BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, PRINCIPAL BENCH, NEW DELHI

ORIGINAL APPLICATION NO. 691 OF 2022

IN THE MATTER OF

RAMA SHANKER AWASTHI …APPLICANT

VERSUS

STATE OF UTTAR PRADESH & ORS. …RESPONDENT(S)

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Respondent No.-3

(Hydrologist Ground Water Department /

Nodal Officer, District Ground Water Management Council, Gonda)

Through



Gigi C. George Advocate

Standing Counsel (UOI)

Ch. No. 457, Lawyers Block,

DHC, New Delhi

Gigicgeorge.adv42@yahoo.in

M-9810625315

Place : New Delhi
Date : 19.02.2025

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, PRINCIPAL BENCH, NEW DELHI

ORIGINAL APPLICATION NO. 691 OF 2022

IN THE MATTER OF

RAMA SHANKER AWASTHI ...APPLICANT

VERSUS

STATE OF UTTAR PRADESH & ORS. ...RESPONDENT(S)

REPLY BY WAY OF AFFIDAVIT ON BEHALF OF RESPONDENT NO. 3 IN COMPLIANCE OF ORDER DATED 7.11.2024

NOTARY GOVT. OF INDIA Exp. 20-09-2027

I, Ajeet Kumar kannaujiya, aged about 31 years working as Hydrologist/Nodal officer do hereby solemnly state and affirm as under: -

1. I say that being the Hydrologist/Nodal officer I am well conversant with the facts surrounding the present Original Application.

2. I say that Instant Original Application no. 691/2022 titled Rama Shanker Awasthi Vs State of Uttar Pradesh & Ors. Hon'ble Tribunal passed the order dated 7.11.2024 with following observation: -

"2. When the order dated 21.12.2023 was passed the Respondents No. 1 and 3 were not represented. It has been pointed out that no notice to those respondents has been issued subsequently.

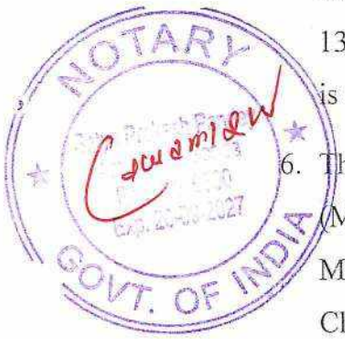
3. Let the notice be issued to the respondents not represented today The Applicant is directed to serve the said respondents and file an affidavit of service at least one week before the next date of hearing.

4. List on 24.02.2025."

3. That the matter is listed for 24.02.2025

4. That it is respectfully submitted that in order to protect, manage and control the ground water resources in the state, Uttar Pradesh Ground Water (Management and Regulation) Act, 2019 has been implemented since 02 October 2019. Copy of Uttar Pradesh Ground Water (Management and Regulations) Act, 2019 is annexed herewith as **Annexure-1**

5. That in exercise of the powers enumerated in Uttar Pradesh Ground Water (Management and Regulation) Act, 2019, Uttar Pradesh Ground water Management and Regulatory Authority has been established by Minor Irrigation and Ground Water section – 1 vide its Notification no. 1320/62-1-2019-10 GW-2014 dated 13.11.2019. Copy of the Notification is annexed herewith as **Annexure-2**.



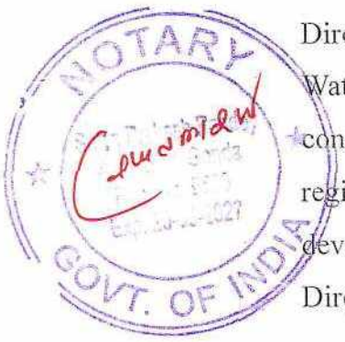
6. That in exercise of the power construed in Uttar Pradesh Ground Water (Management and Regulation) Act, 2019, the District Ground Water Management Council for each District of the state consisting of the Chairperson and members in accordance with the provisions is constituted by the Namami Gange and Rural water Supply Section-3 vide its Notification No. 58/76-3-2020/10 GW/2014 Dated 21.01.2020. Copy of the notification is annexed herewith as **Annexure-3**

7. That in compliance with the notification dated 21.01.2020, the District Ground Water Management Council was constituted in Gonda district vide letter No. 370/ल0सि0/जि0भूगर्भ ज0प्र0 परिषद/वेब पोर्टल/2020–21, dated 27.02.2021 of the District Magistrate Gonda. The District Ground Water Management Council constituted under the chairmanship of the District Magistrate at the district level carries out the work of registration of

ground water users, issuance/renewal of no objection certificate, redressal of grievances etc. Copy of the letter is annexed herewith as **Annexure-4.**

8. That the for the effective and transparent implementation of works like registration, issuance/renewal of no objection certificate etc. for agricultural and domestic consumers, commercial industrial, infrastructural and collective ground water users as enumerated in the Uttar Pradesh Ground Water (Management and Regulation) Act 2019 the web portal has been developed **(upgwdonline.in)** and the District-wise nodal officers have been nominated at the district level in all the 75 districts of Uttar Pradesh for the operation of the website.

9. That for smooth functioning of the Act-2019, orders have been issued to all the districts of the state for formation of task force in compliance of the said orders by letter No. 23/यू0पी0रा0भू0ज0प्र0वि0प्रा0, dated 25.02.2021 of Director, Ground Water Department / Member Secretary, State Ground Water Management and Regulatory Authority, Uttar Pradesh, for conducting on-site verification before disposal of applications related to registration of wells and No Objection Certificate (NOC) etc. through the developed web portal (upgwdonline.in). Copy of the Letter issued by the Director is annexed herewith as **Annexure 5**



10. That In compliance with the above orders, a task force has been constituted for conducting on-site verification before disposal of *applications at the district level by the District Magistrate, District Gonda* vide order number 456/भूजविख–देवी0(गो0)/जी0डब्लू0एक्ट0] dated 27.03.2021 a "Task Force" has been constituted to carry out on-site verification before disposal. Copy of the order of District Magistrate, District Gonda is annexed herewith as **Annexure 6**

11. That In compliance with the order dated 07.11.2024 issued by the Hon'ble Tribunal, the Director of the Ground Water Department, Uttar Pradesh, through Letter No. Letter No. 1316/भू0ज0वि0/एस–26 (एन0जी0टी0) dated 05.12.2024, has nominated the Nodal Officer of the District Ground Water Management Council, District Gonda, to represent the department regarding firms operating in Gonda district. The officer has been assigned to investigate and prepare the departmental compliance report on behalf of Respondent No.-3 and to submit the required reply/affidavit. A copy of the letter dated 05.12.2024 is annexed as **Annexure 7.**

12. That in Pursuant to Letter No. 1316/भू0ज0वि0/एस–26 (एन0जी0टी0) dated 05.12.2024 issued by the Director of the Ground Water Department, Uttar Pradesh, and in compliance with the order in OA No. 691/2022, the district task force conducted a field inspection and verification of the sites of M/s Bajaj Energy Limited and Bajaj Hindustan Sugar Limited, Kundarkhi, District Gonda, on 13.12.2024.

13. That on 13.12.2024, the task force carried out a field inspection and physical verification to ascertain compliance with the conditions stipulated in the No Objection Certificates (NOCs) granted for groundwater extraction to firms operating in Gonda district, including M/s Bajaj Hindustan Sugar Ltd. and M/s Bajaj Energy Ltd. The verification report is detailed below:

    a. **Status of No Objection Certificate Issued to M/s Bajaj Hindustan Sugar Ltd. for Groundwater Extraction:**

    M/s Bajaj Hindustan Sugar Ltd. extracts groundwater through four borewells at Development Block Jhanjhari, Village Kundarkhi, Gonda. The District Council, District Gonda, has issued the

necessary NOCs **(Annexures 8.1, 8.2, 8.3, and 8.4)** for groundwater extraction, the details of which are as follows:

S.No.	NOC No.	Validity of NOCs	Quantity of Maximum Extraction
1	NOC043562	18-06-2021 to 17-06-2026	112500 cubic meter/year
2	NOC047600	18-06-2021 to 17-06-2026	112500 cubic meter/year
3	NOC020211	18-06-2021 to 17-06-2026	45000 cubic meter/year
4	NOC026057	18-06-2021 to 17-06-2026	30000 cubic meter/year
04 Total Quantity of Ground water extraction through borewell			**3[00000 cubic meter/year**

b. Compliance with Conditions Mentioned in the No Objection Certificates:

The investigation into compliance with the conditions specified in 04 NOCs issued for groundwater extraction yielded the following findings:

- M/s Bajaj Hindustan Sugar Ltd. operates in Village Kundarkhi, Block-Jhanjhari, District-Gonda.
- The firm has installed four borewells, each with a depth of approximately 121.93 meters. Three motors operate at a capacity of 50 HP, while one motor operates at 10 HP.
- During the inspection, the discharge from the four borewells was recorded at 138, 93, 48, and 17 cubic meters per hour, respectively.
- That there is no pipeline system for supplying purified water in Village Kundarkhi.

- A rainwater harvesting system has been implemented in firm campus with an annual groundwater recharge of approximately 13,771 cubic meters. The system was found to be operational during verification.
- Mr. Amit Singh who is AGM of the Firm informed that the firm has acquired a pond near village Kundarkhi covering approximately 2.6 hectares for groundwater harvesting, enabling an annual Conservation of approximately 140,400 cubic meters ground water. Copy of the paper of acquisition of pond is annexed herewith as **Annexure-9**
- The firm is authorized to extract 300,000 cubic meters of groundwater annually, however, extracting only 57,589 cubic meters per year. Through rainwater harvesting and the pond, the firm recharges 154,171 cubic meters annually.
- Two piezometers (with DWLR) have been installed, with recorded post-monsoon groundwater levels for 2024 at 3.88 meters (Piezometer-1) and 2.81 meters (Piezometer-2).
- That the year-wise average groundwater level of pre and post monsoon was also assessed in Jhanjhari Block of Gonda district through the departmental piezometer (monitoring well) installed by the Ground Water Department for measuring groundwater level, in which the details of the average groundwater level recorded from the year 2021 to the year 2024 are as follows in Table-1:

Table -1

Year	Pre Monsoon (Meter)	Post Monsoon (Meter)
2021	2.99	1.26
2022	5.13	2.42
2023	4.59	3.79
2024	4.73	2.33

- A water audit report, prepared by the Federation of Indian Chambers of Commerce and Industry (FICCI) under CGWA standards, was reviewed and found compliant Copy of the Audit report is annexed herewith as **Annexure-10.**
- An impact assessment report, prepared by Shri Vijay Rajkumar Yadav (CGWA nominee), was examined and found compliant with CGWA standards. Copy of the assessment report is annexed herewith as **Annexure-11.**
- The firm has installed a 1500 KLD Effluent Treatment Plant (ETP) and a 50 KLD Sewage Treatment Plant (STP).
- The firm has obtained a No Objection (CTO) Certificate from the Uttar Pradesh Pollution Control Board, valid from 01.01.2024 to 31.12.2025. Copy of the report is annexed herewith as **Annexure-12.**

c. Status of No Objection Certificate Issued to M/s Bajaj Energy Ltd. for Groundwater Extraction:

M/s Bajaj Energy Ltd., located at Development Block Kundarkhi, Gonda, extracts groundwater through three borewells. The District

Council, District Gonda, has issued NOCs (**Annexures 13.1, 13.2, and 13.3**) for this purpose. Below are the details of the NOC issued to the firm:

S.No.	NOC No.	Validity of NOCs	Quantity of Extraction by NOCs
1	NOC020081	18-06-2021 to 17-06-2026	1026000 cubic meter/year
2	NOC033164	18-06-2021 to 17-06-2026	756000 cubic meter/year
3	NOC027710	18-06-2021 to 17-06-2026	378000 cubic meter/year
03 Total Quantity of Ground water extraction through borewell			**2160000 cubic meter/year**

NOTARY
Gonda
No. 9500
20-09-2027
GOVT. OF INDIA

d. Compliance with Conditions Mentioned in the No Objection Certificates:

- M/s Bajaj Energy Ltd. Situated in Village Kundarkhi, Block-Jhanjhari, District-Gonda.
- The firm has installed three borewells, each with a depth of approximately 106.7 meters, and the running motor has a capacity of 30 HP.
- During the inspection, the discharge rates of the borewells were found to be 187, 178, and 138 cubic meters per hour.
- No pipeline system for purified water supply exists in Village Kundarkhi.

- The firm has implemented a rainwater harvesting system with annually recharging approximately 13,293 cubic meters of groundwater.
- Mr. Amit Singh who is AGM of the Firm reported that the firm has acquired two ponds covering approximately 10 and 20 hectares for groundwater harvesting, contributing to an annual recharge of approximately 544,680 cubic meters. Copy of the document of acquisition of pond is annexed herewith as **Annexure-14.**
- The firm has been permitted to extract 2,160,000 cubic meters of groundwater annually however, extracts only 1,023,062 cubic meters per year. Through rainwater harvesting and pond recharge, the firm replenishes 559,167 cubic meters annually.
- Two piezometers (with DWLR) have been installed, with recorded post-monsoon groundwater levels for 2024 at 4.3 meters (Piezometer-1) and 3.79 meters (Piezometer-2).
- That the year-wise average groundwater level of pre and post monsoon was also assessed in Jhanjhari Block development office of Gonda district through the departmental piezometer (monitoring well) installed by the Ground Water Department for measuring groundwater level, in which the details of the average groundwater level recorded from the year 2021 to the year 2024 are as follows in Table-2

NOTARY Sarita Prakash Pandey Regd. Distt. Gonda GOVT. OF INDIA

Table -2

Year	Pre Monsoon (Meter)	Post Monsoon (Meter)
2021	2.99	1.26

2022	5.13	2.42
2023	4.59	3.79
2024	4.73	2.33

- A water audit report, prepared by PHD Chambers of Commerce and Industry under CGWA standards, was reviewed and found compliant. Copy of the audit report is annexed herewith as **Annexure-15.**
- An impact assessment report, prepared by Shri V. Pugazhendi (CGWA nominee), was examined and found compliant with CGWA standards. Copy of the impact assessment report is annexed herewith as **Annexure-16.**
- The firm has installed a 1000 KLD Effluent Treatment Plant (ETP) and a 50 KLD Sewage Treatment Plant (STP).
- The firm has obtained a No Objection Certificate (CTO) from the Uttar Pradesh Pollution Control Board, valid from 01.01.2024 to 31.12.2025. Copy of the CTO is annexed herewith as **Annexure-17.**

14. That the site verification by the task force analyzed and Groundwater Assessment Report-2023, which was approved by the Government of India Copy of the Ground Water Assessment Report -2023 is annexed herewith as **Annexure-18**. The report presents the status of groundwater resources in Gonda district as follows:-

The total amount of ground water resources available 110871.55 hectare meter

Groundwater from all sources	66641.95	hectare meter
Amount of extractable groundwater		
Groundwater extraction in Irrigation work	6691.82	hectare meter
Ground water extraction in industrial area	488.51	hectare meter
Ground water extraction in domestic sector	9753.13	hectare meter

15. It is submitted that as per the report the available groundwater resource data that the total amount of groundwater extraction from all sources in Gonda district is 66641.95 hectare meter. In the total groundwater extraction, groundwater extraction for irrigation work is 6691.82 hectare meter and groundwater extraction in industrial area is 488.51 hectare meter. It is further submitted that the total utility of groundwater resources in industrial areas is very less compared to the total groundwater used in agricultural sector in the district.

16. That there are a total of 16 development blocks under Gonda district. According to the Groundwater Resource Assessment-2023 report, block Jhanjhari and all other blocks have been classified in the Safe category. It is also worth mentioning that according to the groundwater resource assessment of the year 2020 and the year 2022, block Jhanjhari was also classified in the Safe category. Copy of the Ground Water resource assessment for the year 2020 and 2022 is annexed herewith as **Annexure 19** and **Annexure 20** respectively.

17. That the Project Proponent is having a Valid NOC issued by the U.P. Ground Water Department and there is no Ground Water Contamination as per the Inspection carried by the answering respondent.

18. That the answering respondent will file additional/further reply as and when directed by this Hon'ble Tribunal

DEPONENT

Verification

Verified at GONDA on 01 Feb. 2025 that the contents of the above affidavit are true and correct to the best of my knowledge and belief and nothing has been concealed therefrom.

DEPONENT

NOTARY Satya Prakash Pandey Gonda Exp. 21-05-2027 GOVT. OF INDIA

SOLEMNLY AFFIRMED & DECLARED BEFORE ME ON 01/02/2025 SATYA PRAKASH PANDEY NOTARY DIST. GONDA (U P

क्रम संख्या–153

रजिस्ट्रेशन नम्बर–एस०एस०पी० / एल०
डब्लू० / एन०पी०–91 / 2014–16
लाइसेन्स टू पोस्ट ऐट कन्सेशनल रेट

सरकारी गजट, उत्तर प्रदेश

उत्तर प्रदेशीय सरकार द्वारा प्रकाशित

असाधारण

विधायी परिशिष्ट
भाग–1, खण्ड (क)
(उत्तर प्रदेश अधिनियम)

लखनऊ, बुधवार, 7 अगस्त, 2019
श्रावण 16, 1941 शक सम्वत्

उत्तर प्रदेश शासन
विधायी अनुभाग–1

संख्या 1468/79-वि-1–19-1(क)-14-19
लखनऊ, 7 अगस्त, 2019

अधिसूचना
विविध

"भारत का संविधान" के अनुच्छेद 200 के अधीन राज्यपाल महोदय ने उत्तर प्रदेश भू-गर्भ जल (प्रबन्धन और विनियमन) विधेयक, 2019 जिससे लघु सिंचाई एवं भू-गर्भ जल अनुभाग-1 प्रशासनिक रूप से सम्बन्धित है, पर दिनांक 5 अगस्त, 2019 को अनुमति प्रदान की और वह उत्तर प्रदेश अधिनियम संख्या 13 सन् 2019 के रूप में सर्वसाधारण की सूचनार्थ इस अधिसूचना द्वारा प्रकाशित किया जाता है।

उत्तर प्रदेश भू–गर्भ जल (प्रबंधन और विनियमन) अधिनियम, 2019

(उत्तर प्रदेश अधिनियम संख्या 13 सन् 2019)

[जैसा उत्तर प्रदेश विधान मण्डल द्वारा पारित हुआ]

राज्य के विशेष रूप से संकट ग्रस्त ग्रामीण तथा नगरीय क्षेत्रों में दोनों परिमाणात्मक एवं गुणात्मक भू-गर्भ जल का अविरत प्रबंधन सुनिश्चित करने हेतु भू–गर्भ जल की सुरक्षा, संरक्षा, नियंत्रण तथा विनियमन और उससे सम्बन्धित या आनुषंगिक विषयों का उपबन्ध करने के लिये

अधिनियम

चूंकि भू-गर्भ जल के अनियंत्रित और तीव्र निष्कर्षण के फलस्वरूप भू–गर्भ जल के स्तरों में आई गिरावट से भयप्रद स्थिति उत्पन्न हो गयी है और राज्य के अनेक भागों के ग्रामीण एवं नगरीय दोनों क्षेत्रों में भू-गर्भ जल के स्रोतों में कमी आ गयी है;

और चूंकि भू-गर्भ जल, घरेलू, कृषि और औद्योगिक उपयोगों हेतु एकल सर्वाधिक महत्वपूर्ण जल स्रोत होने के कारण ग्रामीण एवं नगरीय क्षेत्रों में पेय जल, खाद्य तथा जीविका सुरक्षा का मेरूदण्ड है;

और चूंकि अतिशय भूगर्भ जल निष्कर्षण और भूगर्भ जल संदूषण के कारण गम्भीर भूगर्भ जल संकट विद्यमान है;

और चूंकि भूगर्भ जल का विकास राज्य की आवश्यकता है, इसलिए विशेष रूप से अतिदोहित तथा संकटग्रस्त क्षेत्रों में इसका प्रबंधन, नियंत्रण और विनियमन किया जाना भी इस बहुमूल्य संसाधन की सुरक्षा एवं संरक्षण हेतु समय की माँग है;

और चूंकि संकटग्रस्त क्षेत्रों में भूगर्भ जल की समुचित वृद्धि/पुनर्भरण के प्रयोजनार्थ भूगर्भ जल संसाधनों के संरक्षण, सुरक्षा तथा विकास के लिए, और राज्य में उक्त संकटग्रस्त क्षेत्रों की भूगर्भ जल की पूर्णकालिक गुणवत्ता को अनुरक्षित या पुनर्स्थापित करते हुए भूगर्भ जल प्रदूषण निवारण के लिए उपबन्ध करना भी समीचीन है;

और चूंकि भूगर्भ जल के साम्यपूर्ण तथा पर्यावरणीय रूप से ठोस भूगर्भ जल विनियमन से वर्तमान समय की जलवायु परिवर्तन सहित कतिपय सर्वाधिक महत्वपूर्ण चुनौतियों का सामना करने में सहायता प्राप्त हो सकती है;

और चूंकि जल ऐकिक प्रकृति का होता है जिसके लिए भू–पृष्ठ जल तथा भूगर्भ जल का एकीकृत रूप में होना अपेक्षित है, जो भूमि और वनस्पति से अभिन्न रूप में संयोजित होता है और उसका वर्षा जल (प्राकृतिक पुनर्भरण के माध्यम से) से जटिल रूप में जुड़ाव होता है।

और चूंकि भूगर्भ जल अपनी प्राकृतिक अवस्था में सामान्य रूप में एक सामूहिक संसाधन है और भारत के उच्चतम न्यायालय ने भूगर्भ जल लोक न्यास सिद्धांत को इस मान्यता के साथ लागू किया है कि भूगर्भ जल निजी संपत्ति अधिकार अनुपयुक्त अधिकार है जिनके कारण भूगर्भ जल की प्रास्थिति संकटमय, प्रतिकूल तथा परिवर्तनशील हो जाती है;

और चूंकि राज्य सरकार ने समस्त सम्बन्धित पहलुओं पर सावधानीपूर्वक परीक्षण करने के पश्चात यह विनिश्चय किया है कि भूगर्भ जल का किसी भी रूप में न्यायसंगत रूप में निष्कर्षण और उपयोग का प्रबंधन तथा विनियमन करना और राज्य के संकटग्रस्त क्षेत्रों में भूगर्भ जल का संरक्षण तथा उसकी सुरक्षा करना भी लोकहित में समीचीन तथा आवश्यक है और उसे नियोजन तथा प्रबंधन में सर्वोच्च प्राथमिकता प्रदान की जायेगी;

और चूंकि भूगर्भ जल संसाधनों की गुणात्मक एवं परिमाणात्मक अविरतता और भूगर्भ जल उपयोग में साम्यता को सुनिश्चित करने के लिए एक नया विधिक ढांचा (सन्नियमों, सिद्धान्तों, प्रक्रियाओं और समकालीन तथा आसन्न चुनौतियों को इंगित करने वाली उपयुक्त संस्थाओं सहित) अपेक्षित है;

और चूंकि राज्य सरकार ने समस्त संबंधित पहलुओं पर सावधानी पूर्वक परीक्षण करने के पश्चात यह विनिश्चय किया है कि लोकहित में भूगर्भ जल उपयोग का प्रथम अधिकार पीने के लिए, घरेलू तथा पशु उपयोग हेतु होगा।

एतद्द्वारा भारत गणराज्य के सत्तरवें वर्ष में निम्नलिखित अधिनियम बनाया जाता है :–

अध्याय–एक

प्रारम्भिक

संक्षिप्त नाम, विस्तार और प्रारंभ

1–(1) यह अधिनियम उत्तर प्रदेश भूगर्भ जल (प्रबंधन और विनियमन) अधिनियम, 2019 कहा जायेगा;

(2) इसका विस्तार संपूर्ण उत्तर प्रदेश राज्य में होगा;

(3) यह ऐसे दिनांक को प्रवृत्त होगा जैसा कि राज्य सरकार गजट में अधिसूचना द्वारा नियत करे और भिन्न–भिन्न क्षेत्रों के लिए भिन्न–भिन्न दिनांक नियत किए जा सकते हैं;

(4) इस अधिनियम के अधीन किए गए शास्तिक उपबंध, भूगर्भ जल के घरेलू और कृषि उपयोगकर्ताओं पर प्रयोज्य नहीं होंगे।

परिभाषाएं

2–(1) जब तक संदर्भ से अन्यथा अपेक्षित न हो, इस अधिनियम में :–

(क) **'समुचित प्राधिकरण'** का तात्पर्य 'ग्राम पंचायत भूगर्भ जल उप–समिति', 'विकास खण्ड पंचायत भूगर्भ जल प्रबंधन समिति', 'नगर पालिका जल प्रबंधन समिति', और जिला भूगर्भ जल प्रबंधन परिषद से है;

(ख) **'जलभृत'** का तात्पर्य खण्डित चट्टानों, रेत, बजरी तथा तद्समान तलछटों से समाविष्ट भौगोलिक संरचना, संरचना समूह या आंशिक संरचना समूह के भूमिगत सतह से है जो पर्याप्त सरंध्र, पारगम्य और जल से संतृप्त है और जो किसी कूप या जल स्रोत को पर्याप्त मात्रा में जल प्रेषित करता है/प्रतिगृहीत करता है/प्रदान करता है;

(ग) **'भूजल सेना'** का तात्पर्य उत्तर प्रदेश के प्रत्येक जिला में भूगर्भ जल जागरूकता कार्यक्रम क्रियान्वित करने हेतु गठित व्यक्ति समूह से है;

(घ) **'खण्ड पंचायत भूगर्भ जल प्रबंधन समिति'** का तात्पर्य धारा 4 के अधीन गठित खण्ड पंचायत भूगर्भ जल प्रबंधन समिति से है;

(ङ) **'सामूहिक उपयोक्ता'** का तात्पर्य किसी अधिष्ठान यथा होटलों/लाजों/निजी आवासीय भवनों/आवासीय कालोनियों/रिजार्टों/निजी चिकित्सालयों/ परिचर्या गृहों/कारबार प्रक्षेत्रों/मॉल्स/वाटर पार्कों सहित किसी व्यक्ति या किसी व्यक्ति समूह से है जो अपनी क्रियात्मक जल आवश्यकताओं के प्रयोजनार्थ भूगर्भ जल का निष्कर्षण और उपयोग करते है;

(च) **'केन्द्रीय भूगर्भ जल बोर्ड'** का तात्पर्य केन्द्रीय भूगर्भ जल बोर्ड, जल संसाधन मंत्रालय, नदी विकास और गंगा पुनरूज्जीवन, भारत सरकार से है;

(छ) **'वाणिज्यिक उपयोक्ता'** का तात्पर्य ऐसी किसी संस्था या किसी अभिकरण या किसी अधिष्ठान जो उक्त प्रयोजनार्थ भूगर्भ जल का निष्कर्षण और उपयोग करता है, सहित ऐसे किसी व्यक्ति या व्यक्ति समूह से है जो वित्तीय उपलब्धि या लाभ हेतु अपने कारबार या व्यापार के लिए प्रत्यक्ष या परोक्ष रूप से लाभ प्राप्त करता है;

(ज) **'विकास प्राधिकरण'** का तात्पर्य उत्तर प्रदेश राज्य में किसी जिला विकास प्राधिकरण से है;

(झ) **'जिला भूगर्भ जल प्रबंधन परिषद'** का तात्पर्य, धारा 6 के अधीन गठित जिला भूगर्भ जल प्रबंधन परिषद से है;

(ञ) **'वेधन अभिकरण'** का तात्पर्य ऐसे किसी व्यक्ति या व्यक्तियों के वर्ग या किसी संस्था से है, जो किसी प्रयोजन यथा घरेलू/पीने हेतु/ वाणिज्यिक/औद्योगिक/सामूहिक/अवसंरचनात्मक उपयोग के लिए भूगर्भ जल का निष्कर्षण और उपयोग करने हेतु कूपों/नलकूपों का वेधन करने के व्यवसाय के भाग के रूप में संलग्न है;

(ट) **'पर्यावरणीय प्रवाह'** लोगों को वस्तुएँ और सेवाएँ प्रदान करने वाले जलीय पारिस्थितिकीय तंत्रों के संघटकों, कृत्यों, प्रक्रियाओं तथा नम्यता को अनुरक्षित करने के लिए अपेक्षित जल प्रवाहों की गुणवत्ता, परिमाण तथा समय निर्धारण को निर्दिष्ट करते हैं;

(ठ) **'ग्राम पंचायत भूगर्भ जल उप–समिति'** का तात्पर्य धारा 3 के अधीन गठित ग्राम पंचायत भूगर्भ जल उप–समिति से है;

(ड) **'भूगर्भ जल विभाग'** का तात्पर्य उत्तर प्रदेश सरकार के भूगर्भ जल विभाग से है;

(ढ) **'भूगर्भ जल गुणवत्ता संवेदनशील परिक्षेत्र'** का तात्पर्य इस प्रकार के किसी क्षेत्र से है जहाँ भूगर्भ जल गुणवत्ता, भूजनित या मानव जनित कारणों के फलस्वरूप रासायनिक तत्वों, भौतिक–रासायनिक संघटकों, भारी धातुओं और जीवाण्विक संदूषण के उच्च स्तरीय/अतिशय संकेन्द्रण से प्रभावित है;

(ण) **'भूगर्भ जल संसाधन प्राक्कलन रिपोर्ट'** खण्डों का अतिदोहित, संकटग्रस्त, अर्द्ध संकटग्रस्त और सुरक्षित श्रेणियों में श्रेणीकरण सहित भूगर्भ जल संसाधन खण्डवार निर्धारण के लिए भूगर्भ जल विभाग, उत्तर प्रदेश और केन्द्रीय भूगर्भ जल बोर्ड द्वारा तैयार की गयी भूगर्भ जल प्राक्कलन समिति की पद्धति तंत्र पर आधारित नवीनतम अनुमोदित रिपोर्ट को निर्दिष्ट करती है;

(त) **'भूगर्भ जल सुरक्षा योजना'** का तात्पर्य उपलब्ध जल भूगर्भीय सूचनाओं पर क्रमिक रूप से आधारित किसी योजना से है और उसमें ऐसे उपाय/मध्यक्षेप सम्मिलित हैं जो विनिर्दिष्ट क्षेत्र के रूप में तथा जल भूगर्भीय रूप में संभाव्य है;

(थ) **'भूगर्भ जल'** का तात्पर्य ऐसे जल से है, जो किसी संतृप्त परिक्षेत्र में भूमि की सतह के नीचे पाया जाता है और जिसे कूपों या किन्ही अन्य साधनों से निकाला जा सकता है अथवा धाराओं और नदियों में झरनों तथा मुख्य प्रवाहों के रूप में निकलता है;

(द) **'उद्योग'** का तात्पर्य किसी ऐसे कारबार, व्यापार, उपक्रम, विनिर्माण या नियोजकों की आजीविका से है, जो किसी अभिलाभ या लाभ हेतु चलाया जाता हो और उसके अन्तर्गत कोई आजीविका सम्बन्धी सेवा नियोजन, हस्तशिल्प या औद्योगिक व्यवसाय या श्रमिक का उप व्यवसाय या माल के उत्पादन के लिये किसी नियोजक और उसके श्रमिक (चाहे ऐसा श्रमिक उक्त नियोजक द्वारा सीधे नियोजित किया गया हो या किसी अभिकरण, जिसके अन्तर्गत ठेकेदार भी हैं, द्वारा अथवा उसके माध्यम से) के मध्य सहयोग द्वारा चलाया जाने वाला क्रमबद्ध क्रियाकलाप भी हैं;

(ध) **'अवसंरचनात्मक प्रयोक्ता'** का तात्पर्य ऐसी किसी फर्म या कंपनी सहित व्यक्ति या व्यक्ति समूह से है जो अवसंरचनात्मक विकास से सीधे संबंधित क्रियाकलापों/परियोजनाओं को क्रियान्वित करने के प्रयोजनार्थ भूगर्भ जल का निष्कर्षण और उपयोग करता है;

(न) **'नगर पालिका जल प्रबंधन समिति'** का तात्पर्य धारा 5 के अधीन गठित नगर पालिका जल प्रबंधन समिति से है;

(प) **'अधिसूचित क्षेत्र'** का तात्पर्य धारा 9 के अधीन इस रूप में अधिसूचित क्षेत्र से है जिसमें अति–दोहित, संकटमय और संकटग्रस्त नगरीय क्षेत्र सम्मिलित है;

(फ) **'पानी पंचायत'** का तात्पर्य तालाबों के अनुरक्षण और संरक्षण के लिए तालाब स्तर पर गठित किसी व्यक्ति–समूह से है;

(ब) **'प्रदूषण'** का तात्पर्य भूगर्भ जल या भू–पृष्ठ जल या ऐसे संदूषण या जल के भौतिक, रासायनिक या जैविक गुणों में परिवर्तन या किसी मल, प्लास्टिक, थर्मोकोल या व्यापारिक वहिःस्राव या गैसीय या ठोस पदार्थ युक्त किसी अन्य तरल पदार्थ का भूगर्भ जल में (प्रत्यक्ष या परोक्ष रूप में) निस्सारण से है, जिससे उपताप हो सकता है या उपताप उत्पन्न होना सम्भावित हो या ऐसे भूगर्भ जल को लोक स्वास्थ्य या सुरक्षा हेतु या घरेलू, वाणिज्यिक, औद्योगिक, कृषिगत या अन्य विधिसम्मत उपयोगों के लिए या पशुओं या पौधों या जलीय जीवों के जीवन एवं स्वास्थ्य के लिये हानिकारक या क्षतिकारक हो सकता है;

(भ) **'वर्षा जल संचयन'** का तात्पर्य भूगर्भ जल भण्डारण या उसके पुनर्भरण हेतु छत के ऊपर संचयन सहित सूक्ष्म जल विभाजक पैमाना पर वर्षा जल संग्रहण और भण्डारण तकनीक या प्रणाली से है;

(म) **'ग्रामीण क्षेत्रों'** का तात्पर्य उन क्षेत्रों से है जो नगरीय क्षेत्रों के रूप में वर्गीकृत नही हैं;

(य) **'राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण'** का तात्पर्य धारा 7 के अधीन गठित उत्तर प्रदेश राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण से है;

(क क) **'नगरीय क्षेत्रों'** का तात्पर्य ऐसे क्षेत्रों से है जो यथास्थिति किसी विकास प्राधिकरण या किसी नगर पालिका या किसी नियामक निकाय द्वारा अधिसूचित किये जायं, जिनमें ऐसे क्षेत्र/भूमि सम्मिलित नहीं है, जो किसी विकास प्राधिकरण या किसी नगर पालिका या किसी विनियमित क्षेत्र की महायोजना में कृषि उपयोग हेतु वर्गीकृत किये गये हों;

(क ख) **'भूगर्भ जल उपयोक्ता'** का तात्पर्य किसी ऐसे व्यक्ति या व्यक्तियों के वर्ग या संस्था से है, जो व्यक्तिगत या सामुदायिक आधार पर किये जाने वाले घरेलू उपयोग सहित किसी प्रयोजन के लिए भूगर्भ जल का स्वामित्व रखते हैं, उसका प्रयोग करते हैं या विक्रय करता है/करते हैं और उसमें/उनमें कोई सरकारी या गैर सरकारी उद्योग, वाणिज्यिक उपयोक्ता, सामूहिक उपयोक्ता, कंपनी का कोई प्रतिष्ठान सम्मिलित है, किन्तु उसमें/उनमें ऐसा कोई व्यक्ति या व्यक्ति वर्ग या संस्था सम्मिलित नहीं है, जो हस्तचालित या पशुचालित युक्तियों यथा हैण्डपम्प, रस्सी तथा बाल्टी और रहट आदि द्वारा कूप से निकाले गये भूगर्भ जल का प्रयोग करता है/करते हैं;

(क ग) **'जल और स्वच्छता समिति'** का तात्पर्य जल और स्वच्छता योजनाओं के नियोजन, अनुश्रवण, क्रियान्वयन और अनुरक्षण हेतु प्रत्येक ग्राम पंचायत में गठित किसी समिति से है;

(क घ) **'जल उपयोक्ता संगम'** का तात्पर्य सिंचाई जल प्रणाली का प्रबंधन और अनुरक्षण करने के लिए नहर निकास स्तर पर गठित निर्वाचित लोगों के संगठन से है;

(क ङ) **'कूप'** का तात्पर्य भूगर्भ जल के खोज या निष्कर्षण या पुनर्भरण के लिए निर्मित किसी संरचना से है और उसके अन्तर्गत खुला कूप, डगबेल, बोरबेल, डग कम बोरबेल, नलकूप, अन्तः स्पन्दन गैलरी पुनर्भरण कूप अथवा उनमें से किसी का संयोजन या रूपान्तरण भी है, जिसका उपयोग भूगर्भ जल निष्कर्षण तथा भूगर्भ जल पुनर्भरण के लिए किया जा सकता है;

(2) इसमें प्रयुक्त किन्तु अपरिभाषित और तत्समय प्रवृत्त किसी विधि में परिभाषित शब्दों और पदो के वही अर्थ होंगे जो उनके लिए सम्बन्धित विधियों में क्रमशः समनुदेशित हैं।

अध्याय–दो

संस्थागत ढ़ांचा

ग्राम पंचायत भूगर्भ जल उप–समिति

3–(1) प्रत्येक ग्राम पंचायत में एक ग्राम पंचायत भूगर्भ जल उप–समिति का गठन किया जायेगा, जो इस अधिनियम के अधीन भूगर्भ जल संसाधनों का संरक्षण और प्रबंधन करने हेतु किसी खण्ड के अन्तर्गत ग्रामीण क्षेत्रों की निम्नतम लोक इकाई होगी,

(2) राज्य सरकार गजट में अधिसूचना द्वारा जिला भूगर्भ जल प्रबन्धन परिषद का गठन किये जाने के तीन माह के भीतर ग्राम पंचायत भूगर्भ जल उप समिति का गठन करने के लिए जिला भूगर्भ जल प्रबन्धन परिषद को निदेश देगी, जिसमें निम्नलिखित होंगे:–

(क) अध्यक्ष– ग्राम प्रधान;

(ख) सदस्य सचिव– ग्राम पंचायत सचिव;

(ग) जल संसाधनों का स्थलीय ज्ञान रखने वाले ग्राम पंचायत के प्रतिनिधि के रूप में तीन सदस्य, जो खण्ड विकास अधिकारी द्वारा नाम निर्दिष्ट किये जायेंगे;

(घ) भूजल सेना/पानी पंचायत/जल उपयोक्ता संगम/जल और स्वच्छता समिति के दो सदस्य, जिन्हें खण्ड विकास अधिकारी द्वारा नाम निर्दिष्ट किया जायेगा;

(ङ) खण्ड स्तर पर कार्यरत सम्बन्धित विभागों के प्रतिनिधियों के रूप में दो सदस्य, जिन्हें खण्ड विकास अधिकारी द्वारा नाम निर्दिष्ट किया जायेगा;

(3) सदस्यों की सेवा की निबंधन एवं शर्तें ऐसी होंगी जैसा कि विहित किया जाय;

(4) ग्राम पंचायत भूगर्भ जल उप–समिति के कृत्य निम्नलिखित होंगे;

(क) समस्त स्रोतों से सूचना एकत्र करना;

(ख) धारा 13 में यथा उपबंधित ग्राम पंचायत भूगर्भ जल सुरक्षा योजना तैयार करना;

(ग) ऐसे कृत्यों को क्रियान्वित करना, जैसा कि विहित किया जाय;

खण्ड पंचायत भूगर्भ जल प्रबंधन समिति

4–(1) **खण्ड पंचायत भूगर्भ जल प्रबंधन समिति** का गठन किया जायेगा जो खण्ड स्तर पर भूगर्भ जल के समग्र प्रबंधन हेतु एक सार्वजनिक इकाई होगी;

(2) राज्य सरकार, गजट में अधिसूचना द्वारा जिला भूगर्भ जल प्रबन्धन परिषद का गठन किये जाने के तीन माह के भीतर खण्ड पंचायत भूगर्भ जल प्रबंधन समिति का गठन करने के लिए जिला भूगर्भ जल प्रबंधन परिषद को निदेश जारी करेगी जिसमें निम्नलिखित होंगे :–

(क) अध्यक्ष– खण्ड प्रमुख

(ख) सदस्य सचिव–खण्ड विकास अधिकारी(बी0डी0ओ0)

(ग) जल संसाधनों का स्थलीय ज्ञान रखने वाले ग्राम पंचायत के प्रतिनिधि के रूप में तीन सदस्य, जो जिला मजिस्ट्रेट द्वारा नाम निर्दिष्ट किये जायेंगे;

(घ) भूजल सेना/पानी पंचायत/जल उपयोक्ता संगम/जल और स्वच्छता समिति के दो सदस्य जो जिला मजिस्ट्रेट द्वारा नाम निर्दिष्ट किये जायेंगे;

(ङ) खण्ड स्तर पर कार्यरत संबंधित विभागों के प्रतिनिधि के रूप में दो सदस्य जो जिला मजिस्ट्रेट द्वारा नाम निर्दिष्ट किये जायेंगे;

(3) सदस्यों की सेवा की निबंधन और शर्तें ऐसी होंगी जैसा कि विहित किया जाय।

(4) खण्ड पंचायत भूगर्भ जल प्रबंधन समिति के कृत्य निम्नलिखित होंगे :–

(क) यथा प्रतिपादित/विहित मार्ग दर्शनों के अनुसार प्रत्येक कम से कम दस ग्राम पंचायतों के समूह में तैयार की गयी, ग्राम पंचायत भूगर्भ जल सुरक्षा योजनाओं को समेकित करके एक समग्र खण्ड स्तरीय भूगर्भ जल सुरक्षा योजना तैयार करना;

