |
| Insulation for Roof (excl. embossed plate), | mm | 100 | | Yes considered |
| Insulation for Bottom hopper, thickness | mm | 100 | | Yes considered - 75 mm thick |
| Insulation for Inlet, thickness | mm | 100 | | Yes considered - 75 mm thick |
| Insulation for Outlet, thickness | mm | 100 | | Yes considered - 75 mm thick |
| | | | | |
| COLLECTING SYSTEM (one chamber) | | | | |
| Collecting systems, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 1/1/1/1/1 | To be defined after detailed Engg. | Field 1 to 4 |
| Collecting plates with attachment | Type | H500 | G profile | G-OPZEL |
| MOC | | Alu killed MS Steel | CRCA, IS:513, Grade-D | Corten Steel |
| spare plates for erection. | Pcs | 5 | Not Envisaged. | 1% of Installed Quantity of 1 ESP |
| plate height | Mtr | 7.5 | 8 (nominal) | 7 |
| plate width | Mtr | 0.5 | 0.5 (nominal) | 0.48 |

| | | | | |
|--|--------|-------------------------------|------------------------------------|-----------------------------------|
| plate thickness | mm | 1.25 | 1.5 | 1.2 |
| Total Projected Collecting area | m2 | 6225 | Not used in GE design | |
| Total Active Collecting Area. | m2 | 8155 | 3192 | 4107.72 |
| Projected col. area, field no: 1 / 2 / 3 / 4 / 5 | m2 | 877.5/877.5/877.5/877.5/877.5 | Not used in GE design | 1026.93 |
| Duct spacing field no: 1 / 2 / 3 / 4 / 5 | mm | 300/300/300/300/300 | | 300/300/300 |
| Collecting plates, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 124/124/124/124/124 | To be defined after detailed Engg. | 120/120/120 |
| Drop hammers, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 36/36/36/36/36 | 20 NOS. TUMBLING HAMMER /Field | 42/42/42 |
| Drive units for rapping, incl. gear motor | Type | Roof Mounted | Side drive | N.A. |
| | | | | |
| DISCHARGE SYSTEM (one chamber) | | | | |
| Discharge frame systems, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 1/1/1/1/1 | 19/Field | 72 Nos. per field |
| /discharge frame system | Type | Rigid | Rigid Frame | Rigid Pipe and spike |
| Discharge electrodes | Type | Pin | Rigid type (Multipeak) | Rigid Pipe and spike |
| electrodes per chamber in field no: 1 / 2 / 3 / 4 / 5 | Pcs | 115/115/115/115/115 | To be defined after detailed Engg. | 72 Nos. per field |
| Tube MOC | | | IS:5429 | Carbon / IS 2062 |
| spare electrodes for erection | Pcs | 10 | Not Envisaged. | 1% of Installed Quantity of 1 ESP |
| /electrode length | Mtr | 6.8 | To be defined after detailed Engg | 9.4 |
| /electrode layers | Pcs | 1 | To be defined after detailed Engg | Single |
| / electrode per plate | Pcs | 1 | To be defined after detailed Engg | 1 per Opzel |
| Mast Electrodes | Type | Pin | Not applicable | |
| electrodes per chamber in field no: 1 / 2 / 3 / 4 / 5 | Pcs | 2/2/2/2/2 | Not applicable | N.A. |
| Tube MOC | | EN 10305-3 1993 – E220-CR2-S3 | Not applicable | N.A. |
| spare electrodes for erection | Pcs | | Not applicable | N.A. |
| /electrode length | Mtr | 6.8 | Not applicable | N.A. |
| /electrode layers | Pcs | 1 | Not applicable | N.A. |
| Internal drop hammer rapping system | Yes/No | Included | Not applicable | Yes MIGI Type rapping system |
| Number of discharge rapping system per field | Pcs | 1 | Not applicable | 4 Sets per field |
| Drop hammers for Discharge system | Pcs | 90 | Not applicable | 4 Sets per field |
| Set of electrode frames, bearing bridges, rotary hammer shafts, guide plates, walkways and upper spacer for coll. plates | Pcs | 5 | Not applicable | N.A. |
| Drive units for rapping, incl. gearmotors | Type | Roof mounted | Not applicable | N.A. |
| Cast parts, comprising chain tightener, pinwheels, links, split bearings and the like | Pcs | 20 | Not applicable | N.A. |
| | | | | |

| | | | | |
|---|-----------|---|---|--|
| HIGH VOLTAGE EQUIPMENT (one chamber) | | | | |
| High voltage supply for field no: 1 / 2 / 3 / 4 / 5 | Pcs | 3 ϕ T/R / 3 ϕ T/R / 3 ϕ T/R / 3 ϕ T/R / 3 ϕ T/R | 1 ϕ T/R / 1 ϕ T/R / 1 ϕ T/R | 1 ϕ T/R / 1 ϕ T/R / 1 ϕ T/R |
| DC SUPPLY BY | | | | |
| DC Supply by | Pcs | 5 | TR set | 4 |
| number of DC-supply in field no: 1 / 2 / 3 / 4 / 5 | Pcs | 1/1/1/1/1 | 3 | 1 |
| size of DC-supply for field no: 1 / 2 / 3 / 4 / 5 | kV (Peak) | 100/100/100/100/100 | 90/90/90 | 110/110/110 |
| size of DC-supply for field no: 1 / 2 / 3 / 4 / 5 | mA (Avg) | 600/700/800/800/800 | 575/575/575 | 600/600/600 |
| specific DC-current in field no: 1 / 2 / 3 / 4 / 5 | mA/m2 | 0.68/0.8/0.91/0.91/0.91 | 0.54 | 0.72 |
| TR Control Panel IP class | IP | IP21 | IP31 | Hermetically Sealed |
| MCC protection class | Type | | IP54 | As per OEM standard |
| /color | | | TR set – RAL 5012, TR panel & PMCC – RAL 7032, | Yes |
| /alarms for oil temperature and pressure | Yes/no | Included | Yes | Yes considered, Strick type |
| Grounding equipment for TR-sets at access doors | Type | FLS | Earthing rod | |
| Electrical accessories, comprising: | | | | |
| /Thyristor switching elements | Type | FLS | Firing /triggering command from ESP controller | IGBT based controller and SCR based controller |
| /Connections on high voltage side | | | Through Bus duct | Through HV pipe connection |
| Insulator sets comprising: | | | | |
| / support insulators, conical | Pcs | 20 | 12 | 4 nos / Field |
| / insulator shafts for discharge rapping system | Pcs | 10 | 3 | 4 nos / Field |
| / lead through insulators in trunking | Pcs | 10 | 3 | NA |
| Earthing rods and warning signs | Set | 10 | 1 | Yes 1 lot considered per ESP |
| CONTROL & ELECTRICAL EQUIPMENT (one chamber) | | | | |
| Controller | Type | PIACS Microcomputer controller, with automatic intermittent energization facility for T/R-sets type FLS | Microprocessor controller EPIC-III integrated with rapping programmer | International standard Precicon controller is considered |
| /programmable control for rapping gear motors | Type | Yes | Yes | Micro controller based |
| /control for heating elements | Type | FLS | Through thermostat for support insulator | Thermostatically Controlled |

| | | | | |
|--|--------|----------------------------|---|-------------------------------------|
| /signal for Central Control room. | Std | 4-20 mA | Over modbus TCP-IP/OPC protocol | Shall be provided as applicable |
| /Energy Management Control System | Yes/No | Optional | Yes, if opacity meter feedback is connected through 4-20 mA signal. | Yes |
| / terminal for input of CO alarm | Yes/No | Optional | External configurable DI is available | Yes |
| /terminal for aut. change of operating status | Yes/No | Optional | | Yes |
| /serial communication to CCS (GATEWAY) | Yes/No | Included | Over modbus TCP-IP/OPC protocol | Yes |
| /standard Protocol for Serial Communication | | Modbus RTU | Ethernet | RS485 |
| GENERAL STANDARDS FOR ELECTRICAL EQUIPMENT | | | | |
| Motors: | | | | For Seal air fan motor |
| motor standard | IEC | | IE 1 | As per IEC |
| motor type | | Squirrel Cage, Norm Motors | Squirrel Cage, Norm Motors | SQIM |
| insulation class | | F utilised to B | F utilised to B | Class F |
| protection class | | IP 54 | IP 55 | IP 54 |
| Cubicles: | | | | |
| /internal control voltage | VAC | 230 | 230 V AC | 230 |
| /lamp voltage | VDC | 24 | Later during detail engineering | 220 |
| /protection class | | IP 21 | IP54 | 45 Max |
| / forced cooling of cubicles | | Optional | Not required | |
| Instruments: | | | | |
| /protection class | | IP65 | Later during detail engineering | IP 31 for Indoor, IP 54 for Outdoor |
| Access to High Voltage carrying Equipment/Parts | | | | |
| Key interlocking | Type | Serv Trayvou or Similar | Mechanical castle key | Mechanical |
| ESTIMATED POWER CONSUMPTION | | | | |
| Total power use for T/R sets | kW | 89 | Will be finalized after detailed Engg. | Refer Electrical Load List |
| Total power use of heaters | kW | 37.5 | 16 | Refer Electrical Load List |
| Total power use for rapping motors | kW | 1.2 | 2.59 | Refer Electrical Load List |

| | | | | |
|--|---------|------------------|---|---|
| Total power use of dust transport | kW | 4.9 | Will be finalized after detailed Engg. | Refer Electrical Load List |
| Total Power for Purge Air kW 2.0 | kW | 2 | Will be finalized after detailed Engg. | Refer Electrical Load List |
| Scrapper conveyor | kW | | Will be finalized after detailed Engg. | 15 |
| Drag chain conveyor | kW | | Will be finalized after detailed Engg. | 3.7 |
| RAV | kW | | Will be finalized after detailed Engg. | 3.7 |
| Total estimated Power Consumption | kW | 135 | 18.59 | 22.4 |
| SURFACE TREATMENT FOR PARTS DELIVERED | | | | |
| Collecting plates | Type | Oil Coated | | St.3/Tectyl 506 / Equivalent |
| Discharge electrodes | Type | Oil Coated | | St.3/Tectyl 506 / Equivalent |
| Other internal parts | Program | Transport Primed | | Transport Primed |
| /degree of cleaning (SIS 055900 | Type | St.2 | | SA 2.5 |
| /primer | | 40 | | |
| External parts to be covered by insulation | Program | Transport Primed | | Transport Primed |
| /degree of cleaning (SIS 055900 | Type | St.2 | | |
| /primer | | 40 | | Primer: 2 Coats of red oxide primer (50 microns total DFT) |
| External parts not to be covered by insul. | Program | III | | |
| /degree of cleaning (SIS 055900 | Type | Sa 2.5 | | Sa 2.5 |
| /primer | my | 100 | | Primer: 2 Coats of red oxide primer (50 |
| / finish painting | my | 60 | | microns total DFT) |
| SCOPE OF SUPPLY | | | | |
| | | | | ESP Inlet and Outlet hoods (Corten steel) |
| | | | Outer roof has been included(Chequered plate IS-3502 and MS IS:2062 Gr A) | ESP Hot-roof and cold-roof arrangement (Corten steel) |

| | | | |
|--|---|--|---|
| | Inspection doors included | Inspection door included | ESP Quick opening doors (Corten Steel) |
| | Rapping system for distribution screen,supporting rod etc have been included | ESP internal including electrodes, suspension and steadying frames, rapping shafts,anvils have been included. | ESP internals of Corten steel including electrodes, suspension and steadying frames, rapping shafts,anvils and baffles. |
| | Gas distribution devices with support accessories. | Gas distribution devices with support accessories. | Gas distribution devices with support accessories. |
| | Rapping system for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping system for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping system for collecting electrode, discharge electrodes & inlet gas distribution devices |
| | Rapping motors for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping motors for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping motors for collecting electrode, discharge electrodes & inlet gas distribution devices |
| | Insulators included | Insulators as required by HRC India design. | Insulators as required by HRC India design. |
| | | Bus duct has been included. But no mention of T-R oil trays | HV bus-duct and T-R oil trays |
| | Key interlocking | Mechanical key safety interlocks system. | Mechanical key safety interlocks system. |
| | Slide bearings included | ESP support bearings has been included. | Fixed and slide bearings |
| | Detail engineering only for Stairways and gangways included ,Sun roof structrue for TR Set(Detail Engg),Steel supported outer roof will be fabricated and supplied by Ms FLS. | Staircase & Platform from Ground Level to Casing bottom floor level platform and to ESP roof top has also been included. | Access steel structures including platform and staircase from floor level to ESP roof with galvanized gratings and stair steps. |
| | Weather enclosure, detail engg will be done by Ms FLS | Not given | Weather enclosure for ESP |
| | Electical hoist & trolley included in Trident scope,Maintenance structure with monorail detail engg included in the scope | Monorail with electric hoist Included | Maintenance structure with monorail included |

| | | | |
|--|---|--|--|
| | Inlet & outlet expansion joints - Nonmetallic Type - Only detail engineering included in the scope. | Inlet & outlet expansion joints - Nonmetallic Type | Inlet & outlet expansion joints - Nonmetallic Type |
| | Not mentioned | ESP Inlet DTPA dampers | ESP Inlet DTPA dampers |
| | Not mentioned | ESP Outlet DTPA dampers | ESP Outlet DTPA dampers |
| | | | Rotary valve for ash conveyor outlet |
| | Scraper, incl. gear motor and VFD, Drag chain, incl. gear motor has been included in the scope | Scraper Conveyor & Drag Chain Conveyor | Scraper Conveyor & Drag Chain Conveyor |
| | | Not Given | Graph alloy bearings for Scraper Conveyor |
| | Basic engg for Thermal insulation & cladding of ESP included in the scope | Not included in the scope. | Thermal insulation & cladding of ESP |
| | | Not given | Modification in upstream and downstream ductwork with supports |
| | Not included in the scope. | Not included in the scope. | Induced draft fan included in the scope |
| | | | |

| | | | | |
|--|--|---|--|---|
| <p style="text-align: center;">EXCLUSIONS(SCOPE OF SUPPLY/WORK)</p> | | <ol style="list-style-type: none"> 1.Any other Power, Control & Instrument Cable 2.All Civil work. 3.Finish Painting 4.Erection, Commissioning, PG Testing, supervisor. 5.Power & control of dust transport system (Scraper, drag chain & RAV). 6.Lightning and lightning of ESP 7.Dust Conveying below Rotary air lock valve 8.Electric hoist & trolley (Capacity-2.0 T) for T/R set. 9.Earthing system including ground pit 10.Casing Frames - Concrete 11.Platework, casing - Concrete 12.Flat Bottom Hopper - Concrete 13. Mechanical erection and Electrical erection. 14.Instruments, controllers, cables or electrical erection for central control room.. | <p>1.Civil works including all civil engineering, grouting, minor work, foundation, control room, MCC room.</p> <ul style="list-style-type: none"> • Structural engineering including structural work except specified in our scope of supply • ID fan, motor, VFD & accessories. • Dust handling system / conveyor beyond rotary air lock. • Fabrication drawing preparation & supply of Stack, Duct & duct support • PLC/DCS & its programming, HMI, engineering station, SCADA, laptop/desktop, UPS with backup etc. • All cable (Power/control/instrument/screen/communication) with cable tray, tray support, rack, trestle etc. or associated hardware except those mentioned in our scope of supply.. | <ol style="list-style-type: none"> 1. Civil work 2.ESP casings and casing columns(Corten steel) 3.Ash Mixing tank with Agitator 4.AMT transfer Pump |
|--|--|---|--|---|

| | | | | |
|---|--|---|---|--|
| <p style="text-align: center;">Performance Guarantee</p> | | <p>IS 11255 Part 1 & 3 EN 13284-1:2002 Stationary source emissions - Determination of low range mass concentration of dust. (In-stack standard for emissions < 40 mg/Nm³ - Case 1) ASME Power Test Code PTC 27 and the requirements of Environmental Protection and it has been given subject to certain provisions and has been mentioned clearly in the offer</p> | <p style="text-align: center;"><i>Performance guarantee condition has been given but couldnot find the value .</i></p> | <p>When the equipment covered by this proposal is operated at the design conditions given in Section 5 of this proposal, HRC India guarantees ESP outlet emission as: <50 mg/Nm³ dry gas (Guaranteed with all fields in service, subject to inlet conditions furnished and under steady state of operation</p> |
|---|--|---|---|--|

Soil and Groundwater Quality Assessment

at

Dhanuala Drain, Barnala



Prepared for:



Trident Ltd. and Lotus Integrated Texpark Ltd.

Dhaura Complex, Mansa Road, Barnala, Punjab, 148101

Prepared by:

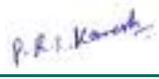
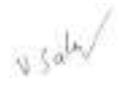


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Annexure I: Laboratory Analytical Test Reports for Groundwater samples

Annexure II: Laboratory Analytical Test Reports for Soil samples

List of Abbreviation

| | | |
|---------|---|---|
| BDL | : | Below Detectable Limits |
| BGL | : | Below Ground Level |
| BIS | : | Bureau of Indian Standards |
| CGWB | : | Central Ground Water Board |
| CMSRSL | : | Cholamandalam MS Risk Services Limited |
| CPCB | : | Central Pollution Control Board |
| DEM | : | Digital Elevation Model |
| EIA | : | Environmental Impact Assessment |
| ICAR | : | Indian Council of Agricultural Research |
| IS | : | Indian Standards |
| MOEF&CC | : | Ministry of Environment and Forests & Climate Change |
| MSL | : | Mean Sea Level |
| NABET | : | National Accreditation Board for Education and Training |

EXECUTIVE SUMMARY

M/s Trident Ltd. and Lotus Integrated Texpark Ltd. are operating an integrated Agro-based paper mill and a textile division respectively in Dhaula Complex, Mansa Road, Barnala, Punjab, 148101. In regards to the notice issued by the Punjab Pollution Control Board, Trident Group has approached Cholamandalam MS Risk Services Limited (CMSRSL), a NABET accredited EIA consulting organization to undertake the groundwater quality assessment along the drain located adjacent to the existing plant in Barnala.

The study team had a detailed site reconnaissance and walkthrough along the drain and collected the samples as mentioned above from Dec 3, 2019, to Dec 6, 2019.

To understand the regional scenario of land details in terms of physiography, elevation profile in the region, groundwater flow direction in the aquifer, etc. the published data by the central groundwater board has been collected. Similarly, the regional level soil and groundwater quality have been studied based on the information collected from published technical and scientific documents.

Based on the collected information regarding groundwater survey and exploration data published by CGWB for Barnala block, the groundwater flow direction in the area was evaluated to be towards the west. The land elevation slope in the area is also in line with the flow direction.

The Water level as per the published EIA report in the region ranges from 8.72m to 23.89m bgl during the pre-monsoon period and 9.95 m to 25.41 m bgl during the post-monsoon period. The seasonal fluctuation varies from 1.05 m to 5.32 m in the study area. The long-term fluctuation trend indicates an average fall of 0.65m/year. Barnala block is categorized as an Over Exploited Zone by CGWB.

Based on the details obtained from during the assessment, the utilisation of treated wastewater for irrigation is in the order of 150 m³ per Ha per day which is in line with the loading rates recommended for the soil texture (for loamy and sandy loamy soil type: 110 to 225 m³/Ha/day) as per the notification of MoEF&CC published on 14 Jan, 2016.

For the purpose of this assessment, the soil and groundwater samples have been collected (i) Along the Dhanuala drain (less than 100m from the Drain), (ii) at the upgradient locations to map the baseline background levels and (iii) at the onsite irrigation area. Groundwater samples were collected from the existing private borewells which were drilled up to the deeper aquifer which are in use.

- pH in the groundwater samples collected was reported in the range of 7.1 to 8.0 which is within the acceptable range as per drinking water standards published by IS 10500:2012. Whereas the pH in soil was found to be more alkaline in the entire region.
- TDS in the samples collected from the existing borewells were recorded to be in the range of 524 to 1276 mg/l. The TDS levels in groundwater from the samples collected is a regional phenomenon and is in line with the published regional level data. The groundwater's Salinity as NaCl is in-line with TDS which contributes to 50% to 60%. Similarly, the electrical conductivity in the soil is also high and depicting regional scenario which reflects the equivalent salinity as NaCl in soil.
- Total hardness in the samples collected from the existing borewells was recorded to be in the range of 140 to 595 mg/l.
- Minor traces of nutrients and Heavy metal were found in the groundwater and soil samples collected but the impact is totally insignificant.

1. INTRODUCTION

Groundwater is a valuable natural resource, being both an important source of water supply and a major component of the water cycle. The groundwater quality in the overall country has undergone a tremendous change over the past decade. Groundwater in shallow aquifers generally contains calcium bicarbonate, mixed type and other types including sodium chloride water near the coastal areas. Similarly, the quality in deeper aquifers also varies from place to place and is generally found suitable for common uses. The main groundwater quality problems in India include due to inland salinity, coastal salinity, fluorides, nitrates, heavy metals including arsenic, iron, etc.

Irrigation through tube wells is well-practiced in Punjab due to the limited availability of canal waters (surface water). Such practices were well established due to the initiative and enterprise of the individual farmers and have spread up to more than 75% of the total agricultural land in the state is depending on the groundwater. Punjab is one of the successful states in the country in terms of agricultural aspects based upon the use of groundwater for irrigation. The quality of groundwater in the state has been characterized by Geogenic contamination and anthropogenic contamination including agricultural activities, animal waste disposals, industrial discharges and urban pollution due to municipal wastes.

M/s Trident Ltd. and Lotus Integrated Texpark Ltd. (part of Trident Group companies- hereafter referred to as Trident Group) are operating an integrated Agro-based paper mill and a textile division respectively in Dhaula Complex, Mansa Road, Barnala, Punjab, 148101. In regards to the notice issued by the Punjab Pollution Control Board, Trident Group has approached Cholamandalam MS Risk Services Limited (CMSRSL), a NABET accredited EIA consulting organization to undertake the groundwater quality assessment along the drain located adjacent to the existing plant in Barnala.

2. ABOUT THE CONSULTING ORGANISATION

Cholamandalam MS Risk Services Limited (CMSRSL) is a 50:50 joint venture between USD \$3.14 Billion Murugappa Group, India and Mitsui Sumitomo Insurance Group, Japan and has a technical collaboration with InterRisk, a group company of Mitsui Sumitomo Insurance Group.

Established in the year 1994, Cholamandalam MS Risk Services is a Chennai based Risk Consulting Company offering comprehensive Risk management & Engineering solutions in the field of Safety, Health and Environment. The company has pioneered many innovative and specialized services catering to the needs of Asian & European markets for the last 15 years. The organization has successfully executed more than 2000 projects (Domestic/International) which not only helped its

clients maintain compliance but also optimize their EHS performance and set new benchmarks. Cholamandalam MS Risk Services, an ISO 9001:2008 company, is a certified “Environment Impact Assessment” Consultant organization by NABET EIA Accreditation committee, a constituent of the Quality Council of India. The company has a well-established experience in safety and environmental studies in India and overseas over the last decade.

3. METHODOLOGY ADOPTED FOR THE STUDY

The soil and groundwater quality assessment in the area has been carried out by adopting the below study methodology:

- The groundwater survey and exploration data published by CGWB for the Barnala block are collected and utilized to map the groundwater flow direction in the aquifer.
- Based on the satellite and topographical maps of the region, the natural drains and canals will be mapped.
- A basic review of the wastewater utilization for irrigation has been done.
- A thorough walkthrough along the Dhanuala drain (approx. 10 km stretch) especially where the industrial wastewater and sewage is being discharged.
- The below sampling program has been adopted for the soil and groundwater assessment:
 - Collection of soil samples at 1m depth along the Dhanuala drain covering the upstream to the plant discharges, near the plant discharge and downstream to the plant discharges.
 - Similarly, the groundwater samples are collected from the existing borewells along the Dhanuala drain (not more than 100m away from the drain) covering the upstream to the plant discharges, near the plant discharge and downstream to the plant discharges.
 - Collection of groundwater samples from the existing borewells and the soil samples from the onsite irrigation area where treated wastewater is being utilized.
 - Collection of groundwater samples from the existing borewells and the soil samples at 5 to 6 km away (upgradient as per the aquifer flow direction) to map the background baseline conditions in terms of soil and groundwater quality.
 - All the soil samples were analyzed for the necessary analytes including pH, electrical conductivity, salinity, total organic carbon, available Phosphorous, total nitrogen, heavy metals, total petroleum hydrocarbons, pesticides and lignin. The analytical data is compared with ICAR and other standards for soil quality.

- Similarly, the groundwater samples were analyzed for the necessary analytes such as pH, electrical conductivity, total dissolved solids, salinity, dissolved oxygen (DO), biological oxygen demand (BOD), chemical oxygen demand (COD), total hardness, essential nutrients (NPK), total petroleum hydrocarbons, heavy metals, pesticides etc. the analytical data is compared with CPCB standards for drinking water to check its compliance.
- Based on the analytical data, the contamination profile is developed depicting as two-dimensional contours or graphical representation for the critical parameters. The long term published groundwater quality data is utilized for mapping the regional level quality profile.

The study team had a detailed site reconnaissance and walkthrough along the drain and collected the samples as mentioned above from Dec 3, 2019 to Dec 6, 2019.

4. OVERALL SOIL AND GROUNDWATER SCENARIO IN BARNALA REGION

4.1. Study area and Geographical details

Trident group's paper manufacturing division and integrated textile park are located in Dhanuala Complex, Mansa Road, Barnala District in the state of Punjab. Based on the Central Ground Water Board (CGWB) published block-wise groundwater resource assessment, 2017, all the three blocks in Barnala district is categorized as *overexploited* in terms of groundwater extraction. The geographical boundary of the study is limited to the plant area and area along the drain where the industrial wastewater is discharged. Hence the primary data of soil and groundwater has been collected from the area which is discussed further in detail. The published regional level quality data has also been collected and presented in the report.

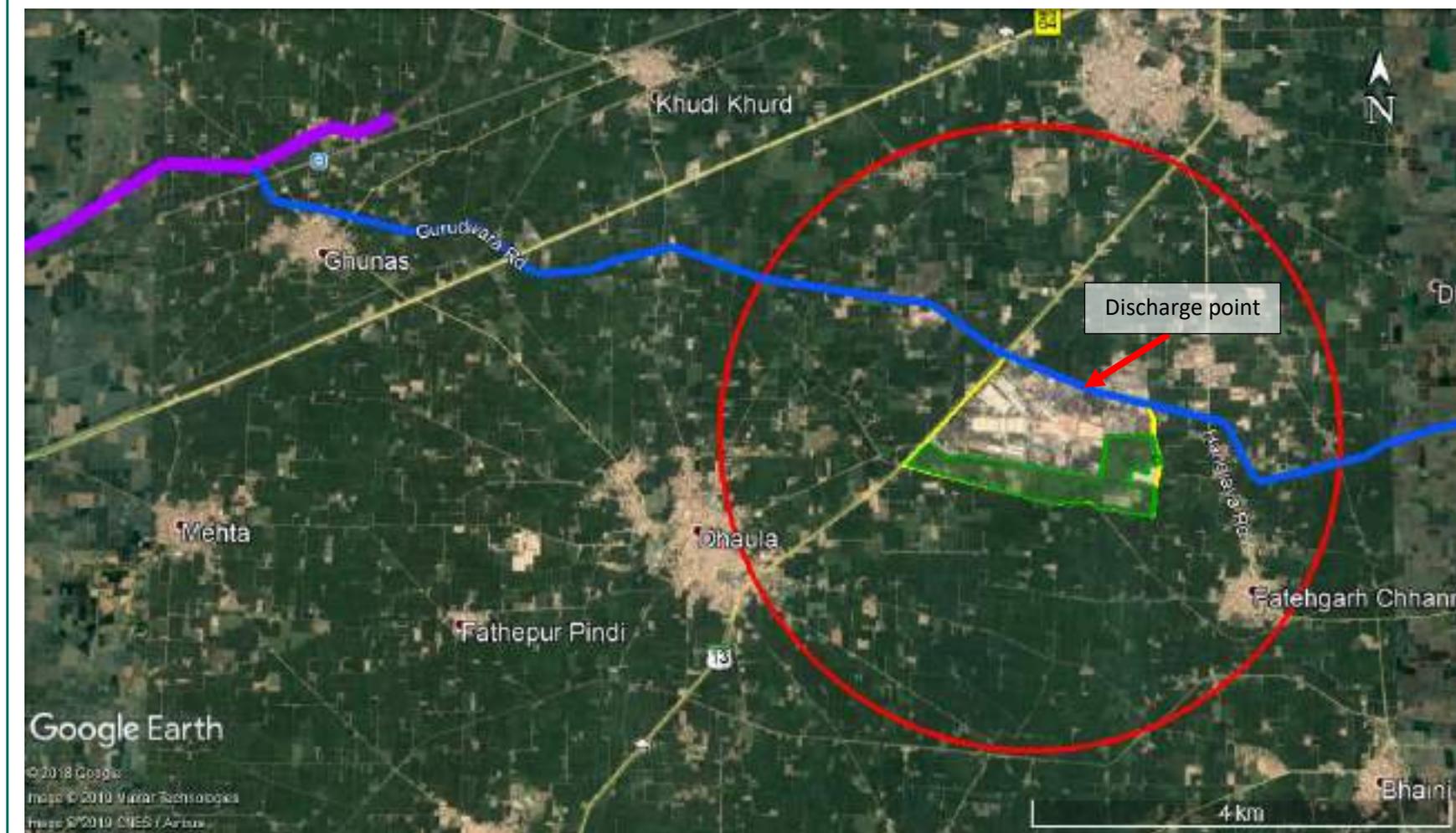
The location map is presented in **Figure 4.1** and **Figure 4.2**. The plant is surrounded by a natural drain named Dhanuala drain (marked as a blue line) along the northern boundary passing from East to West. The Dhanuala drain is joining the Lisarna drain in the west at 8 km downstream from the plant. The plant including the paper division and textile division is spread to an extent of approx. 220 Ha in which approx. 85 Ha is the irrigation area where the treated wastewater (of 12,800 m³/day) is being used. Whereas, the treated wastewater quantity of 8,700 m³/day is being discharged to Dhanuala drain. Thus, utilisation of treated wastewater for irrigation is in the order of 150 m³ per Ha per day which is in line with the loading rates recommended for the soil texture (for loamy and sandy loamy soil type: 110 to 225 m³/Ha/day) as per the notification of MoEF&CC published on 14 Jan, 2016.

Figure 4.1: Location map 1



- Plant Boundary is marked as Yellow line
- Onsite irrigation area is marked as green area
- Adjacent Dhanuala drain is shown as a blue line and the flow direction in the drain is from East to West
-

Figure 4.2: Location map 2



- Plant Boundary is marked as Yellow line. Red circle radius: 3km (from the approx. center of the plant)
- Onsite irrigation area is marked as green area
- Adjacent Dhanuala drain is shown as a blue line. The flow direction in Dhanuala drain is from East to West
- Lisarna drain where the Dhanuala drain is joining is shown as a Purple line. The flow direction in the Lisarna drain is from Northeast to Southwest.

4.2. Land Details

Based on details collected from the published EIA report in 2016, the elevation of the land in the buffer zone (10km from the plant boundary) varies from 196 m above msl in the southwestern to 285 m above msl in the northeast. The elevation of the land in the core zone (5km) varies from 198 m above msl in the southwestern to 250 m above msl in the northeast. Hence it is evident as per the ground elevation that the upgradient is towards east and the downgradient is towards west from the plant site. The Physiography and DEM are shown in [Figure 4.3](#), [Figure 4.4](#) and [Figure 4.5](#) respectively.

According to the Watershed Atlas of India, the study area of 10km forms part of Lower Sutlej Sub-Basin below Bhakra Dam and is shared by SLJL010 watershed. There is no well-defined material drainage system in the area. Two main drains pass through the area – Upper Lisarna Nala in the northwest and Dhanuala Drain in the central part. The drainage with the watershed boundary is presented in [Figure 4.6](#).

The overall land use of a 10 km radius area reveals the dominance of agriculture land (88.55%) followed by built-up land (9.48%), wasteland (1.17%) and water bodies (0.80%). The Level I and Level II land-use landcover maps are presented in [Figure 4.7](#) and [Figure 4.8](#).

Figure 4.4: Digital Elevation Model of the Study Area (10KM from the plant boundary)

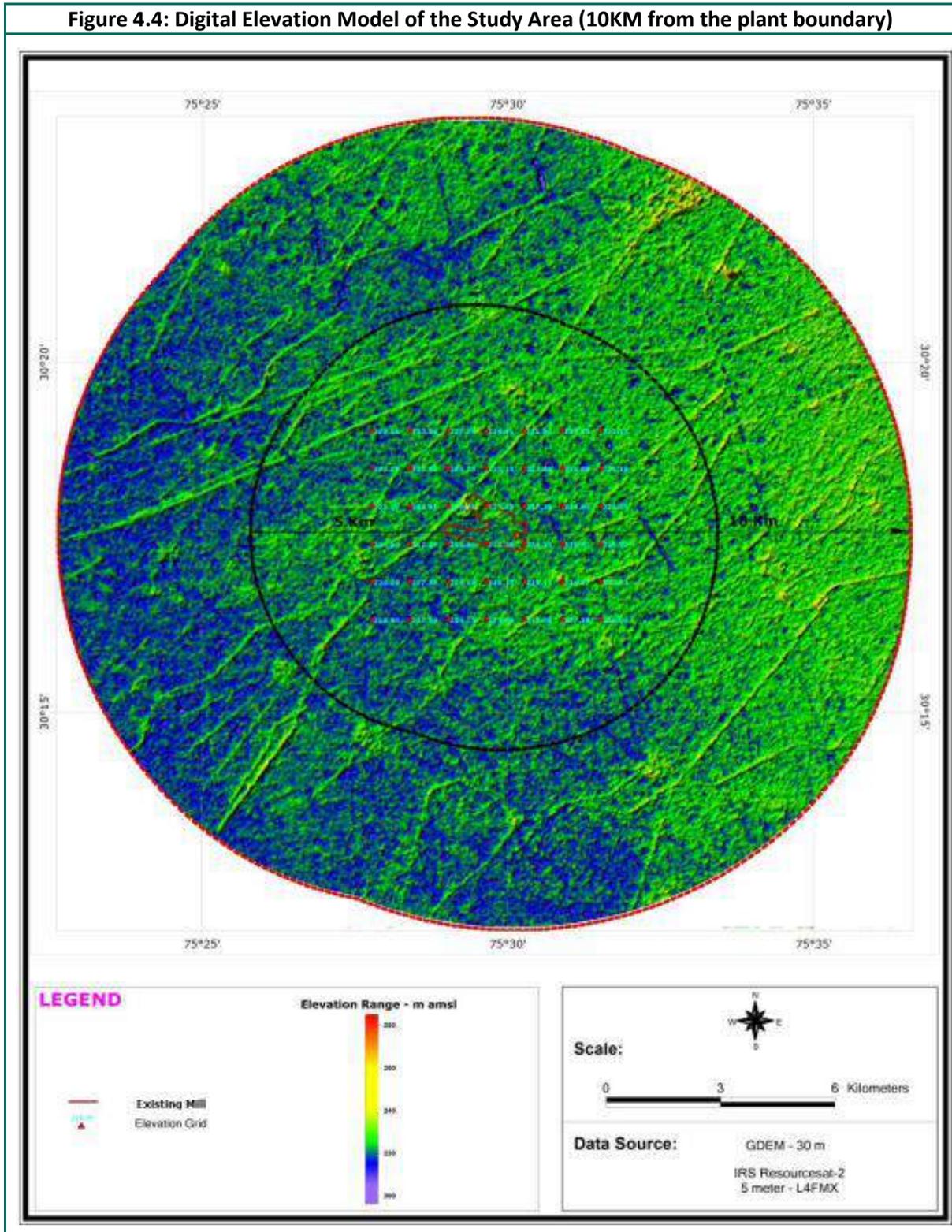


Figure 4.5: Digital Elevation Model of the Study Area (5KM from the plant boundary)

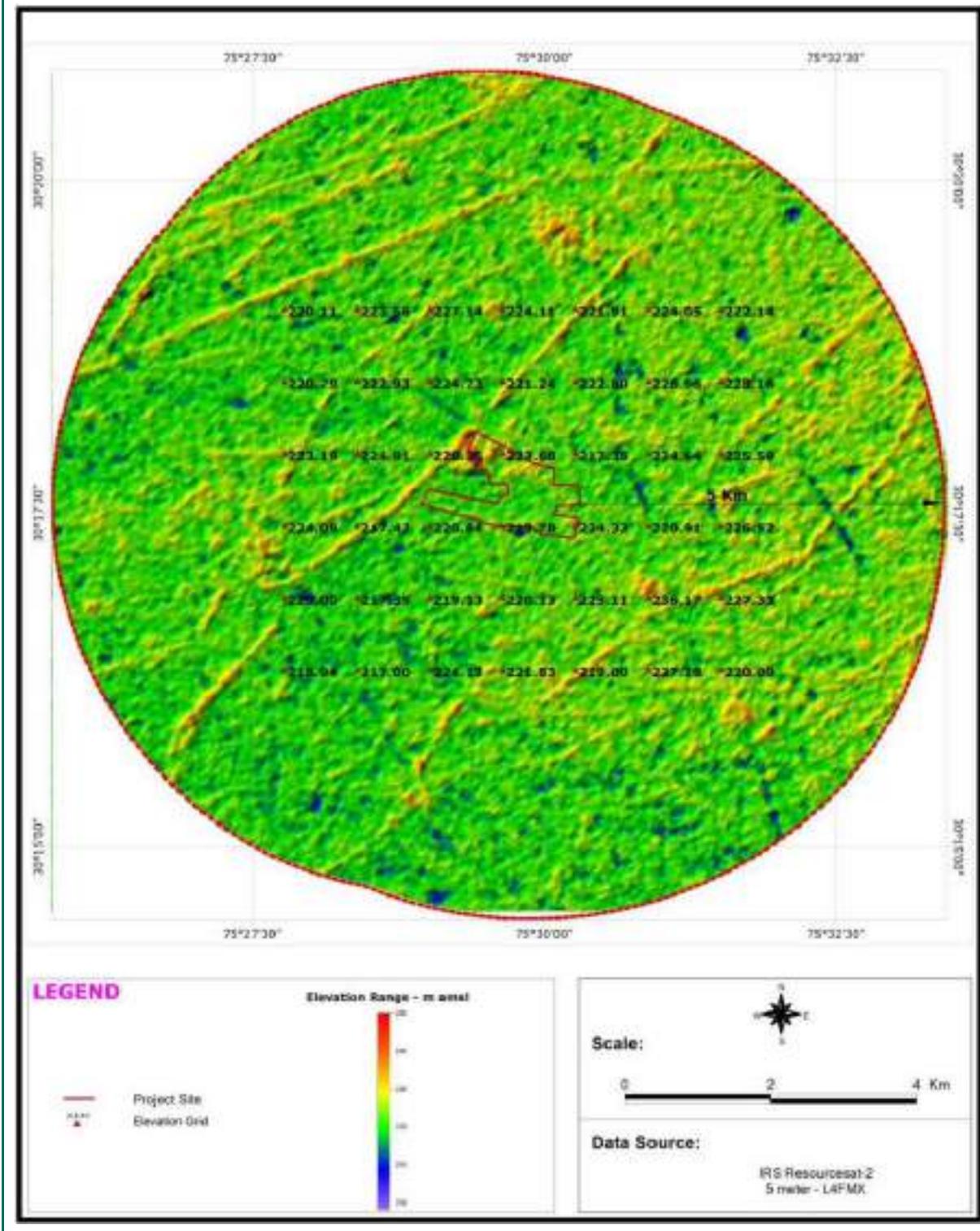


Figure 4.6: Drainage and Water Bodies in the Study Area (10KM from the plant boundary)

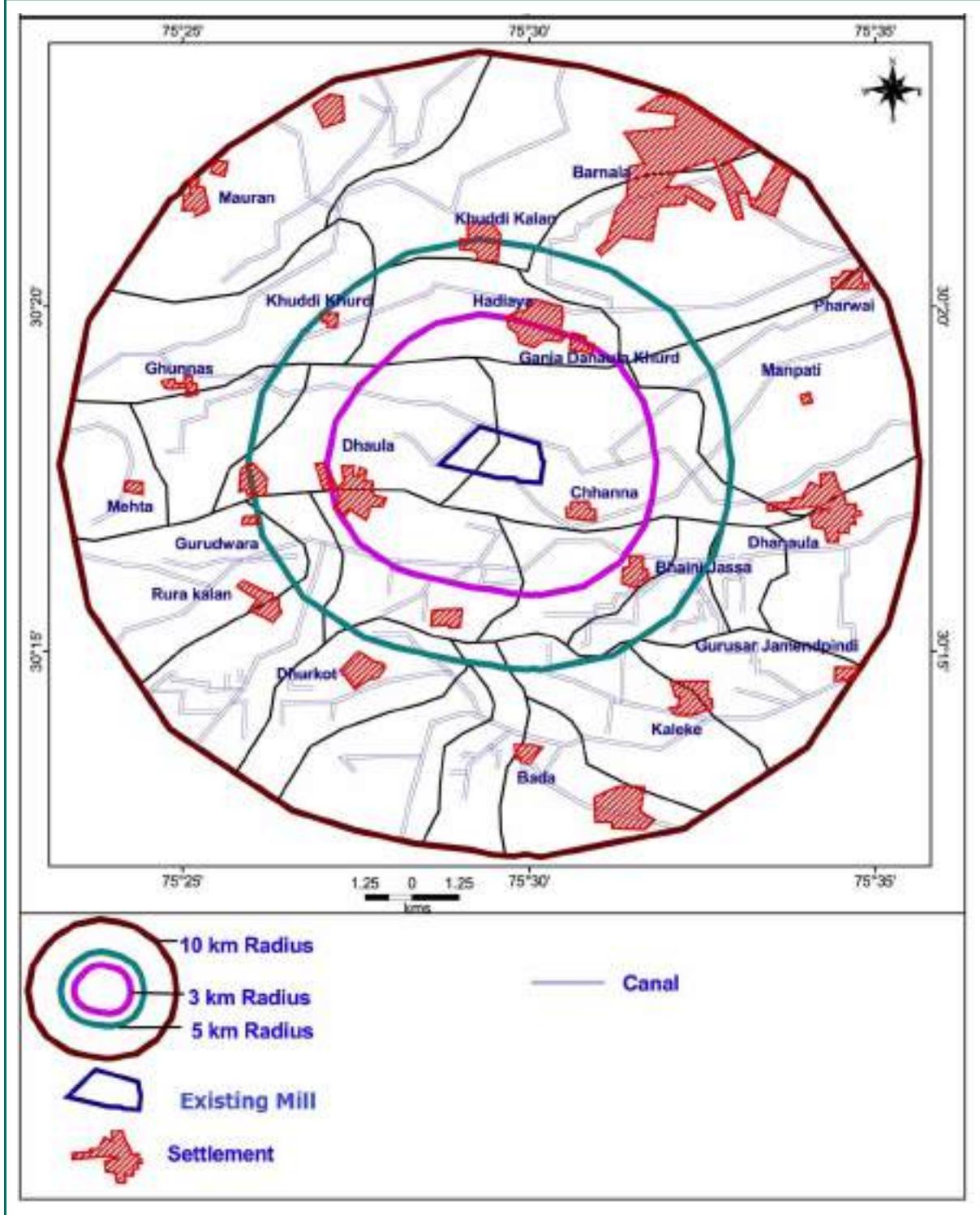


Figure 4.7: Level I Land use and Landcover in the Study Area (10KM from the plant boundary)

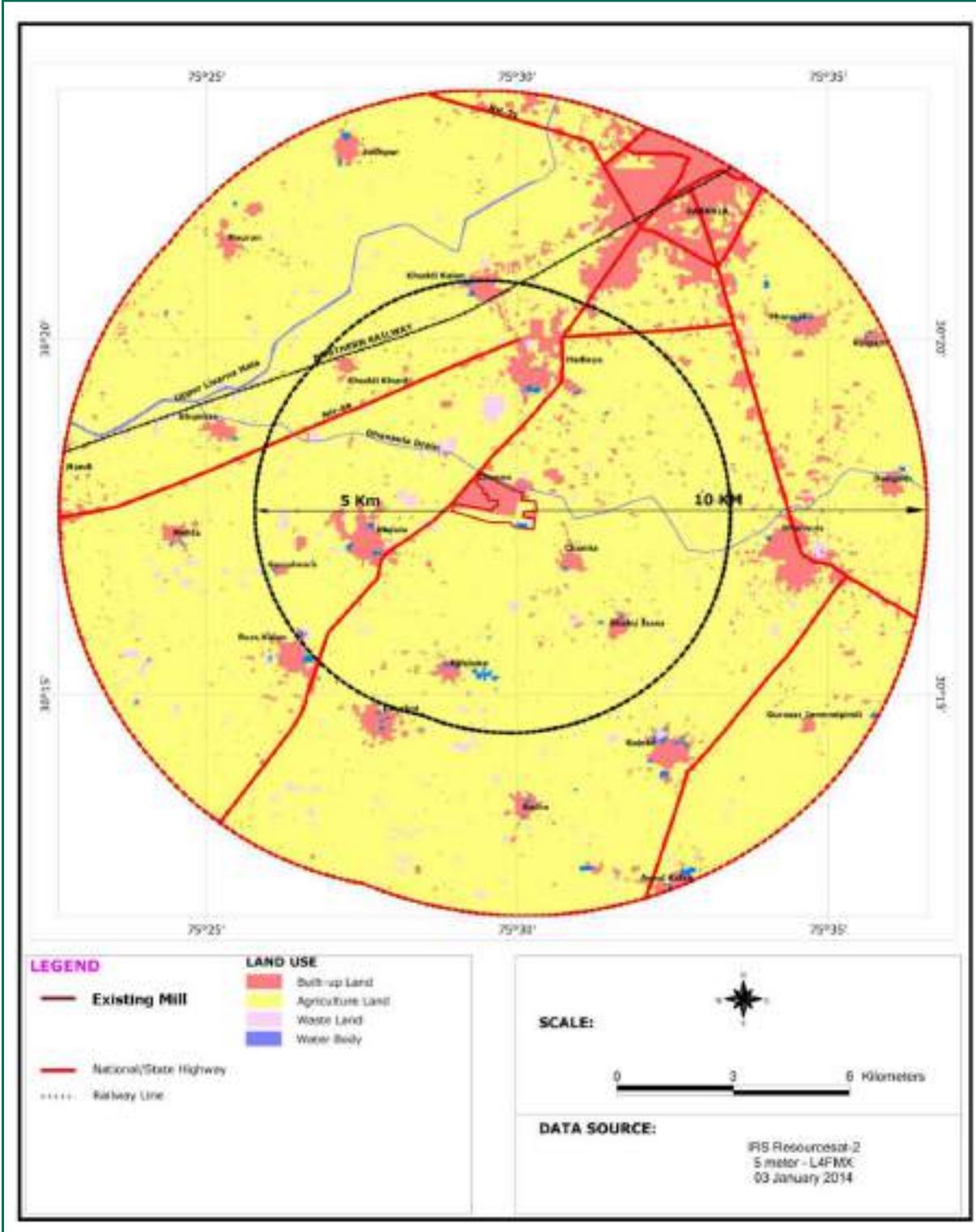
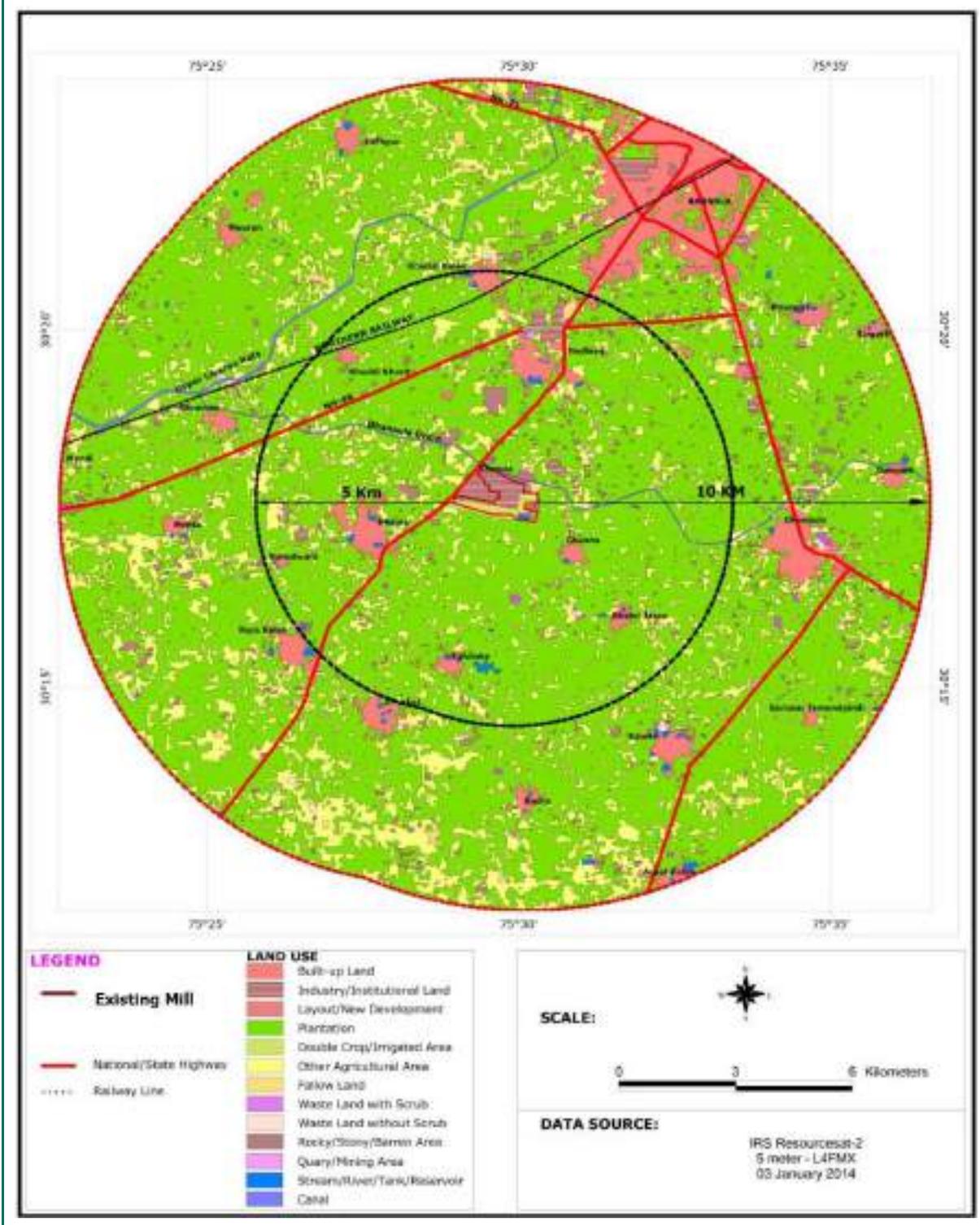


Figure 4.8: Level II Land use and Landcover in the Study Area (10KM from the plant boundary)



4.3. Geology and Soil Type

Based on details collected from the published EIA report in 2016, geologically the area is covered by the Sedimentary formation of the Quaternary area. The region is underlined by Grey micaceous, fine to coarse-grained sand, silt and clay (Active flood plain), Cyclic sequence of grey micaceous sand silt and clay (Older flood plain deposit and Multicyclic sequence of brown to grey silt, clay and kankar and reddish-brown to grey sand (older alluvial plain). The geology of the area (10km radius from the plant boundary) is given in **Figure 4.9**.

The landforms / geomorphic units and structures such as fractures, fissures and faults have been interpreted from the satellite image. All the landform / geomorphic units and structures occurring in the study area are mapped. The geomorphology and structures of the area play a vital role in identifying the groundwater potential zones. Two geomorphic units namely Dune complex, Alluvial plain older – under canal command in the study area. The following geomorphic units have been interpreted.

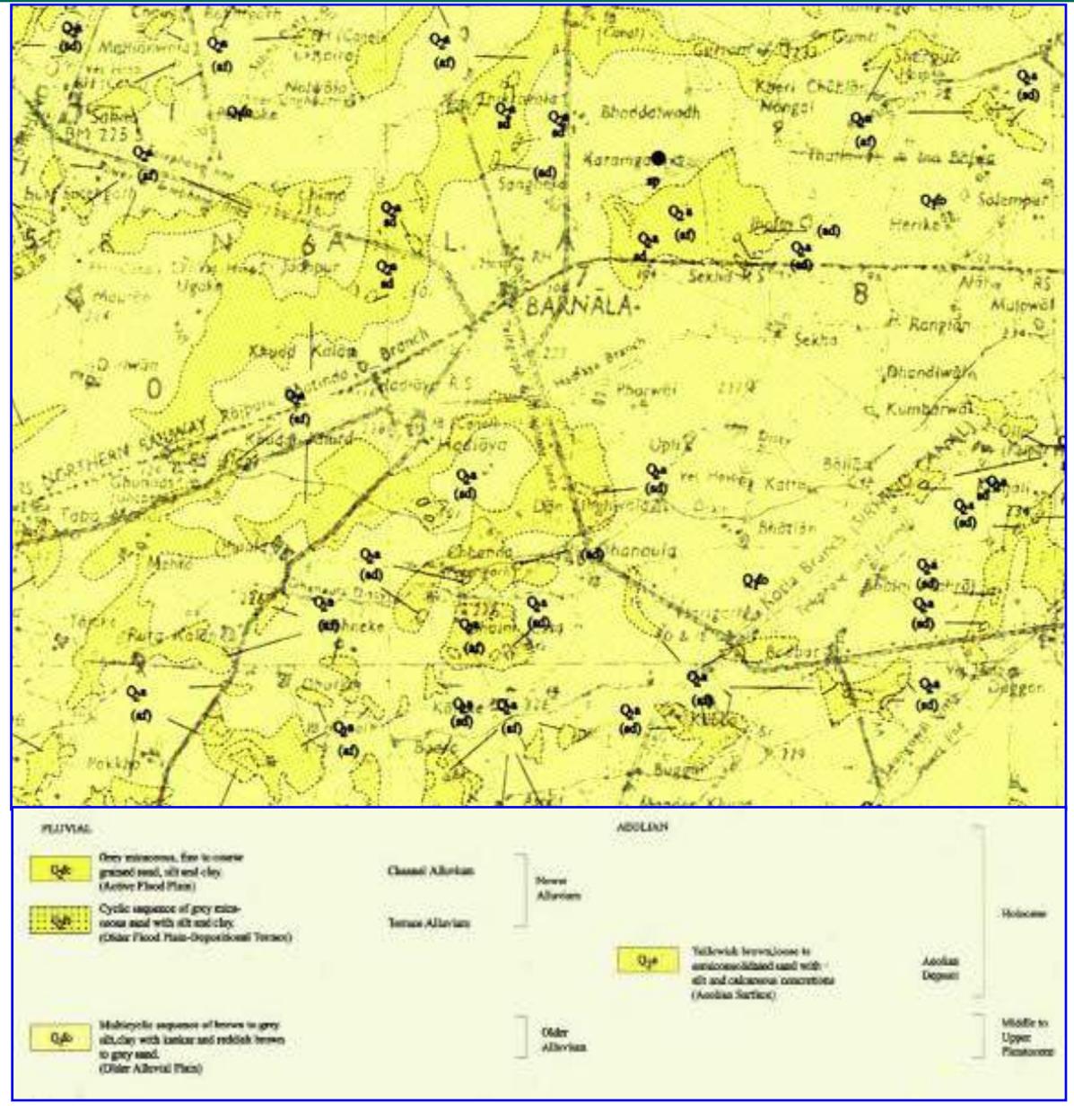
1) Dune Complex

2) Alluvial plain older – under canal command

Dune complex and the Alluvial plain older are good in groundwater occurrence and movement. However, the Dune complex is very good as this unit completely comprised of sand. Alluvial plan older under canal command is clay and silt dominant. The percolation rate is comparatively low in this unit. The existing mill site area is located in Alluvial Plain older under canal command. The Geomorphology of the study area is presented in **Figure 4.10**.

Prominent types of soil in the district are coarse loamy calcareous soils, fine loamy calcareous soils and a thin layer of sandy over loamy soils presents western and southern parts of the district. In the study area more specifically, Coarse loamy over sandy soils, Moderate flooding sandy soils are observed. Soil classification of the area is given in **Figure 4.11**.

Figure 4.9: Geology of the Study Area (10KM from the plant boundary is marked as a circle)



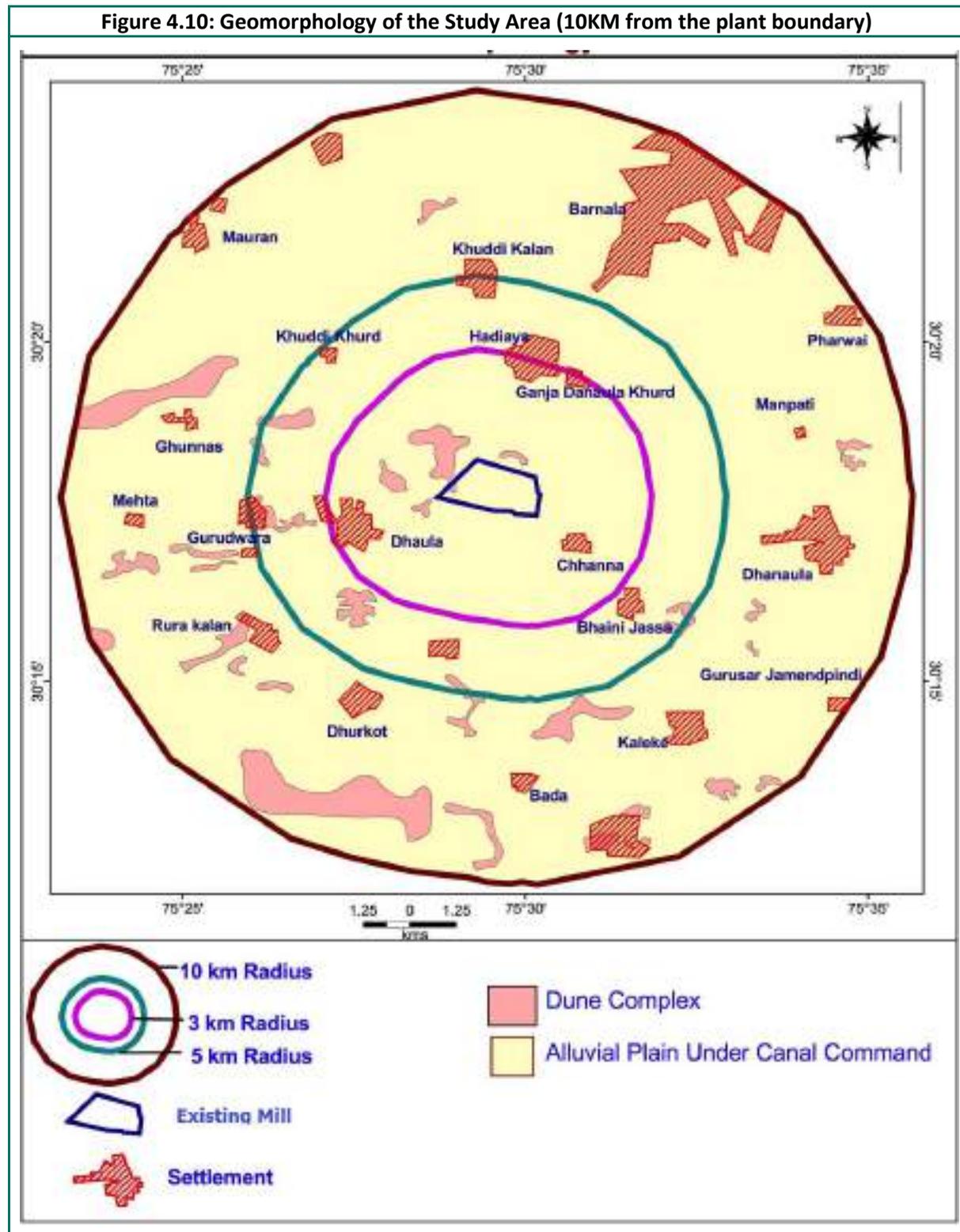
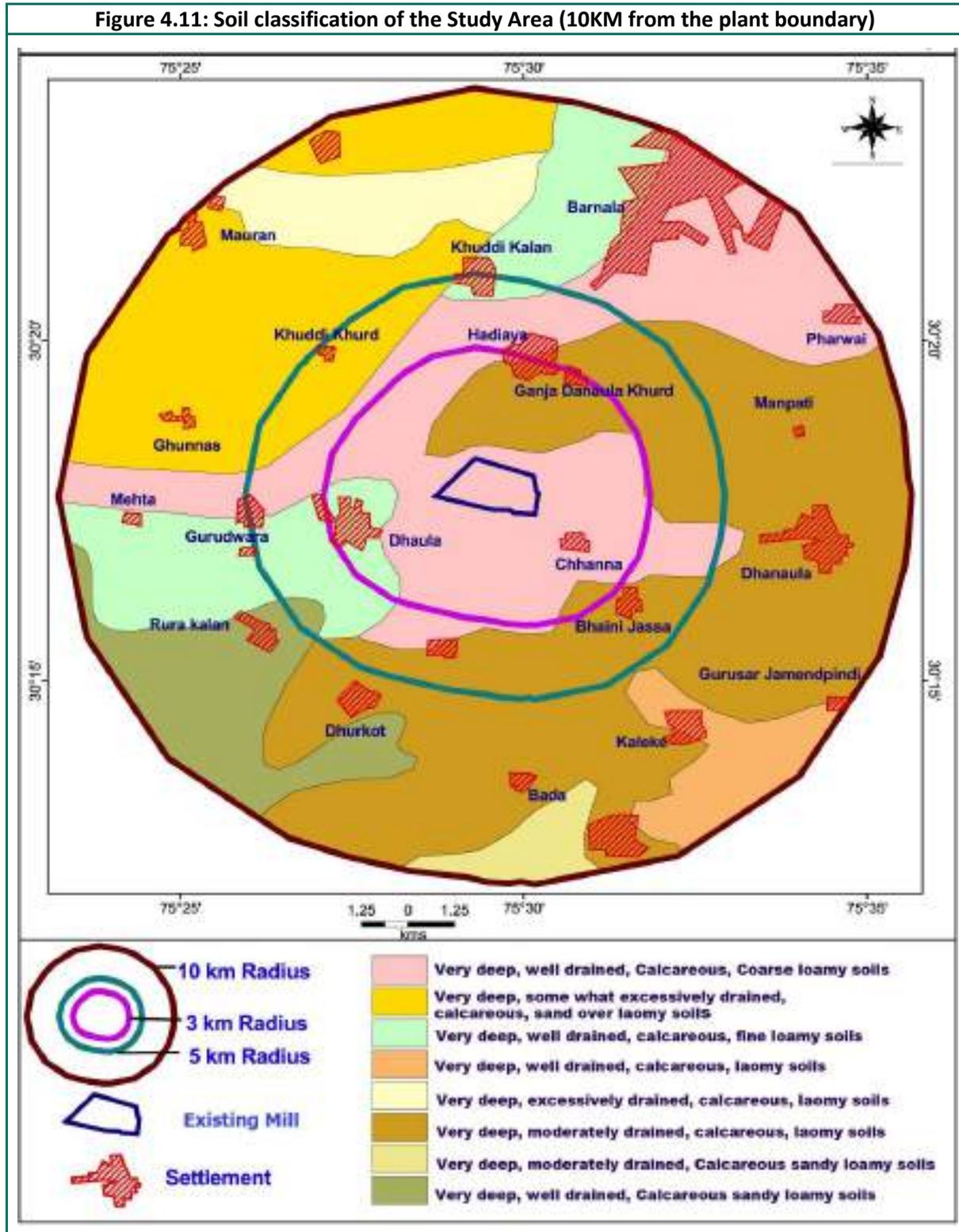


Figure 4.11: Soil classification of the Study Area (10KM from the plant boundary)



4.4. Hydrogeology

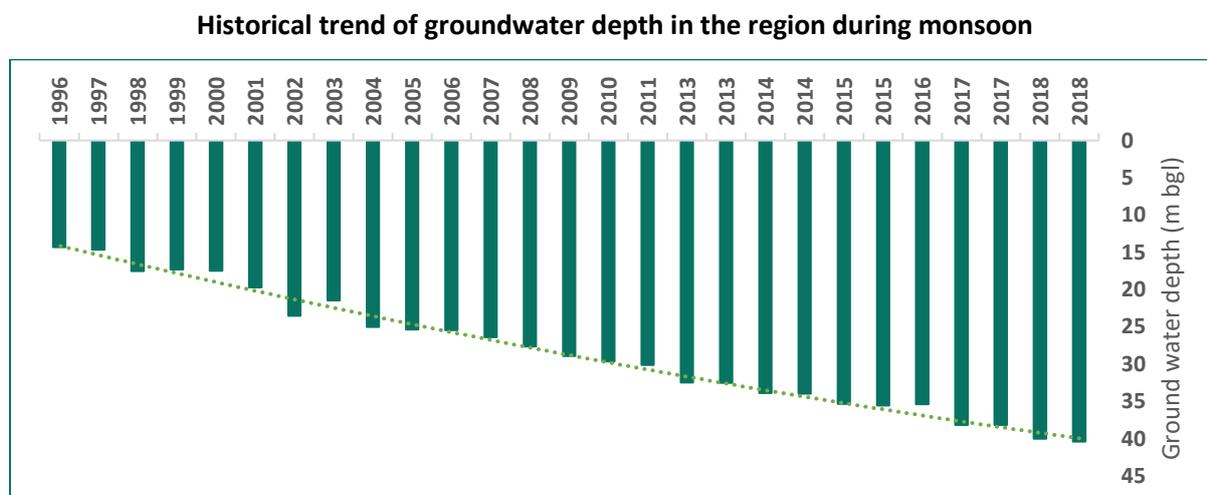
Based on details collected from the published EIA report in 2016, there are around 23 watersheds within the study area of 10km radius from the plant which covers an aerial extent of 328.38 Sq.Km. Watersheds within a 10Km radius from the mill are given in **Figure 4.12**.

The district is occupied by Indo-Gangetic alluvial plain of Quaternary age and falls in Ghaggar sub-basin. The groundwater occurs in alluvium formations comprising fine to coarse sand which forms the potential aquifers. In the shallow aquifers up to 50m bgl groundwater occurs under unconfined /water table conditions whereas in deeper aquifers semi-confined /confined conditions exist.

Water level Behaviour- as per the published EIA report, the depth to the water level in the region ranges from 8.72 m to 23.89 m bgl during the pre-monsoon period and 9.95 m to 25.41m bgl during post-monsoon period. The seasonal fluctuation varies from 1.05 m to 5.32 m in the study area. The long-term fluctuation trend indicates an average fall of 0.65m/year. The hydrogeology map of the district is given in **Figure 4.13**.

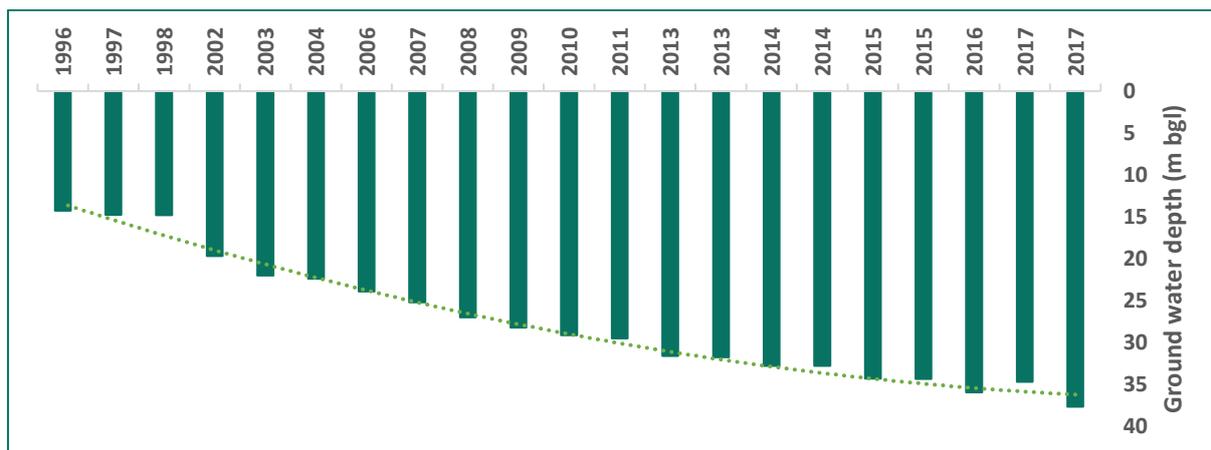
As per the details published by Central Ground Water Board, the Barnala block is categorized as an Over Exploited Zone. The groundwater potential and the categorization of blocks is given in **Figure 4.14**. The regional groundwater levels vary between 15 to 27 m bgl which is in line with the above and the yield of the wells varies between 1000 to 4000 liters per minute. Groundwater level contour is presented in **Figure 4.15**.

The published data on the historical trend of groundwater depth at the nearest CGWB maintained tube well located in Barnala town during monsoon and pre-monsoon is presented below:



Source: Central Ground Water Board

Historical trend of groundwater depth in the region during pre-monsoon



Source: Central Ground Water Board

Over the past 22 years, the groundwater depth has been increased to an extent of approx. 26.1m during monsoon and 23.4m during pre-monsoon which could be due to the extensive utilization of groundwater for irrigation and improved urbanization in the region.

As per the published EIA report in 2016, the soil lithology reveals that the porosity of the soil is 46.82% and the Texture is Sandy clay. The porosity indicates that the infiltration rate of the soil is moderate. The groundwater table contour depicts that the flow is towards the west direction in both the seasons which is in line with the land elevation profile. The hydraulic gradient in the mill site is moderate and has been observed as 4.8 m/Km in pre-monsoon and 3.9 m/Km in post-monsoon. It is also noticed groundwater trough and mound in isolated pockets of the study area which indicates the convergent and divergent flow of groundwater. The groundwater table constructed for the study area is presented in **Figure 16** and **Figure 17**.