(ख) खण्ड पंचायत भूगर्भ जल सुरक्षा योजना के क्रियान्वयन का अनुश्रवण करना;

(ग) सम्बंधित खण्ड की क्षेत्रीय अधिकारिता के भीतर धारा 10 की उपधारा (2) और धारा 11 की उपधारा (2) के उपबंधों के अनुसार विद्यमान वाणिज्यिक, औद्योगिक, अवसंरचनात्मक तथा सामूहिक उपयोक्ताओं के क्षेत्रों से भिन्न अधिसूचित तथा गैर अधिसूचित क्षेत्रों के अन्तर्गत समस्त कूपों को रजिस्ट्रीकृत करना;

(घ) ऐसे अन्य कृत्यों को क्रियान्वित करना जैसाकि विहित किया जाय।

नगर पालिका जल प्रबंधन समिति

5–(1) एक नगर पालिका जल प्रबंधन समिति का गठन किया जायेगा, जो नगरीय क्षेत्रों में एकीकृत रूप में जल प्रबंधन हेतु निम्नतम लोक इकाई होगी;

(2) राज्य सरकार, गजट में अधिसूचना द्वारा जिला भूगर्भ जल प्रबंधन परिषद का गठन किये जाने के तीन माह के भीतर जिला भूगर्भ जल प्रबंधन परिषद को नगर पालिका जल प्रबंधन समिति का गठन करने के लिए निदेश जारी करेगी, जिसमें निम्नलिखित होंगे :–

(क) अध्यक्ष–यथास्थिति नगर प्रमुख/नगर पालिका प्रमुख;

(ख) सदस्य सचिव–यथास्थिति नगर आयुक्त या कार्यपालक अधिकारी;

(ग) जल संसाधनों का स्थलीय ज्ञान रखने वाले लोक–प्रतिनिधि के रूप में दो सदस्य, जो जिला मजिस्ट्रेट द्वारा नाम निर्दिष्ट किये जायेंगे;

(घ) निवासी कल्याण संगम/सामाजिक समूह के दो सदस्य, जो जिला मजिस्ट्रेट द्वारा नाम निर्दिष्ट किये जायेंगे;

(ङ) सम्बन्धित विभागों (भूगर्भ जल विभाग से एक प्रतिनिधि सहित) के प्रतिनिधि के रूप में तीन सदस्य, जो जिला मजिस्ट्रेट द्वारा नाम निर्दिष्ट किये जायेंगे;

(3) सदस्यों की सेवा की निबंधन और शर्तें ऐसी होंगी जैसा कि विहित किया जाय;

(4) नगर पालिका जल प्रबंधन समिति के कृत्य निम्नलिखित होंगे:–

(क) संबंधित नगर पालिका के भीतर सम्बंधित संस्थानों के साथ समन्वय में कार्य करना;

(ख) जल आपूर्ति के स्रोतों (भू–पृष्ठ जल और भूगर्भ जल) को अवधारित करना और उन्हें एकीकृत करना;

(ग) धारा 13 के अधीन उपबंधित समग्र नगर पालिका भूगर्भ जल सुरक्षा योजनाओं को तैयार करना;

(घ) सम्बंधित नगर पालिका की क्षेत्रीय अधिकारिता के भीतर धारा 10 की उपधारा (2) और धारा 11 की उपधारा (2) के उपबंधों के अनुसार विद्यमान वाणिज्यिक, औद्योगिक, अवसंरचनात्मक तथा सामूहिक उपयोक्ताओं के क्षेत्रों से भिन्न अधिसूचित तथा गैर अधिसूचित क्षेत्रों के अन्तर्गत समस्त कूपों को रजिस्ट्रीकृत करना;

(ङ) नगर पालिका भूगर्भ जल सुरक्षा योजना के क्रियान्वयन का अनुश्रवण करना;

(च) ऐसे अन्य कृत्यों को क्रियान्वित करना, जैसा कि विहित किया जाय।

जिला भूगर्भ जल प्रबंधन परिषद्

6–(1) एक जिला भूगर्भ जल प्रबंधन परिषद का गठन किया जायेगा, जो जिला स्तर पर भूगर्भ जल संसाधनों के प्रबंधन के लिए एक समग्र इकाई होगी;

(2) राज्य सरकार, गजट में अधिसूचना द्वारा राज्य भूगर्भ जल प्रबन्धन और नियामक प्राधिकरण का गठन किये जाने के तीन माह के भीतर राज्य भू–गर्भ जल प्रबन्धन और नियामक प्राधिकरण को जिला भूगर्भ जल प्रबंधन परिषद का गठन करने के लिये निदेश जारी करेगी जिसमें निम्नलिखित होंगे;

(क) अध्यक्ष–जिला मजिस्ट्रेट;

(ख) सदस्य सचिव–जिला विकास अधिकारी;

(ग) राज्य में भूगर्भ जल प्रबंधन के क्षेत्र में दीर्घकालिक कार्य करने का अनुभव रखने वाले विषय विशेषज्ञ के रूप में एक सदस्य, जो जिला मजिस्ट्रेट द्वारा नाम निर्दिष्ट किया जायेगा;

(घ) भूगर्भ जल के क्षेत्र में अनुभव रखने वाले सार्वजनिक/गैर सरकारी संगठन/सामाजिक क्षेत्र का 01 सदस्य,जो जिला मजिस्ट्रेट द्वारा नाम निर्दिष्ट किया जायेगा;

(ड.) अन्य सदस्य भूगर्भ जल विभाग, उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड, कृषि विभाग, लघु सिंचाई विभाग, उत्तर प्रदेश जल निगम, स्थानीय निकाय, विकास प्राधिकरण, सिंचाई और जल संसाधन विभाग, उद्योग विभाग, उद्यान विभाग तथा वन और वन्य जीव विभाग के (प्रत्येक से एक) जिला स्तरीय प्रतिनिधि होंगे;

(च) संबंधित खण्ड पंचायत भूगर्भ जल प्रबंधन समिति और नगर पालिका भूगर्भ जल प्रबंधन समिति प्रत्येक में से एक प्रतिनिधि (आमंत्रित के रूप में);

(3) सदस्यों की सेवा की निबंधन एवं शर्तें ऐसी होंगी, जैसा कि विहित किया जाय;

(4) जिला भूगर्भ जल प्रबंधन परिषद के कृत्य निम्नलिखित होंगे:–

(क) सूक्ष्म जल विभाजक पद्धति पर आधारित और यथा विहित मार्गदर्शनों के अनुसार खण्ड पंचायत और नगर पालिका भूगर्भ जल सुरक्षा योजना का जिला स्तरीय भूगर्भ जल सुरक्षा योजना के साथ समन्वय स्थापित करना;

(ख) जिला भूगर्भ जल सुरक्षा योजना का क्रियान्वयन करना;

(ग) जिला भूगर्भ जल सुरक्षा योजना के क्रियान्वयन का अनुश्रवण करना;

(घ) जल जागरूकता कार्यक्रम संचालित करना;

(ड) अधिसूचित और गैर–अधिसूचित क्षेत्रों में समस्त विद्यमान वाणिज्यिक, औद्योगिक, अवसंरचनात्मक तथा सामूहिक उपयोक्ताओं को रजिस्ट्रीकृत करना और गैर–अधिसूचित क्षेत्रों में भूगर्भ जल निष्कर्षण हेतु प्राधिकार प्रमाणपत्र/अनापत्ति प्रमाणपत्र स्वीकृत करना तथा वेधन अभिकरणों को रजिस्ट्रीकृत करना;

(च) ऐसे अन्य कृत्यों को क्रियान्वित करना जैसा कि उत्तर प्रदेश राज्य भू–गर्भ जल प्रबंधन और नियामक प्राधिकरण द्वारा विहित किया जाय या समनुदेशित किया जाय;

(छ) ग्राम पंचायत भूगर्भ जल उप–समितियों, खण्ड पंचायत भूगर्भ जल प्रबंधन समिति और नगर पालिका जल प्रबंधन समितियों और साथ ही साथ राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण के साथ समन्वय स्थापित करना;

राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण

7–(1) राज्य सरकार, गजट में अधिसूचना द्वारा, अधिसूचना में यथा विनिर्दिष्ट दिनांक से एक राज्य प्राधिकरण स्थापित करेगी, जिसे उत्तर प्रदेश राज्य भू–गर्भ जल प्रबंधन और नियामक प्राधिकरण के रूप में जाना जायेगा।

(2) राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण में निम्नलिखित होंगे :–

1.	मुख्य सचिव, उत्तर प्रदेश शासन	अध्यक्ष
2.	अपर मुख्य सचिव/प्रमुख सचिव, लघु सिंचाई और भूगर्भ जल विभाग, उत्तर प्रदेश शासन	सदस्य
3.	अपर मुख्य सचिव/प्रमुख सचिव, वित्त विभाग, उत्तर प्रदेश शासन	सदस्य
4.	प्रमुख अभियन्ता, सिंचाई और जल संसाधन विभाग, उत्तर प्रदेश	सदस्य
5.	निदेशक, कृषि विभाग, उत्तर प्रदेश	सदस्य
6.	निदेशक, उद्यान विभाग, उत्तर प्रदेश	सदस्य
7.	सदस्य सचिव, उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड	सदस्य
8.	मुख्य नगर एवं ग्राम्य नियोजक, आवास एवं शहरी नियोजन विभाग, उत्तर प्रदेश	सदस्य
9.	निदेशक, आवास बन्धु, उत्तर प्रदेश	सदस्य
10.	निदेशक, स्थानीय निकाय, उत्तर प्रदेश	सदस्य
11.	प्रबंध निदेशक, उत्तर प्रदेश जल निगम	सदस्य
12.	मुख्य अभियंता, लघु सिंचाई विभाग, उत्तर प्रदेश	सदस्य
13.	निदेशक, उद्योग विभाग, उत्तर प्रदेश	सदस्य
14.	क्षेत्रीय निदेशक, केन्द्रीय भूगर्भ जल बोर्ड (उ0क्षे0)	सदस्य
15.	मुख्य वन संरक्षक, वन विभाग, उत्तर प्रदेश	सदस्य
16.	उत्तर प्रदेश राज्य में भूगर्भ जल प्रबंधन का दीर्घकालिक कार्य करने का अनुभव रखने वाले तीन विषय विशेषज्ञ (राज्य सरकार द्वारा नाम निर्दिष्ट किये जायेंगे)	सदस्य
17.	भूगर्भ जल के क्षेत्र में कार्य करने वाला सार्वजनिक/गैर सरकारी संगठन/सामाजिक क्षेत्र का एक प्रख्यात व्यक्ति	सदस्य
18.	संबंधित खण्ड पंचायत भूगर्भ जल प्रबंधन समिति, नगर पालिका भूगर्भ जल प्रबंधन समिति और जिला भूगर्भ जल प्रबंधन परिषद प्रत्येक में से एक प्रतिनिधि (आमंत्रित के रूप में)	सदस्य

(3) निदेशक, भूगर्भ जल विभाग, उत्तर प्रदेश,राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण का सदस्य सचिव होगा;

(4) अध्यक्ष और अन्य सदस्यों की पदावधि और रिक्तियों को भरने की रीति तथा सेवा की अन्य शर्तें ऐसी होंगी, जैसा कि विहित किया जाय;

(5) अध्यक्ष राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण का प्रमुख कार्यपालक अधिकारी होगा तथा निदेशक, भूगर्भ जल विभाग का कार्यालय राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण के सचिवालय के रूप में कार्य करेगा;

(6) राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण के कृत्य निम्नलिखित होंगे:–

(क) धारा 9 के अधीन यथा उपबंधित भूगर्भ जल संसाधनों के प्रबंधन और विनियमन हेतु क्षेत्रों को अधिसूचित करना;

(ख) धारा 12 के अधीन यथा उपबंधित भूगर्भ जल संसाधनों के प्रबंधन और विनियमन हेतु क्षेत्रों को गैर अधिसूचित करना;

(ग) धारा 15 के अधीन यथा उपबंधित भूगर्भ जल निष्कर्षण की सीमाओं को नियत करना;

(घ) धारा 26 के अधीन यथा उपबंधित भूगर्भ जल प्रदूषण नियंत्रण के उपाय करना;

(7) राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण के कर्मचारिवृंद

(क) राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण को अपने कृत्यों का समुचित निष्पादन करने और इस अधिनियम के अधीन शक्तियों का प्रयोग करने योग्य बनाने के उद्देश्य से राज्य सरकार उतनी संख्या में प्राविधिक कार्मिकों तथा अन्य कर्मचारिवृंद की नियुक्ति कर सकती है, जैसाकि वह संस्थागत सहायता, सुविधाओं तथा बजट सहित आवश्यक समझे;

(ख) ऐसे कर्मचारियों के कृत्य और सेवा की निबंधन एवं शर्तें वही होंगी, जैसाकि विहित किया जाय;

(ग) राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण राज्य सरकार के समग्र नियंत्रण और पर्यवेक्षण के अधीन कार्य करेगा;

(8) अन्य समुचित निकायों के लिए सहायता:–

ग्राम पंचायत उप–समिति/खण्ड पंचायत/नगर पालिका समिति और जिला परिषद को निर्विघ्न और सम्यक् रूप से कार्य करने के लिए कर्मचारी वर्ग तथा कार्यालय के साथ ही साथ समस्त संस्थागत सहायता और कार्य सुविधाओं तथा बजट सम्बंधी अपेक्षाओं के लिए भी उपबंध किये जायेंगे।

अध्याय–तीन

कर्त्तव्य और उत्तरदायित्व

भूगर्भ जल विभाग के कर्त्तव्य

8–(1) भूगर्भ जल विभाग, जिला भूगर्भ जल प्रबंधन परिषद के माध्यम से समुचित निकाय यथा नगरीय क्षेत्रों के मामले में नगर पालिका भूगर्भ जल प्रबंधन समिति और ग्रामीण क्षेत्रों हेतु खण्ड पंचायत भू–गर्भ जल प्रबंधन समिति के साथ समन्वय स्थापित करने हेतु एक क्रियाविधि विकसित करेगा;

(2) उक्त विभाग, राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण हेतु प्राविधिक सचिवालय के रूप में कार्य करेगा;

(3) भूगर्भ जल के विनियमन के प्रयोजन के लिए क्षेत्रों का अभिनिर्धारण :

भूगर्भ जल विभाग,राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण के परामर्श से ऐसे क्षेत्रों, यथा भूगर्भ जल विभाग और केन्द्रीय भू–गर्भ जल बोर्ड द्वारा किये गये नवीनतम भू–गर्भ जल संसाधन प्राक्कलन के अनुसार श्रेणीकृत अतिदोहित तथा संकटग्रस्त खण्डों और संकटग्रस्त नगर पालिका/नगरीय क्षेत्रों (जहाँ भूगर्भ जल स्तरों में महत्वपूर्ण ह्रास हुआ हो अर्थात् पिछले पॉच वर्षो में प्रतिवर्ष 20 सेमी0 ह्रास अभिलिखित किया गया हो) जिन्हें अधिसूचना के माध्यम से विनियमन के प्रयोजनार्थ अधिसूचित क्षेत्रों के रूप में अभिहित किया जाना हो, में भूगर्भ जल के समग्र प्रबंधन तथा विनियमन हेतु समुचित उपाय करने के लिए उक्त संकटग्रस्त नगर पालिका/ नगरीय क्षेत्रों को अभिनिर्धारित तथा चिन्हांकित करेगा;

(4) भूगर्भ जल सूचना/आकड़े:–अतिदोहित संकटमय खण्डों और संकटग्रस्त नगरीय क्षेत्रों से सम्बन्धित समस्त उपलब्ध भूगर्भ जल सूचना/आकड़े भूगर्भ जल विभाग के सम्बन्धित क्षेत्रीय प्रभागों के प्रभागीय आकड़ा केन्द्रों द्वारा जिला भूगर्भ जल प्रबंधन परिषदों को उपलब्ध करायें जायेंगे। ऐसी सूचना भूगर्भ जल विभाग के वेबसाइट के माध्यम से ऑन–लाइन उपलब्ध करायी जायेगी।

अध्याय–चार

शक्तियां और कृत्य

भूगर्भ जल संसाधनों के प्रबंधन और विनियमन क्षेत्रों को अधिसूचित करने की शक्तियाँ

9–(1) जहॉ (भूगर्भ जल विभाग की जानकारियों पर आधारित) सक्षम प्राधिकरणों से परामर्श करने के पश्चात राज्य भू–गर्भ जल प्रबंधन एवं नियामक प्राधिकरण की यह राय हो कि किसी क्षेत्र मे और किसी रूप में विभिन्न प्रयोजनार्थ भूगर्भ जल का प्रबंधन एवं विनियमन करना और वर्षा जल संचयन/भूगर्भ जल पुनर्भरण को प्रवर्तित करना तथा अतिदोहित/संकटग्रस्त खण्डों एवं संकटमय नगरीय क्षेत्रों (भूगर्भ जल विभाग द्वारा यथा अभिज्ञानित/चिन्हांकित) जहॉ भूगर्भ जल स्तर संकटग्रस्त या चिन्ताजनक स्तरों तक पहुँच गये हों, में विभिन्न समुचित जल संरक्षण/जल बचत/जल दक्ष पद्धतियों को कियान्वित करना लोकहित में आवश्यक और समीचीन हो, वहॉ वह राज्य सरकार को ऐसी रीति से, जैसाकि विहित किया जाय, यह परामर्श देगा कि वह इस अधिनियम के प्रयोजनार्थ अधिसूचना द्वारा ऐसे क्षेत्रों को अधिसूचना में यथा विनिर्दिष्ट दिनांक से अधिसूचित क्षेत्र घोषित करे;

परन्तु यह कि,–

(क) इस उप–धारा के अधीन अधिसूचना में विनिर्दिष्ट दिनांक, अधिसूचना प्रकाशित किये जाने के दिनांक से तीन माह से पूर्वतर दिनांक नहीं होगा;

(ख) इस धारा के अधीन हिन्दी और अंग्रेजी भाषाओं में प्रत्येक अधिसूचना को गजट में प्रकाशित किये जाने के अतिरिक्त उस क्षेत्र में व्यापक प्रसार वाले अन्यून तीन दैनिक क्षेत्रीय समाचार पत्रों में प्रकाशित किया जायेगा और उसे यथा विहित अन्य रीति से भी तामील किया जायेगा;

(2) उप–धारा (1) में निर्दिष्ट क्षेत्रों के सीमांकन और तत्सम्बंधी अधिसूचना जारी किये जाने की प्रकिया वही होगी जैसाकि विहित किया जाय;

(3) उप–धारा–(1) के अधीन जारी की गयी अधिसूचना की नवीन भू–गर्भ जल निर्धारण रिपोर्ट के अनुसार समीक्षा की जायेगी और रिपोर्ट के निष्कर्षो के अनुसार वह इस रूप में होगी जैसाकि विहित किया जाय;

अधिसूचित क्षेत्रों में उपयोक्ताओं का रजिस्ट्रीकरण

10–(1) विद्यमान वाणिज्यिक, औद्योगिक, अवसंरचनात्मक और सामूहिक भूगर्भ जल उपयोक्ताओं का पंजीकरण अधिसूचित क्षेत्रों (नगरीय और ग्रामीण दोनों क्षेत्रों) में अवस्थित प्रत्येक वाणिज्यिक, औद्योगिक, अवसंरचनात्मक और सामूहिक कूप उपयोक्ता को रजिस्ट्रीकरण प्रमाण–पत्र स्वीकृत किये जाने हेतु सम्बंधित जिला भू–गर्भ जल प्रबंधन परिषद् को आवेदन करना होगा। रजिस्ट्रीकरण प्रमाण–पत्र स्वीकृत किये जाने की प्रकिया,समय सीमा, प्रारूप, फीस आदि और अन्य उपबंध वही होंगे जैसाकि विहित किया जाय;

परन्तु यह कि,–

(क) जहां कोई विद्यमान वाणिज्यिक उपयोक्ता या सामूहिक उपयोक्ता रजिस्ट्रीकरण के बिना भूगर्भ जल निकालते हुए पाया जाता है तो यथास्थिति वह या व्यक्ति समूह या कोई अभिकरण अध्याय–आठ के अधीन दंडित किए जाने का भागी होगा/होगी/होंगे;

(ख) जहां कोई रजिस्ट्रीकृत कूप निष्क्रिय हो जाता है वहां भूगर्भ जल के उपयोक्ता द्वारा उक्त तथ्य को तत्काल संबंधित जिला भूगर्भ जल प्रबंधन परिषद के संज्ञान में लाया जाएगा;

(ग) जहॉ रजिस्ट्रीकरण प्रमाण–पत्र धारक कोई भूगर्भ जल उपयोक्ता किसी रजिस्ट्रीकृत कूप में कोई परिवर्द्धन या परिवर्तन करना चाहता हो वहां यथास्थिति उसे या व्यक्ति समूह या किसी अभिकरण को तद्निमित्त राज्य भूगर्भ जल प्रबंधन एवं नियामक प्राधिकरण से यथाविहित रीति से अनापत्ति प्राप्त करना होगा;

(2) उपधारा (1) में उल्लिखित उपयोक्ताओं से भिन्न प्रत्येक विद्यमान और भावी भूगर्भ जल उपयोक्ता जिसमें घरेलू और कृषि भूगर्भ जल उपयोक्ता सम्मिलित है भूगर्भ जल उपयोग के लिए संबंधित खंड पंचायत भूगर्भ जल प्रबंधन समिति/नगर पालिका जल प्रबंधन समिति को ऑनलाइन या सीधे रजिस्ट्रीकृत करना होगा । ऑनलाइन सूचना हेतु वेब पोर्टल के संबंध में सूचना उक्त समिति द्वारा प्रदान की जाएगी।

गैर अधिसूचित क्षेत्रों में विद्यमान वाणिज्यिक, औद्योगिक, अवसंरचनात्मक और सामूहिक भूगर्भ जल उपयोक्ताओं का रजिस्ट्रीकरण

11–(1) गैर अधिसूचित क्षेत्रों में प्रत्येक वाणिज्यिक, औद्योगिक, अवसंरचनात्मक और सामूहिक कूप (विद्यमान या सिंक किया जाने वाला) भूगर्भ जल उपयोक्ता को रजिस्ट्रीकरण प्रमाण पत्र स्वीकृत किए जाने हेतु संबंधित जिला भूगर्भ जल प्रबंधन परिषद को आवेदन करना होगा। रजिस्ट्रीकरण प्रमाण पत्र स्वीकृत किए जाने की प्रक्रिया, समय–सीमा, प्रारूप, फीस इत्यादि और अन्य उपबंध वही होंगे जैसा कि विहित किया जाए;

परन्तु यह कि,–

(क) यदि कोई वाणिज्यिक, औद्योगिक, अवसंरचनात्मक या सामूहिक भूगर्भ जल उपयोक्ता रजिस्ट्रीकरण के बिना भूगर्भ जल निकालते हुए पाया जाता है तो यथास्थिति वह या व्यक्ति समूह या कोई अभिकरण अध्याय 8 के अधीन दण्डित किये जाने का भागी होगा/होगी/होंगे;

(ख) यदि कोई रजिस्ट्रीकृत कूप निष्क्रिय हो जाता है तो भूगर्भ जल उपयोक्ता द्वारा तत्काल इस तथ्य को सम्बंधित जिलों के भूगर्भ जल प्रबंधन परिषद के संज्ञान में लाया जायेगा;

(ग) यदि रजिस्ट्रीकरण प्रमाण पत्र धारक कोई भूगर्भ जल उपयोक्ता, किसी रजिस्ट्रीकृत कूप में कोई परिवर्द्धन या परिवर्तन करना चाहता है तो यथास्थिति उसे या व्यक्ति समूह या किसी अभिकरण को तद्निमित्त सम्बंधित जिला भूगर्भ जल प्रबंधन परिषद से यथा विहित रीति से अनापत्ति प्राप्त करना होगा।

(2) उपधारा (1) में उल्लिखित उपयोक्ताओं से भिन्न घरेलू या कृषि भूगर्भ जल उपयोक्ता सहित प्रत्येक विद्यमान तथा भावी भू–गर्भ जल उपयोक्ता को आन लाइन या सीधे सम्बंधित खण्ड पंचायत भू–गर्भ जल प्रबंधन समिति/नगरपालिका जल प्रबंधन समिति से भू–गर्भ जल उपयोगों हेतु रजिस्ट्रीकृत कराना होगा। आन लाइन सूचना हेतु वेब पोर्टल के सम्बंध में उक्त समिति द्वारा सूचित किया जायेगा।

अधिसूचित क्षेत्रों में नवीन कूप निर्माण पर प्रतिबंध

12–(1) कोई व्यक्ति या व्यक्ति समूह या संस्था या अभिकरण या प्रतिष्ठान, अधिसूचित क्षेत्रों के भीतर सरकारी पेय जलापूर्ति तथा वृक्षारोपण योजनाओं के सिवाय सरकारी योजनाओं के अधीन बोरिंग/नलकूप निर्माण सहित वाणिज्यिक, औद्योगिक, अवसंरचनात्मक और सामूहिक उपयोग हेतु कोई नवीन कूप निर्मित/सिंक नहीं करेगा।

यदि कोई इस उपधारा के उपबन्धों का उल्लंघन करता/करती है तो वह अध्याय 8 के अधीन दण्ड का भागी होगा/होगी।

ऐसा प्रतिबन्ध तब तक जारी रहेगा जब तक राज्य सरकार द्वारा नवीन भूगर्भ जल संसाधन प्राक्कलन रिपोर्ट के आधार पर या नगरीय भूगर्भ जल स्तरों में गिरावट होने की प्रवृत्ति में महत्वपूर्ण सुधार होने के सम्बन्ध में राज्य सरकार का अनुमोदन प्राप्त करने के पश्चात उत्तर प्रदेश राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण के परामर्श पर उक्त क्षेत्र को गैर अधिसूचित नहीं कर दिया जाता है;

(2) अधिसूचित क्षेत्रों में वाणिज्यिक/सामूहिक उपयोगों के प्रयोजन हेतु किसी व्यक्ति या व्यक्ति वर्ग या संस्था या अभिकरणों द्वारा अपरिष्कृत/अप्रसंस्कृत/अनभिक्रियित भूगर्भ जल निकालने, उसका विक्रय करने तथा उसकी आपूर्ति करने की अनुज्ञा नहीं दी जायेगी और ऐसा कार्य किया जाना अध्याय–आठ के अधीन दण्डनीय होगा।

अधिसूचित क्षेत्रों में भूगर्भ जल सुरक्षा योजनाओं का तैयार किया जाना और उनका क्रियान्वयन

13–अधिसूचित क्षेत्रों में भूगर्भ जल संसाधनों के अविरतता को सुनिश्चित करने तथा उसे प्राप्त करने के लिए भूगर्भ जल सुरक्षा योजनाएँ क्रमबद्ध क्रियान्वयन हेतु यथा विहित रीति से तैयार की जाएँगी।

गैर अधिसूचित क्षेत्रों में भूगर्भ जल निकालने के प्राधिकार को स्वीकृत किया जाना

14–गैर अधिसूचित क्षेत्र में वाणिज्यिक, औद्योगिक, अवसंरचनात्मक या सामूहिक उपयोग के लिए भूगर्भ जल निकालने के प्रयोजनार्थ कोई कूप खोदने के इच्छुक किसी व्यक्ति या व्यक्ति–वर्ग या संस्था या अभिकरण या प्रतिष्ठान को इस प्रयोजनार्थ अनापत्ति प्रमाण–पत्र हेतु सम्बन्धित जिला भूगर्भ जल प्रबंधन परिषद को आवेदन करना होगा। अनापत्ति प्रमाण पत्र की प्रकिया,समय–सीमा, प्रारूप,आवेदन, फीस इत्यादि और विभिन्न उपबन्ध, निबन्धन और शर्ते वही होंगी जैसाकि विहित किया जाय;

परन्तु यह कि भूगर्भ जल के पूर्व से विद्यमान उपयोक्ता को इस अधिनियम के प्रारम्भ होने के दिनांक से नब्बे दिन की अवधि के भीतर तद्निमित्त इस धारा के अधीन प्राधिकार प्रमाण–पत्र जारी किये जाने हेतु आवेदन करना होगा;

परन्तु यह और कि,–

(क) निबंधन और शर्तों में निम्नलिखित सम्मिलित होंगे किन्तु वे निम्नलिखित तक निर्बन्धित नहीं होंगे;

(एक) जल की अधिकतम मात्रा जिसे निकालने की अनुज्ञा होगी;

(दो) विद्यमान प्रदूषण नियंत्रण मानकों और उपायों के माध्यम से भूगर्भ जल संदूषण निवारण की सावधानियां;

(तीन) अपनाये जाने वाले वर्षा जल संचयन सहित संरक्षण उपायों का विवरण;

(चार) भूगर्भीय जल संभाव्यता के अनुसार भूगर्भ जल पुनर्भरण के उपाय;

(पॉच) उपयोगार्थ निकाले गये भूगर्भ जल का किसी विहित अनुपात में पुनः उपयोग करना;

(छः) अपशिष्ट जल को बहाने से पूर्व उसे विहित मानकों तक लाने के लिए उसका शोधन करना;

(सात) सर्वाधिक दक्ष जल उपयोग पद्धतियों तथा प्रौद्योगिकी को अपनाना तथा उसके अनुसार चलना;

(ख) किसी विनिर्दिष्ट प्रयोजन हेतु प्रदान किये गये प्राधिकार/ अनापत्ति का प्रयोग, प्रदान किये गये प्रयोजन से भिन्न प्रयोजन के लिए नहीं किया जायेगा;

(ग) प्राधिकार प्रमाण–पत्र/अनापत्ति प्रमाण–पत्र धारक को, प्राधिकार के अधीन निकाले गये भूगर्भ जल का वाणिज्यिक प्रयोग और/या लाभ के लिए, किसी अन्य को किसी भी नाम से या प्रारूप में विकय करने से प्रतिषिद्ध किया जायेगा;

(घ) वांछित प्रयोजन के लिए भूगर्भ जल निकालने और उसका उपयोग करने हेतु प्राधिकार प्रमाण–पत्र/अनापत्ति प्रमाण–पत्र प्राप्त करने के पश्चात् ऐसे नये उपयोक्ता, यह सुनिश्चित करेंगे कि उन्हें कूप का निर्माण कार्य पूरा कर लेने के पश्चात् यथाविधि विहित रीति से सम्बन्धित जिला भूगर्भ जल प्रबंधन परिषद से रजिस्ट्रीकरण प्रमाण–पत्र प्राप्त करना होगा;

(ङ) (एक) जिला भूगर्भ जल प्रबंधन परिषद, प्राधिकार/अनापत्ति प्रमाण–पत्र की निबंधन और शर्तों का अनुपालन न करने की स्थिति में प्राधिकार/अनापत्ति प्रमाण–पत्र रद्द कर सकती है;

परन्तु यह कि सम्बन्धित जिला भूगर्भ जल प्रबंधन परिषद, प्राधिकार प्रमाण–पत्र/अनापत्ति प्रमाण–पत्र धारक को उक्त प्रमाण–पत्र रद्द करने से पूर्व सुनवाई का एक अवसर प्रदान करेगी;

(दो) इस धारा के अधीन जारी किया गया प्राधिकार प्रमाण–पत्र/अनापत्ति प्रमाण–पत्र असंक्राम्य होगा। तथापि किसी व्यक्ति को प्रदान किया गया ऐसा प्रमाण–पत्र, उसका/उसकी विधिक उत्तराधिकारियों द्वारा उत्तराधिकार में प्राप्त किया जायेगा और उक्त प्रमाण–पत्र शेष अवधि के लिए तब तक निरन्तर विधिमान्य रहेगा जब तक कि विधिक उत्तराधिकारी ऐसे मृत प्रमाण–पत्र धारक द्वारा कृत किया–कलापों को जारी रखते हैं। तथापि ऐसी प्रसुविधा जिसके लिए उक्त प्रमाण–पत्र प्रदान किया गया था, के लिए सम्पत्ति का अन्तरण किये जाने पर प्राधिकार प्रमाण–पत्र/अनापत्ति प्रमाण–पत्र तब तक विधिमान्य रहेगा जब तक कि नये स्वामी द्वारा किया–कलाप की प्रकृति अपरिवर्तित रूप में जारी रखी जाती है।

(तीन) प्राधिकार प्रमाण–पत्र/अनापत्ति प्रमाण–पत्र, प्रमाण–पत्र में नियत अवधि तक के लिए विधिमान्य होगा;

(चार) जहाँ प्राधिकार प्रमाण–पत्र/अनापत्ति प्रमाण–पत्र की विधिमान्यता समाप्त हो गयी हो वहाँ ऐसे प्रमाण–पत्र धारक को तत्सम्बंधी निरन्तरता के लिए नये सिरे से आवेदन करना होगा।

वाणिज्यिक, औद्योगिक अवसंरचनात्मक या सामूहिक भूगर्भ जल उपयोक्ताओं हेतु भूगर्भ जल निकालने की सीमा नियत किया जाना

15–(1) राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण, भूगर्भ जल विभाग के परामर्श से (सम्बंधित क्षेत्र के भूगर्भ जलीय शर्तों तथा संसाधन संभाव्यता पर आधारित) अधिसूचित और साथ ही साथ गैर अधिसूचित क्षेत्रों में कूप हेतु रजिस्ट्रीकरण जारी करने के दौरान विद्यमान वाणिज्यिक, औद्योगिक, अवसंरचनात्मक या सामूहिक भूगर्भ जल उपयोक्ताओं हेतु और गैर अधिसूचित क्षेत्रों में कूप हेतु रजिस्ट्रीकरण या प्राधिकार प्रमाणपत्र/अनापत्ति प्रमाणपत्र जारी करने के दौरान समस्त नवीन वाणिज्यिक, औद्योगिक, अवसंरचनात्मक या सामूहिक भूगर्भ जल उपयोक्ताओं हेतु भूगर्भ जल निकालने की सीमा यथाविहित निबंधन एवं शर्तों के अनुसार नियत करेगा।

(2) कोई भी व्यक्ति उपधारा (1) के अधीन नियत सीमा का उल्लंघन करके भूगर्भ जल नहीं निकाल सकता है।

भूगर्भ जल निकालने/खींचने पर फीस

16–(1) कोई भी वाणिज्यिक, औद्योगिक, अवसंरचनात्मक या सामूहिक भूगर्भ जल उपयोक्ता, जिसे आगे इस धारा में उक्त उपयोक्ता कहा गया है, भूगर्भ जल खींचने की मात्रा के आधार पर वार्षिक रूप में प्रभारित किये जाने वाले शुल्क का भुगतान किये बिना दोनों अधिसूचित तथा गैर अधिसूचित क्षेत्रों में भूगर्भ जल नहीं निकालेगा। फीस यथाविहित रूप में जमा की जायेगी;

(2) उपधारा (1) में निर्दिष्ट फीस, जल (प्रदूषण निवारण तथा नियंत्रण) उपकर अधिनियम 1977 के अधीन प्रभारित जल उपकर के अतिरिक्त होगी।

(3) निकाले गये भूगर्भ जल की मात्रा को मापने तथा उसे अभिलिखित करने के प्रयोजनार्थ उक्त प्रत्येक उपयोक्ता को ऐसे मानको का मीटर ऐसे स्थानों पर लगाना होगा, जैसाकि विहित किया जाय और यह मान लिया जायेगा कि मीटर द्वारा अभिलिखित की गयी मात्रा में उक्त उपयोक्ता द्वारा भूगर्भ जल निकासी की गयी है, जब तक कि अन्यथा सिद्ध न हो जाय। निकालने हेतु अनुज्ञात/प्राधिकृत भूगर्भ जल की मात्रा के सापेक्ष वास्तविक रूप में निकाले गये जल की जॉच करने हेतु एक वार्षिक भूगर्भ जल लेखा परीक्षा संचालित की जायेगी।

बेधन अभिकरणों का रजिस्ट्रीकरण

17–(1) सम्बंधित जिला भूगर्भ जल प्रबंधन परिषद में रजिस्ट्रीकरण के बिना फर्म, अभिकरण या कंपनी सहित कोई व्यक्ति भूगर्भ जल निकालने हेतु भूमि का न तो बेधन करेगा और न ही उसमें लगेगा।

(2) भूगर्भ जल निकालने हेतु भूमि बेधन में पहले से ही लगे हुए प्रत्येक व्यक्ति, फर्म, अभिकरण या कंपनी को जिला भूगर्भ जल प्रबंधन परिषद में रजिस्ट्रीकरण के लिए ऐसी अवधि के भीतर आवेदन करना होगा जैसाकि उक्त परिषद द्वारा अपेक्षा की जाय।

किसी भूगर्भ जल उपयोक्ता के लिए अधिसूचित तथा गैर अधिसूचित क्षेत्रों में प्राधिकरण की शक्तियाँ

18–अधिसूचित और गैर अधिसूचित क्षेत्रों में किसी भूगर्भ जल उपयोक्ता तथा बेधन अभिकरणों के लिए प्रत्येक समुचित प्राधिकरण की शक्ति वही होगी जैसाकि विहित की जाय।

आदेशों आदि का तामील किया जाना

19–धारा 14 के अधीन जारी प्रत्येक आदेश या निर्देश को उसी रीति से तामील किया जायेगा, जैसाकि विहित किया जाय।

प्रतिकर दावा करने पर प्रतिबंध

20–किसी व्यक्ति को इस अधिनियम के अधीन कृत किसी कार्यवाही के आधार पर उसे हुई किसी क्षति के लिए राज्य सरकार या किसी समुचित प्राधिकरण से किसी प्रकार की क्षति या प्रतिकर का दावा करने का हक नहीं होगा।

शक्तियों और कर्त्तव्यों का प्रत्यायोजन

21–राज्य भूगर्भ जल प्रबंधन एवं नियामक प्राधिकरण, लिखित रूप में सामान्य या विशेष आदेश द्वारा यह निदेश दे सकता है कि उसके द्वारा प्रयोग की जाने वाली शक्तियों या उसके द्वारा निर्वहन किये जाने वाले कर्तव्यों में से समस्त शक्तियों या किसी शक्ति का प्रयोग/समस्त कर्तव्यों/किसी कर्तव्य का निर्वहन, ऐसी परिस्थितियों तथा ऐसी शर्तों, यदि कोई हो में जैसाकि उसके आदेश में विनिर्दिष्ट किया जाय, इस निमित्त राज्य सरकार के अनुमोदन के पश्चात जारी आदेश में विनिर्दिष्ट किसी व्यक्ति तथा समुचित निकाय द्वारा भी किया जा सकता है।

प्राधिकरण के कर्मचारी, लोक सेवक होंगे

22–राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण के समस्त कर्मचारी, जब इस अधिनियम या तद्धीन बनायी गयी नियमावली के उपबंधों के अनुसरण में कार्यरत हों या उनका कार्यरत होना आशयित हो, भारतीय दण्ड संहिता की धारा 21 के अर्थान्तर्गत लोक सेवक समझें जायेंगे।

सद्भावनापूर्वक की गयी कार्यवाही के सापेक्ष सुरक्षा

23–इस अधिनियम या तद्धीन बनायी गयी नियमावली के अधीन सद्भावना पूर्वक की गयी या किये जाने हेतु आशयित किसी बात के लिये राज्य सरकार या सरकार के किसी समुचित प्राधिकरण, किसी अन्य अधिकारी या किसी समुचित प्राधिकरण के किसी सदस्य या अन्य कर्मचारी के विरूद्ध कोई अभियोग, वाद या अन्य विधिक कार्यवाही संस्थित नहीं की जायेगी।

अध्याय–पांच

भूगर्भ जल का प्रदूषण–निवारण

भूगर्भ जल गुणवत्ता वाले संवेदनशील परिक्षत्रों का सीमांकन तथा संरक्षण

24–(1) भूगर्भ जल विभाग, राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण, जिला भूगर्भ जल प्रबंधन परिषद और विशेषज्ञ निकायों यथा केन्द्रीय भूगर्भ जल बोर्ड, उत्तर प्रदेश जल निगम और उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड के परामर्श से ऐसे क्षेत्रों, जिनकी भूगर्भ जल प्रदूषण निवारण तथा नियंत्रण करने और पेयजल आपूर्ति हेतु सुरक्षित गुणवत्तापरक परिक्षेत्रों का पता लगाने के प्रयोजनार्थ भूगर्भ जल की गुणवत्ता खतरनाक प्रदूषण से प्रभावित पायी गयी है, की (ऊर्ध्व एवं पार्श्व रूप में) पहचान एवं सीमांकन करेगा;

(2) उपधारा (1) में यथा सीमांकित क्षेत्र, भूगर्भ जल प्रदूषण निवारण एवं रोकथाम के प्रयोजनार्थ प्रत्येक दो वर्ष में राज्य सरकार के भूगर्भ जल विभाग द्वारा अधिसूचना के माध्यम से भूगर्भ जल गुणवत्ता संवेदनशील परिक्षेत्र घोषित किये जायेंगे।

भूगर्भ जल प्रदूषण/संदूषण से सम्बंधित सूचना संग्रहण

25—ग्राम पंचायत भूगर्भ जल उप समितियॉं, खण्ड पंचायत भूगर्भ जल प्रबंधन समितियॉं और नगरपालिका भूगर्भ जल प्रबंधन समितियॉं प्रदूषण स्रोतों सहित भूगर्भ जल प्रदूषण से सम्बन्धित सूचना संग्रह करने के लिए उत्तरदायी होंगी। ऐसी सूचना सम्बन्धित जिला भूगर्भ जल प्रबंधन परिषदों के स्तर पर राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण को समुचित कार्यवाही हेतु अग्रतर प्रस्तुत किये जाने के लिए संकलित तथा समेकित की जायेगी।

भूगर्भ जल प्रदूषण नियंत्रण के उपाय

26—(1) राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण, यह सुनिश्चित करेगा कि कोई वाणिज्यिक, औद्योगिक, अवसंरचनात्मक और सामूहिक उपयोक्ता भूगर्भ जल प्रदूषित नहीं करेगा। वह सम्बंधित जिला भूगर्भ जल प्रबंधन परिषद के माध्यम से जहां कहीं आवश्यक हो यथा विहित रूप में अनिवार्य रूप से शोधन संयत्र स्थापित कराना सुनिश्चित करेगा।

(2) जहां उपधारा (1) में निर्दिष्ट ऐसा भूगर्भ जल उपयोक्ता, विहित अवधि के भीतर शोधन संयत्र स्थापित करने में विफल हो जाय वहां राज्य भूगर्भ जल प्रबंधन और नियामक प्राधिकरण के पास यह अधिकार होगा कि वह ऐसे उपयोक्ता के लागत पर आवश्यक शोधन संयत्र निर्मित करवाये और धारा 39 की उपधारा (2) के उपबंधों के अधीन ऐसे उपयोक्ता के विरूद्ध कार्यवाही करें।

जल—भृतों में प्रदूषक पदार्थों आदि का निस्तारण करने हेतु कूप के उपयोग पर प्रतिषेध

27—(1) कोई वाणिज्यिक, औद्योगिक, अवसंरचनात्मक तथा सामूहिक उपयोक्ता, किसी संक्रिया या प्रसंस्करण या शोधन तथा निस्तारण प्रणाली के माध्यम से—

(क) अपशिष्ट जल, मल, व्यापारिक तथा घरेलू वहिःस्राव या संदूषक पदार्थों का निस्सारण या निस्तारण कूप में नहीं करेगा या;

(ख) भूमि पर अपशिष्ट का ढेर नहीं लगायेगा जो घुलकर जलभृत में बह सकता है, या जिसके कारण संदूषक पदार्थ चूकर उसमें फैल सकते हैं तथा उसमें विषैले जीव उत्पन्न हो सकते हैं;

(2) उपधारा (1) के उपबंध का उलंघन करने वाला कोई भूगर्भ जल उपयोक्ता, धारा 39 की उपधारा (2) के अधीन दण्डित किये जाने का भागी होगा।

खुले क्षेत्रों से जलभृतों में सीधे पुनर्भरण पर प्रतिबंध

28—(1) खुली भूमि, मैदान, सड़कों (पक्की/कच्ची) कृषि फार्मों पर गिरने वाले (छत के ऊपर के सिवाय) वर्षा जल से भूगर्भ जल का कृत्रिम पुनर्भरण किए जाने की प्रक्रिया में जलभृतों में पुनर्भरण, बोरवेल, पुनर्भरण कूपक अन्तःक्षेपण कूप आदि के माध्यम से सीधे पुनर्भरण किए जाने की अनुज्ञा नहीं दी जाएगी।

उप धारा (1) के उपबंध का उल्लंघन करने वाला कोई व्यक्ति, धारा 39 की उपधारा (2) के अधीन दंडित किए जाने का भागी होगा।

तालाबों, नदियों, कूपों आदि के प्रदूषण पर प्रतिषेध

29—(1) समुचित प्राधिकरण यह सुनिश्चित करेंगे कि कोई वाणिज्यिक, औद्योगिक, अवसंरचनात्मक और सामूहिक उपयोक्ता, दूषित जल या किसी अन्य प्रदूषणकारी पदार्थ का निस्सारण या निस्तारण करके तालाबों, नदियों, कूपों आदि को प्रदूषित नहीं करेगा।

(2) कोई व्यक्ति जो उपधारा (1) के उपबन्धों का उल्लंघन करेगा, धारा 39 की उपधारा (2) के अधीन दण्डित किये जाने का भागी होगा।

(3) समुचित प्राधिकरणों को यह सुनिश्चित करने के ऐसे समस्त उपाय करने होंगे कि घरेलू गृहस्थी के किसी अपशिष्ट से तालाब, नदियॉं, कूप आदि प्रदूषित न हों।

अध्याय— छः

स्वतः विनियमन, वर्षा जल संचयन, भूगर्भ जल पुनर्भरण, पुनः उपयोग तथा पुनः प्रयोग और जल भराव निवारण

स्वतः विनियमन

30—(1) अधिसूचित क्षेत्रों(ग्रामीण) के कृषक स्वतः विनियमन की प्रक्रिया को ग्रहण करने के लिए संबंधित ग्राम पंचायत भूगर्भ जल उप समितियों और खण्ड पंचायत भूगर्भ जल प्रबंधन समितियों द्वारा प्रोत्साहित किए जाएंगे।

(2) स्वतः विनियमन ग्रहण करने की प्रक्रिया :–

संकटग्रस्त क्षेत्रों में भूगर्भ जल संसाधनों को सुरक्षित रखने, संरक्षित रखने तथा उन्हें विनियमित करने के उद्देश्य से निम्नलिखित रीति से स्वतः विनियमन की प्रक्रिया ग्रहण की जाएगी:–

(क) कृषक यह सुनिश्चित करेंगे कि विभिन्न फसलों हेतु वैज्ञानिक रूप से संस्तुत सिंचाई की आवश्यकता के अनुसार अपेक्षित सिंचाई जल मात्रा/फसल सिंचाई संख्या का प्रयोग करते हुए भूगर्भ जल दुर्व्ययन तथा अति सिंचन से बचा जा सकता है;

(ख) अधिसूचित क्षेत्रों(ग्रामीण) के कृषक कृषि बंधों, कृषि तालाबों, अल्प जल फसल बीजों के प्रयोग और प्रक्षेप तथा फुहारा सिंचाई प्रणाली के प्रयोग सहित विभिन्न जल संरक्षण/जल बचत पद्धतियां अपनाने हेतु प्रोत्साहित किए जाएंगे;

(ग) दोनों ग्रामीण तथा नगरीय क्षेत्रों में भूगर्भ जल के प्रत्येक उपयोक्ता को, मितव्ययिता एवं दक्षता पूर्वक भूगर्भ जल निकालने और उसका उपयोग करने, जल दुर्व्यय को रोकने, पुनः उपयोग किए गए जल का प्राथमिकता पर प्रयोग करने, वर्षा जल संचयन तथा पुनर्भरण पद्धतियों को ग्रहण करने हेतु प्रोत्साहित किया जाएगा।

वर्षा जल संचयन, भूगर्भ जल पुनर्भरण तथा जलागम संरक्षण

31–(1) समुचित प्राधिकरण, भूवैज्ञानिक शर्तों के अनुसार वर्षा जल संचयन और जलागम संरक्षण को प्रोत्साहित करेंगे जो जल सुरक्षा योजनाओं का अभिन्न अंग होना चाहिए। समुचित प्राधिकरण, संकटग्रस्त नगरीय तथा ग्रामीण क्षेत्रों में वर्षा जल संचयन प्रणाली की उपयुक्त प्रौद्योगिकियों के संबंध में विभिन्न भूगर्भ जल उपयोक्ताओं को संवेदनशील बनाएंगे। भूगर्भ जल उपयोक्ता समुचित प्राधिकरणों से वर्षा जल–संचयन प्रणाली का उपयुक्त प्राविधिक रेखा चित्र तथा अभिकल्प प्राप्त कर सकते हैं। उन्हें विकास परख योजनाओं तथा परियोजनाओं से संबंधित समस्त प्राकृतिक संसाधनों के एकीकरण तथा उनमें परिवर्तन के माध्यम से अपनी अधिकारिता के भीतर वर्षा जल–संसाधनों के संवर्धन हेतु एकीकृत प्राकृतिक संसाधन संरक्षण, उपयोग तथा विनियमन के लिए समस्त संभावित कदम उठाने होंगे।

(2) तत्समय प्रवृत्त राज्य की अन्य विधि में अंतर्विष्ट किसी बात के प्रतिकूल होते हुए भी नगर पालिका जल प्रबंधन समिति राज्य सरकार द्वारा अधिसूचना के माध्यम से सम्यक रूप से जारी छतों पर वर्षा जल संचयन संरचनाओं का उपबंध करने की विद्यमान भवन उप विधियों के अधीन निर्धारित शर्तें अधिरोपित करेंगी। ऐसे निर्धारण, भवन योजनाएँ अनुमोदित करने वाले या स्वीकृत करने वाले संबंधित सरकारी अभिकरणों पर बाध्यकारी होंगे। सामूहिक आवास/ कॉलोनियों हेतु सम्मिलित पुनर्भरण प्रणाली का उपबंध किया जाना भी भवन उप विधियों के अधीन अनिवार्य होगा।

(3) जलागम संरक्षण के अंतर्गत क्षेत्र के भू–भाग/मिट्टी की दशा की प्रकृति पर आधारित समुचित भूगर्भ जल संरक्षण तथा पुनर्भरण संरचनाएं सम्मिलित हैं।

भूगर्भ जल का पुनः उपयोग तथा पुनः प्रयोग

32–समुचित प्राधिकरण अपने क्षेत्रों के अंतर्गत अपेय नगरीय औद्योगिक तथा कृषि प्रयोग हेतु और साथ ही साथ अप्रत्यक्ष रूप से पुनः प्रयोग के माध्यम से पेयजल आपूर्ति में वृद्धि हेतु जल का पुनः उपयोग किए जाने तथा विशिष्ट रूप से पोषणीय जल का पुनः प्रयोग करने के लिए प्रोत्साहित करेंगे;

परंतु यह कि अवधारित सीमा से अधिक भूगर्भ जल निकालने वाले वाणिज्यिक, औद्योगिक, अवसंरचनात्मक तथा सामूहिक उपयोक्ता को ऐसे प्रयोजनों, जो उपयुक्त हों, के लिए जल का पुनः उपयोग करने के लिए आदेशित किया जाएगा। समुचित प्राधिकरण ऐसे आदेशों को प्रवर्तित करने के लिए अनुश्रवणकारी तथा प्रोत्साहनकारी तंत्र अभिकल्पित करेंगे।

जल भराव निवारण तथा न्यूनकरण

33–(1) समुचित प्राधिकरण, अपने क्षेत्रों के अंतर्गत ऐसे क्रियाकलापों को हतोत्साहित तथा उनकी रोकथाम करेंगे जिनके कारण भू–जलभराव होना संभाव्य हो। ऐसे निकाय जलभराव के विरुद्ध भू–संरक्षण हेतु समस्त संभावित नियामक उपाय करेंगे;

(2) नहर समादेशों में सिंचाई विभाग को उप–भू–पृष्ठ जलप्लावित स्थितियों में प्रभावी रूप से सुधार करने के लिए समुचित उपाय करना होगा तथा उपबंध करना होगा;

(3) ग्राम पंचायत भूगर्भ जल उपसमिति, खंड पंचायत भूगर्भ जल प्रबंधन समिति या नगरपालिका जल प्रबंधन समिति जलप्लावित क्षेत्रों में ऐसे क्रिया–कलापों, जिनके कारण जलभराव की स्थिति बिगड़ सकती है, का विनियमन करने के लिए ऐसी नियम/शर्तें अधिरोपित कर सकती हैं जैसा कि विहित किया जाए। खंड पंचायत भूगर्भ जल प्रबंधन समिति/नगरपालिका जल प्रबंधन समिति, जिला भूगर्भ जल प्रबंधन परिषदों तथा संबंधित विभागों के परामर्श से भू–शोधन तथा भू–जल निकास से संबंधित समुचित मध्यक्षेपों के माध्यम से यथा विहित रीति से जलभराव को कम करने का उपाय करेगी;

(4) जलभराव न्यूनकरण के उपाय, विशेषज्ञ निकायों/संबंधित विभागों के सम्यक परामर्श से समुचित प्रसंस्करणों तथा प्रौद्योगिकियों का प्रयोग करते हुए किए जाएंगे।

नदियों, तालाबों, कूपों आदि का पुनरूज्जीवन और जीर्णोद्धार

34–समुचित प्राधिकरणों को प्रत्येक ग्राम में नदियों, तालाबों, कूपों आदि के पुनरूज्जीवन और जीर्णोद्धार के लिए कार्य करना होगा। समुचित प्राधिकरणों को ऐसी नदियों, तालाबों, कूपों आदि को संरक्षित करने हेतु दक्ष योजनाओं को विकसित और कियान्वित करना होगा।

अध्याय–सात

प्रभावपूर्ण निर्धारण तथा पारदर्शिता

प्रभावपूर्ण निर्धारण

35–(1) इस अधिनियम के उपबंधों के अनुसार समुचित प्राधिकरणों का यह कर्तव्य होगा कि वे अपनी अधिकारिता क्षेत्र में क्रियान्वित की जाने वाली ऐसी क्रियाकलापों के दोनों सामाजिक तथा पर्यावरणीय पहलुओं का प्रभावपूर्ण निर्धारण करने का उपक्रम करें;

(2) प्रभावपूर्ण निर्धारण की प्रक्रिया में अल्पकालिक तथा संचयी प्रभावपूर्ण निर्धारण सम्मिलित होगा जो विनिर्दिष्ट रूप में निम्नलिखित क्षेत्रों में हो सकता है:–

(क) जीवन जलाधिकार पर प्रभाव;

(ख) पेय जल संसाधनों पर प्रभाव;

(ग) भूगर्भ जल गुणवत्ता तथा परिमाण पर प्रभाव;

(घ) कृषि उत्पादन पर प्रभाव;

(ङ) नदियों तथा जल पिंडों सहित पारिस्थितिक तंत्र पर प्रभाव;

(च) भू–उपयोग पर प्रभाव;

पारदर्शिता प्रणाली

36–(1) समुचित प्राधिकरणों का अपनी अधिकारिता क्षेत्र के अंतर्गत यह कर्तव्य होगा कि वे नागरिकों के साथ प्रभावी तथा मित्रतापूर्ण पारदर्शिता स्थापित करें;

(2) सूचना की न्यूनतम विषयवस्तु, आवर्तन तथा अन्य विवरण सतर्कतापूर्वक प्रस्तुत किए जाएंगे;

(3) किसी जिला के भीतर सूचना हेतु समस्त अनुरोधों को युक्तियुक्त अवधि के भीतर पूरा किया जाएगा।

सतर्क प्रकटीकरण से सम्बन्धित कर्तव्य

37–(1) समुचित प्राधिकरण अपनी–अपनी अधिकारिता क्षेत्र के संबंध में सतर्कतापूर्वक सूचना का प्रकटीकरण करेंगे;

(2) समुचित निकाय का यह कर्तव्य होगा कि वह अभिलेखों का प्रसार इस रीति से करें कि कोई भी व्यक्ति सूचना को सुगमतापूर्वक समझ सके। इस दायित्व में सूचना का समेकित तथा संक्षिप्त रूप में प्रसार करना भी सम्मिलित है।

सूचना सार्वजनिक रूप में रखी जायेगी

38–इस अधिनियम की धारा 35 के अधीन ग्रहीत क्रियाकलापों का प्रभावपूर्ण निर्धारण किए जाने पर तत्संबंधी सूचना सार्वजनिक रूप में पहुंच हेतु इंटरनेट पर रखी जाएगी।

अध्याय–आठ

अपराध और शास्तियां

अपराध और शास्तियां

39–(1) यदि कोई वाणिज्यिक, औद्योगिक, अवसंरचनात्मक और सामूहिक भूगर्भ जल उपयोक्ता या कोई वेधन अभिकरण–

(क) इस अधिनियम या तद्धीन बनायी गयी किसी नियमावली के किसी उपबंध, अध्याय पांच में वर्णित उपबंधों के सिवाय का उल्लंघन करता है या उसका अनुपालन करने में विफल रहता है, या

(ख) इस अधिनियम के अधीन किसी शक्ति का प्रयोग करने हेतु समुचित प्राधिकरणों या राज्य भूगर्भ जल प्रबंधन तथा नियामक प्राधिकरण द्वारा प्राधिकृत किसी अन्य व्यक्ति के लिए व्यवधान उत्पन्न करता है तो वह ऐसे जुर्माने, जो दो लाख रूपये से कम नहीं होगा और जो पांच लाख रूपये तक हो सकता है या ऐसे कारावास, जो छःमाह से कम नहीं होगा और जो एक वर्ष तक हो सकता है, के साथ या प्रथम अपराध के मामले में दोनों के साथ दंडित किया जाएगा;

(ग) उपखण्ड (ख) के अधीन दोष सिद्ध किए जाने के पश्चात पुनः उक्त अपराध करता है तो ऐसा उपयोक्ता द्वितीय अपराध का दोषी समझा जाएगा और वह ऐसे जुर्माने, जो उक्त उपखण्ड के अधीन उसे अधिनिर्णीत किए गए कारावास के अतिरिक्त, उसे अधिनिर्णीत किए गए जुर्माने की धनराशि का दोगुना होगा, के साथ दंडित किया जाएगा। इसके अतिरिक्त इस अधिनियम के अधीन उसे स्वीकृत किया गया प्राधिकार/अनापत्ति प्रमाणपत्र तत्काल प्रभाव से रद्द कर दिया जाएगा।

(2) कोई वाणिज्यिक, औद्योगिक, अवसंरचनात्मक या सामूहिक भूगर्भ जल उपयोक्ता, जो धारा 26 की उपधारा (2), धारा 27, धारा 28 और धारा 29 के अधीन उपबंधित किसी उपबंध का उल्लंघन करेगा, निम्नलिखित दण्ड का भागी होगा:–

(क) ऐसी अवधि का कारावास, जो दो वर्ष से कम नहीं होगा किंतु जो तीन वर्ष तक हो सकता है या जुर्माना, जो पांच लाख रूपये से कम नहीं होगा किंतु जो प्रथम अपराध के मामले में दस लाख रुपए तक हो सकता है;

(ख) ऐसी अवधि का कारावास, जो पांच वर्ष से कम नहीं होगा किंतु जो सात वर्ष तक हो सकता है या जुर्माना, जो दस लाख रुपए से कम नहीं होगा किंतु जो बीस लाख रुपए तक हो सकता है, यदि खण्ड (क) में निर्दिष्ट उक्त अपराध ऐसे व्यक्ति द्वारा किया गया हो जो पहले ही उक्त अपराध के लिए दोष सिद्ध किया गया हो;

(3) कोई जलापूर्तिकर्ता (सरकारी पेयजल आपूर्ति योजनाओं से भिन्न) जो ऐसे भूगर्भ जल की आपूर्ति करता है या कराता है जो तत्समय प्रवृत्त किसी विधि के अधीन विहित गुणवत्ता मानक को पूरा करने में विफल हो, ऐसे जुर्माने, जो दो लाख रूपये से कम नहीं होगा और जो पांच लाख रूपये तक हो सकता है, के साथ दण्डित किया जाएगा;

(4) जो कोई किसी भवन का स्वामी होते हुए इस अधिनियम के अधीन किसी समुचित प्राधिकरण द्वारा जारी रेखा चित्र अभिकल्प और मार्गदर्शनों के अनुसार भूगर्भ जल पुनर्भरण करने के लिए वर्षा जल संचयन तंत्र प्रतिष्ठापित किए जाने हेतु उत्तरदायी हो ऐसा करने में विफल हो तो वह ऐसी रीति से और ऐसे दण्ड के साथ दण्डित किया जाएगा जैसा कि विहित किया जाय।

कंपनियों द्वारा अपराध

40–(1) जब कभी किसी कंपनी द्वारा इस अधिनियम के अधीन कोई अपराध किया गया हो तब प्रत्येक व्यक्ति जो अपराध किए जाने के समय कंपनी के कारबार के संचालन के लिए कंपनी का प्रभारी था या उसके प्रति उत्तरदायी था, अपराध के लिए दोषी समझा जायेगा;

(2) उपधारा (1) में अंतर्विष्ट किसी बात के होते हुए भी जहां इस अधिनियम के अधीन कोई अपराध, कंपनी के निदेशक, प्रबंधक, सचिव या अन्य अधिकारी की सहमति या मौनानुमति से किया गया हो या उसकी ओर से की गई किसी उपेक्षा के कारण हुआ हो वहां ऐसा निदेशक, प्रबंधक, सचिव या अन्य अधिकारी भी उस अपराध का दोषी समझा जाएगा।

स्पष्टीकरण :–

(1) इस धारा के प्रयोजन के लिए कंपनी, का तात्पर्य किसी निगमित निकाय से है और उसके अंतर्गत कोई फर्म या अन्य संगम या व्यक्ति भी है और

(2) किसी फर्म के संबंध में निदेशक का तात्पर्य फर्म में किसी भागीदार से है।

अपराधों का प्रशमन

41–(1) धारा (39) की उपधारा (1) के खण्ड (ख) के उपखण्ड (एक) के अधीन दण्डनीय किसी अपराध का प्रशमन, ऐसे अधिकारियों, जिन्हें राज्य सरकार द्वारा अधिसूचित किया जाए, द्वारा अभियोग संस्थित किए जाने के पूर्व या पश्चात अभियुक्त के आवेदन पर न्यूनतम विहित जुर्माना के साथ प्रशमन फीस स्वरूप अपराध के लिए विहित न्यूनतम जुर्माना का पचास प्रतिशत जुर्माना अधिरोपित करने के पश्चात, किया जा सकता है;

परंतु यह कि प्रशमन का उपचार केवल प्रथम अपराध के लिए उपलब्ध होगा;

(2) उपधारा (1) में निर्दिष्ट प्रत्येक अधिकारी, राज्य सरकार के निदेश, नियंत्रण और पर्यवेक्षण के अध्यधीन किसी अपराध का प्रशमन करने की शक्ति का प्रयोग करेगा;

(3) किसी अपराध के प्रशमन हेतु प्रत्येक आवेदन ऐसे प्रपत्र में और ऐसी रीति से किया जाएगा जैसा कि विहित किया जाय;

(4) जहां किसी अपराध के प्रशमन, कोई अभियोग संस्थित किये जाने के पूर्व किया जाय वहां ऐसे अपराधी, जिसके संबंध में इस प्रकार अपराध प्रशमित किया जाय, के विरुद्ध ऐसे अपराध के संबंध में कोई अभियोग नहीं संस्थित किया जाएगा;

(5) जहां किसी अपराध का प्रशमन, कोई अभियोग संस्थित किये जाने के पश्चात किया जाय वहां ऐसा प्रशमन उपधारा (1) में निर्दिष्ट अधिकारी द्वारा उच्च न्यायालय के संज्ञान में लिखित रूप में लाया जाएगा जिसमें अभियोग लम्बित हो और अपराध प्रशमन का इस प्रकार संज्ञान लिए जाने पर उस व्यक्ति, जिसके विरुद्ध अपराध का इस प्रकार प्रशमन किया जाय, को उन्मोचित कर दिया जाएगा।

अपराधों का संज्ञान

42–(1) इस अधिनियम के अधीन अपराध संज्ञेय होंगे और किसी प्रथम श्रेणी के न्यायिक मजिस्ट्रेट द्वारा विचारणीय होंगे;

(2) जिला भू-गर्भ जल प्रबंधन परिषद या किसी क्षुब्ध व्यक्ति द्वारा दाखिल की गई किसी शिकायत के आधार पर मजिस्ट्रेट अपराध का संज्ञान ले सकता है;

परन्तु यह की अभियोग का पहल करने के पूर्व क्षुब्ध व्यक्ति को अभियोग का पहल करने के लिए अपने आशय से अवगत कराते हुए जिला भू–गर्भ जल प्रबंधन परिषद को एक माह की नोटिस देनी होगी।

अध्याय–नौ

शिकायत निवारण

भूगर्भ जल शिकायत निवारण अधिकारी

43–(1) उत्तर प्रदेश के प्रत्येक जिले का जिला मजिस्ट्रेट जिला भूगर्भ जल शिकायत निवारण अधिकारी के रूप में कार्य करेगा;

(2) कोई भी व्यक्ति भूगर्भ जल के प्रबंधन, संरक्षण, निष्कर्षण और प्रदूषण से संबंधित बिन्दुओं पर अपना/अपनी शिकायत, जिला भू–गर्भ जल शिकायत निवारण अधिकारी को प्रस्तुत कर सकता है/सकती है;

(3) जिला भू-गर्भ जल शिकायत निवारण अधिकारी के विनिश्चय से क्षुब्ध कोई व्यक्ति, अपना/अपनी शिकायत राज्य भू–गर्भ जल प्रबंधन तथा विनियमन प्राधिकरण को प्रस्तुत कर सकता है/सकती है।

भूगर्भ जल शिकायत निवारण अधिकारी की अधिकारिता और उसकी शक्तियां

44–(1) जिला भूगर्भ जल शिकायत निवारण अधिकारी के पास अपनी क्षेत्रीय अधिकारिता के भीतर धारा 41 की उप धारा (2) में उल्लिखित समस्त शिकायतों की अधिकारिता होगी;

(2) शिकायतें, जिला भू-गर्भ जल शिकायत निवारण अधिकारी के समक्ष यथाविहित रीति से प्रस्तुत की जाएगी;

(3) जिला भू-गर्भ जल शिकायत निवारण अधिकारी, किसी अनुवर्ती समय जो तीस दिन से अधिक नहीं होगा, में शिकायत प्रस्तुत किए जाने के पश्चात यथास्थिति संबंधित ग्राम पंचायत भू-गर्भ जल उप समिति/खण्ड पंचायत भूगर्भ जल प्रबंधन समिति/नगर पालिका जल प्रबंधन समिति या जिला भूगर्भ जल प्रबंधन परिषद के माध्यम से समुचित कार्रवाही करेगा;

अध्याय–दस

प्रकीर्ण

समुचित प्राधिकरणों से सूचना मांगने की शक्ति

45–राज्य भू-गर्भ जल प्रबंधन तथा नियामक प्राधिकरण और जिला भू-गर्भ जल प्रबंधन परिषदों के पास राज्य सरकार के किसी विभाग या किसी अन्य व्यक्ति से ऐसी कोई सूचना, जो उसके द्वारा इस अधिनियम या तद्धीन बनाई गई नियमावली, विनियमावली तथा उप-विधियों के अधीन उनकी शक्तियों के प्रयोग तथा उनके कर्तव्यों के निर्वहन में अपेक्षित हो, मांगने की शक्ति होगी और ऐसा विभाग या व्यक्ति ऐसी सूचना उपलब्ध कराने के लिए बाध्य होगा/होगी।

अधिनियम का उल्लंघन करके खोदे गये कूपों को हटाने की समुचित प्राधिकरणों की शक्तियां

46–(1) जिला भूगर्भ जल प्रबंधन परिषद इस अधिनियम के उपबंध के अध्यधीन किसी ऐसे वाणिज्यिक, औद्योगिक, अवसंरचनात्मक या सामूहिक भू-गर्भ जल उपयोक्ता और किसी विद्यमान अभिकरण जो इस अधिनियम के उपबंधों का उल्लंघन करके कूप सिंक किया हो या कर रहा हो या जिसने जल निकाला हो या निकाल रहा हो से लिखित रूप में नोटिस द्वारा यह अपेक्षा कर सकती है कि वह नोटिस में विनिर्दिष्ट अन्यून पन्द्रह दिन की समयावधि के अंतर्गत इस प्रकार जल का निकाला जाना बंद करे और कब्जाधीन कूप के स्वामी या व्यक्ति से यह भी अपेक्षा कर सकती है कि वह कूप को अपने व्यय पर और ऐसी रीति से जैसा कि उक्त परिषद ऐसे आदेश में विनिर्दिष्ट करें, उसको बंद या मुहर बंद कर दे;

(2) यदि ऐसा व्यक्ति जिसे उपधारा (1) के अधीन नोटिस तामील की गई हो नोटिस में विनिर्दिष्ट समय के भीतर इस प्रकार कूप खुदाई बंद नहीं करता है या बंद करता है किंतु समुचित प्राधिकरण के समाधान प्रद रूप में कूप बंद या मुहरबंद नहीं करता है तो (सम्बंधित) परिषद भूमि में प्रवेश करके उक्त कूप को बंद या मुहरबंद कर सकती है;

(3) उपधारा (2) के अधीन (सम्बंधित) परिषद द्वारा उपगत लागत की वसूली, उपधारा (1) के अधीन नोटिस तामील किए गए व्यक्ति से, भू–राजस्व बकाया के रूप में की जा सकती है।

पूर्व विद्यमान अधिकार

47–(1) भू-गर्भ जल उपयोक्ता के पूर्व–विद्यमान अधिकार, इस अधिनियम के प्रारंभ होने के दिनांक से एक वर्ष की अवधि के लिए विधिमान्य रहना जारी रहेंगे;

(2) भूगर्भ जल उपयोक्ता, किन्हीं विधिक या अन्य अधिकारों, जो इस अधिनियम के अधीन समाप्त हो गए हैं, के लिए किसी प्रतिकर का हकदार नहीं होगा।

भूगर्भ जल निधि

48–राज्य सरकार, भू-गर्भ जल निधि नामक एक निधि सृजित करेगी और शास्तियों, रजिस्ट्रीकरण फीस तथा भूगर्भ जल निकालने की फीस आदि की समस्त लेखा–प्राप्तियाँ, इस निधि में जमा की जाएगी। निधि का संचालन निदेशक, भूगर्भ जल विभाग द्वारा किया जायेगा। निधि का उपयोग, राज्य में भूगर्भ जल प्रबंधन क्रिया–कलापों यथा भू-गर्भ जल संरक्षण के लिए मांग पक्ष के मध्यक्षेपों को प्रोत्साहित करने हेतु और राज्य सरकार तथा भूगर्भ जल विभाग द्वारा विनिश्चित किए गए प्रभावी अनुश्रवण युक्तियों/तंत्रों द्वारा भूगर्भ जल उपयोग की दक्षता में वृद्धि करने हेतु दोनों मांग पक्ष तथा आपूर्ति पक्ष के माध्यम से किया जाएगा।

राज्य सरकार की नियम बनाने की शक्ति

49–राज्य सरकार, इस अधिनियम के उपबंधों को क्रियान्वित करने के लिए अधिसूचना द्वारा नियमावली बना सकती है।

कठिनाइयां दूर करने की शक्ति

50–(1) यदि इस अधिनियम के उपबंधों को प्रभावी बनाने में कोई कठिनाई उत्पन्न होती है तो राज्य सरकार गजट में प्रकाशित आदेश द्वारा इस अधिनियम के उपबंधों से संगत ऐसे उपबंध कर सकती है जो कठिनाई दूर करने हेतु आवश्यक या समीचीन प्रतीत हो;

परंतु यह कि इस अधिनियम के प्रारम्भ होने के दिनांक से दो वर्ष की समाप्ति के पश्चात इस धारा के अधीन कोई आदेश नहीं किया जाएगा।

(2) इस धारा के अधीन किया गया प्रत्येक आदेश, इसे किए जाने के पश्चात यथाशक्य शीघ्र राज्य विधानमंडल के दोनों सदनों के समक्ष रखा जाएगा।

किसी उपयोक्ता/वादों को छूट प्रदान करने की राज्य सरकार की शक्तियां

51–राज्य के समग्र विकास के हित में राज्य सरकार, राज्य भू-गर्भ जल प्रबंधन एवं नियामक प्राधिकरण की संस्तुति पर किसी प्रयोक्ता या प्रयोक्ता वर्ग या वाद को इस अधिनियम के किसी उपबंध से छूट प्रदान कर सकती है।

अन्य विधियों पर इस अधिनियम का प्रभाव

52–तत्समय प्रवृत्त उत्तर प्रदेश राज्य की किसी अन्य विधि में अंतर्विष्ट किसी बात के होते हुए भी इस अधिनियम के उपबंध अभिभावी होंगे।

उद्देश्य और कारण

भूगर्भ जल घरेलू, कृषि और औद्योगिक उपयोगों के लिए जल का एकल सर्वाधिक महत्वपूर्ण स्रोत है। यह ग्रामीण और नगरीय क्षेत्रों में पेयजल, भोजन और आजीविका का प्रधान आधार है। राज्य सरकार के संज्ञान में यह लाया गया है कि भूगर्भ जल के अनियन्त्रित और तीव्र निष्कर्षण के फलस्वरूप राज्य के अनेक क्षेत्रों में भूगर्भ जल के स्तरों में गिरावट और भूगर्भ जल जलाशयों में ह्रास होने की भयावह स्थिति उत्पन्न हो गयी है।

राज्य में गम्भीर भूगर्भ जल संकट और भूगर्भ जल संदूषण की स्थिति से निपटने के लिए राज्य में दोनों परिमाणात्मक एवं गुणात्मक भूगर्भ जल का अविरत प्रबन्धन सुनिश्चित करने हेतु भूगर्भ जल की सुरक्षा, संरक्षा, नियंत्रण तथा विनियमन करने के लिए एक विधि बनाने का विनिश्चय किया गया है।

तदनुसार उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) विधेयक, 2019 पुरःस्थापित किया जाता है।

आज्ञा से,
जे0 पी0 सिंह-II,
प्रमुख सचिव।

क्रम-संख्या–216(क)

रजिस्ट्रेशन नम्बर–एस०एस०पी०/एल०डब्लू०/एन०पी०–91/2014–16

लाइसेन्स टू पोस्ट ऐट कन्सेशनल रेट

सरकारी गजट, उत्तर प्रदेश

उत्तर प्रदेशीय सरकार द्वारा प्रकाशित

असाधारण

विधायी परिशिष्ट

भाग–4, खण्ड (ख)

(परिनियत आदेश)

लखनऊ, बुधवार, 13 नवम्बर, 2019

कार्तिक 22, 1941 शक सम्वत्

उत्तर प्रदेश सरकार

लघु सिंचाई एवं भूगर्भ जल अनुभाग–1

संख्या 1320/62-1–2019-10 जीडब्लू-2014

लखनऊ, 13 नवम्बर, 2019

अधिसूचना

प0आ0–344

उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) अधिनियम, 2019 (उत्तर प्रदेश अधिनियम संख्या 13 सन् 2019) की धारा 7 के अधीन शक्तियों का प्रयोग करके राज्यपाल इस अधिसूचना के गजट में प्रकाशित किए जाने के दिनांक से राज्य में एक प्राधिकरण का गठन करती हैं जिसे 'उत्तर प्रदेश राज्य भूगर्भ जल प्रबन्धन विनियामक प्राधिकरण' के रूप में जाना जायेगा।

आज्ञा से,
अनीता सिंह,
प्रमुख सचिव।

IN pursuance of the provisions of clause (3) of Article 348 of the Constitution, the Governor is pleased to order the publication of the following English translation of notification no. 1320/LXII-1–2019-10gw-2014, dated November 13, 2019 :

No. 1320/LXII-1–2019-10gw-2014

Dated Lcknow, November 13, 2019

In exercise of the powers under section 7 of the Uttar Pradesh Ground Water (Management and regulation) Act, 2019 (U.P. Act no. 13 of 2019), the Governor is pleased to establish an authority in the State to be known as the 'Uttar Pradesh State Ground Water Management and Regulatory Authority' with effect from the date of publication of this notification in the *Gazette*.

By order,
ANITA SINGH,
Pramukh Sachiv.

पी0एस0यू0पी0–ए0पी0 379 राजपत्र–(हिन्दी)–2019–(998)–599 प्रतियां–(क0/टी0/ऑफसेट)।
पी0एस0यू0पी0–ए0पी0 3 सा0 लघु सिंचाई–2019–(999)–1,000 प्रतियां–(क0/टी0/ऑफसेट)।

क्रम-संख्या—19

रजिस्ट्रेशन नम्बर—एस०एस०पी०/एल०-डब्लू०/एन०पी०—91/2014—16

लाइसेन्स टू पोस्ट ऐट कन्सेशनल रेट

सरकारी गजट, उत्तर प्रदेश

उत्तर प्रदेशीय सरकार द्वारा प्रकाशित

असाधारण

विधायी परिशिष्ट

भाग—4, खण्ड (ख)

(परिनियत आदेश)

लखनऊ, मंगलवार, 21 जनवरी, 2020

माघ 1, 1941 शक सम्वत्

उत्तर प्रदेश शासन

नमामि गंगे एवं ग्रामीण जलापूर्ति अनुभाग—3

संख्या 58/76-3-2020/10जीडब्लू/2014

लखनऊ, 21 जनवरी, 2020

अधिसूचना

प०आ०—19

उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) अधिनियम, 2019 (उत्तर प्रदेश अधिनियम संख्या 13 सन् 2019) की धारा 6 की उप—धारा (1) के अधीन शक्तियों का प्रयोग करके राज्यपाल, राज्य भूगर्भ जल प्रबन्धन और विनियामक प्राधिकरण को उक्त धारा के उपबंधों के अनुसार अध्यक्ष और सदस्यों से समाविष्ट राज्य के प्रत्येक जिला हेतु जिला भूगर्भ जल प्रबंधन परिषद् का गठन करने के लिये निदेश देती हैं।

आज्ञा से,
अनुराग श्रीवास्तव,
प्रमुख सचिव।

IN pursuance of the provision of clause (3) of article 348 of the Constitution, the Governor is pleased to order the publication of the following English translation of notification no. 58/76-3-2020/10gw/2014, Lucknow dated January 21, 2020 :

No. 58/76-3-2020/10gw/2014

Dated Lucknow, January 21, 2020

IN exercise of the powers under sub-section (1) of section 6 of the Uttar Pradesh Ground Water (Management and Regulation) Act, 2019 (U.P. Act no. 13 of 2019), the Governor is pleased to direct the State Ground Water Management and Regulatory Authority to constitute the District Ground Water Management Council for each district of the State consisting of the Chairperson and members in accordance with the provisions of the said section.

By order,
ANURAG SRIVASTAVA,
Pramukh Sachiv.