Figure 4.12: Water Shed of the Study Area (10KM from the plant boundary)

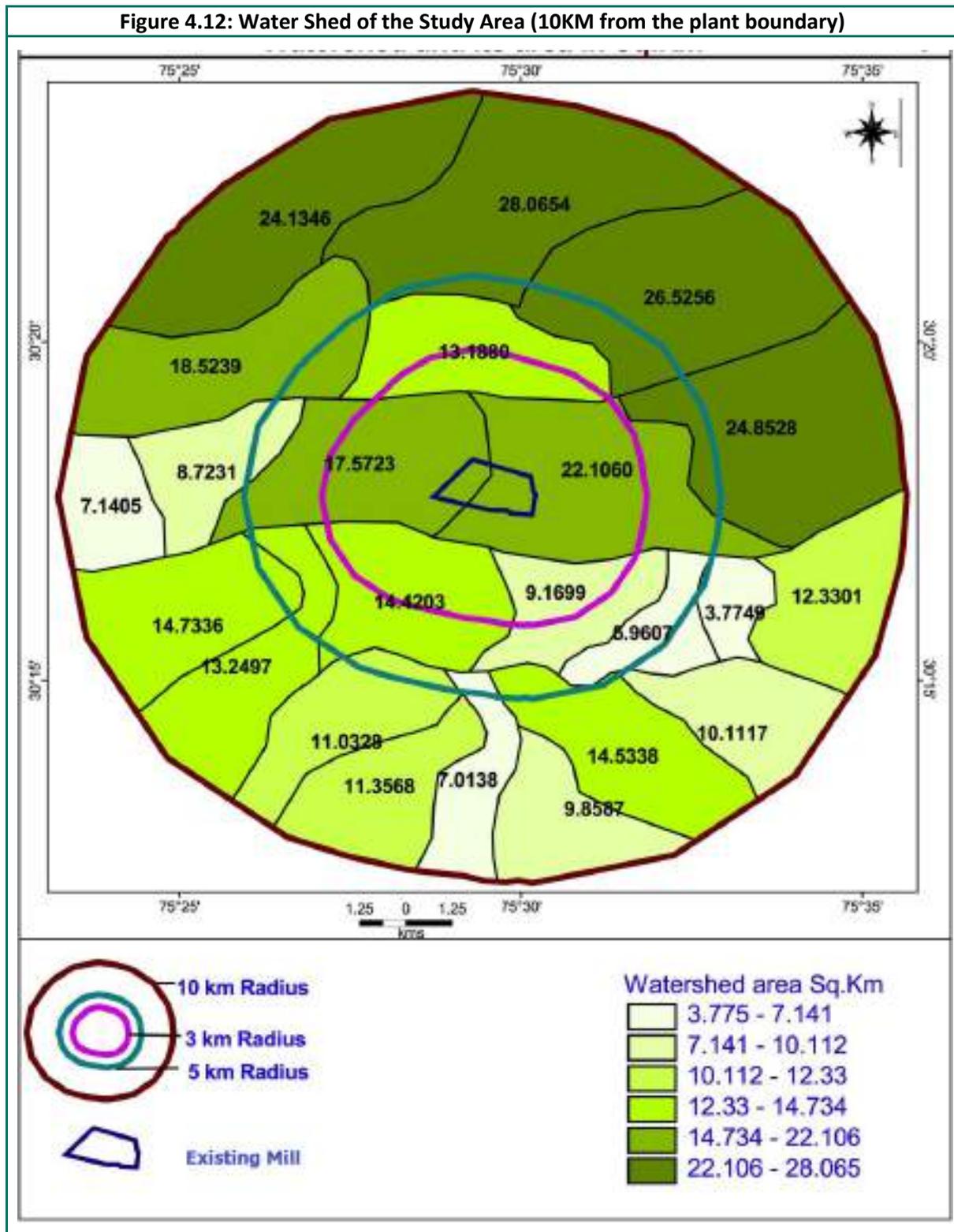


Figure 4.13: Hydrogeology map of the Area

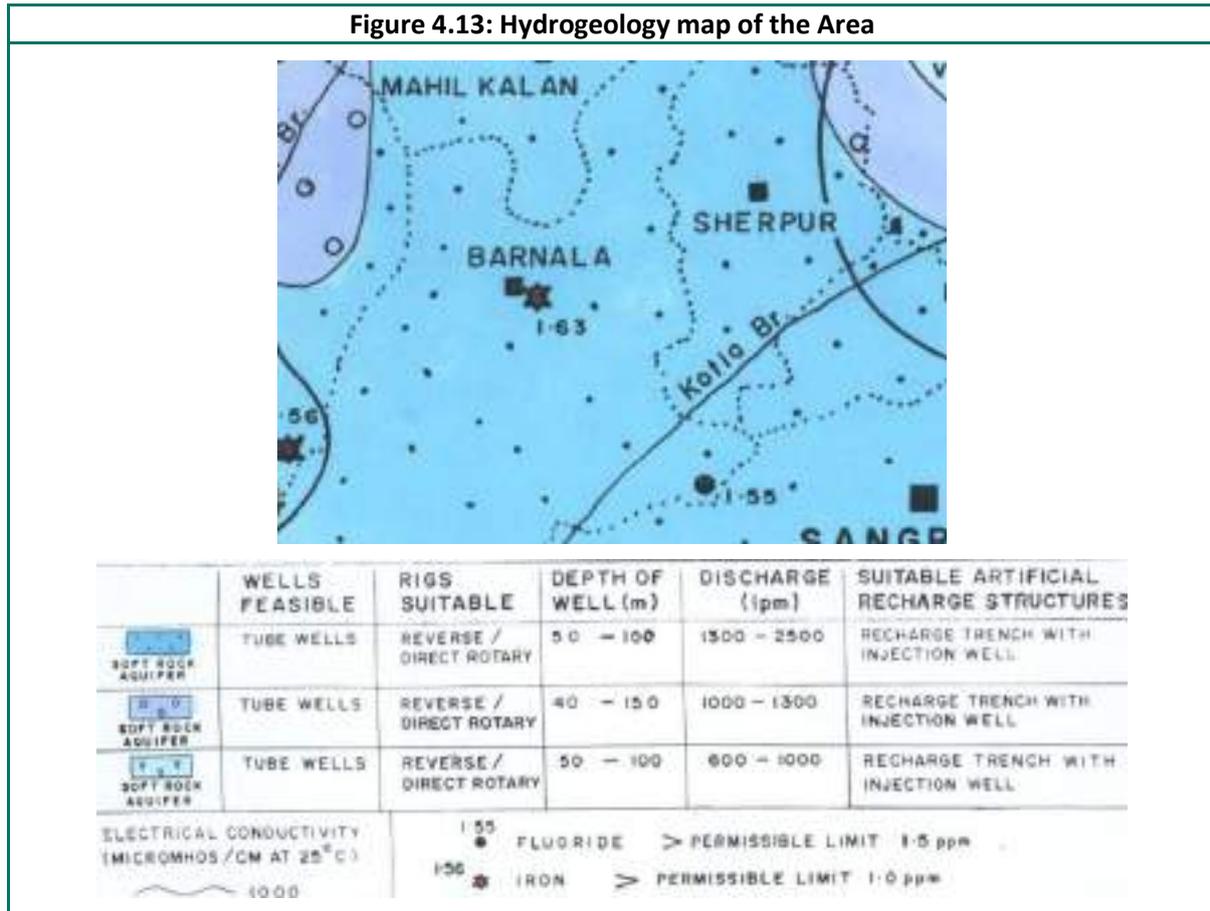


Figure 4.14: Groundwater potential and the categorization of Blocks in the Area

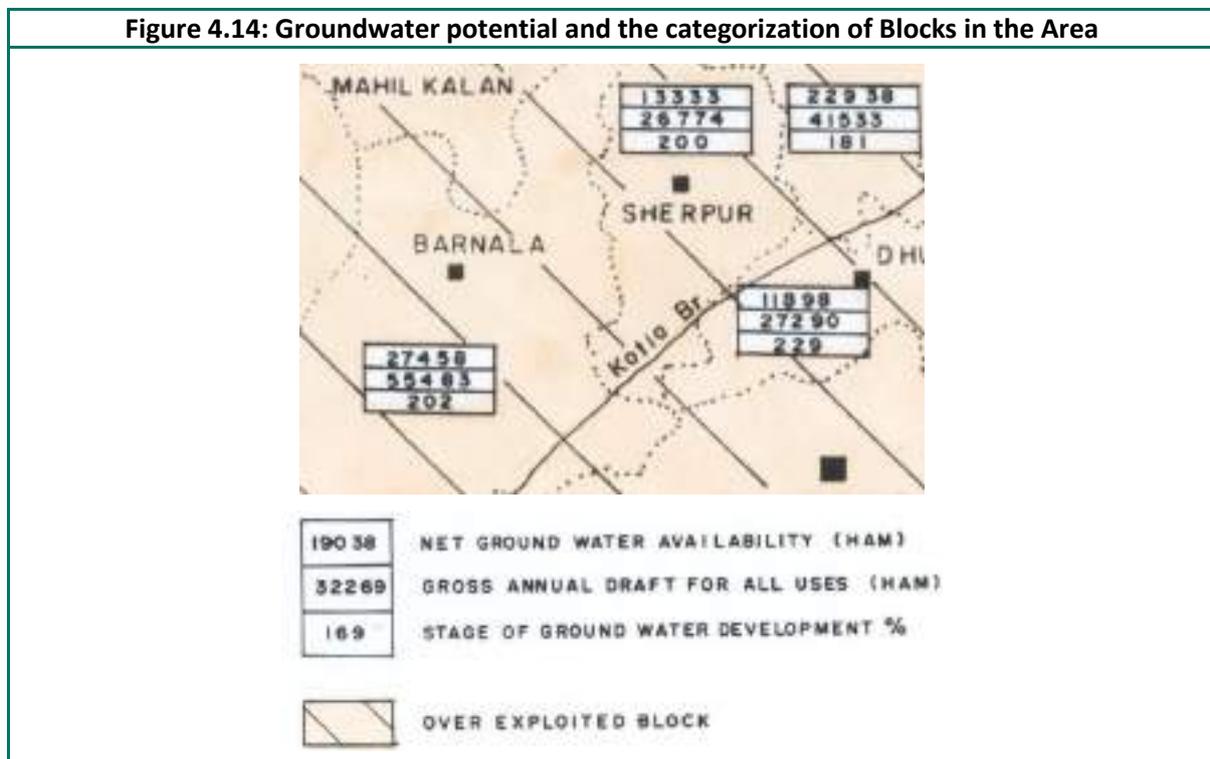


Figure 4.15: Groundwater level contour of the Study Area (10KM from the plant boundary)

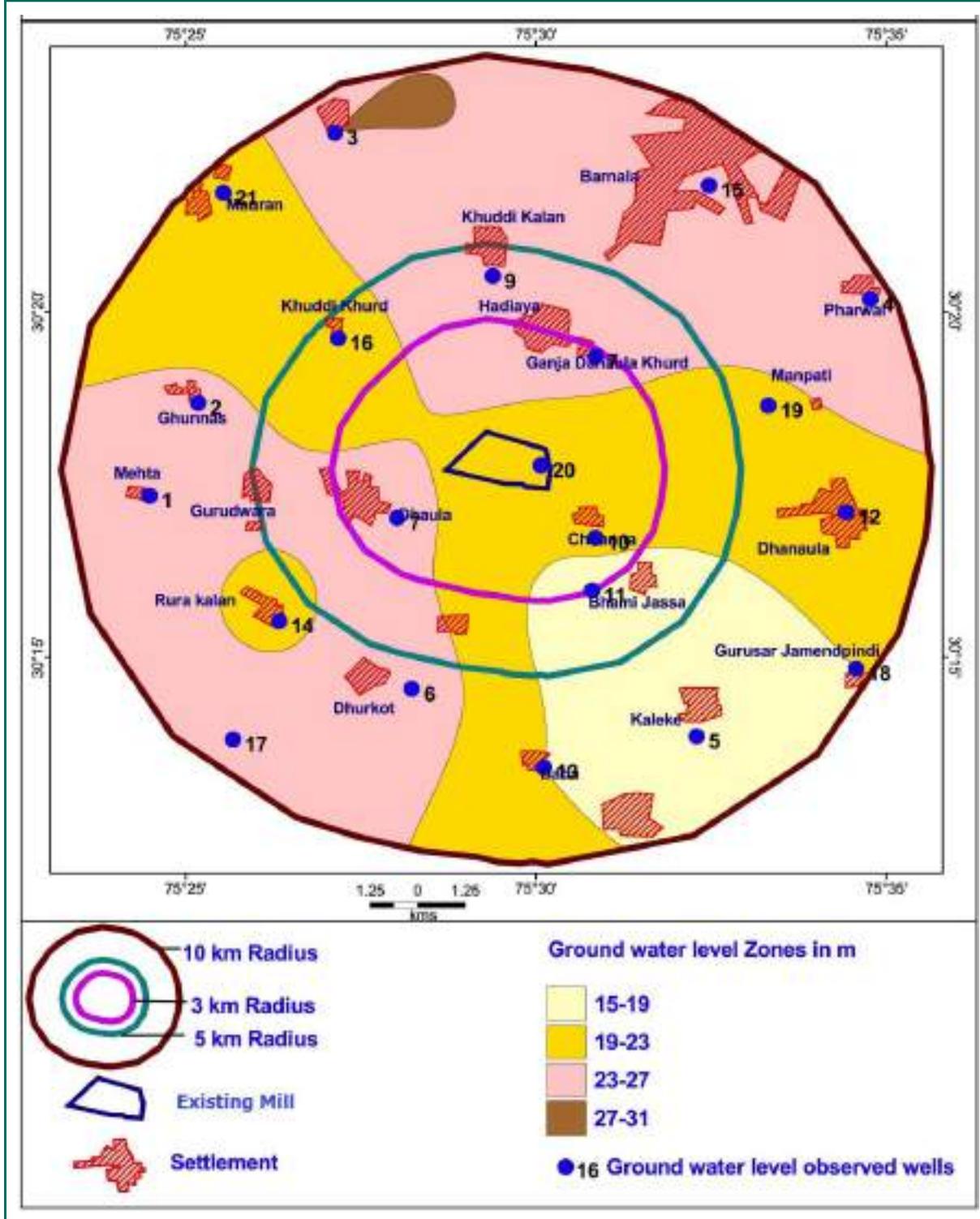


Figure 4.16: Groundwater table and hydraulic gradient during Pre-Monsoon (10KM from the plant boundary)

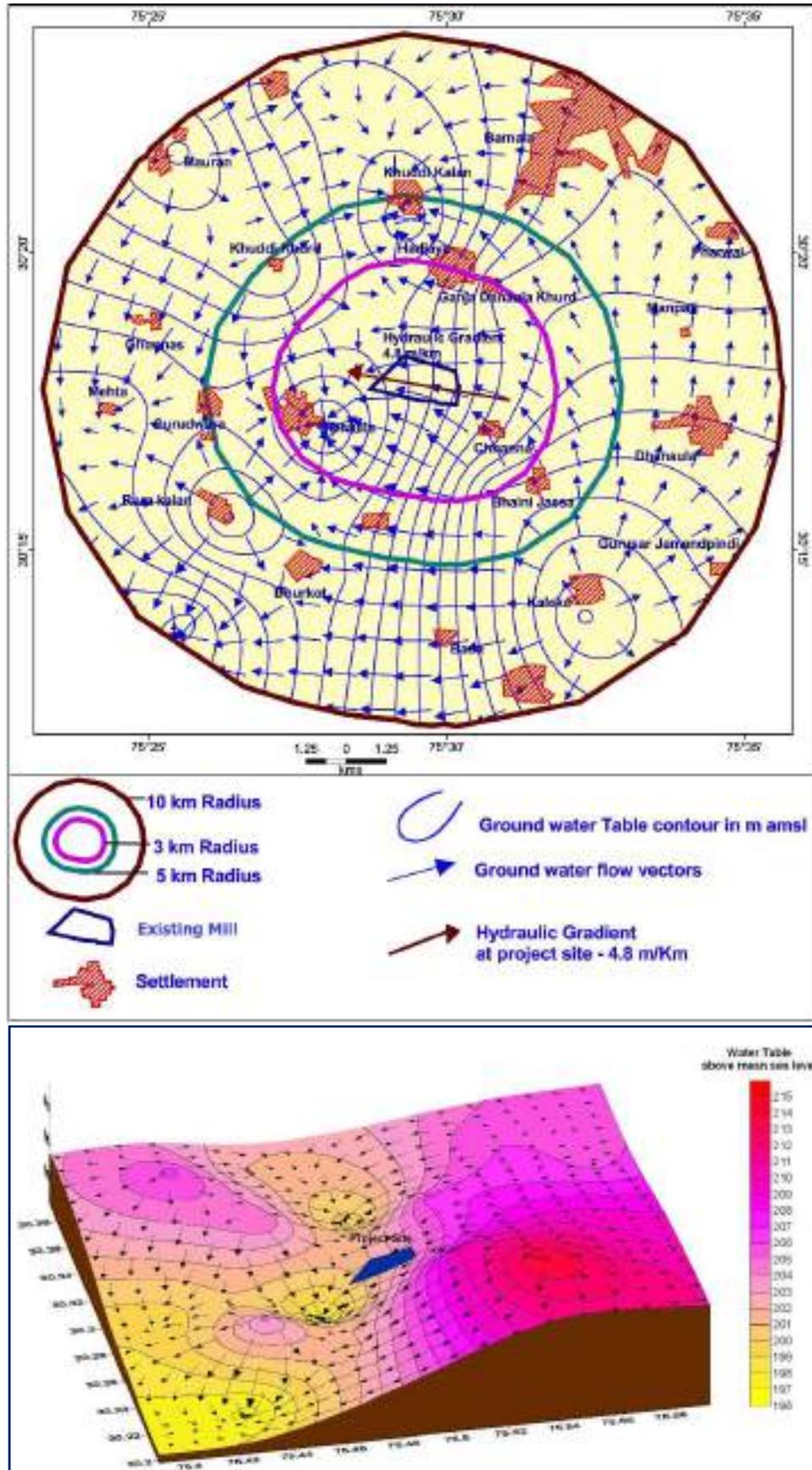
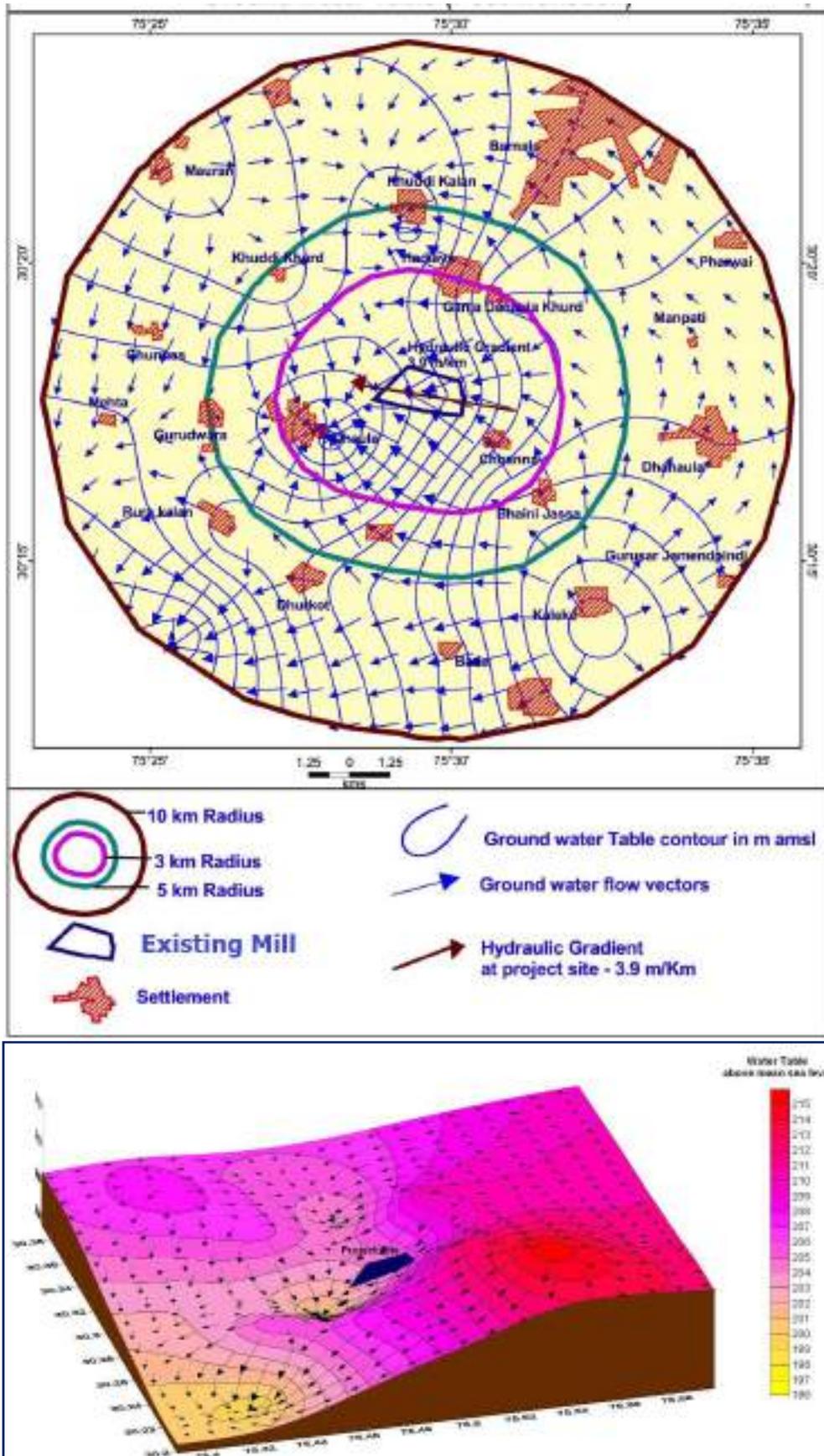


Figure 4.17: Groundwater table and hydraulic gradient during Post-Monsoon (10KM from the plant boundary)



5. SOIL AND GROUNDWATER QUALITY IN THE REGION

5.1. Published Information on Soil and Groundwater Quality in the Region

Based on the quality data published by Central Ground Water Board, Ministry of water resources, Govt. of India, the groundwater in the district is generally alkaline in nature. The chemical quality data from the shallow and deep aquifers indicate that all major cations (Ca, Mg, Na, and K) and anions (CO_3 , HCO_3 , Cl, SO_4) are within the permissible limits set by BIS, 2012. The physical parameters such as electrical conductivity show a wide variation from 827 $\mu\text{S}/\text{cm}$ in the southern and northern part to 1140 $\mu\text{S}/\text{cm}$ in the central part of the district particularly where the existing mill is location. It was also concluded that since all the physical and chemical parameters are below the permissible limit prescribed by BIS and the groundwater in the area is suitable for drinking purposes.

As per the data published by Water Resource Information System under the central water commission, the groundwater quality in the Barnala block (Coordinates of the well: 30.3583, 75.5583) was being recorded during 2015 and 2016. The summary of the quality data is below:

The average electrical conductivity was recorded was about 915 $\mu\text{mhos}/\text{cm}$ which indicates that approx. total dissolved solids concentration is 450 to 500 mg/l. Thus, the regional level of groundwater quality in terms of TDS is moderate. The average pH recorded was about 8.8 which is also slightly exceeding the acceptable limit for drinking water. Hence the tendency to scale is significantly high.

The average *Sodium Adsorption Ratio (SAR)* value of 5.17 and *Residual Sodium Carbonate (RSC)* value of 3.73 has been recorded which indicates the SAR is below the permissible limit of 10 while the RSC value is slightly above the prescribed limit of 2.5 for the agricultural purpose. SAR is an indicator of the suitability of water used for agricultural purposes and also a standard diagnostic parameter for the sodicity hazard of soil. Whereas the RSC is an indicator for alkalinity hazard of soil and it can be inferred that the entire region has the tendency to exhibit higher pH in the soil.

5.2. Soil and Groundwater Quality – Primary Data

For the purpose of this assessment, the soil and groundwater samples have been collected from the below areas. The groundwater samples collected are from the existing private borewells which were drilled up to the deeper aquifer. There are no open wells located in the area.

1. Samples along the Dhanuala drain (less than 100m from the Drain)-

- Upstream with respect to the plant discharge point
- Near the plant discharge point

- Downstream with respect to the plant discharge point

II. Samples to map the baseline background levels

- Upgradient location with respect to the groundwater flow direction (Southeast to the plant)
- Cross gradient location with respect to the groundwater flow direction (Southwest to the plant)

III. Samples within the onsite irrigation area

The location details for the above-mentioned soil and groundwater sampling points are given in **Table 5.1** and **Table 5.2** respectively. The location maps are presented in **Figure 5.1** and **Figure 5.2**.

The analytical data of soil and groundwater samples are summarized and presented in **Table 5.3** and **Table 5.4** respectively. The laboratory test reports are attached as **Annexure** of this report.

Table 5.1: Groundwater Sampling location details

| Code | Location Description | Latitude | Longitude |
|------|---|------------|------------|
| GW1 | Along the drain - Upstream of Dhanuala from plant | 30.295647° | 75.510133° |
| GW2 | Along the drain - Upstream of Dhanuala from plant | 30.293611° | 75.520917° |
| GW3 | Baseline background Location (Upgradient as per groundwater flow direction) | 30.273278° | 75.525667° |
| GW4 | Baseline background Location (Upgradient as per groundwater flow direction) | 30.269889° | 75.529806° |
| GW5 | Along the drain – Near the plant | 30.303547° | 75.491189° |
| GW6 | Along the drain – Downstream of Dhanuala from plant | 30.306944° | 75.480528° |
| GW7 | Along the drain – Downstream of Dhanuala from plant | 30.307833° | 75.474722° |
| GW8 | Along the drain – Downstream of Dhanuala from plant | 30.314167° | 75.429583° |
| GW9 | Along the drain – Downstream of Dhanuala from plant | 30.316199° | 75.418556° |
| GW10 | Baseline background Location (the Nearest village in the South) | 30.283539° | 75.465386° |
| GW11 | Within the onsite irrigation area | 30.297722° | 75.486056° |
| GW12 | Within the onsite irrigation area | 30.290187° | 75.499296° |

Table 5.2: Soil Sampling location details

| Code | Location Description | Latitude | Longitude |
|------|---|------------|------------|
| S1 | Along the drain - Upstream of Dhanuala from plant | 30.297361° | 75.510417° |

| | | | |
|------------|---|------------|------------|
| S2 | Along the drain - Upstream of Dhanuala from plant | 30.293611° | 75.520917° |
| S3 | Baseline background Location (Upgradient as per groundwater flow direction) | 30.273278° | 75.525667° |
| S4 | Baseline background Location (Upgradient as per groundwater flow direction) | 30.269889° | 75.529806° |
| S5 | Along the drain – Near the plant | 30.300357° | 75.497876° |
| S6 | Along the drain – Downstream of Dhanuala from plant | 30.307833° | 75.474722° |
| S7 | Along the drain – Downstream of Dhanuala from plant | 30.313606° | 75.429431° |
| S8 | Along the drain – Downstream of Dhanuala from plant | 30.316173° | 75.418771° |
| S9 | Within the onsite irrigation area | 30.297722° | 75.486053° |
| S10 | Within the onsite irrigation area | 30.295487° | 75.489771° |
| S11 | Within the onsite irrigation area | 30.290632° | 75.499480° |

Figure 5.1: Locations of Groundwater Sampling

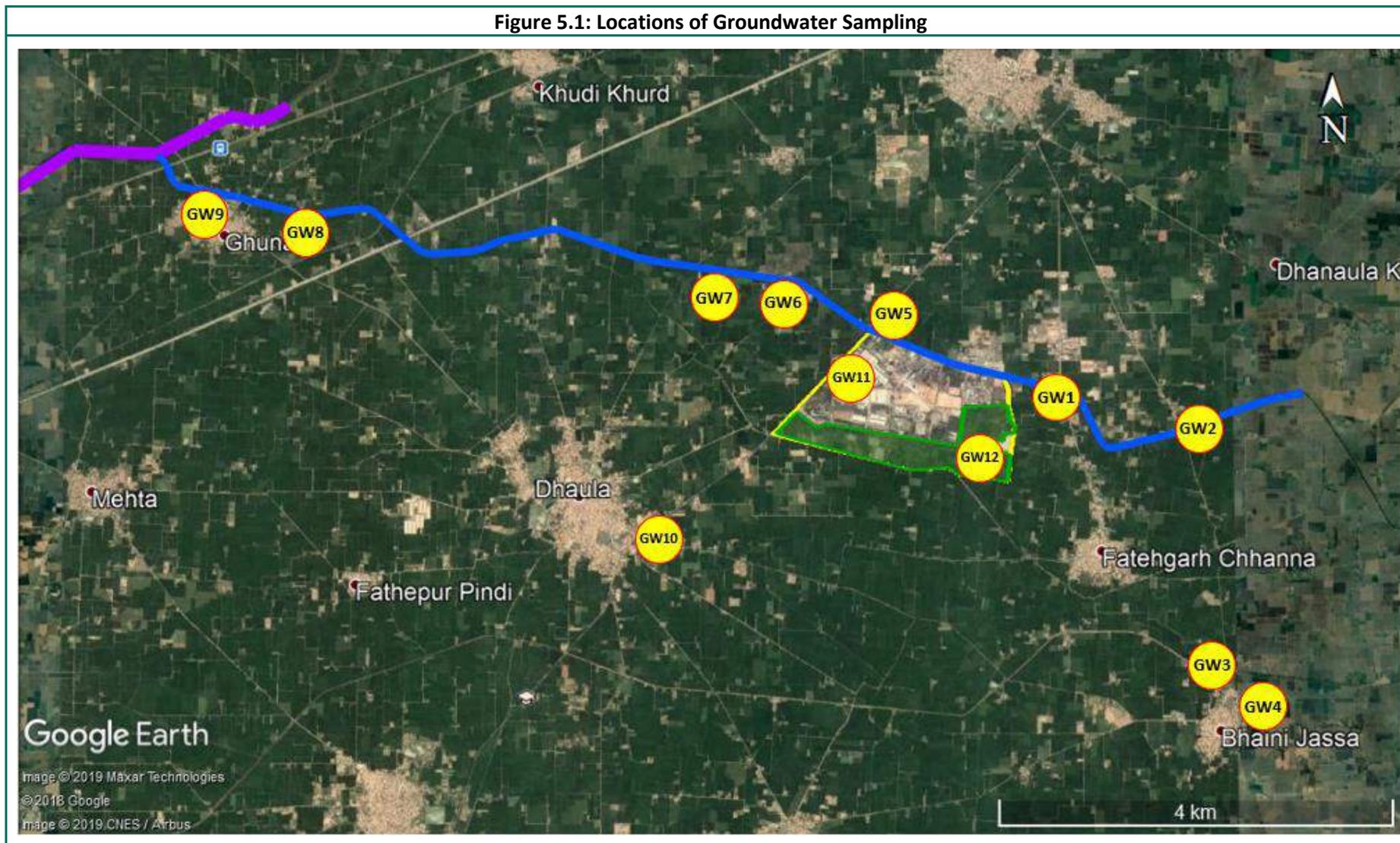


Figure 5.2: Locations of Soil Sampling

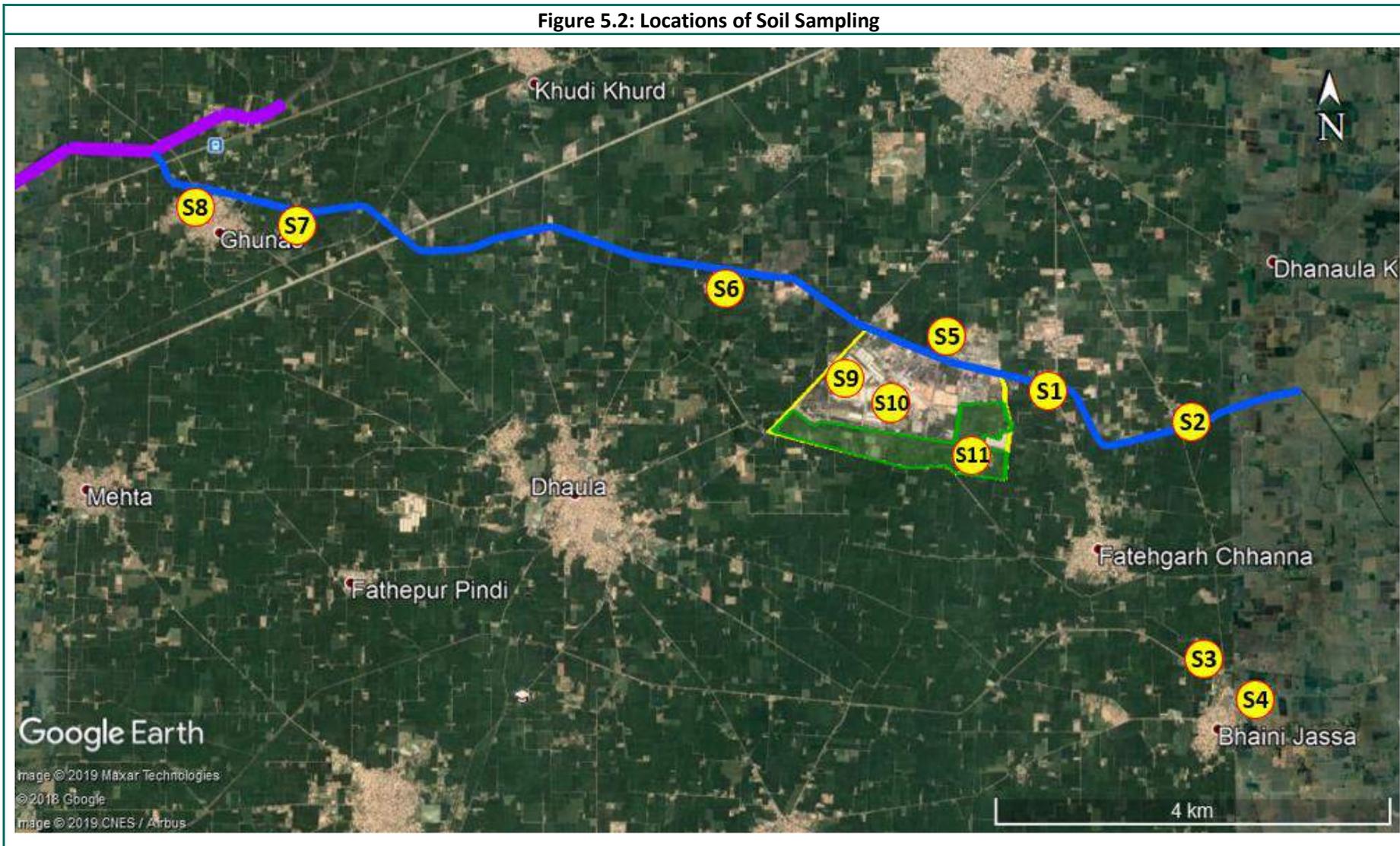


Figure 5.3: Photographs of Soil and Groundwater Sampling



Table 5.3: Summary of Groundwater Analytical results

| S. No. | Parameters | Units | Detection Limit | Along Dhanuala Drain | | | | | | | Within the onsite irrigation area | | Background baseline locations | | | Dutch Standards | |
|--------|--|----------|-----------------|----------------------|--------|----------------|------------|--------|--------|--------|-----------------------------------|--------|-------------------------------|--------|---------------|---------------------|-------|
| | | | | Upstream | | Near the Plant | Downstream | | | GW-11 | GW-12 | GW-3 | GW-4 | GW-10 | Target Values | Intervention Values | |
| | | | | GW-1 | GW-2 | GW-5 | GW-6 | GW-7 | GW-8 | | | | | | | | GW-9 |
| 1 | pH | | | 7.64 | 7.98 | 7.47 | 7.14 | 7.63 | 7.52 | 7.46 | 7.39 | 7.62 | 7.71 | 7.77 | 7.59 | | |
| 2 | Total Dissolved Solids | mg/l | | 874 | 894 | 1060 | 1276 | 876 | 784 | 1062 | 1222 | 942 | 524 | 558 | 676 | | |
| 3 | Electrical Conductivity | µmhos/cm | | 1409 | 1444 | 1710 | 2060 | 1411 | 1265 | 1716 | 1971 | 1523 | 846 | 901 | 1092 | | |
| 4 | Total Hardness (as CaCO ₃) | mg/l | | 260 | 220 | 265 | 595 | 310 | 305 | 375 | 380 | 285 | 145 | 140 | 180 | | |
| 5 | Chemical Oxygen Demand (COD) | mg/l | 4 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | | |
| 6 | BOD at 27°C for 3 days | mg/l | 2 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | | |
| 7 | Dissolved Oxygen | mg/l | | 7.4 | 7.4 | 7.5 | 7.4 | 7.4 | 7.4 | 7.4 | 7.5 | 7.4 | 7.4 | 7.5 | 7.4 | | |
| 8 | Salinity (as NaCl) | mg/l | | 588.05 | 666.83 | 658.7 | 518.42 | 424.39 | 257.68 | 579.03 | 738.5 | 502.16 | 220.83 | 376.36 | 439.13 | | |
| 9 | Nitrogen (as N) | mg/l | 0.3 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | | |
| 10 | Phosphorus (as P) | mg/l | 0.2 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | | |
| 11 | Potassium (as K) | mg/l | | 7.09 | 6.78 | 7.35 | 8.27 | 8.08 | 7.46 | 7.4 | 7.3 | 6.65 | 4.91 | 5.09 | 5.55 | | |
| 12 | Aluminium (as Al) | mg/l | 0.005 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.16 | bdl | bdl | bdl | | |
| 13 | Barium (as Ba) | mg/l | 0.005 | 0.065 | 0.044 | 0.1 | 0.083 | 0.078 | 0.058 | 0.062 | 0.058 | 0.069 | 0.041 | 0.031 | 0.035 | 0.05 | 0.625 |
| 14 | Copper (as Cu) | mg/l | 0.005 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.008 | bdl | bdl | bdl | 0.015 | 0.075 |
| 15 | Iron (as Fe) | mg/l | 0.05 | bdl | bdl | bdl | bdl | bdl | bdl | 0.13 | 0.056 | 0.94 | bdl | bdl | bdl | | |
| 16 | Manganese (as Mn) | mg/l | 0.005 | bdl | bdl | bdl | 0.038 | bdl | bdl | bdl | 0.008 | 0.03 | bdl | bdl | 0.009 | | |
| 17 | Selenium (as Se) | mg/l | 0.005 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.00007 | 0.16 |
| 18 | Silver (as Ag) | mg/l | 0.005 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | - | 0.04 |
| 19 | Zinc (as Zn) | mg/l | 0.02 | bdl | bdl | bdl | bdl | bdl | bdl | 0.025 | bdl | 0.12 | bdl | bdl | bdl | 0.065 | 0.8 |
| 20 | Molybdenum (as Mo) | mg/l | 0.005 | 0.006 | 0.008 | bdl | bdl | 0.011 | bdl | bdl | 0.006 | 0.006 | 0.014 | 0.028 | 0.007 | 0.005 | 0.3 |
| 21 | Cadmium (as Cd) | mg/l | 0.02 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.0004 | 0.006 |
| 22 | Lead (as Pb) | mg/l | 0.005 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.015 | 0.075 |

| | | | | | | | | | | | | | | | | | |
|----|---|------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------|--------|
| 23 | Mercury (as Hg) | mg/l | 0.0005 | bdl | 0.00005 | 0.0003 |
| 24 | Nickel (as Ni) | mg/l | 0.005 | bdl | 0.015 | 0.075 |
| 25 | Total Arsenic (as As) | mg/l | 0.005 | bdl | 0.01 | 0.06 |
| 26 | Total Chromium (as Cr) | mg/l | 0.005 | bdl | 0.001 | 0.03 |
| 27 | Polychlorinated biphenyl (PCB) | µg/l | 0.05 | bdl | 0.01 | 0.01 |
| 28 | Polynuclear Aromatic hydrocarbons (PAH) | µg/l | 0.05 | bdl | | |
| 29 | Residual Pesticides | µg/l | 0.01 | bdl | | |

| | |
|--|--|
| | Detected values |
| | Below detectable levels |
| | Values exceeding the Dutch Target values |
| | Values exceeding the Dutch Intervention values |

Table 5.4: Summary of Soil Analytical results

| S. No. | Parameters | Units | Detection Limit | Along Dhanuala Drain | | | | | | Within the onsite irrigation area | | | Background baseline locations | | Dutch Standards | |
|--------|---|----------|-----------------|----------------------|-------|----------------|------------|-------|-------|-----------------------------------|-------|-------|-------------------------------|---------------|---------------------|-----|
| | | | | Upstream | | Near the Plant | Downstream | | S-9 | S-10 | S-11 | S-3 | S-4 | Target Values | Intervention Values | |
| | | | | S-1 | S-2 | S-5 | S-6 | S-7 | | | | | | | | S-8 |
| 1 | pH | | | 8.72 | 8.86 | 8.39 | 9.23 | 8.49 | 9.05 | 8.98 | 9.25 | 8.95 | 8.62 | 8.68 | | |
| 2 | Electrical conductivity | µmhos/cm | | 220 | 259 | 280 | 119 | 116 | 148 | 108 | 258 | 164 | 279 | 155 | 2000* | |
| 3 | Organic Matter | % wt/wt | | 0.7 | 0.49 | 0.49 | 0.68 | 0.85 | 0.63 | 0.42 | 0.5 | 0.54 | 1.01 | 0.62 | | |
| 4 | Available Phosphorus (as P) | % wt/wt | | 0.083 | 0.101 | 0.054 | 0.063 | 0.08 | 0.091 | 0.069 | 0.033 | 0.054 | 0.083 | 0.056 | | |
| 5 | Total Nitrogen (as N) | % wt/wt | | 0.08 | 0.21 | 0.16 | 0.043 | 0.065 | 0.046 | 0.074 | 0.047 | 0.05 | 0.05 | 0.09 | | |
| 6 | Oil & Grease | % wt/wt | | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | | |
| 7 | Salinity (as NaCl) | % wt/wt | | 0.09 | 0.12 | 0.1 | 0.17 | 0.17 | 0.11 | 0.1 | 0.12 | 0.13 | 0.11 | 0.14 | | |
| 8 | Moisture | % wt/wt | | 13.95 | 13.25 | 10.31 | 9.64 | 13.39 | 10.41 | 1.89 | 5.21 | 2.83 | 10.47 | 11.48 | | |
| 9 | Cadmium (as Cd) | mg/kg | 1 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.8 | 12 |
| 10 | Zinc (as Zn) | mg/kg | 1 | 42.33 | 50.22 | 35.33 | 33.47 | 34.83 | 32.34 | 19.19 | 39.73 | 55.32 | 43.16 | 74.56 | 140 | 720 |
| 11 | Total Chromium (as Cr) | mg/kg | 1 | 22.16 | 30.19 | 21.24 | 18.66 | 17.56 | 16.07 | 10.42 | 14.23 | 13.92 | 21.06 | 19.79 | 100 | 380 |
| 12 | Nickel (as Ni) | mg/kg | 1 | 14.31 | 23.6 | 13.08 | 9.04 | 9.41 | 5.39 | bdl | 6.52 | 6.82 | 13.47 | 12.59 | 35 | 210 |
| 13 | Total Arsenic (as As) | mg/kg | 1 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 29 | 55 |
| 14 | Mercury (as Hg) | mg/kg | 1 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.3 | 10 |
| 15 | Copper (as Cu) | mg/kg | 1 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 36 | 190 |
| 16 | Lead (as Pb) | mg/kg | 1 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 3.95 | 3.95 | bdl | bdl | 85 | 530 |
| 17 | Polychlorinated biphenyl (PCB) | mg/kg | 0.05 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.02 | 1 |
| 18 | Polynuclear aromatic hydrocarbons (PAH) | mg/kg | 0.05 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 1 | 40 |

* Acceptable limit as per Indian counsel of Agricultural research

| | |
|--|--|
| | Detected values |
| | Below Detectable Levels (bdl) |
| | Values exceeding the Dutch Target values |
| | Values exceeding the Dutch Intervention values |

5.3. Summary of Groundwater Quality

pH:

pH may not have a direct impact but one of the important water quality parameters as the lower pH water is more likely to be corrosive and higher pH is water tends to scale. Based on the laboratory test results, the pH of the samples collected is in the range of 7.1 to 8.0 which is within the acceptable range as per drinking water standards published by IS 10500:2012.

Total Dissolved Solids:

The palatability of water with a total dissolved solids (TDS) level of less than about 500 mg/l is an acceptable limit for drinking purposes as per Indian standards. Considering the regional scenario of groundwater quality, the TDS levels in the district are likely to exceed 500 mg/l. Based on the laboratory results, the TDS in the samples collected from the existing borewells was recorded to be in the range of 524 to 1276 mg/l. The contour map is presented in **Figure 5.4** and the graphical representation is presented in **Figure 5.5**.

It can be inferred from the analytical data that the background baseline concentrations of TDS are reported in the range of 524 mg/l to 675 mg/l which is in line with the regional groundwater quality. The TDS concentration along the drain is in the range of 784 mg/l to 1276 mg/l and precisely varying from 874 mg/l to 894 mg/l in the upstream of drain from plant discharge, around 1060 mg/l near the plant discharge and from 784 mg/l to 1276 mg/l in the downstream of drain from plant discharge. The TDS concentration ranging from 942 mg/l to 1222 mg/l is recorded from the samples collected within the onsite irrigation. Based on the TDS level mapping, it can be inferred that the TDS levels in the groundwater is a regional phenomenon and is in line with the published regional level data.

Figure 5.4: TDS Concentration Contour Map

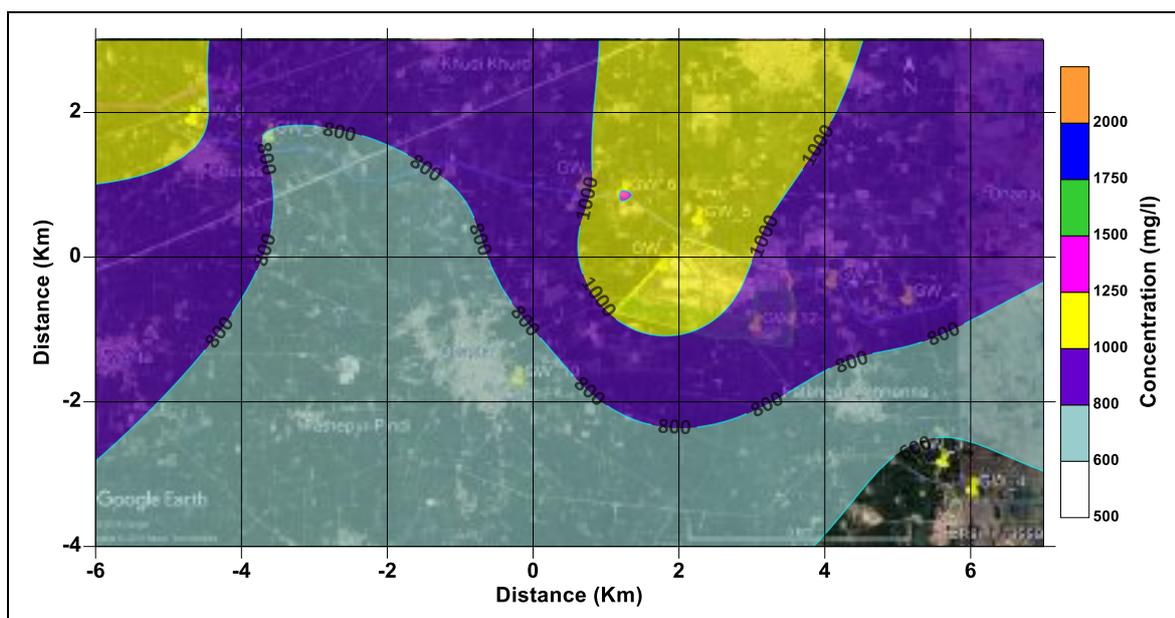
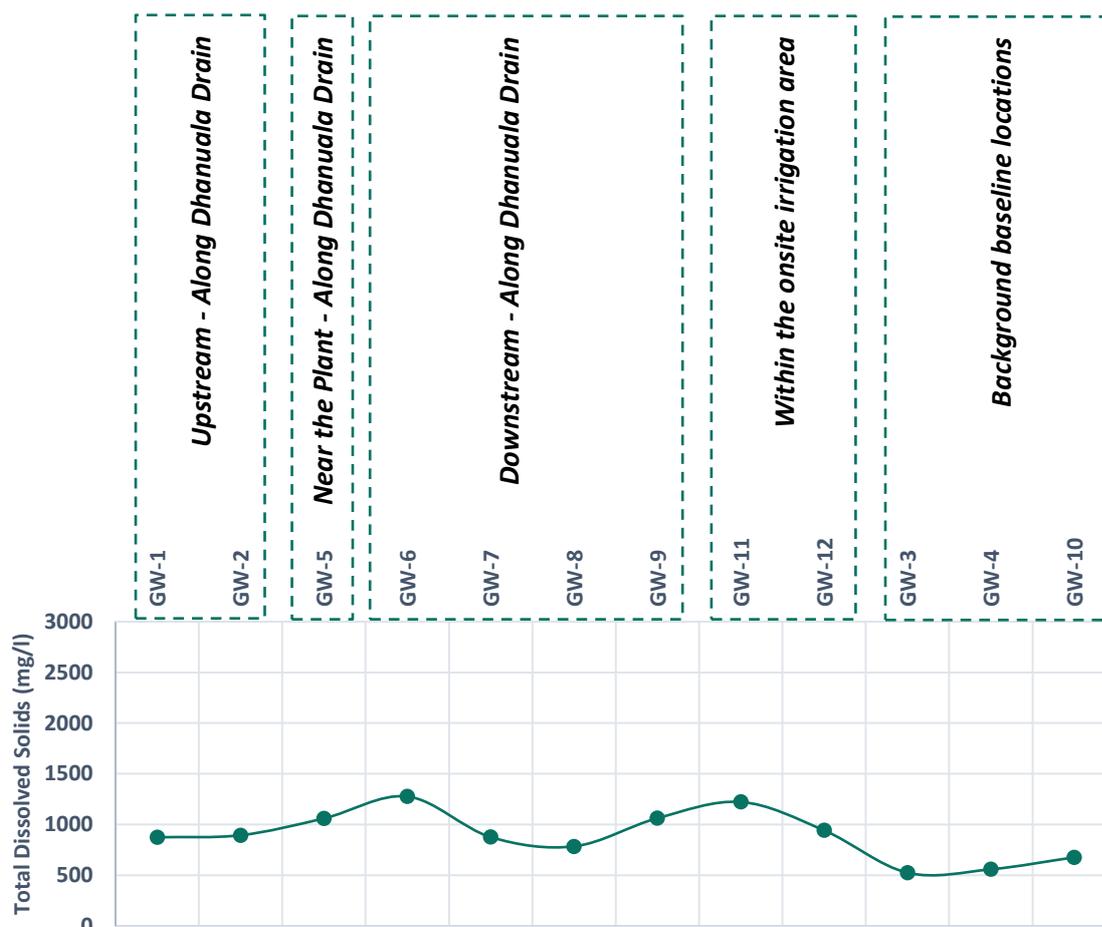


Figure 5.5: TDS Concentration in the Groundwater Samples Collected



Total Hardness:

Depending on the other parameters such as pH and alkalinity, hardness can cause increased scaling and corrosion tendencies. General guidelines for classification of waters are: 0 to 60 mg/l is classified as soft, 60 to 120 mg/l as moderately hard 120 to 180 mg/l as hard and more than 180 mg/l as very hard.

The water with a total hardness of less than 200 mg/l is an acceptable limit for drinking purposes as per Indian standards. Based on the laboratory results, the total hardness in the samples collected from the existing borewells was recorded to be in the range of 140 to 595 mg/l. The contour map is presented in **Figure 5.6** and the graphical representation is presented in **Figure 5.7**.

It can be inferred from the analytical data that the background baseline concentrations of hardness are reported in the range of 140 mg/l to 180 mg/l which is classified as moderately hard to hard but acceptable for drinking purposes as per Indian standards. The hardness concentration along the drain is in the range of 220 mg/l to 595 mg/l and precisely varying from 220 mg/l to 260 mg/l in the upstream of drain from plant discharge, around 265 mg/l near the plant discharge and from 305 mg/l to 595 mg/l in the downstream of drain from plant discharge. The hardness concentrations ranging from 285

mg/l to 380 mg/l are recorded from the samples collected within the onsite irrigation. Based on the hardness level mapping, it can be inferred that hardness is apparent at the plant site and exhibiting to be the local phenomenon and drastically diluted in the surrounding areas.

Figure 5.6: Hardness in Groundwater Contour Map

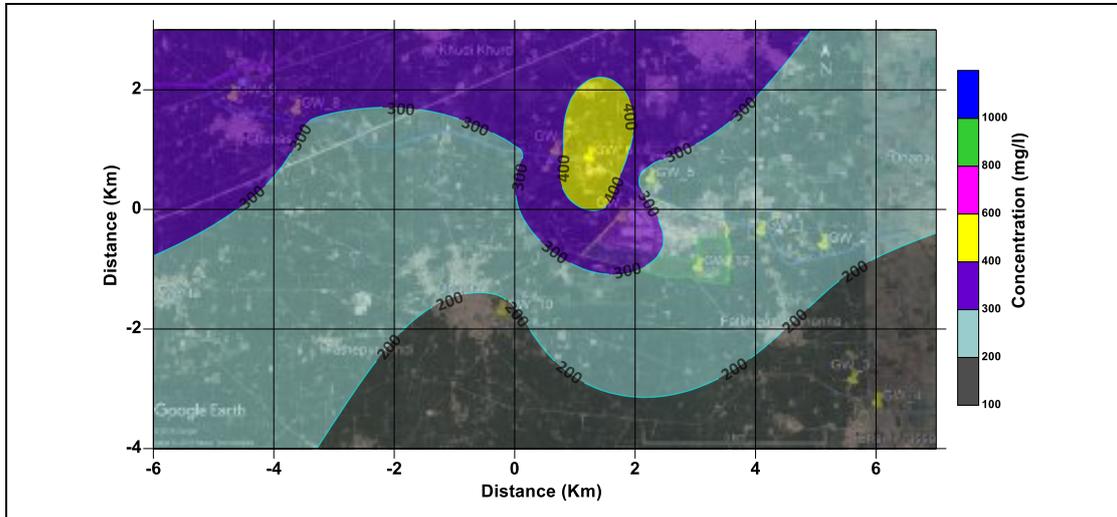
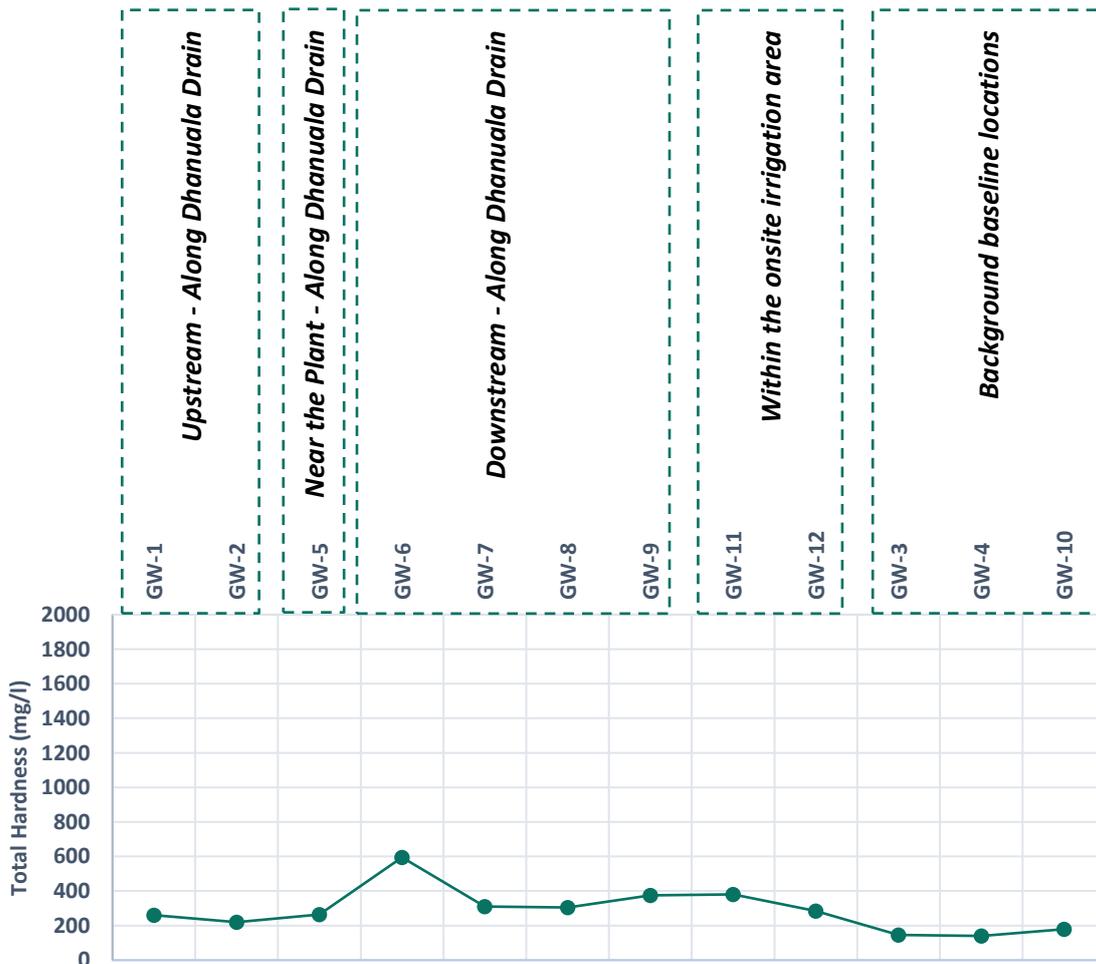


Figure 5.7: Hardness in the Groundwater Samples Collected



COD and BOD:

The chemical oxygen demand and biological oxygen demand concentrations do not exhibit or insignificant or below the detectable limits from the groundwater samples collected. Hence, it is evident that no direct ingress of industrial wastewaters or domestic sewages into the groundwater is envisaged.

Salinity:

In general, the Inland salinity in groundwater is prevalent mainly in the arid and semi-arid regions of various states including Punjab which is also reflected in terms of TDS concentration in the region. The salinity as NaCl concentrations in the groundwater samples collected is in the range of 220 mg/l to 739 mg/l. The contour map is presented in **Figure 5.8** and the graphical representation is presented in **Figure 5.9**.

There are no drinking water standards particularly for Salinity as NaCl. But higher concentrations of salinity in agricultural water impacts on plant growth and yield.

It can be inferred from the analytical data that the background baseline concentrations of salinity as NaCl are reported in the range of 220 mg/l to 439 mg/l. Whereas it is in the range of 258 mg/l to 667 mg/l and precisely varying from 588 mg/l to 667 mg/l in the upstream of drain from plant discharge, around 659 mg/l near the plant discharge and from 257 mg/l to 579 mg/l in the downstream of drain from plant discharge. The salinity as NaCl concentrations ranging from 502 mg/l to 739 mg/l is recorded from the samples collected within the onsite irrigation borewells. Based on the salinity level mapping, it can be inferred that it is a regional phenomenon.

Figure 5.8: Salinity as NaCl in Groundwater Contour Map

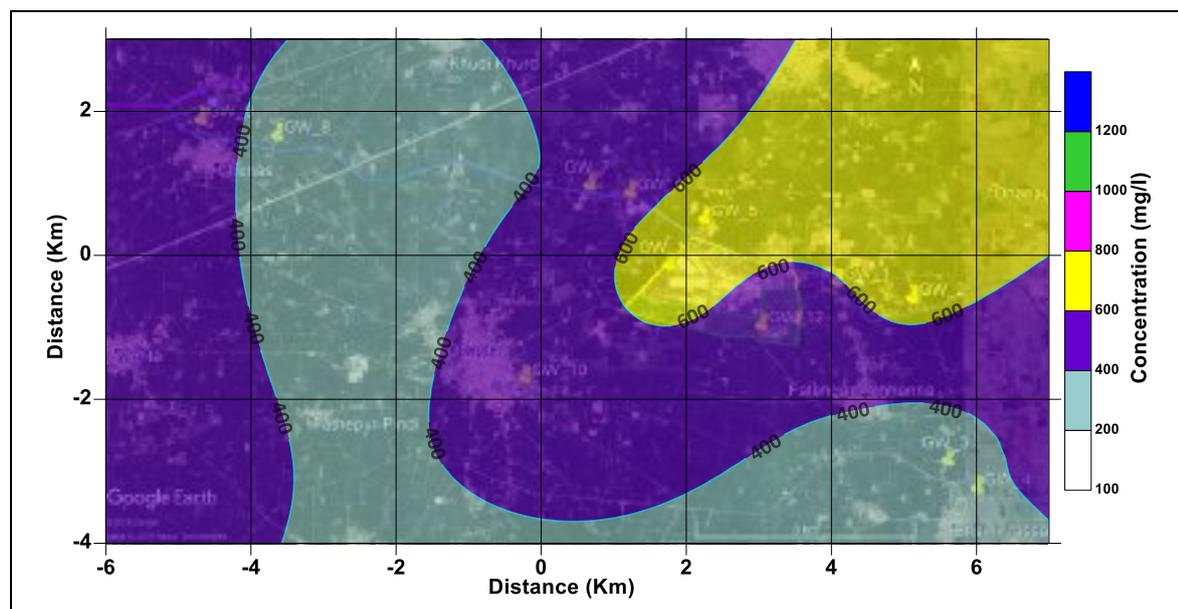
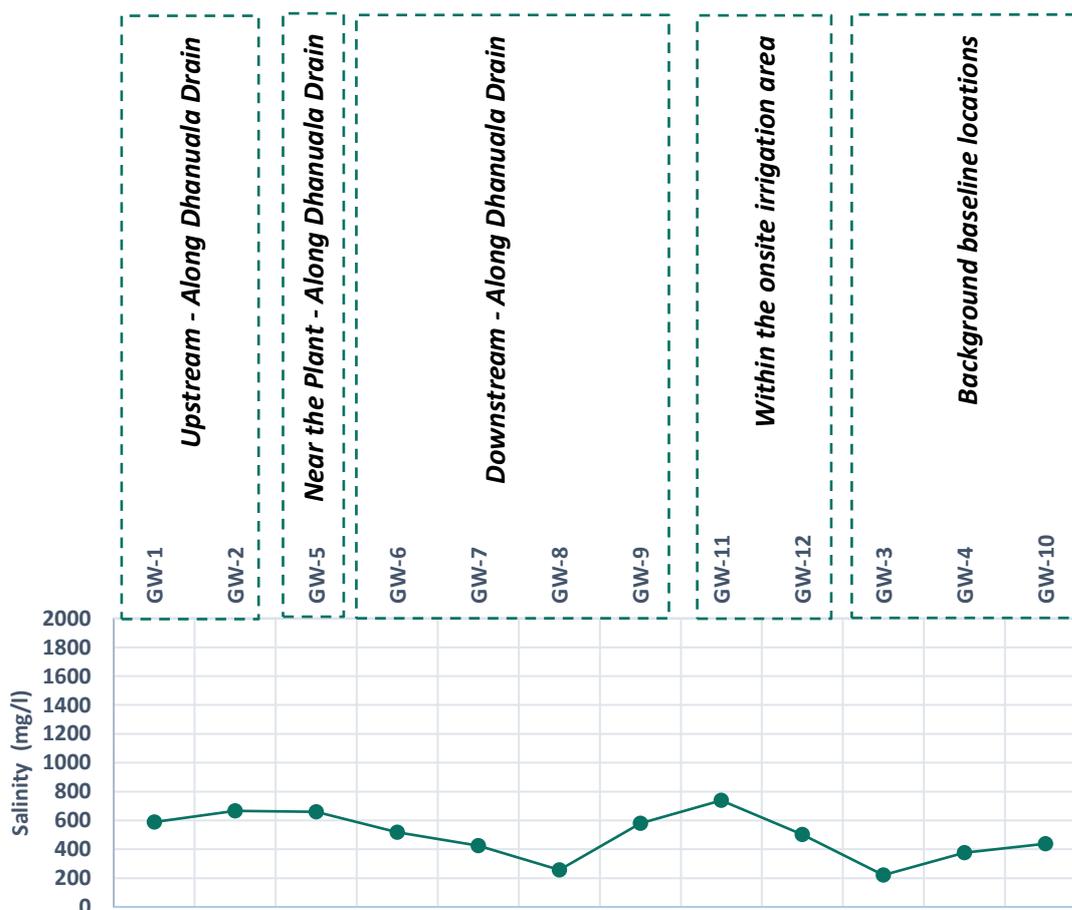


Figure 5.9: Salinity as NaCl in the Groundwater Samples Collected



Nutrients (NPK):

Nitrogen, Phosphorous, and Potassium are three primary nutrients that play an important role in agriculture for plant nutrition. Based on the analytical results of groundwater water samples collected, both nitrogen and phosphorous are concentrations do not exhibit or insignificant or below the detectable limits. Whereas, the potassium is varying in the range of 4.9 mg/l to 8.3 mg/l. There are no specific limiting concentrations for drinking water requirement whereas potassium is one of the primary nutrients for agriculture.

Heavy Metals:

The analytical results of groundwater samples collected and analyzed for Heavy metals concentrations were found to be below the intervention values as per Dutch International Standards. Hence, the groundwater in this region is not contaminated to the level of remediation and no further assessment and delineation of heavy metals contamination in the groundwater are necessarily required. Whereas, comparing the concentrations with the drinking water acceptable limits published by Indian Standards inferences that Aluminium, Iron and Manganese concentrations in the groundwater samples collected from borewell located in onsite irrigation land.

5.3. Summary of Soil Quality

The soil samples collected at various locations mentioned above were analyzed for 18 parameters. The values were then compared with the standard soil classification from the Handbook of Agriculture, Indian Council of Agricultural Research, New Delhi, 2012 to understand the suitability for agriculture and Dutch standards to evaluate the contamination if any.

pH:

The pH of the soil was found to be in the range of 8.39 to 9.25. pH above 7 is normally classified as alkaline and the high values of alkalinity. The pH in soil could be due to nitrogen-rich fertilizers in the soil. However, the alkaline soils could contribute to the growth of the plants rather than the acidic soils.

Electrical Conductivity:

The electrical conductivity of the soil was found to be in the range of 108 $\mu\text{mhos/cm}$ to 280 $\mu\text{mhos/cm}$ which could be a regional phenomenon and may be attributed to the use of fertilizers or could be due to the salinity intrusion in groundwater.

Organic Content & Total Nitrogen:

The organic content in the soil ranged from 0.42% wt/wt to 1.01% wt/wt. This could be due to the potential release of the nitrogen in the soil. The total nitrogen in the soil was found in the range of 0.043% wt/wt to 0.21% wt/wt. A typical agricultural soil would contain 0.10% to 0.15% N and hence the soil can be considered good for crop growth in terms of total nitrogen.

Available Phosphorus:

The available phosphorus in the soil was found between 0.033% wt/wt and 0.101% wt/wt. The cool, wet soils show low values of phosphorus. High values of available phosphorus will induce excessive plant growth due to the supply of essential primary nutrients. The phosphorus values could be increased by the use of phosphorus-rich fertilizers.

Salinity:

The salinity as NaCl in soil was found to be in the range of 0.09% wt/wt to 0.17% wt/wt. Since sodium does not contribute to the growth of the plants, its significance is less. Excessive sodium levels could be attributed to the irrigation waters which is the groundwater in this region.

Moisture:

The moisture in the soil samples was found to be between 1.89 % wt/wt and 13.95 % wt/wt. The higher moisture content implies that the water holding capacity of the soil is more and hence it is good for plant growth.

Zinc:

The values of Zinc ranged from 19.19 mg/kg to 74.56 mg/kg. These were found to be less than the target/Intervention values as per the Dutch Intervention Standards. This shows that the soil is not contaminated and non-toxic. Since the concentration of zinc is found to be moderate, the levels are found to be good for plant growth.

Total Chromium:

The values of Total chromium in the soil was in the range of 10.42 mg/kg to 30.19 mg/kg. This means that the soil is not contaminated. High values of chromium could be toxic.

Nickel:

The values of Nickel were found to be between 5.39 mg/kg and 23.6 mg/kg. The high content of nickel in the soil will cause toxicity. Since the values were found to be less than 35 mg/kg, it acts as a good source of nutrients that could be transferred as an important element in the diet of the human being.

Lead:

The lead values were found to Below Detection Limit (BDL) at all the locations except at the onsite irrigation areas where the traces were found.

All the other parameters such as Oil & grease, Cadmium, Total Arsenic, Mercury, Copper, Polychlorinated biphenyl (PCB) and Polynuclear aromatic hydrocarbons (PAH) were found to be Below Detection Limit (BDL) in all the soil samples collected.

6. SUMMARY AND CONCLUSIONS

The summary of soil and groundwater quality assessment carried out in the area is presented below:

- Based on the collected information regarding groundwater survey and exploration data published by CGWB for Barnala block, the groundwater flow direction in the area was evaluated to be towards the west. The land elevation slope in the area is also in line with the flow direction.
- The Water level as per the published EIA report in the region ranges from 8.72m to 23.89m bgl during the pre-monsoon period and 9.95 m to 25.41 m bgl during the post-monsoon

period. The seasonal fluctuation varies from 1.05 m to 5.32 m in the study area. The long-term fluctuation trend indicates the average fall of 0.65m/year. Barnala block is categorized as an Over Exploited Zone by CGWB.

- Based on the details obtained from during the assessment, the utilisation of treated wastewater for irrigation is in the order of 150 m³ per Ha per day which is in line with the loading rates recommended for the soil texture (for loamy and sandy loamy soil type: 110 to 225 m³/Ha/day) as per the notification of MoEF&CC published on 14 Jan, 2016.
- For the purpose of this assessment, the soil and groundwater samples have been collected (i) Along the Dhanuala drain (less than 100m from the Drain), (ii) at the upgradient locations to map the baseline background levels and (iii) at the onsite irrigation area. Groundwater samples were collected from the existing private borewells which were drilled up to the deeper aquifer which are in use.
 - pH in the groundwater samples collected was reported in the range of 7.1 to 8.0 which is within the acceptable range as per drinking water standards published by IS 10500:2012. Whereas the pH in soil was found to be more alkaline in the entire region.
 - TDS in the samples collected from the existing borewells were recorded to be in the range of 524 to 1276 mg/l. The TDS levels in groundwater from the samples collected is a regional phenomenon and is in line with the published regional level data. The groundwater's Salinity as NaCl is in-line with TDS which contributes to 50% to 60%. Similarly, the electrical conductivity in the soil is also high and depicting regional scenario which reflects the equivalent salinity as NaCl in soil.
 - Total hardness in the samples collected from the existing borewells was recorded to be in the range of 140 to 595 mg/l.
 - Minor traces of nutrients and Heavy metal were found in the groundwater and soil samples collected but the impact is totally insignificant.

Annexure I

Laboratory Analytical Test Reports for Groundwater Samples

Annexure II

Laboratory Analytical Test Reports for Soil Samples

**Guidelines
for
Utilisation of Treated Effluent in Irrigation**



**CENTRAL POLLUTION CONTROL BOARD
(Ministry of Environment, Forest & Climate Change)
'Parivesh Bhawan', East Arjun Nagar,
Delhi- 110 032**

September 2019

Guidelines for Utilisation of Treated Effluent in Irrigation

1.0 Background

The Hon'ble National Green Tribunal (NGT), Principal Bench, New Delhi, vide order dated 24.05.2019 in the matter of O.A. No. 348/2017, Shailesh Singh Vs Al-Dua Food Processing Pvt. Ltd., issued the following directions to CPCB:

"..We may add that no industry can be permitted to dispose treated effluents on land for irrigation, plantation or horticulture/gardening by prescribing standards applicable without assessment of adequate availability of land and impacts of such disposal on agricultural / crops /plants and the recipient ground water. Impact of precipitation levels also needs consideration while granting such approvals. ZLD needs to be considered with respect to use of effluents in the industrial processes not in terms of its disposal on land or farm. Therefore, the CPCB needs to look into this aspect with the help of experts and issue appropriate guidelines in this regard. This aspect may also be covered in the report to be submitted in the present case..."

CPCB, constituted an Expert Group, comprising of members from Indian Institute of Technology (IIT), Delhi, National Environmental Engineering Research Institute (NEERI), Delhi and Central Pollution Control Board (CPCB), Delhi, to lay down guidelines as directed by the Hon'ble NGT. The Expert Group in its two meetings held on 7.8.2019 and 23.09.2019, discussed the issues thoroughly and finalised the **"Guidelines for Utilisation of Treated Effluent in Irrigation"** as given in the following paragraphs/sections.

2.0 Introduction

Zero Liquid Discharge (ZLD) implies that the industries are not discharging any effluent, either on the land or in the water body or at any other place i.e. recycling the same in the process entirely without releasing any effluent.

ZLD accomplishment may need physical & chemical treatment, followed by biological system to remove organic load. The treated effluents can be then subjected for concentration and evaporation. The concentration method quite often involves the adoption of Reverse Osmosis (RO) and Nano Filtration (NF) methods. The evaporation methods involve drying/evaporation of effluent in multi effect evaporators (MEE).

Adopting ZLD practices may not be feasible in many cases in view of techno-economical reasons. However, the industries should still to be encouraged for

recycling and reuse of waste water as far as practicable in order to minimize the fresh water consumption and discharge of waste water into the environment. The treated waste water of an industry may also be utilised for irrigation. This type of utilisation/application is considered an efficient approach for managing/conserving water resources, compensating water shortages caused by seasonality or the irregular availability of water sources for irrigation throughout the year.

The possible risks of wastewater usage in agriculture may range from changes to physico-chemical and micro-biological properties of soils to impact on human health. In unfavorable economic conditions, the search for alternative irrigation sources, such as the use of untreated or inadequately treated wastewater may result in risk factors. Thus, it is necessary to ensure the beneficial aspects of this practice before application of treated wastewater in irrigation.