पी०एस०यू०पी०—ए०पी०—575—राजपत्र (हि०)—(1399)—2020—599 प्रतियां—(कम्प्यूटर/आफसेट)।
पी०एस०यू०पी०—ए०पी०—4 सा० भूगर्भ जल—(1400)—1000 प्रतियां—(कम्प्यूटर/आफसेट)।

राज्य भूगर्भ जल प्रबन्धन और विनियामक प्राधिकरण,

(अधिसूचना संख्या 1320/62–1–2019–10 जी0डब्लू0/2014, दिनांक 13 नवम्बर, 2019 के द्वारा गठित)

संख्या /यूपीराभूजप्रविप्रा

लखनऊः दिनांक : 05 जून, 2020

–: कार्यालय ज्ञाप :–

अधिसूचना संख्या 58/76–3–2020/10जीडब्लू/2014, दिनांक 21 जनवरी, 2020 के द्वारा प्राप्त निर्देशों तथा उत्तर प्रदेश भू–गर्भ जल (प्रबंधन और विनियमन) अधिनियम, 2019 (उत्तर प्रदेश अधिनियम संख्या 13 सन् 2019) की धारा 06 में प्रदत्त अधिकारों के क्रम में प्रदेश के समस्त जनपदों में एतद्द्वारा "जिला भूगर्भ जल प्रबन्धन परिषद्" का गठन निम्नानुसार किया जाता हैः–

1.	जिला मजिस्ट्रेट।	अध्यक्ष
2.	जिला मजिस्ट्रेट द्वारा नाम निर्दिष्ट राज्य में भूगर्भ जल प्रबन्धन के क्षेत्र में दीर्घकालिक कार्य करने का अनुभव रखने वाले एक विषय विशेषज्ञ।	सदस्य
3.	जिला मजिस्ट्रेट द्वारा नाम निर्दिष्ट भूगर्भ जल के क्षेत्र में अनुभव रखने वाले सार्वजनिक/गैर सरकारी संगठन/सामाजिक क्षेत्र का एक व्यक्ति।	सदस्य
4.	सहायक अभियन्ता, भूगर्भ जल विभाग।	सदस्य
5.	क्षेत्रीय अधिकारी, उत्तर प्रदेश प्रदूषण नियन्त्रण बोर्ड।	सदस्य
6.	जिला कृषि अधिकारी।	सदस्य
7.	अधिशासी अभियन्ता, लघु सिंचाई विभाग।	सदस्य
8.	अधिशासी अभियन्ता, उत्तर प्रदेश जल निगम।	सदस्य
9.	नगर आयुक्त, नगर निगम/अधिशासी अधिकारी, नगर पालिका परिषद्/अधिशासी अधिकारी, नगर पंचायत (यथास्थिति)।	सदस्य
10.	मुख्य अभियन्ता, विकास प्राधिकरण।	सदस्य
11.	अधिशासी अभियन्ता, सिंचाई एवम् जल संसाधन विभाग।	सदस्य
12.	उपायुक्त, जिला उद्योग केन्द्र।	सदस्य
13.	प्रभागीय वनाधिकारी।	सदस्य
14.	जिला उद्यान अधिकारी।	सदस्य
15.	जिला विकास अधिकारी।	सदस्य/सचिव

उक्त सदस्यों के अतिरिक्त नगर पालिका, भूगर्भ जल प्रबन्धन समिति तथा खण्ड पंचायत भूगर्भ जल प्रबन्धन समिति से एक–एक सदस्य परिषद् के आमंत्रित सदस्य के रूप में भी सम्मिलित किए जाएंगे। "जिला भूगर्भ जल प्रबन्धन परिषद्" के क्रम संख्या 02, एवम् 03 पर नामित सदस्यों की सेवा एवम् शर्तें, इत्यादि उत्तर प्रदेश भू–गर्भ जल (प्रबन्धन और विनियमन) नियमावली, 2020 के अध्याय–2 के अनुसार होगी।

(राजेन्द्र कुमार तिवारी)
मुख्य सचिव/अध्यक्ष

पत्रांकः ०। /यूपीराभूजप्रविप्रा/तद्दिनांक।

प्रतिलिपि निम्नलिखित को सूचनार्थ एवम् आवश्यक कार्यवाही हेतु प्रेषित हैः–

1. अपर मुख्य सचिव/प्रमुख सचिव, वित्त विभाग, उत्तर प्रदेश शासन (सदस्य प्राधिकरण)।
2. प्रमुख सचिव, नमामि गंगे तथा ग्रामीण जलापूर्ति विभाग, उत्तर प्रदेश शासन (सदस्य प्राधिकरण)।
3. समस्त मण्डलायुक्त, उत्तर प्रदेश।
4. समस्त जिलाधिकारी, उत्तर प्रदेश।
5. समस्त जिला मजिस्ट्रेट, उत्तर प्रदेश।
6. स्टाफ आफिसर, मुख्य सचिव, उत्तर प्रदेश शासन।
7. स्टाफ आफिसर, कृषि उत्पादन आयुक्त, उत्तर प्रदेश शासन।
8. निदेशक, भूगर्भ जल विभाग, 9वाँ तल इन्दिरा भवन, लखनऊ।

आज्ञा से,

(वी0के0 उपाध्याय)
निदेशक, भूगर्भ जल विभाग/सदस्य सचिव

पत्रांकः /यूपीराभूजप्रविप्रा/तद्दिनांक।

प्रतिलिपि निम्नलिखित को सूचनार्थ एवम् आवश्यक कार्यवाही हेतु इस निर्देश के साथ प्रेषित है कि अपने अधीनस्थ प्रत्येक जनपद के सक्षम अधिकारी को जिला भूगर्भ जल प्रबन्धन परिषद् के सदस्य के रूप में पदेन नामित करें।

1. प्रमुख अभियन्ता/विभागाध्यक्ष, सिंचाई और जल संसाधन विभाग, उत्तर प्रदेश।
2. निदेशक, स्थानीय निकाय, उत्तर प्रदेश, लखनऊ।
3. निदेशक, उद्योग विभाग, उत्तर प्रदेश, कानपुर।
4. सदस्य सचिव, उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड, उत्तर प्रदेश, लखनऊ।

आज्ञा से,

(वी0के0 उपाध्याय)
निदेशक, भूगर्भ जल विभाग/सदस्य सचिव

कार्यालय जिला विकास अधिकारी गोण्डा।

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पत्रांक 370 /ल0सि0/जि0 भूगर्भ ज0प्र0 परिषद/बेव पोर्टल/2020–21 दिनांक 27/02/2021

समस्त सदस्य
जिला भूगर्भ जल प्रबन्धन परिषद
गोण्डा।

उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) अधिनियम–2019 विधायी अनुभाग–1 की अधिसूचना दिनांक 07 अगस्त, 2019 के कियान्वयन हेतु मुख्य सचिव, उत्तर प्रदेश शासन के शासनादेश संख्या–1075/62–2–1–2019–10 जी0डब्लू0/2014 दिनांक 20–09–2019 के कम में जिलाधिकारी महोदय गोण्डा के कार्यालय पत्र सं0 3066/पेयजल/भूगर्भ जल प्र0 गठन/2020–21 दिनांक 10.02.2021 द्वारा जिला भूगर्भ जल प्रबन्धन परिषद का गठन निम्नानुसार किया गया है।

1–	जिला मजिस्ट्रेट गोण्डा।	अध्यक्ष
2	जिला विकास अधिकारी गोण्डा।	सदस्य/सचिव
3–	खाद्य निरीक्षक जनपद–गोण्डा।	सदस्य
4–	सहायक अभियन्ता जल निगम–गोण्डा।	सदस्य
5–	सीनियर हाईड्रोजियोलाजिस्ट, भगर्भ जल विभाग।	सदस्य
6–	क्षेत्रीय अधिकारी प्रदूषण नियत्रंण बोर्ड गोण्डा।	सदस्य
7–	उप कृषि निदेशक कृषि विभाग गोण्डा।	सदस्य
8–	सहायक अभियन्ता लघु सिंचाई विभाग गोण्डा।	सदस्य
9–	अधिशासी अभियन्ता जल निगम– गोण्डा।	सदस्य
10–	जिला पंचायत राज अधिकारी गोण्डा।	सदस्य
11–	अधिशासी अभियन्ता जिला विकास प्राधिकरण गोण्डा	सदस्य
12–	अधिशासी अभियन्ता सिंचाई खण्ड– प्रथम गोण्डा।	सदस्य
13–	उपायुक्त जिला उद्योग केन्द्र गोण्डा।	सदस्य
14–	जिला उद्यान अधिकारी गोण्डा।	सदस्य
15–	प्रभागीय वनाधिकारी गोण्डा।	सदस्य
16–	अधिशासी अधिकारी नगर पालिका परिषद गोण्डा।	सदस्य

जिला भूगर्भ जल प्रबन्धन परिषद की बैठक जिलाधिकारी महोदय गोण्डा की अध्यक्षता में दिनांक 01–03–2021 को कलेक्ट्रेट सभागार में समय 12:30 बजे आहूत की जाती है। जिसमें आप सभी की उपस्थिति अनिवार्य है। कृपया समय से बैठक में प्रतिभाग करना सुनिश्चित करें।

27-2-21

जिला विकास अधिकारी
गोण्डा।

पत्रांक /ल0सि0/जि0 भूगर्भ ज0प्र0 परिषद/बेव पोर्टल/2020–21 दिनांकः उक्त।
प्रतिलिपिः– निम्नाकिंत को सूचनार्थ एंव आवश्यक कार्यवाही हेतु प्रेषित।
1– नाजिर, कलेक्ट्रेट सभागार गोण्डा।
2– मुख्य विकास अधिकारी महोदय, गोण्डा।
3– जिलाधिकारी महोदय गोण्डा।

जिला विकास अधिकारी
गोण्डा।

प्रेषक,

निदेशक,
भूगर्भ जल विभाग/सदस्य सचिव,
राज्य भूगर्भ जल प्रबन्धन एवम् नियामक प्राधिकरण, उ0प्र0,
9वाँ तल, इन्दिरा भवन, लखनऊ।

सेवा में,

समस्त जिलाधिकारी/अध्यक्ष,
जिला भूगर्भ जल प्रबन्धन परिषद्,
उत्तर प्रदेश।

संख्याः 23 /यूपीराभूजप्रविप्रा, लखनऊः दिनांकः फरवरी 25, 2021

विषयः उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) अधिनियम, 2019 के अन्तर्गत प्राप्त आवेदन पत्रों के निस्तारण हेतु आवश्यकतानुसार स्थलीय सत्यापन करने हेतु टास्क फोर्स के गठन एवं दिशा–निर्देश के सम्बन्ध में।

महोदय,

अवगत कराना है कि उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) अधिनियम, 2019 प्रदेश में 02 अक्टूबर, 2019 से लागू किया गया है। यह भी अवगत कराना है कि उक्त अधिनियम के सापेक्ष प्राप्त आवेदन पत्रों के निस्तारण हेतु आन–लाइन वेब पोर्टल (upgwdonline.in) भी विकसित किया है, जिसके संचालन के लिए आपके जनपद में उत्तर प्रदेश शासन नमामि गंगे तथा ग्रामीण जलापूर्ति अनुभाग–3, के द्वारा लघु सिंचाई विभाग एवं भूगर्भ जल विभाग के अधिकारियों को नोडल अधिकारी नामित किया गया है। उक्त वेब–पोर्टल के माध्यम से प्राप्त आवेदन पत्रों के नियमानुसार निस्तारण हेतु कतिपय शर्तो यथा रेनवाटर हार्वेस्टिंग प्रणाली की स्थापना, इफलुमेन्ट प्लान्ट (Effluent treatment plant) (उद्योग हेतु), फ्लोमीटर, बोर की साइज, पम्प का प्रकार एवम् क्षमता इत्यादि की आवश्यकतानुसार स्थलीय सत्यापन हेतु आपके जनपद में निम्नानुसार सदस्यो की समिति/टास्क फोर्स का गठन किया जाता हैः–

1. नामित नोडल अधिकारी।
2. सहायक अभियन्ता, लघु सिंचाई विभाग/भूगर्भ जल विभाग (यदि नोडल अधिकारी, लघु सिंचाई विभाग, उत्तर प्रदेश के नामित हैं तो भूगर्भ जल विभाग के अधिकारी सदस्य होगें। यदि नोडल अधिकारी, भूगर्भ जल विभाग के नामित हैं तो लघु सिंचाई विभाग के अधिकारी सदस्य होगें)।

3. अधिशासी अभियन्ता, उत्तर प्रदेश जल निगम।
4. उप आयुक्त, जिला उद्योग केन्द्र।
5. क्षेत्रीय अधिकारी उत्तर प्रदेश प्रदूषण नियन्त्रण बोर्ड।
6. सम्बन्धित विकास खण्ड अधिकारी आवश्यकतानुसार।

सूचनीय है कि उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) अधिनियम, 2019 में निहित प्राविधानों के अन्तर्गत भूगर्भ जल निष्कर्षण हेतु अनापत्ति निर्गमन एवम् पंजीयन सेवाएं जनहित गारण्टी अधिनियम से अच्छादित है। अतएव आवेदन पत्रों के प्राप्त होने से निस्तारण तक की अवधि के समस्त कार्य 30 दिवस के अन्दर किया जाना अनिवार्य है।

अतः जिला भूगर्भ जल प्रबन्धन परिषद् को प्राप्त होने वाले आवेदन पत्रों को निस्तारित किये जाने हेतु आवश्यक दिशा–निर्देश संलग्न कर आपको इस आशय के साथ प्रेषित है कि उपरोक्तानुसार टास्क फोर्स को निर्देशित करते हुए उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) अधिनियम, 2019 के प्राविधानों के अन्तर्गत प्राप्त आवेदन पत्रों का समयबद्ध रूप से निस्तारण कराने हेतु आवश्यक कार्यवाही करने का कष्ट करें।

संलग्नकः–उपरोक्तानुसार।

भवदीय

(वी0के0 उपाध्याय)
निदेशक भूगर्भ जल विभाग/
सदस्य सचिव
राज्य जल प्रबन्धन और नियामक
प्राधिकरण, उत्तर प्रदेश।

संख्याः /यूपीराभूजप्रविप्रा/तद्दिनांक।

प्रतिलिपि निम्नलिखित को सूचनार्थ एवम् आवश्यक कार्यवाही हेतु प्रेषित हैः–

1. प्रतिलिपि निजी सचिव, मुख्य सचिव, उ0प्र0 शासन/अध्यक्ष, राज्य भूगर्भ जल प्रबन्धन एवम् नियामक प्राधिकरण, उ0प्र0 को सूचनार्थ प्रेषित है।
2. अनुसचिव, नमामि गंगे तथा ग्रामीण जलापूर्ति अनुभाग–3, उत्तर प्रदेश शासन।
3. समस्त नोडल अधिकारी, वेब–पोर्टल।

(वी0के0 उपाध्याय)
निदेशक भूगर्भ जल विभाग/
सदस्य सचिव
राज्य जल प्रबन्धन और नियामक
प्राधिकरण, उत्तर प्रदेश।

कार्यालय जिलाधिकारी गोण्डा।

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उ0प्र0 भूगर्भ जल प्रबन्धन एवं विनियमन अधिनियम, 2019 के प्राविधानो के पारदर्शी कियान्वयन हेतु वेब पोर्टल विकसित किया गया है। निदेशक, भूगर्भ जल विभाग/सदस्य सचिव, राज्य भूगर्भ जल प्रबन्धन एवं नियामक प्राधिकरण उ0प्र0 लखनऊ के पत्रांक संख्या 23/यूपीराभूजप्रविप्रा, दिनांक 25–02–2021 के कम में उ0प्र0 भूगर्भ जल प्रबन्धन एवं विनियमन अधिनियम, 2019 के अन्तर्गत प्राप्त आवेदन पत्रों के निस्तारण हेतु आवश्यकतानुसार स्थलीय सत्यापन करने हेतु जनपदीय समिति/टास्क फोर्स का गठन एतद्द्वारा किया जाता है।

जिलाधिकारी
गोण्डा।

कार्यालय जिलाधिकारी गोण्डा।

पत्रांक 456/भूजविख–देवी0(गो0)/जी0डब्लू0एक्ट, दिनांक : 27–03–2021

प्रतिलिपि निम्नलिखित को सूचना एवं अनुपालनार्थ हेतु प्रेषित।

1. नामित नोडल अधिकारी(अजीत कुमार कन्नौजिया, हाइड्रोलाजिस्ट भूगर्भ जल विभाग)।
2. सहायक अभियन्ता/अवर अभियन्ता, लघु सिचांई विभाग।
3. अधिशासी अभियन्ता, उ0प्र0, जल निगम।
4. उपायुक्त, जिला उद्योग केन्द्र।
5. क्षेत्रीय अधिकारी, उ0प्र0 प्रदुषण नियंत्रण बोर्ड।
6. सम्बन्धित खण्ड विकास अधिकारी।
7. सी0आर0ओ0/ए0डी0एम0/तहसीलदार।

जिलाधिकारी
गोण्डा।

कोर्ट केस/एन0जी0टी0/महत्वपूर्ण।
ई–मेल के माध्यम से

कार्यालय निदेशक,
भूगर्भ जल विभाग, उत्तर प्रदेश
भूजल भवन (रा0भू0सू0प्र0के0),
हरिहरपुर, शहीद पथ, लखनऊ।

संख्या– 1316 /भू0ज0वि0/एस–26(एन0जी0टी0) दिनांक/लखनऊ/दिसम्बर 05 2024

विषय– **मा0 राष्ट्रीय हरित अधिकरण (एनजीटी), नई दिल्ली में विचारधीन ओ0ए0 संख्या–691/2022 Rama Shanker Awasthi Vs State of Uttar Pradesh & Ors. में पारित आदेश दिनांक 07.11.2024 के अनुपालन के सम्बन्ध में।**
नोडल अधिकारी, जिला भूगर्भ जल प्रबन्धन परिषद्, जनपद–पीलीभीत/शाहजहॉपुर/गोण्डा/बलरामपुर/लखीमपुर (खीरी)।

उपरोक्त विषयक मा0 राष्ट्रीय हरित अधिकरण (एनजीटी), नई दिल्ली में विचाराधीन **ओ0ए0 संख्या–691/2022 Rama Shanker Awasthi Vs State of Uttar Pradesh & Ors.** में पारित आदेश दिनांक 07.11.2024, जो इस कार्यालय में दिनांक 25.11.2024 को प्राप्त हुआ है (मय संलग्नको सहित छायाप्रति संलग्न), का संदर्भ ग्रहण करें, जिसके माध्यम से अवगत कराया गया है कि प्रदेश में स्थापित फर्म *M/s Bajaj Hindusthan Ltd. and Bajaj Energy Ltd.* के विभिन्न जनपदों यथा–पीलीभीत, शाहजहॉपुर, गोण्डा, बलरामपुर, लखीमपुर(खीरी) में चलित थर्मल पावर प्लांट के द्वारा पर्यावरणीय नियमों का अनुपालन न किये जाने, सम्बन्धित विभागों से बिना अनापत्ति प्रमाण पत्र प्राप्त किये ही यूनिटों का संचालन किये जाने के साथ ही व्यवसायिक कार्य हेतु अवैध रुप से भूजल निष्कर्षण किया जा रहा है। जिसके संबंध में मा0 अधिकरण के सम्मुख विषयांकित वाद दिनांक 27.09.2022 को सूचीबद्ध हुई जिसमें मा0 अधिकरण द्वारा, लगाये गये अरोपों का संज्ञान लेते हुए तथा शर्तो का अनुपालन कराये जाने हेतु केन्द्रीय प्रदूषण नियंत्रण बोर्ड, नई दिल्ली व उ0प्र0 प्रदूषण नियंत्रण बोर्ड की संयुक्त समिति गठित की गयी एवं इस हेतु उ0प्र0 प्रदूषण नियंत्रण बोर्ड को नोडल नामित किया गया।

उक्त वाद मा0 अधिकरण के सम्मुख पुनः दिनांक 07.11.2024 को सूचिबद्ध हुई एवं सुनवाई उपरान्त मा0 अधिकरण द्वारा कार्यालय को नोटिस प्रेषित करते हुए अपेक्षा की गयी है कि अगामी सुनवाई दिनांक 24.02.2025 से पूर्व मा0 अधिकरण के आदेशों का अनुपालन कराया जाना सुनिश्चित किया जाये। दिनांक 07.11.2024 को पारित आदेश का प्रभावी अंश निम्नवत् हैः–

".....2. When the order dated 21.12.2023 was passed the Respondents No. 1 and 3 were not represented. It has been pointed out that no notice to those respondents has been issued subsequently.
3. Let the notice be issued to the respondents not represented today The Applicant is directed to serve the said respondents and file an affidavit of service at least one week before the next date of hearing.
4. List on 24.02.2025."

उल्लेखनीय है कि प्रदेश में प्रख्यापित 'भूगर्भ जल (प्रबन्धन एवं विनियमन) अधिनियम–2019' में निहित प्राविधानों के अन्तर्गत मुख्य सचिव महोदय की अध्यक्षता में "उत्तर प्रदेश राज्य भूगर्भ जल प्रबन्धन एवं विनियामक प्राधिकरण" का गठन किया गया है। अधिनियम, 2019 के प्रभावी अनुश्रवण/क्रियान्वयन हेतु प्रदेश के समस्त जनपदों में जनपद स्तर पर जिलाधिकारी की अध्यक्षता में "जिला भूगर्भ जल प्रबन्धन परिषद्" का गठन भी किया जा चुका है, जिसके अन्तर्गत कूपों के पंजीकरण, भूगर्भ जल निष्कर्षण हेतु अनापत्ति प्रमाण–पत्र निर्गमन/नवीनीकरण आदि के सम्बन्ध में प्राप्त आवेदनों तथा भूजल व उससे सम्बन्धित शिकायतों का निस्तारण किया जाता है। अधिनियम में निहित सेवाओं के सुचारु कियान्वयन हेतु प्रत्येक जनपद में नोडल अधिकारी भी नामित किये गये है।

प्रस्तुत किये गये उक्त वाद में विपक्षी पार्टी संख्या–03 के रुप में भूगर्भ जल विभाग, उ0प्र0 को रखा गया है एवं मा0 अधिकरण द्वारा प्रेषित विधिक नोटिस, जिसके साथ मूल आवेदन का सार संलग्न है। नोटिस द्वारा अपेक्षा की गयी है कि मूल आवेदन में वादी द्वारा कतिपय जनपदों में स्थापित फर्मो/सस्थाओं पर लगाये गये आरोपों/तथ्यों की जॉच करते हुए सम्बन्धित वाद के सापेक्ष प्रस्तरवार विभागीय प्रतिउत्तर तैयार कर वाद की अगामी सुनवाई दिनांक 24.02.2025 से पूर्व प्रतिशपथ पत्र दाखिल किया जाये।

अतएव उपरोक्त के क्रम में आपको विषयांकित वाद में विपक्षी पार्टी संख्या–3/भूगर्भ जल विभाग, उ0प्र0 की ओर से जनपदवार विभागीय प्रतिनिधि नामित करते हुए निर्देशित किया जाता है कि मा0 प्राधिकरण के आदेश दिनांक 07.11.2024 के साथ संलग्न मूल प्रत्यावेदन में की गयी शिकायत के क्रम में मूल आवेदन में वादी द्वारा लगाये गये आरोपों/तथ्यों की जॉच करते हुए सम्बन्धित वाद के सापेक्ष जनपदवार व प्रस्तरवार विभागीय मंतव्य/पैरावाईस नैरेटिव/शपथ पत्र तैयार करते हुए, मा0 अधिकरण के सम्मुख ससमय उपस्थित होते हुए प्रेषित करना सुनिश्चित करें तथा कृत कार्यवाही से इस कार्यालय को भी अवगत करायें, जिससे मा0 राष्ट्रीय हरित अधिकरण (एनजीटी) के आदेशों का अनुपालन किया जा सके। ज्ञातव्य हों कि उक्त वाद में **अगामी सुनवाई दिनांक 24.02.2025** को नियत की गयी है।

संलग्नक–उपरोक्तानुसार।

(अनुपम)
अधिशासी अभियंता/
वै0सहा0(निदेशक)।

संख्या– 1316 /भू0ज0वि0/तद्दिनांक।

प्रतिलिपि निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित है–

1. मा0 राष्ट्रीय हरित अधिकरण (एनजीटी), नई दिल्ली।
2. निजी सचिव, मुख्य सचिव, उ0प्र0 शासन।
3. निजी सचिव, प्रमुख सचिव, नमामि गंगे तथा ग्रामीण जलापूर्ति विभाग, उ0प्र0 शासन।
4. सदस्य सचिव, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, नई दिल्ली।
5. सदस्य सचिव, उ0प्र0 प्रदूषण नियंत्रण बोर्ड, लखनऊ।
6. क्षेत्रीय निदेशक, पर्यावरण, वन एवं जलवायु परिवर्तन विभाग, लखनऊ।
7. जिलाधिकारी/अध्यक्ष, जिला भूगर्भ जल प्रबन्धन परिषद जनपद–पीलीभीत/शाहजहाँपुर/गोण्डा/बलरामपुर/लखीमपुर (खीरी)।

(अनुपम)
अधिशासी अभियंता/
वै0सहा0(निदेशक)।

Ground Water Department

(Ganga Gange & Rural Water Supply Department)

Ministry of Jal Shakti

Government of Uttar Pradesh

Form 8 (C)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC043562

VALID FROM 18/06/2021 TO 17/06/2026

Name of the Applicant	GYANENDRA VIR SINGH		
Address of the Applicant:	Village - Kundarkhi		
Company Name:	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT	**Company Address**	Village - Kundarkhi, PO-Govindpara, Gonda, 271301
Serial No. of Application Form	GNDA0521NIN0004	**Date of Submission**	08/05/2021
Specimen Signature of the User:			

Location particulars:

District	Gonda	**Block**	JHANJHARI
J.L. No		**Plot No.**	Existing land details attached
Municipality/Corporation	NA	**Ward No.**	NA
Holding No.			NA
Rate of Withdrawal (m^3/hr.)	150.00	**Date of Energization (In Case of Electric Pump)**	01/09/2007

Particulars of the Proposed Well and Pumping Device:

Type of the Well	Tube Well/Boring	**Purpose of the Well**	Industrial
Assembly Size (For Tube Well)	30.50	**Approx. Strainer Length (For Tube Well)**	0.00
Diameter (For Dug Well)	0.00	**Type of Pump to be Used:**	Submersible
H.P. of the Pump:	50.00	**Operational Device**	Electric Motor
Maximum Allowable Rate of Withdrawal (m^3/hr.):	150.00	**Maximum Allowable Running Hours Per Day:**	5.00
Maximum Allowable Annual Extraction of Ground Water:	112500.00	**Recharge Required:**	56250.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 56250.00 cubic meter, as specified under the application form within the given time period..

Ground Water Department

(Namami Gange & Rural Water Supply Department)

Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC047600

VALID FROM 18/06/2021 TO 17/06/2026

Name of the Applicant	GYANENDRA VIR SINGH		
Address of the Applicant:	Village - Kundarkhi		
Company Name:	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT	**Company Address**	Village - Kundarkhi, PO-Govindpara, Gonda, 271301
Serial No. of Application Form	GNDA0521NIN0005	**Date of Submission**	08/05/2021
Specimen Signature of the User:			

Location particulars:

District	Gonda	**Block**	JHANJHARI
J.L. No		**Plot No.**	Existing land details attached
Municipality/Corporation	NA	**Ward No.**	NA
Holding No.			NA
Rate of Withdrawal (m^3/hr.)	150.00	**Date of Energization (In Case of Electric Pump)**	01/09/2007

Particulars of the Proposed Well and Pumping Device:

Type of the Well	Tube Well/Boring	**Purpose of the Well**	Industrial
Assembly Size (For Tube Well)	30.50	**Approx. Strainer Length (For Tube Well)**	0.00
Diameter (For Dug Well)	0.00	**Type of Pump to be Used:**	Submersible
H.P. of the Pump:	50.00	**Operational Device**	Electric Motor
Maximum Allowable Rate of Withdrawal (m^3/hr.):	150.00	**Maximum Allowable Running Hours Per Day:**	5.00
Maximum Allowable Annual Extraction of Ground Water:	112500.00	**Recharge Required:**	56250.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 56250.00 cubic meter, as specified under the application form within the given time period..

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Ground Water Department

(Namami Gange & Rural Water Supply Department)

Ministry of Jal Shakti

Government of Uttar Pradesh

Form 8 (C)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC020211

VALID FROM 18/06/2021 TO 17/06/2026

Name of the Applicant	GYANENDRA VIR SINGH		
Address of the Applicant:	Village - Kundarkhi		
Company Name:	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT	**Company Address**	Village - Kundarkhi, PO-Govindpara, Gonda, 271301
Serial No. of Application Form	GNDA0521NIN0006	**Date of Submission**	08/05/2021
Specimen Signature of the User:			

Location particulars:

District	Gonda	**Block**	JHANJHARI
J.L. No		**Plot No.**	Existing land details attached
Municipality/Corporation	NA	**Ward No.**	NA
Holding No.			NA
Rate of Withdrawal (m^3/hr.)	150.00	**Date of Energization (In Case of Electric Pump)**	01/09/2007

Particulars of the Proposed Well and Pumping Device:

Type of the Well	Tube Well/Boring	**Purpose of the Well**	Industrial
Assembly Size (For Tube Well)	30.50	**Approx. Strainer Length (For Tube Well)**	0.00
Diameter (For Dug Well)	0.00	**Type of Pump to be Used:**	Submersible
H.P. of the Pump:	50.00	**Operational Device**	Electric Motor
Maximum Allowable Rate of Withdrawal (m^3/hr.):	150.00	**Maximum Allowable Running Hours Per Day:**	2.00
Maximum Allowable Annual Extraction of Ground Water:	45000.00	**Recharge Required:**	22500.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 22500.00 cubic meter, as specified under the application form within the given time period..

Ground Water Department

(Namami Gange & Rural Water Supply Department)

Ministry of Jal Shakti

Government of Uttar Pradesh

Form 8 (C)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC026057

VALID FROM 18/06/2021 TO 17/06/2026

Name of the Applicant	GYANENDRA VIR SINGH		
Address of the Applicant:	Village - Kundarkhi		
Company Name:	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT	**Company Address**	Village - Kundarkhi, PO-Govindpara, Gonda, 271301
Serial No. of Application Form	GNDA0521NIN0007	**Date of Submission**	08/05/2021
Specimen Signature of the User:			

Location particulars:

District	Gonda	**Block**	JHANJHARI
J.L. No		**Plot No.**	Existing land details attached
Municipality/Corporation	NA	**Ward No.**	NA
Holding No.			NA
Rate of Withdrawal (m^3/hr.)	50.00	**Date of Energization (In Case of Electric Pump)**	01/09/2007

Particulars of the Proposed Well and Pumping Device:

Type of the Well	Tube Well/Boring	**Purpose of the Well**	Industrial
Assembly Size (For Tube Well)	30.50	**Approx. Strainer Length (For Tube Well)**	0.00
Diameter (For Dug Well)	0.00	**Type of Pump to be Used:**	Submersible
H.P. of the Pump:	10.00	**Operational Device**	Electric Motor
Maximum Allowable Rate of Withdrawal (m^3/hr.):	50.00	**Maximum Allowable Running Hours Per Day:**	4.00
Maximum Allowable Annual Extraction of Ground Water:	30000.00	**Recharge Required:**	15000.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.
- Holder of this NOC is hereby directed to assure annual recharge of 15000.00 cubic meter, as specified under the application form within the given time period..

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भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

कोषागार

उत्तर प्रदेश UTTAR PRADESH

01 DEC 2017

मुख्य कोषाधिकारी
गोण्डा

DC 678296

अनापत्ति प्रमाण पत्र

मैं गुड्डी देवी, ग्राम प्रधान बिरवा बभनी, वि0ख0 झंझरी, जनपद गोण्डा (उत्तर प्रदेश) तस्दीक करती हूँ कि पंचायत की सहमति से लिये गये निर्णय के अनुसार हमारे ग्राम में खाता सं0 0023 खसरा/गाटा सं0 223स में स्थित तालाब जिसका क्षेत्रफल 8.130 हेक्टेयर है, को मे0 बजाज हिन्दुस्थान शुगर लिमिटेड, कुन्दरखी, गोण्डा उत्तर प्रदेश को रेन वाटर हर्वेस्टिंग व रिचार्ज के लिए अधिग्रहित करती हूँ तो इस ग्राम की पंचायत को कोई आपत्ति नहीं है।

मैं यह भी दस्तीक ये तालाब किसी अन्य व्यक्ति या कम्पनी को अधिग्रहित नहीं किया गया है एवं नही भविष्य में किया जायेगा।

ग्राम प्रधान

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REPORT
On
Water Audit Study

Bajaj Hindusthan sugar Limited, Unit-Kundarkhi,
Kundarkhi, Gonda, UP-271301



by

Resource Conservation & Management Division
Federation of Indian Chambers of Commerce and Industry
Federation House, Tansen Marg, New Delhi – 110 001

(January2023)

Federation of
Indian Chambers
of Commerce and Industry

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ACKNOWLEDGEMENT

Federation of Indian Chambers of Commerce & Industry (FICCI) places on record its sincere thanks to **Bajaj Hindustan Sugar Limited, Unit-Kundarkhi,** for entrusting the task of conducting "Water Audit Study" as per UPGWD guidelines at **Bajaj Hindustan Sugar Limited, Unit-Kundarkhi**Plant during January2023

We hereby express our sincere thanks to Mr.Manoj Kumar Singh (Unit Head) , Mr. N K Shukla (HR Head), Mr.PK Pandey (GM Engineering) Mr Rajesh Goel(GM Production) & Mr Karandeep Singh ,(AM EHS)From **Bajaj Hindustan Sugar Limited, Unit-Kundarkhi** for their proactive support and courtesy extended to the FICCI team during field study.

We also thank other officials from **Bajaj Hindustan Sugar Limited, Unit-Kundarkhi** Plant for their cooperation and support provided during data collection. We are also grateful to all those we interacted with during the audit who gave us some operational insights.

We hereby submit the Water Audit Report for your reference.



M A Patil
Asst. Secretary General
RCM Group, FICCI
New Delhi

PROJECTTEAMMEMBERS

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Executive Summary

FICCI has conducted a detailed Water Audit Study of the **Bajaj Hindusthan Sugar Ltd., Sugar unit - Kundarkhi plant during January 2023.** The study estimated that the total Water in use by the plant in Season FY 2021-22 (November to March) is **about 6913 m^3/day** out of which about 8.5% is bore well freshwater; **77.5 %** is Cane Sugar water, **13.3 %** is ETP treated water and **0.7 %** is STP treated water. The main source of freshwater for plant is ground water. The plant consumes about **130247 m^3** of groundwater per annum. The water is mainly used for utilities, process, fire hydrant and domestic use in buildings like hand washing, toilet flushing etc. The main water sources and their uses are given in Table below.

Table A: Total Water Requirement by plant on season FY 2021-22

S.N.	Source of Water	m^3/day	Water Quality	*Major Usage Area*	*Water Use (%)*
1	Bore wells	585	Fresh water	DM water & cooling Tower makeup, Utilities, Backwashing, Potable water, Domestic activities, Process Line	8.5%
2	Cane Sugar Water	5360	Cane Sugar water	Process water use	77.5%
3	ETP Treated water	919	Recycle Treated Water	Gardening, Dust Suppression ,Ash quenching	13.3%
4	STP Treated Water	49	Recycle Treated Water	Gardening & green Development	0.7%
Total		**6913**			100%

The study estimated that the total Water use by the plant in Off Season 2021-22 (May to October) is about **239m^3/day** out of which about 85% (202 m3/day) is freshwater and 15 % (37 m3/day) is STP treated water.

Table B: Water Sourcing Off Season FY 2021-22 (April to October)

S.N.	Source of Water	m^3/day	Water Quality	*Major Usage Area*	*Water Use (%)*
1	Borewell	202	Fresh water	Domestic activities in colony & Plant	85%
2	STP Treated Water	37	Recycle Treated Water	Gardening & green Development	15%
	Total	**239**			100%

The total wastewater generation in the plant in Season FY 2021-22 is about **919m^3/day (Maximum waste water generation of plant 1082 m^3/day),** about out of which is the process water , domestic use in Plant building consumption, and DM Regeneration, Filter Backwash, Leakages, service activities, cleaning washing and by other miscellaneous uses. The overall water balance of the plant is given below. The detailed Water balance is discussed in the subsequent chapters.

The plant has recently achieved a reduction in water consumption by implementing the various measure. While, water audit resulted in the identification of potential water-saving measures for both the industrial and domestic aspects of the facility. On the industrial side, the audit suggests that the plant has the potential to save around **37358 m^3/Annum**, which around 29 **%** of total water withdrawn ,By incorporating and executing the proposed strategies, the plant stands to achieve a significant reduction in its water consumption.

Table C: Summary of Proposed Schemes

S.No.	Proposed Schemes	(m3/day)	(m^3/annum)
	Industrial Saving		
1	it is recommended to collect sewage water and treated at STP around 94 m3/day (70 % of domestic water use)	45	16535
2	Installation of water efficient taps /aerator/ dual toilets and water less urinal	57	20823
	Total	102	37358

Table D : Summary of Water Savings

S. No.	Description Unit	Value
1	Annual Total Fresh water Consumption m^3/annum	130247
2	Annual water saving m^3/annum	37358
3	Saving %	29%

Water Management Summary:

Table 1: Fact File- **Bajaj Hindusthan Sugar Ltd., Sugar unit - Kundarkhi plant**	
Plant Name and Location	**Bajaj Hindusthan Sugar Ltd., Sugar unit –Kundarkhi plant**
Plant zone	Safe Zone
Depth of ground water table (Mtr.)	5
Type of products	Sugar
No. of working days/year	84
Annual Production (2021-2022)	Total Production –60117.8T
Major Water Usage Area in the Plant	Production Unit, Utilities, Domestic use, Gardening, Irrigation etc.
Main Source of Freshwater and sourcing cost (Rs/m^3)	Borewell–585 in season and 202 in off season m^3/day (Crushing Season 2021-22) Rs. 1.07m^3/day (Pumping Cost) Rs. 0.8m^3/ day (UPGWD Ground water abstraction Charges)
Total annual Fresh Water consumption (2021-22)	130247 m^3/year
Total Water Use (Freshwater, Recycled RO Reject Water, ETP Treated Water) for Plant	• Freshwater- 585 m^3/day in season and 202 m^3/day in off season • ETP Treated Water-919 m^3/day in season • STP Treated Water 49 m^3/day in season and 37 m^3/day in off

	season
Cost of Water at various water use areas	• Water pumping cost- Rs1.07/ m^3 • Cost of Softening treated water Rs9.75/ m^3 • Cost of Water for ETP treated water Rs8/m3 • Cost of Water for STP treated water Rs0.13/m3
Annual water cost	**10.93 Lakh Rs/year**
Average Effluent Generation in the ETP & generated and STP Reuse (m^3/day)	919 m^3/day in season is treated in ETP and reused for gardening and dust suppression. 49 m^3/day in season and 37 m^3/day in off season treated water reuse in gardening.
Power Supply Cost FY 2021-2022 (Rs. /kWh)	3.24(Rs. /kWh)
Average Specific Water Consumption in terms of Freshwater Use (2021-22)	• Specific water Consumption SWC for Industrial use is **1.1 m^3 of water/tons of Sugar production** of the product and **0.10 m3/Ton of cane Crushing ,** • Specific water Consumption SWC for Colony is 189 liter per person per day • Specific water Consumption SWC for plant domestic is 51 liter per person per day

In view of the above all though the scope of water conservation is limited, yet the waters audit study of the plant has identified various water & cost saving opportunities which are discussed in the report, plant, can easily reduce its freshwater consumption by 29 %.

SUMMARY OF RECOMMENDATIONS

S.No.	Particular	Key Observations	Recommendations	Annual water savings (m3)/ Energy saving	Annual monetary savings (Rs)	Investment (Rs)	Pay-back period (Years)
A. LOW OR NO COST SCHEMES (upto 1 Lakh INR)							
1	Water Savings in the Buildings for Domestic Use	Inefficient water fixtures at many locations leading to water wastages	Install flow restrictors in the existing hand washing taps; about 10-15% of freshwater will be saved	20823 m3 per year (57 m3 /day)	33734	90000	3
2	To enhance sewage water collation and treated at STP plant(100 KLD)	Presently domestic water use around134 m3/day for domestic use in colony and plant, and actual STP treated water around 49 m3/day. As per site visit , It is possibility to collect sewage water and treated at STP around 94 m3/day (70 % of domestic water use	it is recommended to further enhance the capacity of STP plant to around 100 KLD for treatment of outlet water from RCC soak pit .	16535 m3/year (45 m3/day)	26786	50000	2.5
3	Installation of drip irrigation for landscaping/ horticulture	It was observed STP & ETP treated water is used in gardening and irrigation application by using open hose pipe	Installation of water efficient irrigation system like drip irrigation for landscaping/ horticulture/ gardening to have potential **30-50% water**				
4	Regularly calibrate & maintain existing water flow meters	It was observed that bore well has installed magnetic type digital flow meters and also periodically calibrated annual basis	It is suggested to maintain				
5	Maintain logbook of daily groundwater abstraction	It was observed that the plant is maintaining data of daily groundwater abstraction	The plant is suggested to record the water abstraction data, maintain logbook of daily groundwater			**Minimum**	**Immediate**

S.No.	Particular	Key Observations	Recommendations	Annual water savings (m3)/ Energy saving	Annual monetary savings (Rs)	Investment (Rs)	Pay-back period (Years)
			abstraction and submit the data to UPGWD periodically				
6	Training and Awareness of the Employees at all Levels and Placing 'Water Saving' Posters/Slogans at various Locations	It is observed that the training and awareness programs on 'Water Saving & Conservation' and 'Good Housekeeping Practices' helps and motivates employees towards resource conservation.	Periodically organize Awareness Programs for office employees including shop floor workers on Water Conservation and The Plant has already placed/located water saving labels/posters in prominent noticeable location of the plant.	Reduction in Freshwater Use due to awareness and training	Water cost savings due to reduced water use	**Minimum**	**Immediate**
7	Periodically conduct 'Water & Wastewater Audit'	Regular water audits were not being conducted by the plant in past to assess the water system in integration.	Conduct periodic 'Water Audit' at least once in 2 years either by an experienced external Audit Team or by trained internal team to assess the efficiency of water usage in processes; reduce water losses in the system and optimize costs & energy consumption.	Efficient water & wastewater management	Evolving schemes leading to cost savings	**Minimum**	**Immediate**
8	Regular payment of applicable groundwater abstraction charges	The plant has paid applicable groundwater abstraction charges as per UPGWD notification.	It is suggested to maintain the system				
Remarks: It is estimated that by implementing suggested low & medium cost schemes, plant, can easily reduce its freshwater consumption by 29 %							

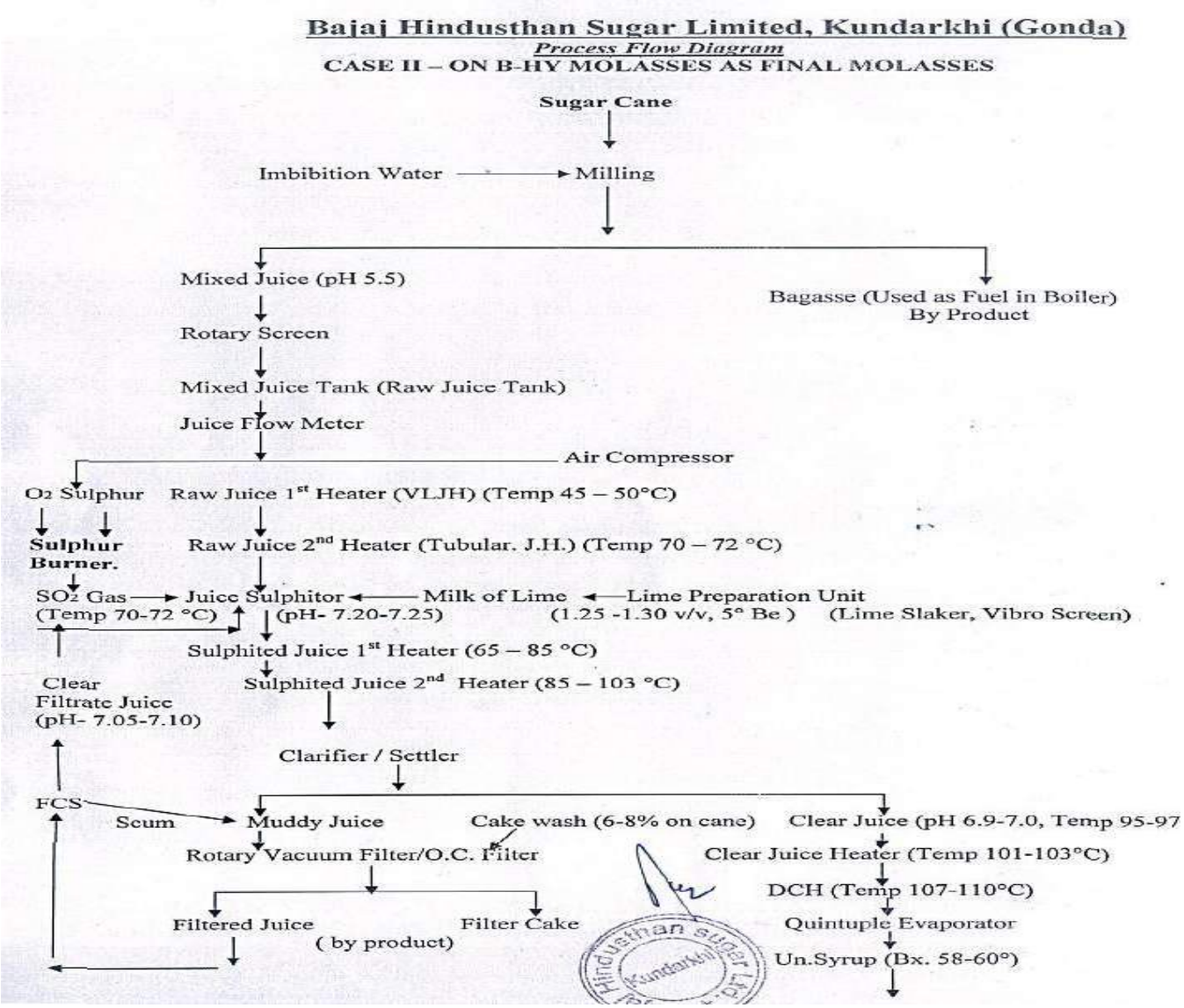
CHAPTER-1 : INTRODUCTION

1.1 About the Plant: General Plant Details

Bajaj Hindusthan Sugar Limited, Unit-Kundarkhi, is located at Village-Kundarkhi P O-Govindpara, Block - Jhanjhari, Gonda.Pin 271301of 8000 TCD of cane crushing with Co- Generation Power Plant.

1.2 Process description

1.2.1 Product flow diagram of Sugar Cane



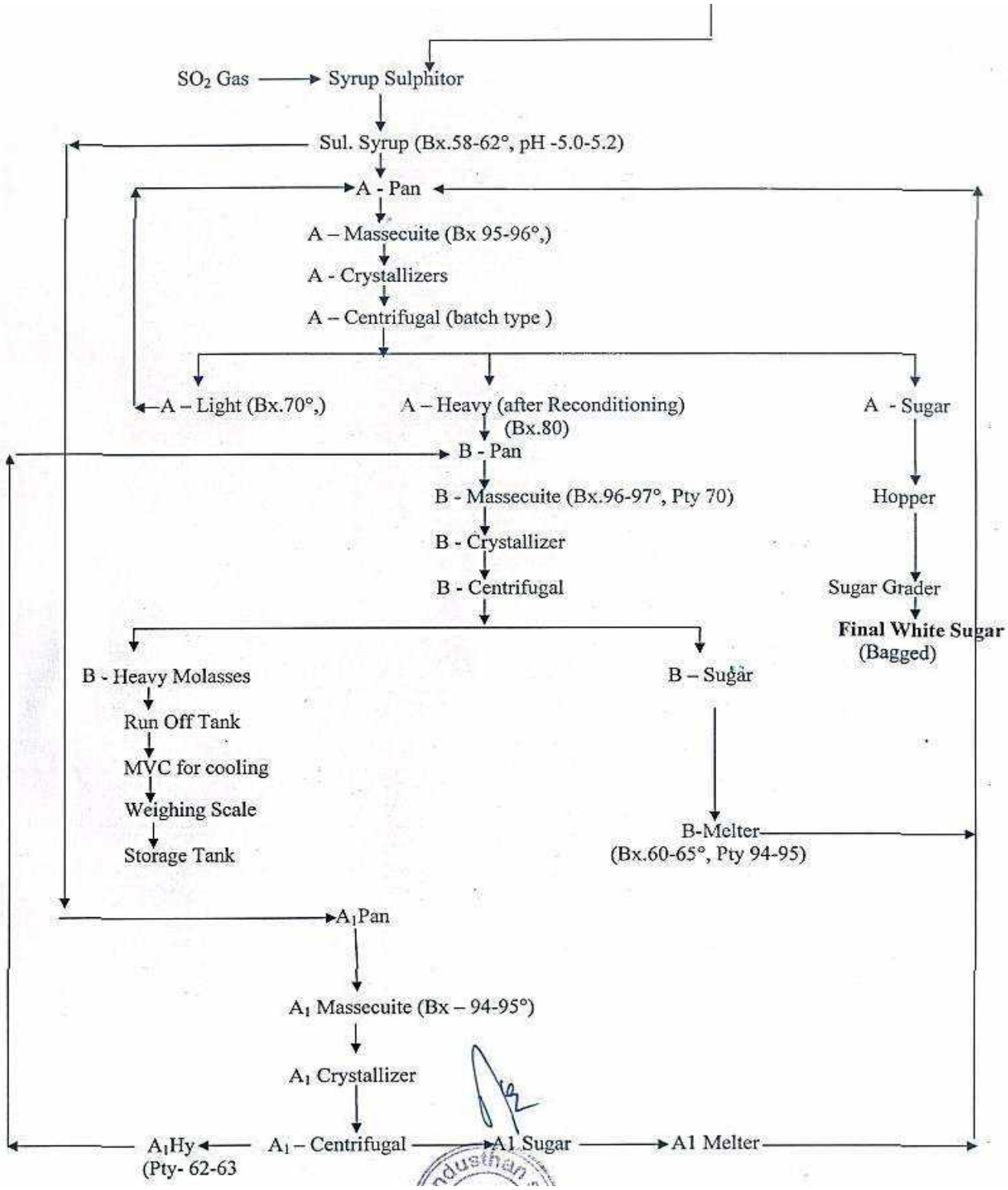


Figure 1:Details of process flow diagram

1.2.2 Details of Cooled Condensate water circuit diagram of Sugar Cane

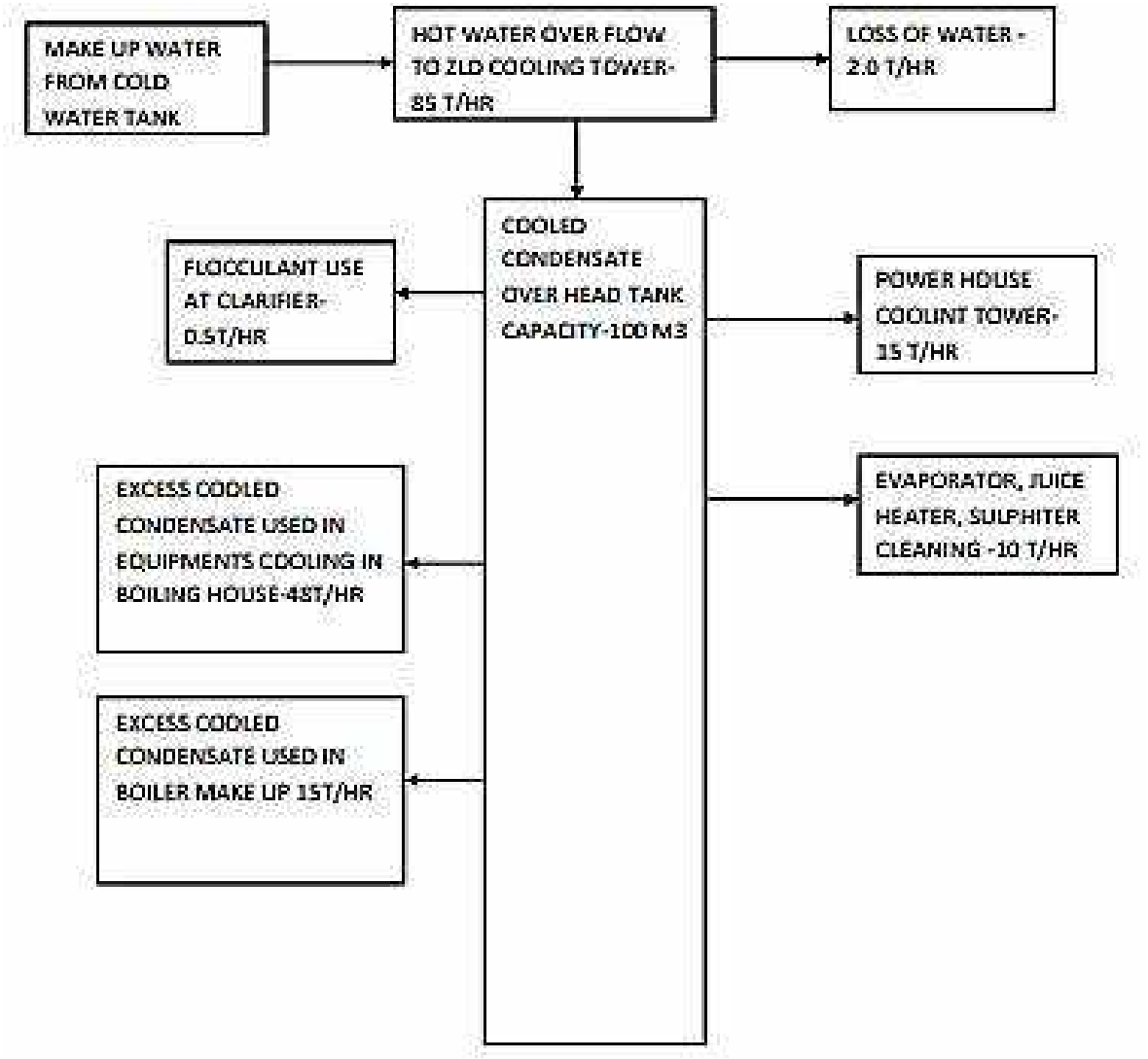


Figure 2:Details of Hot water circuit diagram of Sugar Cane

1.2.3 Details of Cold-water circuit diagram of Sugar Cane

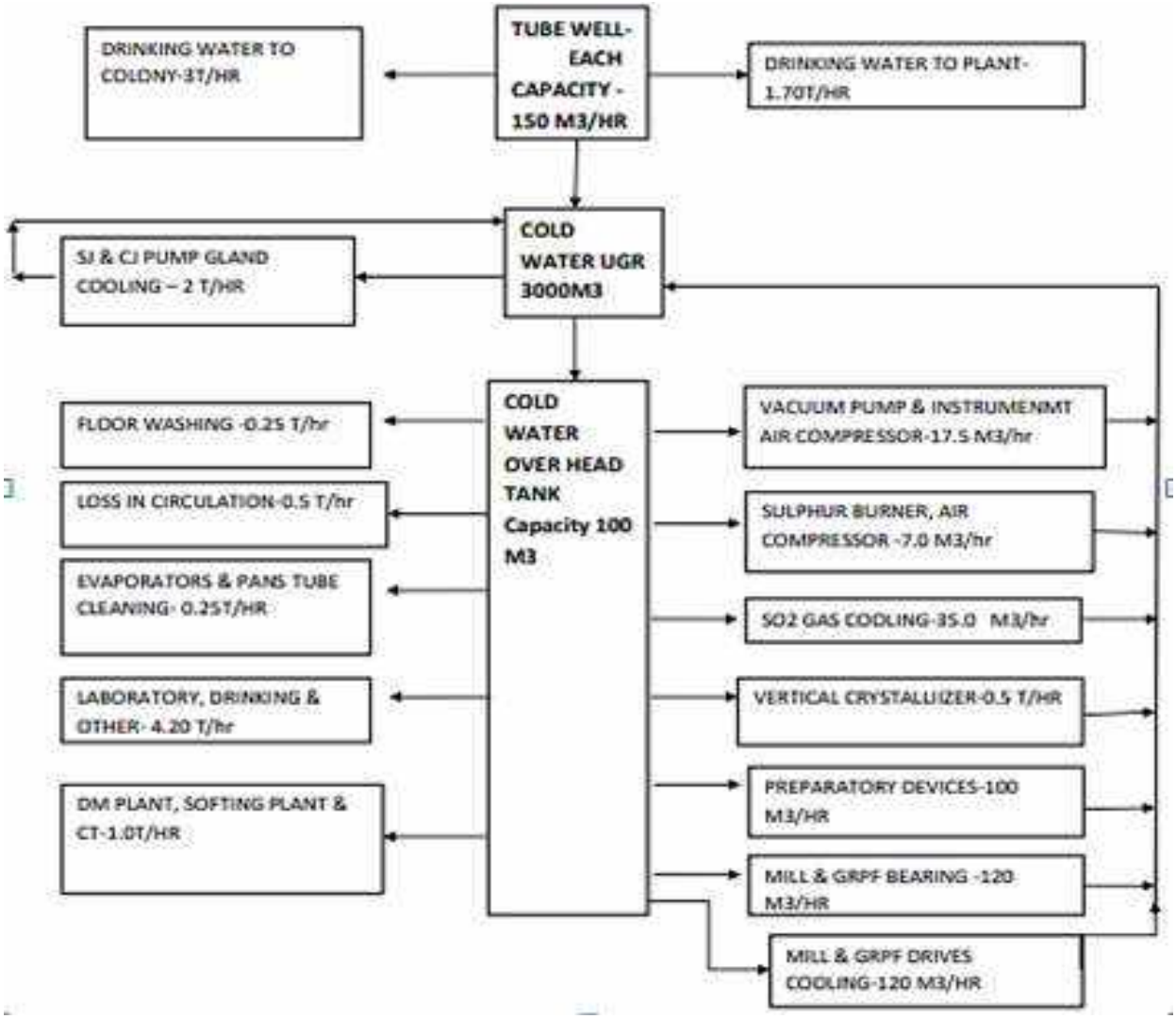


Figure 3:Details of cold-water circuit diagram of Sugar Cane

1.2.4 Sugar Manufacturing Process: -

They follow double sulphitation process and produce plantation white sugar. The major unit operations are extraction of juice, clarification, evaporation, crystallization and centrifugation.

i. **Extraction of juice:** The sugarcane is passed through devices like knives for cutting the stalks into fine chips before being subjected to crushing in a milling tandem roller mill. Fine preparation with its impact on final extraction, is receiving special attention and shredders and particularly the fiberize are gaining popularity. The mills are of modern design, being equipped with turbine drive, special feeding devices, efficient compound imbibition's system, etc. In the best milling practice, more than 95% of the sugar in the cane goes into the juice, this percentage being called the sucrose extraction or more simply the extraction. A fibrous residue called bagasse; with a low sucrose content is produced about 25 to 30% of cane, which contains 45 to 55% moisture.

ii. **Clarification**: The dark-green juice from the mills is acidic (pH 4.5) and turbid, called raw juice or mixed juice. The mixed juice after being heated to 65 to 75°C is treated with phosphoric acid and milk of lime for removal of impurities in suspension in a continuously working apparatus. The treated juice on boiling is fed to continuous clarifier from which the clear juice is decanted while the settled impurities known as mud is sent to rotary drum vacuum filter for removal of unwanted stuff called filter cake is discarded or returned to the field as fertilizer. The clear juice goes to the evaporators without further treatment.

iii. **Evaporation:** The clarified juice contains about 85% water. About 75% of this water is evaporated in vacuum multiple effects consisting of a succeeding (generally four) of vacuum-boiling cells arranged in series so that each succeeding body has higher vacuum. The vapors from the final body go to condenser. The syrup leaves the last body continuously with about 60% solids and 40% water.

iv. **Crystallization:** Crystallization takes place in single-effect vacuum pans, where the syrup is evaporated until saturated with sugar. At this point 'seed grain' is added to serve as a nucleus

v. For the sugar crystals, and more syrup is added as water evaporates. The growth of the crystals continues until the pan is full. Given a skilled sugar boiler or adequate instrumentation, the original crystals can be grown without the formation of additional crystals, so that when the pan is just full, the crystals are all of desired size, and the crystals and syrup form a dense mass known as 'massecuite'. The 'strike' is then discharged through a foot valve into acrystallizer.

vi. **Centrifugation**: The massecuite from crystallizer is drawn into revolving machines called centrifuges. The perforated lining retains the sugar crystals, which may be washed with water, if desired. The mother liquor 'molasses' passes through the lining because of the centrifugal force exerted and after the sugar is 'purged' it is cut down leaving the centrifuge ready for another charge of massecuite. Continuous centrifuges may purge low grades. The other liquor separated from commercial sugar is again sent to pan for boiling and re-crystallization. Three stages of re- crystallization are adopted to ensure maximum recovery of sugar in crystal form. The syrup is evaporated until saturated with sugar. At this point 'seed grain' is added to serve as a nucleus Yeast Propagation developed Strain of Culture Yeast is grown in laboratory during plant startup. Yeast propagation section comprises of molasses Diluter and hygienically engineered Yeast Vessels equipped with heating, cooling and air sparing facility.

1.3 Water Conservation Initiatives taken by Plant.

FICCI took up a detailed Water Audit Study at **Bajaj Hindusthan Sugar Ltd., Sugar unit - Kundarkhi plant**. During the study period it was observed that the plant has already taken following pro-active steps towards water conservation.

Table 2: Water conservation and saving measures undertaken in plant.

Sr.No.	Water Conservation/Saving Measure Undertaken	Annual Water Saving (cubic meter)	Annual Monetary Saving (Rs)	Investments (Rs)	Pay Back Period (Year/s)
01.	Exhaust Drain from PRDS line is collected and taken to feed tank of Boiler				
02.	Additional Cooling Arrangement has been made to cool Second Condensate Water				
03.	Water for Hydraulic testing of various bodies is taken from injection channel in place of fresh/Second Condensate Water				
04.	Arrangement has been made to cool the bearing water in closed loop of various pumps in Cooling Tower				
05.	Top up for Drift losses of Turbine Cooling Tower is made up from Second Condensate Water				
06	Drift losses of Process Cooling Tower is made from Second Condensate Water				
07.	Hot water is taken into Calendria testing & is again reused in hot water tank				
08.	Boiler Make up water is being top up from Second Condensate water after proper chemical treatment.				

FICCI is pleased to offer its services for conducting Water Audit Study at **Bajaj Hindusthan Sugar Ltd., Sugar unit - Kundarkhi plant** as per UPGWA guidelines. FICCI's expertise in Water audit & conservation will complement the in-house efforts of plant in conserving water, reducing wastewater generation as well as reducing operational costs. Plant has done proper water management through reduction of fresh water consumption, utilization and effective recycling of ETP and STP treated water and various other steps are taken to reduce the daily water requirement of the plant.

CHAPTER-2 SCOPEOFWORK

2.1 Scope of Water Audit Study

- On-site training and discussion with facility manager and personnel
- Water system analysis and Quantification of baseline water map
- Water use Monitoring and measurements using pressure and flow meters and various other devices
- Quantification of inefficiencies and leaks in the water system
- Quantification of water quality loads and discharges
- Quantification of variability in flows and quality parameters
- Strategies for water treatment and reuse or direct use
- Development of detailed water circuit diagram and water balance of the facility
- Mapping of water quality requirement to develop' recycle' and' reuse' opportunities
- Developing Water consumption and waste water generation pattern
- Estimating Specific water use and conservation potential
- Develop & Maintain monthly MIS on water extracted from bore wells, water level, water quality etc.
- Calculation of Rainwater Harvesting Potential for the site and assessment of the existing structures
- Evolving Water saving opportunities with method of implementing the proposal with
- Description and figures related to water management schemes
- Investment required for water saving schemes/Cost Benefit Analysis
- Submission of water audit report & its presentation at site (if required)
- Following opportunities would also be assessed for Industries for water conservation:
    - Setting up of norms for water budgeting
    - Modernization of industrial process to reduce water consumption
    - Recycling water with a re-circulating cooling system
    - Ozonation cooling water approach which can result in five fold reduction in blow down when compared to traditional chemical treatment
    - Reductioninreuseofde-ionizedwaterbyeliminatingsomeplenumflushes,convertingfromacontinuousflowtoanintermittent flow system and improving control on the use
    - Use of waste water for gardening
    - Proper processing of effluents to adhere to the norms of disposal

CHAPTER-3 METHODOLOGYOFTHEWATERAUDITSTUDY

3.1 Methodology followed for conducting water &wastewater audit

Step 1: Reconnaissance or Walk-through survey

- Understanding of existing water sourcing, storage and distribution facility.
- Assessing the water demand and water consumption areas/processes.
- Preparation of detailed water circuit diagram.

Step 2: Secondary Data Collection through the Discussion with plant executives, past records, Available technical literature/specifications

- Analyze historic water use and wastewater generation.
- Field measurements for estimating current water use
- Metered& unmetered supplies.
- Understanding of "base" flow and usage trend at site
- Past Water Bills
- Waste water Treatment scheme & costs etc.

Step 3: Site Water Audit Planning (based on site operations and practices)

- Preparation of water flow measurement plan to quantify water use at various locations
- Waste water flow measurement and sampling plan
- Instruments availability like Ultrasonic Water Flow Meter, Doppler type Flow meter, Stop Watch, measuring cylinders ,Power Analyzer etc.

Step 4: Conduction of Detailed Water Audit & Measurements

- Conduction of field measurements to Quantify water/wastewater streams
- Power Measurement of Pumps/Motors
- Measurement of suction & discharge pressure at various pumps
- Waste water sampling & analysis
- Preparation of Water Balance Diagram
- Establishing Water Consumption Pattern
- Evolving value added" cost of water" at various locations
- Detection of potential leaks &water losses in the system
- Assessment of productive and unproductive usage of water

- Determine key opportunities for water consumption reduction, reuse& recycle with paybacks

Step 5: Preparation of Water Audit Report with Sustainable Water Management Plan

- Documentation of collected & analyzed Water Balancing and Measurement details
- Projectsandprocedurestomaximizewatersavingsandminimize/eliminatewaterlosses
- Water Metering and Accounting System
- Opportunities for Water Conservation based on Reduce/ Recycle/ Reuse/ Regeneration/ Recharge options with Cost Benefit Analysis

Step 6: Water Audit Report Finalization and Submission

- Incorporation of required changes based on discussions with plant executives
- Preparation & submission of final report.

3.2 Methodology Adopted for Performance Evaluation of Pumping System

➢ **Water Flow Measurement**

The water flow measurement was conducted using transit time ultrasonic flow meter at the discharge side of the pumps or any suitable location. The step wise methodology is given below,

a. A suitable location for measurement off low rate was identified on discharge pipeline of the pump and initial pipe preparation was done by cleaning and filing of pipe at measurement location

b. The circumference of pipe for calculating the external diameter was measured by in chapter and the pipe thickness was measured by digital thickness gauge or by measurement of spare pipe.

c. The parameter like pipe diameter, type of pipe, water temperature, pipe thickness, roughness etc. Are input in the ultrasonic flow meter

d. Based on above input values, the flow meter reflects the distance between the traducer s to be position of the pipe while measuring the flow

e. Thetraducersareplacedonthesurfaceofthepipe(filedsurface)atthesamedistancegivenbyflowm eter

f. The ultrasonic flow meter displays instantaneous values of water flow rate in m^3/hr. The average of these values may be considered as flow rate of water.

- **Electrical Power Measurement**

The instantaneous electrical power consumption of pumps was measured from the corresponding electrical panel by portable Fluke Make Power analyzer by measurement of electrical parameters like voltage, current, power factor, power etc.

- **Head Measurement**

The discharge head of the pump was determined by noting installed pressure gauges at the pump discharge while the suction head was estimated by physical measurement of horizontal and vertical length of suction pipe line. The total operating head was calculated by addition of suction and discharge head.

- **Efficiency Calculation**

The operating efficiency of the pumps was based on measured flow, head & power drawn by pumps is calculated with the help of following formula:

$$\text{Efficiency},\% = \frac{Q(m^3/hr) \times H(m) \times 9.81 \times \rho\ (kg/m^3)}{1000 \times 3600 \times \text{Motor Input Power(kW)}}$$

Where,

Efficiency %	Efficiency of pump set i.e.(Combined efficiency of pump &motor)
Q	Measured Water Flow rateinm^3/hr
P	densityofwateri.e.,1000kg/m^3
H	Total Head developed (m of water column),Discharge+ Suction
kW	Actual power measured at motor input.

CHAPTER-4 :ASSESSMENTOFPRESENTWATERUSAGE

4.1 Water sourcing and major water use areas.

Details of Source of Water: The main source of freshwater for the plant is 4 no. of borewells. The depth of the Borewells is about 121 meters. The TDS of borewell water is about less than 238-265 ppm.

No. of Borewells and location: The 4 no. of borewells is in the common area of the plant. The rated yield of all borewell is150 m^3/hr for 3 no of borewell and 50 m3/hr for 01 borewell. Which concurred with the measurements done by FICCI team using ultrasonic flow meters and borewells was installed digital type flow meters.

Table 3:Detailsofbore well as per ground water UP GWD NOC

Borewells	Location of Bore-wells	Depth of Bore-wellmeter	Type of Pump (mono-block/ Submersible etc.)	Pump Rated Capacity (HP)	Rated yield (m^3/hr)	TDS (mg/l)
1.	Near Process Cooling Tower	121	Submersible	50	150	265
2.	Near Sugar Sales Office	121	Submersible	50	150	245
3.	Near Bagasse Yard	121	Submersible	50	150	238
4.	Near Admin Office	121	Submersible	10	50	242

Picture 1:Bore wells located inside the plant premises with individual digital telemetry flow meters.



Picture 2: individual digital telemetry flow meters



There are installed 2 no of telemetry-based piezometers, which used to measure pressure via the rise of fluid column and estimate the groundwater level. It is installed at130 m depth and > 300 m distance.

Table 4:Detailsofpiezometerwells(observation well)

Piezometer	**Location of piezometer**	**Depth of piezometer** meter	**Distance from the existing bore well (meter)**
1	Near Bachelors Guest House	130	>300 meter
2	Near Store	130	>300 meter

Picture 3: Details of Piezo meters located inside the plant premises



Piezometer No. 1 **Piezometer no. 2**

Table 5:Total Water sources in Season FY 2021-22

S.N.	Source of Water	m^3/day	Water Quality	*Major Usage Area*	*Water Use (%)*
1	Borewells	585	Fresh water	DM water & cooling Tower makeup, Utilities, Backwashing, Potable water, Domestic activities, Process Line	8.5%
2	Cane Sugar Water	5360	Cane Sugar water	Process water use	77.5%
3	ETP Treated water	919	Recycle Treated Water	Gardening, Dust Suppression ,Ash quenching	13.3%
4	STP Treated Water	49	Recycle Treated Water	Gardening & green Development	0.7%
Total		**6913**			100%

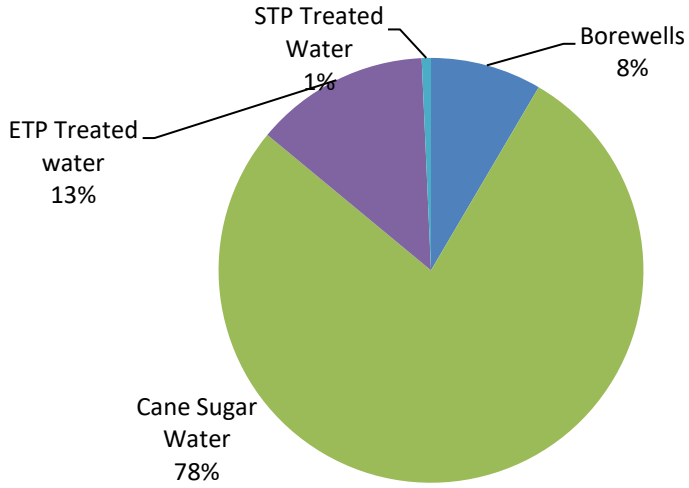


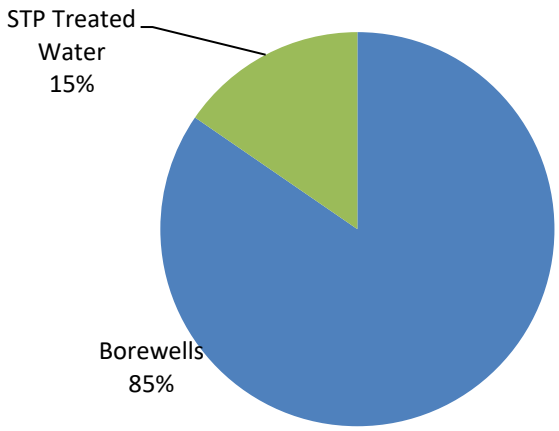
Figure 4:SourcesofWater(Freshwater,recycledwater) FY 2021-22

During Season FY 2021-22 (November to March), Out of the **6913**m^3/day, about 8.5% water is freshwater, 91.5 % is recycled water and reuse water.

Table 6::Total Water sources during OFF season FY 2021-22

S.N.	Source of Water	m^3/day	Water Quality	*Major Usage Area*	*Water Use (%)*
1	Borewells	69	Fresh water	Domestic activities in colony & Plant	85%
2	STP Treated Water	37	Recycle Treated Water	Gardening & green Development	15%
		106			100%

Figure 5:SourcesofWater during OFF season FY 2021-22 (Freshwater, recycled water)

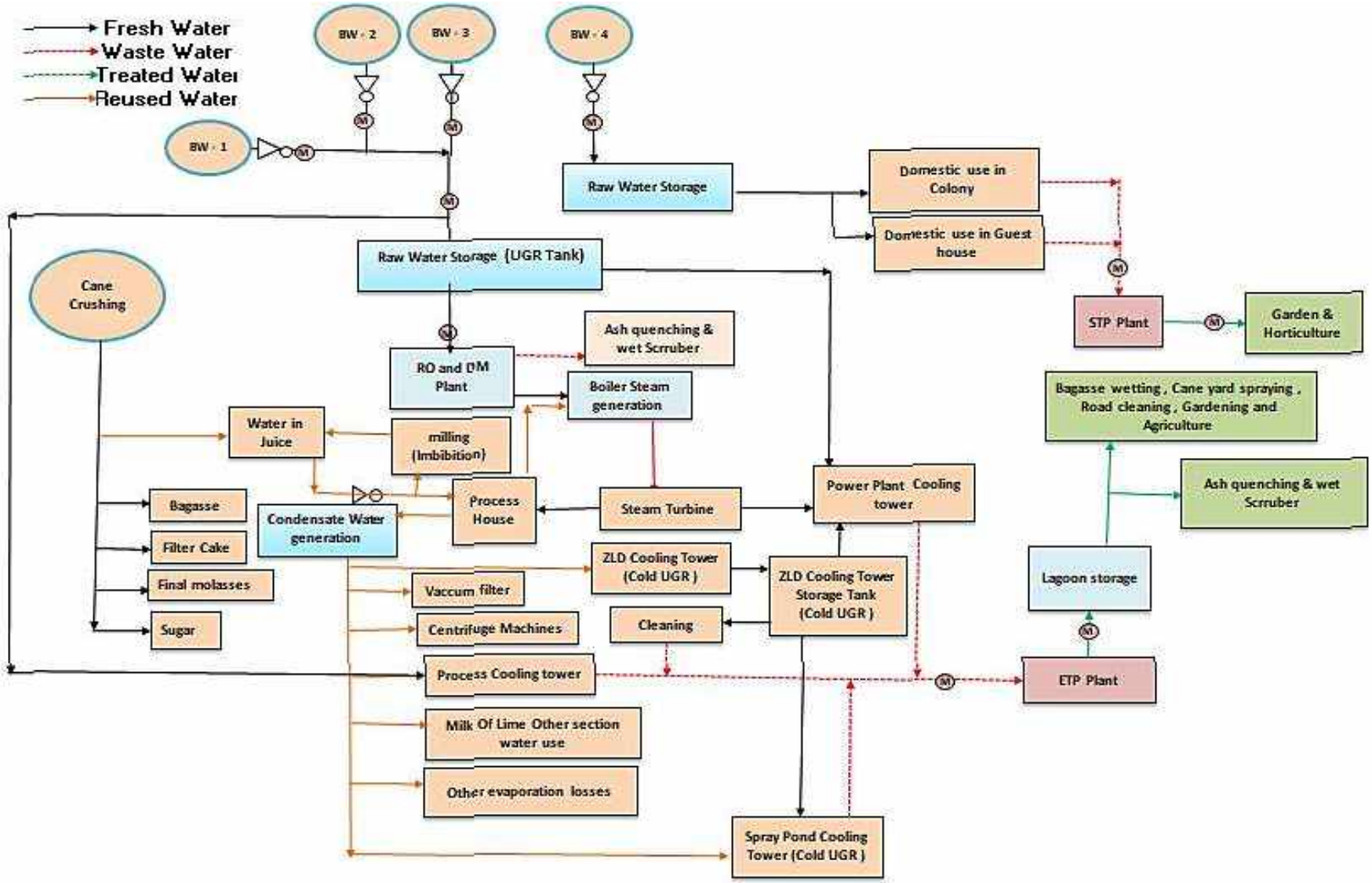


During Off Season FY 2021-22 (April 2021 to October 2022) Out of the 239m^3/day, about 85 % water is freshwater; 15 % is recycled water and reuse water.

4.2 Bore well Water Quality

The plant regularly checks the water quality of the Groundwater every six months with an external lab. The sample bore well water quality test report is provided in Annexure.

Figure 6:Existingwatercircuit diagramoftheplant



4.3 Water Distribution and water balance

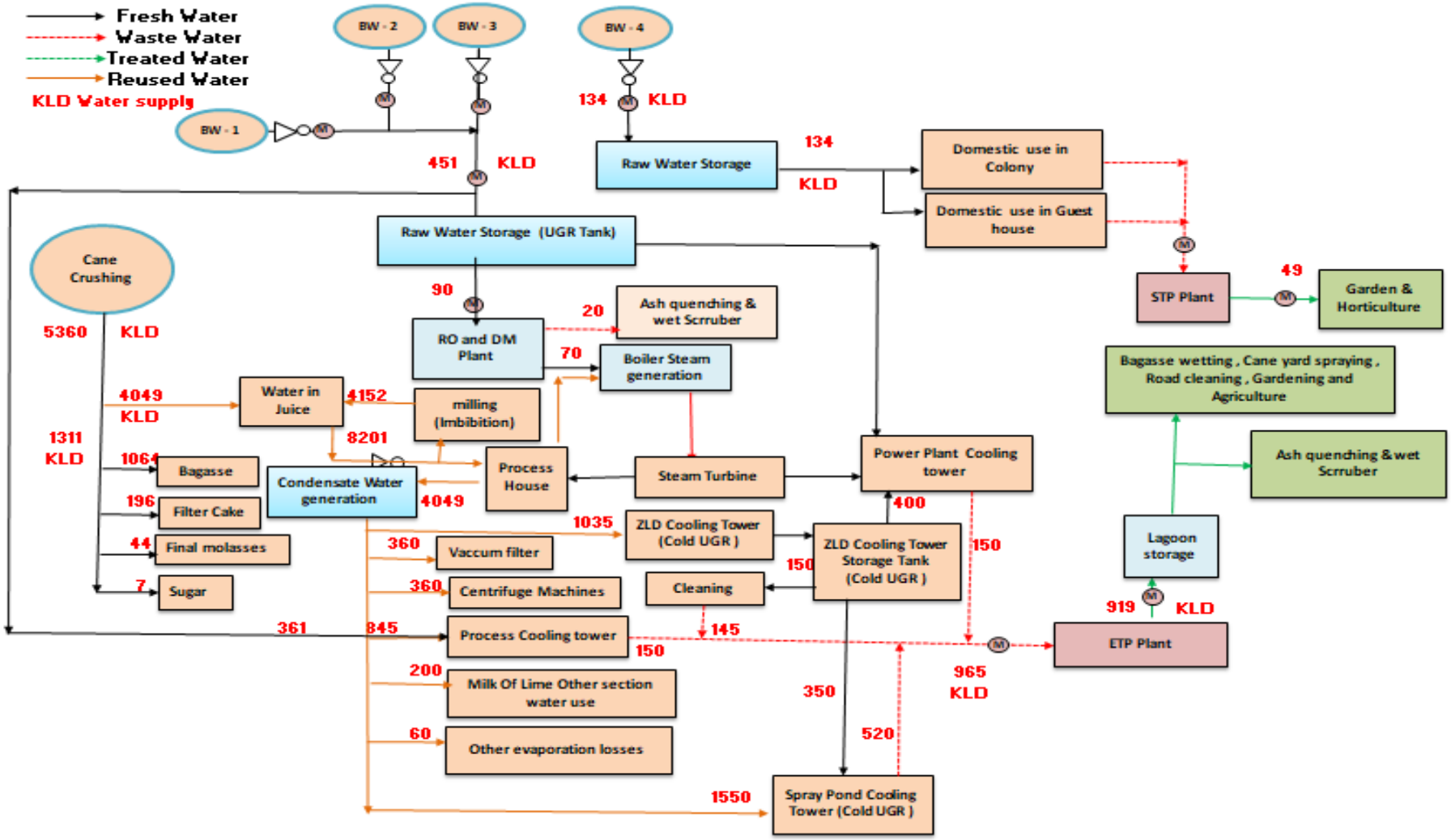
During the opening meeting, On-site training and discussion with facility manager was conducted to explain to the plant officials about effective management of groundwater, purpose of water audit and basic guidelines of the UPGWD notification.

As per the measurements conducted by FICCI team, water distribution and water balance were prepared for the plant, The plant abstracts about 585 m^3/day of groundwater in season and 202 m^3/day in OFF season from 4 no. of bore wells. Instantaneous water flow was measured using ultrasonic flow meters. The measured flow of bore well 1, 2, 3 and4 is 145m^3/hr. and 140m^3/hr. and 96m^3/hr and 34m3/hr. Respectively The bore well no. 1, 2, 3 and 4 has 50, 50, 50 and 10 HP respectively motor that runs for about 1 to4hours daily respectively. Abstracted bore well water is pumped to raw water tank.

Table 7:List of Water Storage Tanks

Type of Storage System (Over Head Tank, Underground Tanks, Reservoir)	Location	Storage Capacity (m^3)	Level from ground (meter)
Overhead Tank	Near Boiling House	300	8 meter
U.G.R Tank	Near Boiling House	3000	

Figure 7:Existing water circuit diagram with water consumption (KLD)at Bajaj sugar Ltd.Unit–Kundarkhi



4.4 Water Metering System

There are 4 meters installed in the plant to monitor the water abstraction and consumption in different sections of the plant. The meters are at bore well pump discharge. The meter readings are recorded regularly, and all the meters are calibrated. List of the meters installed are mentioned in the Table below.

Table 8:Location of Identified Water Meters

Meter Number	Meter location	Type of meter	Regularly recorded (Yes/No)	Calibrated (Yes/No)
1709932	Near Process Cooling Tower	Electro magnetic digital telemetry flow meter	Yes	Yes
1709933	Near Sugar Sales Office	Electro magnetic digital telemetry flow meter	Yes	Yes
1709934	Near Baggase Yard	Electro magnetic digital telemetry flow meter	Yes	Yes
1806200	Near Admin Office	Electro magnetic digital telemetry flow meter	Yes	Yes

4.5 Water Use Base line Data as provided by the Plant

The Month-wise meter readings were provided by the plant for the quantity of water drawn from the bore wells.

Table 9:Monthly water abstraction from borewells

FY-2021-2022	Borewell Water withdrawn	Domestic water use Colony	Industrial water use
21-Apr	***7589***	***4100***	***3489***
21-May	***4915***	***1300***	***3615***
21-Jun	***4325***	***575***	***3750***
21-Jul	***4771***	***1292***	***3479***
21-Aug	***4816***	***1005***	***3811***
21-Sep	***6191***	***2580***	***3611***
21-Oct	***9858***	***4002***	***5856***
21-Nov	***18632***	***4518***	***14114***
21-Dec	***12712***	***3747***	***8965***
22-Jan	***14115***	***3620***	***10495***
22-Feb	***22593***	***3549***	***19044***
22-Mar	***19730***	***4708***	***15022***
Total water in KL	*130247*	*34996*	*95251*
Season (Nov to March)	***585***	***134***	***451***
OFF season (April to October)	**202**	**71**	**131**

4.6 Water Costing

Water and wastewater cost at plant includes water cost of pumping, cost of raw water UV treatment, cost of pre-treatment, Purified Treatment and Cost of ETP. **The actual cost of abstraction borewell water is estimated to be Rs 1.87/m^3(Pumping cost is Rs1.07 m3 and Ground water abstraction charges is Rs 0.8 /m^3 as per UPGWD), the cost ETP is estimated to be about Rs 8 /m^3 and Cost of Water of STP treated water Rs 0.25/m^3**and **the cost softening is estimated to be about Rs 9.75/m^3**

4.6.1 Cost of abstraction of Bore well Water as per UPGWA

Theplantneedstopayapplicablegroundwaterabstractionchargesasper UPGWAnotification.Theapplicable rates of Ground Water abstraction charges for the plant are **0.80** perm^{3}as per the table given below:

Table 10:Rates of Ground Water abstraction charges for other industries projects (Rs per m3)

Sr. No.	Category of area ↓ Ground water use→	Quantum of ground water withdrawal			
		<200 m^3/day	200to<1000 m^3/day		5000 m^3/day and above
1.	Safe	-	-	0.80	-
2.	Semi-critical	-	-	-	-
3.	Critical	-	-	-	-
4	Overexploited	-	-	-	-

4.6.2 Pumping cost-energy

Flow measurements were made during the field study. The Transit time ultrasonic flow meter was used for water flow measurement, below summarizes the water flow measurements at Pump discharge line. Apart from pump discharges, power measurements including voltage, current and power factor etc. were taken. Using the measured data for the pumps, the actual pumping costs are calculated for various pumps**.** Total cost of pumping **is Rs.685/day andRs79278 /year**.