3.0 Guidelines for Utilisation of Effluent in Irrigation

- (i) The industry should engage an agricultural scientist or tie-up with an agricultural university or institute for advice on the utilization or the rate of application of the effluent for irrigation considering the agro-climatic conditions.
- (ii) As seasons and the sowing periods of the crops put restrictions on the utilisation of effluent for irrigation, the industry should prepare a comprehensive Irrigation Management Plan (IMP), which should include the following, in consultation with the agricultural scientist or agriculture university/institute and submit to SPCBs/PCCs which should verify the same while issuing Consent to the industry:
 - a. Areas to be covered under irrigation.
 - b. Survey/plot (khasra) numbers of land and their area covered in the scheme.
 - c. Written agreement with the farmers to bring their land under the scheme.
 - d. The quantity of effluent to be used in different periods of the year and crop-wise.
 - e. The treated effluent distribution system and arrangement for low/no demand period.
 - f. Agronomic plan for effective utilisation of land.
- iii. The treated effluent should meet the norms prescribed for irrigation under Environment (Protection) Rules, 1986/Consent. The effluent should also conform to Total Dissolved Solid (TDS)- 2100 mg/l and Sodium Adsorption Ratio (SAR)- preferably less than 18 but not more than 26, depending on soil/crop type, besides meeting any other parameters suggested by agricultural scientist or agricultural university/institute in the IMP.

- iv. Meeting the prescribed norms shall not be the only criteria for use of treated waste water in irrigation, the requirement of water for irrigation will also be a limiting condition and this depends upon various factors, as follow:
 - a. **Crop:** This is the main subject determining the water requirement, such as, paddy crops (in general) need more water than trees.
 - b. **Climate:** In tropical and subtropical climate especially in arid regions, irrigation frequency is higher. However, in slightly moist conditions the frequency decreases.
 - c. **Irrigation type:** There are various irrigation types, namely, flood irrigation, sprinkler, rain gun, drip irrigation, etc., which influences the water requirement for irrigation.
 - d. **Soil condition:** The various soil types, such as loam, clay, sandy, clay loam, sandy loam etc., determine the crop types and also alters the irrigation system thus determining the water requirement.
 - e. **Soil permeability:** The soil permeability, which is also known as water conductivity of the soil, determines the water retention capacity. This determines the cultivable crops, which in turn determines the water requirement for irrigation.
 - f. **Total Salt Concentration:** Total salt concentration (for all practical purposes, the total dissolved solids) is one of the most important agricultural water quality parameters. The plant growth, crop yield and quality of produce are affected by the total dissolved salts in the irrigation water.
- v. The command area for effluent utilisation should be as near as feasible to the industry in order to facilitate easy monitoring and effective control. The industry should construct a distribution network of impervious conduits to cover the irrigated area.
- vi. The industry should construct impervious lined storage tank of minimum 15 days capacity for storage of treated effluent during low/no demand, based on the Irrigation Management Plan.
- vii. The treated effluent should be analysed regularly, say after every 15 days. The effluent samples should be taken at the point from where the effluent is discharged for irrigation.
- viii. The physico-chemical characteristics of the soil under irrigation with treated effluent, should be monitored twice in a year to assess conditions in summer and post monsoon seasons, in order to determine the deterioration of soil quality.

- ix. Similarly, the groundwater quality should also be monitored twice in a year. Samples should be collected from the first water bearing strata from existing hand pumps or by installing the same for sampling purpose only. The sampling points should be uniformly spread in the command area and near effluent storage area.
- x. The industry should carry out the analysis of various prescribed effluent/soil/ground water quality parameters from the NABL/EPA/SPCBs/PCCs recognised/accredited laboratories.
- xi. Reports regarding compliance of effluent quality standards and status of soil and ground water quality shall be submitted to SPCBs/PCCs twice in a year, in first week of January and July.
- xii. In case of observation of any deterioration of the soil and groundwater quality parameters in the assessment by agricultural scientist or agricultural university/institute, the application of effluent should be stopped immediately and the industry should inform the SPCB, accordingly. The industry shall be solely responsible for reclaiming the soil and water quality at their cost in the affected area.

AEI-1
PR
Dip
22/10/2021

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Web: tridentindia.com

ਨਵੀਂ ਡਾਕ

ਸੀਨੀਅਰ ਵਾਤਾਵਰਣ ਇੰਜੀਨੀਅਰ
: ਇੰਜੀ:-I/II/ਸੀਨੀ: ਸਹਾ:/ਸਟੈਨੋ

TRIDENT/2021/05
18.10.2021

To,

The Senior Environmental Engineer,
Punjab Pollution Control Board,
Zonal Office-2, Nabha Road,
Patiala.

ਜੇਨਲ ਦਫਤਰ-II, ਪਟਿਆਲਾ।

ਜਿਲਾ ਪ੍ਰਦੂਸ਼ਣ ਰੋਕਥਾਮ ਬੋਰਡ
ਜੇਨਲ ਦਫਤਰ-II ਪਟਿਆਲਾ
ਡਾਇਰੀ ਨੰ: 1728
ਮਿਤੀ: 18.10.2021

Subject: Reply to the Show Cause Notice Dated 24 Sep 2021 via Letter No. 3293 regarding the Violation of Provision of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981, received on 30.9.2021.

Respected Sir,

This is in reference to the subject Show Cause Notice dated 24 Sep 2021 via Letter No. 3293 regarding the alleged Violations of Provision of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 which was received by our company/industry on 30.09.2021.

We wish to submit that being a Compliance Oriented Industry, the company has always worked towards a complete adherence to all applicable norms/standards under the Environment Act, the Water/Air Acts, etc. The industry has also continuously worked on the recommendations and the decisions of the personal hearings as well as recommendations/directions of the National Green Tribunal Joint Committee to every extent possible, and is, at this point in time, to justifiably state that the company has been meeting all parameters as prescribed.

The industry hereunder providing the status in respect of the recommendations of the Joint committee and during the Personal Hearing on the points mentioned in the above notice as follows:

| Sr.No | Recommendations | Compliance status |
|-------|---|--|
| 1 | Utilization of treated trade effluent onto land for plantation by developing additional plantation area; to divert the discharge of treated | The Industry has successfully procured/purchased land totalling to 51.5 Acres for additional plantation area for discharge of treated water onto land for plantation. a) The Industry has also completed development of 32 Acres of Plantation area in July 2021. |

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| | <p>effluent onto land for plantation from drains</p> | <p>of 32 Acres of Plantation area in July 2021.</p> <p>The pipeline for the distribution of effluent has been ordered and this will be installed by 20 Nov 21 PO copy of pipes & fittings attached as Annexure 1.</p> <p>b) The Industry has obtained permission from Drain Department dated 16 Aug 21 to lay the pipe line over existing drain for the utilization of treated water onto additional plantation area – 19.5 acres adjacent to drain attached as Annexure 2. Development of said land – 19.5 Acres will be completed by Dec 2021.</p> <p>2.The Industry is further in process of finalization of further procurement of 21 acres additional land to be utilized for the same purpose in order to achieve the desired target of a complete discontinuation of discharge into drains. This additional land is expected to be procured within the coming months by 28 Oct 2021.</p> <p>The Industry is taking all steps to fully stop all its treated water onto drain as per Joint Committee Recommendation by June 2022.</p> <p>Copy of the Lay Out showing the additional procured/ to be procured land outside the premises is attached as Annexure 3, and which would ensure the elimination of discharge into drains.</p> |
| 2 | <p>To achieve the stack emission standard of 75 mg/Nm³ as per EC condition</p> | <p>The Industry (PCD) has consistently been achieving the existing PCB prescribed standards of 150 mg/Nm³ the per the latest test reports dated 11.05.2021. Copy of the latest test report done by PCB is attached as Annexure 4. The latest sampling was conducted on 21 Sep 2021, the report of which is awaited. These standards of emission conform to the standards specified and stipulated in the consents granted to the industry from time to time. The latest consent dated 24 May 2021 also specifies the maximum prescribed limit of SPM to the extent of 150</p> |

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| | | <p>mg/Nm³.</p> <p>However, since a recommendation has been made to reduce the said emission to the max. limit of 75 mg/Nm³, the Industry had submitted the action plan for the achievement of stack emission standard of 75 mg/Nm³ by Sep 2021 to PPCB.</p> <p>The Industry has now sought time till Sep 2022 for the achieving the revised standards, as the finalization of ESP project has been unavoidably delayed on account of pandemic scenario in year 2020-21 resulting in a complete shut down and slowing of all industry during this period.</p> <p>The Industry has already placed the order for HF Controller to reduce the emissions of its thermal power plant stack to achieve the new recommended value of 75 mg/Nm³. The commissioning of the same will be completed by 25 Nov 2021. Purchase order Copy of the HF Controller is attached as Annexure 5.</p> <p>The Industry is in the final stages of commercial negotiation for its new ESP for Recovery Boiler and conducting industrial visit to evaluate and validate the technical performance of the new ESP suppliers. Technical Comparison of the new ESP is attached as Annexure 6.</p> <p>The new delivery period of the ESP for installation and commission is about 10 months.</p> |
| 3 | Utilization of treated trade effluent for irrigation purpose in the surrounding areas by the farmers by providing piping network | <p>The Industry has successfully procured/purchased land totalling to 51.5 Acres for additional plantation area for the utilization of treated water onto plantation.</p> <p>Land development & plantation will be completed for total 51.5 Acres additional procured land by 30 Dec 21. Picture of the New Land Under Development is attached as Annexure 7.</p> |

The industry has also updated the status of the compliance on the recommendations given by Joint Committee in the matter of O.A no. 682/2019. The point wise status for each recommendation is as follows:

| Sr No | Recommendations | Compliance status |
|-------|---|---|
| 1 | <p>An in-depth study for Environmental Audit may be undertaken particularly in respect for Captive Power Plant, Paper & Towel Division to assess the status for compliance of environment norms/standards. The finding(s) and recommendation (s) of study may be incorporated in the consents issued by PPCB for effective compliance. This study on Environment Audit be undertaken in consultation with CPCB either by PPCB or through an institute/ consultant having technical expertise in the relevant field.</p> | <p>An in-depth study for Environmental Audit has duly been conducted for the Towel Division of the Company by National Institute of Technology, Jalandhar & in respect of Pulp & Paper Division of the Company by Central Pulp & Paper Institute, Saharanpur.</p> <p>The report has since been submitted to the Board, and which fact also finds mentions in the order dated 29.7.2021 passed the Hon'ble NGT, New Delhi.</p> <p>The Industry has already started working on the recommendations of the Audit report and has prepared time bound action plan for the same which is attached as Annexure 8.</p> |
| 2 | <p>M/s Trident Limited shall submit a detailed action plan for compliance of condition stipulated by PPCB through its consent orders dated 10.02.2012 and 30.05.2013, wherein the industry was to install Reverse Osmosis System followed by Multiple Effect Evaporator in its H.T.D. This should be accomplished before 30th June 2020; as mandated by PPCB. The industry shall also submit time</p> | <p>The industry (HTD) had informed the Board vide Letter No. Trident/2020/24 dated 31.03.2020 that the industry would not be in a position to complete the project to install Reverse Osmosis System followed by Multiple Effect Evaporator in its towel division. within the given timelines due to the lock down and other restraints and restrictions imposed by the Central Government and the State government in order to curtail the spread of COVID-19 and had sought support of the Board to keep the project in abeyance till the situation becomes conducive to the upgradation.</p> <p>Further, the Industry would like to apprise the Board that it has already made a payment of Rs 2.94 crores for obtaining the delivery of the equipment from M/s Hydrotech Engineering s.r.l, for the</p> |

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| <p>bound action plan by 15th March 2020 for installation of Agitated Thin Film Dryer (ATFD) for the effective handling of MEE reject.</p> | <p>completion of the Project</p> <p>The industry has already received the partial equipment and the delivery of the balance equipment is pending due to the pandemic scenario.</p> <p>It can be assured that since the company has already undertaken the process of procurement and installation of the requisite equipment, the necessary upgradation shall be carried out.</p> <p>As communicated & committed during the personal hearing dated 30 April 2021 and as per proceedings dated 7 May 2021, The industry is in the process for the procurement of additional land to utilize its 100 % treated water onto plantation area at the existing running capacity and will ensure that there may be no discharge of treated water into drain post Dec 2021.</p> |
| <p>M/s Trident Ltd (PCD) shall also gradually reduce water consumption and thus effluent generation. The entire treated effluent to be properly utilized on land for plantation / irrigation purpose. The industry should adopt scientific method for utilization of its treated water onto land plantation within its premises to maximize the utilization of treated water within the complex.</p> <p>An action plan in this regard shall also be submitted by M/s</p> | <p>The industry (PCD) has gradually reduced its water consumption and thus the effluent generation through an improved production system.</p> <p>The Industry has already achieved the water consumption long term objective given by CPCB for Pulp & Paper Industry of 50 m³/T. The Industry is presently running at a water consumption of 46 m³/T by adopting several water conservation measures. Copy of Water Charter Target & List of Measures is attached as Annexure 9(i) & Annexure 9(ii).</p> <p>The industry has adopted scientific methods for utilization of its treated water onto plantation within its premises to maximize the utilization of treated water within the complex.</p> |

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| | <p>Trident Ltd. to PPCB on or before June 2020 detailing pipe network, land use, watering depth and type / age of plants etc.</p> <p>Having implemented the above, further two years from now i.e. by June 2022. M/s Trident Ltd. shall get its treated water utilized to nearby farmers for irrigation purpose.</p> | <p>The industry is further adopting scientific methods (Karnal Technology) for utilization of its treated water onto land plantation within its premises to maximize the utilization of treated water within the complex. Detailed Irrigation management plan is attached herewith as Annexure 10.</p> <p>The industry has done the detailed structuring of its complete plantation area. After the assessment, the industry has laid additional pipeline network for utilization of its treated water on its plantation area. The industry has also procured dedicated infrastructure including tractor/ harrow/ Rota water for regular maintenance of its plantation area. The layout plan showing detailed pipe network, land use, watering depth and type / age of plants etc. has been enclosed herewith as Annexure 11.</p> <p>The Industry will further keep exploring additional land and work to get its 100 % treated water utilized for irrigation by June 2022.</p> |
| 3 | <p>M/s Trident Ltd shall undertake a performance study of ETPs provided for its PCD.</p> <p>The industry shall undertake necessary project on its raw material washing stream which nearly contributes to 30% of the total ETP Load. The industry shall also submit a time bound action plan to PPCB on or before 15th March 2020 for removal of non-biodegradable COD.</p> | <p>The industry (PCD) has already undertaken the performance study of its ETP of PCD from Thapar Institute. The report has since been submitted to the Board vide letter no. Trident/PCD/2020/66 dated 08.12.2020 along with the timely action plan for all the proposed recommendations.</p> <p>All the recommendations given in the study conducted by Thapar Institute have been duly completed.</p> <p>Copy of the report along with its recommendations and its completion status is attached as Annexure 12.</p> <p>The industry has completed the project on its raw material washing stream which nearly contributed to 30% of the total ETP Load by adopting the latest DAF and screw press technology with the total</p> |

The industry will also submit time bound action plan by 30th April 2020 for removing of color from its treated effluent going into the drain.

investment of nearly INR 10.50 crore. Industry has already commissioned the project for the removal of non-biodegradable COD & same is successfully implemented. Pictures of the project area along with the data is attached as **Annexure 13**.

The industry has explored different technologies for the removal of color from its pulp and paper effluent going to drain and has also collaborated with the Department of Energy and Environment at Thapar Institute to conduct a pilot study for the removal of color.

The institute has undertaken the project for achieving the purpose and will share the report by Dec 2021. Meanwhile an interim report will be submitted by them shortly, which shall be duly furnished to the Board. Copy of the MOU & its extension done with Thapar Institute is attached as **Annexure 14** & Interim report is Attached here as **Annexure 15**.

4 The trend analysis of historically data, recorded from OCEMS exhibits that the discharge from M/s Trident Limited remains within compliance zone. If such is the case then M/s Trident Limited shall make all efforts to reuse treated effluent back to production process, resulting in conservation of water owing to less withdrawal of ground water or canal water.

The industry has achieved water consumption level lesser than 50 m³/T and further working on this.

The industry has explored & implemented a project for reducing the water consumption which will not impact the TDS.

The recovery of energy RO plant has been increased from 76% to 84.5% thereby reducing water consumption to an extent of 300-350 M³/day. Copy of the Membranes Order is attached as **Annexure 16**.

Besides, the reuse of treated effluent into the production process will affect efficiency of

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| | ETP as the treatment system would receive high concentration of BOD and COD. An action plan in order to reuse its treated water not impacting the TDS of the final treated effluent to be shared with PPCB by 30 th June 2020. | |
| 5 | The industry has provided pipe network for distribution of treated trade effluent on the plantation area; however, it was observed that certain patches of plantation was flooded with water and some patches were found completely dry because the industry is uniformly distributing treated trade effluent to all cells of plantation area irrespective of the age of plants in that cell. The industry, therefore, is required to provide proper irrigation network for optimum utilization of treated wastewater. The industry shall also provide electromagnetic flow meter at the outlet of each cell of plantation making more effective utilization of treated effluent. | <p>The industry has improved distribution of treated trade effluent on the plantation area and provided proper irrigation network for optimum utilization of treated wastewater.</p> <p>Further Industry would like to submit that industry has already installed the Electromagnetic flow meter at the outlet of each cell of plantation. Pictures of the additional Meters installed for the submetering along with its PO Copy is attached as Annexure 17.</p> |
| 6 | The industry is not achieving the emission standards of 75 mg/Nm ³ from the stack of Chemical Recovery Plant (II) and Energy Section. However, the industry was given | The Industry (PCD) has consistently been achieving the existing PCB prescribed standards of 150 mg/Nm ³ the per the latest test reports dated 11.05.2021 . Copy of the latest test report done by PCB is attached as Annexure 18 . The latest sampling was conducted on 21 Sep 2021, the report |

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| | <p>opportunity of personal hearing before Hon'ble Chairman of PPCB on 07.01.2020, wherein one of the decisions of that the industry shall submit the detailed proposal w.r.t. upgradation of its existing APCDs to achieve the stack emission standard of 75 mg/Nm³ within 3 months along with PERT chart for installation and commissioning of the same.</p> | <p>of which is awaited. These standards of emission conform to the prescribed standards specified and stipulated in the consents granted to the industry from time to time. The latest consent dated 24 May 2021 also specifies the prescribed maximum limit of SPM to the extent of 150 mg/Nm³.</p> <p>However, since a recommendation has been made to reduce the said emission to the max. limit of 75 mg/Nm³, the Industry had submitted the action plan for the achievement of stack emission standard of 75 mg/Nm³ by Sep 2021.</p> <p>The Industry has now sought time till Sep 2022 for the achieving the revised standards, as the finalization of ESP project has been unavoidably delayed on account of pandemic scenario in year 2020-21 resulting in a complete shut down and slowing of all industry during this period.</p> <p>The Industry has already placed the order for HF Controller to reduce the emissions of its thermal power plant stack to achieve the new recommended value of 75 mg/Nm³. The commissioning of the same will be completed by 25 Nov 2021. Order Copy of the HF Controller is attached as Annexure 19.</p> <p>The Industry is in the final stages of commercial negotiation for its new ESP for Recovery Boiler and conducting industrial visit to evaluate and validate the technical performance of the new ESP suppliers. Technical Comparison of the new ESP is attached as Annexure 20.</p> <p>The new delivery period of the ESP for installation and commission is about 10 months.</p> |
| 7 | <p>The Industry (M/s Trident Ltd) will conduct detailed study for monitoring the ground water quality across the Dhanaula Drain in order to evaluate the</p> | <p>Industry has conducted the ground water study & the outcome of the study has been submitted to the Board vide letter dated 27 April 2020.</p> <p>Copy of the report is attached as Annexure 21.</p> |

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| | impact of its treated water discharge onto Drain and submit the report by 30 th April, 2020. | |
| 8 | <p>The concept of 'Zero Liquid Discharged' be considered as minimal discharge of effluent, particularly from the industrial sectors reported upon. According to mechanics of fluids (more precisely thermodynamics) that a continuous operation bound to generate 'rejects', and / or 'blowdown' and / or bleed due to process entropy, despite of whatever technology adopted. Punjab Pollution Control Board, therefore, has to examine what minimal disposal of effluent be permitted to M/s Trident Limited considering the production technology, scale of operation and utilization capacity.*</p> | <p>The Industry is continuously working for minimum discharge of effluent and is continuously reducing its discharge.</p> <p>The Industry is also working on maximum utilization of its treated water onto plantation area and reducing its effluent disposal through alternate routes of ZLD also as suggested by CPCB.</p> <p>Guidelines of CPCB for alternate routes other than ZLD through utilization onto plantation/irrigation is attached as Annexure 22.</p> |

The Industry further submit that the efforts being done were appreciated by the National Institutes. Further, the industry has noted and started working on all the recommendations given in Environment Audit conducted by CPPRI, Saharanpur.

The Industry can assure a complete and effective compliance of all the recommendations, as per the experts and to the extent feasible, that it shall comply with any other suggestions for further improvement.

You are requested to kindly withdraw the subject show cause notice in the light of the sincere efforts and ongoing upgradation, as submitted above, and the compliances already made by the industry.

Thanking you,
Yours faithfully
For Trident Limited

[Sarvjeet Singh]
Factory Manager

Encl: AS above

Dear Sir/ Madam ,

Annexure-1

We are pleased to place the Purchase Order no. 9000111591 on your esteemed organization as per the terms & conditions agreed upon.

Any discrepancy regarding the acceptance of Purchase order including the terms and conditions mentioned therein is to be intimated to the Company within 24 hours of its receipt.

In case, no communication intimating any discrepancy is received by the Company in writing with in 24 hours of the receipt of Purchase Order, the Purchase Order shall be considered to have been accepted by you.

We would also request you to kindly share the progress of the said order on weekly / monthly basis with the under mentioned Email Id

Thanking You

For Trident Limited



E-212, KITCHLU NAGAR, LUDHIANA 141001

Contact No. : 9878999481

Email : jasbirpurchase@tridentindia.com

Purchase Team .



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

| | | | | | | | | | | |
|---|--------------------------|--|---------------------------------|-----------------------|--|--|--|------------|-----------------|------------|
| Vendor 741045 Mogli Labs India Private Limited WHSViksun tower , Ground Floor, adjace LUDHIANA 141008 Country India Vendor GSTIN No. 03AAJCM7312H1ZO | Ship To | | | Bill To | | | PO Number | 9000111591 | Dated | 28.09.2021 |
| | Trident - Dhaura Paper 1 | | | Trident Limited - P&C | | | Our Ref. | 13760 | Currency | INR |
| | Mansa Road,Dhaura | | | Mansa Road,Dhaura | | | Your Ref. | offer | | |
| | BARNALA, (PUNJAB) | | | BARNALA, (PUNJAB) | | | PO Status :- Valid/Approved Quality Certificate :- Required | | | |
| BARNALA | | | BARNALA, (PUNJAB) | | | | | | | |
| 148107 | | | 148107 | | | | | | | |
| Mobile 9878999481 | | | Mobile 9878999481 | | | | | | | |
| jasbirpurchase@tridentindia.com | | | jasbirpurchase@tridentindia.com | | | | | | | |

| S.No. | Item Code | UOM/ Brand | Order Qty. | Basic Rate | Discount | PKG-FWD | HSN/SAC | CGST/SGST/IGST/ C.Cess | Coal Cess | Item Value | Cancellation Date | Plant |
|-----------|---|----------------|------------|------------|----------|---------|------------|------------------------|-----------|------------|-------------------|---------------------|
| 0000 1 | 706120128 BOX-FLUSH-KF0600H-HENSEL | NOS/ HENSEL | 10.000 | 562.38 | 0.00 | 0.00 | 8501.53.90 | 9.00 /9.00 /0.00 | 0.00 | 6,636.08 | 25.12.2021 | TP01 PAPER-1 |
| | | | | INR/ 1 NOS | 0.00 | 0.00 | | 1,012.28 | | | | |
| 0000 2 | 706120128 BOX-FLUSH-KF0600H-HENSEL | NOS/ HENSEL | 15.000 | 562.38 | 0.00 | 0.00 | 8501.53.90 | 9.00 /9.00 /0.00 | 0.00 | 9,954.12 | 25.12.2021 | TP02 PAPER-2 |
| | | | | INR/ 1 NOS | 0.00 | 0.00 | | 1,518.42 | | | | |
| 0000 3 | 706120128 BOX-FLUSH-KF0600H-HENSEL | NOS/ HENSEL | 10.000 | 562.38 | 0.00 | 0.00 | 8501.53.90 | 9.00 /9.00 /0.00 | 0.00 | 6,636.08 | 25.12.2021 | TP02 PAPER-2 |
| | | | | INR/ 1 NOS | 0.00 | 0.00 | | 1,012.28 | | | | |
| 0000 4 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | NOS/ HENSEL | 30.000 | 373.21 | 0.00 | 0.00 | 8501.53.90 | 9.00 /9.00 /0.00 | 0.00 | 13,211.64 | 25.12.2021 | TP02 PAPER-2 |
| | | | | INR/ 1 NOS | 0.00 | 0.00 | | 2,015.34 | | | | |



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

| | | | | | | | | | | |
|---|--------------------------|--|---------------------------------|-----------------------|--|--|--|------------|-----------------|------------|
| Vendor 741045 Mogli Labs India Private Limited WSHViksun tower , Ground Floor, adjace LUDHIANA 141008 Country India Vendor GSTIN No. 03AAJCM7312H1ZO | Ship To | | | Bill To | | | PO Number | 9000111591 | Dated | 28.09.2021 |
| | Trident - Dhaura Paper 1 | | | Trident Limited - P&C | | | Our Ref. | 13760 | Currency | INR |
| | Mansa Road,Dhaura | | | Mansa Road,Dhaura | | | Your Ref. | offer | | |
| | BARNALA, (PUNJAB) | | | BARNALA, (PUNJAB) | | | PO Status :- Valid/Approved Quality Certificate :- Required | | | |
| BARNALA | | | BARNALA, (PUNJAB) | | | | | | | |
| 148107 | | | 148107 | | | | | | | |
| Mobile 9878999481 | | | Mobile 9878999481 | | | | | | | |
| jasbirpurchase@tridentindia.com | | | jasbirpurchase@tridentindia.com | | | | | | | |

| S.No. | Item Code | UOM/ Brand | Order Qty. | Basic Rate | Discount | PKG-FWD | HSN/SAC | CGST/SGST/IGST/ C.Cess | Coal Cess | Item Value | Cancellation Date | Plant |
|-----------|---|----------------|---------------|------------|----------|---------|------------|---------------------------|--------------|------------|----------------------|-----------------------|
| 0000 5 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | NOS/ HENSEL | 30.000 | 373.21 | 0.00 | 0.00 | 8501.53.90 | 9.00 /9.00 /0.00 | 0.00 | 13,211.64 | 25.12.2021 | TP14 RECOVERY |
| | | | | INR/ 1 NOS | 0.00 | 0.00 | | 2,015.34 | | | | |
| 0000 7 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | NOS/ HENSEL | 30.000 | 373.21 | 0.00 | 0.00 | 8501.53.90 | 9.00 /9.00 /0.00 | 0.00 | 13,211.64 | 25.12.2021 | TP13 PULP MILL |
| | | | | INR/ 1 NOS | 0.00 | 0.00 | | 2,015.34 | | | | |
| 0000 8 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | NOS/ HENSEL | 10.000 | 373.21 | 0.00 | 0.00 | 8501.53.90 | 9.00 /9.00 /0.00 | 0.00 | 4,403.88 | 25.12.2021 | TP12 CHEMICAL |
| | | | | INR/ 1 NOS | 0.00 | 0.00 | | 671.78 | | | | |
| 0000 9 | 818010181 PIPE-MS-150NB-C-ERW | M/ JINDAL | 300.000 | 1,540.25 | 0.00 | 0.00 | 7304.19.10 | 9.00 /9.00 /0.00 | 0.00 | 545,248.50 | 15.11.2021 | TP15 UTILITY |
| | | | | INR/ 1 M | 0.00 | 0.00 | | 83,173.50 | | | | |



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 741045
 Mogli Labs India Private Limited
 WHSViksun tower , Ground Floor, adjace
 LUDHIANA
 141008
Country India
Vendor GSTIN No. 03AAJCM7312H1ZO

Ship To
 Trident - Dhaura Paper 1
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 BARNALA
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

Bill To
 Trident Limited - P&C
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 9000111591 | Dated | 28.09.2021 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved | | | |
| Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description Sale Order PO Number/ Week Code | UOM/ Brand | Order Qty. | Basic Rate | Discount | PKG-FWD | HSN/SAC | CGST/SGST/IGST/ C.Cess | Coal Cess | Item Value | Cancellation Date | Plant |
|-----------|---|----------------|---------------|-------------------------------|-----------------------|-----------------------|------------|---------------------------------------|--------------|------------|----------------------|----------------------------|
| 0001 2 | 818010021 PIPE-SS316-15NB-40SCH-ERW-C | M/ JINDAL | 36.000 | 484.80 _____ INR/ 1 M | 0.00 _____ 0.00 | 0.00 _____ 0.00 | 7306.19.11 | 9.00 /9.00 /0.00 _____ 3,141.50 | 0.00 | 20,594.30 | 15.11.2021 | TP13 _____ PULP MILL |
| 0001 4 | 818020102 BEND-SHORT-SS304-2"-40SCH-90D-SMLS | NOS/ FABRIC | 3.000 | 226.24 _____ INR/ 1 NOS | 0.00 _____ 0.00 | 0.00 _____ 0.00 | 7307.29.10 | 0.00 /0.00 /0.00 _____ 0.00 | 0.00 | 678.72 | 15.11.2021 | TP02 _____ PAPER-2 |
| 0001 1 | 818020284 BEND-LONG-MS-150MM-C-90°-ERW | NOS/ FABRIC | 10.000 | 730.00 _____ INR/ 1 NOS | 0.00 _____ 0.00 | 0.00 _____ 0.00 | 7306.19.11 | 9.00 /9.00 /0.00 _____ 1,314.00 | 0.00 | 8,614.00 | 15.11.2021 | TP15 _____ UTILITY |
| 0001 0 | 818060078 MS LOOSE FLANGE(RF)150NB 150#ANSI B16.5 | NOS/ FABRIC | 10.000 | 790.00 _____ INR/ 1 NOS | 0.00 _____ 0.00 | 0.00 _____ 0.00 | 7306.19.11 | 9.00 /9.00 /0.00 _____ 1,422.00 | 0.00 | 9,322.00 | 15.11.2021 | TP15 _____ UTILITY |



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

| | | | | | | | | | | | |
|---|--------------------------|--|--------------------------|-----------------------|--|---------------------------------|--|------------|-----------------|------------|--|
| Vendor 741045 Mogli Labs India Private Limited WHSViksun tower , Ground Floor, adjace LUDHIANA 141008 Country India Vendor GSTIN No. 03AAJCM7312H1ZO | Ship To | | | Bill To | | | PO Number | 9000111591 | Dated | 28.09.2021 | |
| | Trident - Dhaura Paper 1 | | | Trident Limited - P&C | | | Our Ref. | 13760 | Currency | INR | |
| | Mansa Road,Dhaura | | | Mansa Road,Dhaura | | | Your Ref. | offer | | | |
| | BARNALA, (PUNJAB) | | | BARNALA, (PUNJAB) | | | PO Status :- Valid/Approved Quality Certificate :- Required | | | | |
| BARNALA | | | 148107 | | | 148107 | | | | | |
| 148107 | | | Mobile 9878999481 | | | jasbirpurchase@tridentindia.com | | | | | |
| jasbirpurchase@tridentindia.com | | | Mobile 9878999481 | | | jasbirpurchase@tridentindia.com | | | | | |

| S.No. | Item Code | UOM/ Brand | Order Qty. | Basic Rate | Discount | PKG-FWD | HSN/SAC | CGST/SGST/IGST/ C.Cess | Coal Cess | Item Value | Cancellation Date | Plant |
|-------|--|----------------|---------------|------------|----------|---------|------------|---------------------------|--------------|------------|----------------------|-----------|
| 0001 | 818100268 | NOS/ FABRIC | 1.000 | 1,345.00 | 0.00 | 0.00 | 7307.00.00 | 9.00 /9.00 /0.00 | | 1,587.10 | 15.11.2021 | TP13 |
| 3 | REDCR-CONC.ERW-SS304-SCH10- 300MM-150MM | | | INR/ 1 NOS | 0.00 | 0.00 | | 242.10 | 0.00 | | | PULP MILL |

Total Value 653,309.70 INR

Total Value:INR SIX LAKH FIFTY THREE THOUSAND THREE HUNDRED NINE Rupees SEVENTY Paise



**Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER**

Vendor 741045
Mogli Labs India Private Limited
WHSViksun tower , Ground Floor, adjace
LUDHIANA
141008
Country India
Vendor GSTIN No. 03AAJCM7312H1ZO

Ship To
Trident - Dhaura Paper 1
Mansa Road,Dhaura
BARNALA, (PUNJAB)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 9000111591 | Dated | 28.09.2021 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

Price Basis: EXW BATHINDA

Freight : F

Special Instruction

Payment Terms: Due Net in 30 Days **Octroi:** As per Documentary Evidence

Transportation Mode: By AIR /RAIL /SEA /COURIER /ROAD **Transit Insurance** TO BE ARRANGED BY US.

The consignment shall be accepted only if accompanied by Original Invoice for Buyer and Duplicate for Transporter failing which the consignment shall be returned at your risk and cost .

Terms and Conditions As mentioned overleaf

Cancellation Date As above

Our Banker: State Bank of India, Industrial Finance Branch,Golden tower, Dholewal Chowk, Ludhiana

GSTIN No.. 03AABCA4139J1ZO

This is computer generated Purchase Order.Hence requires no signature.



Trident Limited - P&C
Mansa Road,Dhaulta
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 741045
 Mogli Labs India Private Limited
 WSHViksun tower , Ground Floor, adjace
 LUDHIANA
 141008
Country India
Vendor GSTIN No. 03AAJCM7312H1ZO

Ship To
 Trident - Dhaulta Paper 1
 Mansa Road,Dhaulta
 BARNALA, (PUNJAB)
 BARNALA
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

Bill To
 Trident Limited - P&C
 Mansa Road,Dhaulta
 BARNALA, (PUNJAB)
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 9000111591 | Dated | 28.09.2021 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Master Inspection Characteristics(MIC) | Upper Specification Limit | UOM | Target Specification Limit |
|-------|-------------------------------|---|---------------------------|-----|----------------------------|
|-------|-------------------------------|---|---------------------------|-----|----------------------------|

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

| | | | | | | |
|---|--|--|--|------------|-----------------|------------|
| Vendor 741045 Mogli Labs India Private Limited WHSViksun tower , Ground Floor, adjace LUDHIANA 141008 Country India Vendor GSTIN No. 03AAJCM7312H1ZO | Ship To Trident - Dhaura Paper 1 Mansa Road,Dhaura BARNALA, (PUNJAB) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - P&C Mansa Road,Dhaura BARNALA, (PUNJAB) 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number | 9000111591 | Dated | 28.09.2021 |
| | | | Our Ref. | 13760 | Currency | INR |
| | | | Your Ref. | offer | | |
| | | | PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Mat. Classification | PO Material Text |
|-------|---|---------------------|------------------|
| 00001 | 706120128 BOX-FLUSH-KF0600H-HENSEL | Standard | |
| 00002 | 706120128 BOX-FLUSH-KF0600H-HENSEL | Standard | |
| 00003 | 706120128 BOX-FLUSH-KF0600H-HENSEL | Standard | |
| 00004 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | Standard | |
| 00005 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | Standard | |
| 00007 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | Standard | |
| 00008 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | Standard | |
| 00009 | 818010181 PIPE-MS-150NB-C-ERW | Standard | |
| 00012 | 818010021 PIPE-SS316-15NB-40SCH-ERW-C | Customize | |
| 00014 | 818020102 BEND-SHORT-SS304-2"-40SCH-90D-SMLS | Standard | |
| 00011 | 818020284 BEND-LONG-MS-150MM-C-90°-ERW | Standard | |



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 741045
Mogli Labs India Private Limited
WHSViksun tower , Ground Floor, adjace
LUDHIANA
141008
Country India
Vendor GSTIN No. 03AAJCM7312H1ZO

Ship To
Trident - Dhaura Paper 1
Mansa Road,Dhaura
BARNALA, (PUNJAB)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 9000111591 | Dated | 28.09.2021 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Mat. Classification | PO Material Text |
|-------|--|---------------------|------------------|
| 00010 | 818060078 MS LOOSE FLANGE(RF)150NB 150#ANSI B16.5 | On the Shelf | |
| 00013 | 818100268 REDCR-CONC.ERW-SS304-SCH10-300MM-150MM | Customize | |



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 741045
 Mogli Labs India Private Limited
 WHSViksun tower , Ground Floor, adjace
 LUDHIANA
 141008
Country India
Vendor GSTIN No. 03AAJCM7312H1ZO

Ship To
 Trident - Dhaura Paper 1
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 BARNALA
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

Bill To
 Trident Limited - P&C
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 9000111591 | Dated | 28.09.2021 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

DELIVERY SCHEDULE

| S.NO | Item Code Item Description | UOM | PO Qty | Scheduled Date | Sch Qty | Delivered Qty | Open Qty as on 20.10.2021 | Contract No | Remaining Contract Value/Qty |
|-------|---|-----|---------|----------------|---------|---------------|------------------------------|-------------|------------------------------|
| 00001 | 706120128 BOX-FLUSH-KF0600H-HENSEL | NOS | 10.000 | 25.12.2021 | 10.000 | 0.000 | 10.000 | | 0.00 |
| 00002 | 706120128 BOX-FLUSH-KF0600H-HENSEL | NOS | 15.000 | 25.12.2021 | 15.000 | 0.000 | 15.000 | | 0.00 |
| 00003 | 706120128 BOX-FLUSH-KF0600H-HENSEL | NOS | 10.000 | 25.12.2021 | 10.000 | 0.000 | 10.000 | | 0.00 |
| 00004 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | NOS | 30.000 | 25.12.2021 | 30.000 | 0.000 | 30.000 | | 0.00 |
| 00005 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | NOS | 30.000 | 25.12.2021 | 30.000 | 0.000 | 30.000 | | 0.00 |
| 00007 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | NOS | 30.000 | 25.12.2021 | 30.000 | 0.000 | 30.000 | | 0.00 |
| 00008 | 706120134 BOX-JUNCTN-DK 0404 B ,5TB-HENSEL | NOS | 10.000 | 25.12.2021 | 10.000 | 0.000 | 10.000 | | 0.00 |
| 00009 | 818010181 PIPE-MS-150NB-C-ERW | M | 300.000 | 15.11.2021 | 300.000 | 294.980 | 5.020 | | 0.00 |
| 00012 | 818010021 PIPE-SS316-15NB-40SCH-ERW-C | M | 36.000 | 15.11.2021 | 36.000 | 36.000 | 0.000 | | 0.00 |
| 00014 | 818020102 BEND-SHORT-SS304-2"-40SCH-90D-SMLS | NOS | 3.000 | 15.11.2021 | 3.000 | 3.000 | 0.000 | | 0.00 |



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 741045
 Mogli Labs India Private Limited
 WSHViksun tower , Ground Floor, adjace
 LUDHIANA
 141008
Country India
Vendor GSTIN No. 03AAJCM7312H1ZO

Ship To
 Trident - Dhaura Paper 1
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 BARNALA
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

Bill To
 Trident Limited - P&C
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 9000111591 | Dated | 28.09.2021 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.NO | Item Code Item Description | UOM | PO Qty | Scheduled Date | Sch Qty | Delivered Qty | Open Qty as on 20.10.2021 | Contract No | Remaining Contract Value/Qty |
|-------|--|-----|--------|----------------|---------|---------------|---------------------------|-------------|------------------------------|
| 00011 | 818020284 BEND-LONG-MS-150MM-C-90°-ERW | NOS | 10.000 | 15.11.2021 | 10.000 | 10.000 | 0.000 | | 0.00 |
| 00010 | 818060078 MS LOOSE FLANGE(RF)150NB 150#ANSI B16.5 | NOS | 10.000 | 15.11.2021 | 10.000 | 10.000 | 0.000 | | 0.00 |
| 00013 | 818100268 REDCR-CONC.ERW-SS304-SCH10-300MM-150MM | NOS | 1.000 | 15.11.2021 | 1.000 | 1.000 | 0.000 | | 0.00 |

Terms and Conditions

This Purchase Order is subject to all terms, conditions and specifications hereinafter set forth and acceptance of order by the Seller shall be deemed to be an agreement that the order is subject to all of said terms, conditions and specifications.

General

Non Acceptance of Purchase order with its terms and conditions is to be intimated to the Purchaser within 24 hours of its receipt, else the same shall be assumed to be accepted at the discretion of the Purchaser. No deviation to this order shall be honoured unless authorized in writing.

Purchase Order number, material code and GST IN of the Purchaser should be mentioned on each and every invoice. An invoice should not have more than 8 line items in it. Different Invoice should be raised for different Purchase Orders issued by the Purchaser.

The Seller shall be responsible for mentioning the correct details in the invoice, including HSN and GST rate of goods supplied to the Purchaser.

The Seller represents and warrants that it shall comply with the Laws pertaining to GST and other applicable indirect taxes and the requirements therein. The Seller shall be liable for all losses and damages suffered by the Purchaser due to any action or omission or mistake of the Seller.

The Seller shall unconditionally submit its account statement on Quarterly basis for reconciliation.

Weights / quantities as recorded by the Purchaser shall be final and binding on the Seller.

This Purchase Order shall not be amended, modified, altered or changed in any way except by writing executed by a duly authorized representative of the Purchaser.

Any other terms & conditions of the Seller mentioned on its Bills,Invoices, e-mails or any other documents shall not be binding on the Purchaser unless accepted in writing by the Authorized Representative of the Purchaser.

The Seller shall not disclose any confidential information pertaining to the Purchaser's business to any third party.

Neither party shall be entitled to assign the rights, interests and obligations without the previous written consent of the other Party.

The Seller shall not offer, solicit or accept an advantage in connection with the procurement of this Purchase Order. Failure to comply with this clause or any act of offering, soliciting or accepting advantage committed by the Seller shall, without affecting the liability of Seller for such failure and act, result in this Purchase Order being invalidated. For the purpose of this clause, Seller shall include its directors, partners, relatives, agents, associates, employees, servants and sub-consultants.

'Advantage' for this purpose shall mean any gift, loan, fee, reward or commission, any valuable security, office, employment, agreement, loan payment/waiver/discharge, bribe of any kind to Government/other officials, any other service or favour or any offer, undertaking or promise, whether conditional or unconditional, of such advantage.

The Seller or its directors, partners, relatives, associates, employees, agents and/ or sub-consultants shall not trade, directly or indirectly, in the shares of the Company during the currency and six months post expiry of this Purchase Order.

Delivery

The material shall be carefully and properly packed for movement by sea/rail/road transport to withstand damages on account of inclement weather, rough handling etc.

The material shall have to be delivered on the date of delivery specified in this Purchase Order. Decision for acceptance/rejection of material on the dates other than that specified in the Purchase Order along with the liquidated damages shall be at the sole discretion of the Purchaser.

The Seller shall not have any right to terminate the Purchase Order. However, the Purchaser reserves the right to cancel any unshipped portion at any time without assigning any reason.

All costs incurred in procurement of material from other source in the event of failure to supply the material on the scheduled date / rejection as per the terms of Purchase Order shall be to Seller's account and at the sole discretion of the Purchaser.

The price mentioned in the Purchase Order is inclusive of packing and handling charges unless otherwise stated therein.

Seller shall share the progress of the order on weekly basis in writing.

If delivery of the material mentioned in the Order occurs later than time specified and provided such delay is neither the result of force majeure nor the result of circumstances for which the Purchaser is responsible, the Purchaser shall be entitled to damages of 0.5% per week or part thereof subject to the maximum of 5% of the Contract price. For purpose of computing damages in the event of delay in delivery of the material, mere despatch of the material within the agreed date of delivery which are not in accordance with the specifications/standards, or found unacceptable by Purchaser would not amount to delivery within the agreed delivery date.

Inspection and Testing

Complete Test / Inspection reports from an approved source / as generated and certified by the Seller should be submitted along with the supply of material. Test reports generated by the Purchaser shall be binding on the Seller and no disputes whatsoever shall be entertained in this regard. Charges for testing, if any, shall be to the Seller's account and the decision to get the same inspected by any third party shall be at the sole discretion of the Purchaser.

Material must conform to all the specifications as specified in the Purchase Order. Any non-conformity identified during any later stage shall be treated as breach of contract and the Seller shall be liable to any penalties imposed at the sole discretion of the Purchaser.

Terms of payment

Original GST invoice should invariably accompany the material failing which the material may be rejected at the sole discretion of the Purchaser.

In the event of denial of input tax credit to the Purchaser on account of any negligence, erroneous or incorrect reporting, non payment of taxes or any other non-compliance made by the Seller in relation to the GST Law, the Purchaser shall be entitled to recover such loss from the Seller along with Interest @18% per annum.

Advances shall be released against submission of Advance Bank Guarantee of equivalent amount. All Advance and Performance Bank guarantee(s) shall be accepted only if they are in Purchaser's format and issued by the Banks recommended by the Purchaser unless otherwise agreed in writing.

Payment other than advances shall be made as specified in the terms and conditions of the Purchase Order and submission of all required documents.

Forms / Permits / Declarations shall be submitted as per the applicable laws/statute.

The prices under this Order shall remain firm until completion of the Contract

Intellectual property/Warranty, Inspection and Liability

Material supplied by the Seller pursuant to this Purchase Order should not infringe any third party intellectual property rights and the Seller further undertakes to indemnify the Purchaser against all claims for infringements of third party patents and/or other intellectual property rights by material supplied under this Purchase Order.

Material supplied by the Seller pursuant to the Purchase Order should have clean title in favour of the Seller before shipment to the Purchaser. Should there be any dispute to the ownership of the material, the Seller would be liable to make good for the costs incurred by the Purchaser to defend the title and the loss of profits due to its inability to use the subjected material, over and above the costs already paid to the Seller.

In the event of any breach of obligations mentioned in the Purchase Order by the Seller, the Purchaser shall be entitled to incidental and consequential damages including loss of profit. The Seller agrees to indemnify and hold the Purchaser, its customers and users of its products, harmless against any suits, damage or claim or any other expense resulting from a breach or alleged breach of the Seller's obligations including warranty, pursuant hereto. The Purchaser shall have the right to invoke the Performance Bank Guarantee submitted by the Seller for recovering the Liquidated damages.

All goods supplied shall be under an unconditional guarantee of 12 months from the date of commissioning / 18 months from the date of receipt (whichever is earlier) unless specified differently in the Purchase Order.

The Purchaser shall have the right for shop floor rejections even if the material has been accepted on delivery.

All costs (inclusive of taxes & duties) incurred by the Purchaser on account of rejections, despatch/warranty failures of material supplied under this Purchase Order shall be to Supplier's account.

Applicable law and Jurisdiction of Courts

Any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof shall be referred for arbitration to be governed in accordance with the Arbitration and Conciliation Act, 1996.

Accordingly, the purchaser will nominate sole Arbitrator to settle any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof. The place of arbitration shall be in Barnala, Punjab, India and language of proceedings shall be English. Expenses of the arbitration proceeding shall be jointly shared by the parties. This Purchase order shall be governed by and construed in accordance with the laws of India, and the parties agree to submit themselves to the exclusive jurisdiction of the Courts at Barnala, India only. Further, where any material is imported under this Purchase Order, the laws applicable under the Indian statute would govern the resolution of conflicts.

This Purchase Order supersedes any and/or all other oral or written communications or other commitments between the parties with respect to its subject matter except the agreement executed between the parties and contains all of the covenants, terms and conditions agreed between the parties with respect thereto. Wherein an agreement is also executed between the parties on the same subject matter thereto with the terms, conditions and specifications, the Purchase Order shall become the part of the agreement. However, in case of any conflict in the terms, conditions, specifications mentioned in the agreement and the Purchase Order, the terms, conditions, specifications mentioned in the agreement shall prevail.

Each party hereto acknowledges that, except as set forth herein, neither party nor any one on behalf of either party has made any representations, inducements, promises or agreements, orally or otherwise, respecting the subject matter of this Agreement and/or Purchase Order.

Documents required to be attached with invoice.

1. Tax Invoice in original
2. Tax Invoice (Duplicate) in original
3. Quality certificate,

ਫੋਨ ਅਤੇ ਫੈਕਸ ਨੰ: 01672-234086

ਮਿਤੀ 16/8/2021

ਨੰ 6745-46

Annexure-2

ਕਲ

ਮਨੋਜਿੰਗ ਡਾਇਰੈਕਟਰ,
ਟਰਾਈਡੈਂਟ ਲਿਮਿਟਿਡ,
ਹੋਲਾ।

ਵਿਸ਼ਾ :

Request you to allow the usage of Treated trade effluent for irrigation purpose.

ਹਵਾਲਾ :

ਆਪ ਦਾ ਪੱਤਰ ਨੰ: TRIDENT/PCD/2021/38 ਮਿਤੀ 05.08.2021

ਉਪਰੋਕਤ ਵਿਸ਼ੇ ਸਬੰਧੀ ਹਵਾਲੇ ਅਧੀਨ ਪੱਤਰ ਰਾਹੀਂ ਆਪ ਵੱਲੋਂ ਬਾਬਤ ਰਕਮ 10,875/- ਰੁਪਏ ਦਾ ਕੇਨਰਾ ਚੈੱਕ ਦਾ ਡਿਮਾਂਡ ਡਰਾਫਟ (ਡਿਮਾਂਡ ਡਰਾਫਟ ਨੰ: 445225 ਮਿਤੀ 28.07.2021) ਅਤੇ ਹਲਫ਼ੀਆਂ ਬਿਆਨ ਇਸ ਦਫ਼ਤਰ ਵਿੱਚ ਪ੍ਰਾਪਤ ਹੋਇਆ ਹੈ। ਆਪ ਵੱਲੋਂ ਧਨੋਲਾ ਡਰੇਨ ਦੀ ਬੁਰਜੀ 28000 ਉੱਪਰ ਪਾਣੀ ਦੀ ਪਾਈਪ ਲਾਈਨ ਨੂੰ ਕਰਨ ਦੀ ਮੰਗ ਕੀਤੀ ਗਈ ਸੀ। ਕਿਸ ਦੇ ਸਬਬ ਵਿੱਚ ਨਿਗਰਾਨ ਇੰਜੀਨੀਅਰ, ਜਲ ਨਿਕਾਸ ਕਮ ਮਾਈਨਿੰਗ ਹਲਕਾ ਪਟਿਆਲਾ ਜੀ ਦੇ ਪੱਤਰ ਨੰ: 1234/4-ਈ.ਸੰਗਰੂਰ ਮਿਤੀ 17.02.2021 ਰਾਹੀਂ ਧਨੋਲਾ ਡਰੇਨ ਦੀ ਬੁਰਜੀ 28000 ਤੇ ਪਾਈਪਲਾਈਨ ਪਾਉਣ ਦੀ ਮਨਜ਼ੂਰੀ ਹੇਠ ਲਿਖੀਆਂ ਸ਼ਰਤਾਂ ਤਹਿਤ ਜਾਰੀ ਕੀਤੀ ਹੈ :

1. ਤਜਵੀਜ਼ਤ ਪਾਈਪ ਲਾਈਨ ਦੀਆਂ ਹੱਦੀਆਂ ਮਹਿਕਮੇ ਦੀ ਲੈਡ ਵਿਛੋੜ ਤੋਂ ਬਾਹਰ ਬਣਾਈਆਂ ਜਾਣ, ਮਹਿਕਮੇ ਦੇ ਜਮੀਨ ਵਿੱਚ ਕੋਈ ਵੀ ਹੱਦੀ ਆਦਿ ਨਾ ਬਣਾਈ ਜਾਵੇ।
2. ਡਰੇਨ ਦੇ ਦੋਵੇਂ ਪਾਸੇ ਬਣੇ ਬੋਝਾਂ ਵਿੱਚ ਪਾਈਪ ਲਾਈਨ ਨੂੰ ਬੋਝ ਦੇ ਟੋਪ ਲੈਵਲ ਤੋਂ ਨੀਚੇ ਰੱਖਿਆ ਜਾਵੇ।
3. ਡਰੇਨ ਨੂੰ ਪਾਈਪ ਲਾਈਨ ਕਰਾਸ ਕਰਨ ਸਮੇਂ ਬੋਝ ਦੇ ਟੋਪ ਲੈਵਲ ਤੋਂ ਘੱਟ ਘੱਟ 0.5 ਮੀਟਰ ਤੋਂ 1 ਮੀਟਰ ਉੱਚਾ ਰੱਖਿਆ ਜਾਵੇ।
4. ਬਰਸਾਤੀ ਸੈਜਨ ਦੌਰਾਨ ਜੇਕਰ ਡਰੇਨ ਦੀ ਸਫ਼ਾਈ ਕਰਨ ਸਮੇਂ ਪਾਈਪ ਲਾਈਨ ਨੂੰ ਸਫ਼ਾਈ ਮਸ਼ੀਨ ਆਦਿ ਨਾਲ ਕੋਈ ਨੁਕਸਾਨ ਹੁੰਦਾ ਹੈ ਤਾਂ ਇਸ ਦੀ ਰਿਪੋਅਰ ਆਦਿ ਦਾ ਕੰਮ ਟਰਾਈਡੈਂਟ ਕੰਪਨੀ ਵੱਲੋਂ ਆਪਣੇ ਖਰਚੇ ਤੇ ਕਰਵਾਇਆ ਜਾਵੇਗਾ।
5. ਧਨੋਲਾ ਡਰੇਨ ਦੀ ਜੇਕਰ ਭਵਿੱਖ ਵਿੱਚ ਹੀ-ਸੈਕਸਨਿੰਗ ਕਰਨ ਨਾਲ ਇਸ ਪਾਈਪ ਲਾਈਨ ਨੂੰ ਪੁੱਟਣ ਦੀ ਜ਼ਰੂਰਤ ਪੈਂਦੀ ਹੈ ਤਾਂ ਟਰਾਈਡੈਂਟ ਕੰਪਨੀ ਵੱਲੋਂ ਕੋਈ ਇਤਰਾਜ਼ ਨਹੀਂ ਕੀਤਾ ਜਾਵੇਗਾ।
6. ਪਾਈਪ ਲਾਈਨ ਸਬੰਧੀ ਕਿਸੇ ਦੂਜੇ ਧਿਰ ਵੱਲ ਇਤਰਾਜ਼ ਕਰਨ ਤੇ ਇਸ ਨੂੰ ਰੋਕ ਕਰਨ ਦਾ ਅਧਿਕਾਰ ਇਸ ਦਫ਼ਤਰ ਕੋਲ ਰਾਖਵਾਂ ਹੋਵੇਗਾ।
7. ਤਜਵੀਜ਼ਤ ਪਾਈਪ ਲਾਈਨ ਕਰਾਸਿੰਗ ਦਾ ਕੰਮ ਇਸ ਦਫ਼ਤਰ ਦੀ ਉਪ ਮੰਡਲ ਅਫ਼ਸਰ ਦੀ ਨਿਗਰਾਨੀ ਹੇਠ ਕਰਵਾਇਆ ਜਾਵੇ।
8. ਮਹਿਕਮੇ ਦੀਆਂ ਹਦਾਇਤਾਂ ਅਨੁਸਾਰ ਹਰ ਸਾਲ ਬਣਦਾ ਮੇਨਟੇਨੈਂਸ ਚਾਰਜਜ ਜਮ੍ਹਾਂ ਕਰਵਾਇਆ ਜਾਵੇ।
9. ਐਨ.ਓ.ਸੀ. ਵਿੱਚ ਦਰਜ ਸ਼ਰਤਾਂ ਦੀ ਉਲੰਘਣਾ ਕਰਨ ਦੀ ਸੂਰਤ ਵਿੱਚ ਐਨ.ਓ.ਸੀ. ਹੱਦ ਸਮਝੀ ਜਾਵੇਗੀ।


ਰਵਿੰਦਰ ਗਗਨਦੀਪ ਸਿੰਘ ਗਿੱਲ,
ਕਾਰਜਕਾਰੀ ਇੰਜੀਨੀਅਰ,
ਜਲ ਨਿਕਾਸ ਕਮ ਮਾਈਨਿੰਗ ਮੰਡਲ,
ਸੰਗਰੂਰ।

ਕਾਪੀ :

ਉਪ ਮੰਡਲ ਅਫ਼ਸਰ, ਜਲ ਨਿਕਾਸ ਕਮ ਮਾਈਨਿੰਗ ਉਪ ਮੰਡਲ ਬਰਨਾਲਾ ਨੂੰ ਭੇਜ ਕੇ ਲਿਖਿਆ ਜਾਂਦਾ ਹੈ ਕਿ ਉਕਤ ਆਪਣੀ / ਫੀਲਡ ਸਟਾਫ਼ ਦੀ ਨਿਗਰਾਨੀ ਹੇਠ ਕਰਵਾਇਆ ਜਾਵੇ ਅਤੇ ਇਤਰਾਜ਼ਜ਼ਹੀਦਤਾ ਸਰਟੀਫਿਕੇਟ ਵਿੱਚ ਦਰਜ ਸ਼ਰਤਾਂ ਇਨ ਬਿਨ ਪਾਲਣਾ ਯਕੀਨੀ ਬਣਾਈ ਜਾਵੇ।



| | | | | | | | | | | | |
|---------------------|-------------|--------|-------|----------|------|------|--|------------|------|---|--|
| | | | | | | | | | | TRIDENT LIMITED SANGHERA - 148101 | |
| DATE | CAD | CKB | APP. | SCALE | MAT. | QTY. | | | | | |
| 03.12.2020 | VIPAN | ANUMAN | RAJAT | 1MM=3MTR | NA | NA | | | | | |
| TITLE:- | | | | | | | | | | DRG. NO. | |
| NEW PLANTATION LINE | | | | | | | | | | VIII/12/21 | |
| REV. | DESCRIPTION | APPD. | DATE | | | | | SHEET-1 OF | REV. | 01 | |
| DHANLA | | | | | | | | | | | |



PUNJAB POLLUTION CONTROL BOARD
HEAD OFFICE AIR LAB. VATAVARAN BHAWAN, PATIALA

Web: www.ppcb.gov.in

E-mail: ppcbairlab@gmail.com

Ph:- 0175-2302392

- | | |
|--|---|
| 1. Laboratory Sample No. | 93-94/ H.O.Lab./Air/Monitoring/2020-21 |
| 2. Name of Industry | M/s Trident Ltd. (PCD), Mansa Road, Dhaula, Distt. Barnala. |
| 3. Name of Sample collecting Officer | Er. Vipin Kumar AEE and Dr. Sonam Dogra, SA |
| 4. Designation of authorizing Test | EE, RO, Sangrur |
| 5. Type of Sample | Stack Emission |
| 6. Date & Time of Sample collection | 30.04.2021 |
| 7. Date & Time of Sample receipt in Lab. | 03.05.2021 |
| 8. Point of Sample collection | Details as Given Below |

Results

| Point of sample Collection | Parameter | Results | Prescribed Standards |
|--|--------------------|--|---|
| Port Hole on stack after APCD of Chemical recovery plant-II | Particulate Matter | 83 mg/Nm ³ | 150 mg/Nm ³ |
| Port Hole on stack after APCD of 2 no Boilers of Cap. 130 TPH each | Particulate Matter | 86 mg/Nm ³ at 12% CO ₂ | 150 mg/Nm ³ at 12% CO ₂ |

Note: If any, stringent limits/specific standard has been prescribed time to time by MoEF&CC, CPCB and PPCB, then stringent limits/specific standard would prevail subject to clarification from the concerned Regional office

B. S. Prakash
5/5/2021
for Scientific Officer

Endst. No:

1128385

Dt.

11/5/2021

A copy of the above is forwarded to the following for information and necessary action:-

1. The Chief Environmental Engineer, Punjab Pollution Control Board (Air), Jalandhar
2. The Senior Environmental Engineer, Punjab Pollution Control Board, Zonal Office-II Patiala
3. The Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur

B. S. Prakash
5/5/2021
for Scientific Officer

Dear Sir/ Madam ,

Annexure-5

We are pleased to place the Purchase Order no. 7600007938 on your esteemed organization as per the terms & conditions agreed upon.

Any discrepancy regarding the acceptance of Purchase order including the terms and conditions mentioned therein is to be intimated to the Company within 24 hours of its receipt.

In case, no communication intimating any discrepancy is received by the Company in writing with in 24 hours of the receipt of Purchase Order, the Purchase Order shall be considered to have been accepted by you.

We would also request you to kindly share the progress of the said order on weekly / monthly basis with the under mentioned Email Id

Thanking You

For Trident Limited



E-212, KITCHLU NAGAR, LUDHIANA 141001

Contact No. : 9878999481

Email : jasbirpurchase@tridentindia.com

Purchase Team .



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | | | |
|---|--|---|------------------|------------|-----------------|------------|
| Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA | Ship To TL - Dhaura Energy 2 P&C Division, Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number | 7600007938 | Dated | 25.08.2021 |
| | | | Our Ref. | 13760 | Currency | INR |
| | | | Your Ref. | offer | | |
| PO Status :- Invalid/Unapproved Quality Certificate :- Required | | | | | | |

| S.No. | Item Code Item Description Sale Order PO Number/ Week Code | UOM/ Brand | Order Qty. | Basic Rate | Discount | PKG-FWD | HSN/SAC | CGST/SGST/IGST/ C.Cess | Coal Cess | Item Value | Cancellation Date | Plant |
|-----------|---|---------------|---------------|-----------------------------------|---------------------|---------------------|------------|--|--------------|--------------|----------------------|-------------------------|
| 0000 1 | 877015678 CONVENTIONAL PANEL PRECICON R CONT. ADOR | NOS/ ADOR | 1.000 | 303,000.00 <u>INR/ 1 NOS</u> | 0.00 <u>0.00</u> | 0.00 <u>0.00</u> | 8541.40.90 | 0.00 /0.00 /18.00 <u>54,540.00</u> | 0.00 | 357,540.00 | 25.12.2021 | TE02 <u>ENERGY-2</u> |
| 0000 2 | 877015618 IGBT BASED HFPS CONTROL PANEL ESP | NOS/ ADOR | 2.000 | 1,262,500.00 <u>INR/ 1 NOS</u> | 0.00 <u>0.00</u> | 0.00 <u>0.00</u> | 8548.10.90 | 0.00 /0.00 /18.00 <u>454,500.00</u> | 0.00 | 2,979,500.00 | 25.12.2021 | TE02 <u>ENERGY-2</u> |

Total Value 3,337,040.00 INR

Total Value: INR THIRTY THREE LAKH THIRTY SEVEN THOUSAND FORTY Rupees



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | |
|---|--|---|--|-------------------------|
| Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA | Ship To TL - Dhaura Energy 2 P&C Division, Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number 7600007938 | Dated 25.08.2021 |
| | | | Our Ref. 13760 | Currency INR |
| | | | Your Ref. offer | |
| | | | PO Status :- Invalid/Unapproved Quality Certificate :- Required | |

Price Basis: EXW PUNE

Freight : F

Special Instruction 1) 90% against COD with 100% GST. 2) 10% PBG valid for 1 year 3) PBG will release subject to minimum emission reduction of more than 40% from current level.

Payment Terms: Payable in 2 partial amounts **Octroi:** As per Documentary Evidence

Transportation Mode: By AIR /RAIL /SEA /COURIER /ROAD **Transit Insurance** TO BE ARRANGED BY US.

The consignment shall be accepted only if accompanied by Original Invoice for Buyer and Duplicate for Transporter failing which the consignment shall be returned at your risk and cost .

Terms and Conditions As mentioned overleaf

Cancellation Date As above

Our Banker: State Bank of India, Industrial Finance Branch, Golden tower, Dholewal Chowk, Ludhiana

GSTIN No.: 03AABCA4139J1Z0

This is computer generated Purchase Order. Hence requires no signature.



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | |
|---|--|---|--|-------------------------|
| Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA | Ship To TL - Dhaura Energy 2 P&C Division, Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number 7600007938 | Dated 25.08.2021 |
| | | | Our Ref. 13760 | Currency INR |
| | | | Your Ref. offer | |
| | | | PO Status :- Invalid/Unapproved Quality Certificate :- Required | |

| S.No. | Item Code Item Description | Master Inspection Characteristics(MIC) | Upper Specification Limit | UOM | Target Specification Limit |
|-------|-------------------------------|---|---------------------------|-----|----------------------------|
|-------|-------------------------------|---|---------------------------|-----|----------------------------|



Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER

Vendor 740059
ADOR POWERTRON LIMITED
PLOT NO -51, D-II BLOCK, RAM NAGAR
PUNE
411019
Country India
Vendor GSTIN No. 27AABCA5150B1ZA

Ship To
TL - Dhaura Energy 2
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - (Paper & Chemical Division)
Mansa Road, Dhaura
BARANALA (PUNJAB)
148101
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600007938 | Dated | 25.08.2021 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Invalid/Unapproved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Mat. Classification | PO Material Text |
|-------|---|---------------------|------------------|
| 00001 | 877015676 CONVENTIONAL PANEL PRECICON R CONT. ADOR | Standard | |
| 00002 | 877015618 IGBT BASED HFPS CONTROL PANEL ESP | Customize | |



Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER

Vendor 740059
ADOR POWERTRON LIMITED
PLOT NO -51, D-II BLOCK, RAM NAGAR
PUNE
411019
Country India
Vendor GSTIN No. 27AABCA5150B1ZA

Ship To
TL - Dhaura Energy 2
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - (Paper & Chemical Division)
Mansa Road, Dhaura
BARANALA (PUNJAB)
148101
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|----------|------------|
| PO Number | 7600007938 | Dated | 25.08.2021 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Invalid/Unapproved Quality Certificate :- Required | | | |

DELIVERY SCHEDULE

| S.NO | Item Code Item Description | UOM | PO Qty | Scheduled Date | Sch Qty | Delivered Qty | Open Qty as on 25.08.2021 | Contract No | Remaining Contract Value/Qty |
|-------|---|-----|--------|-------------------|---------|---------------|------------------------------|-------------|---------------------------------|
| 00001 | 877015676 CONVENTIONAL PANEL PRECICON R CONT. ADOR | NOS | 1.000 | 25.12.2021 | 1.000 | 0.000 | 1.000 | | 0.00 |
| 00002 | 877015618 IGBT BASED HFPS CONTROL PANEL ESP | NOS | 2.000 | 25.12.2021 | 2.000 | 0.000 | 2.000 | | 0.00 |

Terms and Conditions

This Purchase Order is subject to all terms, conditions and specifications hereinafter set forth and acceptance of order by the Seller shall be deemed to be an agreement that the order is subject to all of said terms, conditions and specifications.

General

Non Acceptance of Purchase order with its terms and conditions is to be intimated to the Purchaser within 24 hours of its receipt, else the same shall be assumed to be accepted at the discretion of the Purchaser. No deviation to this order shall be honoured unless authorized in writing.

Purchase Order number, material code and GST IN of the Purchaser should be mentioned on each and every invoice. An invoice should not have more than 8 line items in it. Different Invoice should be raised for different Purchase Orders issued by the Purchaser.

The Seller shall be responsible for mentioning the correct details in the invoice, including HSN and GST rate of goods supplied to the Purchaser.

The Seller represents and warrants that it shall comply with the Laws pertaining to GST and other applicable indirect taxes and the requirements therein. The Seller shall be liable for all losses and damages suffered by the Purchaser due to any action or omission or mistake of the Seller.

The Seller shall unconditionally submit its account statement on Quarterly basis for reconciliation.

Weights / quantities as recorded by the Purchaser shall be final and binding on the Seller.

This Purchase Order shall not be amended, modified, altered or changed in any way except by writing executed by a duly authorized representative of the Purchaser.

Any other terms & conditions of the Seller mentioned on its Bills,Invoices, e-mails or any other documents shall not be binding on the Purchaser unless accepted in writing by the Authorized Representative of the Purchaser.

The Seller shall not disclose any confidential information pertaining to the Purchaser's business to any third party.

Neither party shall be entitled to assign the rights, interests and obligations without the previous written consent of the other Party.

The Seller shall not offer, solicit or accept an advantage in connection with the procurement of this Purchase Order. Failure to comply with this clause or any act of offering, soliciting or accepting advantage committed by the Seller shall, without affecting the liability of Seller for such failure and act, result in this Purchase Order being invalidated. For the purpose of this clause, Seller shall include its directors, partners, relatives, agents, associates, employees, servants and sub-consultants.

'Advantage' for this purpose shall mean any gift, loan, fee, reward or commission, any valuable security, office, employment, agreement, loan payment/waiver/discharge, bribe of any kind to Government/other officials, any other service or favour or any offer, undertaking or promise, whether conditional or unconditional, of such advantage.

The Seller or its directors, partners, relatives, associates, employees, agents and/ or sub-consultants shall not trade, directly or indirectly, in the shares of the Company during the currency and six months post expiry of this Purchase Order.

Delivery

The material shall be carefully and properly packed for movement by sea/rail/road transport to withstand damages on account of inclement weather, rough handling etc.

The material shall have to be delivered on the date of delivery specified in this Purchase Order. Decision for acceptance/rejection of material on the dates other than that specified in the Purchase Order along with the liquidated damages shall be at the sole discretion of the Purchaser.

The Seller shall not have any right to terminate the Purchase Order. However, the Purchaser reserves the right to cancel any unshipped portion at any time without assigning any reason.

All costs incurred in procurement of material from other source in the event of failure to supply the material on the scheduled date / rejection as per the terms of Purchase Order shall be to Seller's account and at the sole discretion of the Purchaser.

The price mentioned in the Purchase Order is inclusive of packing and handling charges unless otherwise stated therein.

Seller shall share the progress of the order on weekly basis in writing.

If delivery of the material mentioned in the Order occurs later than time specified and provided such delay is neither the result of force majeure nor the result of circumstances for which the Purchaser is responsible, the Purchaser shall be entitled to damages of 0.5% per week or part thereof subject to the maximum of 5% of the Contract price. For purpose of computing damages in the event of delay in delivery of the material, mere despatch of the material within the agreed date of delivery which are not in accordance with the specifications/standards, or found unacceptable by Purchaser would not amount to delivery within the agreed delivery date.

Inspection and Testing

Complete Test / Inspection reports from an approved source / as generated and certified by the Seller should be submitted along with the supply of material. Test reports generated by the Purchaser shall be binding on the Seller and no disputes whatsoever shall be entertained in this regard. Charges for testing, if any, shall be to the Seller's account and the decision to get the same inspected by any third party shall be at the sole discretion of the Purchaser.

Material must conform to all the specifications as specified in the Purchase Order. Any non-conformity identified during any later stage shall be treated as breach of contract and the Seller shall be liable to any penalties imposed at the sole discretion of the Purchaser.

Terms of payment

Original GST invoice should invariably accompany the material failing which the material may be rejected at the sole discretion of the Purchaser.

In the event of denial of input tax credit to the Purchaser on account of any negligence, erroneous or incorrect reporting, non payment of taxes or any other non-compliance made by the Seller in relation to the GST Law, the Purchaser shall be entitled to recover such loss from the Seller along with Interest @18% per annum.

Advances shall be released against submission of Advance Bank Guarantee of equivalent amount. All Advance and Performance Bank guarantee(s) shall be accepted only if they are in Purchaser's format and issued by the Banks recommended by the Purchaser unless otherwise agreed in writing.

Payment other than advances shall be made as specified in the terms and conditions of the Purchase Order and submission of all required documents.

Forms / Permits / Declarations shall be submitted as per the applicable laws/statute.

The prices under this Order shall remain firm until completion of the Contract

Intellectual property/Warranty, Inspection and Liability

Material supplied by the Seller pursuant to this Purchase Order should not infringe any third party intellectual property rights and the Seller further undertakes to indemnify the Purchaser against all claims for infringements of third party patents and/or other intellectual property rights by material supplied under this Purchase Order.

Material supplied by the Seller pursuant to the Purchase Order should have clean title in favour of the Seller before shipment to the Purchaser. Should there be any dispute to the ownership of the material, the Seller would be liable to make good for the costs incurred by the Purchaser to defend the title and the loss of profits due to its inability to use the subjected material, over and above the costs already paid to the Seller.

In the event of any breach of obligations mentioned in the Purchase Order by the Seller, the Purchaser shall be entitled to incidental and consequential damages including loss of profit. The Seller agrees to indemnify and hold the Purchaser, its customers and users of its products, harmless against any suits, damage or claim or any other expense resulting from a breach or alleged breach of the Seller's obligations including warranty, pursuant hereto. The Purchaser shall have the right to invoke the Performance Bank Guarantee submitted by the Seller for recovering the Liquidated damages.

All goods supplied shall be under an unconditional guarantee of 12 months from the date of commissioning / 18 months from the date of receipt (whichever is earlier) unless specified differently in the Purchase Order.

The Purchaser shall have the right for shop floor rejections even if the material has been accepted on delivery.

All costs (inclusive of taxes & duties) incurred by the Purchaser on account of rejections, despatch/warranty failures of material supplied under this Purchase Order shall be to Supplier's account.

Applicable law and Jurisdiction of Courts

Any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof shall be referred for arbitration to be governed in accordance with the Arbitration and Conciliation Act, 1996.

Accordingly, the purchaser will nominate sole Arbitrator to settle any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof. The place of arbitration shall be in Barnala, Punjab, India and language of proceedings shall be English. Expenses of the arbitration proceeding shall be jointly shared by the parties. This Purchase order shall be governed by and construed in accordance with the laws of India, and the parties agree to submit themselves to the exclusive jurisdiction of the Courts at Barnala, India only. Further, where any material is imported under this Purchase Order, the laws applicable under the Indian statute would govern the resolution of conflicts.

This Purchase Order supersedes any/all other oral or written communications or other commitments between the parties with respect to its subject matter except the agreement executed between the parties and contains all of the covenants, terms and conditions agreed between the parties with respect thereto. Wherein an agreement is also executed between the parties on the same subject matter thereto with the terms, conditions and specifications, the Purchase Order shall become the part of the agreement. However, in case of any conflict in the terms, conditions, specifications mentioned in the agreement and the Purchase Order, the terms, conditions, specifications mentioned in the agreement shall prevail.

Each party hereto acknowledges that, except as set forth herein, neither party nor any one on behalf of either party has made any representations, inducements, promises or agreements, orally or otherwise, respecting the subject matter of this Agreement and/or Purchase Order.

Documents required to be attached with invoice.

1. Tax Invoice in original
2. Tax Invoice (Duplicate) in original
3. Quality certificate,

Annexure-6

| TECHNICAL PARTICULARS | UOM | M/s FLS Smidth 70% MCR -DESIGN Proposal: 9814168-1-ver.2a | M/s GE Power 70% MCR- DESIGN Offer Ref.: 1401113 | M/s Hamon 70% MCR- DESIGN Proposal ref : P1943334 Revision : 02 |
|---|-----------------------|---|--|--|
| OPERATING CONDITIONS | | | | |
| No. of chambers | Pcs | 1 | 1 | 1 |
| Bus sections in operation | | All | | 4 |
| Bus sections in operation, total | | 5 | 3 | 4 |
| Gas volume to precipitator @ 3 % O2 dry | Nm ³ /s | 16.2 | 16.18 | 16.18 |
| Gas volume to precipitator @ 3 % O2 dry | m3/Hr | 103855 | | 148300 |
| Operating temperature | Deg C | 190 | 190 | 180-190 |
| Operating pressure | Pa | -2157 | -2156 | -2157.463 |
| Operating pressure | mm of WC | -220 | -220 | -220 |
| Water content | % | 27.6 | | 26.7 |
| Dew Point (water) | Deg C | 66 | | Estimated 20 Deg C Above flue gas temperature Later |
| Raw gas dust loading @ 3 vol%O2 | g/Nm ³ ,D | 25 | | 25 |
| Altitude above sea level | Mtr | 224 | | 224 |
| Atmospheric pressure | mm Hg | 739 | | 739 |
| | | | | |
| PRECIPITATOR DESIGN DATA | | | | |
| | | | | |
| Effective cross section | m2 | 38.3 | | 45.12 |
| Gas velocity | m/s | 0.75 | Operating : 0.45 Design : 0.63 | 0.64 |
| Retention time | sec. | 23.2 | Operating : 23.2 Design : 16.6 | 21.39 |
| Total specific collecting area | m2/m3/sec | 152.34 | Operating : 110.5 Design : 154.9 | 142 |
| W - Deutsch particle migration velocity | cm/s | 4.23 | | 4.52 |
| | | | | |
| ESTIMATED PERFORMANCE | | | | |
| Dust Emission @ 3 vol%O2 | mg/Nm ³ ,D | 40 | ≤40 | 40 |

| | | | | |
|---|---------------------------------|---------------------------------|-------------------------------------|------------------------------|
| Efficiency. | % | 99.84 | Operating : 99.88 Design : 99.84 | 99.84 |
| Emitted dust in outlet of filter | Kg/h | 2 | | 2 |
| Collected dust in hopper | Kg/h | 1050 | | 1065 |
| Power consumption of High Voltage supply (at guaranteed conditions) | kW | 80 | | |
| Pressure drop over the precipitator (guaranteed) | Pa | 250 | | 245 |
| MECHANICAL DESIGN DATA | | | | |
| Casing design temperature. | Deg C | 250 | | 200 |
| Casing design pressure, max. static | mm of WC | -300 | | -300 |
| Specific Weight of Dust in Hopper | t/m3 | 0.4 | 150 kg/m3 for dead load | 0.15 |
| Specific Weight of Dust for transport calculation | t/m3 | 0.2 | | 0.4 |
| Wind load calculated according to: | | | | |
| wind velocity pressure | kN/m2 | 1.5 | 47 m/Sec | 2.007 |
| Snow load | kN/m2 | 0.8 | N.A. | 2 |
| Live load, roof | kN/m2 | 2 | 3500 Pa | 500 |
| Live load, access facilities | kN/m2 | 3 | 250 kg/m2 | 1000 |
| Earthquake zone | UBC | 2b | Zone-IV | Zone - IV |
| Standards for Steel profiles | EN, GB, JIS, ASTM or equivalent | EN, GB, JIS, ASTM or equivalent | IS:808 | ASTM A36 / IS 2062 |
| Strength calculation of casing | | FLS Standard | | IS:800 |
| Strength calculation of supporting structure | | FLS Standard | | ANSI 13th Ed |
| Mechanical Design | | FLS Standard | | IS:800 / IS 875 / Equivalent |
| ELECTRICAL DESIGN DATA | | | | |
| Mains voltageV | VAC | 400-660 | 415 | 415 |
| Mains voltage tolerance% | % | ± 5% | ± 10% | 0.05 |
| Mains frequencyHz | Hz | 50/60 | 50 Hz ± 5% | 50 |
| Control voltage in control cubicles, VAC | VAC | 230 | 230 | 230 |
| Ambient temperature, max/min °C | Deg C | 40/0 | 50 | 45°C /10°C |
| Electrical Design | | FLS Standard | | As per IEC |
| Electrical components - according to | | FLS Standard | | As per IEC |

| | | | | |
|--|------|----------------------|---|--|
| | | | | |
| | | | | |
| PRECIPITATOR DATA | | | | |
| Chambers offered | PCS | 1 | 1 | 1 |
| Serial fields per chamber | PCS | 5 | 3 | 4 |
| Bus sections per chamber, field no: 1 / 2 / 3 / 4 / 5 | PCS | 1/1/1/1/1 | 1/1/,1 | 1 |
| Number of ducts per chamber, field no: 1 / 2 / 3 / 4 / 5 | PCS | 17/17/17/17/17 | One chamber | 1 |
| Effective length of field no: 1 / 2 / 3 / 4 / | Mtr | 3.5/3.5/3.5/3.5/3.5 | 3.5/3.5/3.5 | 3.4 |
| Width of fields per chamber, field no: 1 / 2 / 3 / 4 / 5 | Mtr | 5.1 | 5.7/5.7/5.7 | 4.8/4.8/4.8/4.8 |
| Effective height | Mtr | 7.5 | 8 | 9.4 |
| Aspect ratio (effective length / effective height) | | 2.33 | 3 | 1.45 |
| Total Projected Collecting area per Chamber | m2 | 4388 | Not used in GE design | 4107.72 |
| Total Active Collecting area per Chamber | m2 | 5748 | 3192 | 4107.72 |
| | | | | |
| ESP CASING (one chamber) | | | | |
| Structural frames, Concrete | Type | E | Concrete | Concrete |
| Bottom hoppers | Type | Flat bottom concrete | Flat bottom | Trough Arrangement with conveyor |
| Inlet transition piece | Type | Upper | | |
| /rapping of inlet transition bottom | | Yes | Yes | 2 Nos (Common for both conr and GD screen) |
| / adjustable gas distribution screens, inlet | Pcs | 2 | Fixed GD screen with adjustable baffles | 2 |
| /rapping of inlet gas distribution screens | | Yes | Yes | 2 Nos (Common for both conr and GD screen) |
| Outlet transition piece | Type | Bottom | | |
| /rapping of outlet transition bottom | | Yes | No | 1 Nos (Common for both conr and GD screen) |
| /adjustable gas distribution screens, outlet | Pcs | 1 | Fixed | 1 |
| /rapping of outlet gas distribution screens | | Yes | No | 1 Nos (Common for both conr and GD screen) |
| platework In & Outlet; mild steel, plate thickness | mm | 5 | Funnel 6 mm, IS:2062, Grade-A | 5 |

| | | | | |
|--|--------|---------------------|------------------------------------|---------------------------------------|
| Set of insulator and connection boxes, supp. for T/R | Type | FLS | | 8 sets per ESP |
| Inspection doors | Type | FLS | | Manual |
| | | | | |
| | | | | |
| SUPPORTING STRUCTURE (one chamber) | | | | |
| Support for precipitator | Type | Slide bearing | | Slide bearing |
| | | | | |
| | | | | |
| ACCESS FACILITIES | | | | |
| Set of standard access facilities | Design | FLS/DIN | | 1 Set with RCC and Steel construction |
| /Stairs from ground to platform, height | Mtr | 0 | | Yes considered |
| /Platform for inspection doors in casing, length | Mtr | 21.5 | | Yes considered |
| /Stairs from platform to roof, height | Mtr | 8.4 | | Yes considered |
| /Railing around roof, length | Mtr | 55.5 | | Yes considered |
| | | | | |
| INSULATION AND CLADDING | | | | |
| Thermal insulation material consisting of : | | | | LRB Mineral wool with cladding sheet |
| mineral wool, fittings and cover plate | m2 | 1220 | | Yes considered |
| Cladding: 19mm corrugated alu/galvanized Steel plate - thickness | mm | 0.7 | | 0.6 mm aluminium cladding |
| or plane alu/galvanized steel plate - thickness | mm | 0.9/1 | | 0.6 mm aluminium cladding |
| Insulation for Casing (exclusive roof), thickness | mm | 100 | | Yes considered |
| Insulation for Roof (excl. embossed plate), | mm | 100 | | Yes considered |
| Insulation for Bottom hopper, thickness | mm | 100 | | Yes considered - 75 mm thick |
| Insulation for Inlet, thickness | mm | 100 | | Yes considered - 75 mm thick |
| Insulation for Outlet, thickness | mm | 100 | | Yes considered - 75 mm thick |
| | | | | |
| COLLECTING SYSTEM (one chamber) | | | | |
| Collecting systems, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 1/1/1/1/1 | To be defined after detailed Engg. | Field 1 to 4 |
| Collecting plates with attachment | Type | H500 | G profile | G-OPZEL |
| MOC | | Alu killed MS Steel | CRCA, IS:513, Grade-D | Corten Steel |
| spare plates for erection. | Pcs | 5 | Not Envisaged. | 1% of Installed Quantity of 1 ESP |
| plate height | Mtr | 7.5 | 8 (nominal) | 7 |
| plate width | Mtr | 0.5 | 0.5 (nominal) | 0.48 |

| | | | | |
|--|--------|-------------------------------|------------------------------------|-----------------------------------|
| plate thickness | mm | 1.25 | 1.5 | 1.2 |
| Total Projected Collecting area | m2 | 6225 | Not used in GE design | |
| Total Active Collecting Area. | m2 | 8155 | 3192 | 4107.72 |
| Projected col. area, field no: 1 / 2 / 3 / 4 / 5 | m2 | 877.5/877.5/877.5/877.5/877.5 | Not used in GE design | 1026.93 |
| Duct spacing field no: 1 / 2 / 3 / 4 / 5 | mm | 300/300/300/300/300 | | 300/300/300 |
| Collecting plates, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 124/124/124/124/124 | To be defined after detailed Engg. | 120/120/120 |
| Drop hammers, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 36/36/36/36/36 | 20 NOS. TUMBLING HAMMER /Field | 42/42/42 |
| Drive units for rapping, incl. gear motor | Type | Roof Mounted | Side drive | N.A. |
| | | | | |
| DISCHARGE SYSTEM (one chamber) | | | | |
| Discharge frame systems, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 1/1/1/1/1 | 19/Field | 72 Nos. per field |
| /discharge frame system | Type | Rigid | Rigid Frame | Rigid Pipe and spike |
| Discharge electrodes | Type | Pin | Rigid type (Multipeak) | Rigid Pipe and spike |
| electrodes per chamber in field no: 1 / 2 / 3 / 4 / 5 | Pcs | 115/115/115/115/115 | To be defined after detailed Engg. | 72 Nos. per field |
| Tube MOC | | | IS:5429 | Carbon / IS 2062 |
| spare electrodes for erection | Pcs | 10 | Not Envisaged. | 1% of Installed Quantity of 1 ESP |
| /electrode length | Mtr | 6.8 | To be defined after detailed Engg | 9.4 |
| /electrode layers | Pcs | 1 | To be defined after detailed Engg | Single |
| / electrode per plate | Pcs | 1 | To be defined after detailed Engg | 1 per Opzel |
| Mast Electrodes | Type | Pin | Not applicable | |
| electrodes per chamber in field no: 1 / 2 / 3 / 4 / 5 | Pcs | 2/2/2/2/2 | Not applicable | N.A. |
| Tube MOC | | EN 10305-3 1993 – E220-CR2-S3 | Not applicable | N.A. |
| spare electrodes for erection | Pcs | | Not applicable | N.A. |
| /electrode length | Mtr | 6.8 | Not applicable | N.A. |
| /electrode layers | Pcs | 1 | Not applicable | N.A. |
| Internal drop hammer rapping system | Yes/No | Included | Not applicable | Yes MIGI Type rapping system |
| Number of discharge rapping system per field | Pcs | 1 | Not applicable | 4 Sets per field |
| Drop hammers for Discharge system | Pcs | 90 | Not applicable | 4 Sets per field |
| Set of electrode frames, bearing bridges, rotary hammer shafts, guide plates, walkways and upper spacer for coll. plates | Pcs | 5 | Not applicable | N.A. |
| Drive units for rapping, incl. gearmotors | Type | Roof mounted | Not applicable | N.A. |
| Cast parts, comprising chain tightener, pinwheels, links, split bearings and the like | Pcs | 20 | Not applicable | N.A. |
| | | | | |

| | | | | |
|---|-----------|---|---|--|
| HIGH VOLTAGE EQUIPMENT (one chamber) | | | | |
| High voltage supply for field no: 1 / 2 / 3 / 4 / 5 | Pcs | 3 ϕ T/R / 3 ϕ T/R / 3 ϕ T/R / 3 ϕ T/R / 3 ϕ T/R | 1 ϕ T/R / 1 ϕ T/R / 1 ϕ T/R | 1 ϕ T/R / 1 ϕ T/R / 1 ϕ T/R |
| DC SUPPLY BY | | | | |
| DC Supply by | Pcs | 5 | TR set | 4 |
| number of DC-supply in field no: 1 / 2 / 3 / 4 / 5 | Pcs | 1/1/1/1/1 | 3 | 1 |
| size of DC-supply for field no: 1 / 2 / 3 / 4 / 5 | kV (Peak) | 100/100/100/100/100 | 90/90/90 | 110/110/110 |
| size of DC-supply for field no: 1 / 2 / 3 / 4 / 5 | mA (Avg) | 600/700/800/800/800 | 575/575/575 | 600/600/600 |
| specific DC-current in field no: 1 / 2 / 3 / 4 / 5 | mA/m2 | 0.68/0.8/0.91/0.91/0.91 | 0.54 | 0.72 |
| TR Control Panel IP class | IP | IP21 | IP31 | Hermetically Sealed |
| MCC protection class | Type | | IP54 | As per OEM standard |
| /color | | | TR set – RAL 5012, TR panel & PMCC – RAL 7032, | Yes |
| /alarms for oil temperature and pressure | Yes/no | Included | Yes | Yes considered, Strick type |
| Grounding equipment for TR-sets at access doors | Type | FLS | Earthing rod | |
| Electrical accessories, comprising: | | | | |
| /Thyristor switching elements | Type | FLS | Firing /triggering command from ESP controller | IGBT based controller and SCR based controller |
| /Connections on high voltage side | | | Through Bus duct | Through HV pipe connection |
| Insulator sets comprising: | | | | |
| / support insulators, conical | Pcs | 20 | 12 | 4 nos / Field |
| / insulator shafts for discharge rapping system | Pcs | 10 | 3 | 4 nos / Field |
| / lead through insulators in trunking | Pcs | 10 | 3 | NA |
| Earthing rods and warning signs | Set | 10 | 1 | Yes 1 lot considered per ESP |
| CONTROL & ELECTRICAL EQUIPMENT (one chamber) | | | | |
| Controller | Type | PIACS Microcomputer controller, with automatic intermittent energization facility for T/R-sets type FLS | Microprocessor controller EPIC-III integrated with rapping programmer | International standard Precicon controller is considered |
| /programmable control for rapping gear motors | Type | Yes | Yes | Micro controller based |
| /control for heating elements | Type | FLS | Through thermostat for support insulator | Thermostatically Controlled |

| | | | | |
|--|--------|----------------------------|---|-------------------------------------|
| /signal for Central Control room. | Std | 4-20 mA | Over modbus TCP-IP/OPC protocol | Shall be provided as applicable |
| /Energy Management Control System | Yes/No | Optional | Yes, if opacity meter feedback is connected through 4-20 mA signal. | Yes |
| / terminal for input of CO alarm | Yes/No | Optional | External configurable DI is available | Yes |
| /terminal for aut. change of operating status | Yes/No | Optional | | Yes |
| /serial communication to CCS (GATEWAY) | Yes/No | Included | Over modbus TCP-IP/OPC protocol | Yes |
| /standard Protocol for Serial Communication | | Modbus RTU | Ethernet | RS485 |
| | | | | |
| GENERAL STANDARDS FOR ELECTRICAL EQUIPMENT | | | | |
| Motors: | | | | For Seal air fan motor |
| motor standard | IEC | | IE 1 | As per IEC |
| motor type | | Squirrel Cage, Norm Motors | Squirrel Cage, Norm Motors | SQIM |
| insulation class | | F utilised to B | F utilised to B | Class F |
| protection class | | IP 54 | IP 55 | IP 54 |
| Cubicles: | | | | |
| /internal control voltage | VAC | 230 | 230 V AC | 230 |
| /lamp voltage | VDC | 24 | Later during detail engineering | 220 |
| /protection class | | IP 21 | IP54 | 45 Max |
| / forced cooling of cubicles | | Optional | Not required | |
| Instruments: | | | | |
| /protection class | | IP65 | Later during detail engineering | IP 31 for Indoor, IP 54 for Outdoor |
| Access to High Voltage carrying Equipment/Parts | | | | |
| Key interlocking | Type | Serv Trayvou or Similar | Mechanical castle key | Mechanical |
| | | | | |
| ESTIMATED POWER CONSUMPTION | | | | |
| Total power use for T/R sets | kW | 89 | Will be finalized after detailed Engg. | Refer Electrical Load List |
| Total power use of heaters | kW | 37.5 | 16 | Refer Electrical Load List |
| Total power use for rapping motors | kW | 1.2 | 2.59 | Refer Electrical Load List |

| | | | | |
|--|---------|------------------|---|---|
| Total power use of dust transport | kW | 4.9 | Will be finalized after detailed Engg. | Refer Electrical Load List |
| Total Power for Purge Air kW 2.0 | kW | 2 | Will be finalized after detailed Engg. | Refer Electrical Load List |
| Scrapper conveyor | kW | | Will be finalized after detailed Engg. | 15 |
| Drag chain conveyor | kW | | Will be finalized after detailed Engg. | 3.7 |
| RAV | kW | | Will be finalized after detailed Engg. | 3.7 |
| Total estimated Power Consumption | kW | 135 | 18.59 | 22.4 |
| SURFACE TREATMENT FOR PARTS DELIVERED | | | | |
| Collecting plates | Type | Oil Coated | | St.3/Tectyl 506 / Equivalent |
| Discharge electrodes | Type | Oil Coated | | St.3/Tectyl 506 / Equivalent |
| Other internal parts | Program | Transport Primed | | Transport Primed |
| /degree of cleaning (SIS 055900 | Type | St.2 | | SA 2.5 |
| /primer | | 40 | | |
| External parts to be covered by insulation | Program | Transport Primed | | Transport Primed |
| /degree of cleaning (SIS 055900 | Type | St.2 | | |
| /primer | | 40 | | Primer: 2 Coats of red oxide primer (50 microns total DFT) |
| External parts not to be covered by insul. | Program | III | | |
| /degree of cleaning (SIS 055900 | Type | Sa 2.5 | | Sa 2.5 |
| /primer | my | 100 | | Primer: 2 Coats of red oxide primer (50 |
| / finish painting | my | 60 | | microns total DFT) |
| SCOPE OF SUPPLY | | | | |
| | | | | ESP Inlet and Outlet hoods (Corten steel) |
| | | | Outer roof has been included(Chequered plate IS-3502 and MS IS:2062 Gr A) | ESP Hot-roof and cold-roof arrangement (Corten steel) |

| | | | |
|--|---|--|---|
| | Inspection doors included | Inspection door included | ESP Quick opening doors (Corten Steel) |
| | Rapping system for distribution screen,supporting rod etc have been included | ESP internal including electrodes, suspension and steadying frames, rapping shafts,anvils have been included. | ESP internals of Corten steel including electrodes, suspension and steadying frames, rapping shafts,anvils and baffles. |
| | Gas distribution devices with support accessories. | Gas distribution devices with support accessories. | Gas distribution devices with support accessories. |
| | Rapping system for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping system for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping system for collecting electrode, discharge electrodes & inlet gas distribution devices |
| | Rapping motors for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping motors for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping motors for collecting electrode, discharge electrodes & inlet gas distribution devices |
| | Insulators included | Insulators as required by HRC India design. | Insulators as required by HRC India design. |
| | | Bus duct has been included. But no mention of T-R oil trays | HV bus-duct and T-R oil trays |
| | Key interlocking | Mechanical key safety interlocks system. | Mechanical key safety interlocks system. |
| | Slide bearings included | ESP support bearings has been included. | Fixed and slide bearings |
| | Detail engineering only for Stairways and gangways included ,Sun roof structrue for TR Set(Detail Engg),Steel supported outer roof will be fabricated and supplied by Ms FLS. | Staircase & Platform from Ground Level to Casing bottom floor level platform and to ESP roof top has also been included. | Access steel structures including platform and staircase from floor level to ESP roof with galvanized gratings and stair steps. |
| | Weather enclosure, detail engg will be done by Ms FLS | Not given | Weather enclosure for ESP |
| | Electical hoist & trolley included in Trident scope,Maintenance structure with monorail detail engg included in the scope | Monorail with electric hoist Included | Maintenance structure with monorail included |

| | | | |
|--|---|--|--|
| | Inlet & outlet expansion joints - Nonmetallic Type - Only detail engineering included in the scope. | Inlet & outlet expansion joints - Nonmetallic Type | Inlet & outlet expansion joints - Nonmetallic Type |
| | Not mentioned | ESP Inlet DTPA dampers | ESP Inlet DTPA dampers |
| | Not mentioned | ESP Outlet DTPA dampers | ESP Outlet DTPA dampers |
| | | | Rotary valve for ash conveyor outlet |
| | Scraper, incl. gear motor and VFD, Drag chain, incl. gear motor has been included in the scope | Scraper Conveyor & Drag Chain Conveyor | Scraper Conveyor & Drag Chain Conveyor |
| | | Not Given | Graph alloy bearings for Scraper Conveyor |
| | Basic engg for Thermal insulation & cladding of ESP included in the scope | Not included in the scope. | Thermal insulation & cladding of ESP |
| | | Not given | Modification in upstream and downstream ductwork with supports |
| | Not included in the scope. | Not included in the scope. | Induced draft fan included in the scope |
| | | | |

| | | | | |
|--|--|--|--|---|
| <p style="text-align: center;">EXCLUSIONS(SCOPE OF SUPPLY/WORK)</p> | | <ol style="list-style-type: none"> 1.Any other Power, Control & Instrument Cable 2.All Civil work. 3.Finish Painting 4.Erection, Commissioning, PG Testing, supervisor. 5.Power & control of dust transport system (Scraper, drag chain & RAV). 6.Lightning and lightning of ESP 7.Dust Conveying below Rotary air lock valve 8.Electric hoist & trolley (Capacity- 2.0 T) for T/R set. 9.Earthing system including ground pit 10.Casing Frames - Concrete 11.Platework, casing - Concrete 12.Flat Bottom Hopper - Concrete 13. Mechanical erection and Electrical erection. 14.Instruments, controllers, cables or electrical erection for central control room.. | <p>1.Civil works including all civil engineering, grouting, minor work, foundation, control room, MCC room.</p> <ul style="list-style-type: none"> • Structural engineering including structural work except specified in our scope of supply • ID fan, motor, VFD & accessories. • Dust handling system / conveyor beyond rotary air lock. • Fabrication drawing preparation & supply of Stack, Duct & duct support • PLC/DCS & its programming, HMI, engineering station, SCADA, laptop/desktop, UPS with backup etc. • All cable (Power/control/instrument/screen/communication) with cable tray, tray support, rack, trestle etc. or associated hardware except those mentioned in our scope of supply.. | <ol style="list-style-type: none"> 1. Civil work 2.ESP casings and casing columns(Corten steel) 3.Ash Mixing tank with Agitator 4.AMT transfer Pump |
|--|--|--|--|---|

| | | | | |
|---|--|---|---|--|
| <p style="text-align: center;">Performance Guarantee</p> | | <p>IS 11255 Part 1 & 3 EN 13284-1:2002 Stationary source emissions - Determination of low range mass concentration of dust. (In-stack standard for emissions < 40 mg/Nm³ - Case 1) ASME Power Test Code PTC 27 and the requirements of Environmental Protection and it has been given subject to certain provisions and has been mentioned clearly in the offer</p> | <p style="text-align: center;"><i>Performance guarantee condition has been given but couldnot find the value .</i></p> | <p>When the equipment covered by this proposal is operated at the design conditions given in Section 5 of this proposal, HRC India guarantees ESP outlet emission as: <50 mg/Nm³ dry gas (Guaranteed with all fields in service, subject to inlet conditions furnished and under steady state of operation</p> |
|---|--|---|---|--|







RECOMMENDATIONS OF NIT AFTER ENVIRONMENT AUDIT – TOWEL DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE |
|-------|---|---|------------------|
| 1 | <p>Despite the fact that the treated effluent is complying the regulations of the statutory body, the discharge of the coloured effluent may cause aesthetical unpleasantness. Moreover, it is highly objectionable to the general public. So, in the current scenario, the emphasis should be given to develop more efficient microbial mass for de-colorization of effluent in the activated sludge process. A further study may be conducted from the Central/State government institutes of national importance such as IITS, NITS etc. to assess the application of microbial consortia/dedicated pure culture/tertiary treatment for de-colorization of the effluent.</p> | <p>The collaboration with national institute for the color study will be done before 31 Oct 2021</p> | <p>31 Oct'21</p> |
| 2 | <p>The raw water requirement of the HTD is mainly met from the withdrawal of groundwater. As per test reports of the groundwater, it contains a high level of TDS(900-1000 mg/l). The high level of TDS in raw water would ultimately lead to higher TDS in the treated effluent affecting its quality for plantation and drainage. The replacement of the source of water from groundwater to other source with better quality of water (such as surface water) could help in further reduction of pollutant load of the treated effluent.</p> | <p>Industry will develop the infrastructure for utilization of canal water in home textile & make an action plan along with irrigation department to get the additional canal water</p> | <p>15-Jun-22</p> |

RECOMMENDATIONS OF NIT AFTER ENVIRONMENT AUDIT – TOWEL DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE |
|-------|--|---|-----------|
| 3 | <p>In the absence of RO & MEE system, the other safe ways of disposal of effluent should be explored. The HTD is currently disposing only 3000 KLD of its treated effluent onto 48.5 acres of land for plantation. The industry should look into the possibility of enhancement of the plantation area (land requirement, type of plant, piping network, watering depth etc.) for more utilization of the treated effluent for plantation in an effective manner to eventually achieve zero liquid discharge (ZLD) to the drain. The option of providing some portion of the treated effluent to nearby farmers for irrigation of the cash crops should also be given a thought. Further, a detailed hydrogeological study of the area around the industry should be conducted from the Central/State government institutes of national importance such as IITS, NITS and NIH etc. on yearly basis to know the impact and footprints of the industrial effluent (used for plantation) onto the groundwater and soil of the locality. The hydrogeological study would also suggest effective remedial measures to meet any adverse impact of the use of the industrial effluent on the aquifers and soil, if any.</p> | <p>The Industry is in process for procurement of additional land & 100 % utilization of treated water onto plantation will be completed by Dec'21 at the present plant utilization capacity .</p> <p>The industry has already conducted hydrogeological study to access the impact and footprints of industrial effluent.</p> | 31-Dec-21 |

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE | CAPEX (Rs cr) |
|-------|---|--|-----------|------------------|
| 1 | The mill has adopted several water conservation strategies to reduce the freshwater consumption. The level of mill's freshwater consumption is similar to contemporary agro based writing and printing paper mills. However, looking into the reported freshwater consumption benchmarks, the mill has still a scope to reduce freshwater consumption by further 3-4 m ³ /t paper and mill may explore areas for the same, for example 100% utilization of foul condensate in pulp mill can help in reducing water consumption by 1m ³ /t paper while installation of disc filter at PM1 can facilitate reduction in freshwater consumption by 1.5 -2.0 m ³ /t paper | Utilization of foul condensate in Pulp Mill & more back water in Pulp Mill . | 28-Dec-21 | |
| 2 | The mill is advised to have sub monitoring of its treated effluent being utilized in its plantation area to have proper water balance. | Completed | Completed | |
| 3 | The mill may explore installation of appropriate technology for the recovery of white rejects (centri cleaner rejects) coming from paper machine for further improving performance of the ETP. | Installation of 2 No. Disc Filters against existing Vibratory Screens to increase the capture Suspended Solids efficiency from existing 40 % to > 80 % | 10-Nov-21 | |

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE | CAPEX (Rs cr) |
|-------|--|---|-----------|---------------|
| 4 | The mill needs to immediately upgrade / retrofit the existing UASB reactor as the mill is not able to utilize the biogas generated as the gas collection and distribution system have corroded developing leakages. This is resulting in an estimated loss of Rs 60-70 lakhs/ annum. | Purchase order will be placed by 20 Dec 21 .The new system will be made functional by 28 Aug 2022 | 28-Aug-22 | 4.7 |
| 5 | The mill may should reduce the suspended soild level in primary clarifier overflow through use of coagulants and flocculants to further improve the performance of existing ETP. | Usage of cogulants and flocculants | 20-Oct-21 | |
| 6 | The mill may install a coagulation and flocculation system before primary clarifier to improve its performance. | Installation of Coagulation-flocculation Project | 15-Dec-21 | 0.68 |

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE | Capex (Rs Cr) |
|-------|--|---|--------------------------|-------------------|
| 7 | The mill is advised to make a proper boundary of existing equalization tank and make provision of air supply for homogenizing the effluent. | The industry will take necessary steps for proper boundary by 20 Feb 22 and provision of air supply system in equalization tank by 20 Jun 2022. | 20-Feb-22 & 20 Jun-22 | 0.1 |
| 8 | The mill is advised to install poly disc filter (PDF) at Paper Machine 1 also for increased fibre recovery and reuse/ recycled of paper machine backwater. | The industry will explore the recycling technology for the paper machine -1 effluent for the recovery and reuse of paper machine backwater this will be completed by 30 Oct'22. | 30-Oct-22 | 3.0 |
| 9 | The treated effluent quality meets the stipulated norms. However, the mill needs to adopt appropriate technology to reduce the colour. | Collaboration with Thapar has been done . Study will be completed in Dec 21. | 30 Dec 21 | |
| 10 | The mill is advised to get the OCEMS at final discharge and ESP outlet calibrated on periodical basis. | Same will be implemented on immediate basis and report will be shared by 30 Oct 2021 | Completed | |

RECOMMENDATIONS BY CPPRI AFTER ENVIRONMENT AUDIT – PAPER DIVISION

| S No. | RECOMMENDATION | ACTION PLAN | TIME LINE | Capex (Rs Cr) |
|-------|--|---|------------------------|--------------------|
| 11 | The SPM level in the stack emissions are lower than stipulated norms of 150 mg/Nm ³ . However, in context of the EC norms of 75 mg / Nm ³ for SPM, the mill need to look into optimization of its boiler operation / ESP operation or Upgrade ESPs to comply with the new norms. | Commercial negotiation is under progress. New ESP will be installed for Rec 2 by 30 Sept 2022. Delivery Period of New ESP is 10 months . For energy ESP, we will install HF controller to reduce its SPM levels to 75 mg/Nm ³ by 30 Nov 2021. | 30-Nov-21 30-Sep-22 | 12 |
| 12 | Though the mill has appropriate facilities and trained & experienced manpower for environmental monitoring and analysis the mill may get quarterly / half yearly/ yearly environmental monitoring done from a third party / independent institution. | Yearly monitoring will be implemented before 30 Nov'21 | 30 Nov'21 | |

Charter for Water Recycling & Pollution Prevention in Pulp & Paper Industries (Specific to Ganga River Basin States)



A.K.Vidyarthi
Additional Director
Central Pollution Control Board
Delhi

April, 2015

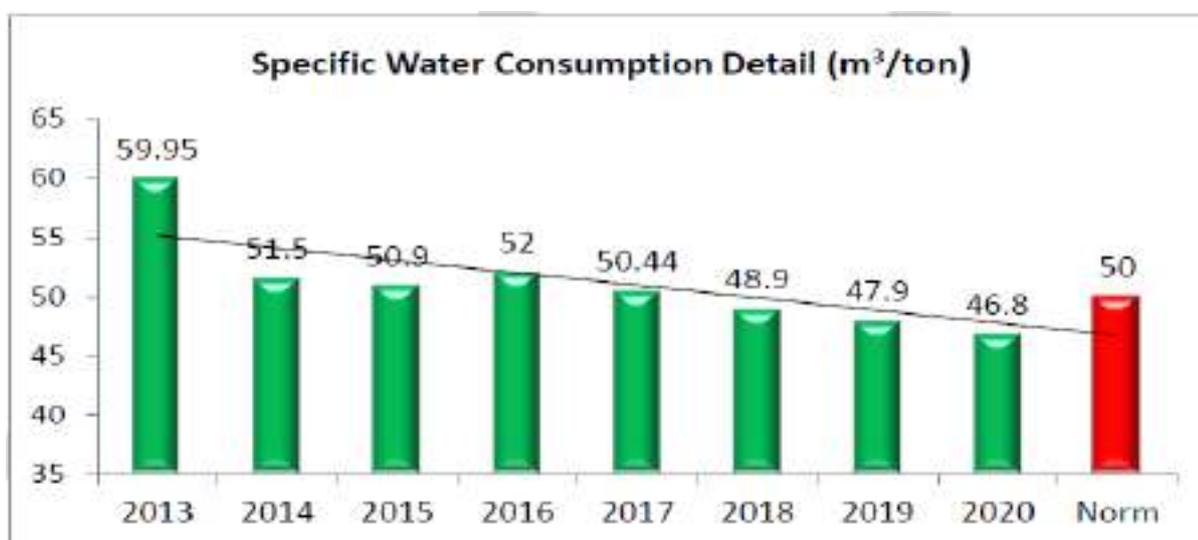
Fresh Water Consumption Norms (m³/t of product)

| Category | Short Term Objectives | Long Term Goals |
|---|-----------------------|-----------------|
| A1: Wood Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint | 60 | 50 |
| A2: Wood Based Pulp & Paper Mills producing unbleached grades of chemical pulps, papers and paperboards | 40 | 25 |
| B1: Agro Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint | 60 | 50 |
| B2: Agro Based Pulp & Paper Mills producing unbleached grades of papers and paperboards | 40 | 25 |
| C1: RCF & Market Pulp Based Paper Mills producing bleached grades of papers, paperboards & newsprint | 20 | 15 |
| C2: RCF & Market Pulp Based Paper Mills producing unbleached grades of papers and paperboards | 15 | 10 |
| D : RCF & Market Pulp Based Specialty Paper Mills[#] | 60 | 50 |
| <p>Notes:</p> <ol style="list-style-type: none"> 1. Short and Long Term norms become applicable 1yr, and 2 yrs respectively, from the date of notification of Charter. Long Term norms will be reviewed after 18 months. 2. “[#]” applies to mills that manufacture only specialty papers 3. "tpd" refers to Air-Dry (ADt) for pulp; Saleable weight for paper. 4. Not applicable to mills at ZLD | | |

| | | | | | |
|-------------------------------------|-----------------------------------|-----------------|--------|---|-------------------|
| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | PAPER CHEMICAL DIVISION | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WATER CONSUMPTION |
| PROCESS : | WATER REDUCTION MEASURES AND DATA | | | | |

Paper Business

Trident Paper division has already achieved its long-term target of specific water consumption in Paper business of 50 m³ /T by executing different projects.



| Sr. No. | Year | Water Consumption | Paper Production | Specific Water Consumption |
|---------|---------|-------------------|------------------|----------------------------|
| | UOM | KLD | TPD | Ltr/Kg |
| 1 | CY-2017 | 21054 | 417 | 50.4 |
| 2 | CY-2018 | 20384 | 417 | 48.9 |
| 3 | CY-2019 | 19963 | 417 | 47.9 |
| 4 | CY-2020 | 16942 | 362 | 46.8 |

The industry has further taken projects to reduce its water consumption which is attached follow
The mill has adopted certain water conservation measures namely:

| | | |
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| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | PAPER CHEMICAL DIVISION | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WATER CONSUMPTION |
| PROCESS : | WATER REDUCTION MEASURES AND DATA | | | | |

- **Automation of water treatment plant for optimum water consumption in various process operations.**
- **Installation of flow meter in various distribution pipelines as well as secondary clarifier outlet.**
- **Installation of Wet Wash Clarifier to reuse the clarified wet washings to maximum extent.**
- **Carrying out of straw fibre line operations at high consistency (less water consumption)**
- **Adoption of twin roll press for reduced water consumption in pulp washing.**
- **Adoption of poly disc filter for reuse / recycling of paper machine back water into paper machine.**
- **Optimisation of shower nozzle diameter on paper machine.**
- **Utilisation of black liquor secondary condensate from chemical recovery in raw material washing in SFL and lime mud washing.**
- **Utilisation of treated effluent for irrigation / land application.**

The plant has implemented additional measures for water conservation during 2020-21 which has further reduced the freshwater consumption.

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STANDARD OPERATING PROCEDURE



| | | | | | |
|---------------------------|-----------------------------------|-----------------|--------|--------------------------------------|-------------------|
| BUSINESS/ UNIT | PAPER CHEMICAL DIVISION | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WATER CONSUMPTION |
| PROCESS : | WATER REDUCTION MEASURES AND DATA | | | | |

| S. No. | Water Conservation Measures | Impact on Fresh water Consumption |
|--------|--|--|
| 1 | Reuse of sealing water in wet wash in SFL | Reduction in fresh water consumption from 17.98 m ³ /t of bleached pulp to 16.18m ³ /t of bleached pulp in SFL Total Saving : 400 m ³ /day |
| 2 | Reduction of number of water showers in press section | |
| 3 | Use of Treated Effluent for preparation of Lime Slurry at ETP | Total Saving : 50 m ³ /day |
| 4 | Reuse of sealing water for bleaching, digester and washing area in WFL | Reduction in fresh water consumption from 7.6 m ³ /t of bleached pulp to 7.2 m ³ /t of bleached pulp in WFL Total Saving : 50 m ³ /day |
| 5 | Replacement of RO Membranes in Power House | Total Saving : 270 m ³ /day |
| 6 | Increase in Cycle of Concentration (CoC) based upon hardness values. | Reduction in fresh water consumption by 75 m ³ /day in cooling tower of cogeneration plant |
| | Total Fresh Water Saving | 875 m³ / day |

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| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | PAPER CHEMICAL DIVISION | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WATER CONSUMPTION |
| PROCESS : | WATER REDUCTION MEASURES AND DATA | | | | |



Due to its continuous efforts, the industry was also rewarded in water and waste management company within the Excellence Reward in Paper Business by Confederation of Indian Industry.

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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

WASTE WATER MANAGEMENT IRRIGATION PLAN



TRIDENT GROUP
BARNALA

| | | |
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| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

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5. Zone wise water flow
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10. Team matrix
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STANDARD OPERATING PROCEDURE

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|---------------------------|----------------------------|-----------------|--------|--------------------------------------|------------------------|
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

EFFLUENT GENERATION DATA

PRESENT SCENARIO

| S NO | DESCRIPTION | UOM | HTD | PCD | TOTAL |
|------|--|---------|--------|-------|---------|
| 1 | TOTAL EFFLUENT GENERATION | KLD | 5146.5 | 19000 | 25146.5 |
| 2 | TREATED WATER INTO PLANTATION | KLD | 3395 | 13200 | 16595.0 |
| 3 | TOTAL AREA OF PLANTATION | ACRE | 48.5 | 105 | 213.5 |
| 4 | EFFLUENT CONSUMPTION | KL/ACRE | 70.00 | 60.00 | 75.00 |
| 5 | UTILIZATION OF TREATED WATER ONTO PLANTATION | % | 55.2 | 69.5 | 62.0 |

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PLANTATION LAYOUT



| | | |
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| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ZONE WISE PLANTATION AREA

PAPER PLANTATION AREA (ACRES)

TOWEL PLANTATION AREA (ACRES)

| ZONE | TOTAL | ZONE | TOTAL |
|-------------------|------------|-------------------|-------------|
| ZONE 1 | 5 | ZONE 1 | 4 |
| ZONE 2 | 40 | ZONE 2 | 14 |
| ZONE 3 | 16 | ZONE 3 | 3 |
| ZONE 4 | 5 | ZONE 4 | 1.5 |
| ZONE 5 | 10 | ZONE 5 | 3 |
| ZONE 6 | 15 | ZONE 6 | 12 |
| ZONE 7 | 8 | ZONE 7 | 2.5 |
| ZONE 8 | 14 | ZONE 8 | 2.5 |
| ZONE 9 | 6 | ZONE 9 | 6 |
| ZONE 10 | 2 | TOTAL AREA | 48.5 |
| ZONE 11 | 2 | | |
| ZONE 12 | 10 | | |
| ZONE 13 | 2 | | |
| ZONE 14 | 4 | | |
| ZONE 15 | 2 | | |
| ZONE 16 | 2 | | |
| ZONE 17 | 3 | | |
| ZONE 18 | 2 | | |
| ZONE 19 | 3 | | |
| ZONE 20 | 5 | | |
| ZONE 21 | 9 | | |
| TOTAL AREA | 165 | | |

| | | |
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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ZONE WISE PLANTATION AGE

PAPER PLANTATION AREA (YEAR)

| ZONE | TOTAL | AGE (YEARS) |
|---------|-------|-------------|
| ZONE 1 | 2020 | 1 |
| ZONE 2 | 2019 | 2 |
| ZONE 3 | 2010 | 11 |
| ZONE 4 | 2008 | 13 |
| ZONE 5 | 2021 | 0.9 |
| ZONE 6 | 2010 | 11 |
| ZONE 7 | 2019 | 2 |
| ZONE 8 | 2021 | 0 |
| ZONE 9 | 2020 | 1 |
| ZONE 10 | 2010 | 11 |
| ZONE 11 | 2021 | 0.9 |
| ZONE 12 | 2020 | 1 |
| ZONE 13 | 2010 | 11 |
| ZONE 14 | 2009 | 12 |
| ZONE 15 | 2014 | 7 |
| ZONE 16 | 2010 | 11 |
| ZONE 17 | 2010 | 11 |
| ZONE 18 | 2010 | 11 |
| ZONE 19 | 2012 | 9 |
| ZONE 20 | 2021 | 0.9 |
| ZONE 21 | 2019 | 2 |

TOWEL PLANTATION AREA (YEAR)

| ZONE | TOTAL | AGE (YEARS) |
|--------|-------|-------------|
| ZONE 1 | 2021 | 0.8 |
| ZONE 2 | 2010 | 11 |
| ZONE 3 | 2021 | 0.8 |
| ZONE 4 | 2021 | 0.8 |
| ZONE 5 | 2020 | 1 |
| ZONE 6 | 2019 | 2 |
| ZONE 7 | 2009 | 12 |
| ZONE 8 | 2020 | 1 |
| ZONE 9 | 2021 | 0.8 |

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| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

| ZONE WISE IRRIGATION PLAN | | | | |
|--|--------------|---------------------|--------------|------------------------------------|
| PAPER PLANTATION AREA (AREA-WISE) | | | | |
| ZONE | TOTAL | AREA (ACRES) | TOTAL | MAX. WATER FLOW @ 80m3/acre |
| AREA 1 | ZONE 2A | 20 | 46 | 3680 |
| | ZONE 4 | 5 | | |
| | ZONE 10 | 2 | | |
| | ZONE 13 | 2 | | |
| | ZONE 19 | 3 | | |
| | ZONE 20 | 5 | | |
| AREA 2 | ZONE 1 | 5 | 13 | 1040 |
| | ZONE 9 | 6 | | |
| | ZONE 18 | 2 | | |
| AREA 3 | ZONE 17 | 3 | 3 | 240 |
| AREA 4 | ZONE 2B | 20 | 87 | 6960 |
| | ZONE 12 | 10 | | |
| | ZONE 3 | 16 | | |
| | ZONE 6 | 15 | | |
| | ZONE 7 | 8 | | |
| | ZONE 8 | 14 | | |
| | ZONE 15 | 2 | | |
| ZONE 16 | 2 | | | |
| AREA 5 | ZONE 14 | 4 | 4 | 320 |
| AREA 6 | ZONE 5 | 10 | 12 | 960 |
| | ZONE 11 | 2 | | |
| TOTAL | | | 165 | 13200 |

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|-------------------------------------|----------------------------|-----------------|--------|---|------------------------|
| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ZONE WISE IRRIGATION PLAN

TOWEL PLANTATION AREA (AREA-WISE)

| ZONE | TOTAL | AREA (ACRES) | TOTAL | MAX. WATER FLOW @ 70m ³ /acre |
|--------------|--------|--------------|-------------|--|
| | ZONE 1 | 4 | | |
| | ZONE 2 | 14 | | |
| AREA 1 | ZONE 3 | 3 | 31 | 2170 |
| | ZONE 4 | 1.5 | | |
| | ZONE 7 | 2.5 | | |
| | ZONE 9 | 8 | | |
| AREA 2 | ZONE 5 | 3 | 15 | 1050 |
| | ZONE 6 | 12 | | |
| AREA 3 | ZONE 5 | 2.5 | 2.5 | 175 |
| TOTAL | | 48.5 | 48.5 | 3395 |

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STANDARD OPERATING PROCEDURE



| | | | | | |
|-----------------------|----------------------------|-----------------|--------|----------------------------------|------------------------|
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ELECTROMAGNETIC FLOW METER RECORD -PLANTATION-PAPER ZONE

| Date | Main Meter | | | Meter 1 (Area-1) | | | Meter 2 (Area-2) | | | Meter 3 (Area-3) | | | Meter 4 (Area-4) | | | Area-5 | | | Meter 5 (Area-6) | | |
|--------|-----------------|---------------|------------|------------------|---------------|------------|------------------|---------------|------------|------------------|---------------|------------|------------------|---------------|------------|-----------------|---------------|------------|------------------|---------------|------------|
| | Initial Reading | Final Reading | Flow (KLD) | Initial Reading | Final Reading | Flow (KLD) | Initial Reading | Final Reading | Flow (KLD) | Initial Reading | Final Reading | Flow (KLD) | Initial Reading | Final Reading | Flow (KLD) | Initial Reading | Final Reading | Flow (KLD) | Initial Reading | Final Reading | Flow (KLD) |
| Target | | | 1700 | | | 560 | | | 55 | | | 25 | | | 655 | | | 30 | | | 34 |
| 18-Sep | 129571 | 129584 | 13 | 259 | 272 | 13 | 61 | 50 | 11 | 109 | 18 | 50 | 590 | 580 | 10 | 53 | 20 | 7 | 129 | 129 | 3 |
| 19-Sep | 129580 | 129593 | 13 | 260 | 273 | 13 | 111 | 104 | 5 | 99 | 10 | 511 | 504 | 7 | 52 | 151 | 150 | 1 | 130 | 130 | 0 |
| 20-Sep | 129589 | 129602 | 13 | 270 | 283 | 13 | 163 | 156 | 7 | 150 | 20 | 1230 | 1217 | 13 | 53 | 160 | 20 | 120 | 120 | 0 | 14 |
| 21-Sep | 129598 | 129611 | 13 | 280 | 293 | 13 | 215 | 208 | 7 | 199 | 18 | 1713 | 1700 | 13 | 54 | 170 | 20 | 120 | 120 | 0 | 15 |
| 22-Sep | 129607 | 129620 | 13 | 290 | 303 | 13 | 267 | 260 | 7 | 248 | 21 | 2146 | 2133 | 13 | 55 | 180 | 20 | 120 | 120 | 0 | 16 |
| 23-Sep | 129616 | 129629 | 13 | 300 | 313 | 13 | 319 | 312 | 7 | 297 | 24 | 2579 | 2566 | 13 | 56 | 190 | 20 | 120 | 120 | 0 | 17 |
| 24-Sep | 129625 | 129638 | 13 | 310 | 323 | 13 | 371 | 364 | 7 | 346 | 25 | 3012 | 2999 | 13 | 57 | 200 | 20 | 120 | 120 | 0 | 18 |
| 25-Sep | 129634 | 129647 | 13 | 320 | 333 | 13 | 423 | 416 | 7 | 395 | 26 | 3445 | 3432 | 13 | 58 | 210 | 20 | 120 | 120 | 0 | 19 |
| 26-Sep | 129643 | 129656 | 13 | 330 | 343 | 13 | 475 | 468 | 7 | 444 | 27 | 3878 | 3865 | 13 | 59 | 220 | 20 | 120 | 120 | 0 | 20 |
| 27-Sep | 129652 | 129665 | 13 | 340 | 353 | 13 | 527 | 520 | 7 | 493 | 28 | 4311 | 4298 | 13 | 60 | 230 | 20 | 120 | 120 | 0 | 21 |
| 28-Sep | 129661 | 129674 | 13 | 350 | 363 | 13 | 579 | 572 | 7 | 542 | 29 | 4744 | 4731 | 13 | 61 | 240 | 20 | 120 | 120 | 0 | 22 |
| 29-Sep | 129670 | 129683 | 13 | 360 | 373 | 13 | 631 | 624 | 7 | 591 | 30 | 5177 | 5164 | 13 | 62 | 250 | 20 | 120 | 120 | 0 | 23 |
| 30-Sep | 129679 | 129692 | 13 | 370 | 383 | 13 | 683 | 676 | 7 | 640 | 31 | 5610 | 5597 | 13 | 63 | 260 | 20 | 120 | 120 | 0 | 24 |
| 01-Oct | 129688 | 129701 | 13 | 380 | 393 | 13 | 735 | 728 | 7 | 689 | 32 | 6043 | 6030 | 13 | 64 | 270 | 20 | 120 | 120 | 0 | 25 |
| 02-Oct | 129697 | 129710 | 13 | 390 | 403 | 13 | 787 | 780 | 7 | 738 | 33 | 6476 | 6463 | 13 | 65 | 280 | 20 | 120 | 120 | 0 | 26 |
| 03-Oct | 129706 | 129719 | 13 | 400 | 413 | 13 | 839 | 832 | 7 | 787 | 34 | 6909 | 6896 | 13 | 66 | 290 | 20 | 120 | 120 | 0 | 27 |
| 04-Oct | 129715 | 129728 | 13 | 410 | 423 | 13 | 891 | 884 | 7 | 836 | 35 | 7342 | 7329 | 13 | 67 | 300 | 20 | 120 | 120 | 0 | 28 |
| 05-Oct | 129724 | 129737 | 13 | 420 | 433 | 13 | 943 | 936 | 7 | 885 | 36 | 7775 | 7762 | 13 | 68 | 310 | 20 | 120 | 120 | 0 | 29 |
| 06-Oct | 129733 | 129746 | 13 | 430 | 443 | 13 | 995 | 988 | 7 | 934 | 37 | 8208 | 8195 | 13 | 69 | 320 | 20 | 120 | 120 | 0 | 30 |
| 07-Oct | 129742 | 129755 | 13 | 440 | 453 | 13 | 1047 | 1040 | 7 | 983 | 38 | 8641 | 8628 | 13 | 70 | 330 | 20 | 120 | 120 | 0 | 31 |
| 08-Oct | 129751 | 129764 | 13 | 450 | 463 | 13 | 1099 | 1092 | 7 | 1032 | 39 | 9074 | 9061 | 13 | 71 | 340 | 20 | 120 | 120 | 0 | 32 |
| 09-Oct | 129760 | 129773 | 13 | 460 | 473 | 13 | 1151 | 1144 | 7 | 1081 | 40 | 9507 | 9494 | 13 | 72 | 350 | 20 | 120 | 120 | 0 | 33 |
| 10-Oct | 129769 | 129782 | 13 | 470 | 483 | 13 | 1203 | 1196 | 7 | 1130 | 41 | 9940 | 9927 | 13 | 73 | 360 | 20 | 120 | 120 | 0 | 34 |
| 11-Oct | 129778 | 129791 | 13 | 480 | 493 | 13 | 1255 | 1248 | 7 | 1179 | 42 | 10373 | 10360 | 13 | 74 | 370 | 20 | 120 | 120 | 0 | 35 |
| 12-Oct | 129787 | 129800 | 13 | 490 | 503 | 13 | 1307 | 1300 | 7 | 1228 | 43 | 10806 | 10793 | 13 | 75 | 380 | 20 | 120 | 120 | 0 | 36 |
| 13-Oct | 129796 | 129809 | 13 | 500 | 513 | 13 | 1359 | 1352 | 7 | 1277 | 44 | 11239 | 11226 | 13 | 76 | 390 | 20 | 120 | 120 | 0 | 37 |
| 14-Oct | 129805 | 129818 | 13 | 510 | 523 | 13 | 1411 | 1404 | 7 | 1326 | 45 | 11672 | 11659 | 13 | 77 | 400 | 20 | 120 | 120 | 0 | 38 |
| 15-Oct | 129814 | 129827 | 13 | 520 | 533 | 13 | 1463 | 1456 | 7 | 1375 | 46 | 12105 | 12092 | 13 | 78 | 410 | 20 | 120 | 120 | 0 | 39 |
| 16-Oct | 129823 | 129836 | 13 | 530 | 543 | 13 | 1515 | 1508 | 7 | 1424 | 47 | 12538 | 12525 | 13 | 79 | 420 | 20 | 120 | 120 | 0 | 40 |
| 17-Oct | 129832 | 129845 | 13 | 540 | 553 | 13 | 1567 | 1560 | 7 | 1473 | 48 | 12971 | 12958 | 13 | 80 | 430 | 20 | 120 | 120 | 0 | 41 |
| 18-Oct | 129841 | 129854 | 13 | 550 | 563 | 13 | 1619 | 1612 | 7 | 1522 | 49 | 13404 | 13391 | 13 | 81 | 440 | 20 | 120 | 120 | 0 | 42 |
| 19-Oct | 129850 | 129863 | 13 | 560 | 573 | 13 | 1671 | 1664 | 7 | 1571 | 50 | 13837 | 13824 | 13 | 82 | 450 | 20 | 120 | 120 | 0 | 43 |
| 20-Oct | 129859 | 129872 | 13 | 570 | 583 | 13 | 1723 | 1716 | 7 | 1620 | 51 | 14270 | 14257 | 13 | 83 | 460 | 20 | 120 | 120 | 0 | 44 |
| 21-Oct | 129868 | 129881 | 13 | 580 | 593 | 13 | 1775 | 1768 | 7 | 1669 | 52 | 14703 | 14690 | 13 | 84 | 470 | 20 | 120 | 120 | 0 | 45 |
| 22-Oct | 129877 | 129890 | 13 | 590 | 603 | 13 | 1827 | 1820 | 7 | 1718 | 53 | 15136 | 15123 | 13 | 85 | 480 | 20 | 120 | 120 | 0 | 46 |
| 23-Oct | 129886 | 129899 | 13 | 600 | 613 | 13 | 1879 | 1872 | 7 | 1767 | 54 | 15569 | 15556 | 13 | 86 | 490 | 20 | 120 | 120 | 0 | 47 |
| 24-Oct | 129895 | 129908 | 13 | 610 | 623 | 13 | 1931 | 1924 | 7 | 1816 | 55 | 16002 | 15989 | 13 | 87 | 500 | 20 | 120 | 120 | 0 | 48 |
| 25-Oct | 129904 | 129917 | 13 | 620 | 633 | 13 | 1983 | 1976 | 7 | 1865 | 56 | 16435 | 16422 | 13 | 88 | 510 | 20 | 120 | 120 | 0 | 49 |
| 26-Oct | 129913 | 129926 | 13 | 630 | 643 | 13 | 2035 | 2028 | 7 | 1914 | 57 | 16868 | 16855 | 13 | 89 | 520 | 20 | 120 | 120 | 0 | 50 |
| 27-Oct | 129922 | 129935 | 13 | 640 | 653 | 13 | 2087 | 2080 | 7 | 1963 | 58 | 17301 | 17288 | 13 | 90 | 530 | 20 | 120 | 120 | 0 | 51 |
| 28-Oct | 129931 | 129944 | 13 | 650 | 663 | 13 | 2139 | 2132 | 7 | 2012 | 59 | 17734 | 17721 | 13 | 91 | 540 | 20 | 120 | 120 | 0 | 52 |
| 29-Oct | 129940 | 129953 | 13 | 660 | 673 | 13 | 2191 | 2184 | 7 | 2061 | 60 | 18167 | 18154 | 13 | 92 | 550 | 20 | 120 | 120 | 0 | 53 |
| 30-Oct | 129949 | 129962 | 13 | 670 | 683 | 13 | 2243 | 2236 | 7 | 2110 | 61 | 18600 | 18587 | 13 | 93 | 560 | 20 | 120 | 120 | 0 | 54 |
| 31-Oct | 129958 | 129971 | 13 | 680 | 693 | 13 | 2295 | 2288 | 7 | 2159 | 62 | 19033 | 19020 | 13 | 94 | 570 | 20 | 120 | 120 | 0 | 55 |
| 01-Nov | 129967 | 129980 | 13 | 690 | 703 | 13 | 2347 | 2340 | 7 | 2208 | 63 | 19466 | 19453 | 13 | 95 | 580 | 20 | 120 | 120 | 0 | 56 |
| 02-Nov | 129976 | 129989 | 13 | 700 | 713 | 13 | 2399 | 2392 | 7 | 2257 | 64 | 19899 | 19886 | 13 | 96 | 590 | 20 | 120 | 120 | 0 | 57 |
| 03-Nov | 129985 | 130000 | 15 | 710 | 723 | 13 | 2451 | 2444 | 7 | 2306 | 65 | 20332 | 20319 | 13 | 97 | 600 | 20 | 120 | 120 | 0 | 58 |
| 04-Nov | 130000 | 130000 | 0 | 720 | 720 | 0 | 2503 | 2503 | 0 | 2355 | 66 | 20765 | 20765 | 0 | 98 | 610 | 20 | 120 | 120 | 0 | 59 |



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STANDARD OPERATING PROCEDURE



| | | | | | |
|-----------------------|----------------------------|-----------------|--------|----------------------------------|------------------------|
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

HTD PLANTATION WATER DISTRIBUTION

| DATE | ELECTROMAGNETIC FLOW METER-1 (AREA-1) | | | ELECTROMAGNETIC FLOW METER-2 (AREA-2) | | | ELECTROMAGNETIC FLOW METER-3 (AREA-3) | | | TOTAL FLOW TO PLANTATION |
|------------|---------------------------------------|---------------|------------------|---------------------------------------|---------------|------------------|---------------------------------------|---------------|------------------|--------------------------|
| | INITIAL READING | FINAL READING | TOTAL FLOW (KLD) | INITIAL READING | FINAL READING | TOTAL FLOW (KLD) | INITIAL READING | FINAL READING | TOTAL FLOW (KLD) | KLD |
| 01-09-2021 | 71267 | 72706 | 1438 | 55788 | 57615 | 1826 | 5968 | 7002 | 34 | 3311 |
| 02-09-2021 | 72706 | 74167 | 1462 | 57615 | 59218 | 1603 | 7002 | 7047 | 45 | 3110 |
| 03-09-2021 | 74167 | 75679 | 1512 | 59218 | 60906 | 1688 | 7047 | 7145 | 98 | 3295 |
| 04-09-2021 | 75679 | 77164 | 1485 | 60906 | 62520 | 1614 | 7145 | 7211 | 66 | 3155 |
| 05-09-2021 | 77164 | 78685 | 1485 | 62520 | 64225 | 1705 | 7211 | 7304 | 22 | 3133 |
| 06-09-2021 | 78685 | 80220 | 1451 | 64225 | 65978 | 1753 | 7304 | 7322 | 44 | 3192 |
| 07-09-2021 | 80220 | 81252 | 1073 | 65978 | 67733 | 1755 | 7322 | 7403 | 21 | 3209 |
| 08-09-2021 | 81252 | 82429 | 1148 | 67733 | 69748 | 2015 | 7403 | 7454 | 51 | 3212 |
| 09-09-2021 | 82429 | 83854 | 1415 | 69748 | 71453 | 1705 | 7454 | 7542 | 88 | 3209 |
| 10-09-2021 | 83854 | 85152 | 1339 | 71453 | 73238 | 1785 | 7542 | 7593 | 51 | 3175 |
| 11-09-2021 | 85152 | 86487 | 1294 | 73238 | 74974 | 1736 | 7593 | 7661 | 68 | 3119 |
| 12-09-2021 | 86487 | 87829 | 1429 | 74974 | 76616 | 1642 | 7661 | 7772 | 91 | 3190 |



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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

PCD Plantation Zone Wise Roster

| Description | Zone No | Area (Acres) | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---------------|---------|--------------|--------|---------|-----------|----------|--------|----------|--------|
| AREA 1 | ZONE 2A | 20 | | | | | | | |
| | ZONE 4 | 5 | | | | | | | |
| | ZONE 10 | 2 | | | | | | | |
| | ZONE 13 | 2 | | | | | | | |
| | ZONE 19 | 3 | | | | | | | |
| | ZONE 20 | 5 | | | | | | | |
| | ZONE 21 | 9 | | | | | | | |
| AREA 2 | ZONE 1 | 5 | | | | | | | |
| | ZONE 9 | 6 | | | | | | | |
| AREA 3 | ZONE 18 | 2 | | | | | | | |
| | ZONE 17 | 3 | | | | | | | |
| AREA 4 | ZONE 2B | 20 | | | | | | | |
| | ZONE 12 | 10 | | | | | | | |
| | ZONE 3 | 16 | | | | | | | |
| | ZONE 6 | 15 | | | | | | | |
| AREA 5 | ZONE 7 | 8 | | | | | | | |
| | ZONE 8 | 14 | | | | | | | |
| | ZONE 15 | 2 | | | | | | | |
| | ZONE 16 | 2 | | | | | | | |
| AREA 6 | ZONE 14 | 4 | | | | | | | |
| | ZONE 5 | 10 | | | | | | | |
| AREA 6 | ZONE 11 | 2 | | | | | | | |
| | | | | | | | | | |

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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

HTD Plantation Zone Wise Roster

| Description | Zone No. | Area (Acres) | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|-------------|----------|--------------|--------|---------|-----------|----------|--------|----------|--------|
| AREA 1 | ZONE 1 | 4 | █ | | | | | | |
| | ZONE 2 | 14 | | █ | █ | | | | |
| | ZONE 3 | 3 | █ | | | | | | |
| | ZONE 4 | 14 | | | | █ | | | |
| | ZONE 5 | 2.5 | | | | █ | █ | | |
| AREA 2 | ZONE 6 | 3 | | | | █ | █ | | |
| | ZONE 7 | 12 | | | | | | █ | █ |
| AREA 3 | ZONE 8 | 2.5 | | | | | █ | | |

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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

INFRASTRUCTURE AVAILABLE

| S.NO. | DESCRIPTION | UOM | QUANTITY |
|-------|--------------|-----|----------|
| 1 | TRACTOR | NOS | 2 |
| 2 | TROLLEY | NOS | 1 |
| 3 | HARROW | NOS | 2 |
| 4 | ROTAVATOR | NOS | 1 |
| 5 | TOOLKIT | NOS | 10 |
| 6 | SPRAYER PUMP | NOS | 4 |

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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

Name:

Salary Code:

IRRIGATION CHECKLIST

Deptt

Month:

POINTS OF CONCERN/ACTIVITIES

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|

ZONE WISE INSPECTION FOR PLANTATION

ZONE WISE WATER DISTRIBUTION

MANPOWER DEPLOYED AS PER ROSTER

MILD GROWTH/GRASS REMOVAL

CHECKING FOR THE FLOODING/WATER ACCUMULATION

CHECKING FOR THE MACHINERY

TOOL KIT AVAILABILITY

SUPERVISOR SIGNATURE

POINTS OF CONCERN/ACTIVITIES

| | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

ZONE WISE INSPECTION FOR PLANTATION

ZONE WISE WATER DISTRIBUTION

MANPOWER DEPLOYED AS PER ROSTER

MILD GROWTH/GRASS REMOVAL

CHECKING FOR THE FLOODING/WATER ACCUMULATION

CHECKING FOR THE MACHINERY

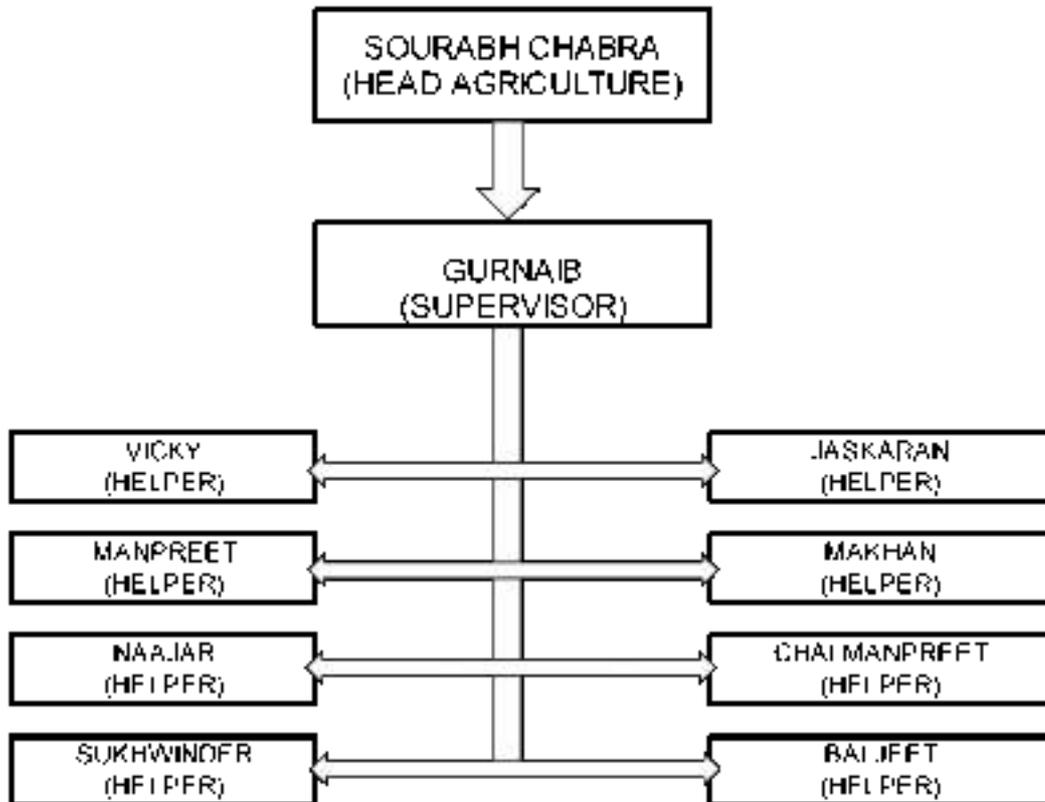
TOOL KIT AVAILABILITY

SUPERVISOR SIGNATURE

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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

TEAM MATRIX



| | | |
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| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

GLIMPSE OF PLANTATION AREA



| | | |
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STANDARD OPERATING PROCEDURE

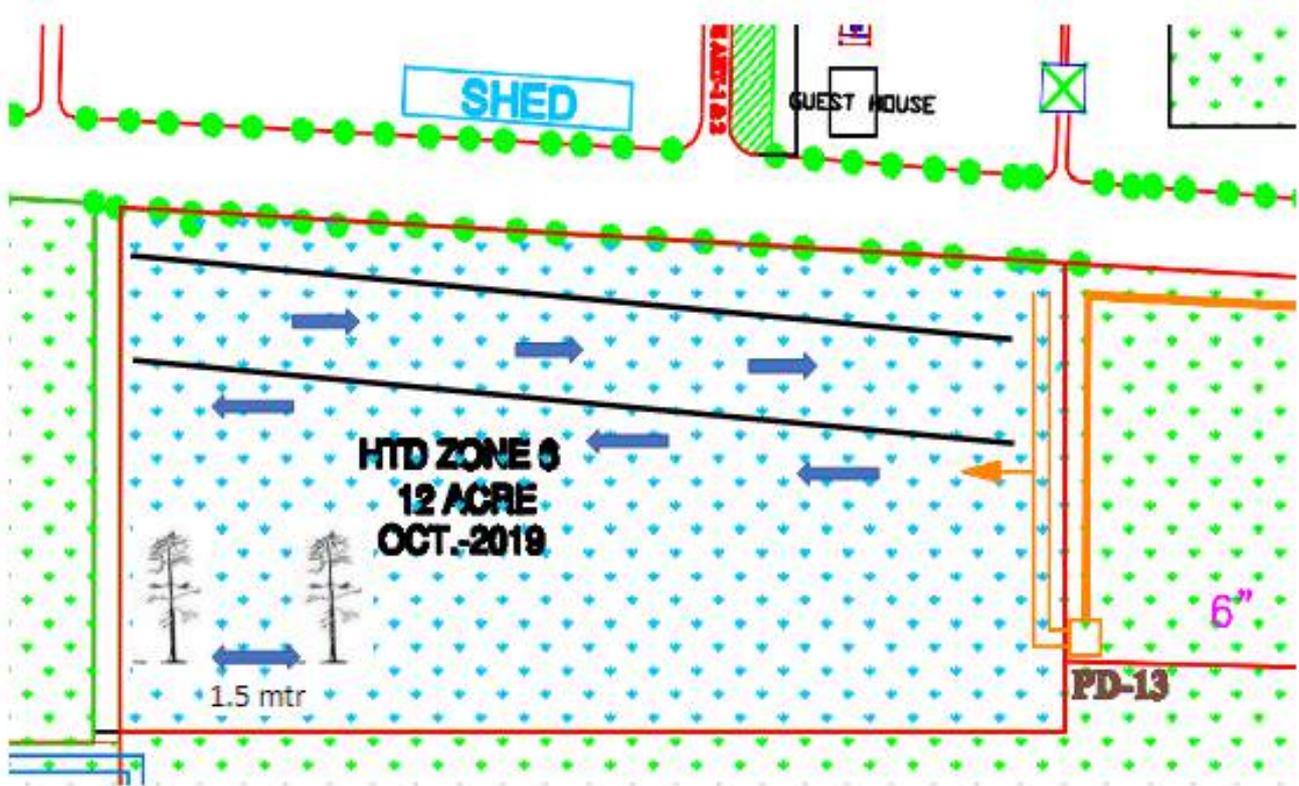
| | | | | | |
|---------------------------|----------------------------|-----------------|--------|--------------------------------------|------------------------|
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |



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|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

IRRIGATION PROCESS



| Ridges | |
|--------|---------|
| Wide | 1 meter |
| High | 50 cm |

| Furrow | |
|--------|---------|
| Wide | 2 meter |

| | | |
|--------------------|-----------------------|------------------------------------|
| PREPARED BY | DOCUMENT NO | PAGE 18 OF 20 |
| AJAY KUMAR | SUS/PB/IRRIGATION -01 | |
| APPROVED BY | ISSUE DATE | REVISION NO./ REVISION DATE |
| RAJAT MONGA | 10/03/2021 | - |

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STANDARD OPERATING PROCEDURE

| | | | | | |
|-----------------------|----------------------------|-----------------|--------|----------------------------------|------------------------|
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

EFFLUENT GENERATION & PROPOSED CONSUMPTION PLAN

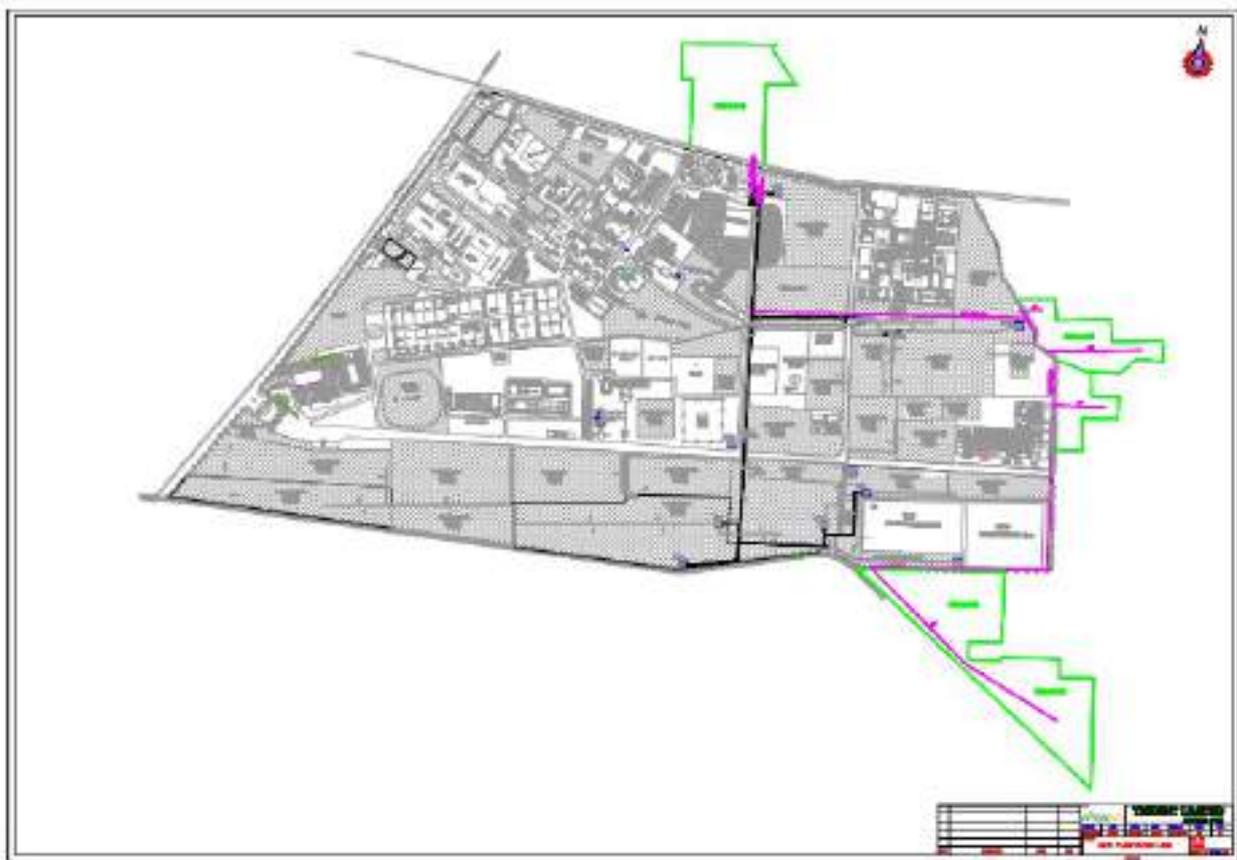
PROPOSED SCENARIO

| S NO. | DESCRIPTION | UOM | HTD | PCD | TOTAL |
|-------|--|---------|-------|-------|-------|
| 1 | TOTAL EFFLUENT GENERATION | KLD | 6500 | 19000 | 25500 |
| 2 | TREATED WATER INTO PLANTATION | KLD | 6500 | 19000 | 25500 |
| 3 | TOTAL AREA OF PLANTATION REQUIRED | ACRE | 93 | 237.5 | 330 |
| 4 | EXISTING LAND | ACRE | 48.5 | 165 | 214 |
| 5 | NEW LAND REQUIRED | ACRE | 44 | 72.5 | 117 |
| 6 | EFFLUENT CONSUMPTION | KL/ACRE | 70 | 80 | 80 |
| 5 | UTILIZATION OF TREATED WATER ONTO PLANTATION | % | 100.0 | 100.0 | 100.0 |

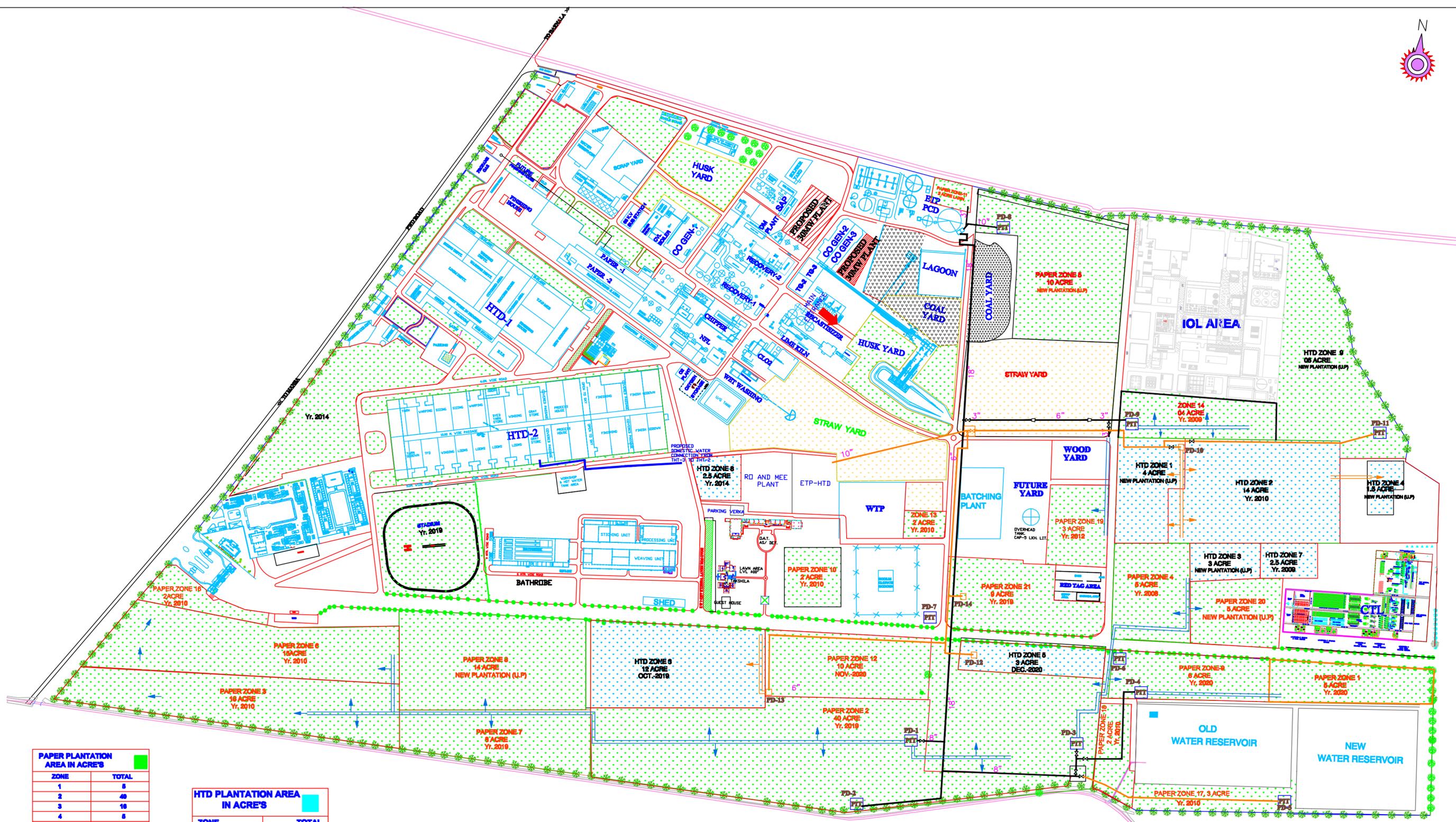
| | | |
|--|-----------------------|------------------------------------|
| PREPARED BY | DOCUMENT NO | PAGE 19 OF 20 |
| AJAY KUMAR | SUS/PB/IRRIGATION -01 | |
| APPROVED BY | ISSUE DATE | REVISION NO./ REVISION DATE |
| RAJAT MONGA | 10/03/2021 | - |
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| | | | | | |
|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ADDITIONAL LAND LAYOUT AND PIPING



| | | |
|--|-----------------------|------------------------------------|
| PREPARED BY | DOCUMENT NO | PAGE 20 OF 20 |
| AJAY KUMAR | SUS/PB/IRRIGATION -01 | |
| APPROVED BY | ISSUE DATE | REVISION NO./ REVISION DATE |
| RAJAT MONGA | 10/03/2021 | - |
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| PAPER PLANTATION AREA IN ACRES | |
|--------------------------------|------------|
| ZONE | TOTAL |
| 1 | 5 |
| 2 | 40 |
| 3 | 10 |
| 4 | 5 |
| 5 | 10 |
| 6 | 10 |
| 7 | 8 |
| 8 | 14 |
| 9 | 6 |
| 10 | 2 |
| 11 | 2 |
| 12 | 10 |
| 13 | 2 |
| 14 | 4 |
| 15 | 2 |
| 16 | 2 |
| 17 | 3 |
| 18 | 2 |
| 19 | 3 |
| 20 | 5 |
| 21 | 9 |
| TOTAL | 108 |

| HTD PLANTATION AREA IN ACRES | |
|------------------------------|-------------|
| ZONE | TOTAL |
| 1 | 4 |
| 2 | 14 |
| 3 | 3 |
| 4 | 1.5 |
| 5 | 3 |
| 6 | 12 |
| 7 | 2.5 |
| 8 | 2.5 |
| 9 | 6 |
| TOTAL AREA | 48.5 |

| | |
|-----------------------|------------------|
| COAL YARD AREA | 10970 SQM |
| COAL YARD AREA | 14825 SQM |
| TOTAL AREA | 33795 SQM |

LEGEND

- PAPER PLANTATION
- HTD PLANTATION
- PAPER PIPE LINE
- HTD PIPELINE
- PAPER WATER CHANNEL

GROUND WATER LEVEL = 39.5 - 40.8 MTR.

| REV. | DESCRIPTION | APPD. | DATE | REV. | DESCRIPTION | APPD. | DATE |
|------|-------------------------------|--------------|----------|------|-------------------------------|--------------|----------|
| 1 | ADDED THE PROPOSED LAND | KULVINDER | 14/05/12 | 1 | UPDATED AS PER SITE | RAJAT MONGA | 17/07/17 |
| 2 | PROPOSED AREA FOR DEVELOPMENT | R.K. THAKRAL | 12/01/13 | 2 | 03 FRESH WATER PONTS ADDED | RAJAT MONGA | 21/11/14 |
| 3 | ADDED THE PROPOSED LAND | KULVINDER | 14/05/12 | 3 | 05 ACRE ADDED NEAR CTL | D.P. SINGH | 13/02/14 |
| 4 | 03 FRESH WATER PONTS ADDED | RAJAT MONGA | 21/11/14 | 4 | 06 ACRE ADDED NEAR CTL | D.P. SINGH | 13/02/14 |
| 5 | UPDATED AS PER SITE | RAJAT MONGA | 17/07/17 | 5 | PROPOSED AREA FOR DEVELOPMENT | R.K. THAKRAL | 12/01/13 |

TRIDENT LIMITED
SANGHERA - 140101

DHAULA COMPLEX PLANTATION

DATE: 12/01/13
SCALE: 1:1000
TITLE: DHAULA COMPLEX PLANTATION
SHEET-1 OF 1 REV. 06



Sophisticated Analytical Instruments Laboratories Society
 (Registered as Society with Registrar of Firms & Societies, Punjab, Chandigarh)
 Thapar Technology Campus, Bhadson Road, Patiala-147 004 (India)



Performance Study of ETP Plant of Paper
 Chemical Division (PCD)
 Trident Limited, Barnala, Punjab

Prepared by:
 Dr. Raj Kumar Gupta
 Professor, Department of Chemical Engineering, TIET, Patiala
 On behalf of:
 Sophisticated Analytical Instrument Laboratories
 Thapar Institute of Engineering & Technology

Recommendations

Based on the above study the following action point are recommended to be undertaken to improve the performance of the waste water treatment plant:

1. BOD to COD ratio at USBR inlet is 0.2, which is on lower side. This ratio may be improved by reducing the COD, i.e., the COD caused by suspended particles. It is recommended to install a suitable unit operation for the removal of this COD. This will help in improving the efficiency of the USBR. Also, the sludge that will be generated in the separation system may be sold or burned as boiler fuel.
2. Food to Biomass (F/M) ratio in the aeration tank 1 (AT1) is 0.56, which is on the higher side. It should be kept less than 0.4. It is recommended that the total inlet flow be split into two parts. One part of the flow should be sent to AT1 and the other part be sent to AT2.
3. Oxygen being supplied in AT1 based on the current F/M ratio is less. After the flow diversion to AT2, the quantity of oxygen supplied will become adequate.
4. Food to Biomass (F/M) ratio in the aeration tank 2 (AT2) is 0.06, which is on the lower side. For better performance of the system, it is recommended to keep this ratio above 0.1. The action suggested at point no. 3, would also help in improving the F/M ratio of AT2.
5. The recommendation for action point 4 would lead to higher demand of oxygen in AT2. A suitable system for the increased oxygen demand should be put in place in AT2.
6. It is further recommended that a suitable arrangement for the online measurement of the dissolved oxygen (DO) should be installed for continuous monitoring of oxygen levels in AT1 and AT2.

R.K. Gupta
 15/12/2020
 Dr. R. K. GUPTA
 Professor
 Department of Chemical Engineering
 Thapar Institute of Engineering & Technology
 (Deemed to be University)
 Patiala - 147004, Punjab (INDIA)

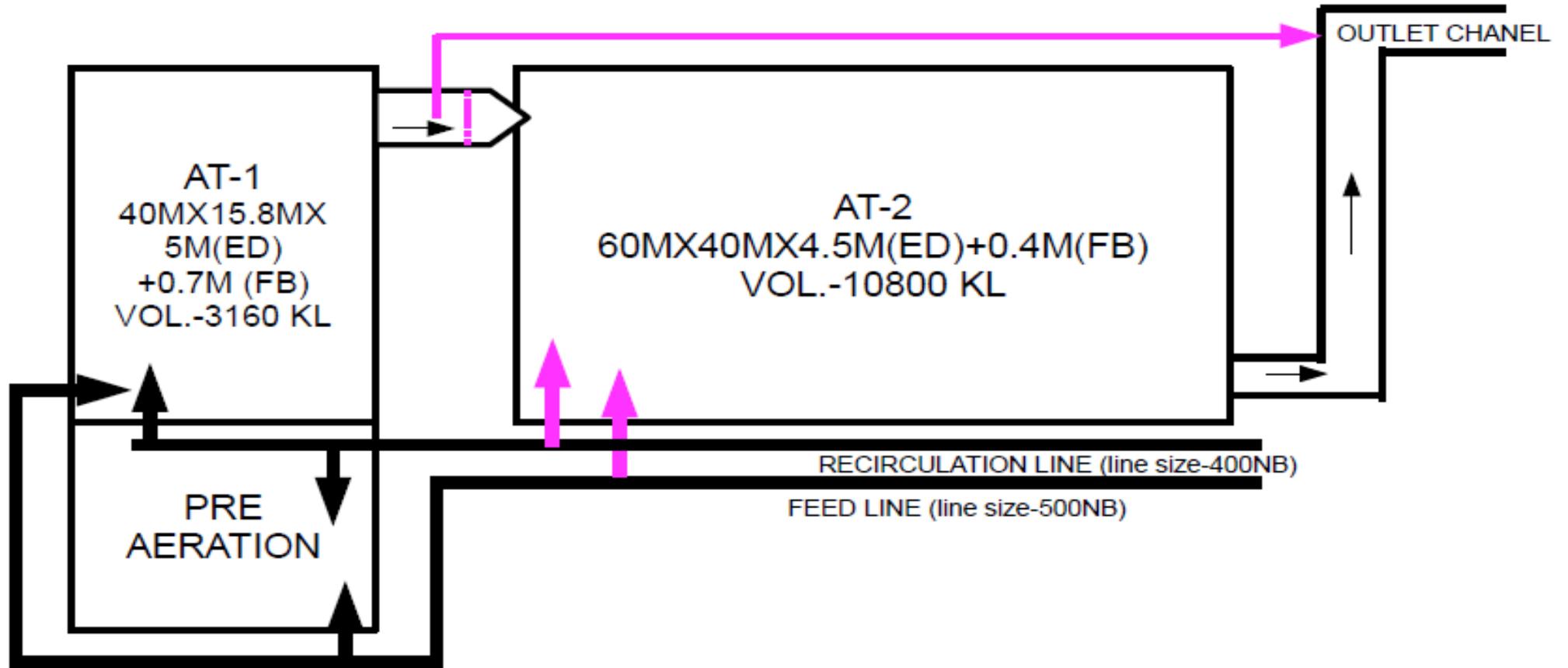
| S No. | Recommendations of Thapar Study to improve ETP performance | Action Point | Status |
|-------|--|---|---|
| 1. | BOD to COD Ratio at USBR inlet is 0.2 , which is on lower side . This ratio may be improved by reducing the COD, i.e., the COD caused by suspended particles. It is recommended to install a suitable unit operation for the removal of this COD. This will help in improving the efficiency of the USBR. Also, the sludge that will be generated in the separation system may be sold or burned as boiler fuel. | The industry has just recently installed and commissioned suitable technology including DAF and Screw Press for the removal of COD caused by suspended particles to improve the efficiency of USBR. This was also a joint committee recommendation point which has been completed . The biomass generated from this system is being utilized in boiler as a biomass fuel also resulting in carbon foot print reduction . | Complied |
| 2 | Food to Biomass (F/M) ratio in the aeration tank 1 (AT1) is 0.56, which is on the higher side. It should be kept less than 0.4. It is recommended that the total inlet flow be split into two parts. One part of the flow should be sent to AT1 and the other part be sent to AT2. | The industry will install a pipeline along with valves to divert the inlet flow into Aeration Tank 2 to reduce the ratio from 0.56 to < 0.4 . This will be completed by 5 Feb 2021. | Complied |
| 3 | Oxygen being supplied in AT1 based on the current F/M ratio is less. After the flow diversion to AT2, the quantity of oxygen supply will become adequate. | This point will be closed after the completion of action of S No. 2 | Complied |
| 4 | Food to Biomass (F/M) ratio in the aeration tank 2 (AT2) is 0.06, which is on the lower side. For better performance of the system, it is recommended to keep the ratio above 0.1. The action suggested at point no. 3, would also help in improving the F/M ratio of AT2. | This point will be closed after the completion of action of S No. 2 | Complied |
| 5 | The recommendation of action point 4 would lead to higher demand of oxygen in AT2. A suitable system for the increased oxygen demand should be put in place in AT2. | The industry will install new advanced aerators with high oxygen transfer efficiency (2.2 Kg/kwh from existing 1.0 Kg/Kwh) . The total investment of the project is 248 Lacs and this will be installed , commissioned and stabilized by 20 Feb . | Complied. Advanced aerators has been installed after making an project investment of 209 lacs. Vendor Scope 110 Lacs. |

TECHNOLOGY UPGRADATION TO INCREASE OXYGEN HANDLING CAPACITY FROM 100 KG/HR TO 264 KG/HR (AERATION TANK 2 – PAPER ETP)

HIGH EFFICIENCY ADVANCED AERATORS – 2.2 Kg/KWH (Oxygen Transfer Efficiency)
Earlier Efficiency – 1.0 Kg/KWH



PIPE LINE DIVERSION COMPLETED TO REDUCE LOADING ON AERATION TANK 1



EXISTING



MODIFICATION

STORY OF INNOVATIVE PROJECTS AT ETP

In the journey of innovative projects we recently did the projects in area of ETP with the below main objectives:

- ❖ To reduce the ETP inlet load by recovery of biomass from washing effluent through adoption of DAF & Screw Press technology.

The above projects were implemented in collaboration with Krofta India, Bellmer Germany.

The projects were completed by the hard efforts of all respective team members including civil, process, electrical, mechanical, instrumentation and administration.

The implementations of projects have given following advantages:

- a) Reduction in load to ETP.
- b) Recovery of Biomass and usage as co incineration fuel.
- c) Reduction in GHG Emissions (Carbon foot print).

The implantation of above projects has motivated the team.



DAF



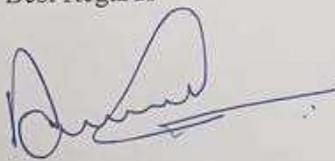
Screw Press

| Wet Wash load reduction details By Installation of DAF | | | | |
|---|-----------------------|--|---------|---|
| Sr. No. | Month | UASB inlet COD (Before Installation of DAF) (in PPM) | Month | UASB inlet COD (After Installation of DAF) (in PPM) |
| 1 | May-20 | 5087 | Nov-20 | 3627 |
| 2 | Jun-20 | 5604 | Dec-20 | 3846 |
| 3 | Jul-20 | 5769 | Jan-21 | 3876 |
| 4 | Aug-20 | 6065 | Feb-21 | 3914 |
| 5 | Sep-20 | 5896 | Mar-21 | 4539 |
| 6 | Average | 5684 | Average | 3960.4 |
| 7 | Reduction of COD load | | % | 30.3 |

This is in reference to our institute collaboration with your organization for color removal project from the effluent stream. We really thank you for showing faith in our organization for carrying out the this feasibility study. We would like to mention here that we had been in discussion with your organization since February 2021 and collected the samples accordingly as per the project allocated to us. However due to pandemic, work could not be started as our institute was closed. Research scholars were not allowed to work in the labs. Now as per the instructions from the government, institutes are open and research activities have started. We have initiated the preliminary trails for color removal using some advanced techniques and hopefully complete the project with 2-3 months.

We are really looking forward to have more promising results in next trials.

Best Regards



Dr. Anoop Verma
Associate Professor and Head
School of Energy and Environment
Thapar Institute of Engineering and Technology, Patiala-147004
email: anoop.kumar@thapar.edu
Ph: 09815654776(M)

RICHESH SAMANTARAY

From: RAJAT MONGA
Sent: 09 October 2021 16:27
To: RICHESH SAMANTARAY
Subject: FW: Regarding the extension of the Allotted project_Thapar Institute

Thanks & Regards



Rajat Monga
DC | Sustainability Pb
Sustainability Pb
Dhaura

Corporate Address:



E-212 Kitchlu Nagar, Ludhiana - 141001 , Fax : +91 161 5039900
Mob. +91-+919878997508 | Toll Free No.1800-180-2999 (Extn. 2708)
| rajatmonga@tridentindia.com
Visit us at <http://www.tridentindia.com>  _ _ _ _

From: Anoop Kumar <anoop.kumar@thapar.edu>
Sent: 28 September 2021 11:20
To: RAJAT MONGA <rajatmonga@tridentindia.com>; SOURAV CHOUDHARY <SouravChoudhary@tridentindia.com>
Subject: Regarding the extension of the Allotted project_Thapar Institute

*****EXTERNAL EMAIL: Treat hyperlinks and attachments in this email with caution*****

Dear Mr. RAJAT and SOURAV

Hope you are doing well. As mentioned in subject matter, you are kindly requested to extend the allotted project for colour removal which was allotted to Thapar Institute. **The project was allotted in April 2021 and was supposed to end on September 30, 2021.**

Actually the project started late due to COVID restrictions and the first 2-3 months didn't contribute much to our targets.

Now we are on track and getting very good results in terms of colour and COD reduction. We will soon submit the interim report for your reference.

In this context, you are kindly requested to extend the project for **another two months** so that we can really optimize the process.

Note: No financial liability is involved in this extension.

Submitted for your kind consideration,

Best Regards

Dr. Anoop Verma
Associate Professor and Head
School of Energy and Environment
Thapar Institute of Engineering and Technology, Patiala-147004

*Affiliate Faculty—Virginia Tech- TIET
Center of Excellence in Emerging Materials
Thapar Trinity Fellow*

email: anoop.kumar@thapar.edu, anoop_tiet@yahoo.co.in
Ph: 09815654776(M)

<http://scholar.google.co.in/citations?user=HZHZGVUAAAAJ&hl=en>

<https://orcid.org/0000-0003-2818-6348>

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Feasibility of using Advanced Oxidation Processes (AOPs) as pre or post treatment option for treating industry waste water: An approach towards reuse of treated trade effluent for the industry



Submitted by:

Dr. Anoop Verma

Associate Professor and Head

School of Energy and Environment

Thapar Institute of Engineering and Technology, Patiala.

1. Scope of work:

There is wider demand and scope for industries to approach Zero Liquid Discharge (ZLD) using appropriate technologies. Accordingly, ZLD industries will need to develop a technology which can treat their own wastewater so as to recycle and reuse the same. Especially when we talk about Pulp and Paper (P&P) industry a fastest growing sector around the world which highly demands freshwater utilization for their processes. P&P industry using best technologies for treating their waste water but presence of colour in their wastewater even after secondary treatment restrict any further applications. The methods used for colour removal, as per the technology available so far, are quite expensive and less efficient. Hence certain technological interventions need to be successfully implemented in different stages of industrial treatment system for colour removal.

2. Proposed technology:

With deliberation to the industry, Thapar team proposes the technology to remove the colour from various possible sections of the industry.

To cover the former mentioned drawbacks our study will try to incorporate two processes i.e. advance treatment techniques as dual technology to efficiently overcome the problem of industry, and the plus point of our technology is zero sludge or waste generation as it converts the organic contaminants to simple water and carbon dioxide. Best efforts would be made to integrate the in-situ dual effect (photocatalysis and photo-Fenton) at various stages of the selected pulp and paper making industry. Photocatalysis is considered an effective system for the mineralization of many organics through the generation of HO• and O₂•⁻ radical, reducing the organic load of effluents as this technology converts the harmful substances to water and carbon dioxide which are non-toxic. The principle of photocatalysis involves the initial absorption of photons with energy equal to or greater than the bandgap energy of the semiconductor, leading to the formation of electrons and holes (Sujatha et. al., 2020). In photo-Fenton when the system is irradiated with UV or visible light, the photo-reduction of ferric to ferrous ions is promoted concomitantly with the generation of additional HO• (Romero et. al., 2016). These two technologies have shown their proficiency in removing colour or treating wastewater of the P&P (Kumar et. al., 2011) industry as well as the textile industry (Tian et. al., 2020). The proposed study attempts to incorporate the in-situ dual processes (Photocatalysis and photo-Fenton) in fixed-mode to visualize its feasibility to

treat different streams of P&P industry. The study also incorporates the idea of circular economy by using waste materials in fabrication of composite to make it more cost effective.



Fig. 1 Concept of in-situ dual effect of both photocatalysis and photo-Fenton.

Fig. 2 shows targeted streams to be worked upon. To start with, we have worked on the final stream i.e. O/L. Presently we have optimized the batch scale study and came up with some delightful outcome as results of colour removal. Fig. 3 depicts the graph of % colour from the selected stream. Fig. 4 shows initial and final absorbance of the untreated and treated sample using UV-vis spectrophotometer. The decrement in UV region of final sample shows the effective removal of the colour of final stream which is also clearly visible in the solutions in testubes.

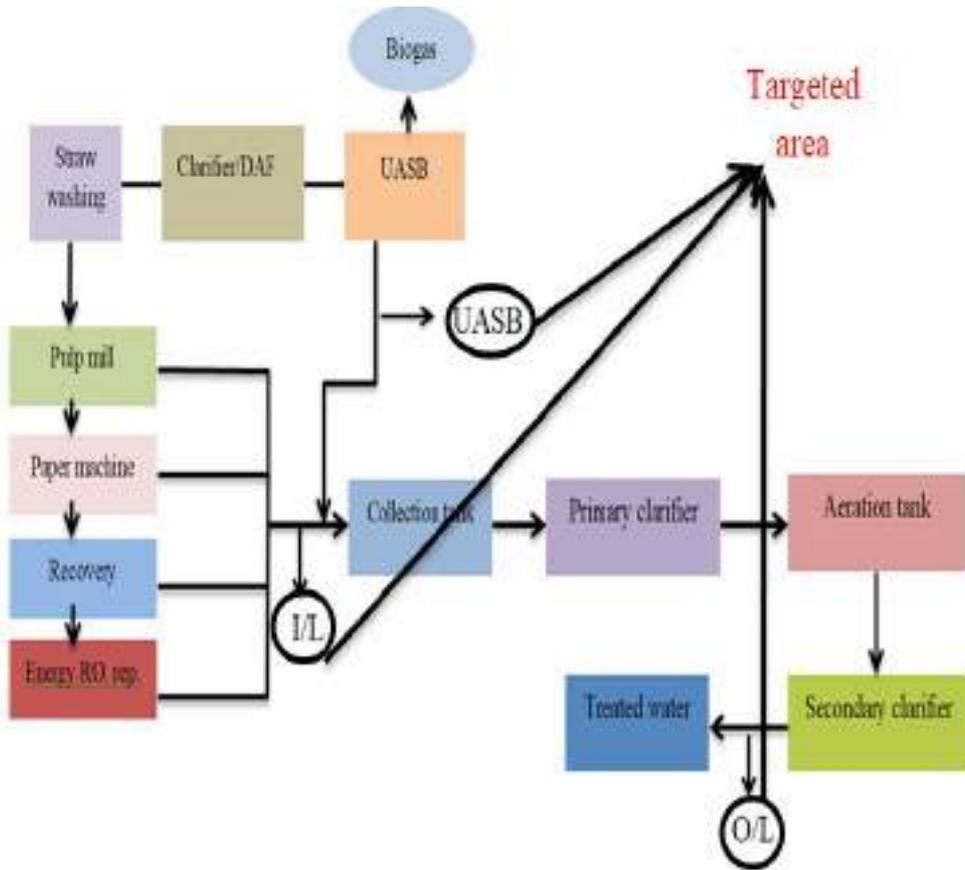


Fig. 2: Targeted streams of industry

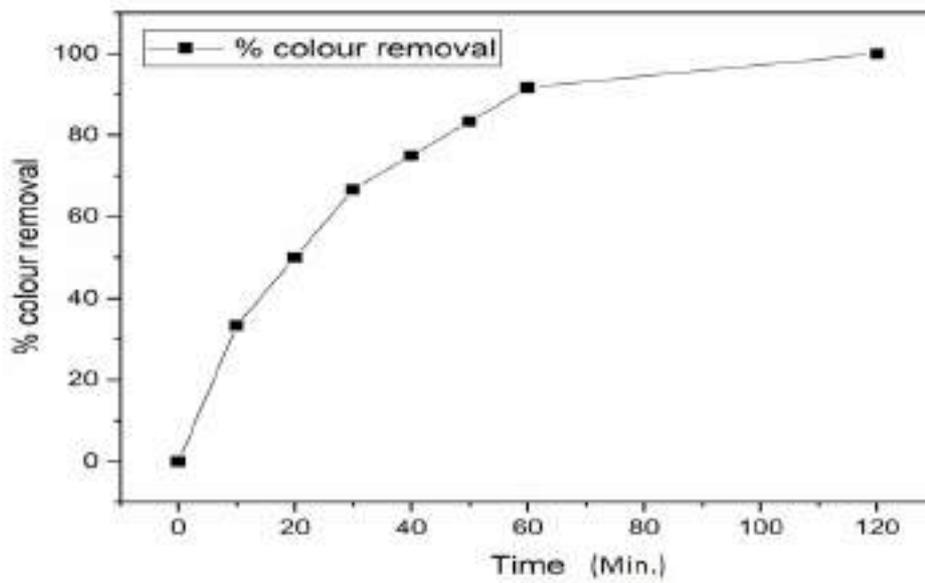


Fig.3: Graph of % colour removal with respect to time of treatment.

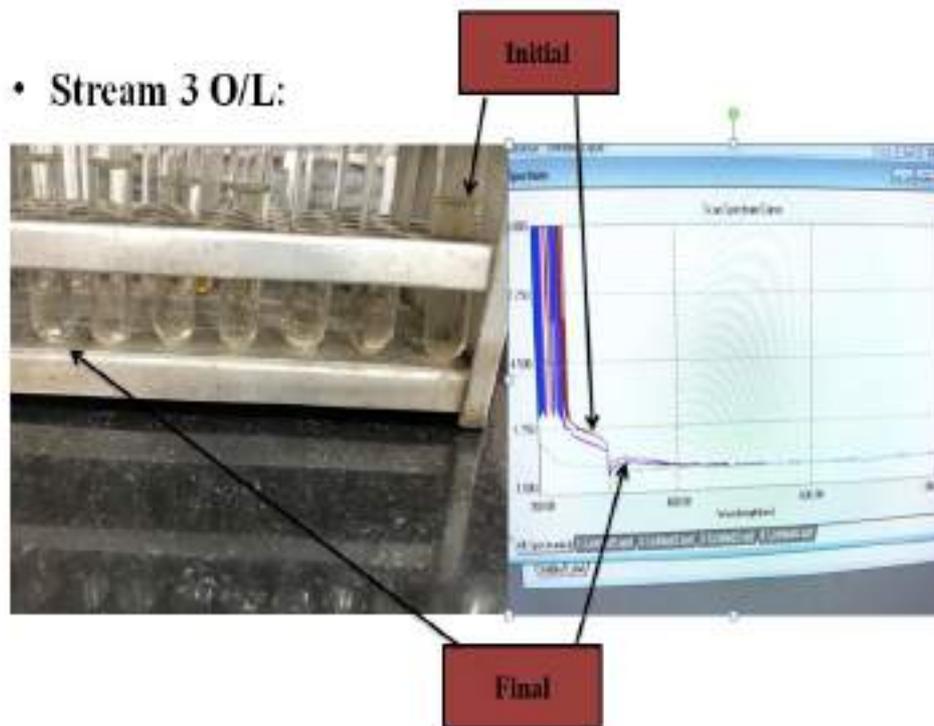


Fig.4: Spectroscopic analysis of O/L after treatment.

3. Future plans:

- Currently we are working on final effluent but in near future we will start optimization studies and hit and trials on other streams i.e. UASB and I/L as well.
- Further testing and process optimization will be done by varying factors like catalyst dose, time, oxidant dose, pH etc.
- Best efforts would also be made to study dual effect in once through process using fixed bed reactors. Furthermore, this study will try to increase the process economics and will suggest the suitable steps to be taken to the concerned industry for further applications.

Dear Sir/ Madam ,

Annexure-16

We are pleased to place the Purchase Order no. 7600006838 on your esteemed organization as per the terms & conditions agreed upon.

Any discrepancy regarding the acceptance of Purchase order including the terms and conditions mentioned therein is to be intimated to the Company within 24 hours of its receipt.

In case, no communication intimating any discrepancy is received by the Company in writing with in 24 hours of the receipt of Purchase Order, the Purchase Order shall be considered to have been accepted by you.

We would also request you to kindly share the progress of the said order on weekly / monthly basis with the under mentioned Email Id

Thanking You

For Trident Limited



E-212, KITCHLU NAGAR, LUDHIANA 141001

Contact No. : 9878999481

Email : jasbirpurchase@tridentindia.com

Purchase Team .



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | | | | | | | |
|---|--|--|--|--|--|--|------------------|------------|-----------------|------------|
| Vendor 850275 JAY WATER MANAGEMENT PVT LTD 239,GROUND FLOOR,PATPARGANJ INDUSTR DELHI 110092 Country India Vendor GSTIN No. 07AABCJ6770C1ZP | Ship To | | | Bill To | | | PO Number | 7600006838 | Dated | 30.10.2020 |
| | TL - Dhaura Energy 2 P&C Division,Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 | | | Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 | | | Our Ref. | 13760 | Currency | INR |
| | Mobile 9878999481 jasbirpurchase@tridentindia.com | | | Mobile 9878999481 jasbirpurchase@tridentindia.com | | | Your Ref. | offer | | |
| | PO Status :- Valid/Approved Quality Certificate :- Required | | | | | | | | | |

| S.No. | Item Code | UOM/ Brand | Order Qty. | Basic Rate | Discount | PKG-FWD | HSN/SAC | CGST/SGST/IGST/ C.Cess | Coal Cess | Item Value | Cancellation Date | Plant |
|-----------|--|---------------|---------------|------------|----------|---------|------------|---------------------------|--------------|--------------|----------------------|----------|
| 0000 1 | 811010280 MEMBRN FILTR-POLYAMD-0.001MIC-40"-8"-ROU TORAY MEMBRANES TM720D-400 | NOS/ TORAY | 72.000 | 26,500.00 | 0.00 | 0.00 | 8421.99.00 | 0.00 /0.00 /18.00 | 0.00 | 2,251,440.00 | 25.11.2020 | TE02 |
| | | | | INR/ 1 NOS | 0.00 | 0.00 | | 343,440.00 | | | | ENERGY-2 |

Total Value 2,251,440.00 INR

Total Value:INR TWENTY TWO LAKH FIFTY ONE THOUSAND FOUR HUNDRED FORTY Rupees



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

Vendor 850275
JAY WATER MANAGEMENT PVT LTD
239,GROUND FLOOR,PATPARGANJ INDUSTR
DELHI
110092
Country India
Vendor GSTIN No. 07AABCJ6770C1ZP

Ship To
TL - Dhaura Energy 2
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - (Paper & Chemical Division)
Mansa Road, Dhaura
BARANALA (PUNJAB)
148101
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006838 | Dated | 30.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

Price Basis: EXW DELHI

Freight : F

Special Instruction

Payment Terms: Due Net in 30 Days **Octroi:** As per Documentary Evidence

Transportation Mode: By AIR /RAIL /SEA /COURIER /ROAD **Transit Insurance** TO BE ARRANGED BY US.

The consignment shall be accepted only if accompanied by Original Invoice for Buyer and Duplicate for Transporter failing which the consignment shall be returned at your risk and cost .

Terms and Conditions As mentioned overleaf

Cancellation Date As above

Our Banker: State Bank of India, Industrial Finance Branch, Golden tower, Dholewal Chowk, Ludhiana

GSTIN No.. 03AABCA4139J1Z0

This is computer generated Purchase Order.Hence requires no signature.



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

Vendor 850275
JAY WATER MANAGEMENT PVT LTD
239,GROUND FLOOR,PATPARGANJ INDUSTR
DELHI
110092
Country India
Vendor GSTIN No. 07AABCJ6770C1ZP

Ship To
TL - Dhaura Energy 2
P&C Division,Mansa Road
Dhaura, Barnala (Punjab)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - (Paper & Chemical Division)
Mansa Road, Dhaura
BARANALA (PUNJAB)
148101
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006838 | Dated | 30.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Master Inspection Characteristics(MIC) | Upper Specification Limit | UOM | Target Specification Limit |
|-------|-------------------------------|---|---------------------------|-----|----------------------------|
|-------|-------------------------------|---|---------------------------|-----|----------------------------|



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

Vendor 850275
JAY WATER MANAGEMENT PVT LTD
239,GROUND FLOOR,PATPARGANJ INDUSTRIAL
DELHI
110092
Country India
Vendor GSTIN No. 07AABCJ6770C1ZP

Ship To
TL - Dhaura Energy 2
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
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Trident Limited - (Paper & Chemical Division)
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| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006838 | Dated | 30.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Mat. Classification | PO Material Text |
|-------|---|---------------------|------------------|
| 00001 | 811010280 MEMBRN FILTR-POLYAMD-0.001MIC-40"-8"-ROU | Standard | |



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

Vendor 850275
JAY WATER MANAGEMENT PVT LTD
239,GROUND FLOOR,PATPARGANJ INDUSTRIAL
DELHI
110092
Country India
Vendor GSTIN No. 07AABCJ6770C1ZP

Ship To
TL - Dhaura Energy 2
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - (Paper & Chemical Division)
Mansa Road, Dhaura
BARANALA (PUNJAB)
148101
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006838 | Dated | 30.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

DELIVERY SCHEDULE

| S.NO | Item Code Item Description | UOM | PO Qty | Scheduled Date | Sch Qty | Delivered Qty | Open Qty as on 09.10.2021 | Contract No | Remaining Contract Value/Qty |
|-------|---|-----|--------|-------------------|---------|---------------|------------------------------|-------------|---------------------------------|
| 00001 | 811010280 MEMBRN FILTR-POLYAMD-0.001MIC-40"-8"-ROU | NOS | 72.000 | 25.11.2020 | 72.000 | 72.000 | 0.000 | | 0.00 |

Terms and Conditions

This Purchase Order is subject to all terms, conditions and specifications hereinafter set forth and acceptance of order by the Seller shall be deemed to be an agreement that the order is subject to all of said terms, conditions and specifications.

General

Non Acceptance of Purchase order with its terms and conditions is to be intimated to the Purchaser within 24 hours of its receipt, else the same shall be assumed to be accepted at the discretion of the Purchaser. No deviation to this order shall be honoured unless authorized in writing.

Purchase Order number, material code and GST IN of the Purchaser should be mentioned on each and every invoice. An invoice should not have more than 8 line items in it. Different Invoice should be raised for different Purchase Orders issued by the Purchaser.

The Seller shall be responsible for mentioning the correct details in the invoice, including HSN and GST rate of goods supplied to the Purchaser.

The Seller represents and warrants that it shall comply with the Laws pertaining to GST and other applicable indirect taxes and the requirements therein. The Seller shall be liable for all losses and damages suffered by the Purchaser due to any action or omission or mistake of the Seller.

The Seller shall unconditionally submit its account statement on Quarterly basis for reconciliation.

Weights / quantities as recorded by the Purchaser shall be final and binding on the Seller.

This Purchase Order shall not be amended, modified, altered or changed in any way except by writing executed by a duly authorized representative of the Purchaser.

Any other terms & conditions of the Seller mentioned on its Bills,Invoices, e-mails or any other documents shall not be binding on the Purchaser unless accepted in writing by the Authorized Representative of the Purchaser.

The Seller shall not disclose any confidential information pertaining to the Purchaser's business to any third party.

Neither party shall be entitled to assign the rights, interests and obligations without the previous written consent of the other Party.

The Seller shall not offer, solicit or accept an advantage in connection with the procurement of this Purchase Order. Failure to comply with this clause or any act of offering, soliciting or accepting advantage committed by the Seller shall, without affecting the liability of Seller for such failure and act, result in this Purchase Order being invalidated. For the purpose of this clause, Seller shall include its directors, partners, relatives, agents, associates, employees, servants and sub-consultants.

'Advantage' for this purpose shall mean any gift, loan, fee, reward or commission, any valuable security, office, employment, agreement, loan payment/waiver/discharge, bribe of any kind to Government/other officials, any other service or favour or any offer, undertaking or promise, whether conditional or unconditional, of such advantage.

The Seller or its directors, partners, relatives, associates, employees, agents and/ or sub-consultants shall not trade, directly or indirectly, in the shares of the Company during the currency and six months post expiry of this Purchase Order.

Delivery

The material shall be carefully and properly packed for movement by sea/rail/road transport to withstand damages on account of inclement weather, rough handling etc.

The material shall have to be delivered on the date of delivery specified in this Purchase Order. Decision for acceptance/rejection of material on the dates other than that specified in the Purchase Order along with the liquidated damages shall be at the sole discretion of the Purchaser.

The Seller shall not have any right to terminate the Purchase Order. However, the Purchaser reserves the right to cancel any unshipped portion at any time without assigning any reason.

All costs incurred in procurement of material from other source in the event of failure to supply the material on the scheduled date / rejection as per the terms of Purchase Order shall be to Seller's account and at the sole discretion of the Purchaser.

The price mentioned in the Purchase Order is inclusive of packing and handling charges unless otherwise stated therein.

Seller shall share the progress of the order on weekly basis in writing.

If delivery of the material mentioned in the Order occurs later than time specified and provided such delay is neither the result of force majeure nor the result of circumstances for which the Purchaser is responsible, the Purchaser shall be entitled to damages of 0.5% per week or part thereof subject to the maximum of 5% of the Contract price. For purpose of computing damages in the event of delay in delivery of the material, mere despatch of the material within the agreed date of delivery which are not in accordance with the specifications/standards, or found unacceptable by Purchaser would not amount to delivery within the agreed delivery date.

Inspection and Testing

Complete Test / Inspection reports from an approved source / as generated and certified by the Seller should be submitted along with the supply of material. Test reports generated by the Purchaser shall be binding on the Seller and no disputes whatsoever shall be entertained in this regard. Charges for testing, if any, shall be to the Seller's account and the decision to get the same inspected by any third party shall be at the sole discretion of the Purchaser.

Material must conform to all the specifications as specified in the Purchase Order. Any non-conformity identified during any later stage shall be treated as breach of contract and the Seller shall be liable to any penalties imposed at the sole discretion of the Purchaser.

Terms of payment

Original GST invoice should invariably accompany the material failing which the material may be rejected at the sole discretion of the Purchaser.

In the event of denial of input tax credit to the Purchaser on account of any negligence, erroneous or incorrect reporting, non payment of taxes or any other non-compliance made by the Seller in relation to the GST Law, the Purchaser shall be entitled to recover such loss from the Seller along with Interest @18% per annum.

Advances shall be released against submission of Advance Bank Guarantee of equivalent amount. All Advance and Performance Bank guarantee(s) shall be accepted only if they are in Purchaser's format and issued by the Banks recommended by the Purchaser unless otherwise agreed in writing.

Payment other than advances shall be made as specified in the terms and conditions of the Purchase Order and submission of all required documents.

Forms / Permits / Declarations shall be submitted as per the applicable laws/statute.

The prices under this Order shall remain firm until completion of the Contract

Intellectual property/Warranty, Inspection and Liability

Material supplied by the Seller pursuant to this Purchase Order should not infringe any third party intellectual property rights and the Seller further undertakes to indemnify the Purchaser against all claims for infringements of third party patents and/or other intellectual property rights by material supplied under this Purchase Order.

Material supplied by the Seller pursuant to the Purchase Order should have clean title in favour of the Seller before shipment to the Purchaser. Should there be any dispute to the ownership of the material, the Seller would be liable to make good for the costs incurred by the Purchaser to defend the title and the loss of profits due to its inability to use the subjected material, over and above the costs already paid to the Seller.

In the event of any breach of obligations mentioned in the Purchase Order by the Seller, the Purchaser shall be entitled to incidental and consequential damages including loss of profit. The Seller agrees to indemnify and hold the Purchaser, its customers and users of its products, harmless against any suits, damage or claim or any other expense resulting from a breach or alleged breach of the Seller's obligations including warranty, pursuant hereto. The Purchaser shall have the right to invoke the Performance Bank Guarantee submitted by the Seller for recovering the Liquidated damages.

All goods supplied shall be under an unconditional guarantee of 12 months from the date of commissioning / 18 months from the date of receipt (whichever is earlier) unless specified differently in the Purchase Order.

The Purchaser shall have the right for shop floor rejections even if the material has been accepted on delivery.

All costs (inclusive of taxes & duties) incurred by the Purchaser on account of rejections, despatch/warranty failures of material supplied under this Purchase Order shall be to Supplier's account.

Applicable law and Jurisdiction of Courts

Any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof shall be referred for arbitration to be governed in accordance with the Arbitration and Conciliation Act, 1996.

Accordingly, the purchaser will nominate sole Arbitrator to settle any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof. The place of arbitration shall be in Barnala, Punjab, India and language of proceedings shall be English. Expenses of the arbitration proceeding shall be jointly shared by the parties. This Purchase order shall be governed by and construed in accordance with the laws of India, and the parties agree to submit themselves to the exclusive jurisdiction of the Courts at Barnala, India only. Further, where any material is imported under this Purchase Order, the laws applicable under the Indian statute would govern the resolution of conflicts.

This Purchase Order supersedes any and/or all other oral or written communications or other commitments between the parties with respect to its subject matter except the agreement executed between the parties and contains all of the covenants, terms and conditions agreed between the parties with respect thereto. Wherein an agreement is also executed between the parties on the same subject matter thereto with the terms, conditions and specifications, the Purchase Order shall become the part of the agreement. However, in case of any conflict in the terms, conditions, specifications mentioned in the agreement and the Purchase Order, the terms, conditions, specifications mentioned in the agreement shall prevail.

Each party hereto acknowledges that, except as set forth herein, neither party nor any one on behalf of either party has made any representations, inducements, promises or agreements, orally or otherwise, respecting the subject matter of this Agreement and/or Purchase Order.

Documents required to be attached with invoice.

1. Tax Invoice in original
2. Tax Invoice (Duplicate) in original
3. Quality certificate,

Dear Sir/ Madam ,

We are pleased to place the Purchase Order no. 7600006816 on your esteemed organization as per the terms & conditions agreed upon.

Any discrepancy regarding the acceptance of Purchase order including the terms and conditions mentioned therein is to be intimated to the Company within 24 hours of its receipt.

In case, no communication intimating any discrepancy is received by the Company in writing with in 24 hours of the receipt of Purchase Order, the Purchase Order shall be considered to have been accepted by you.

We would also request you to kindly share the progress of the said order on weekly / monthly basis with the under mentioned Email Id

Thanking You

For Trident Limited



E-212, KITCHLU NAGAR, LUDHIANA 141001

Contact No. : 9878999481

Email : jasbirpurchase@tridentindia.com

Purchase Team .



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 740022
 ALPHA ENGINEERING & SYSTEMS
 A - 2, 2ND FLOOR, RAJOURI GARDEN
 NEW DELHI
 110027
Country India
Vendor GSTIN No. 07AAEPA1177G1Z5

Ship To
 Trident-Dhaura (Utility)
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 BARNALA
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

Bill To
 Trident Limited - P&C
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006816 | Dated | 23.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved | | | |
| Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description Sale Order PO Number/ Week Code | UOM/ Brand | Order Qty. | Basic Rate | Discount | PKG-FWD | HSN/SAC | CGST/SGST/IGST/ C.Cess | Coal Cess | Item Value | Cancellation Date | Plant |
|-----------|---|---------------|---------------|------------|------------|---------|------------|---------------------------|--------------|------------|----------------------|---------------------|
| 0000 2 | 701010146 MAGNETIC FLOWMETER,6",MODEL:6410,ADEPT | NOS/ ADEPT | 1.000 | 71,800.00 | 25.00- | 0.00 | 9026.80.90 | 0.00 /0.00 /18.00 | 0.00 | 63,543.00 | 25.12.2020 | TP15 UTILITY |
| | | | | INR/ 1 NOS | 17,950.00 | 0.00 | | 9,693.00 | | | | |
| 0000 1 | 701010147 MAGNETIC FLOWMETER,8",MODEL:6410,ADEPT | NOS/ ADEPT | 4.000 | 109,600.00 | 25.00- | 0.00 | 9031.49.90 | 0.00 /0.00 /18.00 | 0.00 | 387,984.00 | 25.12.2020 | TP15 UTILITY |
| | | | | INR/ 1 NOS | 109,600.00 | 0.00 | | 59,184.00 | | | | |

Total Value 451,527.00 INR

Total Value:INR FOUR LAKH FIFTY ONE THOUSAND FIVE HUNDRED TWENTY SEVEN Rupees



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 740022
 ALPHA ENGINEERING & SYSTEMS
 A - 2, 2ND FLOOR, RAJOURI GARDEN
 NEW DELHI
 110027
Country India
Vendor GSTIN No. 07AAEPA1177G1Z5

Ship To
 Trident-Dhaura (Utility)
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 BARNALA
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

Bill To
 Trident Limited - P&C
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

| | | | |
|------------------|------------|-----------------|------------|
| PO Number | 7600006816 | Dated | 23.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |

PO Status :- Valid/Approved
Quality Certificate :- Required

Price Basis: EXW DELHI

Freight : F

Special Instruction Magflow Meter with Integral Display

Payment Terms: Due Net in 45 Days **Octroi:** As per Documentary Evidence

Transportation Mode: By AIR /RAIL /SEA /COURIER /ROAD **Transit Insurance** TO BE ARRANGED BY US.

The consignment shall be accepted only if accompanied by Original Invoice for Buyer and Duplicate for Transporter failing which the consignment shall be returned at your risk and cost .

Terms and Conditions As mentioned overleaf

Cancellation Date As above

Our Banker: State Bank of India, Industrial Finance Branch,Golden tower, Dholewal Chowk, Ludhiana

GSTIN No.. 03AABCA4139J1Z0

This is computer generated Purchase Order.Hence requires no signature.



Trident Limited - P&C
Mansa Road,Dhaulta
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 740022
ALPHA ENGINEERING & SYSTEMS
A - 2, 2ND FLOOR, RAJOURI GARDEN
NEW DELHI
110027
Country India
Vendor GSTIN No. 07AAEPA1177G1Z5

Ship To
Trident-Dhaulta (Utility)
Mansa Road,Dhaulta
BARNALA, (PUNJAB)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - P&C
Mansa Road,Dhaulta
BARNALA, (PUNJAB)
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006816 | Dated | 23.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Master Inspection Characteristics(MIC) | Upper Specification Limit | UOM | Target Specification Limit |
|-------|-------------------------------|---|---------------------------|-----|----------------------------|
|-------|-------------------------------|---|---------------------------|-----|----------------------------|



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 740022
ALPHA ENGINEERING & SYSTEMS
A - 2, 2ND FLOOR, RAJOURI GARDEN
NEW DELHI
110027
Country India
Vendor GSTIN No. 07AAEPA1177G1Z5

Ship To
Trident-Dhaura (Utility)
Mansa Road,Dhaura
BARNALA, (PUNJAB)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006816 | Dated | 23.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Mat. Classification | PO Material Text |
|-------|---|---------------------|------------------|
| 00002 | 701010146 MAGNETIC FLOWMETER,6",MODEL:6410,ADEPT | Standard | |
| 00001 | 701010147 MAGNETIC FLOWMETER,8",MODEL:6410,ADEPT | Standard | |



Trident Limited - P&C
Mansa Road,Dhaura
BARNALA, (PUNJAB)
PURCHASE ORDER

Vendor 740022
 ALPHA ENGINEERING & SYSTEMS
 A - 2, 2ND FLOOR, RAJOURI GARDEN
 NEW DELHI
 110027
Country India
Vendor GSTIN No. 07AAEPA1177G1Z5

Ship To
 Trident-Dhaura (Utility)
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 BARNALA
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

Bill To
 Trident Limited - P&C
 Mansa Road,Dhaura
 BARNALA, (PUNJAB)
 148107
Mobile 9878999481
 jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600006816 | Dated | 23.10.2020 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Valid/Approved Quality Certificate :- Required | | | |

DELIVERY SCHEDULE

| S.NO | Item Code Item Description | UOM | PO Qty | Scheduled Date | Sch Qty | Delivered Qty | Open Qty as on 08.10.2021 | Contract No | Remaining Contract Value/Qty |
|-------|---|-----|--------|----------------|---------|---------------|---------------------------|-------------|------------------------------|
| 00002 | 701010146 MAGNETIC FLOWMETER,6",MODEL:6410,ADEPT | NOS | 1.000 | 25.12.2020 | 1.000 | 1.000 | 0.000 | | 0.00 |
| 00001 | 701010147 MAGNETIC FLOWMETER,8",MODEL:6410,ADEPT | NOS | 4.000 | 25.12.2020 | 4.000 | 4.000 | 0.000 | | 0.00 |

Terms and Conditions

This Purchase Order is subject to all terms, conditions and specifications hereinafter set forth and acceptance of order by the Seller shall be deemed to be an agreement that the order is subject to all of said terms, conditions and specifications.

General

Non Acceptance of Purchase order with its terms and conditions is to be intimated to the Purchaser within 24 hours of its receipt, else the same shall be assumed to be accepted at the discretion of the Purchaser. No deviation to this order shall be honoured unless authorized in writing.

Purchase Order number, material code and GST IN of the Purchaser should be mentioned on each and every invoice. An invoice should not have more than 8 line items in it. Different Invoice should be raised for different Purchase Orders issued by the Purchaser.

The Seller shall be responsible for mentioning the correct details in the invoice, including HSN and GST rate of goods supplied to the Purchaser.

The Seller represents and warrants that it shall comply with the Laws pertaining to GST and other applicable indirect taxes and the requirements therein. The Seller shall be liable for all losses and damages suffered by the Purchaser due to any action or omission or mistake of the Seller.

The Seller shall unconditionally submit its account statement on Quarterly basis for reconciliation.

Weights / quantities as recorded by the Purchaser shall be final and binding on the Seller.

This Purchase Order shall not be amended, modified, altered or changed in any way except by writing executed by a duly authorized representative of the Purchaser.

Any other terms & conditions of the Seller mentioned on its Bills,Invoices, e-mails or any other documents shall not be binding on the Purchaser unless accepted in writing by the Authorized Representative of the Purchaser.

The Seller shall not disclose any confidential information pertaining to the Purchaser's business to any third party.

Neither party shall be entitled to assign the rights, interests and obligations without the previous written consent of the other Party.

The Seller shall not offer, solicit or accept an advantage in connection with the procurement of this Purchase Order. Failure to comply with this clause or any act of offering, soliciting or accepting advantage committed by the Seller shall, without affecting the liability of Seller for such failure and act, result in this Purchase Order being invalidated. For the purpose of this clause, Seller shall include its directors, partners, relatives, agents, associates, employees, servants and sub-consultants.

'Advantage' for this purpose shall mean any gift, loan, fee, reward or commission, any valuable security, office, employment, agreement, loan payment/waiver/discharge, bribe of any kind to Government/other officials, any other service or favour or any offer, undertaking or promise, whether conditional or unconditional, of such advantage.

The Seller or its directors, partners, relatives, associates, employees, agents and/ or sub-consultants shall not trade, directly or indirectly, in the shares of the Company during the currency and six months post expiry of this Purchase Order.

Delivery

The material shall be carefully and properly packed for movement by sea/rail/road transport to withstand damages on account of inclement weather, rough handling etc.

The material shall have to be delivered on the date of delivery specified in this Purchase Order. Decision for acceptance/rejection of material on the dates other than that specified in the Purchase Order along with the liquidated damages shall be at the sole discretion of the Purchaser.

The Seller shall not have any right to terminate the Purchase Order. However, the Purchaser reserves the right to cancel any unshipped portion at any time without assigning any reason.

All costs incurred in procurement of material from other source in the event of failure to supply the material on the scheduled date / rejection as per the terms of Purchase Order shall be to Seller's account and at the sole discretion of the Purchaser.

The price mentioned in the Purchase Order is inclusive of packing and handling charges unless otherwise stated therein.

Seller shall share the progress of the order on weekly basis in writing.

If delivery of the material mentioned in the Order occurs later than time specified and provided such delay is neither the result of force majeure nor the result of circumstances for which the Purchaser is responsible, the Purchaser shall be entitled to damages of 0.5% per week or part thereof subject to the maximum of 5% of the Contract price. For purpose of computing damages in the event of delay in delivery of the material, mere despatch of the material within the agreed date of delivery which are not in accordance with the specifications/standards, or found unacceptable by Purchaser would not amount to delivery within the agreed delivery date.

Inspection and Testing

Complete Test / Inspection reports from an approved source / as generated and certified by the Seller should be submitted along with the supply of material. Test reports generated by the Purchaser shall be binding on the Seller and no disputes whatsoever shall be entertained in this regard. Charges for testing, if any, shall be to the Seller's account and the decision to get the same inspected by any third party shall be at the sole discretion of the Purchaser.

Material must conform to all the specifications as specified in the Purchase Order. Any non-conformity identified during any later stage shall be treated as breach of contract and the Seller shall be liable to any penalties imposed at the sole discretion of the Purchaser.

Terms of payment

Original GST invoice should invariably accompany the material failing which the material may be rejected at the sole discretion of the Purchaser.

In the event of denial of input tax credit to the Purchaser on account of any negligence, erroneous or incorrect reporting, non payment of taxes or any other non-compliance made by the Seller in relation to the GST Law, the Purchaser shall be entitled to recover such loss from the Seller along with Interest @18% per annum.

Advances shall be released against submission of Advance Bank Guarantee of equivalent amount. All Advance and Performance Bank guarantee(s) shall be accepted only if they are in Purchaser's format and issued by the Banks recommended by the Purchaser unless otherwise agreed in writing.

Payment other than advances shall be made as specified in the terms and conditions of the Purchase Order and submission of all required documents.

Forms / Permits / Declarations shall be submitted as per the applicable laws/statute.

The prices under this Order shall remain firm until completion of the Contract

Intellectual property/Warranty, Inspection and Liability

Material supplied by the Seller pursuant to this Purchase Order should not infringe any third party intellectual property rights and the Seller further undertakes to indemnify the Purchaser against all claims for infringements of third party patents and/or other intellectual property rights by material supplied under this Purchase Order.

Material supplied by the Seller pursuant to the Purchase Order should have clean title in favour of the Seller before shipment to the Purchaser. Should there be any dispute to the ownership of the material, the Seller would be liable to make good for the costs incurred by the Purchaser to defend the title and the loss of profits due to its inability to use the subjected material, over and above the costs already paid to the Seller.

In the event of any breach of obligations mentioned in the Purchase Order by the Seller, the Purchaser shall be entitled to incidental and consequential damages including loss of profit. The Seller agrees to indemnify and hold the Purchaser, its customers and users of its products, harmless against any suits, damage or claim or any other expense resulting from a breach or alleged breach of the Seller's obligations including warranty, pursuant hereto. The Purchaser shall have the right to invoke the Performance Bank Guarantee submitted by the Seller for recovering the Liquidated damages.

All goods supplied shall be under an unconditional guarantee of 12 months from the date of commissioning / 18 months from the date of receipt (whichever is earlier) unless specified differently in the Purchase Order.

The Purchaser shall have the right for shop floor rejections even if the material has been accepted on delivery.

All costs (inclusive of taxes & duties) incurred by the Purchaser on account of rejections, despatch/warranty failures of material supplied under this Purchase Order shall be to Supplier's account.

Applicable law and Jurisdiction of Courts

Any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof shall be referred for arbitration to be governed in accordance with the Arbitration and Conciliation Act, 1996.

Accordingly, the purchaser will nominate sole Arbitrator to settle any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof. The place of arbitration shall be in Barnala, Punjab, India and language of proceedings shall be English. Expenses of the arbitration proceeding shall be jointly shared by the parties. This Purchase order shall be governed by and construed in accordance with the laws of India, and the parties agree to submit themselves to the exclusive jurisdiction of the Courts at Barnala, India only. Further, where any material is imported under this Purchase Order, the laws applicable under the Indian statute would govern the resolution of conflicts.

This Purchase Order supersedes any and/or all other oral or written communications or other commitments between the parties with respect to its subject matter except the agreement executed between the parties and contains all of the covenants, terms and conditions agreed between the parties with respect thereto. Wherein an agreement is also executed between the parties on the same subject matter thereto with the terms, conditions and specifications, the Purchase Order shall become the part of the agreement. However, in case of any conflict in the terms, conditions, specifications mentioned in the agreement and the Purchase Order, the terms, conditions, specifications mentioned in the agreement shall prevail.

Each party hereto acknowledges that, except as set forth herein, neither party nor any one on behalf of either party has made any representations, inducements, promises or agreements, orally or otherwise, respecting the subject matter of this Agreement and/or Purchase Order.

Documents required to be attached with invoice.

1. Tax Invoice in original
2. Tax Invoice (Duplicate) in original
3. Quality certificate,

MagFlow 6410



| | | | |
|------------|----------------------------|-------------------------------|-----------------------|
| SR. NO. | 2004489 | DN SIZE | 150 |
| FLANGE | ANSI 150 | ELECTRODE | SS 316L |
| LINER | PTFE | OPERATING PRESSURE | 10 kg/cm ² |
| FLOW RANGE | 0 - 200 m ³ /hr | OPERATING TEMPERATURE | 80 °C |
| SERVICE | WATER | METER CONSTANT K _i | 0.835853 |



01/09/2021 15:25





PUNJAB POLLUTION CONTROL BOARD
HEAD OFFICE AIR LAB. VATAVARAN BHAWAN, PATIALA

Ph:- 0175-2302392

Web: www.ppcb.gov.in
 E-mail: - ppcbairlab@gmail.com

- | | |
|--|---|
| 1. Laboratory Sample No. | 93-94/ H.O.Lab./Air/Monitoring/2020-21 |
| 2. Name of Industry | M/s Trident Ltd. (PCD), Mansa Road, Dhaula, Distt. Barnala. |
| 3. Name of Sample collecting Officer | Er. Vipin Kumar AEE and Dr. Sonam Dogra, SA |
| 4. Designation of authorizing Test | EE, RO, Sangrur |
| 5. Type of Sample | Stack Emission |
| 6. Date & Time of Sample collection | 30.04.2021 |
| 7. Date & Time of Sample receipt in Lab. | 03.05.2021 |
| 8. Point of Sample collection | Details as Given Below |

Results

| Point of sample Collection | Parameter | Results | Prescribed Standards |
|--|--------------------|--|---|
| Port Hole on stack after APCD of Chemical recovery plant-II | Particulate Matter | 83 mg/Nm ³ | 150 mg/Nm ³ |
| Port Hole on stack after APCD of 2 no Boilers of Cap. 130 TPH each | Particulate Matter | 86 mg/Nm ³ at 12% CO ₂ | 150 mg/Nm ³ at 12% CO ₂ |

Note: If any, stringent limits/specific standard has been prescribed time to time by MoEF&CC, CPCB and PPCB, then stringent limits/specific standard would prevail subject to clarification from the concerned Regional office

B. S. Prakash
 5/5/2021
 for Scientific Officer

Endst. No: 1128385

Dt. 11/5/2021

A copy of the above is forwarded to the following for information and necessary action:-

1. The Chief Environmental Engineer, Punjab Pollution Control Board (Air), Jalandhar
2. The Senior Environmental Engineer, Punjab Pollution Control Board, Zonal Office-II Patiala
3. The Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur

B. S. Prakash
 5/5/2021
 for Scientific Officer

Dear Sir/ Madam ,

Annexure-19

We are pleased to place the Purchase Order no. 7600007938 on your esteemed organization as per the terms & conditions agreed upon.

Any discrepancy regarding the acceptance of Purchase order including the terms and conditions mentioned therein is to be intimated to the Company within 24 hours of its receipt.

In case, no communication intimating any discrepancy is received by the Company in writing with in 24 hours of the receipt of Purchase Order, the Purchase Order shall be considered to have been accepted by you.

We would also request you to kindly share the progress of the said order on weekly / monthly basis with the under mentioned Email Id

Thanking You

For Trident Limited



E-212, KITCHLU NAGAR, LUDHIANA 141001

Contact No. : 9878999481

Email : jasbirpurchase@tridentindia.com

Purchase Team .



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | | | |
|---|--|---|------------------|------------|-----------------|------------|
| Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA | Ship To TL - Dhaura Energy 2 P&C Division, Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number | 7600007938 | Dated | 25.08.2021 |
| | | | Our Ref. | 13760 | Currency | INR |
| | | | Your Ref. | offer | | |
| PO Status :- Invalid/Unapproved Quality Certificate :- Required | | | | | | |

| S.No. | Item Code Item Description Sale Order PO Number/ Week Code | UOM/ Brand | Order Qty. | Basic Rate | Discount | PKG-FWD | HSN/SAC | CGST/SGST/IGST/ C.Cess | Coal Cess | Item Value | Cancellation Date | Plant |
|-----------|---|---------------|---------------|-----------------------------------|---------------------|---------------------|------------|--|--------------|--------------|----------------------|-------------------------|
| 0000 1 | 877015678 CONVENTIONAL PANEL PRECICON R CONT. ADOR | NOS/ ADOR | 1.000 | 303,000.00 <u>INR/ 1 NOS</u> | 0.00 <u>0.00</u> | 0.00 <u>0.00</u> | 8541.40.90 | 0.00 /0.00 /18.00 <u>54,540.00</u> | 0.00 | 357,540.00 | 25.12.2021 | TE02 <u>ENERGY-2</u> |
| 0000 2 | 877015618 IGBT BASED HFPS CONTROL PANEL ESP | NOS/ ADOR | 2.000 | 1,262,500.00 <u>INR/ 1 NOS</u> | 0.00 <u>0.00</u> | 0.00 <u>0.00</u> | 8548.10.90 | 0.00 /0.00 /18.00 <u>454,500.00</u> | 0.00 | 2,979,500.00 | 25.12.2021 | TE02 <u>ENERGY-2</u> |

Total Value 3,337,040.00 INR

Total Value: INR THIRTY THREE LAKH THIRTY SEVEN THOUSAND FORTY Rupees



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | |
|---|--|---|--|-------------------------|
| Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA | Ship To TL - Dhaura Energy 2 P&C Division, Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number 7600007938 | Dated 25.08.2021 |
| | | | Our Ref. 13760 | Currency INR |
| | | | Your Ref. offer | |
| | | | PO Status :- Invalid/Unapproved Quality Certificate :- Required | |

Price Basis: EXW PUNE

Freight : F

Special Instruction 1) 90% against COD with 100% GST. 2) 10% PBG valid for 1 year 3) PBG will release subject to minimum emission reduction of more than 40% from current level.

Payment Terms: Payable in 2 partial amounts **Octroi:** As per Documentary Evidence

Transportation Mode: By AIR /RAIL /SEA /COURIER /ROAD **Transit Insurance** TO BE ARRANGED BY US.

The consignment shall be accepted only if accompanied by Original Invoice for Buyer and Duplicate for Transporter failing which the consignment shall be returned at your risk and cost .

Terms and Conditions As mentioned overleaf

Cancellation Date As above

Our Banker: State Bank of India, Industrial Finance Branch, Golden tower, Dholewal Chowk, Ludhiana

GSTIN No.: 03AABCA4139J1Z0

This is computer generated Purchase Order. Hence requires no signature.



**Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER**

| | | | | |
|---|--|---|--|-------------------------|
| Vendor 740059 ADOR POWERTRON LIMITED PLOT NO -51, D-II BLOCK, RAM NAGAR PUNE 411019 Country India Vendor GSTIN No. 27AABCA5150B1ZA | Ship To TL - Dhaura Energy 2 P&C Division, Mansa Road Dhaura, Barnala (Punjab) BARNALA 148107 Mobile 9878999481 jasbirpurchase@tridentindia.com | Bill To Trident Limited - (Paper & Chemical Division) Mansa Road, Dhaura BARANALA (PUNJAB) 148101 Mobile 9878999481 jasbirpurchase@tridentindia.com | PO Number 7600007938 | Dated 25.08.2021 |
| | | | Our Ref. 13760 | Currency INR |
| | | | Your Ref. offer | |
| | | | PO Status :- Invalid/Unapproved Quality Certificate :- Required | |

| S.No. | Item Code Item Description | Master Inspection Characteristics(MIC) | Upper Specification Limit | UOM | Target Specification Limit |
|-------|-------------------------------|---|---------------------------|-----|----------------------------|
|-------|-------------------------------|---|---------------------------|-----|----------------------------|



Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER

Vendor 740059
ADOR POWERTRON LIMITED
PLOT NO -51, D-II BLOCK, RAM NAGAR
PUNE
411019
Country India
Vendor GSTIN No. 27AABCA5150B1ZA

Ship To
TL - Dhaura Energy 2
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - (Paper & Chemical Division)
Mansa Road, Dhaura
BARANALA (PUNJAB)
148101
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|-----------------|------------|
| PO Number | 7600007938 | Dated | 25.08.2021 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Invalid/Unapproved Quality Certificate :- Required | | | |

| S.No. | Item Code Item Description | Mat. Classification | PO Material Text |
|-------|---|---------------------|------------------|
| 00001 | 877015676 CONVENTIONAL PANEL PRECICON R CONT. ADOR | Standard | |
| 00002 | 877015618 IGBT BASED HFPS CONTROL PANEL ESP | Customize | |



Trident Limited - Energy
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
PURCHASE ORDER

Vendor 740059
ADOR POWERTRON LIMITED
PLOT NO -51, D-II BLOCK, RAM NAGAR
PUNE
411019
Country India
Vendor GSTIN No. 27AABCA5150B1ZA

Ship To
TL - Dhaura Energy 2
P&C Division, Mansa Road
Dhaura, Barnala (Punjab)
BARNALA
148107
Mobile 9878999481
jasbirpurchase@tridentindia.com

Bill To
Trident Limited - (Paper & Chemical Division)
Mansa Road, Dhaura
BARANALA (PUNJAB)
148101
Mobile 9878999481
jasbirpurchase@tridentindia.com

| | | | |
|--|------------|----------|------------|
| PO Number | 7600007938 | Dated | 25.08.2021 |
| Our Ref. | 13760 | Currency | INR |
| Your Ref. | offer | | |
| PO Status :- Invalid/Unapproved Quality Certificate :- Required | | | |

DELIVERY SCHEDULE

| S.NO | Item Code Item Description | UOM | PO Qty | Scheduled Date | Sch Qty | Delivered Qty | Open Qty as on 25.08.2021 | Contract No | Remaining Contract Value/Qty |
|-------|---|-----|--------|-------------------|---------|---------------|------------------------------|-------------|---------------------------------|
| 00001 | 877015676 CONVENTIONAL PANEL PRECICON R CONT. ADOR | NOS | 1.000 | 25.12.2021 | 1.000 | 0.000 | 1.000 | | 0.00 |
| 00002 | 877015618 IGBT BASED HFPS CONTROL PANEL ESP | NOS | 2.000 | 25.12.2021 | 2.000 | 0.000 | 2.000 | | 0.00 |

Terms and Conditions

This Purchase Order is subject to all terms, conditions and specifications hereinafter set forth and acceptance of order by the Seller shall be deemed to be an agreement that the order is subject to all of said terms, conditions and specifications.

General

Non Acceptance of Purchase order with its terms and conditions is to be intimated to the Purchaser within 24 hours of its receipt, else the same shall be assumed to be accepted at the discretion of the Purchaser. No deviation to this order shall be honoured unless authorized in writing.

Purchase Order number, material code and GST IN of the Purchaser should be mentioned on each and every invoice. An invoice should not have more than 8 line items in it. Different Invoice should be raised for different Purchase Orders issued by the Purchaser.

The Seller shall be responsible for mentioning the correct details in the invoice, including HSN and GST rate of goods supplied to the Purchaser.

The Seller represents and warrants that it shall comply with the Laws pertaining to GST and other applicable indirect taxes and the requirements therein. The Seller shall be liable for all losses and damages suffered by the Purchaser due to any action or omission or mistake of the Seller.

The Seller shall unconditionally submit its account statement on Quarterly basis for reconciliation.

Weights / quantities as recorded by the Purchaser shall be final and binding on the Seller.

This Purchase Order shall not be amended, modified, altered or changed in any way except by writing executed by a duly authorized representative of the Purchaser.

Any other terms & conditions of the Seller mentioned on its Bills,Invoices, e-mails or any other documents shall not be binding on the Purchaser unless accepted in writing by the Authorized Representative of the Purchaser.

The Seller shall not disclose any confidential information pertaining to the Purchaser's business to any third party.

Neither party shall be entitled to assign the rights, interests and obligations without the previous written consent of the other Party.

The Seller shall not offer, solicit or accept an advantage in connection with the procurement of this Purchase Order. Failure to comply with this clause or any act of offering, soliciting or accepting advantage committed by the Seller shall, without affecting the liability of Seller for such failure and act, result in this Purchase Order being invalidated. For the purpose of this clause, Seller shall include its directors, partners, relatives, agents, associates, employees, servants and sub-consultants.

'Advantage' for this purpose shall mean any gift, loan, fee, reward or commission, any valuable security, office, employment, agreement, loan payment/waiver/discharge, bribe of any kind to Government/other officials, any other service or favour or any offer, undertaking or promise, whether conditional or unconditional, of such advantage.

The Seller or its directors, partners, relatives, associates, employees, agents and/ or sub-consultants shall not trade, directly or indirectly, in the shares of the Company during the currency and six months post expiry of this Purchase Order.

Delivery

The material shall be carefully and properly packed for movement by sea/rail/road transport to withstand damages on account of inclement weather, rough handling etc.

The material shall have to be delivered on the date of delivery specified in this Purchase Order. Decision for acceptance/rejection of material on the dates other than that specified in the Purchase Order along with the liquidated damages shall be at the sole discretion of the Purchaser.

The Seller shall not have any right to terminate the Purchase Order. However, the Purchaser reserves the right to cancel any unshipped portion at any time without assigning any reason.

All costs incurred in procurement of material from other source in the event of failure to supply the material on the scheduled date / rejection as per the terms of Purchase Order shall be to Seller's account and at the sole discretion of the Purchaser.

The price mentioned in the Purchase Order is inclusive of packing and handling charges unless otherwise stated therein.

Seller shall share the progress of the order on weekly basis in writing.

If delivery of the material mentioned in the Order occurs later than time specified and provided such delay is neither the result of force majeure nor the result of circumstances for which the Purchaser is responsible, the Purchaser shall be entitled to damages of 0.5% per week or part thereof subject to the maximum of 5% of the Contract price. For purpose of computing damages in the event of delay in delivery of the material, mere despatch of the material within the agreed date of delivery which are not in accordance with the specifications/standards, or found unacceptable by Purchaser would not amount to delivery within the agreed delivery date.

Inspection and Testing

Complete Test / Inspection reports from an approved source / as generated and certified by the Seller should be submitted along with the supply of material. Test reports generated by the Purchaser shall be binding on the Seller and no disputes whatsoever shall be entertained in this regard. Charges for testing, if any, shall be to the Seller's account and the decision to get the same inspected by any third party shall be at the sole discretion of the Purchaser.

Material must conform to all the specifications as specified in the Purchase Order. Any non-conformity identified during any later stage shall be treated as breach of contract and the Seller shall be liable to any penalties imposed at the sole discretion of the Purchaser.

Terms of payment

Original GST invoice should invariably accompany the material failing which the material may be rejected at the sole discretion of the Purchaser.

In the event of denial of input tax credit to the Purchaser on account of any negligence, erroneous or incorrect reporting, non payment of taxes or any other non-compliance made by the Seller in relation to the GST Law, the Purchaser shall be entitled to recover such loss from the Seller along with Interest @18% per annum.

Advances shall be released against submission of Advance Bank Guarantee of equivalent amount. All Advance and Performance Bank guarantee(s) shall be accepted only if they are in Purchaser's format and issued by the Banks recommended by the Purchaser unless otherwise agreed in writing.

Payment other than advances shall be made as specified in the terms and conditions of the Purchase Order and submission of all required documents.

Forms / Permits / Declarations shall be submitted as per the applicable laws/statute.

The prices under this Order shall remain firm until completion of the Contract

Intellectual property/Warranty, Inspection and Liability

Material supplied by the Seller pursuant to this Purchase Order should not infringe any third party intellectual property rights and the Seller further undertakes to indemnify the Purchaser against all claims for infringements of third party patents and/or other intellectual property rights by material supplied under this Purchase Order.

Material supplied by the Seller pursuant to the Purchase Order should have clean title in favour of the Seller before shipment to the Purchaser. Should there be any dispute to the ownership of the material, the Seller would be liable to make good for the costs incurred by the Purchaser to defend the title and the loss of profits due to its inability to use the subjected material, over and above the costs already paid to the Seller.

In the event of any breach of obligations mentioned in the Purchase Order by the Seller, the Purchaser shall be entitled to incidental and consequential damages including loss of profit. The Seller agrees to indemnify and hold the Purchaser, its customers and users of its products, harmless against any suits, damage or claim or any other expense resulting from a breach or alleged breach of the Seller's obligations including warranty, pursuant hereto. The Purchaser shall have the right to invoke the Performance Bank Guarantee submitted by the Seller for recovering the Liquidated damages.

All goods supplied shall be under an unconditional guarantee of 12 months from the date of commissioning / 18 months from the date of receipt (whichever is earlier) unless specified differently in the Purchase Order.

The Purchaser shall have the right for shop floor rejections even if the material has been accepted on delivery.

All costs (inclusive of taxes & duties) incurred by the Purchaser on account of rejections, despatch/warranty failures of material supplied under this Purchase Order shall be to Supplier's account.

Applicable law and Jurisdiction of Courts

Any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof shall be referred for arbitration to be governed in accordance with the Arbitration and Conciliation Act, 1996.

Accordingly, the purchaser will nominate sole Arbitrator to settle any dispute, controversy, differences or question arising out of, in relation to or incidental to this Purchase Order or the breach, termination or invalidity thereof. The place of arbitration shall be in Barnala, Punjab, India and language of proceedings shall be English. Expenses of the arbitration proceeding shall be jointly shared by the parties. This Purchase order shall be governed by and construed in accordance with the laws of India, and the parties agree to submit themselves

to the exclusive jurisdiction of the Courts at Barnala, India only. Further, where any material is imported under this Purchase Order, the laws applicable under the Indian statute would govern the resolution of conflicts.

This Purchase Order supersedes any/all other oral or written communications or other commitments between the parties with respect to its subject matter except the agreement executed between the parties and contains all of the covenants, terms and conditions agreed

between the parties with respect thereto. Wherein an agreement is also executed between the parties on the same subject matter thereto with the terms, conditions and specifications, the Purchase Order shall become the part of the agreement. However, in case of any

conflict in the terms, conditions, specifications mentioned in the agreement and the Purchase Order, the terms, conditions, specifications mentioned in the agreement shall prevail.

Each party hereto acknowledges that, except as set forth herein, neither party nor any one on behalf of either party has made any representations, inducements, promises or agreements, orally or otherwise, respecting the subject matter of this Agreement and/or Purchase

Order.

Documents required to be attached with invoice.

1. Tax Invoice in original
2. Tax Invoice (Duplicate) in original
3. Quality certificate,

| <i>TECHNICAL PARTICULARS</i> | <i>UOM</i> | <i>M/s FLS Smidth 70% MCR -DESIGN Proposal: 9814168-1-ver.2a</i> | <i>M/s GE Power 70% MCR- DESIGN Offer Ref.: 1401113</i> | <i>M/s Hamon 70% MCR- DESIGN Proposal ref : P1943334 Revision : 02</i> |
|---|-------------------------------------|--|---|--|
| OPERATING CONDITIONS | | | | |
| No. of chambers | Pcs | 1 | 1 | 1 |
| Bus sections in operation | | All | | 4 |
| Bus sections in operation, total | | 5 | 3 | 4 |
| Gas volume to precipitator @ 3 % O2 dry | Nm ³ /s | 16.2 | 16.18 | 16.18 |
| Gas volume to precipitator @ 3 % O2 dry | m ³ /Hr | 103855 | | 148300 |
| Operating temperature | Deg C | 190 | 190 | 180-190 |
| Operating pressure | Pa | -2157 | -2156 | -2157.463 |
| Operating pressure | mm of WC | -220 | -220 | -220 |
| Water content | % | 27.6 | | 26.7 |
| Dew Point (water) | Deg C | 66 | | Estimated 20 Deg C Above flue gas temperature Later |
| Raw gas dust loading @ 3 vol%O2 | g/Nm ³ ,D | 25 | | 25 |
| Altitude above sea level | Mtr | 224 | | 224 |
| Atmospheric pressure | mm Hg | 739 | | 739 |
| | | | | |
| PRECIPITATOR DESIGN DATA | | | | |
| | | | | |
| Effective cross section | m ² | 38.3 | | 45.12 |
| Gas velocity | m/s | 0.75 | Operating : 0.45 Design : 0.63 | 0.64 |
| Retention time | sec. | 23.2 | Operating : 23.2 Design : 16.6 | 21.39 |
| Total specific collecting area | m ² /m ³ /sec | 152.34 | Operating : 110.5 Design : 154.9 | 142 |
| W - Deutsch particle migration velocity | cm/s | 4.23 | | 4.52 |
| | | | | |
| ESTIMATED PERFORMANCE | | | | |
| Dust Emission @ 3 vol%O2 | mg/Nm ³ ,D | 40 | ≤40 | 40 |

| | | | | |
|---|---------------------------------|---------------------------------|-------------------------------------|------------------------------|
| Efficiency. | % | 99.84 | Operating : 99.88 Design : 99.84 | 99.84 |
| Emitted dust in outlet of filter | Kg/h | 2 | | 2 |
| Collected dust in hopper | Kg/h | 1050 | | 1065 |
| Power consumption of High Voltage supply (at guaranteed conditions) | kW | 80 | | |
| Pressure drop over the precipitator (guaranteed) | Pa | 250 | | 245 |
| MECHANICAL DESIGN DATA | | | | |
| Casing design temperature. | Deg C | 250 | | 200 |
| Casing design pressure, max. static | mm of WC | -300 | | -300 |
| Specific Weight of Dust in Hopper | t/m3 | 0.4 | 150 kg/m3 for dead load | 0.15 |
| Specific Weight of Dust for transport calculation | t/m3 | 0.2 | | 0.4 |
| Wind load calculated according to: | | | | |
| wind velocity pressure | kN/m2 | 1.5 | 47 m/Sec | 2.007 |
| Snow load | kN/m2 | 0.8 | N.A. | 2 |
| Live load, roof | kN/m2 | 2 | 3500 Pa | 500 |
| Live load, access facilities | kN/m2 | 3 | 250 kg/m2 | 1000 |
| Earthquake zone | UBC | 2b | Zone-IV | Zone - IV |
| Standards for Steel profiles | EN, GB, JIS, ASTM or equivalent | EN, GB, JIS, ASTM or equivalent | IS:808 | ASTM A36 / IS 2062 |
| Strength calculation of casing | | FLS Standard | | IS:800 |
| Strength calculation of supporting structure | | FLS Standard | | ANSI 13th Ed |
| Mechanical Design | | FLS Standard | | IS:800 / IS 875 / Equivalent |
| ELECTRICAL DESIGN DATA | | | | |
| Mains voltageV | VAC | 400-660 | 415 | 415 |
| Mains voltage tolerance% | % | ± 5% | ± 10% | 0.05 |
| Mains frequencyHz | Hz | 50/60 | 50 Hz ± 5% | 50 |
| Control voltage in control cubicles, VAC | VAC | 230 | 230 | 230 |
| Ambient temperature, max/min °C | Deg C | 40/0 | 50 | 45°C /10°C |
| Electrical Design | | FLS Standard | | As per IEC |
| Electrical components - according to | | FLS Standard | | As per IEC |

| | | | | |
|--|------|----------------------|---|--|
| | | | | |
| | | | | |
| PRECIPITATOR DATA | | | | |
| Chambers offered | PCS | 1 | 1 | 1 |
| Serial fields per chamber | PCS | 5 | 3 | 4 |
| Bus sections per chamber, field no: 1 / 2 / 3 / 4 / 5 | PCS | 1/1/1/1/1 | 1/1/,1 | 1 |
| Number of ducts per chamber, field no: 1 / 2 / 3 / 4 / 5 | PCS | 17/17/17/17/17 | One chamber | 1 |
| Effective length of field no: 1 / 2 / 3 / 4 / | Mtr | 3.5/3.5/3.5/3.5/3.5 | 3.5/3.5/3.5 | 3.4 |
| Width of fields per chamber, field no: 1 / 2 / 3 / 4 / 5 | Mtr | 5.1 | 5.7/5.7/5.7 | 4.8/4.8/4.8/4.8 |
| Effective height | Mtr | 7.5 | 8 | 9.4 |
| Aspect ratio (effective length / effective height) | | 2.33 | 3 | 1.45 |
| Total Projected Collecting area per Chamber | m2 | 4388 | Not used in GE design | 4107.72 |
| Total Active Collecting area per Chamber | m2 | 5748 | 3192 | 4107.72 |
| | | | | |
| ESP CASING (one chamber) | | | | |
| Structural frames, Concrete | Type | E | Concrete | Concrete |
| Bottom hoppers | Type | Flat bottom concrete | Flat bottom | Trough Arrangement with conveyor |
| Inlet transition piece | Type | Upper | | |
| /rapping of inlet transition bottom | | Yes | Yes | 2 Nos (Common for both conr and GD screen) |
| / adjustable gas distribution screens, inlet | Pcs | 2 | Fixed GD screen with adjustable baffles | 2 |
| /rapping of inlet gas distribution screens | | Yes | Yes | 2 Nos (Common for both conr and GD screen) |
| Outlet transition piece | Type | Bottom | | |
| /rapping of outlet transition bottom | | Yes | No | 1 Nos (Common for both conr and GD screen) |
| /adjustable gas distribution screens, outlet | Pcs | 1 | Fixed | 1 |
| /rapping of outlet gas distribution screens | | Yes | No | 1 Nos (Common for both conr and GD screen) |
| platework In & Outlet; mild steel, plate thickness | mm | 5 | Funnel 6 mm, IS:2062, Grade-A | 5 |

| | | | | |
|--|--------|---------------------|------------------------------------|---------------------------------------|
| Set of insulator and connection boxes, supp. for T/R | Type | FLS | | 8 sets per ESP |
| Inspection doors | Type | FLS | | Manual |
| | | | | |
| | | | | |
| SUPPORTING STRUCTURE (one chamber) | | | | |
| Support for precipitator | Type | Slide bearing | | Slide bearing |
| | | | | |
| | | | | |
| ACCESS FACILITIES | | | | |
| Set of standard access facilities | Design | FLS/DIN | | 1 Set with RCC and Steel construction |
| /Stairs from ground to platform, height | Mtr | 0 | | Yes considered |
| /Platform for inspection doors in casing, length | Mtr | 21.5 | | Yes considered |
| /Stairs from platform to roof, height | Mtr | 8.4 | | Yes considered |
| /Railing around roof, length | Mtr | 55.5 | | Yes considered |
| | | | | |
| INSULATION AND CLADDING | | | | |
| Thermal insulation material consisting of : | | | | LRB Mineral wool with cladding sheet |
| mineral wool, fittings and cover plate | m2 | 1220 | | Yes considered |
| Cladding: 19mm corrugated alu/galvanized Steel plate - thickness | mm | 0.7 | | 0.6 mm aluminium cladding |
| or plane alu/galvanized steel plate - thickness | mm | 0.9/1 | | 0.6 mm aluminium cladding |
| Insulation for Casing (exclusive roof), thickness | mm | 100 | | Yes considered |
| Insulation for Roof (excl. embossed plate), | mm | 100 | | Yes considered |
| Insulation for Bottom hopper, thickness | mm | 100 | | Yes considered - 75 mm thick |
| Insulation for Inlet, thickness | mm | 100 | | Yes considered - 75 mm thick |
| Insulation for Outlet, thickness | mm | 100 | | Yes considered - 75 mm thick |
| | | | | |
| COLLECTING SYSTEM (one chamber) | | | | |
| Collecting systems, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 1/1/1/1/1 | To be defined after detailed Engg. | Field 1 to 4 |
| Collecting plates with attachment | Type | H500 | G profile | G-OPZEL |
| MOC | | Alu killed MS Steel | CRCA, IS:513, Grade-D | Corten Steel |
| spare plates for erection. | Pcs | 5 | Not Envisaged. | 1% of Installed Quantity of 1 ESP |
| plate height | Mtr | 7.5 | 8 (nominal) | 7 |
| plate width | Mtr | 0.5 | 0.5 (nominal) | 0.48 |

| | | | | |
|--|--------|-------------------------------|------------------------------------|-----------------------------------|
| plate thickness | mm | 1.25 | 1.5 | 1.2 |
| Total Projected Collecting area | m2 | 6225 | Not used in GE design | |
| Total Active Collecting Area. | m2 | 8155 | 3192 | 4107.72 |
| Projected col. area, field no: 1 / 2 / 3 / 4 / 5 | m2 | 877.5/877.5/877.5/877.5/877.5 | Not used in GE design | 1026.93 |
| Duct spacing field no: 1 / 2 / 3 / 4 / 5 | mm | 300/300/300/300/300 | | 300/300/300 |
| Collecting plates, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 124/124/124/124/124 | To be defined after detailed Engg. | 120/120/120 |
| Drop hammers, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 36/36/36/36/36 | 20 NOS. TUMBLING HAMMER /Field | 42/42/42 |
| Drive units for rapping, incl. gear motor | Type | Roof Mounted | Side drive | N.A. |
| | | | | |
| DISCHARGE SYSTEM (one chamber) | | | | |
| Discharge frame systems, field no: 1 / 2 / 3 / 4 / 5 | Pcs | 1/1/1/1/1 | 19/Field | 72 Nos. per field |
| /discharge frame system | Type | Rigid | Rigid Frame | Rigid Pipe and spike |
| Discharge electrodes | Type | Pin | Rigid type (Multipeak) | Rigid Pipe and spike |
| electrodes per chamber in field no: 1 / 2 / 3 / 4 / 5 | Pcs | 115/115/115/115/115 | To be defined after detailed Engg. | 72 Nos. per field |
| Tube MOC | | | IS:5429 | Carbon / IS 2062 |
| spare electrodes for erection | Pcs | 10 | Not Envisaged. | 1% of Installed Quantity of 1 ESP |
| /electrode length | Mtr | 6.8 | To be defined after detailed Engg | 9.4 |
| /electrode layers | Pcs | 1 | To be defined after detailed Engg | Single |
| / electrode per plate | Pcs | 1 | To be defined after detailed Engg | 1 per Opzel |
| Mast Electrodes | Type | Pin | Not applicable | |
| electrodes per chamber in field no: 1 / 2 / 3 / 4 / 5 | Pcs | 2/2/2/2/2 | Not applicable | N.A. |
| Tube MOC | | EN 10305-3 1993 – E220-CR2-S3 | Not applicable | N.A. |
| spare electrodes for erection | Pcs | | Not applicable | N.A. |
| /electrode length | Mtr | 6.8 | Not applicable | N.A. |
| /electrode layers | Pcs | 1 | Not applicable | N.A. |
| Internal drop hammer rapping system | Yes/No | Included | Not applicable | Yes MIGI Type rapping system |
| Number of discharge rapping system per field | Pcs | 1 | Not applicable | 4 Sets per field |
| Drop hammers for Discharge system | Pcs | 90 | Not applicable | 4 Sets per field |
| Set of electrode frames, bearing bridges, rotary hammer shafts, guide plates, walkways and upper spacer for coll. plates | Pcs | 5 | Not applicable | N.A. |
| Drive units for rapping, incl. gearmotors | Type | Roof mounted | Not applicable | N.A. |
| Cast parts, comprising chain tightener, pinwheels, links, split bearings and the like | Pcs | 20 | Not applicable | N.A. |
| | | | | |

| | | | | |
|---|-----------|---|---|--|
| HIGH VOLTAGE EQUIPMENT (one chamber) | | | | |
| High voltage supply for field no: 1 / 2 / 3 / 4 / 5 | Pcs | 3 ϕ T/R / 3 ϕ T/R / 3 ϕ T/R / 3 ϕ T/R / 3 ϕ T/R | 1 ϕ T/R / 1 ϕ T/R / 1 ϕ T/R | 1 ϕ T/R / 1 ϕ T/R / 1 ϕ T/R |
| DC SUPPLY BY | | | | |
| DC Supply by | Pcs | 5 | TR set | 4 |
| number of DC-supply in field no: 1 / 2 / 3 / 4 / 5 | Pcs | 1/1/1/1/1 | 3 | 1 |
| size of DC-supply for field no: 1 / 2 / 3 / 4 / 5 | kV (Peak) | 100/100/100/100/100 | 90/90/90 | 110/110/110 |
| size of DC-supply for field no: 1 / 2 / 3 / 4 / 5 | mA (Avg) | 600/700/800/800/800 | 575/575/575 | 600/600/600 |
| specific DC-current in field no: 1 / 2 / 3 / 4 / 5 | mA/m2 | 0.68/0.8/0.91/0.91/0.91 | 0.54 | 0.72 |
| TR Control Panel IP class | IP | IP21 | IP31 | Hermetically Sealed |
| MCC protection class | Type | | IP54 | As per OEM standard |
| /color | | | TR set – RAL 5012, TR panel & PMCC – RAL 7032, | Yes |
| /alarms for oil temperature and pressure | Yes/no | Included | Yes | Yes considered, Strick type |
| Grounding equipment for TR-sets at access doors | Type | FLS | Earthing rod | |
| Electrical accessories, comprising: | | | | |
| /Thyristor switching elements | Type | FLS | Firing /triggering command from ESP controller | IGBT based controller and SCR based controller |
| /Connections on high voltage side | | | Through Bus duct | Through HV pipe connection |
| Insulator sets comprising: | | | | |
| / support insulators, conical | Pcs | 20 | 12 | 4 nos / Field |
| / insulator shafts for discharge rapping system | Pcs | 10 | 3 | 4 nos / Field |
| / lead through insulators in trunking | Pcs | 10 | 3 | NA |
| Earthing rods and warning signs | Set | 10 | 1 | Yes 1 lot considered per ESP |
| CONTROL & ELECTRICAL EQUIPMENT (one chamber) | | | | |
| Controller | Type | PIACS Microcomputer controller, with automatic intermittent energization facility for T/R-sets type FLS | Microprocessor controller EPIC-III integrated with rapping programmer | International standard Precicon controller is considered |
| /programmable control for rapping gear motors | Type | Yes | Yes | Micro controller based |
| /control for heating elements | Type | FLS | Through thermostat for support insulator | Thermostatically Controlled |

| | | | | |
|--|--------|----------------------------|---|-------------------------------------|
| /signal for Central Control room. | Std | 4-20 mA | Over modbus TCP-IP/OPC protocol | Shall be provided as applicable |
| /Energy Management Control System | Yes/No | Optional | Yes, if opacity meter feedback is connected through 4-20 mA signal. | Yes |
| / terminal for input of CO alarm | Yes/No | Optional | External configurable DI is available | Yes |
| /terminal for aut. change of operating status | Yes/No | Optional | | Yes |
| /serial communication to CCS (GATEWAY) | Yes/No | Included | Over modbus TCP-IP/OPC protocol | Yes |
| /standard Protocol for Serial Communication | | Modbus RTU | Ethernet | RS485 |
| GENERAL STANDARDS FOR ELECTRICAL EQUIPMENT | | | | |
| Motors: | | | | For Seal air fan motor |
| motor standard | IEC | | IE 1 | As per IEC |
| motor type | | Squirrel Cage, Norm Motors | Squirrel Cage, Norm Motors | SQIM |
| insulation class | | F utilised to B | F utilised to B | Class F |
| protection class | | IP 54 | IP 55 | IP 54 |
| Cubicles: | | | | |
| /internal control voltage | VAC | 230 | 230 V AC | 230 |
| /lamp voltage | VDC | 24 | Later during detail engineering | 220 |
| /protection class | | IP 21 | IP54 | 45 Max |
| / forced cooling of cubicles | | Optional | Not required | |
| Instruments: | | | | |
| /protection class | | IP65 | Later during detail engineering | IP 31 for Indoor, IP 54 for Outdoor |
| Access to High Voltage carrying Equipment/Parts | | | | |
| Key interlocking | Type | Serv Trayvou or Similar | Mechanical castle key | Mechanical |
| ESTIMATED POWER CONSUMPTION | | | | |
| Total power use for T/R sets | kW | 89 | Will be finalized after detailed Engg. | Refer Electrical Load List |
| Total power use of heaters | kW | 37.5 | 16 | Refer Electrical Load List |
| Total power use for rapping motors | kW | 1.2 | 2.59 | Refer Electrical Load List |

| | | | | |
|--|---------|------------------|---|---|
| Total power use of dust transport | kW | 4.9 | Will be finalized after detailed Engg. | Refer Electrical Load List |
| Total Power for Purge Air kW 2.0 | kW | 2 | Will be finalized after detailed Engg. | Refer Electrical Load List |
| Scrapper conveyor | kW | | Will be finalized after detailed Engg. | 15 |
| Drag chain conveyor | kW | | Will be finalized after detailed Engg. | 3.7 |
| RAV | kW | | Will be finalized after detailed Engg. | 3.7 |
| Total estimated Power Consumption | kW | 135 | 18.59 | 22.4 |
| SURFACE TREATMENT FOR PARTS DELIVERED | | | | |
| Collecting plates | Type | Oil Coated | | St.3/Tectyl 506 / Equivalent |
| Discharge electrodes | Type | Oil Coated | | St.3/Tectyl 506 / Equivalent |
| Other internal parts | Program | Transport Primed | | Transport Primed |
| /degree of cleaning (SIS 055900 | Type | St.2 | | SA 2.5 |
| /primer | | 40 | | |
| External parts to be covered by insulation | Program | Transport Primed | | Transport Primed |
| /degree of cleaning (SIS 055900 | Type | St.2 | | |
| /primer | | 40 | | Primer: 2 Coats of red oxide primer (50 microns total DFT) |
| External parts not to be covered by insul. | Program | III | | |
| /degree of cleaning (SIS 055900 | Type | Sa 2.5 | | Sa 2.5 |
| /primer | my | 100 | | Primer: 2 Coats of red oxide primer (50 |
| / finish painting | my | 60 | | microns total DFT) |
| SCOPE OF SUPPLY | | | | |
| | | | | ESP Inlet and Outlet hoods (Corten steel) |
| | | | Outer roof has been included(Chequered plate IS-3502 and MS IS:2062 Gr A) | ESP Hot-roof and cold-roof arrangement (Corten steel) |

| | | | |
|--|---|--|---|
| | Inspection doors included | Inspection door included | ESP Quick opening doors (Corten Steel) |
| | Rapping system for distribution screen,supporting rod etc have been included | ESP internal including electrodes, suspension and steadying frames, rapping shafts,anvils have been included. | ESP internals of Corten steel including electrodes, suspension and steadying frames, rapping shafts,anvils and baffles. |
| | Gas distribution devices with support accessories. | Gas distribution devices with support accessories. | Gas distribution devices with support accessories. |
| | Rapping system for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping system for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping system for collecting electrode, discharge electrodes & inlet gas distribution devices |
| | Rapping motors for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping motors for collecting electrode, discharge electrodes & inlet gas distribution devices | Rapping motors for collecting electrode, discharge electrodes & inlet gas distribution devices |
| | Insulators included | Insulators as required by HRC India design. | Insulators as required by HRC India design. |
| | | Bus duct has been included. But no mention of T-R oil trays | HV bus-duct and T-R oil trays |
| | Key interlocking | Mechanical key safety interlocks system. | Mechanical key safety interlocks system. |
| | Slide bearings included | ESP support bearings has been included. | Fixed and slide bearings |
| | Detail engineering only for Stairways and gangways included ,Sun roof structrue for TR Set(Detail Engg),Steel supported outer roof will be fabricated and supplied by Ms FLS. | Staircase & Platform from Ground Level to Casing bottom floor level platform and to ESP roof top has also been included. | Access steel structures including platform and staircase from floor level to ESP roof with galvanized gratings and stair steps. |
| | Weather enclosure, detail engg will be done by Ms FLS | Not given | Weather enclosure for ESP |
| | Electical hoist & trolley included in Trident scope,Maintenance structure with monorail detail engg included in the scope | Monorail with electric hoist Included | Maintenance structure with monorail included |

| | | | |
|--|---|--|--|
| | Inlet & outlet expansion joints - Nonmetallic Type - Only detail engineering included in the scope. | Inlet & outlet expansion joints - Nonmetallic Type | Inlet & outlet expansion joints - Nonmetallic Type |
| | Not mentioned | ESP Inlet DTPA dampers | ESP Inlet DTPA dampers |
| | Not mentioned | ESP Outlet DTPA dampers | ESP Outlet DTPA dampers |
| | | | Rotary valve for ash conveyor outlet |
| | Scraper, incl. gear motor and VFD, Drag chain, incl. gear motor has been included in the scope | Scraper Conveyor & Drag Chain Conveyor | Scraper Conveyor & Drag Chain Conveyor |
| | | Not Given | Graph alloy bearings for Scraper Conveyor |
| | Basic engg for Thermal insulation & cladding of ESP included in the scope | Not included in the scope. | Thermal insulation & cladding of ESP |
| | | Not given | Modification in upstream and downstream ductwork with supports |
| | Not included in the scope. | Not included in the scope. | Induced draft fan included in the scope |
| | | | |

| | | | | |
|--|--|--|--|---|
| <p style="text-align: center;">EXCLUSIONS(SCOPE OF SUPPLY/WORK)</p> | | <ol style="list-style-type: none"> 1.Any other Power, Control & Instrument Cable 2.All Civil work. 3.Finish Painting 4.Erection, Commissioning, PG Testing, supervisor. 5.Power & control of dust transport system (Scraper, drag chain & RAV). 6.Lightning and lightning of ESP 7.Dust Conveying below Rotary air lock valve 8.Electric hoist & trolley (Capacity- 2.0 T) for T/R set. 9.Earthing system including ground pit 10.Casing Frames - Concrete 11.Platework, casing - Concrete 12.Flat Bottom Hopper - Concrete 13. Mechanical erection and Electrical erection. 14.Instruments, controllers, cables or electrical erection for central control room.. | <p>1.Civil works including all civil engineering, grouting, minor work, foundation, control room, MCC room.</p> <ul style="list-style-type: none"> • Structural engineering including structural work except specified in our scope of supply • ID fan, motor, VFD & accessories. • Dust handling system / conveyor beyond rotary air lock. • Fabrication drawing preparation & supply of Stack, Duct & duct support • PLC/DCS & its programming, HMI, engineering station, SCADA, laptop/desktop, UPS with backup etc. • All cable (Power/control/instrument/screen/communication) with cable tray, tray support, rack, trestle etc. or associated hardware except those mentioned in our scope of supply.. | <ol style="list-style-type: none"> 1. Civil work 2.ESP casings and casing columns(Corten steel) 3.Ash Mixing tank with Agitator 4.AMT transfer Pump |
|--|--|--|--|---|

| | | | | |
|---|--|---|---|--|
| <p style="text-align: center;">Performance Guarantee</p> | | <p>IS 11255 Part 1 & 3 EN 13284-1:2002 Stationary source emissions - Determination of low range mass concentration of dust. (In-stack standard for emissions < 40 mg/Nm³ - Case 1) ASME Power Test Code PTC 27 and the requirements of Environmental Protection and it has been given subject to certain provisions and has been mentioned clearly in the offer</p> | <p style="text-align: center;"><i>Performance guarantee condition has been given but couldnot find the value .</i></p> | <p>When the equipment covered by this proposal is operated at the design conditions given in Section 5 of this proposal, HRC India guarantees ESP outlet emission as: <50 mg/Nm³ dry gas (Guaranteed with all fields in service, subject to inlet conditions furnished and under steady state of operation</p> |
|---|--|---|---|--|

Soil and Groundwater Quality Assessment

at

Dhanuala Drain, Barnala



Prepared for:



Trident Ltd. and Lotus Integrated Texpark Ltd.

Dhaura Complex, Mansa Road, Barnala, Punjab, 148101

Prepared by:



Cholamandalam MS Risk Services Limited

Parry House, 3rd Floor,
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December 2019

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| Project Site: | Dhaura Complex, Mansa Road, Barnala, Punjab, 148101 | |
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Annexure I: Laboratory Analytical Test Reports for Groundwater samples

Annexure II: Laboratory Analytical Test Reports for Soil samples

List of Abbreviation

| | | |
|---------|---|---|
| BDL | : | Below Detectable Limits |
| BGL | : | Below Ground Level |
| BIS | : | Bureau of Indian Standards |
| CGWB | : | Central Ground Water Board |
| CMSRSL | : | Cholamandalam MS Risk Services Limited |
| CPCB | : | Central Pollution Control Board |
| DEM | : | Digital Elevation Model |
| EIA | : | Environmental Impact Assessment |
| ICAR | : | Indian Council of Agricultural Research |
| IS | : | Indian Standards |
| MOEF&CC | : | Ministry of Environment and Forests & Climate Change |
| MSL | : | Mean Sea Level |
| NABET | : | National Accreditation Board for Education and Training |

EXECUTIVE SUMMARY

M/s Trident Ltd. and Lotus Integrated Texpark Ltd. are operating an integrated Agro-based paper mill and a textile division respectively in Dhaula Complex, Mansa Road, Barnala, Punjab, 148101. In regards to the notice issued by the Punjab Pollution Control Board, Trident Group has approached Cholamandalam MS Risk Services Limited (CMSRSL), a NABET accredited EIA consulting organization to undertake the groundwater quality assessment along the drain located adjacent to the existing plant in Barnala.

The study team had a detailed site reconnaissance and walkthrough along the drain and collected the samples as mentioned above from Dec 3, 2019, to Dec 6, 2019.

To understand the regional scenario of land details in terms of physiography, elevation profile in the region, groundwater flow direction in the aquifer, etc. the published data by the central groundwater board has been collected. Similarly, the regional level soil and groundwater quality have been studied based on the information collected from published technical and scientific documents.

Based on the collected information regarding groundwater survey and exploration data published by CGWB for Barnala block, the groundwater flow direction in the area was evaluated to be towards the west. The land elevation slope in the area is also in line with the flow direction.

The Water level as per the published EIA report in the region ranges from 8.72m to 23.89m bgl during the pre-monsoon period and 9.95 m to 25.41 m bgl during the post-monsoon period. The seasonal fluctuation varies from 1.05 m to 5.32 m in the study area. The long-term fluctuation trend indicates an average fall of 0.65m/year. Barnala block is categorized as an Over Exploited Zone by CGWB.

Based on the details obtained from during the assessment, the utilisation of treated wastewater for irrigation is in the order of 150 m³ per Ha per day which is in line with the loading rates recommended for the soil texture (for loamy and sandy loamy soil type: 110 to 225 m³/Ha/day) as per the notification of MoEF&CC published on 14 Jan, 2016.

For the purpose of this assessment, the soil and groundwater samples have been collected (i) Along the Dhanuala drain (less than 100m from the Drain), (ii) at the upgradient locations to map the baseline background levels and (iii) at the onsite irrigation area. Groundwater samples were collected from the existing private borewells which were drilled up to the deeper aquifer which are in use.

- pH in the groundwater samples collected was reported in the range of 7.1 to 8.0 which is within the acceptable range as per drinking water standards published by IS 10500:2012. Whereas the pH in soil was found to be more alkaline in the entire region.
- TDS in the samples collected from the existing borewells were recorded to be in the range of 524 to 1276 mg/l. The TDS levels in groundwater from the samples collected is a regional phenomenon and is in line with the published regional level data. The groundwater's Salinity as NaCl is in-line with TDS which contributes to 50% to 60%. Similarly, the electrical conductivity in the soil is also high and depicting regional scenario which reflects the equivalent salinity as NaCl in soil.
- Total hardness in the samples collected from the existing borewells was recorded to be in the range of 140 to 595 mg/l.
- Minor traces of nutrients and Heavy metal were found in the groundwater and soil samples collected but the impact is totally insignificant.

1. INTRODUCTION

Groundwater is a valuable natural resource, being both an important source of water supply and a major component of the water cycle. The groundwater quality in the overall country has undergone a tremendous change over the past decade. Groundwater in shallow aquifers generally contains calcium bicarbonate, mixed type and other types including sodium chloride water near the coastal areas. Similarly, the quality in deeper aquifers also varies from place to place and is generally found suitable for common uses. The main groundwater quality problems in India include due to inland salinity, coastal salinity, fluorides, nitrates, heavy metals including arsenic, iron, etc.

Irrigation through tube wells is well-practiced in Punjab due to the limited availability of canal waters (surface water). Such practices were well established due to the initiative and enterprise of the individual farmers and have spread up to more than 75% of the total agricultural land in the state is depending on the groundwater. Punjab is one of the successful states in the country in terms of agricultural aspects based upon the use of groundwater for irrigation. The quality of groundwater in the state has been characterized by Geogenic contamination and anthropogenic contamination including agricultural activities, animal waste disposals, industrial discharges and urban pollution due to municipal wastes.

M/s Trident Ltd. and Lotus Integrated Texpark Ltd. (part of Trident Group companies- hereafter referred to as Trident Group) are operating an integrated Agro-based paper mill and a textile division respectively in Dhaula Complex, Mansa Road, Barnala, Punjab, 148101. In regards to the notice issued by the Punjab Pollution Control Board, Trident Group has approached Cholamandalam MS Risk Services Limited (CMSRSL), a NABET accredited EIA consulting organization to undertake the groundwater quality assessment along the drain located adjacent to the existing plant in Barnala.

2. ABOUT THE CONSULTING ORGANISATION

Cholamandalam MS Risk Services Limited (CMSRSL) is a 50:50 joint venture between USD \$3.14 Billion Murugappa Group, India and Mitsui Sumitomo Insurance Group, Japan and has a technical collaboration with InterRisk, a group company of Mitsui Sumitomo Insurance Group.

Established in the year 1994, Cholamandalam MS Risk Services is a Chennai based Risk Consulting Company offering comprehensive Risk management & Engineering solutions in the field of Safety, Health and Environment. The company has pioneered many innovative and specialized services catering to the needs of Asian & European markets for the last 15 years. The organization has successfully executed more than 2000 projects (Domestic/International) which not only helped its

clients maintain compliance but also optimize their EHS performance and set new benchmarks. Cholamandalam MS Risk Services, an ISO 9001:2008 company, is a certified “Environment Impact Assessment” Consultant organization by NABET EIA Accreditation committee, a constituent of the Quality Council of India. The company has a well-established experience in safety and environmental studies in India and overseas over the last decade.

3. METHODOLOGY ADOPTED FOR THE STUDY

The soil and groundwater quality assessment in the area has been carried out by adopting the below study methodology:

- The groundwater survey and exploration data published by CGWB for the Barnala block are collected and utilized to map the groundwater flow direction in the aquifer.
- Based on the satellite and topographical maps of the region, the natural drains and canals will be mapped.
- A basic review of the wastewater utilization for irrigation has been done.
- A thorough walkthrough along the Dhanuala drain (approx. 10 km stretch) especially where the industrial wastewater and sewage is being discharged.
- The below sampling program has been adopted for the soil and groundwater assessment:
 - Collection of soil samples at 1m depth along the Dhanuala drain covering the upstream to the plant discharges, near the plant discharge and downstream to the plant discharges.
 - Similarly, the groundwater samples are collected from the existing borewells along the Dhanuala drain (not more than 100m away from the drain) covering the upstream to the plant discharges, near the plant discharge and downstream to the plant discharges.
 - Collection of groundwater samples from the existing borewells and the soil samples from the onsite irrigation area where treated wastewater is being utilized.
 - Collection of groundwater samples from the existing borewells and the soil samples at 5 to 6 km away (upgradient as per the aquifer flow direction) to map the background baseline conditions in terms of soil and groundwater quality.
 - All the soil samples were analyzed for the necessary analytes including pH, electrical conductivity, salinity, total organic carbon, available Phosphorous, total nitrogen, heavy metals, total petroleum hydrocarbons, pesticides and lignin. The analytical data is compared with ICAR and other standards for soil quality.

- Similarly, the groundwater samples were analyzed for the necessary analytes such as pH, electrical conductivity, total dissolved solids, salinity, dissolved oxygen (DO), biological oxygen demand (BOD), chemical oxygen demand (COD), total hardness, essential nutrients (NPK), total petroleum hydrocarbons, heavy metals, pesticides etc. the analytical data is compared with CPCB standards for drinking water to check its compliance.
- Based on the analytical data, the contamination profile is developed depicting as two-dimensional contours or graphical representation for the critical parameters. The long term published groundwater quality data is utilized for mapping the regional level quality profile.

The study team had a detailed site reconnaissance and walkthrough along the drain and collected the samples as mentioned above from Dec 3, 2019 to Dec 6, 2019.

4. OVERALL SOIL AND GROUNDWATER SCENARIO IN BARNALA REGION

4.1. Study area and Geographical details

Trident group's paper manufacturing division and integrated textile park are located in Dhanuala Complex, Mansa Road, Barnala District in the state of Punjab. Based on the Central Ground Water Board (CGWB) published block-wise groundwater resource assessment, 2017, all the three blocks in Barnala district is categorized as *overexploited* in terms of groundwater extraction. The geographical boundary of the study is limited to the plant area and area along the drain where the industrial wastewater is discharged. Hence the primary data of soil and groundwater has been collected from the area which is discussed further in detail. The published regional level quality data has also been collected and presented in the report.

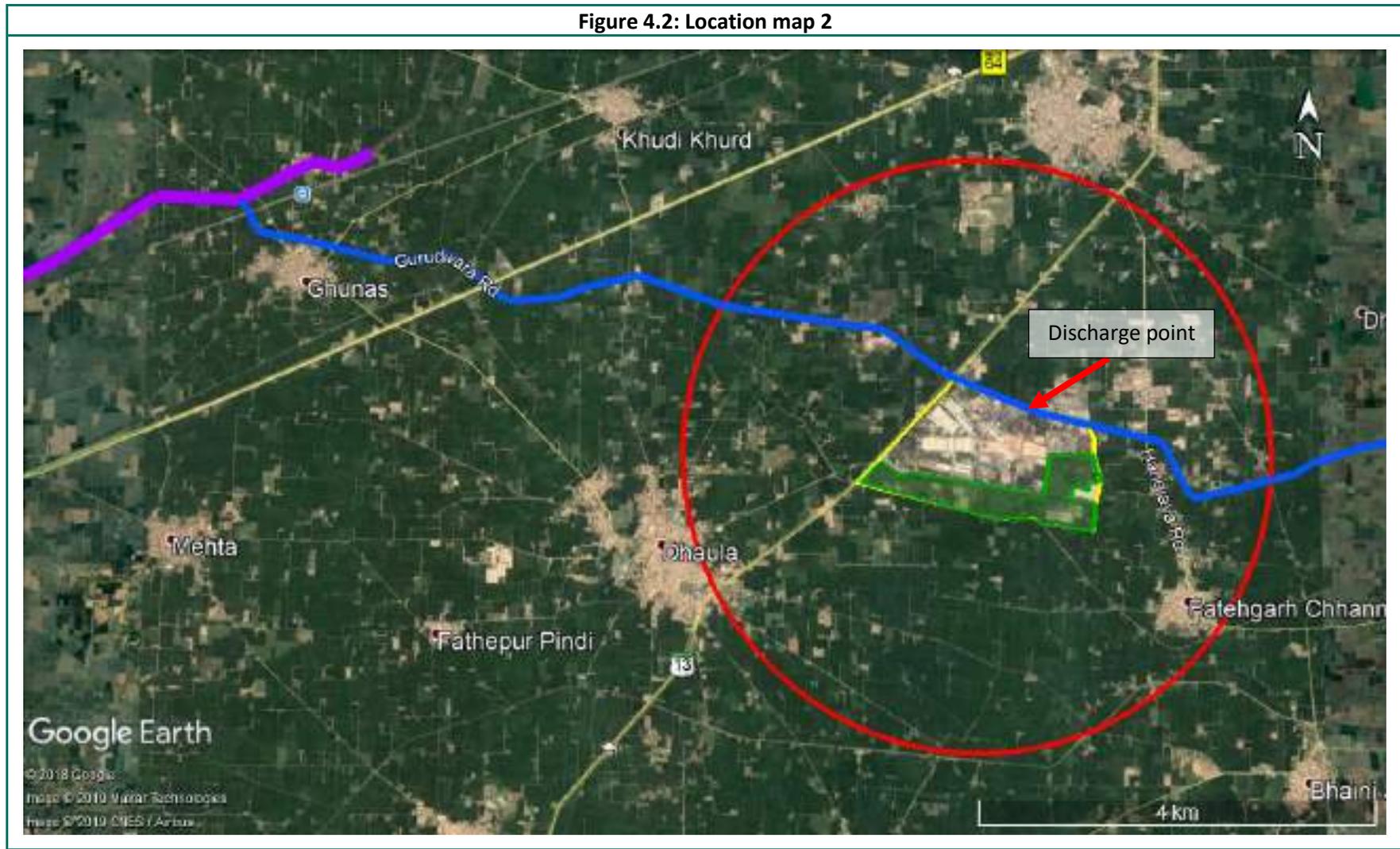
The location map is presented in **Figure 4.1** and **Figure 4.2**. The plant is surrounded by a natural drain named Dhanuala drain (marked as a blue line) along the northern boundary passing from East to West. The Dhanuala drain is joining the Lisarna drain in the west at 8 km downstream from the plant. The plant including the paper division and textile division is spread to an extent of approx. 220 Ha in which approx. 85 Ha is the irrigation area where the treated wastewater (of 12,800 m³/day) is being used. Whereas, the treated wastewater quantity of 8,700 m³/day is being discharged to Dhanuala drain. Thus, utilisation of treated wastewater for irrigation is in the order of 150 m³ per Ha per day which is in line with the loading rates recommended for the soil texture (for loamy and sandy loamy soil type: 110 to 225 m³/Ha/day) as per the notification of MoEF&CC published on 14 Jan, 2016.

Figure 4.1: Location map 1



- Plant Boundary is marked as Yellow line
- Onsite irrigation area is marked as green area
- Adjacent Dhanuala drain is shown as a blue line and the flow direction in the drain is from East to West
-

Figure 4.2: Location map 2



- Plant Boundary is marked as Yellow line. Red circle radius: 3km (from the approx. center of the plant)
- Onsite irrigation area is marked as green area
- Adjacent Dhanuala drain is shown as a blue line. The flow direction in Dhanuala drain is from East to West
- Lisarna drain where the Dhanuala drain is joining is shown as a Purple line. The flow direction in the Lisarna drain is from Northeast to Southwest.

4.2. Land Details

Based on details collected from the published EIA report in 2016, the elevation of the land in the buffer zone (10km from the plant boundary) varies from 196 m above msl in the southwestern to 285 m above msl in the northeast. The elevation of the land in the core zone (5km) varies from 198 m above msl in the southwestern to 250 m above msl in the northeast. Hence it is evident as per the ground elevation that the upgradient is towards east and the downgradient is towards west from the plant site. The Physiography and DEM are shown in [Figure 4.3](#), [Figure 4.4](#) and [Figure 4.5](#) respectively.

According to the Watershed Atlas of India, the study area of 10km forms part of Lower Sutlej Sub-Basin below Bhakra Dam and is shared by SLJL010 watershed. There is no well-defined material drainage system in the area. Two main drains pass through the area – Upper Lisarna Nala in the northwest and Dhanuala Drain in the central part. The drainage with the watershed boundary is presented in [Figure 4.6](#).

The overall land use of a 10 km radius area reveals the dominance of agriculture land (88.55%) followed by built-up land (9.48%), wasteland (1.17%) and water bodies (0.80%). The Level I and Level II land-use landcover maps are presented in [Figure 4.7](#) and [Figure 4.8](#).

Figure 4.3: Physiography of the Study Area (10KM from the plant boundary)

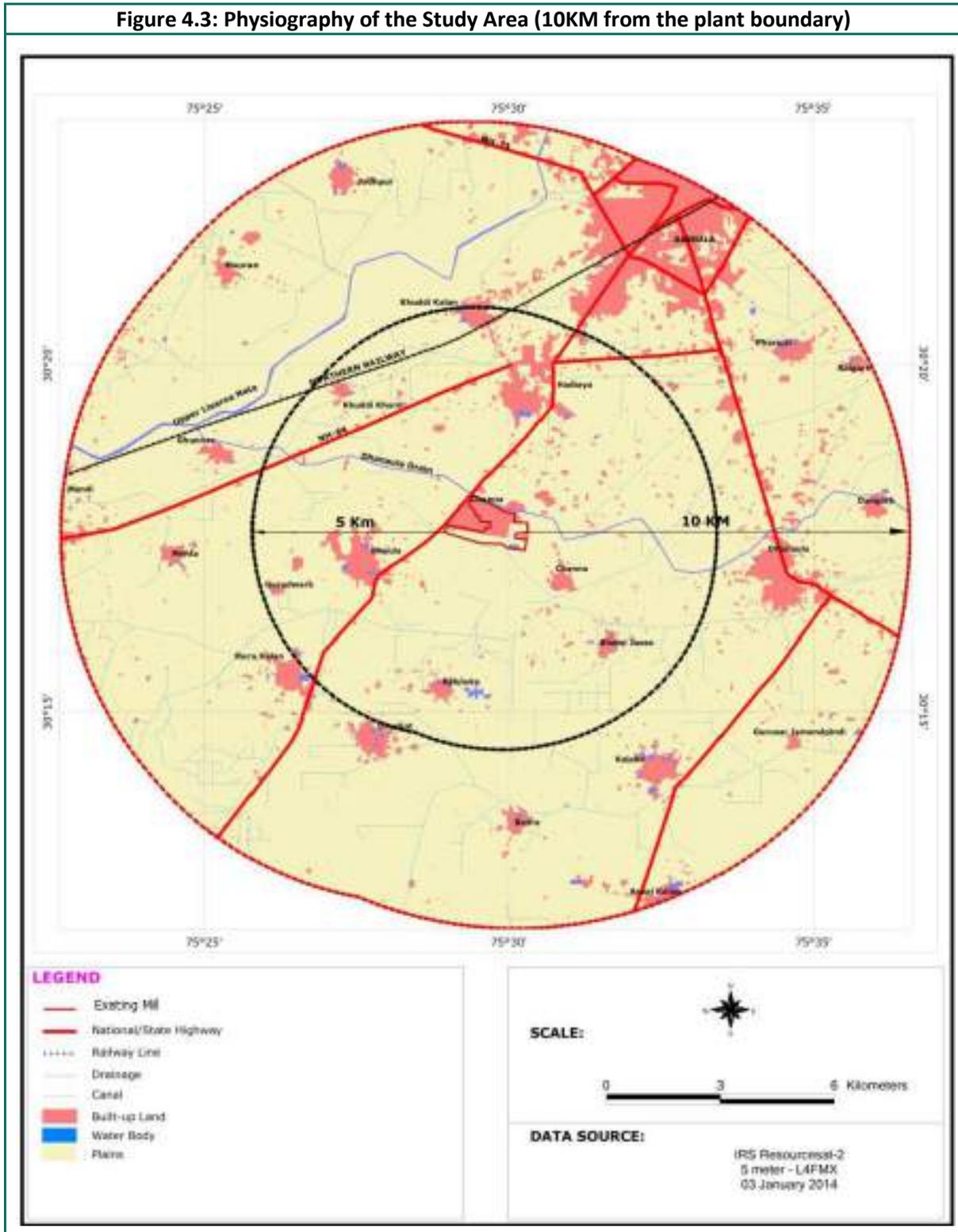


Figure 4.4: Digital Elevation Model of the Study Area (10KM from the plant boundary)

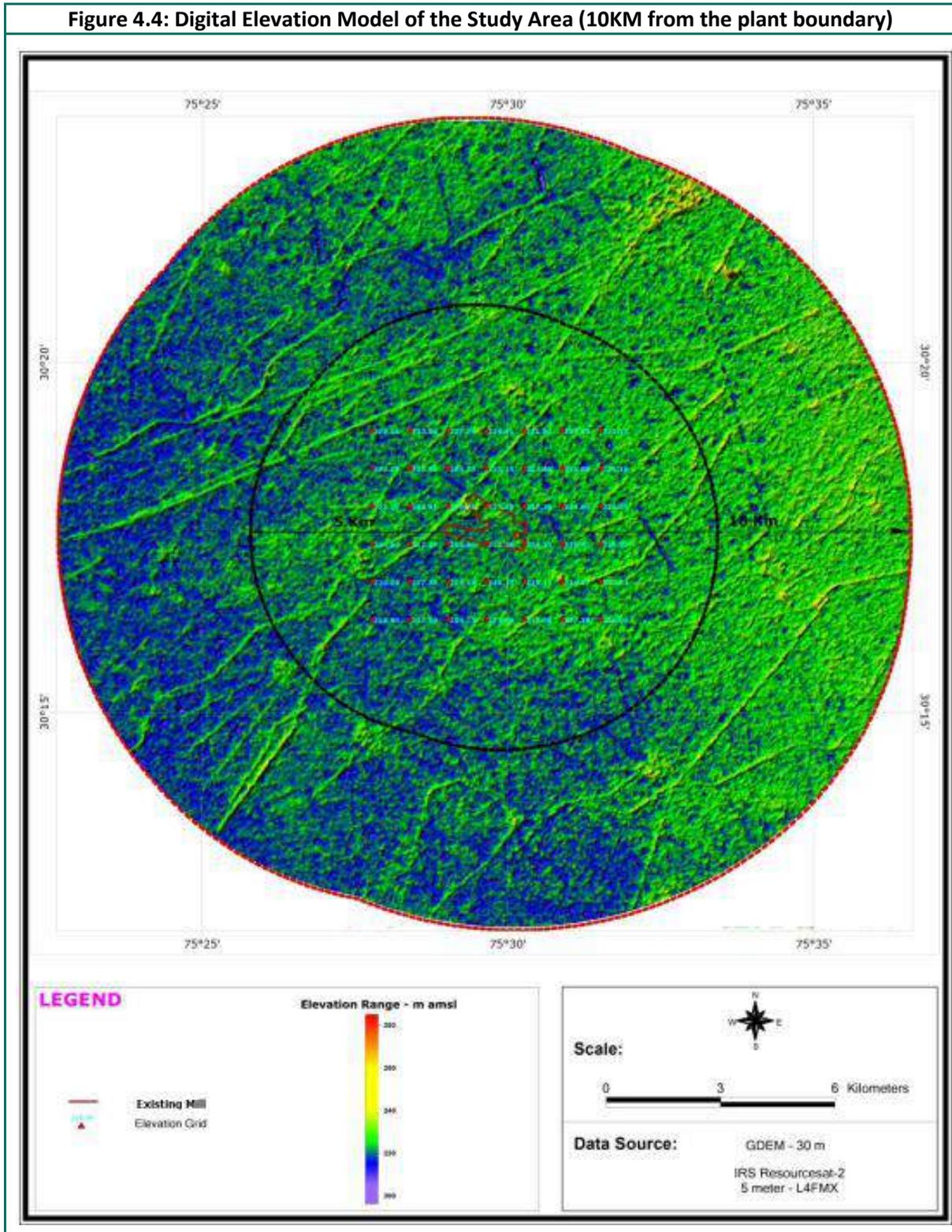


Figure 4.5: Digital Elevation Model of the Study Area (5KM from the plant boundary)

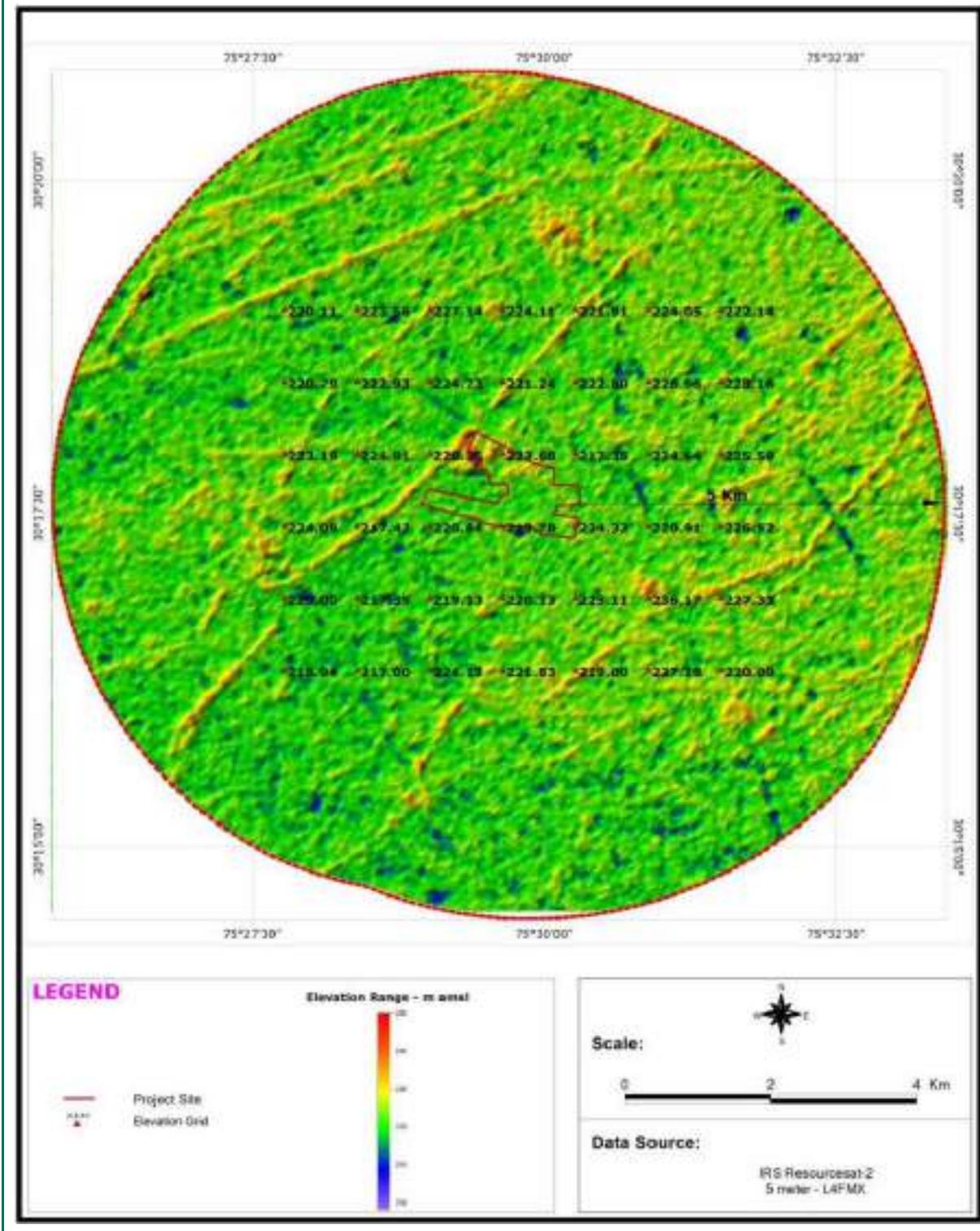


Figure 4.6: Drainage and Water Bodies in the Study Area (10KM from the plant boundary)

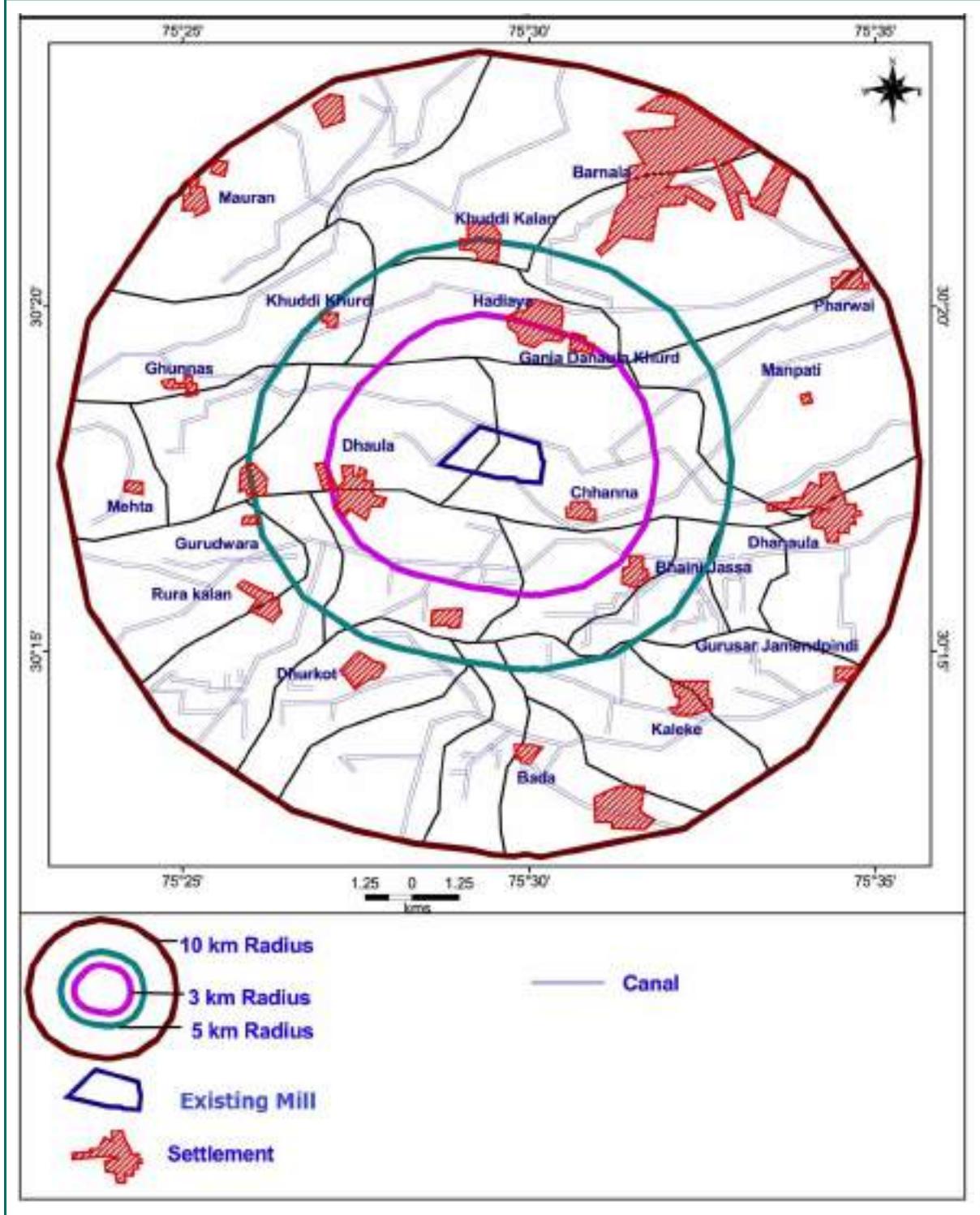


Figure 4.7: Level I Land use and Landcover in the Study Area (10KM from the plant boundary)

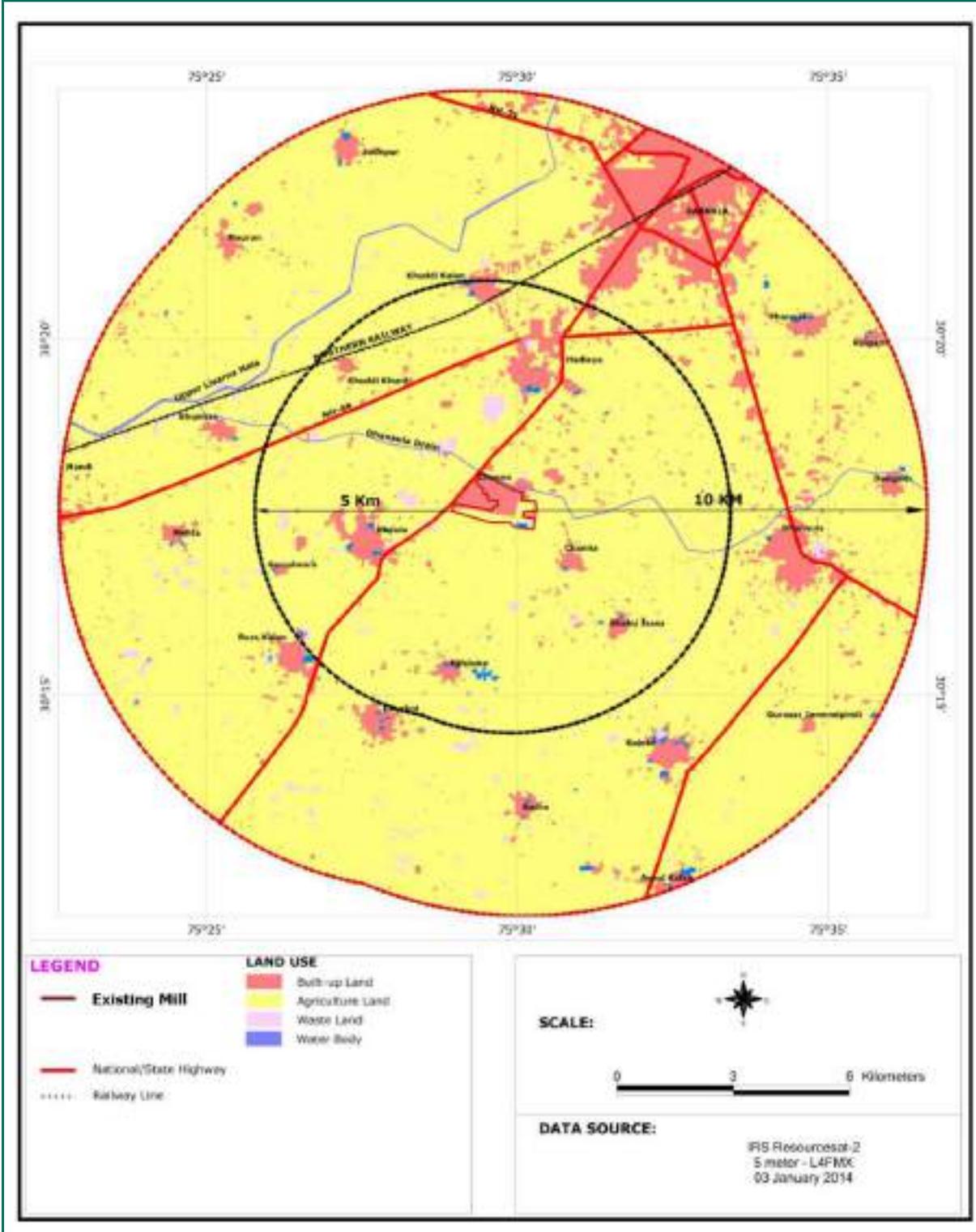
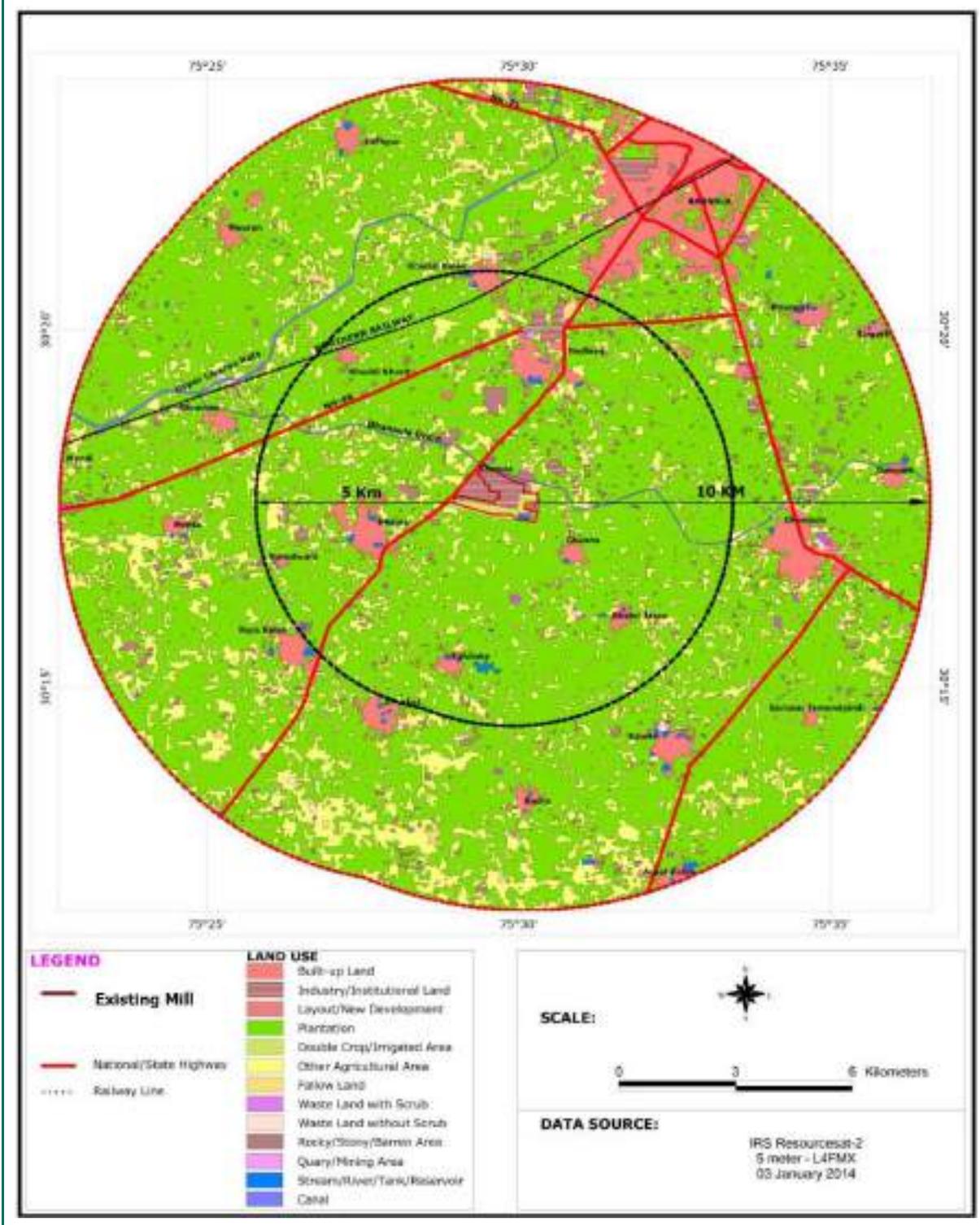


Figure 4.8: Level II Land use and Landcover in the Study Area (10KM from the plant boundary)



4.3. Geology and Soil Type

Based on details collected from the published EIA report in 2016, geologically the area is covered by the Sedimentary formation of the Quaternary area. The region is underlined by Grey micaceous, fine to coarse-grained sand, silt and clay (Active flood plain), Cyclic sequence of grey micaceous sand silt and clay (Older flood plain deposit and Multicyclic sequence of brown to grey silt, clay and kankar and reddish-brown to grey sand (older alluvial plain). The geology of the area (10km radius from the plant boundary) is given in **Figure 4.9**.