Table 11:Cost of pumping analysis

Estimation of Efficiencies of Pumps											
Pump Name	**Measured**	**Diff.**	**Motor**	**Pump**							
	Flow	**Head**	**input**	**Efficiency**	**Operation**		**Estimated flow**	**Electrical Unit Cost**	**Pumping cost**		
	m^3/hr	**m**	**kW**	**%**	**hr/day**	**days/year**	**m3/day**	**Rs./kWh**	**Rs/m3**	**Rs./day**	**Rs./year**
Bore Well No -1 Industrial	145.0	51.0	47.88	50.3%	3	84	435	3.24	1.07	465.4	39095
Bore Well No -2 industrial	140.0	45.9	48.73	39.9%	1	84	112	3.24	1.13	126.3	10610
Bore well No-3 industrial	96.0	35.7	37.6	31.1%	0.1	1	10	3.24	1.27	12.2	12
Bore well No-4 Domestic use Colony	34	30.6	6.2	50.4%	4	365	136	3.24	0.60	81.0	29561
Total									1.02	684.9	79278.0

4.6.3 Cost of ETP Treated Water

About **1082 m^3/day** water is treated daily by Effluent treatment plant ,The average cost of treatment from softening plant is **Rs. 8 /m^3** as shown in table below:

Table 12: Cost of ETP treated Water(chemical and Electrical)

Effluent Treatment Plant		
Installed Capacity (m^3/hr)		62.5
Average Quantity of treated wastewater (m^3/day)		1082
Chemical Details		
Name of Chemical/s	**Quantity kg/month or liters/month**	**Price (Rs/Kg or Rs/liters)**
Lime	6000	6
Alum	3000	12
Power Consumption (Units/day)		1800
Is treated effluent reused or discharged?		Ferti-irrigation
If reused, provide area of its application &reused quantity (m3/day)		1082
Total Cost of treatment (Rs/m^3)		8

4.6.4 Cost of Treated water at Sewage Treatment Plant (STP)

About**49m^3/day** water is treated daily at STP plant ,the average cost of treatment from **STP is Rs. 0.25 /m^3** as shown in table below:

Table 13: Cost of STP Treated Water

Sewage Treatment Plant		
Installed Capacity (m^3/hr)	4.16	
Average Quantity of treated sewage (m^3/day)	49	
Chemical Details		
Name of Chemical/s	**Quantity kg/month or litres/month**	**Price (Rs/Kg or Rs/litres)**
Lime	60	6
Power Consumption (Units/day)		
Is treated sewage reused or discharged?	Re-used in Ferti-irrigation	
Total Cost of treatment (Rs/m^3)	0.25	

4.6.5 Cost of Soft Water Plant (Softener)

About **15 m^3/day** water is treated daily by softening plant ,the average cost of treatment from **softener is Rs. 9.75/m^3** as shown in table below:

Table 14: Cost of Softening Treated Water

Softening Plant		
Installed Capacity (m^3/hr)	50	
Average Quantity of treated water (m^3/day)	15	
Chemical Details		
Name of Chemical/s	**Quantity kg/month**	**Price Rs/Kg**
NaCl	500	4
Power Consumption (Units/day)	24	
Total Cost of treatment (Rs/m^3)	9.75	

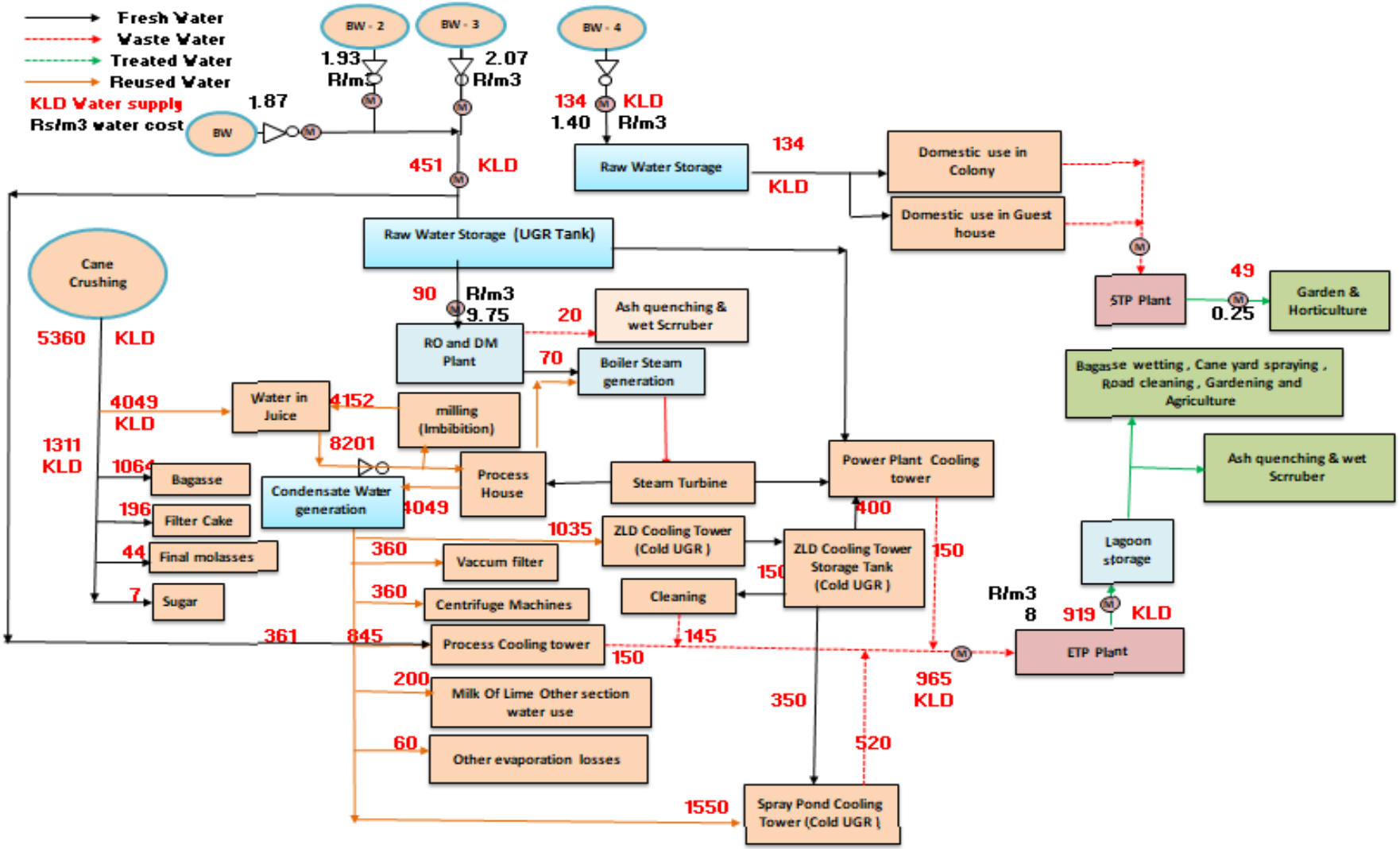
4.6.6 Annual Water & Wastewater Management Cost of the Plant

Thetotalannualwaterandwastewatercostiscalculatedbythesumof TotalWaterabstracted,TotalPumpingcost and Total Water Treatment costs as mentioned in the previous part. The total annual water cost for theplantis**Rs14.11 Lakh/year** as shown below in Table 15.

Table 15:Total Annual Water Cost of at Bajaj Hindusthan Sugar Ltd., Sugar unit –Kundarkhiplant

S. No.		Cost	Total cost	Total Annual Cost
		Rs/m^3	(Rs/day)	(Rs/year)
1	Pumping Cost			**90363**
	Borewell Pumps	1.07	715	90363
2	STP Treated water cost	0.25	23	8213
3	Soft water Softener treatment Cost	9.75	146	53381
4	ETP Treated water	8.0	8400	1260000
	Total Water Cost			**1411957**

Figure 8:Existing water cost at user location accounting water pumping and treatment cost at plant



CHAPTER-5 : WATER & WASTEWATER TREATMENT & RECYCLING PRACTICES

The plant has installed the following water and wastewater treatment systems for treating the incoming freshwater:

- Effluent Treatment Plant (ETP)
- Sewage Treatment Plant (STP)

5.1 Effluent Treatment Plant (ETP)

There is installed **1500 m^3/day** capacity effluent treatment plant, which was treated about **919 m^3/day in season FY 2021-22,and**supplied to lagoon storage system, which used in irrigation application.

The ETP consists of bar screen, Oil and grease trap coagulation and flocculation tank, equalization tank, ,Primary clarifier tank , aeration tank , secondary clarifier tank followed tertiary treatment with MGF and ACF . The bar screens are present before the Oil and grease trap tank ,to separate the settle able solid from the waste water , Lime is dosed to coagulation tank.

Provision of diffused air is made in equalization tank for uniform mixing and transferred effluent to primary clarifier tank and also Provision of diffused air made in aeration tank facilitate development of MLSS for digestion of organic impurities of the effluent . The settling of suspended solids in form of sludge, which is collected from primary and secondary clarifier for further thickening and extraction to mechanical centrifuge to system .The clear water from secondary clarified is collected and pass through Multigrade Sand Filter and ACF obtained final treated water, which is used gardening and irrigation system .

Picture 4 : Details of Effluent Treatment Plant





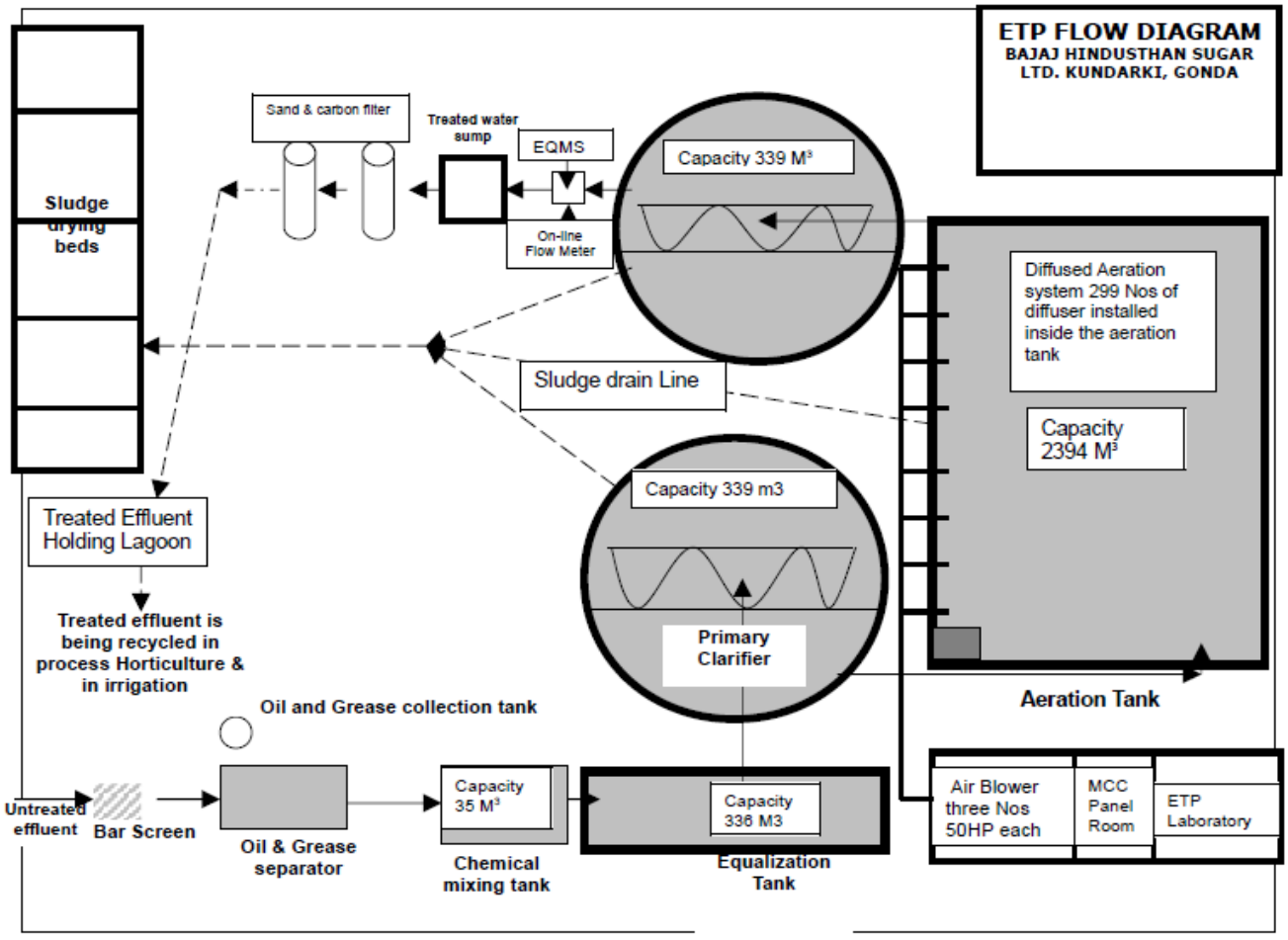


Figure 9:Detail Scheme of ETP Plant

5.2.1 Classification of Effluent Water Treatment

Effluent treatment options may be classified into groups of processes according to the function they perform and their complexity:

Primary Treatment – includes simple processes that deal with debris and solid material. The purpose of preliminary treatment is to remove the big size particles. This is usually performed by screening (usually by bar screens) and grit removal. Their removal is important in order to increase the effectiveness of the later treatment processes and prevent damages to the pipes, pumps and fittings.

Physio-chemical Treatment– In Physio-chemical Treatment, first increase the pH up to 9 by lime dosing then add Ferric Chloride & poly electrolyte into Reaction Tank, Coagulation Tank & Flocculation has been generated by slow mixing into Flocculator. Outlet of Flocculator feed to Primary Tube Settling Tank to remove suspended solids.

Tertiary treatment– is the polishing process whereby treated effluent is further purified to acceptable levels for discharge. It is usually for the removal of specific pollutants e.g., remaining suspended solid, colour and order for the Effluent. Tertiary treatment processes are generally specialized processes.

5.2.2 Unit Description

Buffer Tank

The function of the buffer tank is to collect the different streams of industrial effluent/wastewater generated from different processes. As the retention time is very less in this tank aeration is provided from the blowers to mix the effluent so that there will be no settling of solid particles/sludge in the bottom of the tank. This tank acts as storage for wastewater.

Thickener

Thickening of sludge increases its solids content and reduces the volume of free water thereby minimizing the unit load on downstream processes such as digestion and dewatering. The most commonly used thickening processes include gravity thickening, dissolved air flotation, and rotary drum thickening. The effluent in the form of injection water is treated in this tank to increase its solid content to achieve maximum settling in the primary clarifier unit.

Oil And Grease Trap

The oil and grease trap are placed before EQT to arrest solid and fatty matter at source or it is placed after screen chamber so as prevent the fatty matter to enter Equalization chamber. The wastewater output from this unit is taken to the equalization tank. The solids and fats that are separated in this unit are disposed-off along with other biodegradable waste, and can be used as feed for piggeries.

Collection Cum Equalization Tank

The effluent from the oil & grease trap comes to the equalization tank. The equalization tank is the second collection tank in an ETP. Its main function is to act as buffer: To collect the incoming raw Effluent that comes at widely. Equalization tank is used only for buffering the daily fluctuations in the Effluent flow quantity. The equalization tank must be of sufficient capacity to hold the peak time inflow volumes. Equalization tank with a capacity to hold 4-6 hours of average hourly flow should be adequate.

Effluent Lift Pumps

EFFLUENT transfer pump is use to lift Effluent from equalization tank to flash mixer chamber. It is a typical pair of pumps (working and standby). The pumping rate can be set at a calibrated uniform flow, so that downstream units are not affected by fluctuating flows. These pumps are submersible pump submersed into the equalization tank.

Flash Mixing Tank

It is a chemical water treatment technique typically applied prior to sedimentation and filtration (e.g. rapid sand filtration) to enhance the ability of a treatment process to remove particles. Chemical dosing of Lime, Ferric Chloride& Poly in Reaction, Coagulation and flocculation tank are generally for the chemical treatment. Lime is used to increase the pH in the ETP for the further process and post coagulation and for clarity of water. Ferric Chloride is used as coagulant for much industrial and sanitary waste water treatment application. Due to its high efficiency, effectiveness in clarification, and utility as a sludge dewatering agent. The chemical leaves no residual colour, offers very good turbidity removal. Poly-aluminium chloride is used as a flocculent by which fine particulates are caused to clump together into a floc& increase the sludge water separation. The floc may then float to the top of the liquid (creaming), settle to the bottom of the liquid (sedimentation), or be readily filtered from the liquid.

Coagulation is a process used to neutralize charges and form a gelatinous mass to trap (or bridge) particles thus forming a mass large enough to settle or be trapped in the filter. Flocculation is gentle stirring or agitation to encourage the particles thus formed to agglomerate into masses large enough to settle or be filtered from solution.

Primary Clarifier

Primary clarifier is Incorporated before the biological process to settle down the agglomerate form after coagulation and flocculation process purpose and function of the clarifier is threefold: Allow settling of biomass solids in the Mixed Liquor coming out of the flocculation, to the bottom of the clarifier to thicken the settled biomass, in order to produce a thick underflow to produce clear supernatant water, in the overflow from the clarifier feed to Aeration Tank. All the above actions occur due to gravity. The thick biomass is re-circulated back to the aeration tank.

Aeration Tank

Aeration brings water and air in close contact in order to remove dissolved gases (such as carbon dioxide) and oxidizes dissolved metals such as iron, hydrogen supplied, and volatile organic chemicals (VOCs). Aeration is often the first major process at the treatment plant. During aeration, constituents are removed or modified before they can interfere with the treatment processes.

Aeration brings water and air in close contact by exposing drops or thin sheets of water to the air or by introducing small bubbles of air (the smaller the bubble, the better) and letting them rise through the water. The scrubbing process caused by the turbulence of aeration physically removes dissolved gases from solution and allows them to escape into the surrounding air. Aeration also helps remove dissolved metals through oxidation, the chemical combination of oxygen from the air with certain undesirable metals in the water. Once oxidized, these chemicals fall out of solution and become particles in the water and can be removed by filtration or flotation.

Secondary Clarifier

Secondary clarifier is Incorporated after the biological process to settle down the solids form after aeration. Polyelectrolyte is used sometimes to achieve maximum solid settling after aeration process. To produce clear supernatant water, in the overflow from the clarifier feed to clear water tank. All the above actions occur due to gravity. The thick biomass is re-circulated back to the aeration tank & if there is excess sludge then it is sent to belt press for sludge dewatering.

Belt Press & Sludge Holding Tanks

Biological treatment of wastewater perforce produces excess biological solids due to the growth and multiplication of bacteria and other microorganisms in the system. The excess biomass thus produced needs to be bled out of the system, and disposed-off efficiently. This is a five-step process: sludge removal, storage, conditioning, dewatering and disposal. Sludge is removed ("bled") from the system from the sludge recirculation pipeline (through a branch). The sludge is in the form of thick slurry. It is taken into a sludge-holding tank, and kept under aeration (to prevent the living organisms from putrefying) until dewatering operations can be carried out. Before dewatering, polymer or other chemicals may be added for conditioning the sludge, to facilitate the process. Sludge is then dewatered in a Centrifuge.

It consists of three to four parts: Sludge-holding tank with aeration. Centrifuge Feed Pump are used to feed sludge from the sludge holding tank to Centrifuge to dewatering the sludge and convert it into the dry sludge cake.

Function Filter feed pumps are used to take the water from the clarified water sump and pass it through the pressure sand filter and activated carbon filter installed in series.

Filter Feed Pumps- Function Filter feed pumps are used to take the water from the clarified water sump and pass it through the pressure sand filter and activated carbon filter installed in series.

Pressurised Sand Filter

Function of the pressurized sand filter is used as a tertiary treatment unit to trap the trace amounts of solids which escape the clarifier, and can typically handle up to 50 mg/l of solids in an economical manner. This unit is essentially filled with graded media (sand and gravel). The water filtered with sand filter is passed on to the next stage in the ETP chain: The Activated Carbon Filter.

Activated Carbon Filter

An activated carbon filter, like the Pressure Sand Filter, is a tertiary treatment unit. It receives the water that is already filtered by the Pressure Sand Filter and improves multiple quality parameters of the water: BOD, COD, clarity (turbidity), color and odor.

TREATED WATER STORAGE TANK

Treated water tank is a simple storage system for final treated water obtained from activated carbon filter & disinfection. The treated water can be used in irrigation as well as further storing in lagoons.

5.2 Sewage Treatment Plant

There is installed 5**0 m³/day** capacity Sewage treatment plant, which was treated about **49 m³/day in Season and 37 m3/day in off season** STP treated water which used in gardening application, Plant treats Domestic Sewage in well-designed existing sewage treatment plants.

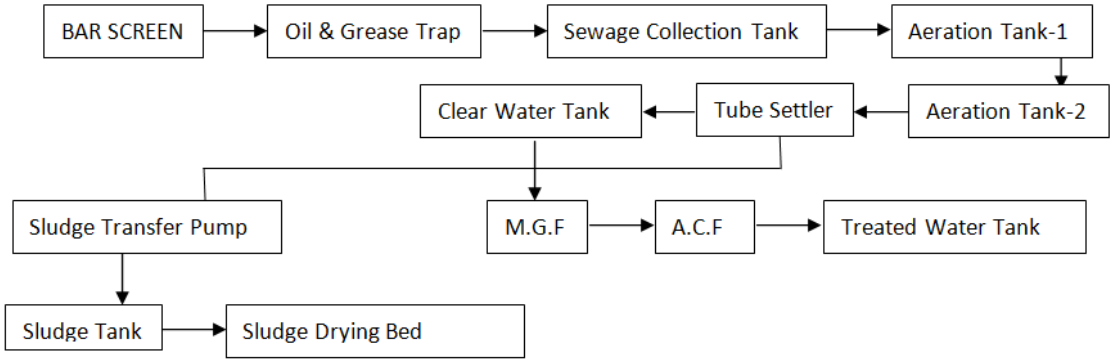


Figure 10: Detail Scheme of 50 KLD STP Plant



Picture 5: Detail of STP Plant layout

CHAPTER-6 DATA ANALYSIS & RESULTS

6.1 Water Consumptive Units and Wastewater Mapping

6.1.1 Water consumption Pattern

The water consumption pattern shows that out of total water (**6729m^3/day**) about 1% is used by utilities; about 32 % is used for Process use; about 2 % is used in Domestic like toilet, drinking & canteen (Fresh water); about 50 % is recycled water and fresh water it is used for Power plant cooling tower and rest 14 % is ETP recycled water used for cane yard spraying and 1% is Other process losses as given below. The major water utilization areas are mentioned below in table.

Table 16:Water Consumption for Different Applications in Season during FY 2021-22

SN	Key Water Usage Section	Type of water used	Water Consuming activities	Quantity Used (m^3/day)	Percentage
1	Domestic Water use Colony	Fresh Water	Toilets Flushing , Drinking , Canteen and domestic	134	**2%**
2	Boiler (DM Make up Water)	Fresh Water	Boiler Feed and Steam Generation	70	**1%**
3	ZLD Cooling Tower (Cold UGR Power Plant Cooling tower and spray water pond cooling Tower	Fresh raw water & Recycle Water	Make Up Cooling Tower	3430	**50%**
4	Process water use	Recycle Water	Process in Vacuum Filter , Pan Boiler , Centrifuge machines	2231	32%
5	Other Process Losses	Recycle Water	Evaporate and other losses	60	**1%**
6	Ash handling quenching & wet Scrubber and spray in Bagasse wetting and Gardening and Agriculture	Recycle Water	RO reject, DM Backwash & regeneration water , ETP and STP treated water	987	**14%**
	Total			**6913**	**100%**

The water consumption pattern in off season shows that out of total water (**239m^3/day**) about 56% is used by Domestic application likes (Domestic like toilet, drinking & canteen) and about 44 % is used for gardening.

Table 17:Water Consumption for Different Applications in OFF season during FY 2021-22

SN	Key Water Usage Section	Type of water used	Water Consuming activities	Quantity Used (m^3/day)	Percentage
1	Domestic Water Colony	Fresh Water	Toilets Flushing , Drinking , Canteen and domestic	134	56%
2	Gardening	STP Recycled & Fresh Water	Gardening area	105	44%
	Total			**239**	**100%**

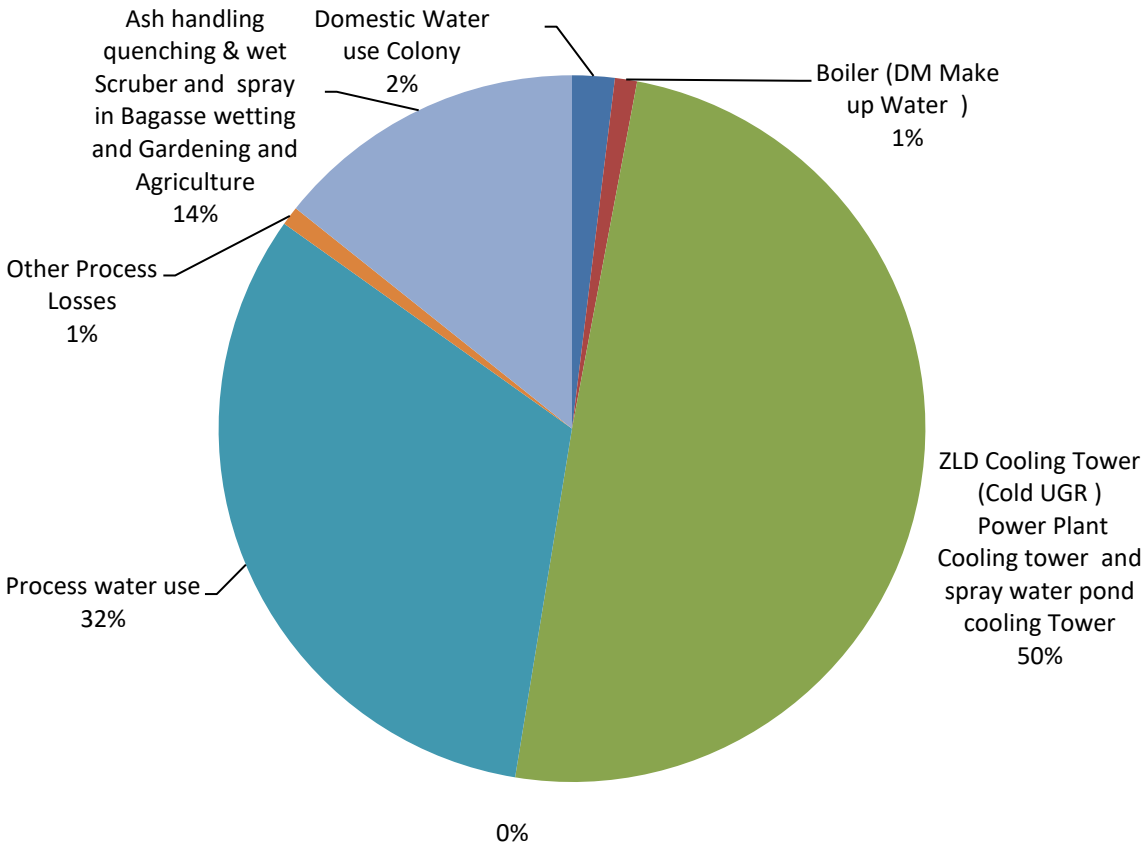


Figure 11:Percentage of water consumption in season during FY 2021-22

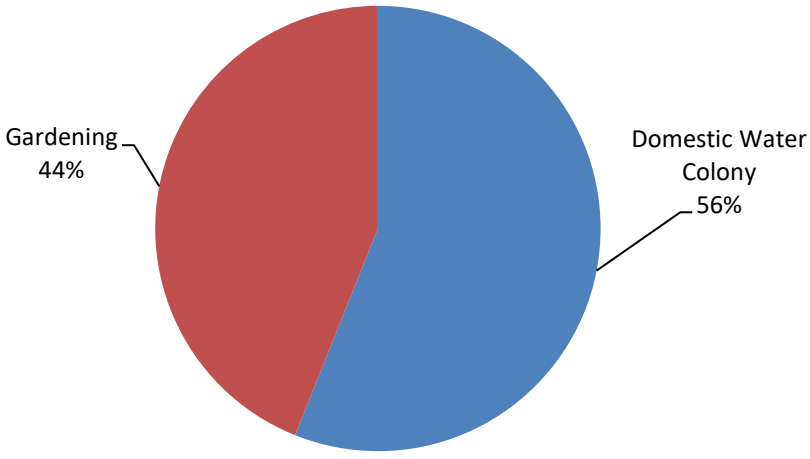


Figure 12: Percentage of water consumption area season during FY 2021-22

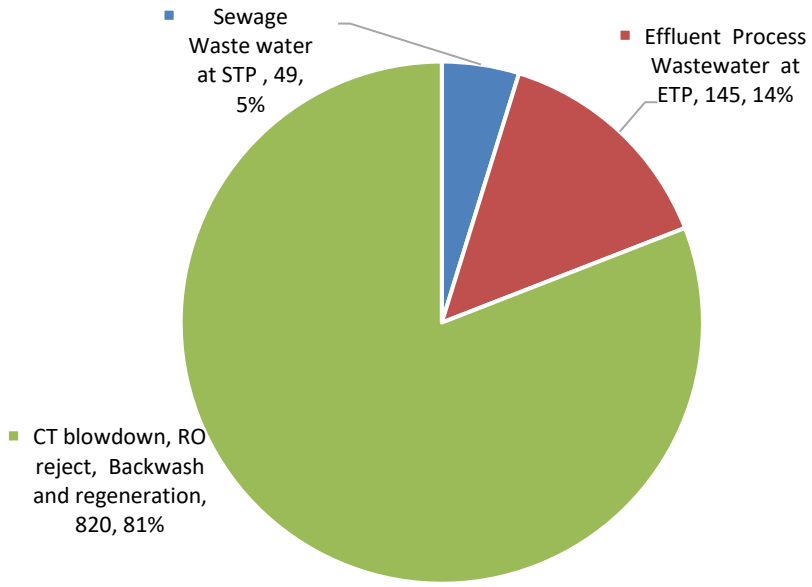
6.1.2 Wastewater generation & mapping

The total wastewater generation in the plant is about 1014 m^3/day, out of which about 5% is generated by domestic use; 14% is generated by process use; 81% is generated by CT blow down, reject from boiler industrial as given below.

Table 18:Major Wastewater generating areas FY 2021-22

S. No.	Major Sections	Wastewater discharged (m^3/day)	Percentage
1	Sewage Waste water at STP	49	5%
2	Effluent Process Wastewater at ETP	145	14%
3	CT blow down, RO reject, Backwash and regeneration	820	81%
		1014	100%

Figure 13:Percentage of waste water generation in season FY 2021-22



6.2 Specific Water Consumption in terms of Water Use Ratio (WUR) of the Plant

As per the data provided by Plant, the specific water consumption for FY 2021-2022 of the plant comes out to be **1.1m^3 of water/tons of Sugar production**of the product and **0.10 m^3/Ton of cane Crushing ,** Details of SWC were observed and discussed below.

Table 19:Specific Water Consumption in Industrial use FY 2021-22

Industrial Fresh Water utilization	**Sugar Production**	**Specific Water Consumption (SWC)**
m3/ Year	**Ton/Year**	**m3/Ton of Sugar production**
67640	**60118**	1.1
Industrial Fresh Water utilization	**Cane Crushing**	**Specific Water Consumption (SWC)**
m3/ Year	**Ton/Year**	**m3/Ton of cane Crushing**
67640	**649500**	**0.104**

Colony Domestic Specific Water Consumption (SWC) comes out to be **189litres per person per day in colony domestic and 51 liter per person per day.** Details of SWC were observed and discussed below.

Table 20:Specific Water Consumption Domestic use FY 2021-22

Average Domestic Water Uses in Colony FY 2021-22	**No. of person in colony**	**Specific Water Consumption (SWC)for Colony**
m3/day	**No.**	**litre per person per day**
134	710	189
Average Domestic Water Uses in plant FY 2021-22	**No. of employee /Staff**	**Specific Water Consumption**
m3/day	**No.**	**litre per person per day**
15	294	51

6.3 Comparison of SWC with International Benchmark

As per the data provided by Plant, the specific water consumption for FY 2021-2022 of the plant comes out to be **1.1 m^3 of water/tons** of Sugar product the product and For comparison the various 'International Benchmarks' and best achieved SWC were observed and discussed below.

Table 21:SWC Best Practice

	Bajaj Hindusthan Sugar mill Kundarkhi Unit, SWC	**BalrampurChini mill BCML Kumbhi Unit, SWC**	**International Best Practice SWC**
Present FY 2021-2022	1.1 m^3 of water/tons	1.03 m^3 of water/tons	

CHAPTER-7 WATER CONSERVATION OPPORTUNITIES AND UP-GWD/UPGWACOMPLIANCES

7.1 Water Savings in the Buildings for Domestic Use

Existing Scenario: The plant uses about **134 m^3/day** of fresh water as domestic water in Season, Which is used for domestic activities like drinking, hand-washing, toilet flushing in the colony and plant area.

During the audit, a detailed building survey including process area was conducted to measure the flow rates of the fixtures, inspection of flushes and analysing the water use practices of officials. The measured flow rates of the sampled fixtures/taps in various buildings are given in table below

Picture 6: Pictures taken during taps flow measurements at different areas of plant



Table 22: Water Flow rate Measurements in Taps

Sr No	Location	No of Taps	Measured taps water (ml)	Time taken (Second)	Water taps flow rate (LPM)
1	Admin Office	1	500	5.2	5.77
2	Dispensary	1	500	8.7	3.45
3	Canteen	1	500	8.2	3.66
4	Store toilet	1	500	4.15	7.23
5	Old admin Office	1	500	3.9	7.69

To optimize water, use in the buildings for domestic purpose, the following observations and suggestions are made based on the building survey during the water audit:

- **Optimize water flow in hand-washing and other taps:** Water flow rates in hand washing taps vary from 3.45 – 7.69 lpm; however, about 0.0 % sampled taps have flow rates > 5 lpm as shown in table below. Although plants have optimized the water flow in hand-washing taps in the common Hand-wash area of confectionary unit by installing foot operated taps where the flow in taps is > 5lpm. Similarly, it is suggested to install flow restrictors in the hand washing taps of the other plant area to reduce the excess flow in hand-wash taps to 5 lpm. Generally, the water efficient hand-washing taps use 3-5 lpm only.

Table 23: Water Flow rates in sampled Hand-washing Taps

Taps usage	No. of sampled Taps	Taps with flow >5 lpm	% Of taps having excess flowrate
Hand-washing Taps	**5**	**3**	**60%**

- **Flush tank capacities are about 6-10 liters/flush –** Use tank bank in existing flush tanks to reduce 2-3 liters water per flush or install water efficient cistern/flush tank with capacity 3/6 liters per flush.

Recommendations: It is suggested to maintain following water efficient fixtures in the buildings to save domestic water consumption.

Retrofit flow restrictors in hand-washing taps and other taps: Retrofit high flowrate hand-washing taps with 'aerators and flow restrictors' so as to have 3-5lpm flow rate in hand washing taps and 7 lpm flow rate in pantry and other taps in the buildings.



Picture 7: Water efficient taps

- **Stop use of filtered water in toilet flushing, instead use recycled, treated wastewater or raw water.** It is suggested to use low quality water for flushing instead of good quality filtered water.
- **Install 'Tank Bank (For Flush Tanks)' or install with Water efficient flushes with dual flush Cistern 3-6 litres capacity flush tanks** – In toilets filtered water is used for flushing and about 7-10 litres of water are flushed per flush. To reduce the flushing water per flush, it is suggested to install scientifically designed easy to install 'Tank-Bank' in the existing flush tanks. By just placing tank bank in the flush tank, we displace and save water equal to the space occupied by the tank bank for every flush. This will save about 20% of flush water in toilets. However, the existing 7-10 litres flush tanks can also be replaced by Water efficient flushes with dual flush Cistern 3-6 litres capacity flush tanks to save water. This will save about 40% of the flush water in toilets.

Picture 8: Tank Bank (For Flush Tanks) and Dual flush Cistern 3-6 liters



Table 24: Potential water savings per person per day by replacing Conventional Cistern with Slim dual flush Cistern / Using Flush Tank Bank

Estimated Flush usage per person per day	**Conventional Cistern**	**Slim Dual Flush Cistern**		**Using Flush Tank Bank**
Handle Type	Conventional	Small	Large	
Usage per day per person (Numbers)	5	4	1	5
Cistern Capacity (Litres)	7-10	3	6	6
Water Consumption (Litres)	35-50	12	6	30
Total Water Consumption (Litres/Person/day)	**42.5**	**18**		**30**
Water Saving (Litres/person/day)		**42.5-18 =24.5**		**42.5-30=12.5**
		Reduction in 57% of water use in flushing activity		**Reduction in 30% of water use in flushing activity**

Table 25: Suggested Water Efficient Fixtures and Estimated Investment

Particular	Unit	Value
Average amount of domestic water used in colony and plant	m3/day	134
	m3/Year	48910
Average cost of raw water including water charges as per UPGWD notification	Rs./m3	1.62
Actual domestic water Requirement for 570 person , 135 Litres per person per day as per UPGWD	m3/Year	77
Amount of water saving by installing water efficient fixture like water taps and toilet dual flushing	m3/day	57
	m3/Year	20823
	Rs./year	33734
Investment	Rs	90000
Simple Payback period	Months	32

7.2 To enhance sewage water collation and treated at STP plant

Existing Scenario: Presently domestic water use around 134 m^3/day for domestic use in colony and plant, and actual STP treated water around 49 m^3/day.

Recommendation: it is recommended to collect sewage water and treated at STP around 94 m3/day (70 % of domestic water use) and total amount of water saving potential around 45 m3/day and 16535 m3/year.

Particular	Unit	Value
Average amount of domestic water used in colony and plant	m3/day	134
	m3/Year	48910
Average cost of raw water including water charges as per UPGWD notification	Rs./m3	1.62
Actual Amount of Sewage water and treated upto 70% potential	m3/Year	94
Actual Amount of STP water treated around	m3/Year	49
Amount of water saving potential at STP	m3/day	45
	m3/Year	16535
	Rs./year	26786
Investment	Rs	50000
Simple Payback period	Months	22

7.3 Install Drip Irrigation in the garden/horticulture area for efficient water use in landscaping/gardening

Existing Scenario: The plant has total area of **396410**-meter square and green belt area is **164936**, The plant uses for irrigation/landscaping/horticulture. It is observed that the watering in green belt is mainly done with the help of hose pipe hydrants provided at strategic points.

Recommendation: It is suggested that the plant should install Drip Irrigation system in plant premises and also motivate and guide other formers,which is water efficient for gardening/horticulture and irrigation application. **The drip irrigation system will save 30-50% of water.** By installing drip irrigation system, the requirement of water for greenbelt (horticulture) could be met from available recycled / treated wastewater. The benefits of the drip irrigation system are given below:

Benefits of a Drip Irrigation System:

- **Saves Water:** Studies show that drip irrigation systems use 30 – 50% less water than conventional watering methods, such as sprinklers or using open ended hose pipes.
- **Improves Growth:** Smaller amounts of water applied over a longer amount of time provide ideal growing conditions. Drip irrigation extends watering times for plants, &prevents soil erosion and nutrient runoff. Also, because the flow is continuous, water penetrates deeply into the soil to get well down into the root zone.
- **Discourages Weeds:** Water is only delivered where it's needed.
- **Saves Time:** Setting and moving sprinklers is not required. A timer can be added to the system for automatic watering.
- **Helps control fungal diseases**, which grow quickly under moist conditions. Also, wet foliage can spread disease.
- **Adaptable:** A drip irrigation system can be modified easily to adjust to the changing needs of a garden or lawn.

7.4 Rainwater harvesting system

The Rainwater Harvesting is a technique to capture the rainwater when it precipitates, store that water for direct use or charge the groundwater and use it later. This happens naturally in open areas however, in congested, over-paved places, we need to create methods to capture the rainwater in more efficient way. There are two main techniques of rainwater harvesting:

a) Storage of rainwater on surface for direct use
b) Recharge to ground water

Harvesting rainwater reduces storm-water runoff volume and velocity and can provide an alternative water source to help conserve potable water supplies. There are typically three components in a rainwater harvesting system: 1) collection; 2) transport; and 3) infiltration or storage and use. If rainwater is not harvested and channelized; its runoffs quickly and flow out through storm-water drains. For storm-water management the recharge pits, percolation pits and porous trenches are constructed to allow stormwater to infiltrate inside the soil. RWH will also reduce the rainwater wastage as storm-water runoff.

Existing Scenario:

As M/s. Bajaj Hindusthan Sugar Unit Kundarkhiis located in safe zone specified by UPGWD, the unit has to use at least 357 mm rain water per year, Plant have rain water storage tank and also adapted rain water harvesting pond near village.

Table 26: Existing Rain water Storage Pond calculation and analysis

Pond Type	Area (Hectare)	Area (m2)	Depth in meter	Depth in meter after De silting	Total Storage Capacity (m^3)	Assumption total Actual storage capacity at 60%	No of Storage tank Filling	Quantity of Water to be Recharge m^3/year
Pond I Type	2.6	26000	2.5	3	78000	46800	**3**	**140400**

The Total Amount of recharge through adopted pond will be 140400 m^3 in a year and withdrawal will be 300000 m^3per Year ,Existing industry is situated in Safe block Jhanjhari of district Gonda as per ground water dynamic 2020, hence we will have to recharge 50 % of total withdrawal annually .

As per CGWA guidelines total amount of rain water to recharge for the withdrawal of 300000 m^3per Year is 150000 m^3per Year. Against requirement of 300000 m^3per Year, the company will recharge 154171 m^3per Year through (within premises+Pond), Details are given Below :

Table 27: Rain Water Harvesting recharge summary

Sr. No.	Details of Parameter	Value
1	Total fresh water requirement for Sugar project	2000 KLD
		300000 m^3 /year
2	Source of water for plant activates	Ground Water
3	RHW potential /Artificial recharge required	Maximum up to 50 % recharge Criteria (Safe Zone)
		150000 m^3 /year
4	Total artificial rain water recharge outside the plant	140400 m^3 /year
5	Total artificial rain water recharge inside the plant	13771m^3 /year
6	Total Amount of Recharge	154171 m^3 /year



Picture 9: RWH Lagoon areas of plant

Recommendations:

To maximize the rainwater and constructed a rain water storage tank and effective functioning of the installed RWH scheme, the following are suggested:

- Ensure proper cleaning of rainwater catchment area (roof tops, roads, storm water channels etc.) before the onset of the monsoon to minimize dirt & dust entry into the recharge structure along with the rainwater.
- Periodic cleaning RWH storage tank (once in 1-2 years, before onset of the monsoon)

The Rainwater Harvesting Potential of the plant is substantial; however, the actual harvesting/recharging of rainwater depends on the rainwater runoff and collection from catchment area to the storage structure.

Benefits:

- Improved infiltration of rainwater into ground through recharge bore
- Improved groundwater availability and quality
- Ensuring sustainability of the Groundwater in the area

7.5 Trainingandawarenessoftheemployeesatalllevelsandplacing'watersaving'Posters/slogansatvariouslocations:

The plant has a workforce of about 301 employees including contractual staff. It is suggested that the plant employees at all levels should be made aware on 'Water Saving & Conservation' and 'Good Housekeeping Practices'. Therefore, it is recommended to periodically organize Awareness Programs for office employees including shop floor workers on Water Conservation.

The Plant has already placed/located water saving labels/posters in prominent noticeable location of the plant like process area; near hand washing taps; wash rooms, reception office etc. This will create awareness & sense of responsibility among staff/employees/visitors.



Picture 10: Water saving posters in plant premises

7.6 Periodically conduct' water &waste water audit'

The plant should periodically conduct 'Water & Wastewater Audits' to assess the efficiency of water usage in processes; reduce water losses in the system and optimize costs & energy consumption. A detailed 'Water & Wastewater Audit' should be done at least once ina year or as per requirement by an experienced Audit Team. The plant can create its own internal Audit team for conducting regular

comprehensive 'Water & Wastewater Audit' after providing requisite training to the concerned officials.

7.7 Regularly calibrate & maintain existing water flow meters

The plant has installed water meters at various important locations including borewells. It is suggested to periodically calibrate the meters and maintain them.

7.8 Ensure to comply with the NOC conditions to avoid any penalty.

It is suggested that the plant should comply with the applicable NOC conditions to avoid any penalty. The party provisions for non-compliance of NOC are given below:

Table 28: Penalty provision for non-Compliance of No Objection Certificate conditions

S.No.	Items	Charges in Rs.
1	Non installation /faulty Digital water Flow meter with telemetry system.	200000
2	Non-disclosure/constructionofadditionalgroundwaterabstractionstructures a) Non-functional Structures. b) Defunct/Abandoned Note: Given rates are for unit non-functional/defunct/abandoned structures. This shall be multiplied with total such structures to arrive at consolidated penalty.	200000 100000
3	Reporting of fresh water zones as Brackish/Saline zones in application.	200000
4	Non-Installation of Piezometer.	200000
5	Non-Installation/faulty DWLR/ Telemetry system	100000
6	Non-Construction/Inadequate capacity of Recharge / Water conservation structures.	500000
7	Non maintenance of Recharge structures.	200000
8	Injection of treated/untreated water in to the aquifer system. Note: In addition to penalty, the proponent shall bear the cost of aquiferremediationasperttheprovisionsofEnvironment(Protection)Act,1986.	1000000
9	Non-Submission of Water level/Water quality Data.	50000
10	Non-maintenance of logbook of daily withdrawal/non submission of Groundwater abstraction data.	50000
11	Non submission of photo graph of recharge structure(s).	50000
12	Non-Submission of Self- Compliance report.	100000
13	Construction of groundwater abstraction structures by unauthorized/unregistered Drilling Rigs(per structures).	100000
14	Non registration of water supply tankers.	500000
15	Submission of false in formation/undertaking.	100000

CHAPTER-8 :IMPLEMENTATIONPLAN

S. No.	Particular	Key Observations	Recommendations	Annual water savings (m3)/ Energy saving	Annual monetary savings (Rs)	Investment (Rs)	Pay-back period (Years)	Estimated Time Frame for Implementation (months)/In progress
A. LOW OR NO COST SCHEMES (upto 1 Lakh INR)								
1	Water Savings in the Buildings for Domestic Use	Inefficient water fixtures at many locations leading to water wastages	Install flow restrictors in the existing hand washing taps; about 10-15% of freshwater will be saved	20823 m3 per year (57 m3 /day)	33734	90000	3	
2	To enhance sewage water collation and treated at STP plant	Presently domestic water use around 134 m3/day for domestic use in colony and plant, and actual STP treated water around 49 m3/day	it is recommended to collect sewage water and treated at STP around 94 m3/day (70 % of domestic water use)	16535 m3/year (45 m3/day)	26786	50000	2.5	
3	Installation of drip irrigation for landscaping/ horticulture	It was observed STP & ETP treated water is used in gardening and irrigation application by using open hose pipe	Installation of water efficient irrigation system like drip irrigation for landscaping/ horticulture/ gardening to have potential **30-50% water**					
4	Regularly calibrate & maintain existing water flow meters	It was observed that bore well install digital flow meters and also calibrated annual.	It is suggested to periodically calibrate the meters and maintain them.					
5	Maintain logbook of daily groundwater abstraction	It was observed that the plant is maintaining data of daily groundwater	The plant is suggested to record the water abstraction data, maintain logbook of daily groundwater abstraction and			**Minimum**	**Immediate**	

S. No.	Particular	Key Observations	Recommendations	Annual water savings (m3)/ Energy saving	Annual monetary savings (Rs)	Investment (Rs)	Pay-back period (Years)	Estimated Time Frame for Implementation (months)/In progress
		abstraction	submit the data to UPGWD periodically					
6	Training and Awareness of the Employees at all Levels and Placing 'Water Saving' Posters/Slogans at various Locations	It is observed that the training and awareness programs on 'Water Saving & Conservation' and 'Good Housekeeping Practices' helps and motivates employees towards resource conservation.	Periodically organize Awareness Programs for office employees including shop floor workers on Water Conservation and The Plant has already placed/located water saving labels/posters in prominent noticeable location of the plant.	Reduction in Freshwater Use due to awareness and training	Water cost savings due to reduced water use	**Minimum**	**Immediate**	
7	Periodically conduct 'Water & Wastewater Audit'	Regular water audits were not being conducted by the plant in past to assess the water system in integration.	Conduct periodic 'Water Audit' at least once in 2-3 years either by an experienced external Audit Team or by trained internal team to assess the efficiency of water usage in processes; reduce water losses in the system and optimize costs & energy consumption.	Efficient water & wastewater management	Evolving schemes leading to cost savings	**Minimum**	**Immediate**	
8	Regular payment of applicable groundwater abstraction charges	The plant has paid applicable groundwater abstraction charges as per UPGWD notification.	It is suggested to maintain the system					
Remarks: It is estimated that by implementing suggested low & medium cost schemes, plant, can easily reduce its freshwater consumption by 29 %								

CHAPTER-9 : CONCLUSION

Bajaj Sugar Unit Kundarkhi plant awarded the task of carrying out Water Audit at its plant to FICCI with reference of Ministry of Water Resource, River Development and Ganga Rejuvenation (Central Ground Water Authority) notification S.O. 3289 (E) dated 24.09.2020.

All the system was well established & Industry has adopted excellent measures in plant for water conservation at site. Though there are always chances of improvement and we expect them to improvethe present scenario as continual improvement will leads to sustainable development. The company follows all statutory requirements and is **found satisfactory.**

9.1 Details of Proposed Water Saving analysis :

The plant has recently achieved a reduction in water consumption by implementing the various measure. While, water audit resulted in the identification of potential water-saving measures for both the industrial and domestic aspects of the facility. On the industrial side, the audit suggests that the plant has the potential to save around **37358 m^3/Annum**, which around 29 **%** of total water withdrawn ,By incorporating and executing the proposed strategies, the plant stands to achieve a significant reduction in its water consumption.

Table 29: Summary of Proposed Schemes

S.No.	Proposed Schemes	(m3/day)	(m^3/annum)
Industrial Saving			
1	it is recommended to collect sewage water and treated at STP around 94 m3/day (70 % of domestic water use)	45	16535
2	Installation of water efficient taps /aerator/ dual toilets and water less urinal	57	20823
	Total	102	37358

Table 30: Summary of Water Savings

S. No.	Description Unit	Value
1	Annual Total Fresh water Consumption m^3/annum	130247
2	Annual water saving m^3/annum	37358
3	Saving %	29%

ANNEXURES (MEASURED DATA)

Annexure I: Pump Efficiency and other measurements

A. Performance Evaluation of Pumps

The Table below shows estimated efficiency of the major operating pumps based on their operating head, flow rate & actual power consumption.

Estimation of Efficiencies of Pumps				
Pump Name	**Measured**	**Diff.**	**Pump**	
	Flow	**Head**	**Input**	**Efficiency**
	m^3/hr	**m**	**kW**	**%**
Bore Well No -1 Industrial	145.0	51.0	40.0	50.3%
Bore Well No -2 industrial	140.0	45.9	43.9	39.9%
Bore well No-3 industrial	96.0	35.7	30.0	31.1%
Bore well No-4 Domestic use Colony	34	30.6	6.2	50.4%



B. Flow Measurements at Pump Discharge & Pumping Cost

Flow measurements were made during the field study. The Transit time ultrasonic flow meter was used for water flow measurements. Table below summarizes the water flow measurements at Pump discharge line. Apart from pump discharges, power measurements including voltage, current and power factor etc. were taken. Using the measured data for the pumps, the actual pumping costs are calculated for various pumps**.**

Estimation of Efficiencies of Pumps									
Pump Name	**Measured**	**Diff.**	**Pump**						
	Flow	**Head**	**Input**	**Efficiency**	**Operation**		**Pumping cost**		
	m^3/hr	**m**	**kW**	**%**	**hr/day**	**days/year**	**Rs/m3**	**Rs./day**	**Rs./year**
Bore Well No -1 Industrial	145.0	51.0	40.0	50.3%	3	84	1.07	465.4	39095
Bore Well No -2 industrial	140.0	45.9	43.9	39.9%	1	84	1.13	126.3	10610
Bore well No-3 industrial	96.0	35.7	30.0	31.1%	0.1	1	1.27	12.2	12
Bore well No-4 Domestic use Colony	34	30.6	6.2	50.4%	4	365	0.60	81.0	29561

C. Domestic Measurements

In order to account for Domestic consumption, flow measurements were conducted at various locations in plant Washrooms as shown below Flush tanks were observed to be of 10-12litres capacity. In order to assess the water flow-rates, measurements were carried out using measuring cylinder and stop-watch method. Flow-rates were observed to be high in few of the taps.

Sr No	Location	No of Taps	Measured taps water (ml)	Time taken (Second)	Water taps flow rate (LPM)
1	Admin Office	1	500	5.2	5.77
2	Dispensary	1	500	8.7	3.45
3	Canteen	1	500	8.2	3.66
4	Store toilet	1	500	4.15	7.23
5	Old admin Office	1	500	3.9	7.69



D. Opening meeting:



Picture 11: opening meeting, discussion/training

During the opening meeting, On-site training and discussion with facility manager was conducted to explain to the plant officials about effective management of groundwater, purpose of water audit and basic guidelines of the UP GWA notification

E. List of Vendors

R P Joshi Director **GeoSun Power Pvt. Ltd.** +91-9810720882 rajendra@geosunindia.com Regd. Office: I-123, Shiv Ram Park, Nangloi, Delhi – 110041 Corporate Office: F 58, Gr. Floor., Sector 11, NOIDA ,Pin 201301, U.P., www.geosunindia.com	Water & Wastewater Treatment
V.K.Singh Manager Sales **FLOSYS WATER SOLUTIONS PVT.LTD.** G. NOIDA. +91-8295548879 info@fwspl.com	Water & Wastewater Treatment
Mr. MunishGoswami Project Engg **Kilton Water Technology (I) Pvt. Ltd.** 9654728276, 9119213805 kilton.water.tech@gmail.com Plot No – 604/1, J-Block, SangamVihar, New Delhi – 110080. Head Office : G-29, Upper Ground Floor, Regus Tower 2, Assotech Business Cresterra, Sector 135, Noida - 201301 Website: www.kiltonwater.com	Water & Wastewater Treatment
AshishVermaDeputy Manager **Arya Water Technologies** +91 9540110203|D: +91 120-4622376|T: +91 120 2553100|F: +91 120 2553101|Toll Free: 1800221953 ashish.v@aryawater.com Number 8, Plot A-8, Sector-136, Noida (U.P.) - 201305, INDIA	Water & Wastewater Treatment
MsRohini **Anuj Enterprises,** 02024433027/24489118 Shop No.4. Survey No. 148, Chaitanya Apartments, ParvatiGaon, Pune - 411009 Web site : www.anujenterprises.com	Water Treatment
Akshat Jain Business Developer **Suvidha Cooling Towers Pvt. Ltd.,** 9911045664 akshat@suvidhacooling.com 1/2625, Ram Nagar, Loni Road, Shahdara,	Cooling Towers

Delhi – 110032. Website: www.suvidhacooling.in	
KhursheedHussain **Sr. Manager Sales** Armec Cooling Tower (P) Ltd Tel: 011-22162488 / 9212696111	Cooling Towers
DevangVora **TechnovaThermoplast** Cell : +91-9823353629 Email: technovathermoplast@gmail.com Website: www.technovaspray.com	Spray Nozzles
MrAnkit Mishra **Om Jyoti Engineering Enterprises** Address:45, 1st Cross Avenue, Block F, Gamma 1, Greater Noida, Uttar Pradesh 201310 Phone: 098105 10789 Email: ankitmishra.ojee@gmail.com	Rainwater Harvesting
MrBaldevChugh **Water Solutions** U -51/35, DLF III Near Cyber City Gurgaon-122002, Haryana Mobile: +919811025140 Email: baldev.chugh@gmail.com	Rainwater Harvesting
Green Ecowater Systems G. V. Krishna, Director @ 0-9246 188 817 **P. SHARDA - 9561390732** **GREEN ECOWATER SYSTEMS** **H. No: 10-25/171, Plot No: 171,** **TajMahal Colony, SaiNagar,Opp: Global Indian International School,** **Peerzadiguda,Hyderabad-500039,** **Ph: + 91-40-29888811 , + 91-40-29888822** **E MAIL:gvk@greenecowater.com** **Sales Greenecowatersales@greenecowater.com**	Water and Wastewater treatment
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EnviroChem Services (OPC) Pvt Ltd **Sameer Dohare** Managing Director **EnviroChem Services (OPC) Pvt. Ltd.** **Engineering Environment for Better Tomorrow** A/G-15, UdhnaUdhyog Nagar, Road No. 3, Udhna, Surat - 394 210, Gujarat (India). **servicesenvirochem@gmail.com** m. +91-63587-43301 | w. www.envirochems.com	Water & Wastewater Treatment
Sunway Technologies Private Limited No. 492/351, 1st Floor, Mangamanpalya Main Road, Next To SBI, Sector 7, Bengaluru-560068, Karnataka, India **Phone: 080 40937628, +91 8494904082** **Email: info@sunwaytech.in** **Website: www.sunwaytech.in**	Toilet Tank Bank (Toilet Flush Tank Water Saver)
ECO 365 Phone : +91 96 8619 4711 Mail : info@eco365.co.in Link: Water Savers In India , Water Saving Components	Toilet Tank Bank (Toilet Flush Tank Water Saver)
Jaquar Group Plot No.3, Sector – 11, IMT Manesar, Gurgaon, National Capital Region – 122050 India service@jaquar.com Tel: 0124-4746800	Cistern, flush tanks, Urinals and other sanitary ware
Hindware GURUGRAM: 301-302, 3rd Floor, Park Centra, Sector-30, NH-8, Gurugram-122001 Tel: +91-124-47792 00 Fax: +91-124-429 2898/99 E-mail: marketing@hindware.co.in	Water saving Cistern, flush tanks, Urinals and other sanitary ware

ANNEXURES (DATA PROVIDED BY PLANT)

a. Months wise water consumption details

(m^3/month)	Bore well Water withdrawn	Domestic water use Colony	Industrial water use
21-Apr	*7589*	*4100*	*3489*
21-May	*4915*	*1300*	*3615*
21-Jun	*4325*	*575*	*3750*
21-Jul	*4771*	*1292*	*3479*
21-Aug	*4816*	*1005*	*3811*
21-Sep	*6191*	*2580*	*3611*
21-Oct	*9858*	*4002*	*5856*
21-Nov	*18632*	*4518*	*14114*
21-Dec	*12712*	*3747*	*8965*
22-Jan	*14115*	*3620*	*10495*
22-Feb	*22593*	*3549*	*19044*
22-Mar	*19730*	*4708*	*15022*
Total water in KL	***130247***	***34996***	***95251***
Season (Nov to March)	***585***	***134***	***451***
OFF season (April to October)	**202**	**71**	**131**

b. Bore well- UP-GWD NOC Certificate

11/13/2021

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)
[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC043562
VALID FROM 18/06/2021 TO 17/06/2026
{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202105000104			
Name of the Owner	GYANENDRA VIR SINGH		
Designation पद	Assistant Vice President (Unit Head)	**Company Name** कंपनी का नाम	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT
Company Address कंपनी का पता	Village - Kundarkhi, PO- Govindpara, Gonda, 271301	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Village - Kundarkhi	**Application Form Serial No.**	GNDA0521NIN0004
Date of Submission	08/05/2021	**Specimen Signature**	
Location Particulars			
District	Gonda	**Block**	JHANJHARI
Plot No./Khasra No.	Existing land details attached	**Municipality/Corporation**	NA
Ward No./Holding No.			NA

11/13/2021

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	01/09/2007		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	121.93
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	50.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	150.00
Date of Energization (In Case of Electric Pump)		01/09/2007	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	150.00	**Maximum Allowable Running Hours Per Day:**	2.00
Maximum Allowable Annual Extraction of Ground Water:			45000

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

GENERAL CONDITIONS:

- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration
- In case, any of the particulars / information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage , this registration is liable for cancellation.
- The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.

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11/13/2021

- Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis
- **Guidelines for Installation of Piezometers and their Monitoring**

  Piezometer is a borewell /tubewell used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing when ever needed. General guidelines for installation of piezometers are as follows:

  - The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
  - The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometers are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
  - No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitoring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

  - The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter upto two decimal.
  - For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
  - The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.
  - All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
  - The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
  - A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
  - Any other site specific requirement regarding safety and access for measurement may be taken care of.
- Any other condition(s) that may be imposed by the concerned Authority.
- In case. any of the particulars / information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage. this permit is liable for cancellation.
-
- **SPECIFIC CONDITIONS:**
- **(A) For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10

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11/13/2021

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC020211

VALID FROM 18/06/2021 TO 17/06/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202105000106			
Name of the Owner	GYANENDRA VIR SINGH		
Designation पद	Assistant Vice President (Unit Head)	**Company Name** कंपनी का नाम	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT
Company Address कंपनी का पता	Village - Kundarkhi, PO- Govindpara, Gonda, 271301	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Village - Kundarkhi	**Application Form Serial No.**	GNDA0521NN0006
Date of Submission	08/05/2021	**Specimen Signature**	
Location Particulars			
District	Gonda	**Block**	JHANJHARI
Plot No./Khasra No.	Existing land details attached	**Municipality/Corporation**	NA
Ward No./Holding No.			NA

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11/13/2021

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC047600

VALID FROM 18/06/2021 TO 17/06/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202105000105			
Name of the Owner	GYANENDRA VIR SINGH		
Designation पद	Assistant Vice President (Unit Head)	**Company Name** कंपनी का नाम	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT
Company Address कंपनी का पता	Village - Kundarkhi, PO- Govindpara, Gonda, 271301	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Village - Kundarkhi	**Application Form Serial No.**	GNDA0521NN0005
Date of Submission	08/05/2021	**Specimen Signature**	
Location Particulars			
District	Gonda	**Block**	JHANJHARI
Plot No./Khasra No.	Existing land details attached	**Municipality/Corporation**	NA
Ward No./Holding No.			NA

11/13/2021

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC026057

VALID FROM 18/06/2021 TO 17/06/2026

(UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019)

Registration No.: 202105000107			
Name of the Owner	GYANENDRA VIR SINGH		
Designation पद	Assistant Vice President (Unit Head)	**Company Name** कंपनी का नाम	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT
Company Address कंपनी का पता	Village - Kundarkhi, PO- Govindpara, Gonda, 271301	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Village - Kundarkhi	**Application Form Serial No.**	GNDA0521NIN0007
Date of Submission	08/05/2021	**Specimen Signature**	
Location Particulars			
District	Gonda	**Block**	JHANJHARI
Plot No./Khasra No.	Existing land details attached	**Municipality/Corporation**	NA
Ward No./Holding No.			NA

c. Annexure: 1:Borewell- Water quality test report

Borewell Water Quality Test Report, BorewellUGR Location

NOIDA TESTING LABORATORIES

TEST CERTIFICATE

Issued To: M/s Bajaj Hindusthan Sugar Ltd.	**Report Code** : W-200123-029
Address: Unit – Sugar, Vill- Kundarkhi, District– Gona (U.P), India	**ULR No.** : TC681423000000157 1 F
	Test Report of : Water
	Service Request No : NTL/SRF/01/23-029
	Service Request Date : 18/01/2023
	Report Issue Date : 25/01/2023

SAMPLING & ANALYSIS DATA

Sample Drawn On	:	20/01/2023
Sample Drawn By	:	NTL Representative
Analysis Duration	:	20/01/2023 to 25/01/2023
Sample Quantity	:	2.0 lit.
Sampling Location	:	Near Sales Office
Sample Description	:	Ground Water

S. No.	Parameter	Unit	Test Method	Results	Limit (IS-10500:2012)	
					Desirable	Permissible
1	Colour	Hazen	IS:3025(P-04)	<5	5	15
2	Odour	-	IS:3025(P-05)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS:3025(P-07 & 08)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	IS:3025(P-10)	<1.0	1	5
5	pH	-	IS:3025(P-11)	7.36	6.5-8.5	No Relaxation
6	Total Hardness (as CaCO3)	mg/l	IS: 3025 (P- 23)	189.0	200	600
7	Iron (as Fe)	mg/l	IS: 3025(P-53)	0.125	0.3	No Relaxation
8	Chlorides (as Cl)	mg/l	IS: 3025 (P- 32)	34.8	250	1000
9	Fluoride (as F)	mg/l	IS: 3025 (P-60)	0.141	1	1.5
10	TDS	mg/l	IS-3025(P-16)	228	500	2000
11	Calcium(as Ca2+)	mg/l	IS: 3025 (P- 40)	41.5	75	200
12	Magnesium (as Mg2+)	mg/l	IS: 3025 (P-46)	12.0	30	100
13	Sulphate (as SO4)	mg/l	IS: 3025 (P- 24)	25.6	200	400
14	Nitrate(as NO3)	mg/l	IS: 3025 (P- 34)	1.82	45	No Relaxation
15	Lead (as Pb)	mg/l	IS-3025(P-47)	NIL	0.01	No Relaxation
16	Zinc (as Zn)	mg/l	IS: 3025 (P- 49)	BDL	5	15
17	Chromium (as Cr6+)	mg/l	Annex J of IS-13428	BDL	0.05	No Relaxation
18	Pesticides	mg/l	Table 5	Nil	Nil	Nil
19	MNP of Coliform count/100ml	mg/l	IS: 3025 (P- 23)	Nil	Absent	10 max

BDL- Below detection limit.

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

CHECKED BY

AUTHORIZED SIGNATORY

NOIDA TESTING LABORATORIES



TEST CERTIFICATE

Issued To: M/s Bajaj Hindusthan Sugar Ltd.	**Report Code** : W-200123-028
Address: Unit – Sugar, Vill- Kundarkhi, District– Gonn (U.P), India	**ULR No.** : TC681423000001570 F
	Test Report of : Water
	Service Request No : NTL/SRF/01/23-028
	Service Request Date : 18/01/2023
	Report Issue Date : 25/01/2023

SAMPLING & ANALYSIS DATA

Sample Drawn On	:	20/01/2023
Sample Drawn By	:	NTL Representative
Analysis Duration	:	20/01/2023 to 25/01/2023
Sample Quantity	:	2.0 lit.
Sampling Location	:	Near Admin Building
Sample Description	:	Ground Water

S. No	Parameter	Unit	Test Method	Results	Limit (IS-10500:2012)	
					Desirable	Permissible
1	Colour	Hazen	IS:3025(P-04)	<5	5	15
2	Odour	-	IS:3025(P-05)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS:3025(P-07 & 08)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	IS:3025(P-10)	<1.0	1	5
5	pH	-	IS:3025(P-11)	7.18	6.5-8.5	No Relaxation
6	Total Hardness (as CaCO3)	mg/l	IS: 3025 (P- 23)	172.0	200	600
7	Iron (as Fe)	mg/l	IS: 3025(P-53)	0.123	0.3	No Relaxation
8	Chlorides (as Cl)	mg/l	IS: 3025 (P- 32)	30.8	250	1000
9	Fluoride (as F)	mg/l	IS: 3025 (P-60)	0.125	1	1.5
10	TDS	mg/l	IS-3025(P-16)	289	500	2000
11	Calcium(as Ca2+)	mg/l	IS: 3025 (P- 40)	38.8	75	200
12	Magnesium (as Mg2+)	mg/l	IS: 3025 (P-46)	12.10	30	100
13	Sulphate (as SO4)	mg/l	IS: 3025 (P- 24)	8.65	200	400
14	Nitrate(as NO3)	mg/l	IS: 3025 (P- 34)	1.27	45	No Relaxation
15	Lead (as Pb)	mg/l	IS-3025(P-47)	NIL	0.01	No Relaxation
16	Zinc (as Zn)	mg/l	IS: 3025 (P- 49)	BDL	5	15
17	Chromium (as Cr6+)	mg/l	Annex J of IS-13428	BDL	0.05	No Relaxation
18	Pesticides	mg/l	Table 5	Nil	Nil	Nil
19	MNP of Coliform count/100ml	mg/l	IS: 3025 (P- 23)	Nil	Absent	10 max

BDL- Below detection limit.

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

CHECKED BY

AUTHORIZED SIGNATORY



NOIDA TESTING LABORATORIES

TEST CERTIFICATE

Issued To: M/s Bajaj Hindusthan Sugar Ltd.	**Report Code** : W-200123-027
Address: Unit – Sugar, Vill- Kundarkhi, District– Gona (U.P), India	**ULR No.** : TC681423000001569 F
	Test Report of : Water
	Service Request No : NTL/SRF/01/23-027
	Service Request Date : 18/01/2023
	Report Issue Date : 25/01/2023

SAMPLING & ANALYSIS DATA

Sample Drawn On	:	20/01/2023
Sample Drawn By	:	NTL Representative
Analysis Duration	:	20/01/2023 to 25/01/2023
Sample Quantity	:	2.0 lit.
Sampling Location	:	Near Cooling Tower
Sample Description	:	Ground Water

S. No	Parameter	Unit	Test Method	Results	Limit (IS-10500:2012)	
					Desirable	Permissible
1	Colour	Hazen	IS:3025(P-04)	<5	5	15
2	Odour	-	IS:3025(P-05)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS:3025(P-07 & 08)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	IS:3025(P-10)	<1.0	1	5
5	pH	-	IS:3025(P-11)	7.28	6.5-8.5	No Relaxation
6	Total Hardness (as CaCO3)	mg/l	IS: 3025 (P- 23)	151.0	200	600
7	Iron (as Fe)	mg/l	IS: 3025(P-53)	0.118	0.3	No Relaxation
8	Chlorides (as Cl)	mg/l	IS: 3025 (P- 32)	36.5	250	1000
9	Fluoride (as F)	mg/l	IS: 3025 (P-60)	0.128	1	1.5
10	TDS	mg/l	IS-3025(P-16)	240	500	2000
11	Calcium(as Ca2+)	mg/l	IS: 3025 (P- 40)	44.6	75	200
12	Magnesium (as Mg2+)	mg/l	IS: 3025 (P-46)	8.23	30	100
13	Sulphate (as SO4)	mg/l	IS: 3025 (P- 24)	10.8	200	400
14	Nitrate(as NO3)	mg/l	IS: 3025 (P- 34)	1.46	45	No Relaxation
15	Lead (as Pb)	mg/l	IS-3025(P-47)	NIL	0.01	No Relaxation
16	Zinc (as Zn)	mg/l	IS: 3025 (P- 49)	BDL	5	15
17	Chromium (as Cr6+)	mg/l	Annex J of IS-13428	BDL	0.05	No Relaxation
18	Pesticides	mg/l	Table 5	Nil	Nil	Nil
19	MNP of Coliform count/100ml	mg/l	IS: 3025 (P- 23)	Nil	Absent	10 max

BDL- Below detection limit.

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above test only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

CHECKED BY
Ajali

AUTHORIZED SIGNATORY

NOIDA TESTING LABORATORIES

TEST CERTIFICATE

Issued To: M/s Bajaj Hindusthan Sugar Ltd.	**Report Code** : W-200123-026
Address: Unit – Sugar, Vill- Kundarkhi, District– Gona (U.P), India	**ULR No.** : TC681423000000156 8F
	Test Report of : Water
	Service Request No : NTL/SRF/01/23-026
	Service Request Date : 18/01/2023
	Report Issue Date : 25/01/2023

SAMPLING & ANALYSIS DATA

Sample Drawn On	:	20/01/2023
Sample Drawn By	:	NTL Representative
Analysis Duration	:	20/01/2023 to 25/01/2023
Sample Quantity	:	2.0 lit.
Sampling Location	:	Bagasse Yard Area
Sample Description	:	Ground Water

S. No	Parameter	Unit	Test Method	Results	Limit (IS-10500:2012)	
					Desirable	Permissible
1	Colour	Hazen	IS:3025(P-04)	<5	5	15
2	Odour	-	IS:3025(P-05)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS:3025(P-07 & 08)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	IS:3025(P-10)	<1.0	1	5
5	pH	-	IS:3025(P-11)	7.56	6.5-8.5	No Relaxation
6	Total Hardness (as CaCO3)	mg/l	IS: 3025 (P- 23)	185.0	200	600
7	Iron (as Fe)	mg/l	IS: 3025(P-53)	0.124	0.3	No Relaxation
8	Chlorides (as Cl)	mg/l	IS: 3025 (P- 32)	32.0	250	1000
9	Fluoride (as F)	mg/l	IS: 3025 (P-60)	0.126	1	1.5
10	TDS	mg/l	IS-3025(P-16)	260	500	2000
11	Calcium(as Ca2+)	mg/l	IS: 3025 (P- 40)	41.2	75	200
12	Magnesium (as Mg2+)	mg/l	IS: 3025 (P-46)	15.0	30	100
13	Sulphate (as SO4)	mg/l	IS: 3025 (P- 24)	7.60	200	400
14	Nitrate(as NO3)	mg/l	IS: 3025 (P- 34)	1.38	45	No Relaxation
15	Lead (as Pb)	mg/l	IS-3025(P-47)	NIL	0.01	No Relaxation
16	Zinc (as Zn)	mg/l	IS: 3025 (P- 49)	BDL	5	15
17	Chromium (as Cr6+)	mg/l	Annex J of IS-13428	BDL	0.05	No Relaxation
18	Pesticides	mg/l	Table 5	Nil	Nil	Nil
19	MNP of Coliform count/100ml	mg/l	IS: 3025 (P- 23)	Nil	Absent	10 max

BDL- Below detection limit.

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

CHECKED BY **AUTHORIZED SIGNATORY**

STP OUTLET

NOIDA TESTING LABORATORIES

TEST CERTIFICATE

Issued To: M/s Bajaj Hindusthan Sugar Ltd.	**Report Code** : WW-200123-031
Address: Unit – Sugar, Vill- Kundarkhi, District– Gona (U.P), India	**ULR No.** : TC681423000001573 F
	Test Report of : Waste Water
	Service Request No : NTL/SRF/01/23-031
	Service Request Date : 18/01/2023
	Report Issue Date : 25/01/2023

SAMPLING & ANALYSIS DATA

Sample Drawn On	:	20/01/2023
Sample Drawn By	:	NTL Representative
Sample Description	:	STP Outlet
Sample Received On	:	20/01/2023
Sample Quantity/Packing detail	:	2 lt/Plastic Cane
Weather Conditions	:	Normal
Analysis Duration	:	20/01/2023 to 25/01/2023

TEST RESULTS

S.No	Parameter	Test Method	Results	Units	Limits as per CPCB Norms
1.	pH	IS:3025(Part-11):1983	7.38	-	5.5 - 9.0
2.	Total Dissolved Solid	IS:3025(Part-16):1984	760.0	mg/l	—
3.	Total Suspended Solid	IS:3025(Part-17):1984	12.0	mg/l	20.0
4.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	35.0	mg/l	50.0
5.	Biological Oxygen Demand (as O_2) (3 days at 27°C)	IS:3025(Part-44):1993	8.4	mg/l	10.0
6.	*Faecal Coliform*	IS 1622:1981	46	MPN/ 100 ml	<100

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

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AUTHORIZED SIGNATORY

ETP OUTLET

NOIDA TESTING LABORATORIES

(A Government of India Approved Testing Laboratory)

TEST CERTIFICATE

Issued To: M/s Bajaj Hindusthan Sugar Ltd.	**Report Code** : WW-200123-019
Address: Unit – Sugar, Vill- Kundarkhi, District– Gona (U.P), India	**ULR No.** : TC681423000001561 F
	Test Report of : Waste Water
	Service Request No : NTL/SRF/01/23-019
	Service Request Date : 18/01/2023
	Report Issue Date : 25/01/2023

SAMPLING & ANALYSIS DATA

Sample Drawn On	:	20/01/2023
Sample Drawn By	:	NTL Representative
Sample Description	:	ETP Outlet
Sample Received On	:	20/01/2023
Sample Quantity/Packing detail	:	2 lt/Plastic Cane
Weather Conditions	:	Normal
Analysis Duration	:	20/01/2023 to 25/01/2023

TEST RESULTS

S.No	Parameter	Test Method	Results	Units	Limits as per CPCB Norms
1.	pH	IS:3025(Part-11):1983	7.60	-	5.5 - 9.0
2.	Total Dissolved Solid	IS:3025(Part-16):1984	1620	mg/l	----
3.	Total Suspended Solid	IS:3025(Part-17):1984	14.3	mg/l	100.0
4.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	140.0	mg/l	250.0
5.	Biological Oxygen Demand (as O_2) (3 days at 27°C)	IS:3025(Part-44):1993	18.0	mg/l	30.0

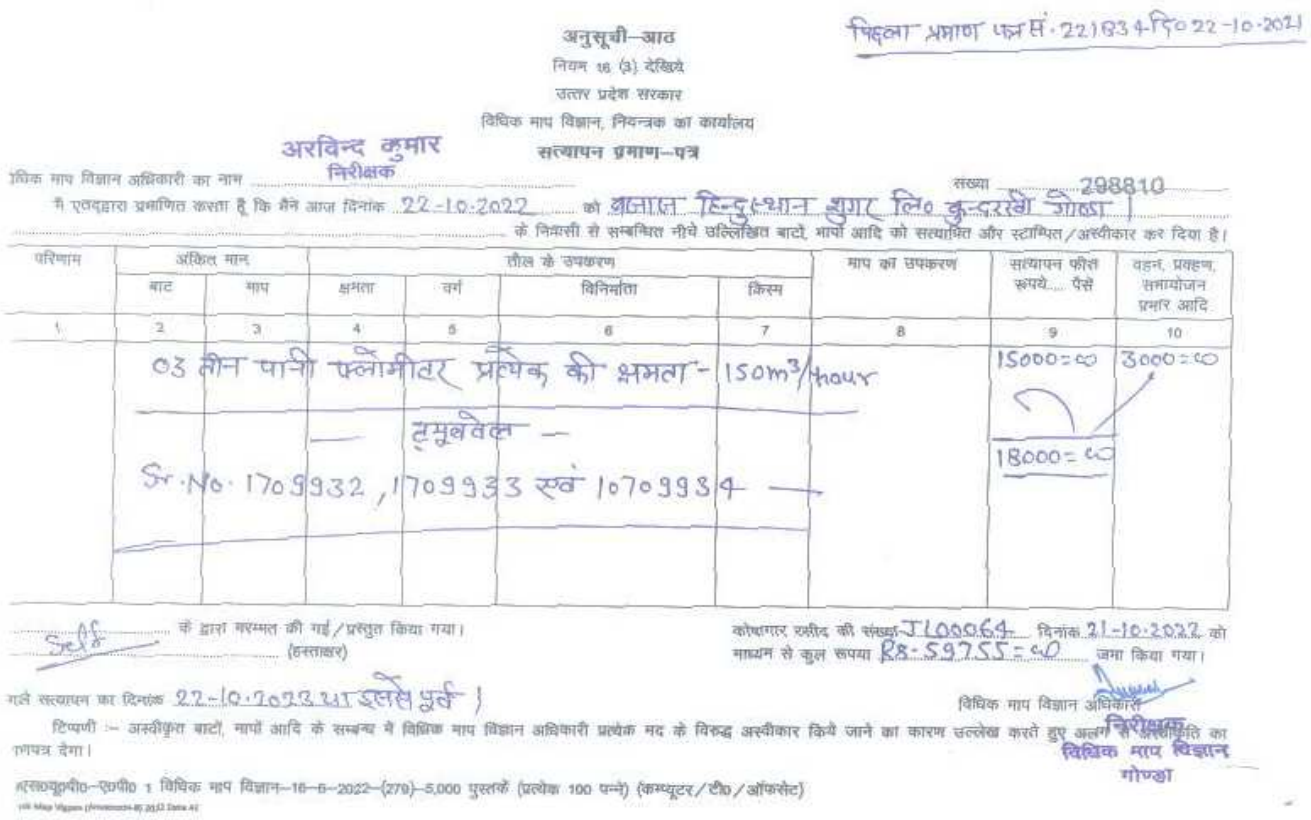
Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

CHECKED BY

AUTHORIZED SIGNATORY

d. Calibration Certificate



पिछला प्रमाण पत्र सं॰ 221934 दि॰ 22-10-2021

अनुसूची–आठ
नियम 16 (3) देखिये
उत्तर प्रदेश सरकार
विधिक माप विज्ञान, नियन्त्रक का कार्यालय
सत्यापन प्रमाण–पत्र

विधिक माप विज्ञान अधिकारी का नाम अरविन्द कुमार निरीक्षक

मैं एतद्द्वारा प्रमाणित करता हूँ कि मैंने आज दिनांक 22-10-2022 को बजाज हिन्दुस्थान शुगर लि॰ कुन्दरखी गोण्डा के निवासी से सम्बन्धित नीचे उल्लिखित बाटों, मापों आदि को सत्यापित और स्टाम्पित/अस्वीकार कर दिया है। संख्या 298810

परिणाम	अंकित मान		तौल के उपकरण				माप का उपकरण	सत्यापन फीस रुपये.... पैसे	वहन, प्रवहण, समायोजन प्रभार आदि
	बाट	माप	क्षमता	वर्ग	विनिर्माता	किस्म			
1	2	3	4	5	6	7	8	9	10
	03 तीन पानी फ्लोमीटर प्रत्येक की क्षमता - 150m³/hour — इमुवेल — Sr.No. 1709932, 1709933 एवं 1709934							15000=00 18000=00	3000=00

Self के द्वारा मरम्मत की गई/प्रस्तुत किया गया।
(हस्ताक्षर)

कोषागार रसीद की संख्या J1000664 दिनांक 21-10-2022 को माध्यम से कुल रुपया 88-59755=00 जमा किया गया।

गत सत्यापन का दिनांक 22-10-2021 को इससे पूर्व।

विधिक माप विज्ञान अधिकारी
निरीक्षक
विधिक माप विज्ञान
गोण्डा

टिप्पणी :– अस्वीकृत बाटों, मापों आदि के सम्बन्ध में विधिक माप विज्ञान अधिकारी प्रत्येक मद के विरुद्ध अस्वीकार किये जाने का कारण उल्लेख करते हुए अलग से अस्वीकृति का प्रमाणपत्र देगा।

एस0यू0पी0–एप्पी0 1 विधिक माप विज्ञान–16–6–2022–(279)–5,000 पुस्तकें (प्रत्येक 100 पन्ने) (कम्प्यूटर/टी0/ऑफसेट)

4250

e. Water flow meter specification

- Flow meter Type: Electromagnetic
- Make: Adept
- Size: 150 mm
- Qty : 3 No
- Flowmeter Type: Electromagnetic
- Make: Adept
- Size: 80 mm
- Qty : 1 No

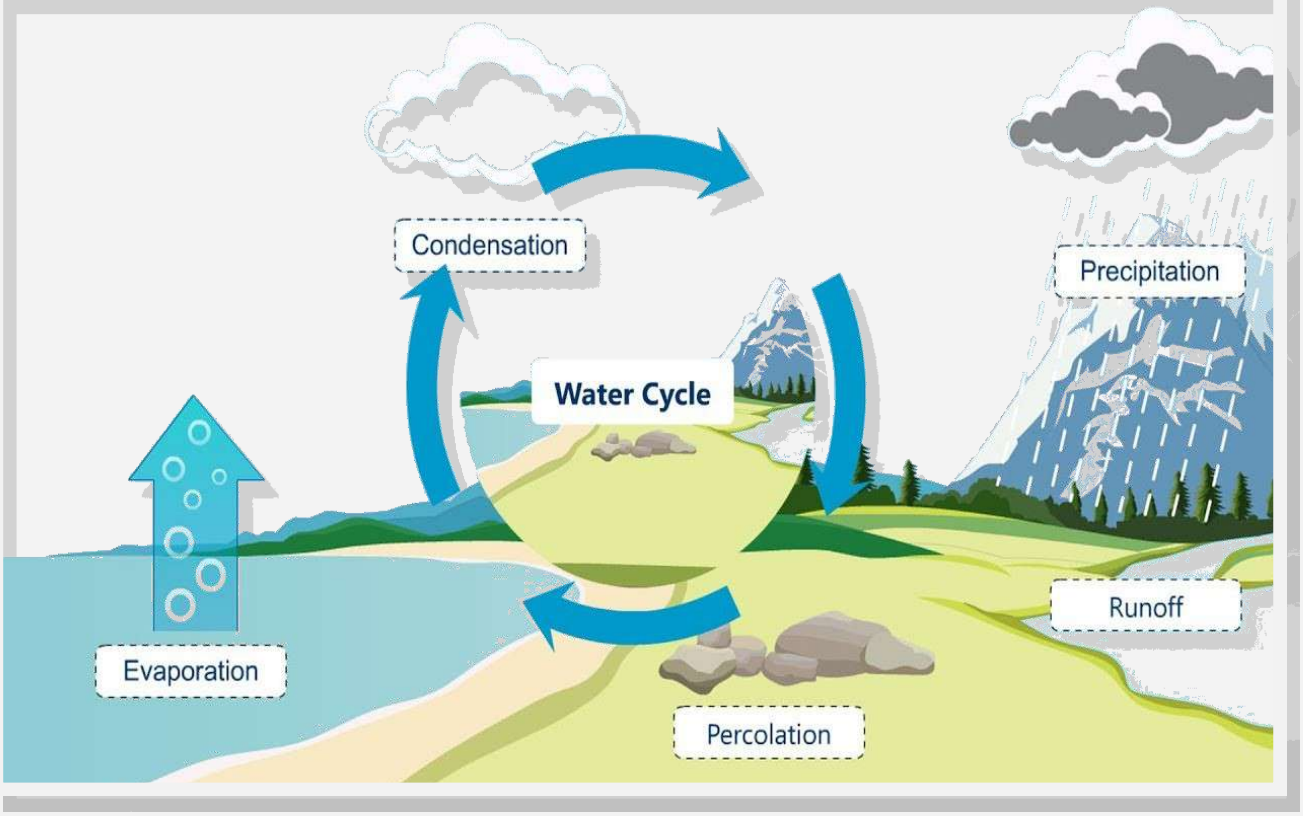
HYDROGEOLOGICAL AND IMPACT ASSESSMENT REPORT

Annexure 11

(AS PER UTTAR PRADESH GROUND WATER MANAGEMENT AND REGULATION BILL, 2019)

FOR

UNIT: SUGAR UNIT



AT

VILLAGE: KUNDARKHI, BLOCK: JHANJHARI, DISTRICT: GONDA, UTTAR PRADESH

OF

M/S BAJAJ HINDUSTHAN SUGAR LIMITED,

UNIT: KUNDARKHI (UNIT: SUGAR).