The landforms / geomorphic units and structures such as fractures, fissures and faults have been interpreted from the satellite image. All the landform / geomorphic units and structures occurring in the study area are mapped. The geomorphology and structures of the area play a vital role in identifying the groundwater potential zones. Two geomorphic units namely Dune complex, Alluvial plain older – under canal command in the study area. The following geomorphic units have been interpreted.

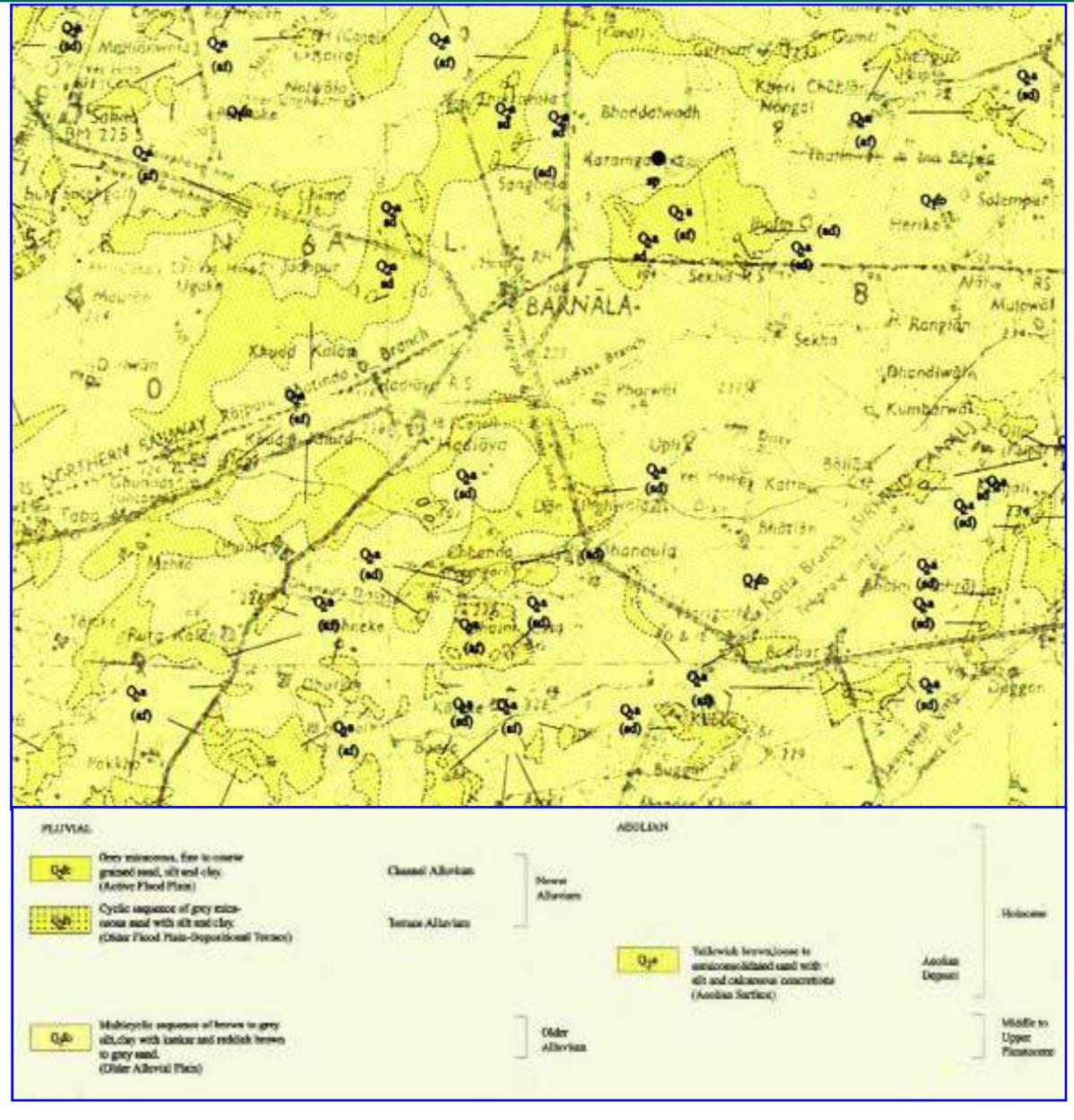
1) Dune Complex

2) Alluvial plain older – under canal command

Dune complex and the Alluvial plain older are good in groundwater occurrence and movement. However, the Dune complex is very good as this unit completely comprised of sand. Alluvial plan older under canal command is clay and silt dominant. The percolation rate is comparatively low in this unit. The existing mill site area is located in Alluvial Plain older under canal command. The Geomorphology of the study area is presented in **Figure 4.10**.

Prominent types of soil in the district are coarse loamy calcareous soils, fine loamy calcareous soils and a thin layer of sandy over loamy soils presents western and southern parts of the district. In the study area more specifically, Coarse loamy over sandy soils, Moderate flooding sandy soils are observed. Soil classification of the area is given in **Figure 4.11**.

Figure 4.9: Geology of the Study Area (10KM from the plant boundary is marked as a circle)



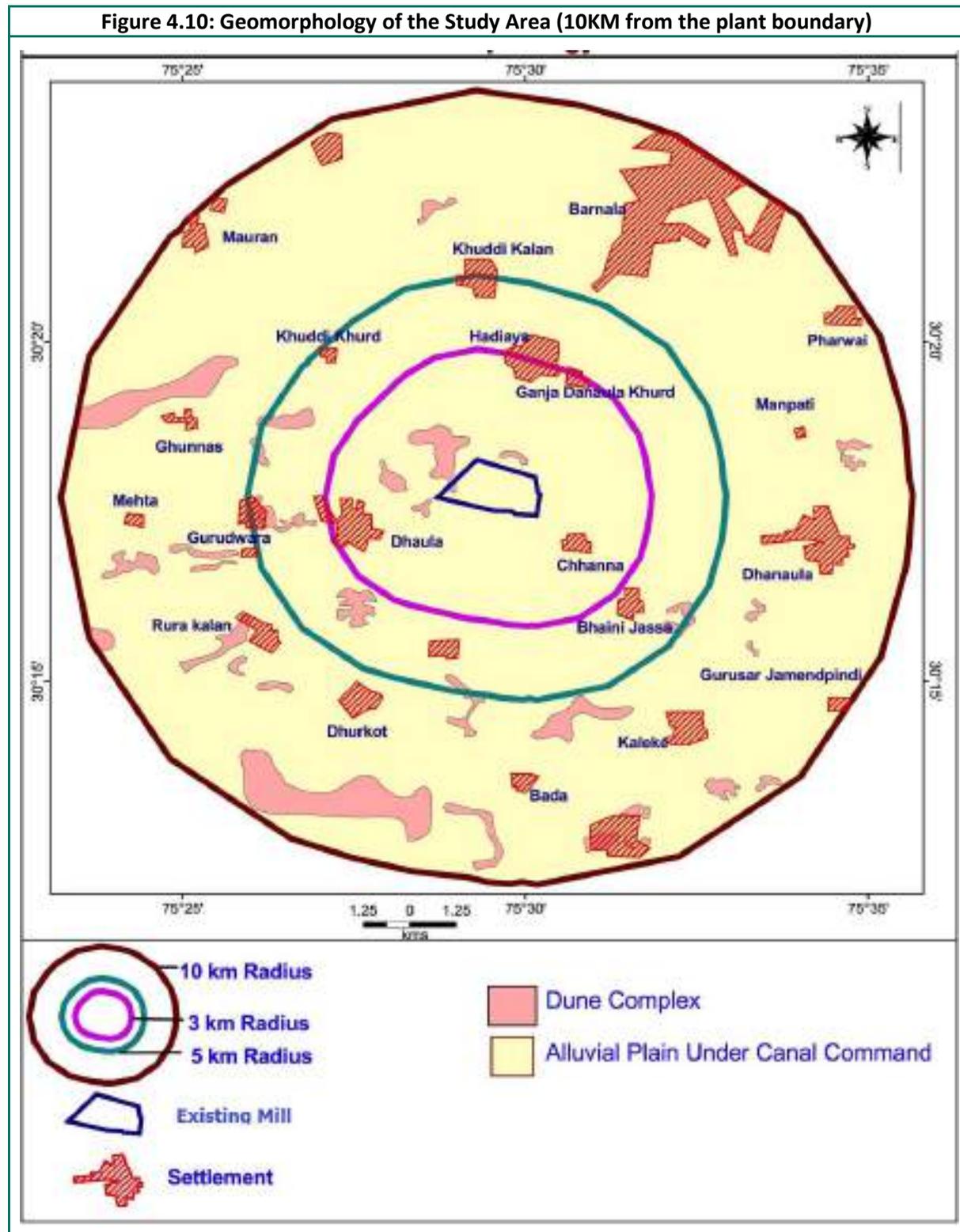
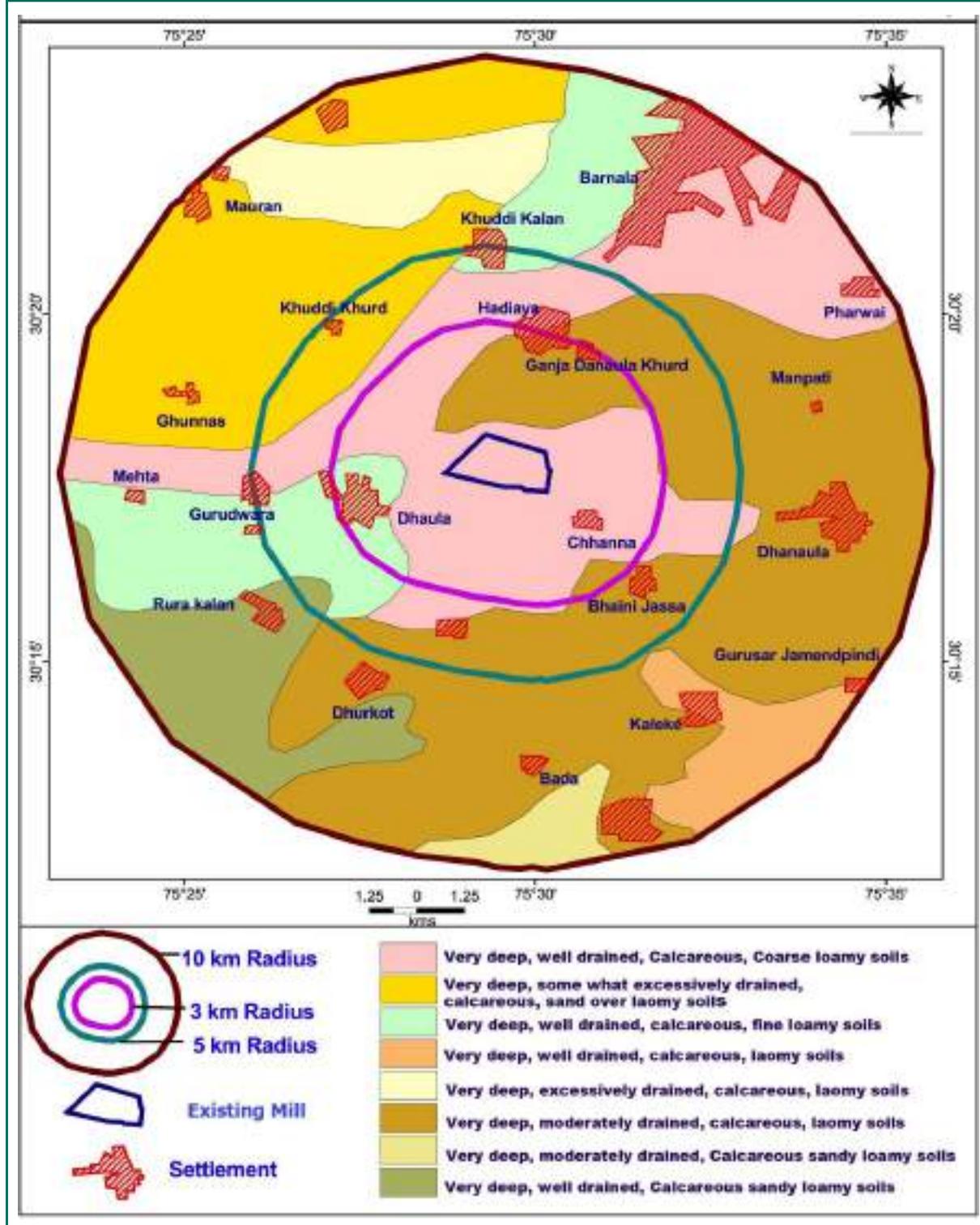


Figure 4.11: Soil classification of the Study Area (10KM from the plant boundary)



4.4. Hydrogeology

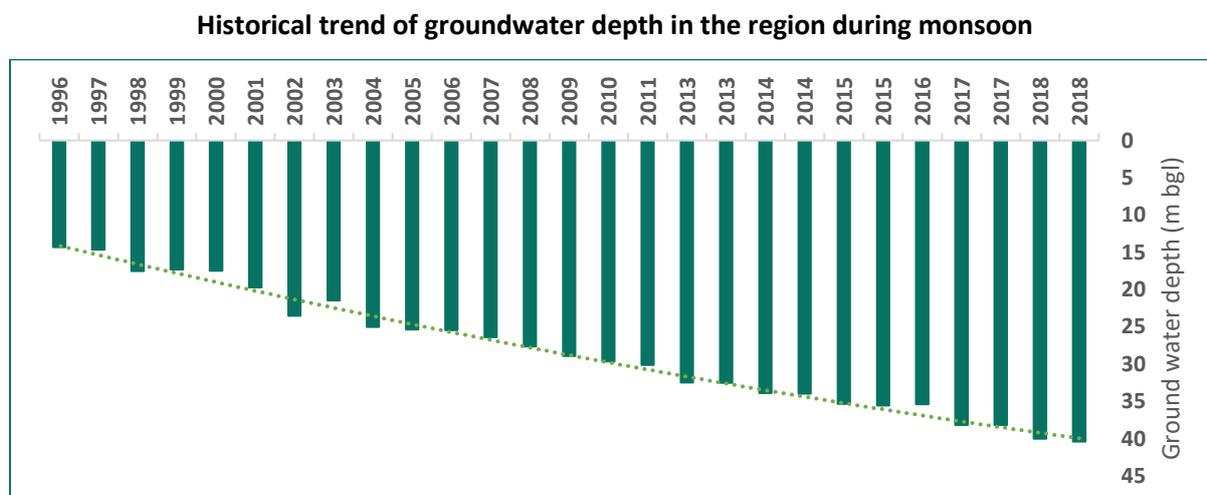
Based on details collected from the published EIA report in 2016, there are around 23 watersheds within the study area of 10km radius from the plant which covers an aerial extent of 328.38 Sq.Km. Watersheds within a 10Km radius from the mill are given in **Figure 4.12**.

The district is occupied by Indo-Gangetic alluvial plain of Quaternary age and falls in Ghaggar sub-basin. The groundwater occurs in alluvium formations comprising fine to coarse sand which forms the potential aquifers. In the shallow aquifers up to 50m bgl groundwater occurs under unconfined /water table conditions whereas in deeper aquifers semi-confined /confined conditions exist.

Water level Behaviour- as per the published EIA report, the depth to the water level in the region ranges from 8.72 m to 23.89 m bgl during the pre-monsoon period and 9.95 m to 25.41m bgl during post-monsoon period. The seasonal fluctuation varies from 1.05 m to 5.32 m in the study area. The long-term fluctuation trend indicates an average fall of 0.65m/year. The hydrogeology map of the district is given in **Figure 4.13**.

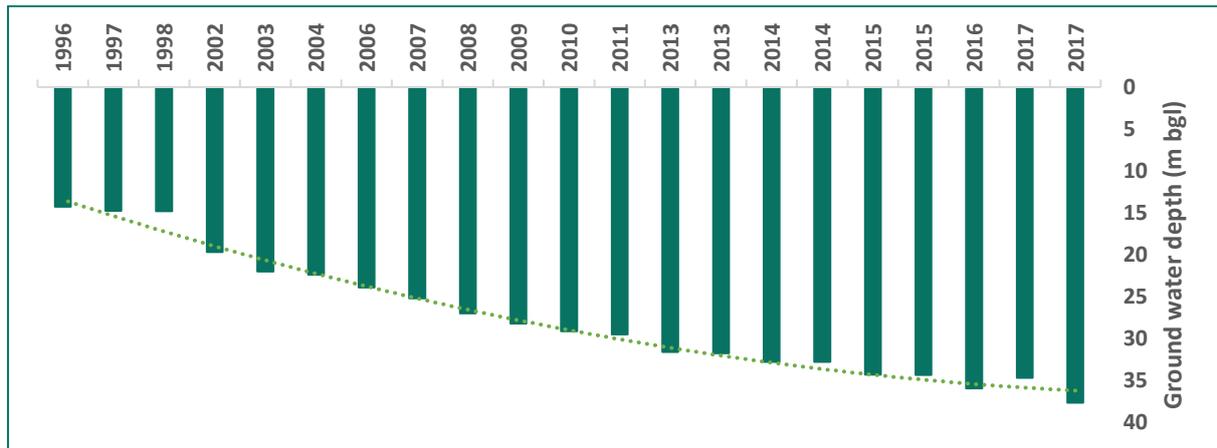
As per the details published by Central Ground Water Board, the Barnala block is categorized as an Over Exploited Zone. The groundwater potential and the categorization of blocks is given in **Figure 4.14**. The regional groundwater levels vary between 15 to 27 m bgl which is in line with the above and the yield of the wells varies between 1000 to 4000 liters per minute. Groundwater level contour is presented in **Figure 4.15**.

The published data on the historical trend of groundwater depth at the nearest CGWB maintained tube well located in Barnala town during monsoon and pre-monsoon is presented below:



Source: Central Ground Water Board

Historical trend of groundwater depth in the region during pre-monsoon



Source: Central Ground Water Board

Over the past 22 years, the groundwater depth has been increased to an extent of approx. 26.1m during monsoon and 23.4m during pre-monsoon which could be due to the extensive utilization of groundwater for irrigation and improved urbanization in the region.

As per the published EIA report in 2016, the soil lithology reveals that the porosity of the soil is 46.82% and the Texture is Sandy clay. The porosity indicates that the infiltration rate of the soil is moderate. The groundwater table contour depicts that the flow is towards the west direction in both the seasons which is in line with the land elevation profile. The hydraulic gradient in the mill site is moderate and has been observed as 4.8 m/Km in pre-monsoon and 3.9 m/Km in post-monsoon. It is also noticed groundwater trough and mound in isolated pockets of the study area which indicates the convergent and divergent flow of groundwater. The groundwater table constructed for the study area is presented in **Figure 16** and **Figure 17**.

Figure 4.12: Water Shed of the Study Area (10KM from the plant boundary)

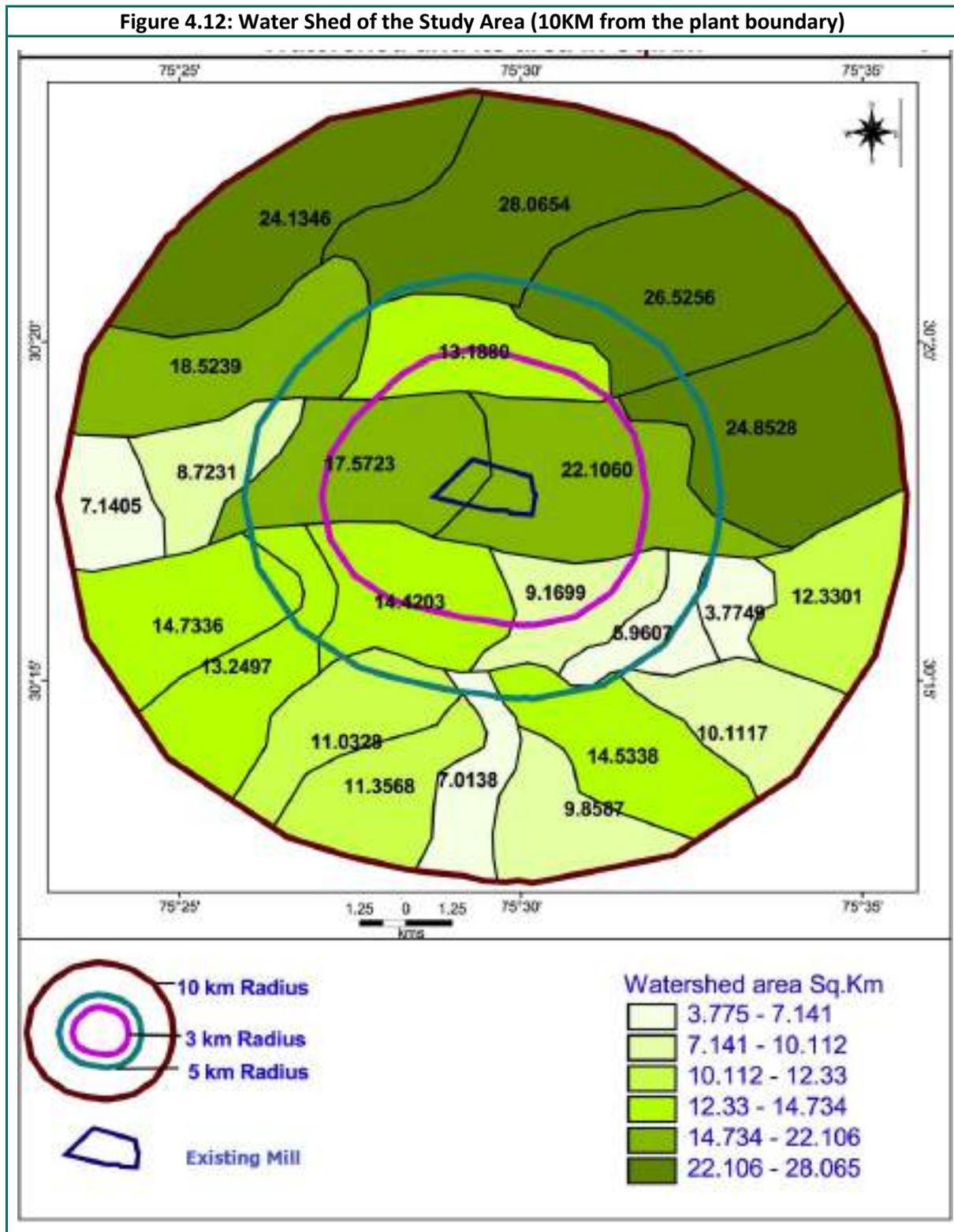


Figure 4.13: Hydrogeology map of the Area

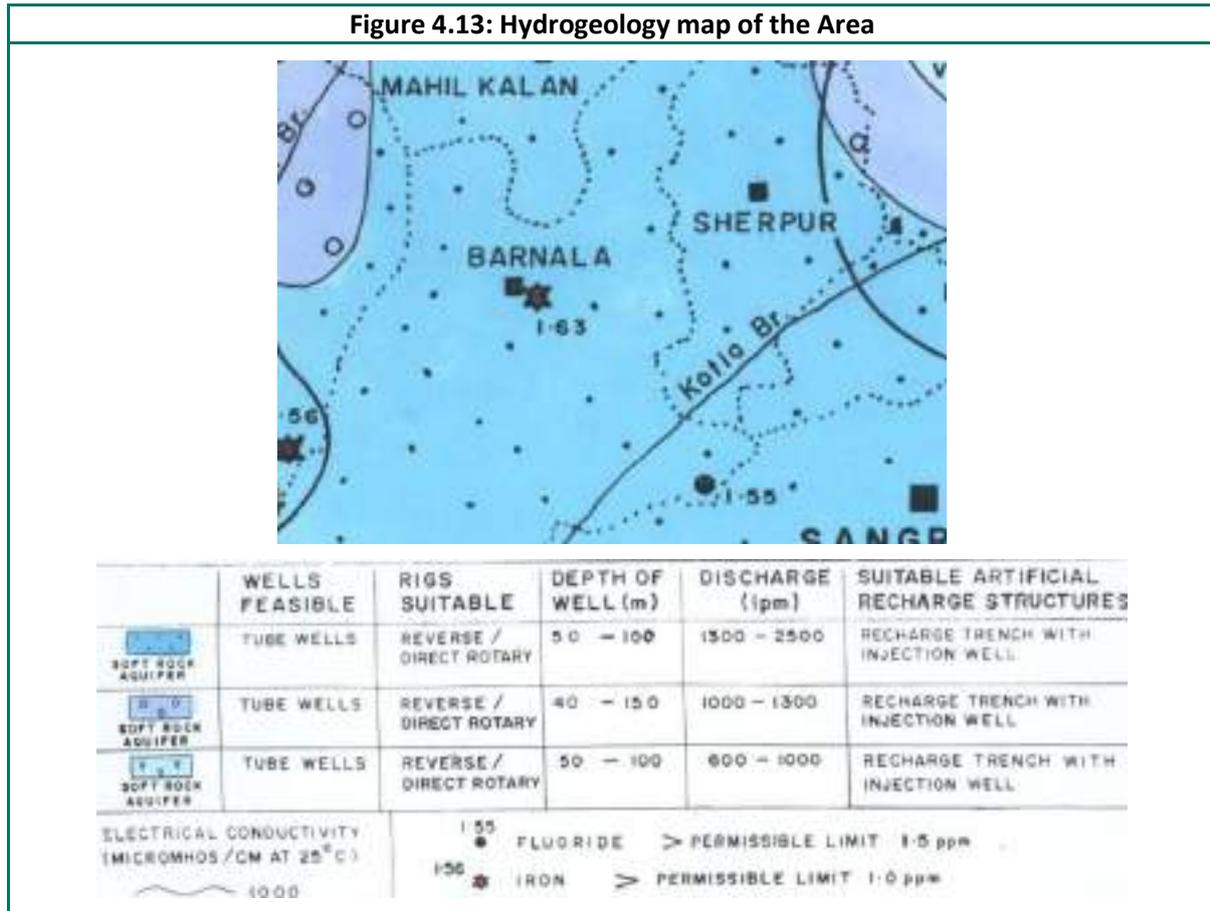


Figure 4.14: Groundwater potential and the categorization of Blocks in the Area

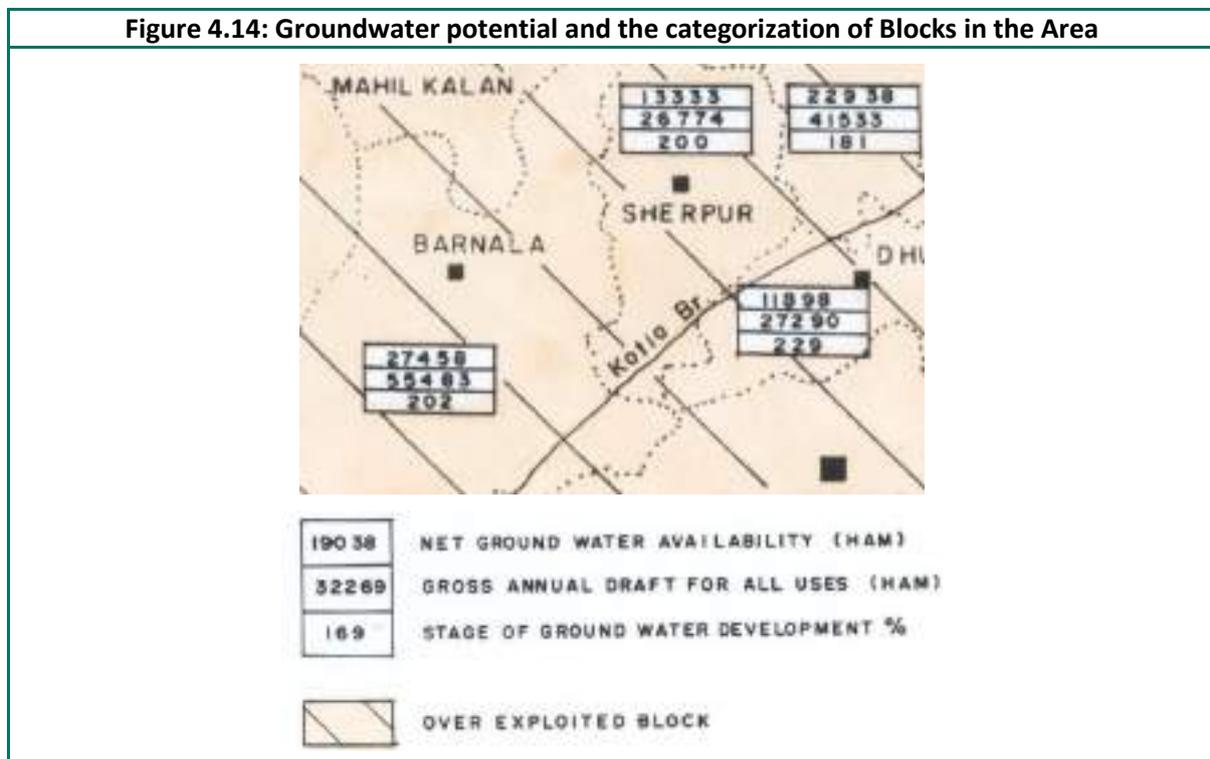


Figure 4.15: Groundwater level contour of the Study Area (10KM from the plant boundary)

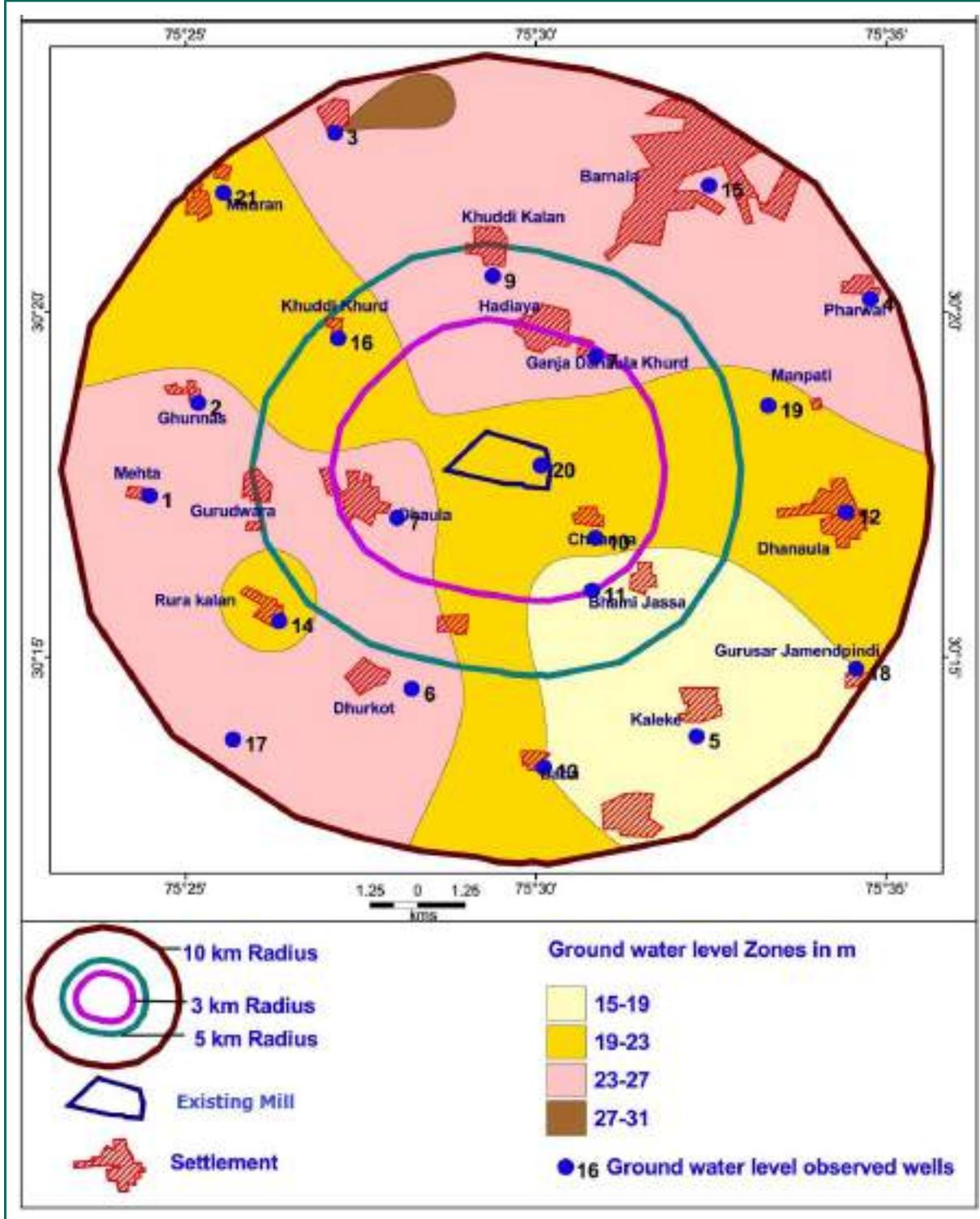


Figure 4.16: Groundwater table and hydraulic gradient during Pre-Monsoon (10KM from the plant boundary)

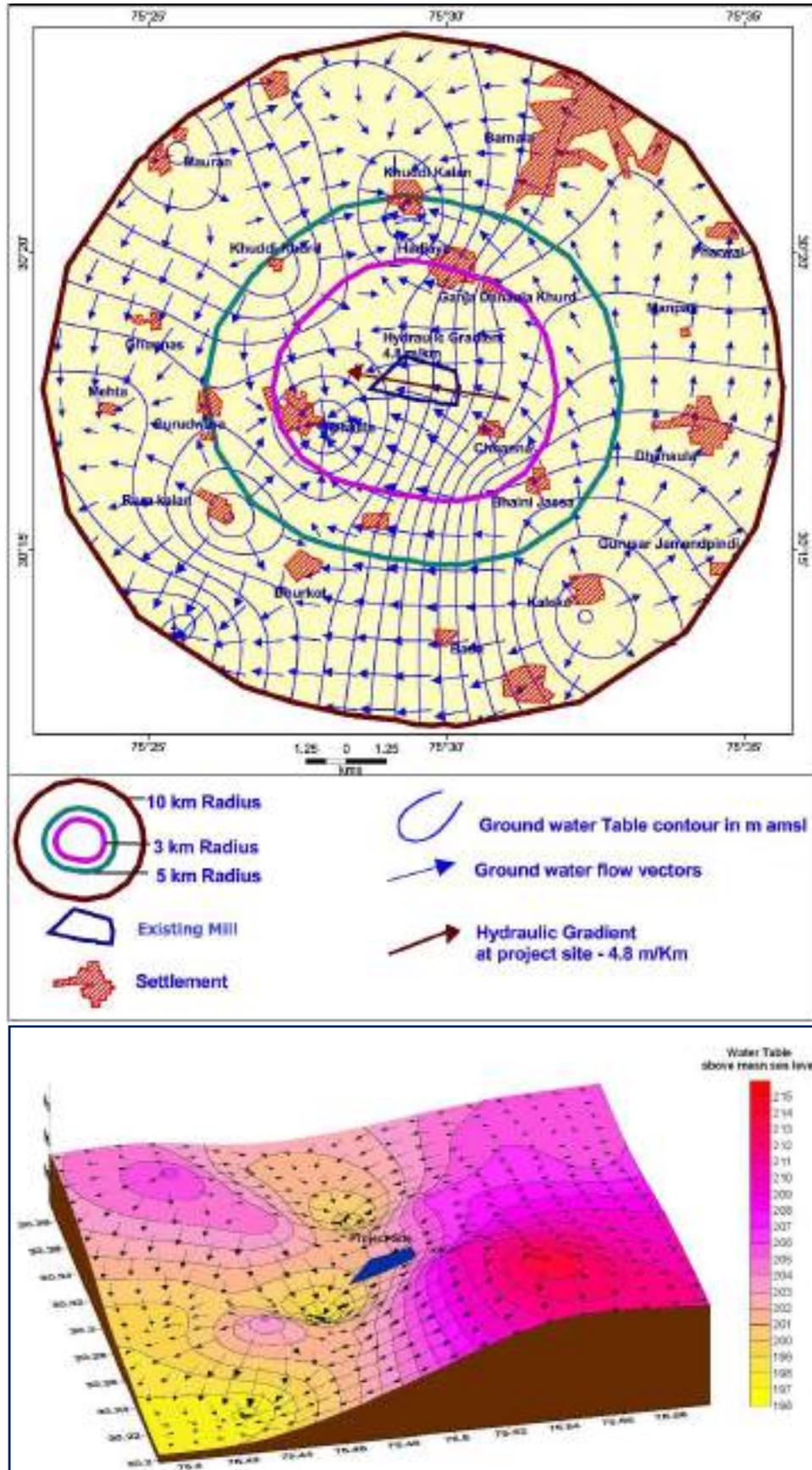
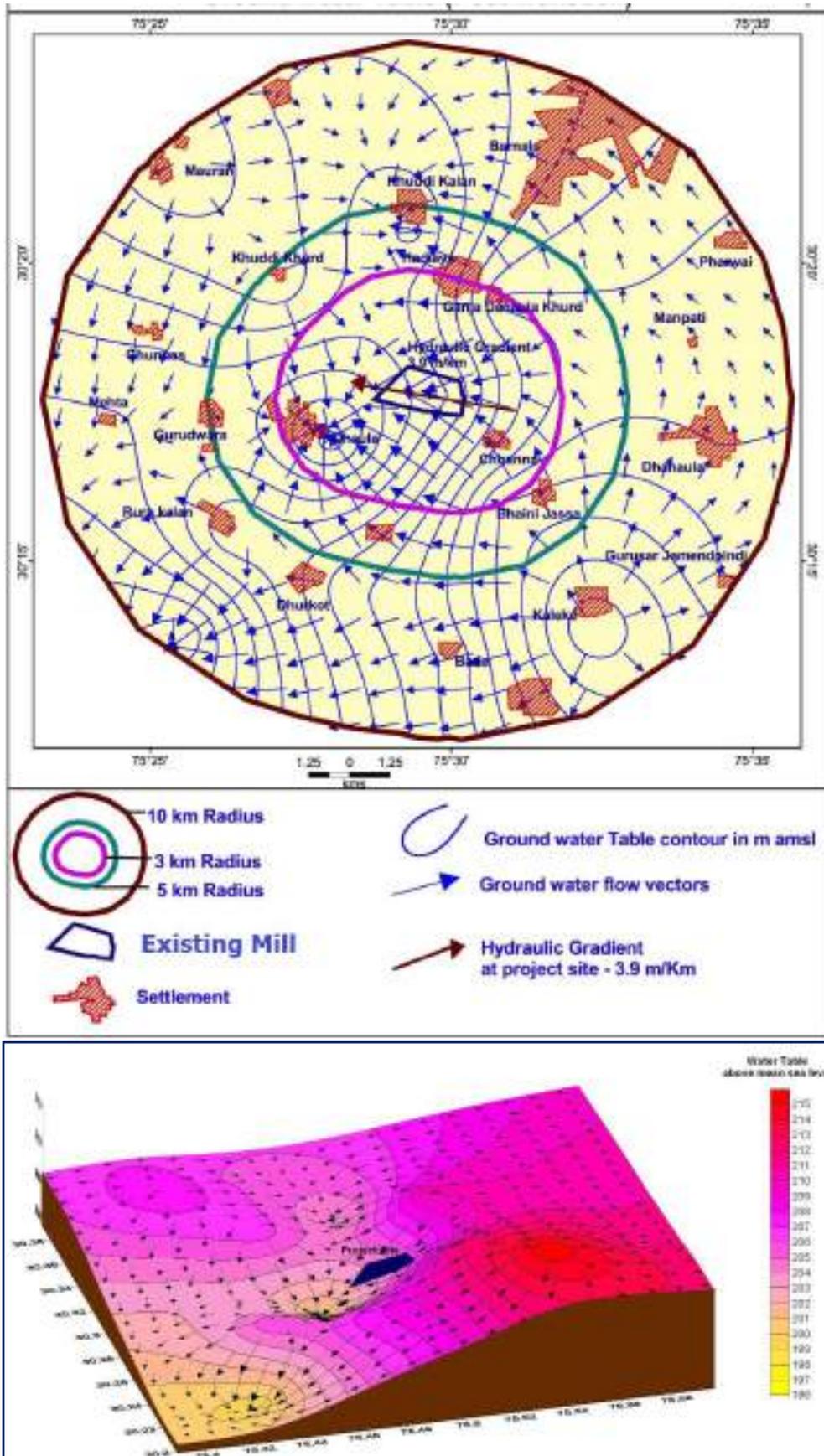


Figure 4.17: Groundwater table and hydraulic gradient during Post-Monsoon (10KM from the plant boundary)



5. SOIL AND GROUNDWATER QUALITY IN THE REGION

5.1. Published Information on Soil and Groundwater Quality in the Region

Based on the quality data published by Central Ground Water Board, Ministry of water resources, Govt. of India, the groundwater in the district is generally alkaline in nature. The chemical quality data from the shallow and deep aquifers indicate that all major cations (Ca, Mg, Na, and K) and anions (CO_3 , HCO_3 , Cl, SO_4) are within the permissible limits set by BIS, 2012. The physical parameters such as electrical conductivity show a wide variation from 827 $\mu\text{S}/\text{cm}$ in the southern and northern part to 1140 $\mu\text{S}/\text{cm}$ in the central part of the district particularly where the existing mill is location. It was also concluded that since all the physical and chemical parameters are below the permissible limit prescribed by BIS and the groundwater in the area is suitable for drinking purposes.

As per the data published by Water Resource Information System under the central water commission, the groundwater quality in the Barnala block (Coordinates of the well: 30.3583, 75.5583) was being recorded during 2015 and 2016. The summary of the quality data is below:

The average electrical conductivity was recorded was about 915 $\mu\text{mhos}/\text{cm}$ which indicates that approx. total dissolved solids concentration is 450 to 500 mg/l. Thus, the regional level of groundwater quality in terms of TDS is moderate. The average pH recorded was about 8.8 which is also slightly exceeding the acceptable limit for drinking water. Hence the tendency to scale is significantly high.

The average *Sodium Adsorption Ratio (SAR)* value of 5.17 and *Residual Sodium Carbonate (RSC)* value of 3.73 has been recorded which indicates the SAR is below the permissible limit of 10 while the RSC value is slightly above the prescribed limit of 2.5 for the agricultural purpose. SAR is an indicator of the suitability of water used for agricultural purposes and also a standard diagnostic parameter for the sodicity hazard of soil. Whereas the RSC is an indicator for alkalinity hazard of soil and it can be inferred that the entire region has the tendency to exhibit higher pH in the soil.

5.2. Soil and Groundwater Quality – Primary Data

For the purpose of this assessment, the soil and groundwater samples have been collected from the below areas. The groundwater samples collected are from the existing private borewells which were drilled up to the deeper aquifer. There are no open wells located in the area.

1. Samples along the Dhanuala drain (less than 100m from the Drain)-

- Upstream with respect to the plant discharge point
- Near the plant discharge point

- Downstream with respect to the plant discharge point

II. Samples to map the baseline background levels

- Upgradient location with respect to the groundwater flow direction (Southeast to the plant)
- Cross gradient location with respect to the groundwater flow direction (Southwest to the plant)

III. Samples within the onsite irrigation area

The location details for the above-mentioned soil and groundwater sampling points are given in **Table 5.1** and **Table 5.2** respectively. The location maps are presented in **Figure 5.1** and **Figure 5.2**.

The analytical data of soil and groundwater samples are summarized and presented in **Table 5.3** and **Table 5.4** respectively. The laboratory test reports are attached as **Annexure** of this report.

Table 5.1: Groundwater Sampling location details

| Code | Location Description | Latitude | Longitude |
|------|---|------------|------------|
| GW1 | Along the drain - Upstream of Dhanuala from plant | 30.295647° | 75.510133° |
| GW2 | Along the drain - Upstream of Dhanuala from plant | 30.293611° | 75.520917° |
| GW3 | Baseline background Location (Upgradient as per groundwater flow direction) | 30.273278° | 75.525667° |
| GW4 | Baseline background Location (Upgradient as per groundwater flow direction) | 30.269889° | 75.529806° |
| GW5 | Along the drain – Near the plant | 30.303547° | 75.491189° |
| GW6 | Along the drain – Downstream of Dhanuala from plant | 30.306944° | 75.480528° |
| GW7 | Along the drain – Downstream of Dhanuala from plant | 30.307833° | 75.474722° |
| GW8 | Along the drain – Downstream of Dhanuala from plant | 30.314167° | 75.429583° |
| GW9 | Along the drain – Downstream of Dhanuala from plant | 30.316199° | 75.418556° |
| GW10 | Baseline background Location (the Nearest village in the South) | 30.283539° | 75.465386° |
| GW11 | Within the onsite irrigation area | 30.297722° | 75.486056° |
| GW12 | Within the onsite irrigation area | 30.290187° | 75.499296° |

Table 5.2: Soil Sampling location details

| Code | Location Description | Latitude | Longitude |
|------|---|------------|------------|
| S1 | Along the drain - Upstream of Dhanuala from plant | 30.297361° | 75.510417° |

| | | | |
|------------|---|------------|------------|
| S2 | Along the drain - Upstream of Dhanuala from plant | 30.293611° | 75.520917° |
| S3 | Baseline background Location (Upgradient as per groundwater flow direction) | 30.273278° | 75.525667° |
| S4 | Baseline background Location (Upgradient as per groundwater flow direction) | 30.269889° | 75.529806° |
| S5 | Along the drain – Near the plant | 30.300357° | 75.497876° |
| S6 | Along the drain – Downstream of Dhanuala from plant | 30.307833° | 75.474722° |
| S7 | Along the drain – Downstream of Dhanuala from plant | 30.313606° | 75.429431° |
| S8 | Along the drain – Downstream of Dhanuala from plant | 30.316173° | 75.418771° |
| S9 | Within the onsite irrigation area | 30.297722° | 75.486053° |
| S10 | Within the onsite irrigation area | 30.295487° | 75.489771° |
| S11 | Within the onsite irrigation area | 30.290632° | 75.499480° |

Figure 5.1: Locations of Groundwater Sampling

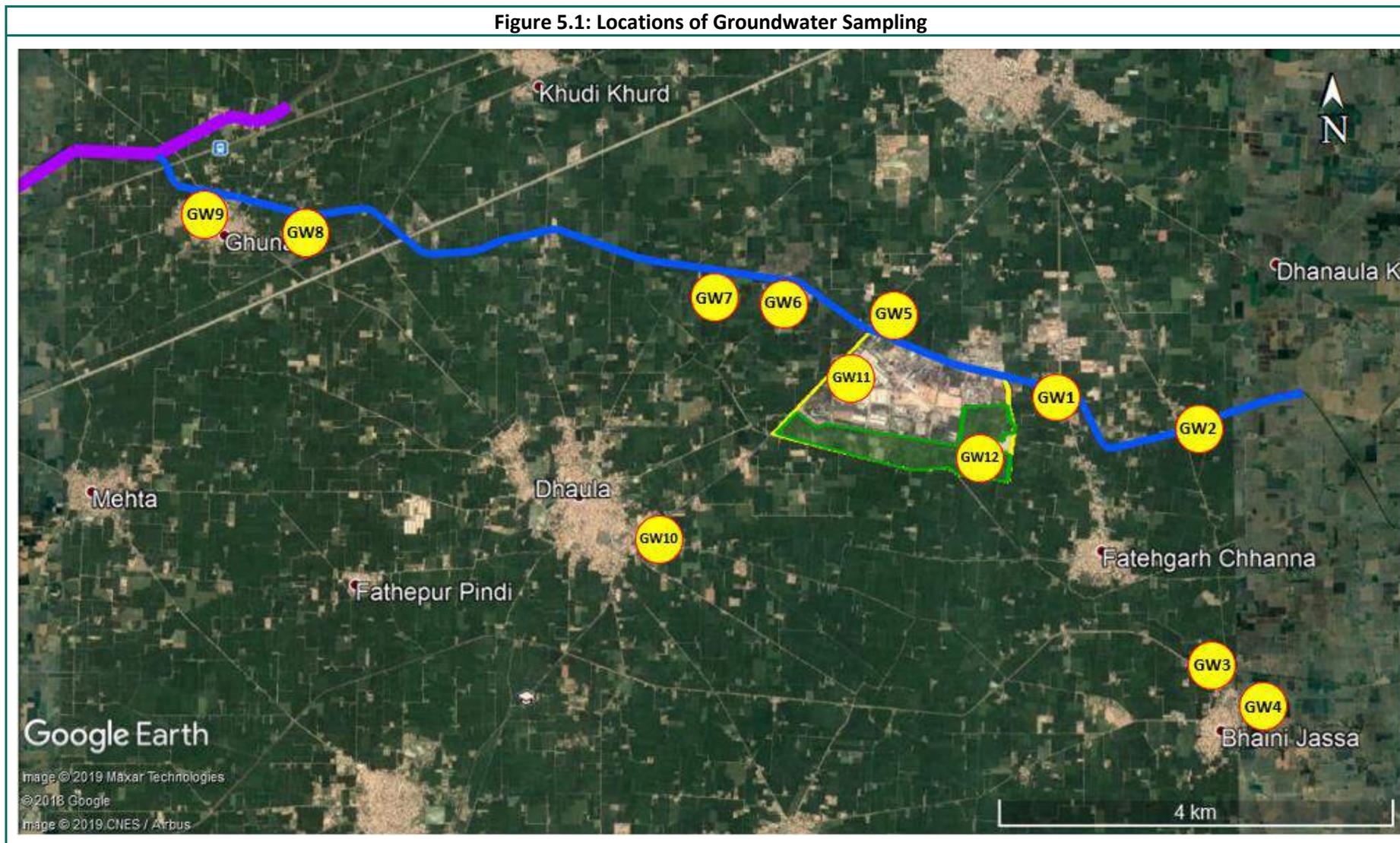


Figure 5.2: Locations of Soil Sampling

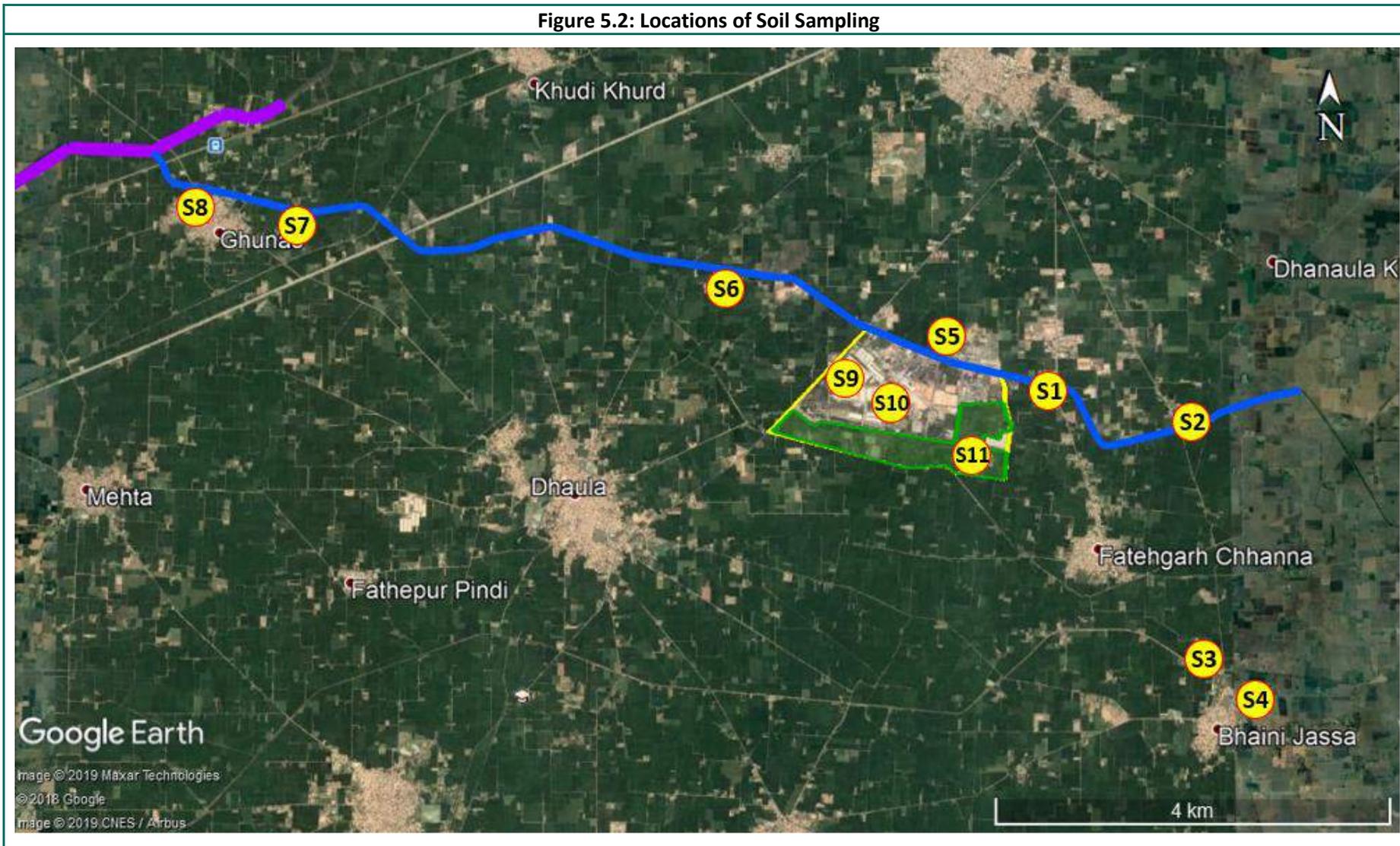


Figure 5.3: Photographs of Soil and Groundwater Sampling



Table 5.3: Summary of Groundwater Analytical results

| S. No. | Parameters | Units | Detection Limit | Along Dhanuala Drain | | | | | | | Within the onsite irrigation area | | Background baseline locations | | | Dutch Standards | |
|--------|--|----------|-----------------|----------------------|--------|----------------|------------|--------|--------|--------|-----------------------------------|--------|-------------------------------|--------|---------------|---------------------|-------|
| | | | | Upstream | | Near the Plant | Downstream | | | GW-11 | GW-12 | GW-3 | GW-4 | GW-10 | Target Values | Intervention Values | |
| | | | | GW-1 | GW-2 | GW-5 | GW-6 | GW-7 | GW-8 | | | | | | | | GW-9 |
| 1 | pH | | | 7.64 | 7.98 | 7.47 | 7.14 | 7.63 | 7.52 | 7.46 | 7.39 | 7.62 | 7.71 | 7.77 | 7.59 | | |
| 2 | Total Dissolved Solids | mg/l | | 874 | 894 | 1060 | 1276 | 876 | 784 | 1062 | 1222 | 942 | 524 | 558 | 676 | | |
| 3 | Electrical Conductivity | µmhos/cm | | 1409 | 1444 | 1710 | 2060 | 1411 | 1265 | 1716 | 1971 | 1523 | 846 | 901 | 1092 | | |
| 4 | Total Hardness (as CaCO ₃) | mg/l | | 260 | 220 | 265 | 595 | 310 | 305 | 375 | 380 | 285 | 145 | 140 | 180 | | |
| 5 | Chemical Oxygen Demand (COD) | mg/l | 4 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | | |
| 6 | BOD at 27°C for 3 days | mg/l | 2 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | | |
| 7 | Dissolved Oxygen | mg/l | | 7.4 | 7.4 | 7.5 | 7.4 | 7.4 | 7.4 | 7.4 | 7.5 | 7.4 | 7.4 | 7.5 | 7.4 | | |
| 8 | Salinity (as NaCl) | mg/l | | 588.05 | 666.83 | 658.7 | 518.42 | 424.39 | 257.68 | 579.03 | 738.5 | 502.16 | 220.83 | 376.36 | 439.13 | | |
| 9 | Nitrogen (as N) | mg/l | 0.3 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | | |
| 10 | Phosphorus (as P) | mg/l | 0.2 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | | |
| 11 | Potassium (as K) | mg/l | | 7.09 | 6.78 | 7.35 | 8.27 | 8.08 | 7.46 | 7.4 | 7.3 | 6.65 | 4.91 | 5.09 | 5.55 | | |
| 12 | Aluminium (as Al) | mg/l | 0.005 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.16 | bdl | bdl | bdl | | |
| 13 | Barium (as Ba) | mg/l | 0.005 | 0.065 | 0.044 | 0.1 | 0.083 | 0.078 | 0.058 | 0.062 | 0.058 | 0.069 | 0.041 | 0.031 | 0.035 | 0.05 | 0.625 |
| 14 | Copper (as Cu) | mg/l | 0.005 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.008 | bdl | bdl | bdl | 0.015 | 0.075 |
| 15 | Iron (as Fe) | mg/l | 0.05 | bdl | bdl | bdl | bdl | bdl | bdl | 0.13 | 0.056 | 0.94 | bdl | bdl | bdl | | |
| 16 | Manganese (as Mn) | mg/l | 0.005 | bdl | bdl | bdl | 0.038 | bdl | bdl | bdl | 0.008 | 0.03 | bdl | bdl | 0.009 | | |
| 17 | Selenium (as Se) | mg/l | 0.005 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.00007 | 0.16 |
| 18 | Silver (as Ag) | mg/l | 0.005 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | - | 0.04 |
| 19 | Zinc (as Zn) | mg/l | 0.02 | bdl | bdl | bdl | bdl | bdl | bdl | 0.025 | bdl | 0.12 | bdl | bdl | bdl | 0.065 | 0.8 |
| 20 | Molybdenum (as Mo) | mg/l | 0.005 | 0.006 | 0.008 | bdl | bdl | 0.011 | bdl | bdl | 0.006 | 0.006 | 0.014 | 0.028 | 0.007 | 0.005 | 0.3 |
| 21 | Cadmium (as Cd) | mg/l | 0.02 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.0004 | 0.006 |
| 22 | Lead (as Pb) | mg/l | 0.005 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.015 | 0.075 |

| | | | | | | | | | | | | | | | | | | |
|----|---|------|--------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|---------|--------|
| 23 | Mercury (as Hg) | mg/l | 0.0005 | <i>bdl</i> | 0.00005 | 0.0003 |
| 24 | Nickel (as Ni) | mg/l | 0.005 | <i>bdl</i> | 0.015 | 0.075 |
| 25 | Total Arsenic (as As) | mg/l | 0.005 | <i>bdl</i> | 0.01 | 0.06 |
| 26 | Total Chromium (as Cr) | mg/l | 0.005 | <i>bdl</i> | 0.001 | 0.03 |
| 27 | Polychlorinated biphenyl (PCB) | µg/l | 0.05 | <i>bdl</i> | 0.01 | 0.01 |
| 28 | Polynuclear Aromatic hydrocarbons (PAH) | µg/l | 0.05 | <i>bdl</i> | | |
| 29 | Residual Pesticides | µg/l | 0.01 | <i>bdl</i> | | |

| | |
|--|--|
| | Detected values |
| | Below detectable levels |
| | Values exceeding the Dutch Target values |
| | Values exceeding the Dutch Intervention values |

Table 5.4: Summary of Soil Analytical results

| S. No. | Parameters | Units | Detection Limit | Along Dhanuala Drain | | | | | | Within the onsite irrigation area | | | Background baseline locations | | Dutch Standards | |
|--------|---|----------|-----------------|----------------------|-------|----------------|------------|-------|-------|-----------------------------------|-------|-------|-------------------------------|---------------|---------------------|-----|
| | | | | Upstream | | Near the Plant | Downstream | | S-9 | S-10 | S-11 | S-3 | S-4 | Target Values | Intervention Values | |
| | | | | S-1 | S-2 | S-5 | S-6 | S-7 | | | | | | | | S-8 |
| 1 | pH | | | 8.72 | 8.86 | 8.39 | 9.23 | 8.49 | 9.05 | 8.98 | 9.25 | 8.95 | 8.62 | 8.68 | | |
| 2 | Electrical conductivity | µmhos/cm | | 220 | 259 | 280 | 119 | 116 | 148 | 108 | 258 | 164 | 279 | 155 | 2000* | |
| 3 | Organic Matter | % wt/wt | | 0.7 | 0.49 | 0.49 | 0.68 | 0.85 | 0.63 | 0.42 | 0.5 | 0.54 | 1.01 | 0.62 | | |
| 4 | Available Phosphorus (as P) | % wt/wt | | 0.083 | 0.101 | 0.054 | 0.063 | 0.08 | 0.091 | 0.069 | 0.033 | 0.054 | 0.083 | 0.056 | | |
| 5 | Total Nitrogen (as N) | % wt/wt | | 0.08 | 0.21 | 0.16 | 0.043 | 0.065 | 0.046 | 0.074 | 0.047 | 0.05 | 0.05 | 0.09 | | |
| 6 | Oil & Grease | % wt/wt | | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | | |
| 7 | Salinity (as NaCl) | % wt/wt | | 0.09 | 0.12 | 0.1 | 0.17 | 0.17 | 0.11 | 0.1 | 0.12 | 0.13 | 0.11 | 0.14 | | |
| 8 | Moisture | % wt/wt | | 13.95 | 13.25 | 10.31 | 9.64 | 13.39 | 10.41 | 1.89 | 5.21 | 2.83 | 10.47 | 11.48 | | |
| 9 | Cadmium (as Cd) | mg/kg | 1 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.8 | 12 |
| 10 | Zinc (as Zn) | mg/kg | 1 | 42.33 | 50.22 | 35.33 | 33.47 | 34.83 | 32.34 | 19.19 | 39.73 | 55.32 | 43.16 | 74.56 | 140 | 720 |
| 11 | Total Chromium (as Cr) | mg/kg | 1 | 22.16 | 30.19 | 21.24 | 18.66 | 17.56 | 16.07 | 10.42 | 14.23 | 13.92 | 21.06 | 19.79 | 100 | 380 |
| 12 | Nickel (as Ni) | mg/kg | 1 | 14.31 | 23.6 | 13.08 | 9.04 | 9.41 | 5.39 | bdl | 6.52 | 6.82 | 13.47 | 12.59 | 35 | 210 |
| 13 | Total Arsenic (as As) | mg/kg | 1 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 29 | 55 |
| 14 | Mercury (as Hg) | mg/kg | 1 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.3 | 10 |
| 15 | Copper (as Cu) | mg/kg | 1 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 36 | 190 |
| 16 | Lead (as Pb) | mg/kg | 1 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 3.95 | 3.95 | bdl | bdl | 85 | 530 |
| 17 | Polychlorinated biphenyl (PCB) | mg/kg | 0.05 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 0.02 | 1 |
| 18 | Polynuclear aromatic hydrocarbons (PAH) | mg/kg | 0.05 | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | bdl | 1 | 40 |

* Acceptable limit as per Indian counsel of Agricultural research

| | |
|--|--|
| | Detected values |
| | Below Detectable Levels (bdl) |
| | Values exceeding the Dutch Target values |
| | Values exceeding the Dutch Intervention values |

5.3. Summary of Groundwater Quality

pH:

pH may not have a direct impact but one of the important water quality parameters as the lower pH water is more likely to be corrosive and higher pH is water tends to scale. Based on the laboratory test results, the pH of the samples collected is in the range of 7.1 to 8.0 which is within the acceptable range as per drinking water standards published by IS 10500:2012.

Total Dissolved Solids:

The palatability of water with a total dissolved solids (TDS) level of less than about 500 mg/l is an acceptable limit for drinking purposes as per Indian standards. Considering the regional scenario of groundwater quality, the TDS levels in the district are likely to exceed 500 mg/l. Based on the laboratory results, the TDS in the samples collected from the existing borewells was recorded to be in the range of 524 to 1276 mg/l. The contour map is presented in **Figure 5.4** and the graphical representation is presented in **Figure 5.5**.

It can be inferred from the analytical data that the background baseline concentrations of TDS are reported in the range of 524 mg/l to 675 mg/l which is in line with the regional groundwater quality. The TDS concentration along the drain is in the range of 784 mg/l to 1276 mg/l and precisely varying from 874 mg/l to 894 mg/l in the upstream of drain from plant discharge, around 1060 mg/l near the plant discharge and from 784 mg/l to 1276 mg/l in the downstream of drain from plant discharge. The TDS concentration ranging from 942 mg/l to 1222 mg/l is recorded from the samples collected within the onsite irrigation. Based on the TDS level mapping, it can be inferred that the TDS levels in the groundwater is a regional phenomenon and is in line with the published regional level data.

Figure 5.4: TDS Concentration Contour Map

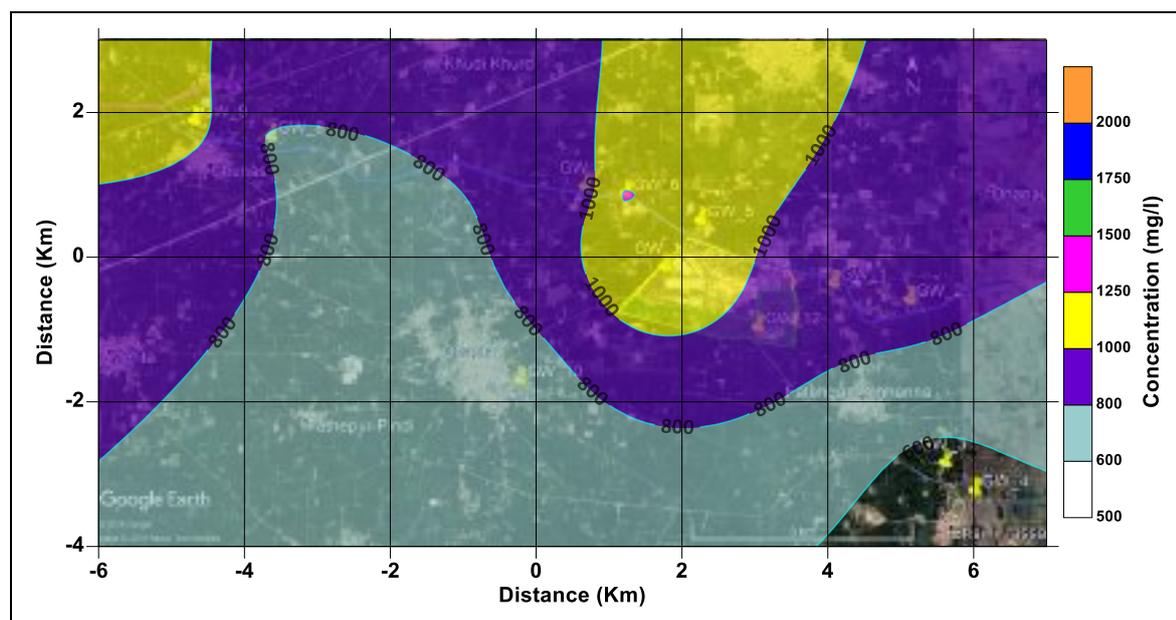
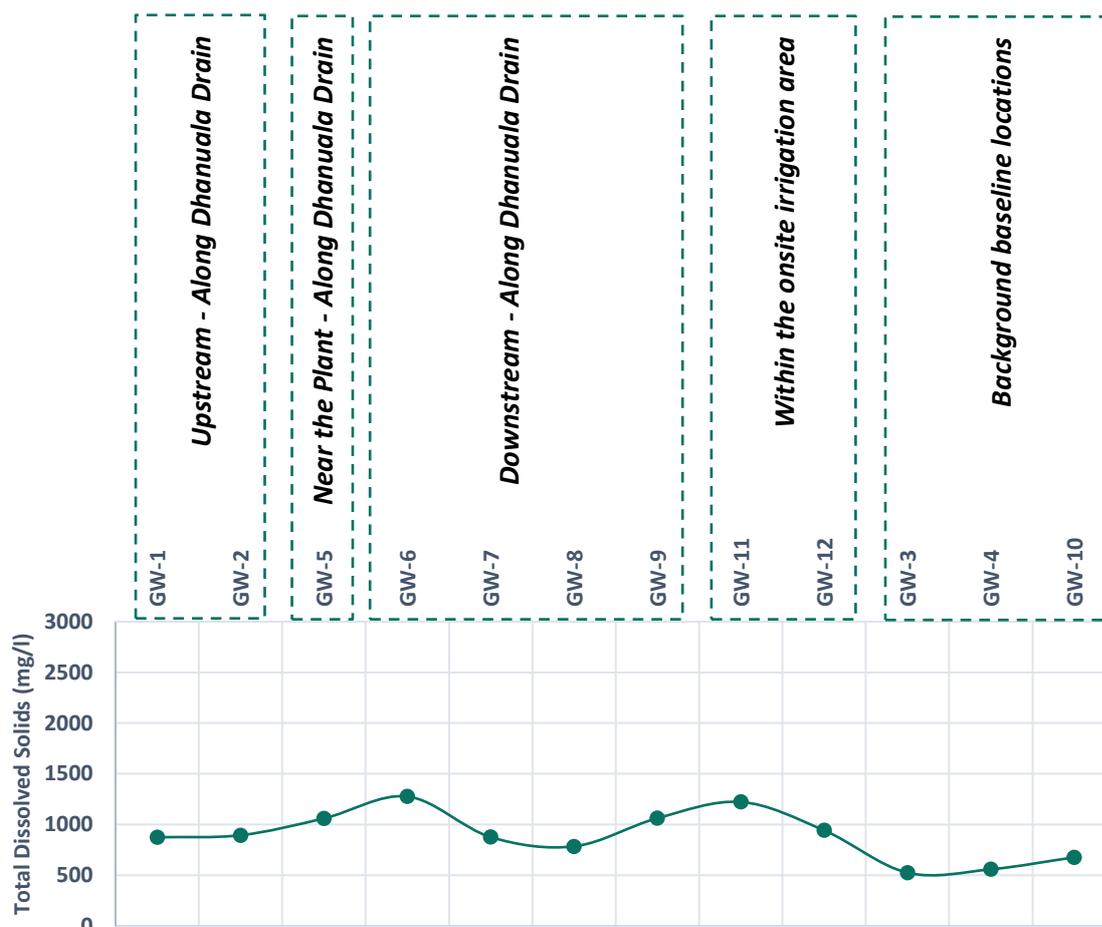


Figure 5.5: TDS Concentration in the Groundwater Samples Collected



Total Hardness:

Depending on the other parameters such as pH and alkalinity, hardness can cause increased scaling and corrosion tendencies. General guidelines for classification of waters are: 0 to 60 mg/l is classified as soft, 60 to 120 mg/l as moderately hard 120 to 180 mg/l as hard and more than 180 mg/l as very hard.

The water with a total hardness of less than 200 mg/l is an acceptable limit for drinking purposes as per Indian standards. Based on the laboratory results, the total hardness in the samples collected from the existing borewells was recorded to be in the range of 140 to 595 mg/l. The contour map is presented in **Figure 5.6** and the graphical representation is presented in **Figure 5.7**.

It can be inferred from the analytical data that the background baseline concentrations of hardness are reported in the range of 140 mg/l to 180 mg/l which is classified as moderately hard to hard but acceptable for drinking purposes as per Indian standards. The hardness concentration along the drain is in the range of 220 mg/l to 595 mg/l and precisely varying from 220 mg/l to 260 mg/l in the upstream of drain from plant discharge, around 265 mg/l near the plant discharge and from 305 mg/l to 595 mg/l in the downstream of drain from plant discharge. The hardness concentrations ranging from 285

mg/l to 380 mg/l are recorded from the samples collected within the onsite irrigation. Based on the hardness level mapping, it can be inferred that hardness is apparent at the plant site and exhibiting to be the local phenomenon and drastically diluted in the surrounding areas.

Figure 5.6: Hardness in Groundwater Contour Map

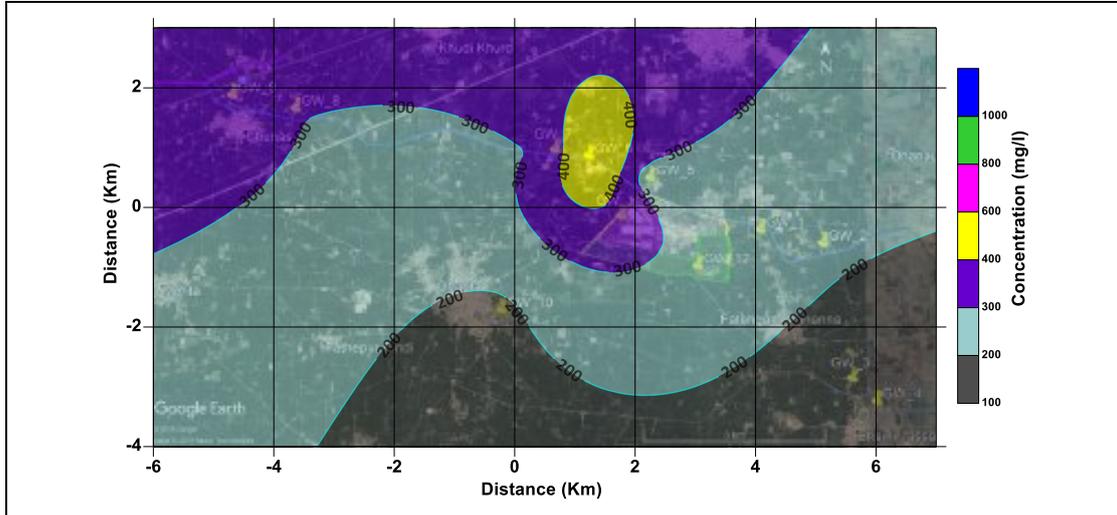
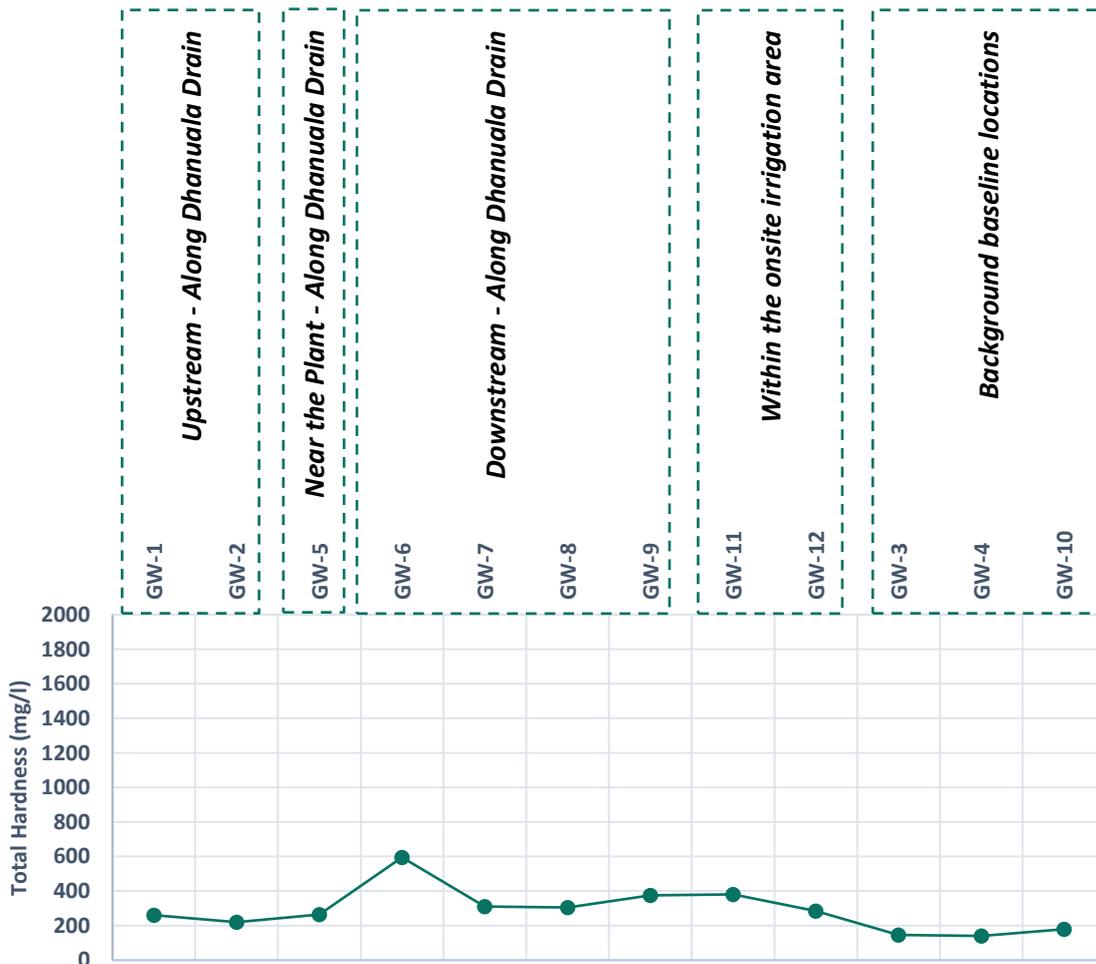


Figure 5.7: Hardness in the Groundwater Samples Collected



COD and BOD:

The chemical oxygen demand and biological oxygen demand concentrations do not exhibit or insignificant or below the detectable limits from the groundwater samples collected. Hence, it is evident that no direct ingress of industrial wastewaters or domestic sewages into the groundwater is envisaged.

Salinity:

In general, the Inland salinity in groundwater is prevalent mainly in the arid and semi-arid regions of various states including Punjab which is also reflected in terms of TDS concentration in the region. The salinity as NaCl concentrations in the groundwater samples collected is in the range of 220 mg/l to 739 mg/l. The contour map is presented in **Figure 5.8** and the graphical representation is presented in **Figure 5.9**.

There are no drinking water standards particularly for Salinity as NaCl. But higher concentrations of salinity in agricultural water impacts on plant growth and yield.

It can be inferred from the analytical data that the background baseline concentrations of salinity as NaCl are reported in the range of 220 mg/l to 439 mg/l. Whereas it is in the range of 258 mg/l to 667 mg/l and precisely varying from 588 mg/l to 667 mg/l in the upstream of drain from plant discharge, around 659 mg/l near the plant discharge and from 257 mg/l to 579 mg/l in the downstream of drain from plant discharge. The salinity as NaCl concentrations ranging from 502 mg/l to 739 mg/l is recorded from the samples collected within the onsite irrigation borewells. Based on the salinity level mapping, it can be inferred that it is a regional phenomenon.

Figure 5.8: Salinity as NaCl in Groundwater Contour Map

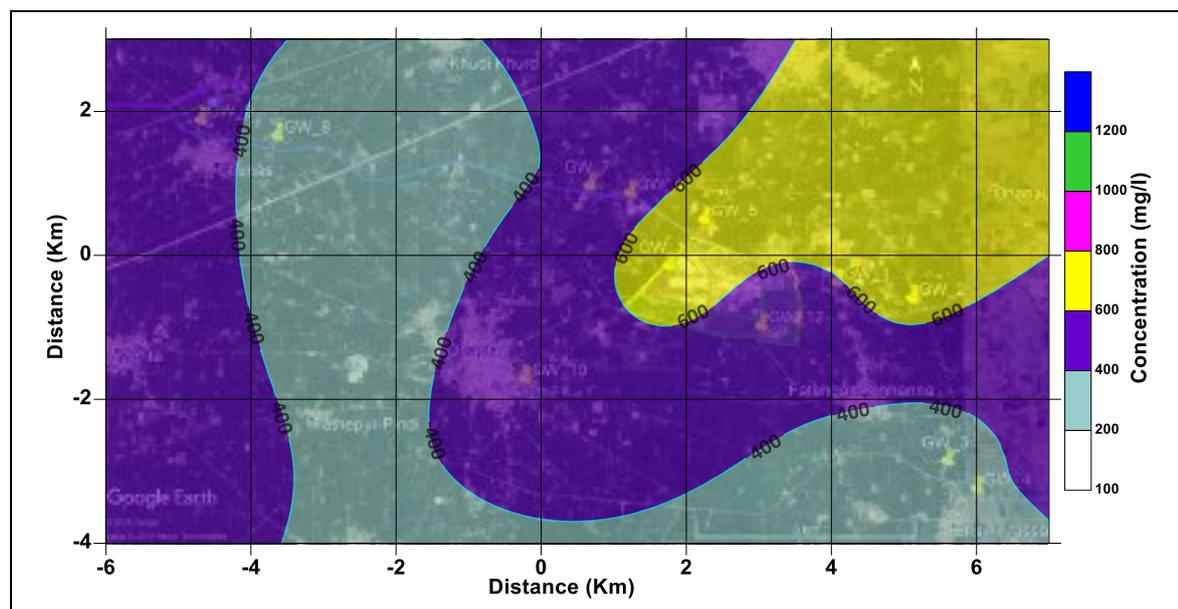
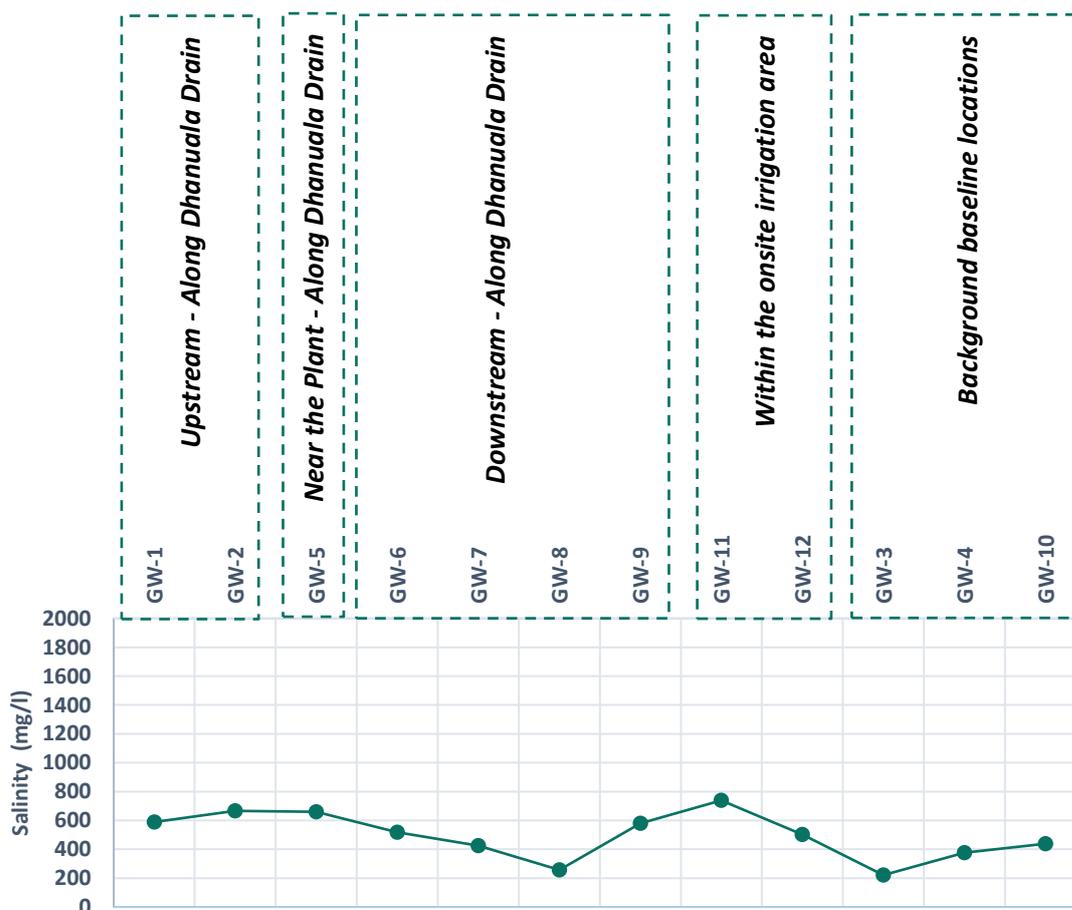


Figure 5.9: Salinity as NaCl in the Groundwater Samples Collected



Nutrients (NPK):

Nitrogen, Phosphorous, and Potassium are three primary nutrients that play an important role in agriculture for plant nutrition. Based on the analytical results of groundwater water samples collected, both nitrogen and phosphorous are concentrations do not exhibit or insignificant or below the detectable limits. Whereas, the potassium is varying in the range of 4.9 mg/l to 8.3 mg/l. There are no specific limiting concentrations for drinking water requirement whereas potassium is one of the primary nutrients for agriculture.

Heavy Metals:

The analytical results of groundwater samples collected and analyzed for Heavy metals concentrations were found to be below the intervention values as per Dutch International Standards. Hence, the groundwater in this region is not contaminated to the level of remediation and no further assessment and delineation of heavy metals contamination in the groundwater are necessarily required. Whereas, comparing the concentrations with the drinking water acceptable limits published by Indian Standards inferences that Aluminium, Iron and Manganese concentrations in the groundwater samples collected from borewell located in onsite irrigation land.

5.3. Summary of Soil Quality

The soil samples collected at various locations mentioned above were analyzed for 18 parameters. The values were then compared with the standard soil classification from the Handbook of Agriculture, Indian Council of Agricultural Research, New Delhi, 2012 to understand the suitability for agriculture and Dutch standards to evaluate the contamination if any.

pH:

The pH of the soil was found to be in the range of 8.39 to 9.25. pH above 7 is normally classified as alkaline and the high values of alkalinity. The pH in soil could be due to nitrogen-rich fertilizers in the soil. However, the alkaline soils could contribute to the growth of the plants rather than the acidic soils.

Electrical Conductivity:

The electrical conductivity of the soil was found to be in the range of 108 $\mu\text{mhos/cm}$ to 280 $\mu\text{mhos/cm}$ which could be a regional phenomenon and may be attributed to the use of fertilizers or could be due to the salinity intrusion in groundwater.

Organic Content & Total Nitrogen:

The organic content in the soil ranged from 0.42% wt/wt to 1.01% wt/wt. This could be due to the potential release of the nitrogen in the soil. The total nitrogen in the soil was found in the range of 0.043% wt/wt to 0.21% wt/wt. A typical agricultural soil would contain 0.10% to 0.15% N and hence the soil can be considered good for crop growth in terms of total nitrogen.

Available Phosphorus:

The available phosphorus in the soil was found between 0.033% wt/wt and 0.101% wt/wt. The cool, wet soils show low values of phosphorus. High values of available phosphorus will induce excessive plant growth due to the supply of essential primary nutrients. The phosphorus values could be increased by the use of phosphorus-rich fertilizers.

Salinity:

The salinity as NaCl in soil was found to be in the range of 0.09% wt/wt to 0.17% wt/wt. Since sodium does not contribute to the growth of the plants, its significance is less. Excessive sodium levels could be attributed to the irrigation waters which is the groundwater in this region.

Moisture:

The moisture in the soil samples was found to be between 1.89 % wt/wt and 13.95 % wt/wt. The higher moisture content implies that the water holding capacity of the soil is more and hence it is good for plant growth.

Zinc:

The values of Zinc ranged from 19.19 mg/kg to 74.56 mg/kg. These were found to be less than the target/Intervention values as per the Dutch Intervention Standards. This shows that the soil is not contaminated and non-toxic. Since the concentration of zinc is found to be moderate, the levels are found to be good for plant growth.

Total Chromium:

The values of Total chromium in the soil was in the range of 10.42 mg/kg to 30.19 mg/kg. This means that the soil is not contaminated. High values of chromium could be toxic.

Nickel:

The values of Nickel were found to be between 5.39 mg/kg and 23.6 mg/kg. The high content of nickel in the soil will cause toxicity. Since the values were found to be less than 35 mg/kg, it acts as a good source of nutrients that could be transferred as an important element in the diet of the human being.

Lead:

The lead values were found to Below Detection Limit (BDL) at all the locations except at the onsite irrigation areas where the traces were found.

All the other parameters such as Oil & grease, Cadmium, Total Arsenic, Mercury, Copper, Polychlorinated biphenyl (PCB) and Polynuclear aromatic hydrocarbons (PAH) were found to be Below Detection Limit (BDL) in all the soil samples collected.

6. SUMMARY AND CONCLUSIONS

The summary of soil and groundwater quality assessment carried out in the area is presented below:

- Based on the collected information regarding groundwater survey and exploration data published by CGWB for Barnala block, the groundwater flow direction in the area was evaluated to be towards the west. The land elevation slope in the area is also in line with the flow direction.
- The Water level as per the published EIA report in the region ranges from 8.72m to 23.89m bgl during the pre-monsoon period and 9.95 m to 25.41 m bgl during the post-monsoon

period. The seasonal fluctuation varies from 1.05 m to 5.32 m in the study area. The long-term fluctuation trend indicates the average fall of 0.65m/year. Barnala block is categorized as an Over Exploited Zone by CGWB.

- Based on the details obtained from during the assessment, the utilisation of treated wastewater for irrigation is in the order of 150 m³ per Ha per day which is in line with the loading rates recommended for the soil texture (for loamy and sandy loamy soil type: 110 to 225 m³/Ha/day) as per the notification of MoEF&CC published on 14 Jan, 2016.
- For the purpose of this assessment, the soil and groundwater samples have been collected (i) Along the Dhanuala drain (less than 100m from the Drain), (ii) at the upgradient locations to map the baseline background levels and (iii) at the onsite irrigation area. Groundwater samples were collected from the existing private borewells which were drilled up to the deeper aquifer which are in use.
 - pH in the groundwater samples collected was reported in the range of 7.1 to 8.0 which is within the acceptable range as per drinking water standards published by IS 10500:2012. Whereas the pH in soil was found to be more alkaline in the entire region.
 - TDS in the samples collected from the existing borewells were recorded to be in the range of 524 to 1276 mg/l. The TDS levels in groundwater from the samples collected is a regional phenomenon and is in line with the published regional level data. The groundwater's Salinity as NaCl is in-line with TDS which contributes to 50% to 60%. Similarly, the electrical conductivity in the soil is also high and depicting regional scenario which reflects the equivalent salinity as NaCl in soil.
 - Total hardness in the samples collected from the existing borewells was recorded to be in the range of 140 to 595 mg/l.
 - Minor traces of nutrients and Heavy metal were found in the groundwater and soil samples collected but the impact is totally insignificant.

Annexure I

Laboratory Analytical Test Reports for Groundwater Samples

Annexure II

Laboratory Analytical Test Reports for Soil Samples

**Guidelines
for
Utilisation of Treated Effluent in Irrigation**



CENTRAL POLLUTION CONTROL BOARD
(Ministry of Environment, Forest & Climate Change)
'Parivesh Bhawan', East Arjun Nagar,
Delhi- 110 032

September 2019

Guidelines for Utilisation of Treated Effluent in Irrigation

1.0 Background

The Hon'ble National Green Tribunal (NGT), Principal Bench, New Delhi, vide order dated 24.05.2019 in the matter of O.A. No. 348/2017, Shailesh Singh Vs Al-Dua Food Processing Pvt. Ltd., issued the following directions to CPCB:

"..We may add that no industry can be permitted to dispose treated effluents on land for irrigation, plantation or horticulture/gardening by prescribing standards applicable without assessment of adequate availability of land and impacts of such disposal on agricultural / crops /plants and the recipient ground water. Impact of precipitation levels also needs consideration while granting such approvals. ZLD needs to be considered with respect to use of effluents in the industrial processes not in terms of its disposal on land or farm. Therefore, the CPCB needs to look into this aspect with the help of experts and issue appropriate guidelines in this regard. This aspect may also be covered in the report to be submitted in the present case..."

CPCB, constituted an Expert Group, comprising of members from Indian Institute of Technology (IIT), Delhi, National Environmental Engineering Research Institute (NEERI), Delhi and Central Pollution Control Board (CPCB), Delhi, to lay down guidelines as directed by the Hon'ble NGT. The Expert Group in its two meetings held on 7.8.2019 and 23.09.2019, discussed the issues thoroughly and finalised the **"Guidelines for Utilisation of Treated Effluent in Irrigation"** as given in the following paragraphs/sections.

2.0 Introduction

Zero Liquid Discharge (ZLD) implies that the industries are not discharging any effluent, either on the land or in the water body or at any other place i.e. recycling the same in the process entirely without releasing any effluent.

ZLD accomplishment may need physical & chemical treatment, followed by biological system to remove organic load. The treated effluents can be then subjected for concentration and evaporation. The concentration method quite often involves the adoption of Reverse Osmosis (RO) and Nano Filtration (NF) methods. The evaporation methods involve drying/evaporation of effluent in multi effect evaporators (MEE).

Adopting ZLD practices may not be feasible in many cases in view of techno-economical reasons. However, the industries should still to be encouraged for

recycling and reuse of waste water as far as practicable in order to minimize the fresh water consumption and discharge of waste water into the environment. The treated waste water of an industry may also be utilised for irrigation. This type of utilisation/application is considered an efficient approach for managing/conserving water resources, compensating water shortages caused by seasonality or the irregular availability of water sources for irrigation throughout the year.

The possible risks of wastewater usage in agriculture may range from changes to physico-chemical and micro-biological properties of soils to impact on human health. In unfavorable economic conditions, the search for alternative irrigation sources, such as the use of untreated or inadequately treated wastewater may result in risk factors. Thus, it is necessary to ensure the beneficial aspects of this practice before application of treated wastewater in irrigation.

3.0 Guidelines for Utilisation of Effluent in Irrigation

- (i) The industry should engage an agricultural scientist or tie-up with an agricultural university or institute for advice on the utilization or the rate of application of the effluent for irrigation considering the agro-climatic conditions.
- (ii) As seasons and the sowing periods of the crops put restrictions on the utilisation of effluent for irrigation, the industry should prepare a comprehensive Irrigation Management Plan (IMP), which should include the following, in consultation with the agricultural scientist or agriculture university/institute and submit to SPCBs/PCCs which should verify the same while issuing Consent to the industry:
 - a. Areas to be covered under irrigation.
 - b. Survey/plot (khasra) numbers of land and their area covered in the scheme.
 - c. Written agreement with the farmers to bring their land under the scheme.
 - d. The quantity of effluent to be used in different periods of the year and crop-wise.
 - e. The treated effluent distribution system and arrangement for low/no demand period.
 - f. Agronomic plan for effective utilisation of land.
- iii. The treated effluent should meet the norms prescribed for irrigation under Environment (Protection) Rules, 1986/Consent. The effluent should also conform to Total Dissolved Solid (TDS)- 2100 mg/l and Sodium Adsorption Ratio (SAR)- preferably less than 18 but not more than 26, depending on soil/crop type, besides meeting any other parameters suggested by agricultural scientist or agricultural university/institute in the IMP.

- iv. Meeting the prescribed norms shall not be the only criteria for use of treated waste water in irrigation, the requirement of water for irrigation will also be a limiting condition and this depends upon various factors, as follow:
- a. **Crop:** This is the main subject determining the water requirement, such as, paddy crops (in general) need more water than trees.
 - b. **Climate:** In tropical and subtropical climate especially in arid regions, irrigation frequency is higher. However, in slightly moist conditions the frequency decreases.
 - c. **Irrigation type:** There are various irrigation types, namely, flood irrigation, sprinkler, rain gun, drip irrigation, etc., which influences the water requirement for irrigation.
 - d. **Soil condition:** The various soil types, such as loam, clay, sandy, clay loam, sandy loam etc., determine the crop types and also alters the irrigation system thus determining the water requirement.
 - e. **Soil permeability:** The soil permeability, which is also known as water conductivity of the soil, determines the water retention capacity. This determines the cultivable crops, which in turn determines the water requirement for irrigation.
 - f. **Total Salt Concentration:** Total salt concentration (for all practical purposes, the total dissolved solids) is one of the most important agricultural water quality parameters. The plant growth, crop yield and quality of produce are affected by the total dissolved salts in the irrigation water.
- v. The command area for effluent utilisation should be as near as feasible to the industry in order to facilitate easy monitoring and effective control. The industry should construct a distribution network of impervious conduits to cover the irrigated area.
- vi. The industry should construct impervious lined storage tank of minimum 15 days capacity for storage of treated effluent during low/no demand, based on the Irrigation Management Plan.
- vii. The treated effluent should be analysed regularly, say after every 15 days. The effluent samples should be taken at the point from where the effluent is discharged for irrigation.
- viii. The physico-chemical characteristics of the soil under irrigation with treated effluent, should be monitored twice in a year to assess conditions in summer and post monsoon seasons, in order to determine the deterioration of soil quality.

- ix. Similarly, the groundwater quality should also be monitored twice in a year. Samples should be collected from the first water bearing strata from existing hand pumps or by installing the same for sampling purpose only. The sampling points should be uniformly spread in the command area and near effluent storage area.
- x. The industry should carry out the analysis of various prescribed effluent/soil/ground water quality parameters from the NABL/EPA/SPCBs/PCCs recognised/accredited laboratories.
- xi. Reports regarding compliance of effluent quality standards and status of soil and ground water quality shall be submitted to SPCBs/PCCs twice in a year, in first week of January and July.
- xii. In case of observation of any deterioration of the soil and groundwater quality parameters in the assessment by agricultural scientist or agricultural university/institute, the application of effluent should be stopped immediately and the industry should inform the SPCB, accordingly. The industry shall be solely responsible for reclaiming the soil and water quality at their cost in the affected area.

Comparative report of analysis results - M/s Trident Ltd. (HTD)

1. Samples collected by Punjab Pollution Control Board :-

| Sr. No. | Date of sampling | Location of sampling | Parameters | | | | | | | | | | | | | |
|---------|------------------|-------------------------------------|------------|---------------------|------------|------------|------------|------------|-----------------|---------------|------------|------------------|--------------|--------------------------|-------------|--------------|
| | | | pH | Colour Pt. Co. Unit | TSS mg/ltr | TDS mg/ltr | COD mg/ltr | BOD mg/ltr | Sulphide mg/ltr | Ammn.N mg/ltr | SAR mg/ltr | Total Cr. mg/ltr | O & G mg/ltr | Phenolic Compound mg/ltr | MLSS mg/ltr | MLVSS mg/ltr |
| 1. | 20.06.2019 | Inlet of ETP | 9.88 | 185 | 190 | 4701 | 962 | 210 | 4.0 | 4.8 | 26 | BDL | 8.0 | BDL | - | - |
| | | Outlet of ETP leading to plantation | 7.75 | 35 | 20 | 1845 | 58 | 14 | BDL | BDL | 18 | BDL | BDL | BDL | - | - |
| | | Outlet of ETP leading to drain | 8.0 | 30 | 18 | 1823 | 54 | 12 | BDL | BDL | 16 | BDL | BDL | BDL | - | - |
| | | Aeration tank -I | - | - | - | - | - | - | - | - | - | - | - | - | 1130 | 680 |
| | | Aeration tank -II | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2. | 28.07.2020 | Inlet of ETP | 10.2 | 380 | 316 | 2620 | 880 | 280 | 5.4 | 11.0 | - | BDL | 6.8 | BDL | - | - |
| | | Outlet of ETP leading to plantation | 8.0 | 30 | 22 | 1643 | 92 | 16 | BDL | 5.4 | 11 | BDL | BDL | BDL | - | - |
| | | Outlet of ETP leading to drain | 7.7 | 35 | 27 | 1697 | 104 | 18 | BDL | 6.8 | 11 | BDL | BDL | BDL | - | - |
| | | Aeration tank -I | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | Aeration tank -II | - | - | - | - | - | - | - | - | - | - | - | - | 3490 | 2760 |
| 3. | 30.04.2021 | Inlet of ETP | 9.4 | 240 | 62 | 1980 | 460 | 110 | 3.2 | 12.8 | - | BDL | 1.2 | BDL | - | - |
| | | Outlet of ETP leading to plantation | 7.8 | 30 | 14 | 1548 | 64 | 13 | BDL | 2.6 | 9.6 | BDL | BDL | BDL | - | - |
| | | Outlet of ETP leading to drain | 7.9 | 30 | 19 | 1560 | 84 | 15 | BDL | 3.0 | 9.7 | BDL | BDL | BDL | - | - |
| | | Aeration tank -I | - | - | - | - | - | - | - | - | - | - | - | - | 3010 | 2260 |
| | | Aeration tank -II | - | - | - | - | - | - | - | - | - | - | - | - | 3460 | 2540 |

3. Sample collected by NIT, Jalandhar :-

| Date | Parameter | Raw Effluent at entry of screen | Equalization tank inlet | %Reduction | Neutralization tank outlet / Aeration tank inlet | Lamella clarifier outlet | %Reduction | Activated Carbon bed outlet | %Reduction | %Overall Reduction |
|---|-----------|---------------------------------|-------------------------|------------|--|--------------------------|------------|-----------------------------|------------|--------------------|
| 11-12/ March/2021 (Sample collected in three shifts after 8 hours) | TDS | 2066.8 | 1697 | 17.91 | 1688 | 1876.7 | -11.17 | 2060 | -9.76 | 0.33 |
| | TSS | 54.3 | 57.3 | -5.5 | 58.3 | 13.7 | 76.5 | 11.0 | 19.7 | 79.74 |
| | COD | 1030.0 | 1155.43 | -11.74 | 1040 | 72.5 | 93.02 | 79.45 | -9.58 | 92.31 |
| | BOD | 401.0 | 370.0 | 7.73 | 294.0 | 19.0 | 93.53 | 12.6 | 33.68 | 96.85 |

Note :- All values are in mg/l while reduction is in percentage

| | | | | | | | | | |
|----|------------|-------------------------------------|------|-----|------|-----|------|------|------|
| 3. | 10.06.2020 | Inlet of ETP | 6.3 | 428 | 904 | 250 | 7.4 | - | - |
| | | Outlet of ETP leading to plantation | 6.91 | 42 | 186 | 21 | 6.6 | - | - |
| | | Outlet of ETP leading to drain | 7.0 | 49 | 182 | 20 | 6.4 | - | - |
| | | Aeration tank -I | - | - | - | - | - | 4530 | 2950 |
| | | Aeration tank -II | - | - | - | - | - | - | - |
| 4. | 17.09.2020 | Inlet of ETP | 8.9 | 502 | 1260 | 280 | - | - | - |
| | | Outlet of ETP leading to plantation | 7.6 | 25 | 204 | 23 | 6.8 | - | - |
| | | Outlet of ETP leading to drain | 7.9 | 22 | 192 | 21 | 6.4 | - | - |
| | | Aeration tank -I | - | - | - | - | - | 3140 | 2650 |
| | | Aeration tank -II | - | - | - | - | - | 2980 | 2460 |
| 5. | 10.12.2020 | Inlet of ETP | 7.1 | 837 | 884 | 212 | - | - | - |
| | | Outlet of ETP leading to plantation | 7.7 | 17 | 204 | 26 | 10.7 | - | - |
| | | Outlet of ETP leading to drain | 7.7 | 47 | 141 | 19 | 10.6 | - | - |

| | | | | | | | | | |
|----|------------|-------------------------------------|-----|-----|-----|-----|------|------|------|
| | | Aeration tank -I | - | - | - | - | - | 2845 | 2080 |
| | | Aeration tank -II | - | - | - | - | - | - | - |
| 6. | 30.04.2021 | Inlet of ETP | 6.6 | 146 | 680 | 118 | - | - | - |
| | | Outlet of ETP leading to plantation | 7.6 | 33 | 130 | 16 | 7.8 | - | - |
| | | Outlet of ETP leading to drain | 7.7 | 48 | 138 | 18 | 8.2 | - | - |
| | | Aeration tank -I | - | - | - | - | - | 2890 | 2240 |
| | | Aeration tank -II | - | - | - | - | - | 3250 | 2380 |
| 7. | 29.09.2021 | Inlet of ETP | 7.1 | 247 | 610 | 150 | - | - | - |
| | | Outlet of ETP leading to plantation | 7.5 | 38 | 158 | 22 | 9.10 | - | - |
| | | Outlet of ETP leading to drain | 7.6 | 41 | 164 | 23 | 7.29 | - | - |
| | | Aeration tank -I | - | - | - | - | - | 2290 | 1600 |
| | | Aeration tank -II | - | - | - | - | - | 2820 | 2080 |

2. Sample collected by Joint Committee :-

| Sr. No. | Date of sampling | Location of sampling | Parameters | | | | | | | | | | |
|---------|------------------|-------------------------------------|------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------------|--------------------------------|-------------------------------|---------------|--------------------------------------|-----------------|--|
| | | | pH | Total Suspended Solids mg/ltr | Total Dissolved Solids mg/ltr | Chemical Oxygen Demand mg/ltr | Bio-chemical oxygen Demand mg/ltr | Sodium Absorption Ratio mg/ltr | Mixed Suspended Solids mg/ltr | Liquid Solids | Mixed Liquid Suspended Solids mg/ltr | Volatile Solids | |
| 1. | 23.01.2020 | | | | | | | | | | | | |
| | | Inlet of ETP | 6.4 | 514 | 2305 | 1310 | 410 | - | - | - | - | - | |
| | | Outlet of ETP leading to plantation | 7.9 | 34 | 2017 | 244 | 26 | 6.32 | - | - | - | - | |
| | | Outlet of ETP leading to drain | 7.85 | 37 | 2080 | 276 | 28 | 6.08 | - | - | - | - | |
| | | Aeration tank -I | - | - | - | - | - | - | - | - | - | - | |
| | | Aeration tank -II | - | - | - | - | - | - | - | - | - | - | |

3. Sample collected by CPPRI, Saharanpur :-

| Sr. No. | Date of sampling | Location of sampling | Parameters | | | | | | | | | | |
|---------|--|-------------------------------------|------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------------|--------------|-------------------------------|---------------|--------------------------------------|-----------------|--|
| | | | pH | Total Suspended Solids mg/ltr | Total Dissolved Solids mg/ltr | Chemical Oxygen Demand mg/ltr | Bio-chemical oxygen Demand mg/ltr | Colour (PCU) | Mixed Suspended Solids mg/ltr | Liquid Solids | Mixed Liquid Suspended Solids mg/ltr | Volatile Solids | |
| 1. | Average of sample collected on 02/03/2021, 15/03/2021 & 10/04/2021 | | | | | | | | | | | | |
| | | Inlet of ETP | | - | - | - | - | - | - | - | - | - | |
| | | Outlet of ETP leading to plantation | 7.59 | 18 | 1679 | 223 | 19 | 823 | - | - | - | - | |

Charter for Water Recycling & Pollution Prevention in Pulp & Paper Industries (Specific to Ganga River Basin States)



A.K.Vidyarthi
Additional Director
Central Pollution Control Board
Delhi

April, 2015

Fresh Water Consumption Norms (m³/t of product)

| Category | Short Term Objectives | Long Term Goals |
|--|-----------------------|-----------------|
| A1: Wood Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint | 60 | 50 |
| A2: Wood Based Pulp & Paper Mills producing unbleached grades of chemical pulps, papers and paperboards | 40 | 25 |
| B1: Agro Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint | 60 | 50 |
| B2: Agro Based Pulp & Paper Mills producing unbleached grades of papers and paperboards | 40 | 25 |
| C1: RCF & Market Pulp Based Paper Mills producing bleached grades of papers, paperboards & newsprint | 20 | 15 |
| C2: RCF & Market Pulp Based Paper Mills producing unbleached grades of papers and paperboards | 15 | 10 |
| D : RCF & Market Pulp Based Specialty Paper Mills[#] | 60 | 50 |
| <p>Notes:</p> <ol style="list-style-type: none"> 1. Short and Long Term norms become applicable 1yr, and 2 yrs respectively, from the date of notification of Charter. Long Term norms will be reviewed after 18 months. 2. “#” applies to mills that manufacture only specialty papers 3. "tpd" refers to Air-Dry (ADt) for pulp; Saleable weight for paper. 4. Not applicable to mills at ZLD | | |

| | | | | | |
|-------------------------------------|---|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | PAPER CHEMICAL DIVISION | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER DRAIN |
| PROCESS : | TREATED WATER UTILIZATION 100% BY FARMERS | | | | |

ACTION PLAN FOR UTILIZATION OF ALL TREATED WATER BY FARMERS BY JUNE 2022

Trident Paper is utilize its 67% of treated water into existing developed plantation land and discharge only less than 33% treated water into permitted drain.

Submitted the details and timelines to zero discharge in permitted drain.

| Sr. No. | Month | Total Water | Water in Drain | Water in Plantation |
|---------|----------------|--------------|----------------|---------------------|
| | UOM | KLD | KLD | KLD |
| 1 | Jan-21 | 15337 | 4150 | 11187 |
| 2 | Feb-21 | 15976 | 5568 | 10408 |
| 3 | Mar-21 | 15975 | 5468 | 10507 |
| 4 | Apr-21 | 15462 | 5524 | 9938 |
| 5 | May-21 | 15395 | 5336 | 10059 |
| 6 | Jun-21 | 15517 | 5345 | 10172 |
| 7 | Jul-21 | 15482 | 5397 | 10085 |
| 8 | Aug-21 | 16003 | 5400 | 10603 |
| 9 | Sep-21 | 16012 | 5507 | 10505 |
| 10 | Average | 15688 | 5299 | 10510 |

| | | | |
|----|--|------|----|
| 11 | Land required for utilize drain water for plantation | Acre | 66 |
|----|--|------|----|

| Sr. No. | Activity Description | UOM | Jan-22 | Mar-22 | May-22 | Jun-22 |
|---------|---|------|--------|--------|------------|------------|
| 1 | Agreement with farmers and laying of pipeline & ordering of pipeline | Acre | 21 | 18 | | 27 |
| 2 | Approval from drain department for laying the pipe parallel to the drain | | | | Completion | |
| 3 | Laying of pipeline to additional land/farmers land and agreement with farmers | | | | | Completion |

| | | | | | |
|-------------------------------------|----------------------------|-----------------|--------|---|------------------------|
| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

Annexure -2 – Action plan detailing pipe network, land use, watering depth and type / age of plants etc.

WASTE WATER MANAGEMENT IRRIGATION PLAN



TRIDENT GROUP
BARNALA

| | | |
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| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

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1. Effluent generation data
2. Plantation layout
3. Zone wise plantation area
4. Zone wise plant age
5. Zone wise water flow
6. EMF metering
7. Roster Zone Wise
8. Infrastructure available
9. Irrigation check list
10. Team matrix
11. Plantation Images PCD
12. Plantation Images HTD
13. Irrigation process
14. Proposed Plan
15. Additional land layout & piping.

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| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

EFFLUENT GENERATION DATA

PRESENT SCENARIO

| S NO | DESCRIPTION | UOM | HTD | PCD | TOTAL |
|------|--|---------|--------|-------|---------|
| 1 | TOTAL EFFLUENT GENERATION | KLD | 5146.5 | 19000 | 25146.5 |
| 2 | TREATED WATER INTO PLANTATION | KLD | 3395 | 13200 | 16595.0 |
| 3 | TOTAL AREA OF PLANTATION | ACRE | 48.5 | 105 | 213.5 |
| 4 | EFFLUENT CONSUMPTION | KL/ACRE | 70.00 | 60.00 | 75.00 |
| 5 | UTILIZATION OF TREATED WATER ONTO PLANTATION | % | 55.2 | 69.5 | 62.0 |

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|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

PLANTATION LAYOUT



| | | |
|--|-----------------------|------------------------------------|
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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ZONE WISE PLANTATION AREA

PAPER PLANTATION AREA (ACRES)

TOWEL PLANTATION AREA (ACRES)

| ZONE | TOTAL | ZONE | TOTAL |
|-------------------|------------|-------------------|-------------|
| ZONE 1 | 5 | ZONE 1 | 4 |
| ZONE 2 | 40 | ZONE 2 | 14 |
| ZONE 3 | 16 | ZONE 3 | 3 |
| ZONE 4 | 5 | ZONE 4 | 1.5 |
| ZONE 5 | 10 | ZONE 5 | 3 |
| ZONE 6 | 15 | ZONE 6 | 12 |
| ZONE 7 | 8 | ZONE 7 | 2.5 |
| ZONE 8 | 14 | ZONE 8 | 2.5 |
| ZONE 9 | 6 | ZONE 9 | 6 |
| ZONE 10 | 2 | TOTAL AREA | 48.5 |
| ZONE 11 | 2 | | |
| ZONE 12 | 10 | | |
| ZONE 13 | 2 | | |
| ZONE 14 | 4 | | |
| ZONE 15 | 2 | | |
| ZONE 16 | 2 | | |
| ZONE 17 | 3 | | |
| ZONE 18 | 2 | | |
| ZONE 19 | 3 | | |
| ZONE 20 | 5 | | |
| ZONE 21 | 9 | | |
| TOTAL AREA | 165 | | |

| | | |
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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ZONE WISE PLANTATION AGE

PAPER PLANTATION AREA (YEAR)

| ZONE | TOTAL | AGE (YEARS) |
|---------|-------|-------------|
| ZONE 1 | 2020 | 1 |
| ZONE 2 | 2019 | 2 |
| ZONE 3 | 2010 | 11 |
| ZONE 4 | 2008 | 13 |
| ZONE 5 | 2021 | 0.9 |
| ZONE 6 | 2010 | 11 |
| ZONE 7 | 2019 | 2 |
| ZONE 8 | 2021 | 0 |
| ZONE 9 | 2020 | 1 |
| ZONE 10 | 2010 | 11 |
| ZONE 11 | 2021 | 0.9 |
| ZONE 12 | 2020 | 1 |
| ZONE 13 | 2010 | 11 |
| ZONE 14 | 2009 | 12 |
| ZONE 15 | 2014 | 7 |
| ZONE 16 | 2010 | 11 |
| ZONE 17 | 2010 | 11 |
| ZONE 18 | 2010 | 11 |
| ZONE 19 | 2012 | 9 |
| ZONE 20 | 2021 | 0.9 |
| ZONE 21 | 2019 | 2 |

TOWEL PLANTATION AREA (YEAR)

| ZONE | TOTAL | AGE (YEARS) |
|--------|-------|-------------|
| ZONE 1 | 2021 | 0.8 |
| ZONE 2 | 2010 | 11 |
| ZONE 3 | 2021 | 0.8 |
| ZONE 4 | 2021 | 0.8 |
| ZONE 5 | 2020 | 1 |
| ZONE 6 | 2019 | 2 |
| ZONE 7 | 2009 | 12 |
| ZONE 8 | 2020 | 1 |
| ZONE 9 | 2021 | 0.8 |

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|-------------------------------------|----------------------------|-----------------|--------|---|------------------------|
| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ZONE WISE IRRIGATION PLAN

PAPER PLANTATION AREA (AREA-WISE)

| ZONE | TOTAL | AREA (ACRES) | TOTAL | MAX. WATER FLOW @ 80m ³ /acre |
|---------------|-------|--------------|-------|--|
| | | ZONE 2A | 20 | |
| | | ZONE 4 | 5 | |
| | | ZONE 10 | 2 | |
| AREA 1 | | ZONE 13 | 2 | 46 |
| | | ZONE 19 | 3 | 3680 |
| | | ZONE 20 | 5 | |
| | | ZONE 21 | 9 | |
| | | ZONE 1 | 5 | |
| AREA 2 | | ZONE 9 | 6 | 13 |
| | | ZONE 18 | 2 | 1040 |
| AREA 3 | | ZONE 17 | 3 | 3 |
| | | ZONE 23 | 20 | 240 |
| | | ZONE 12 | 10 | |
| | | ZONE 3 | 16 | |
| AREA 4 | | ZONE 6 | 15 | 87 |
| | | ZONE 7 | 8 | 6960 |
| | | ZONE 8 | 14 | |
| | | ZONE 15 | 2 | |
| | | ZONE 16 | 2 | |
| AREA 5 | | ZONE 14 | 4 | 4 |
| | | ZONE 5 | 10 | 320 |
| AREA 6 | | ZONE 11 | 2 | 12 |
| | | | | 960 |
| TOTAL | | | 165 | 13200 |

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| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ZONE WISE IRRIGATION PLAN

TOWEL PLANTATION AREA (AREA-WISE)

| ZONE | TOTAL | AREA (ACRES) | TOTAL | MAX. WATER FLOW @ 70m³/acre |
|--------------|--------------|---------------------|--------------|---|
| AREA 1 | ZONE 1 | 4 | 31 | 2170 |
| | ZONE 2 | 14 | | |
| | ZONE 3 | 3 | | |
| | ZONE 4 | 1.5 | | |
| | ZONE 7 | 2.5 | | |
| AREA 2 | ZONE 9 | 8 | 15 | 1050 |
| | ZONE 5 | 3 | | |
| AREA 3 | ZONE 6 | 12 | 2.5 | 175 |
| | ZONE 8 | 2.5 | | |
| TOTAL | | 48.5 | 48.5 | 3395 |

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STANDARD OPERATING PROCEDURE



| | | | | | |
|-----------------------|----------------------------|----------|--------|----------------------------------|------------------------|
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ELECTROMAGNETIC FLOW METER RECORD -PLANTATION-PAPER ZONE

| Date | Main Meter | | | Meter 1 (Area-1) | | | Meter 2 (Area-2) | | | Meter 3 (Area-3) | | | Meter 4 (Area-4) | | | Area-5 | | | Meter 5 (Area-6) | | | |
|--------|-----------------|---------------|------------|------------------|---------------|------------|------------------|---------------|------------|------------------|---------------|------------|------------------|---------------|------------|-----------------|---------------|------------|------------------|---------------|------------|----|
| | Initial Reading | Final Reading | Flow (MLD) | Initial Reading | Final Reading | Flow (KLD) | Initial Reading | Final Reading | Flow (KLD) | Initial Reading | Final Reading | Flow (MLD) | Initial Reading | Final Reading | Flow (MLD) | Initial Reading | Final Reading | Flow (KLD) | Initial Reading | Final Reading | Flow (KLD) | |
| Target | | | 1700 | | | 360 | | | 55 | | | 25 | | | 655 | | | 30 | | | 34 | |
| 14-Sep | 182671 | 182684 | 12.13 | 229 | 230 | 290 | 300 | 300 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 15-Sep | 182680 | 182693 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 16-Sep | 182689 | 182702 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 17-Sep | 182698 | 182711 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 18-Sep | 182707 | 182720 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 19-Sep | 182716 | 182729 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 20-Sep | 182725 | 182738 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 21-Sep | 182734 | 182747 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 22-Sep | 182743 | 182756 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 23-Sep | 182752 | 182765 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 24-Sep | 182761 | 182774 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 25-Sep | 182770 | 182783 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 26-Sep | 182779 | 182792 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 27-Sep | 182788 | 182801 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 28-Sep | 182797 | 182810 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 29-Sep | 182806 | 182819 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 30-Sep | 182815 | 182828 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| 31-Sep | 182824 | 182837 | 12.13 | 230 | 230 | 290 | 290 | 290 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| Target | | | 1700 | | | 360 | | | 55 | | | 25 | | | 655 | | | 30 | | | 34 | |



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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

HTD PLANTATION WATER DISTRIBUTION

| DATE | ELECTROMAGNETIC FLOW METER-1 (AREA-1) | | | ELECTROMAGNETIC FLOW METER-2 (AREA-2) | | | ELECTROMAGNETIC FLOW METER-3 (AREA-3) | | | TOTAL FLOW TO PLANTATION |
|------------|---------------------------------------|---------------|------------------|---------------------------------------|---------------|------------------|---------------------------------------|---------------|------------------|--------------------------|
| | INITIAL READING | FINAL READING | TOTAL FLOW (KLD) | INITIAL READING | FINAL READING | TOTAL FLOW (KLD) | INITIAL READING | FINAL READING | TOTAL FLOW (KLD) | K_ID |
| 01-09-2021 | 71257 | 72705 | 1448 | 55788 | 57615 | 1825 | 5968 | 7302 | 34 | 3311 |
| 02-09-2021 | 72705 | 74167 | 1462 | 57615 | 59218 | 1603 | 7002 | 7547 | 45 | 3113 |
| 03-09-2021 | 74167 | 75679 | 1512 | 59218 | 60906 | 1688 | 7347 | 7145 | 98 | 3295 |
| 04-09-2021 | 75679 | 77164 | 1485 | 60906 | 62520 | 1614 | 7145 | 7211 | 66 | 3155 |
| 05-09-2021 | 77164 | 78685 | 1485 | 62520 | 64225 | 1705 | 7211 | 7334 | 23 | 3133 |
| 06-09-2021 | 78685 | 80220 | 1451 | 64225 | 65978 | 1753 | 7334 | 7522 | 44 | 3192 |
| 07-09-2021 | 80220 | 81763 | 1273 | 65978 | 67733 | 1755 | 7522 | 7403 | 31 | 3209 |
| 08-09-2021 | 81763 | 83329 | 1148 | 67733 | 69546 | 2015 | 7403 | 7454 | 51 | 3212 |
| 09-09-2021 | 83329 | 84854 | 1415 | 69546 | 71453 | 1705 | 7454 | 7542 | 88 | 3209 |
| 10-09-2021 | 84854 | 86452 | 1339 | 71453 | 73238 | 1785 | 7542 | 7593 | 51 | 3175 |
| 11-09-2021 | 86452 | 88127 | 1254 | 73238 | 74974 | 1735 | 7593 | 7661 | 88 | 3119 |
| 12-09-2021 | 88127 | 89823 | 1435 | 74974 | 76618 | 1642 | 7661 | 7772 | 91 | 3159 |



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|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

PCD Plantation Zone Wise Roster

| Description | Zone No | Area (Acres) | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---------------|---------|--------------|--------|---------|-----------|----------|--------|----------|--------|
| AREA 1 | ZONE 2A | 20 | █ | | | | | | |
| | ZONE 4 | 5 | | █ | | | | | |
| | ZONE 10 | 2 | █ | | | | | | |
| | ZONE 13 | 2 | █ | | | | | | |
| | ZONE 19 | 3 | █ | | | | | | |
| | ZONE 20 | 5 | | █ | | | | | |
| AREA 2 | ZONE 21 | 9 | | █ | | | | | |
| | ZONE 1 | 5 | | | █ | | | | |
| | ZONE 9 | 6 | | | █ | | | | |
| AREA 3 | ZONE 18 | 2 | | | █ | | | | |
| | ZONE 17 | 3 | | | █ | | | | |
| AREA 4 | ZONE 2B | 20 | | | | █ | | | |
| | ZONE 12 | 10 | | | █ | | | | |
| | ZONE 3 | 16 | | | | | █ | | |
| | ZONE 6 | 15 | | | | | | █ | |
| | ZONE 7 | 8 | | | | | █ | | |
| AREA 5 | ZONE 8 | 14 | | | | | | | █ |
| | ZONE 15 | 2 | | | | █ | | | |
| | ZONE 16 | 2 | | | | █ | | | |
| AREA 6 | ZONE 14 | 4 | | | | | | █ | |
| | ZONE 5 | 10 | | | | | | | █ |
| AREA 6 | ZONE 11 | 2 | | | | | | █ | |

| | | |
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|-------------------------------------|----------------------------|-----------------|--------|---|------------------------|
| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

HTD Plantation Zone Wise Roster

| Description | Zone No. | Area (Acres) | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|-------------|----------|--------------|--------|---------|-----------|----------|--------|----------|--------|
| AREA 1 | ZONE 1 | 4 | | | | | | | |
| | ZONE 2 | 14 | | | | | | | |
| | ZONE 3 | 3 | | | | | | | |
| | ZONE 4 | 1.5 | | | | | | | |
| | ZONE 5 | 2.5 | | | | | | | |
| AREA 2 | ZONE 6 | 3 | | | | | | | |
| | ZONE 7 | 3 | | | | | | | |
| AREA 3 | ZONE 8 | 12 | | | | | | | |
| AREA 3 | ZONE 9 | 2.5 | | | | | | | |

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| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

INFRASTRUCTURE AVAILABLE

| S.NO. | DESCRIPTION | UOM | QUANTITY |
|-------|--------------|-----|----------|
| 1 | TRACTOR | NOS | 2 |
| 2 | TROLLEY | NOS | 1 |
| 3 | HARROW | NOS | 2 |
| 4 | ROTAVATOR | NOS | 1 |
| 5 | TOOLKIT | NOS | 10 |
| 6 | SPRAYER PUMP | NOS | 4 |

| | | |
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|-------------------------------------|----------------------------|-----------------|--------|---|------------------------|
| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

Name:

Salary Code:

IRRIGATION CHECKLIST

Dept:

Month:

POINTS OF CONCERN/ACTIVITIES

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|

ZONE WISE INSPECTION FOR PLANTATION

ZONE WISE WATER DISTRIBUTION

MANPOWER DEPLOYED AS PER ROSTER

MILD GROWTH/GRASS REMOVAL

CHECKING FOR THE FLOODING/WATER ACCUMULATION

CHECKING FOR THE MACHINERY

TOOL KIT AVAILABILITY

SUPERVISOR SIGNATURE

POINTS OF CONCERN/ACTIVITIES

| | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

ZONE WISE INSPECTION FOR PLANTATION

ZONE WISE WATER DISTRIBUTION

MANPOWER DEPLOYED AS PER ROSTER

MILD GROWTH/GRASS REMOVAL

CHECKING FOR THE FLOODING/WATER ACCUMULATION

CHECKING FOR THE MACHINERY

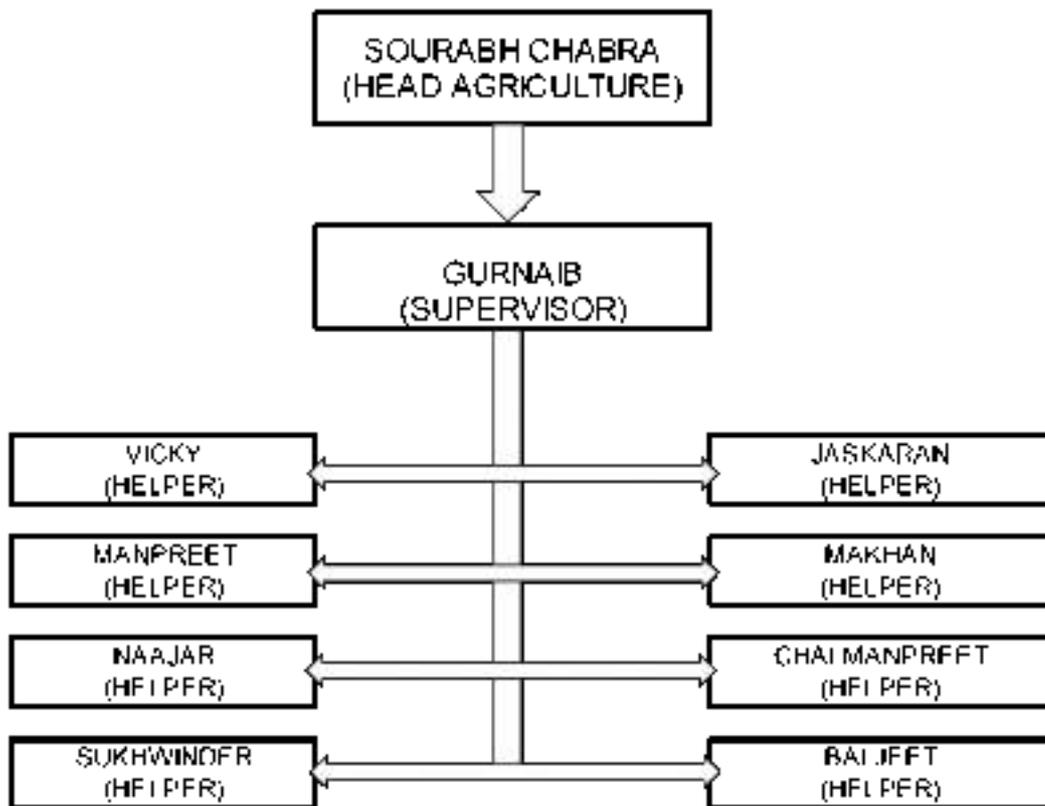
TOOL KIT AVAILABILITY

SUPERVISOR SIGNATURE

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|--|-----------------------|------------------------------------|
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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

TEAM MATRIX



| | | |
|--------------------|-----------------------|------------------------------------|
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|-------------------------------------|----------------------------|-----------------|--------|----------------------------------|---|
| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

GLIMPSE OF PLANTATION AREA



| | | |
|---|-----------------------|------------------------------------|
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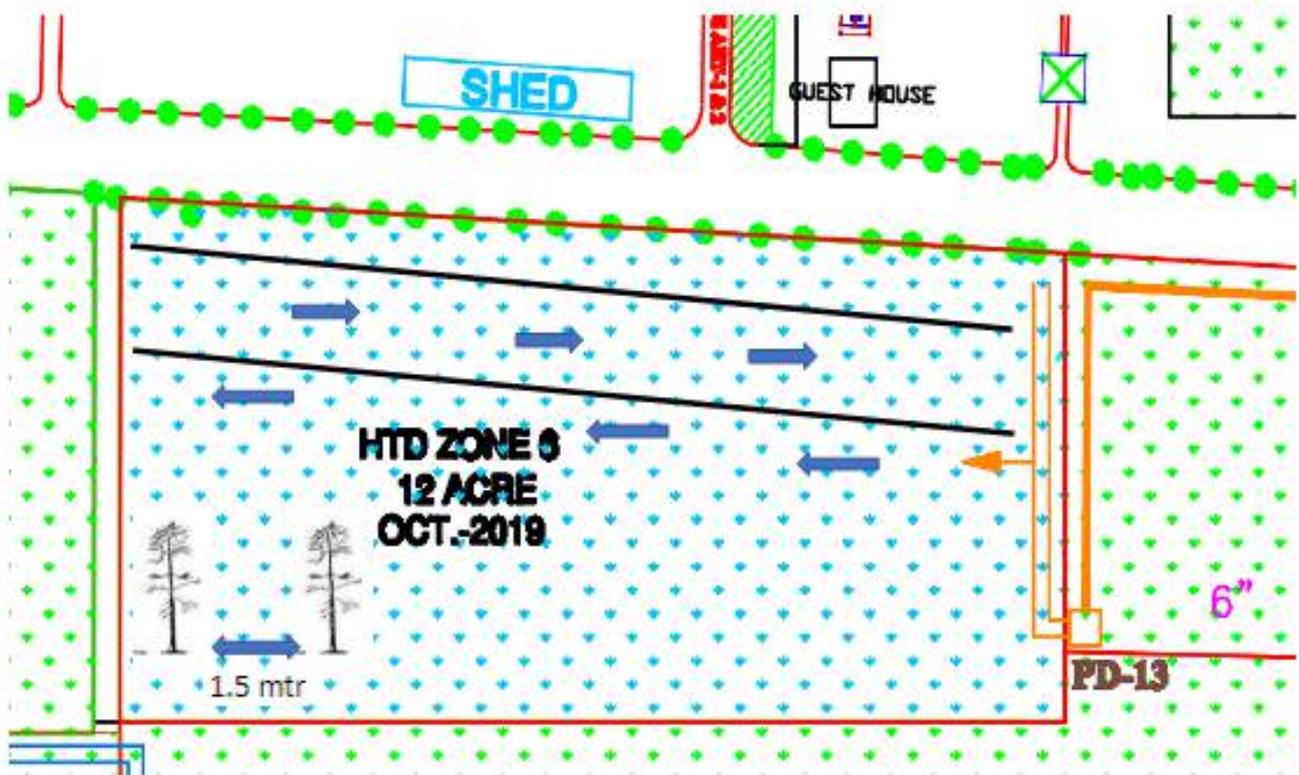
| | | | | | |
|-------------------------------------|----------------------------|-----------------|--------|---|------------------------|
| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |



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| STANDARD OPERATING PROCEDURE | | | | |  |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

IRRIGATION PROCESS



| Ridges | |
|--------|---------|
| Wide | 1 meter |
| High | 50 cm |

| Furrow | |
|--------|---------|
| Wide | 2 meter |

| | | |
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STANDARD OPERATING PROCEDURE

| | | | | | |
|---------------------------|----------------------------|-----------------|--------|--------------------------------------|------------------------|
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

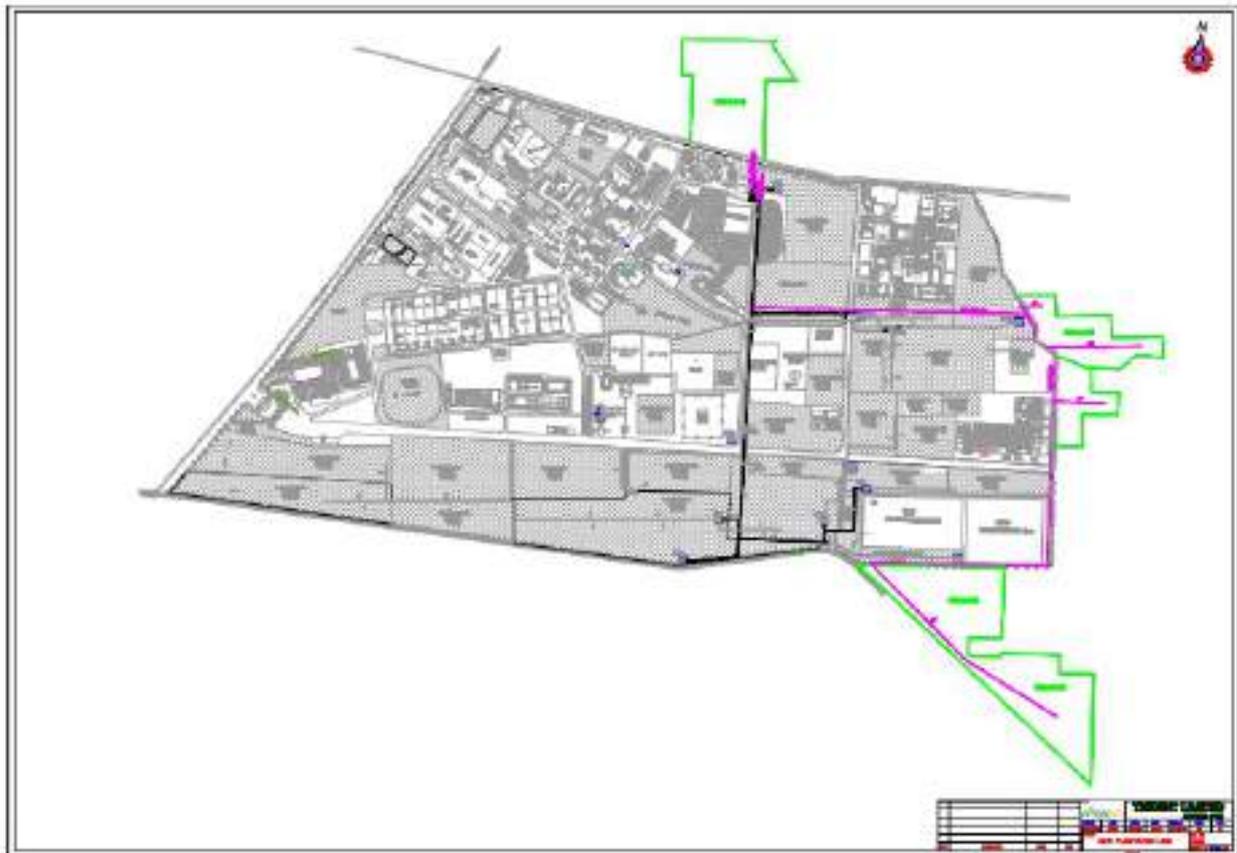
EFFLUENT GENERATION & PROPOSED CONSUMPTION PLAN**PROPOSED SCENARIO**

| S NO. | DESCRIPTION | WDM | HTD | PCD | TOTAL |
|-------|--|---------|-------|-------|-------|
| 1 | TOTAL EFFLUENT GENERATION | KLD | 6500 | 19000 | 25500 |
| 2 | TREATED WATER INTO PLANTATION | KLD | 6500 | 19000 | 25500 |
| 3 | TOTAL AREA OF PLANTATION REQUIRED | ACRE | 93 | 237.5 | 330 |
| 4 | EXISTING LAND | ACRE | 48.5 | 165 | 214 |
| 5 | NEW LAND REQUIRED | ACRE | 44 | 72.5 | 117 |
| 6 | EFFLUENT CONSUMPTION | KL/ACRE | 70 | 60 | 80 |
| 5 | UTILIZATION OF TREATED WATER ONTO PLANTATION | % | 100.0 | 100.0 | 100.0 |

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| STANDARD OPERATING PROCEDURE | | | |  | |
| BUSINESS/ UNIT | SUSTAINABILITY | LOCATION | PUNJAB | MACHINE NAME/PROCESS NAME | WASTE WATER MANAGEMENT |
| PROCESS : | IRRIGATION MANAGEMENT PLAN | | | | |

ADDITIONAL LAND LAYOUT AND PIPING



| | | |
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Charter for Water Recycling & Pollution Prevention in Pulp & Paper Industries (Specific to Ganga River Basin States)



A.K.Vidyarthi
Additional Director
Central Pollution Control Board
Delhi

April, 2015

Fresh Water Consumption Norms (m³/t of product)

| Category | Short Term Objectives | Long Term Goals |
|---|-----------------------|-----------------|
| A1: Wood Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint | 60 | 50 |
| A2: Wood Based Pulp & Paper Mills producing unbleached grades of chemical pulps, papers and paperboards | 40 | 25 |
| B1: Agro Based Pulp & Paper Mills producing bleached grades of chemical pulps, papers, paperboards & newsprint | 60 | 50 |
| B2: Agro Based Pulp & Paper Mills producing unbleached grades of papers and paperboards | 40 | 25 |
| C1: RCF & Market Pulp Based Paper Mills producing bleached grades of papers, paperboards & newsprint | 20 | 15 |
| C2: RCF & Market Pulp Based Paper Mills producing unbleached grades of papers and paperboards | 15 | 10 |
| D : RCF & Market Pulp Based Specialty Paper Mills[#] | 60 | 50 |
| <p>Notes:</p> <ol style="list-style-type: none"> 1. Short and Long Term norms become applicable 1yr, and 2 yrs respectively, from the date of notification of Charter. Long Term norms will be reviewed after 18 months. 2. “[#]” applies to mills that manufacture <u>only</u> specialty papers 3. "tpd" refers to Air-Dry (ADt) for pulp; Saleable weight for paper. 4. Not applicable to mills at ZLD | | |



ਪੰਜਾਬ ਪ੍ਰਦੂਸ਼ਣ ਰੋਕਥਾਮ ਬੋਰਡ
PUNJAB POLLUTION CONTROL BOARD

No. _____

REGD

Dated: _____

To

M/s Trident Ltd. (PCD),
Trident Complex, Mansa Road,
Vill. Dhaula, Tehsil & Distt. Barnala.

Subject: Order dated 29/07/2021 passed by the Hon'ble National Green Tribunal in OA no. 682/2019 – Notice for imposition of Environmental Compensation and appearance before the Hon'ble National Green Tribunal.

Please refer to the subject cited above.

2) It is informed that the case relating to remedial action against violation of environmental norms by Trident Ltd., Village Dhaula, Mansa Road, Barnala is under consideration of the Hon'ble National Green Tribunal in Original Application no. 682 of 2019 titled as Beant Singh Bajwa, President National Anti Corruption Council V/s State of Punjab.

3) The recommendations of the Joint Committee constituted by the Hon'ble National Green Tribunal were separately conveyed to the industry by the Board and condition was imposed for compliance of the said recommendations of the Joint Committee in the consent letter issued by the Board on 30.6.2020.

4) In compliance to the order dated 29.7.2021, the Board has already put the industry on notice about the proceedings before the Hon'ble Tribunal, so that the industry has an opportunity to show cause before the Tribunal. The industry is directed to appear before the Hon'ble National Green Tribunal in O.A No. 682 of 2019 on 12.11.2021.

5) That the industry has now given the time lines to achieve the standard of 75 mg/Nm³, but has not achieved the same in reference to the notice issued by the Board for violation of the provisions of the Air (Prevention & Control of Pollution) Act, 1981 vide letter dated 24.9.2021. The reply of the industry given on 18.10.2021 (received on 19.10.2021) is considered. In view of the non-compliance by the industry with regard to the non-achievement of standard of 75 mg/Nm³ and the orders of the Hon'ble National Green Tribunal, the Board has assessed and decided to impose the environmental compensation amounting to Rs. 58.32 Lakh on the industry with effect from 01.07.2020 upto 30.10.2021 (for 486 days).

6) You are hereby directed to show cause within 15 days as to why the action proposed against the industry may not be taken.

DA/as above

Endst. No. 3717

SJ
Sr. Environmental Engineer,
For & on behalf of PPCB

Dated 8-11-2021

A copy of the above is forwarded to the Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur for information & necessary action.

[Signature]
Sr. Environmental Engineer,
For & on behalf of PPCB

08.11.2021



ਪੰਜਾਬ ਪ੍ਰਦੂਸ਼ਣ ਰੋਕਥਾਮ ਬੋਰਡ
PUNJAB POLLUTION CONTROL BOARD

No. _____

REGD

Dated: _____

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Vill. Dhaula, Tehsil & Distt. Barnala.

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2) It is informed that the case relating to remedial action against violation of environmental norms by Trident Ltd., Village Dhaula, Mansa Road, Barnala is under consideration of the Hon'ble National Green Tribunal in Original Application no. 682 of 2019 titled as Beant Singh Bajwa, President National Anti Corruption Council V/s State of Punjab.

3) The recommendations of the Joint Committee constituted by the Hon'ble National Green Tribunal were separately conveyed to the industry by the Board and condition was imposed for compliance of the said recommendations of the Joint Committee in the consent letter issued by the Board on 30.6.2020.

4) In compliance to the order dated 29.7.2021, the Board has already put the industry on notice about the proceedings before the Hon'ble Tribunal, so that the industry has an opportunity to show cause before the Tribunal. The industry is directed to appear before the Hon'ble National Green Tribunal in O.A No. 682 of 2019 on 12.11.2021.

5) That the industry was requested to achieve Zero Liquid Discharge (ZLD), latest by 30.06.2020, but has not achieved the same in reference to the notice issued by the Board for violation of the provisions of the Water (Prevention & Control of Pollution) Act, 1974 vide letter dated 24.9.2021. The reply of the industry given on 16.10.2021 (received on 19.10.2021) is considered. In view of the non-compliance by the industry with regard to the non-achievement of ZLD status and the orders of the Hon'ble National Green Tribunal, the Board has assessed and decided to impose the environmental compensation amounting to Rs. 58.32 Lakh with effect from 1.7.2020 upto 30.10.2021 (for 486 days).

6) You are hereby directed to show cause within 15 days as to why the action proposed against the industry may not be taken.

DA/as above

Sl.
Sr. Environmental Engineer,
For & on behalf of PPCB

Endst. No. 3719

Dated 8-11-2021

A copy of the above is forwarded to the Environmental Engineer, Punjab Pollution Control Board, Regional Office, Sangrur for information & necessary action.

[Signature]
Sr. Environmental Engineer,
For & on behalf of PPCB

[Signature]
8-11-2021