PREPARED & SUBMITTING BY

(CGWA Accredited Individual Consultant)
Certificate No.: CGWA/RGI/035

ACKNOWLEDGEMENT

This report contains Hydrogeological condition and Impact Assessment Report within 5 km of radius of existing Sugar at Village: Kundarkhi, Block: Jhanjhari, District: Gonda, Uttar Pradesh by M/s Bajaj Hindusthan Sugar Limited, Unit: Kundarkhi (Unit: Sugar).

For the purpose of the preparation of the Hydrogeological condition and Impact Assessment Report, the format regarding Impact Assessment Report as per the Gazette Notification of Ministry if Jal Shakti (Department of water resources, River Development and Ganga Rejuvenation) (Central Ground Water Authority). Notification has been published on dated 24th September 2020.

The Ground water parameters such as the Water level (Pre-Monsoon & Post Monsoon), Water level fluctuation, ground water quality have been determined by actual monitoring and sampling conducted at Site. The data of water level have been collected is actual on site. The present report is a final report of Hydrogeological and Impact Assessment study based on field data obtained in the month of February 2022. Field study conducted by Our team. The Ground water impact assessment identifies the various negative and positive impacts of the project. It is based on the impact analysis and studies. The Management plan incorporates the measures, which are envisaged to mitigate the adverse impacts as well as to enhance values.



Vijay Rajkumar Yadav
(Accredited Consultant, CGWA)
Certificate no. & issue date:
(Certificate No.: CGWA/RGI/035 Dated 07.07.2021)

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CHAPTER 1
PROJECT DETAILS

1.1 BRIEF DESCRIPTION ABOUT COMPANY

Bajaj Hindusthan Sugar Ltd. (BHSL), a part of the 'Bajaj Group', is India's Number One sugar and ethanol manufacturing company, headquartered at Mumbai (Maharashtra), India.

The Company has fourteen sugar plants, which are all located in the northern Indian state of Uttar Pradesh (UP): Golagokarannath, PaliaKalan and Khambarkhera (district Lakhimpur Kheri), Barkhera (district Pilibhit), Kinauni (district Meerut), Gangnauli (district Saharanpur), Thanabhavan and Budhana (district Muzaffarnagar), Bilai (district Bijnore), Maqsoodapur (district Shahjahanpur), Pratappur (district Deoria), Rudauli (district Basti), Kundarkhi (district Gonda) and Utraula (district Balrampur). These plants have an aggregate sugarcane crushing capacity of 136,000 TCD (tonnes crushed per day) and a distillery capacity to produce 800,000 litres of alcohol per day.

BHSL is also one of the largest ethanol producers. It is the pioneer of India's fuel ethanol program and is currently producing 38 million liters of ethanol in a year. In anticipation of emerging market demand, the Company has increased its ethanol manufacturing capacity to nearly 218 million liters per year. BHSL generates close to 430 MW of power from the bagasse produced in its sugar mills. After meeting its own energy needs, BHSL has a surplus of around 100 MW. The Company supplies a significant part of this surplus power to the UP-state grid. BHSL recently embarked upon the expansion of its power generation capacity by 450 MW through the setting up of new coal-based power plants of 90 MW each in the vicinity of 5 of its existing sugar units. These new projects have been commissioned successfully at an aggregate project cost of around Rs. 23 billion.

1.2 NEED AND PROPOSE OF THE PROJECT

Industry has obtained NOC for ground water abstraction in the tune of 2000 KLD through vide UPGWD NOC Certificate No: NOC043562, NOC047600, NOC020211 & NOC026057 dated 18/6/2021 as per The Uttar Pradesh Ground water (Management and Regulation) Act, 2019 (U.P. Act no 13 of 2019) dated 07th august 2019 and its rules Ground Water (Management and Regulation) Rules dated 25th February 2020.

Ground Water Department of Uttar Pradesh mandatory the submission of Hydrogeological and Impact Assessment Report along with application as per the Gazette Notification of Ministry if Jal Shakti (Department of water resources, River Development and Ganga Rejuvenation) (Central Ground Water Authority). Notification has been published on dated 24th September 2020.

As per the notification Impact Assessment Report is mandatory for Industries abstracting ground water in the tune more than 100 KLD. In order to comply the same, submission of Impact Assessment Report is made mandatory for processing of NOC.

Hydrogeological and Impact Assessment Study is a process for considering the implications, for people and their environment, of proposed actions while there is still an opportunity to modify (or even, if appropriate, abandon) the proposals. It is applied at all levels of decision-making, from policies to specific projects. The main impact of the project on ground water regime will affect the social and environmental sector. The main purpose of this report is to assess sensitivity of the baseline hydrological environment and the potential impacts of the proposed development upon it and proposes mitigation measures in order to ensure that the potential adverse impacts of the project development on the hydrological environment will be slight and neutral. It contains essential information:

- To assess the risk of water quality impacts from the Project to the groundwater resource.
- Implementation of groundwater monitoring and contingency program is a common requirement of the project.
- Information collected in this study was used to determine if the Project is located in a sensitive groundwater area, and to make recommendations.

1.3 PROJECT LOCATION

Existing Sugar Unit located at Village: Kundarkhi, PO – Govinpara, Distt. Gonda (Uttar Pradesh). It has shown on SOI Topo sheet no.63I/3 & 63I/4 in the map below **Fig: 1.2.**

Table No.: 1.1
Salient features of the Project

S. No	Particulars	Details
1.	District and State	Gonda, Uttar Pradesh
2.	Block	Jhanjhari
3.	Village/Town	Kundrakhi
4.	Project Area	56.06 Ha.
5.	Coordinates	Latitude: 27.083868° Longitude: 82.083954°

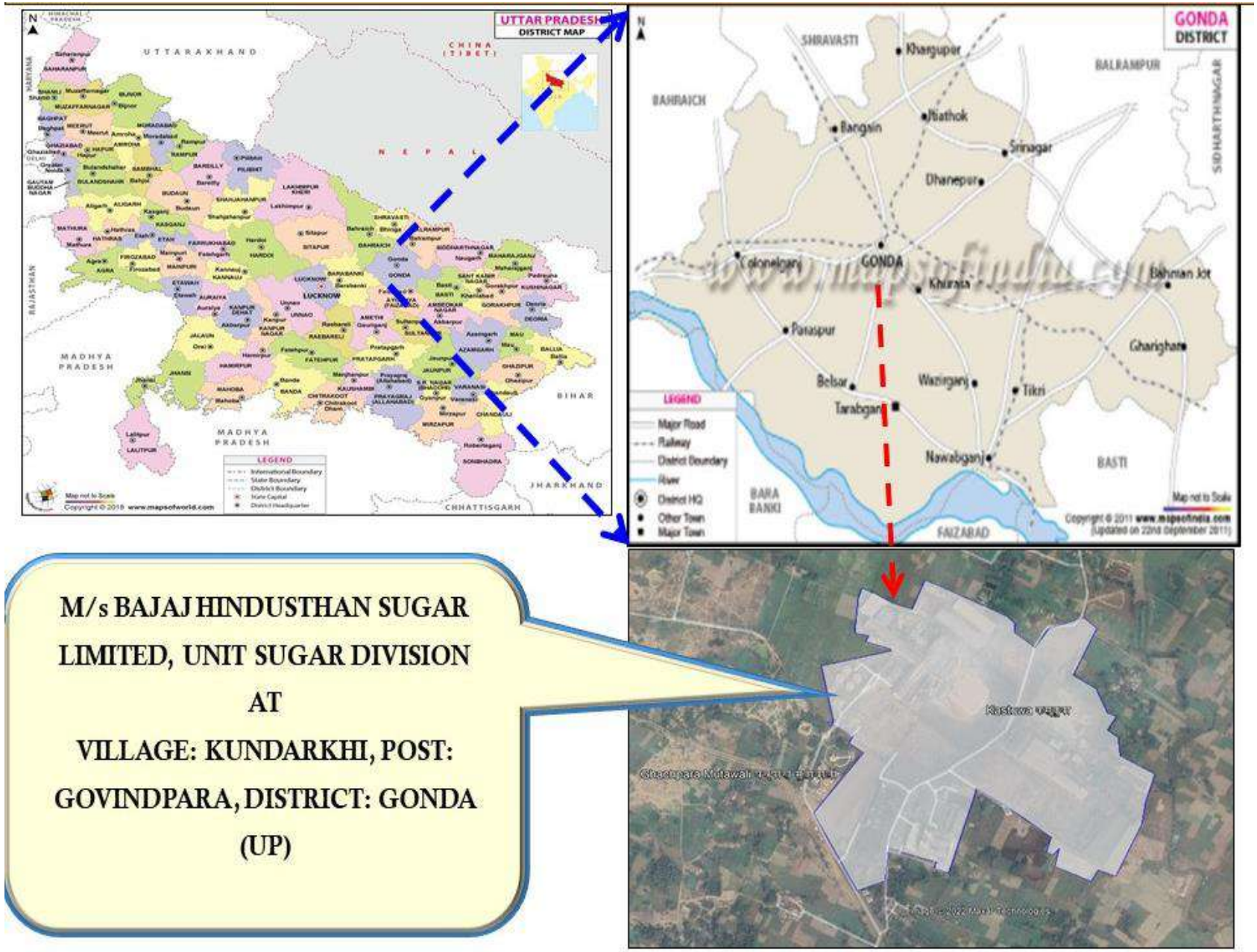


Fig No. 1.1 Location of the Project Site

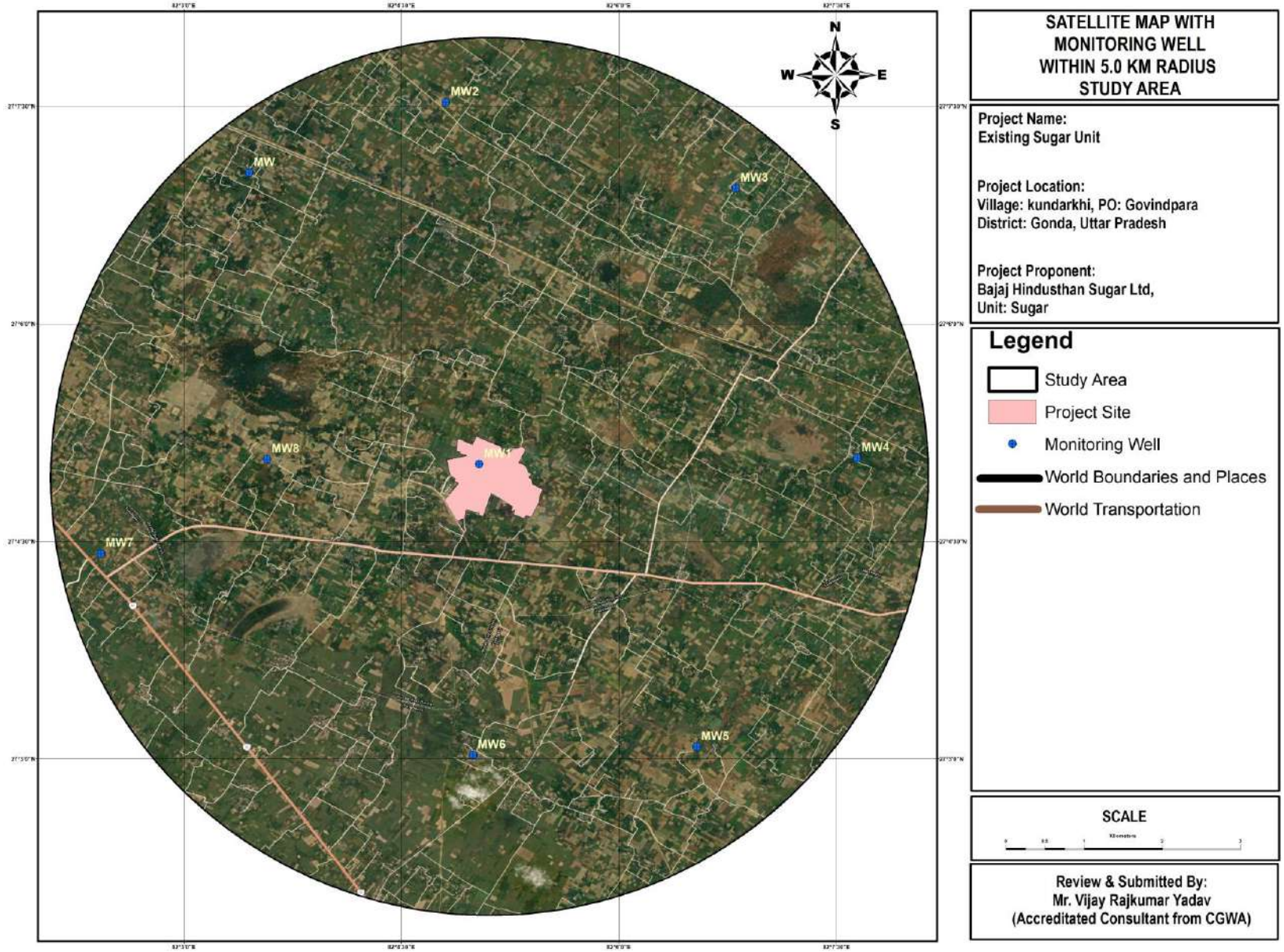


Fig No. 1.2 Satellite Map of the project site

1.4 LAND USE DETAIL:

Total plant area is 56.06 Hectare amounting to an area of 560600 sqm. Out of 56.06 Hectare of total land, 18.49 Hectare (> 33% of total plot area) is being developed under green-belt and plantation and same will be maintained. Land Area breakup for within industry premises is given in table below:

Table No.: 1.2
Land Use Breakup within Premises

S.No	Land Use	Area (Sq.m)	Percentage (%)
1.	Roof Top Area	14968.02	2.68
2.	Road/Paved area	140000	24.97
3.	Green Area	184900	32.98
4.	Open land	220731.98	39.37
	Total	**560600**	**100**

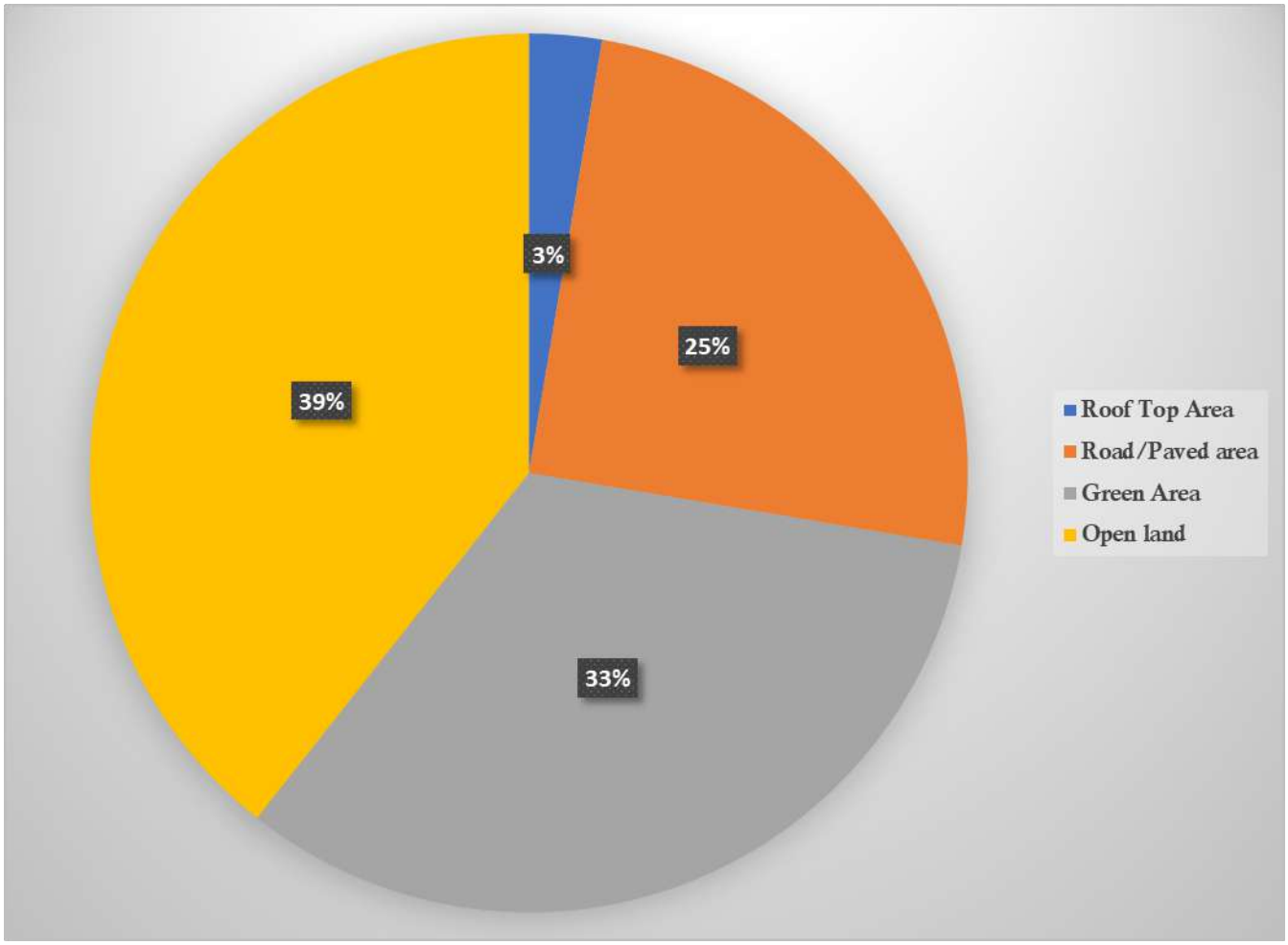
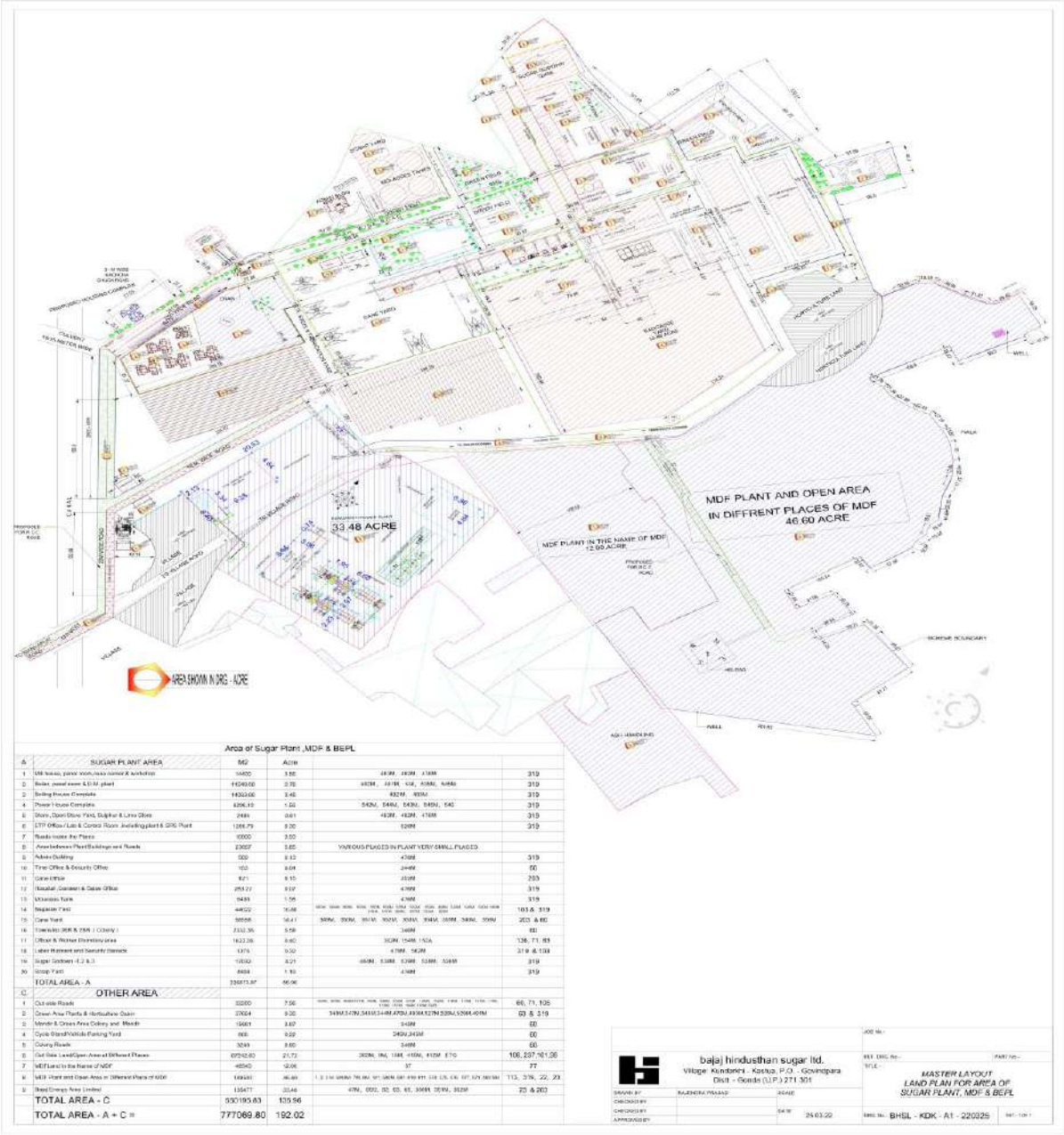


Fig No. 1.3: Land use Breakup



Area of Sugar Plant ,MDF & BEPL

A	SUGAR PLANT AREA	M2	Acre		
1	Mill house, power room,mess named & workshop	14400	3.56	480M ,480M ,480M	319
2	Boiler, vessel room & D.M. plant	11040.00	2.73	480M , 480M, 480, 480M, 480M	319
3	Boiling House (Complete	14302.66	3.46	462M , 480M	319
4	Power House Complex	8296.10	1.92	540M, 546M, 540M, 546M, 540	319
5	Store, Open Store Yard, Sulphur & Lime Store	2484	0.61	462M, 462M, 476M	319
6	ETP Office / Lab & Control Room ,Including plant & CPS Plant	1266.79	0.30	526M	319
7	Roads inside the Plants	10000	2.50		
8	Area between Plant Buildings and Roads	23057	5.65	VARIOUS PLACES IN PLANT VERY SMALL PLACES	
9	Admin Building	500	0.12	476M	319
10	Time Office & Security Office	150	0.04	244M	60
11	Cane Office	621	0.15	253M	253
12	Assistant, Overseers & Sales Office	2553.27	0.57	476M	319
13	Workmen Toilet	5481	1.35	476M	319
14	Bagasse Yard	44000	10.88	300M, 350M, 350M, 350M, 350M, 394M, 394M, 394M, 394M	103 & 319
15	Cane Yard	58568	14.47	394M, 350M, 350M, 350M, 350M, 394M, 394M, 394M	253 & 60
16	Township (MK & ZMK) Colony)	2332.36	0.58	246M	60
17	Officer & Worker Dormitory area	1623.26	0.40	352M, 154M, 152A	126, 71, 83
18	Labor Hutment and Security Barrack	1375	0.33	476M , 562M	319 & 103
19	Sugar Godown -1,2 & 3	17000	4.21	480M , 536M, 536M, 536M, 536M	319
20	Scrap Yard	6858	1.70	476M	319
	TOTAL AREA - A	336813.57	66.96		
C	OTHER AREA				
1	Outside Roads	32000	7.90		66, 71, 105
2	Green Area Plants & Horticultural Oasis	37004	9.20	349M,347M,341M,344M,476M,480M,527M,529M,526M,469M	60 & 319
3	Mandir & Green Area Colony and Mandir	15601	3.87	349M	60
4	Cycle Stand/Vehicle Parking Yard	600	0.22	349M,349M	60
5	Colony Roads	3249	0.80	349M	60
6	Get Gate Land(Open Area at Different Places	675540.80	21.72	350M, 9M, 134M, 145M, 410M , 67G	106, 207, 161, 06
7	MEP Land in the Name of MDF	48540	12.00		77
8	MDF Plant and Open Area in Different Plans of KDK	186000	46.00		113, 378, 22, 23
9	Bajaj Energy Area Limited	135477	33.48	476, 002, 02, 03, 05, 356M, 350M, 352M	23 & 203
	TOTAL AREA - C	930195.83	135.96		
	TOTAL AREA - A + C =	777089.80	192.02		

Fig No 1.4. Plant Layout

1.5 TECHNOLOGY AND PROCESS DESCRIPTION

a. Sugar manufacturing process involves mainly seven stages as mentioned below

- Weighing of sugar cane
- Crushing of Sugarcane
- Juice clarification (double sulphitation)
- Evaporation & boiling
- Crystallization
- Curing
- Grading and bagging

❖ **Cane weighment and unloading system**

Harvested Sugarcane is brought to the factory by trucks trailers and bullock carts. The factory will have 24 out station purchase centers and one local centre at the factory gate. All the purchase centers will be provided with suitable platform type computerized electronic weigh bridges to weigh the cane. There will be separate weigh bridges for cart cane weighing and truck/trailer cane weighing at the factory gate before unloading the cane on to the conveyors.

The received cane in carts and trailers in the purchase centers will be weighed. The cane received by trucks will be directly unloaded by hydraulic truck tipplers provided at the hand end of the auxiliary cane carrier. Cane weights are recorded and, in the statements, issued to the cane suppliers with the weight, total value payable etc. by a computerized system.

❖ **Cane Preparatory system & Milling System**

The cane carrier is a slat type conveyor width dragged by three strands of roller chains of sturdy construction moving on well aligned flat rails. The system will be driven by suitable variable speed drive motors to adjust the speed between 3m/min. to 10m/min.

The main cane carrier will be of 40-60m horizontal length and 20m inclined length of 12 Deg. and 7 Deg. slope with a loading depth of 1.2m at the horizontal length.

One cane leveler set with 48 knives driven by 2 x 150 KW, 600 rpm synchronous speed sling ring motor of 15% slip and an adjustable clearance of 250mm to 300mm between the tip of knives and the carrier slat will be provided.

A heavy duty swing hammer type fibrizer with 120 hammers and box type anvils driven by 2 Nos. 600 KW slip ring motors of 15% slip running at 800 rpm is considered as a cane preparatory equipment.

❖ **Milling System**

The prepared cane is crushed in the mills will be driven by DC motors of connected to the rollers through speed reduction gears to enable the rollers to run at 3 rpm to 4 rpm speed.

The fibrized cane will be fed to the crusher through a donnelly chute and under feed rollers and the extracted juice is screened through a rotary screen to remove fine bagasse particles. The

bagasse after extraction of juice will pass through successive mills through rake type elevators and donnely chutes to enable maximum extraction of juice from the cane. Imbitions water at 40 Deg. C will be added after the penultimate mill to extract the last traces of juice in the bagasse. The bagasse coming out of the fifth mill will be used as fuel for generation of steam which in turn will be used for production of electrical power and supply of process steam.

- **Juice Clarification (Defication Process)**

The mechanism of Phosphatation is primarily the flocculation of impurity particles (Bennett). The majority of colouring matter & colloids by nature are negatively charged and so the addition of cations such as calcium neutralises these charges and allows flocculation to take place. The anionic colour bodies are therefore most effectively removed by this process, and some soluble colours are absorbed by the tri-calcium phosphate. The open and bulky nature of the precipitate allows micro-flocs to be enmeshed in the precipitate mass. Larger particles must be screened because they do not float in the flotation clarifier. This process consists of adding phosphoric acid to hot raw melt (80-85 deg.c) at 0.02 – 0.05% P2O5 on brix depending on the sugar quality, i.e. colour and suspended solids. Lime in the form of lime sucrate/ low brix (2.0-2.5 be) lime slurry is added almost simultaneously. The reaction produces a precipitate of tricalcium phosphate, to which is added a flocculent to coagulate it. $3Ca(OH)2 + 2 H3 PO4 = Ca3(PO4)2 + 6H2O$ The precipitate is very fine and cannot be easily filtered; therefore, the liquor is aerated by dispersed air and subject to flotation in a clarifier. The precipitate and other debris are scraped/skimmed off as a scum. The scum is de-sweetened in several ways, the most popular of which is a series of two or three counter current clarifiers. The clear liquor underflow is led to one or two filtration processes where any ca carry over is removed.

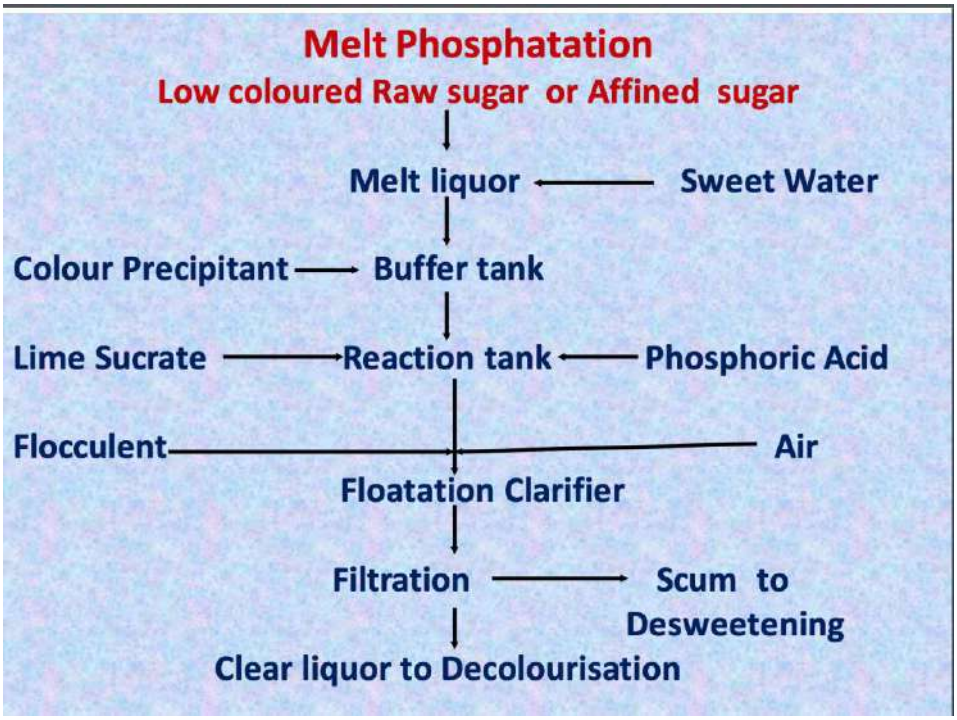


Fig: Juice Clarification (Double sulphitation)

❖ **Evaporation, Boiling & Crystallisation**

Clear juice at a pH level of 7 from the clarified passed to the first effect of the quintuple effect evaporator at about 103°C to 105°C through a juice heater. The first evaporator vessel will be a thin film long tube rising film type evaporator (semi-kestener) of modern design with provision of efficient internal and external vapour scrubbing designs. Exhaust inlet, level indicators, samplers, condensate outlets, etc.

Suitable desuperheating system for exhaust steam and pressure reducing desuperheating provision for live steam bleeding into exhaust will also be provided. The targeted evaporation percentage in the quintuple effect will be about 78 to 80.

❖ **Syrup Clarification**

The syrup coming out of the evaporator will be maintained between 55 Brix to 60 Brix. Since the production of quality acceptable to international standards is very essential these days an automatic syrup clarification system of proven technology will be provided by which it will be possible to manufacture sugar as per the requirement upto 50 ICUMSA.

For required sugar production below 50 ICUMSA, a smaller capacity refinery as per our requirement may be planned at a later date as an extension of the plant.

❖ **Vacuum Pan Boiling**

- Total automation of the boiling operations.
- Totally automatic continuous pans for B&C boiling.
- Vacuum crystallizers for storage of B-grain, C-grain and A-footing.
- Open seed crystallizer for dry seed and B-seed.
- Conventional water cooled crystallizers for B&C masscuite storage and air cooled for A massecuite. B&C crystallizers will be of continuous cooling type.
- Slurry graining for B&C.
- B-Seed or dry seed for A-footing as per needs.
- External save all for all pans.
- Automated injection and spray system to reduce power consumption at this station to 2.5 KW/t/hr at peak crushing rates.
- Final molasses purity less that 29%.

❖ **Curing, Drying, Grading and sugar bagging**

The crystal sugar developed in vacuum pans and nurtured in crystallizers is separated as white crystals from the mother liquor surrounding it. The mixture of sugar crystals and the another liquor which attains the name as massecuites and the spun in high speed centrifugal machines.

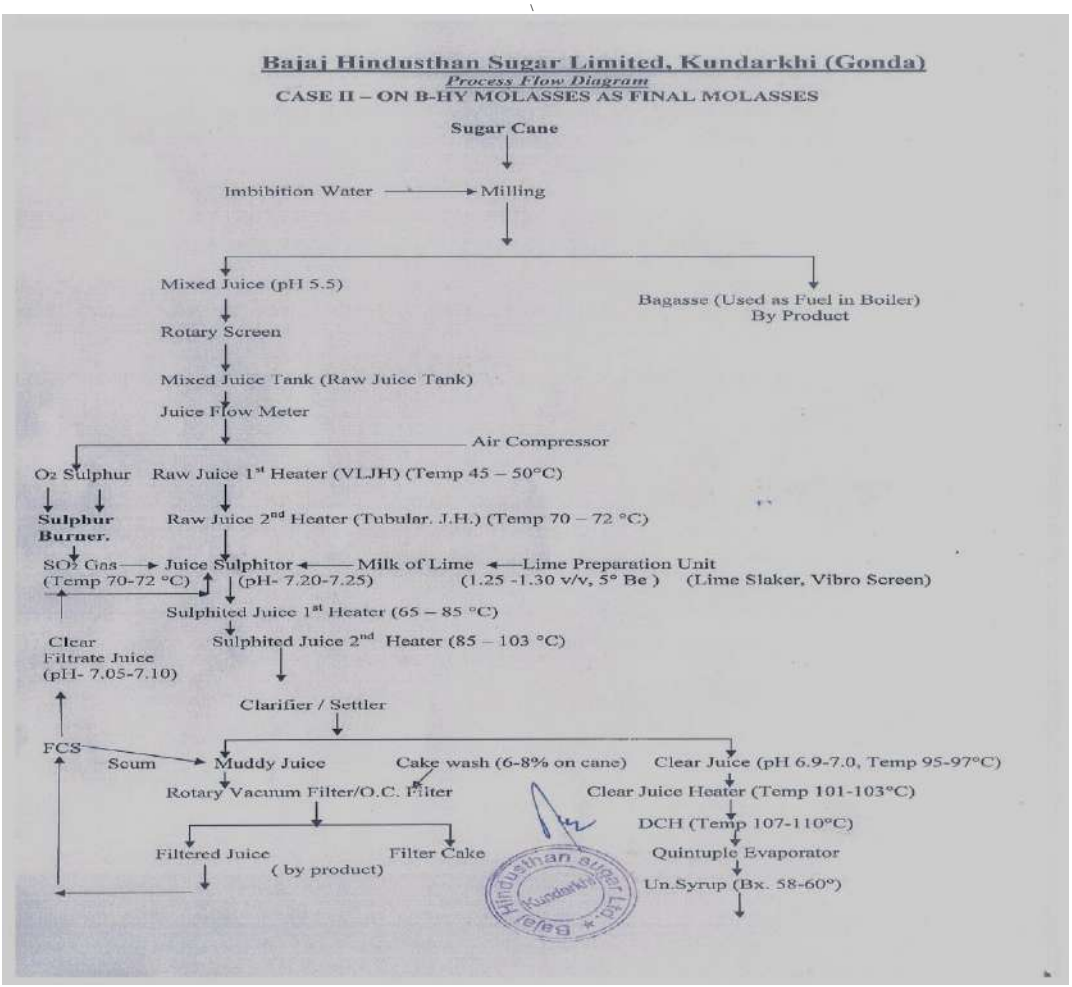
A-massecuite from which the commercial white sugar is separated is cured in modern, fully automatic, high speed, batch type, flat bottomed, plough discharging centrifugals driver by

thyristor-controlled D.C. motors of 1440 rpm. The sugar will be discharged into a plain tray grass hopper conveyer at the bottom from where it will be conveyed to fluidized bed sugar drier. The dried sugar after cooling in the hopper will be elevated by bucket elevators to a vibrating screen assembly above the sugar bins. The factory proposes to make 85% and above of M-size crystals as per ISS, S-Size crystals 10% and other Sizes of 5%. The colour will be 31 plus which is the highest as per ISS. The sieved sugar will be stored in the sugar bins according to the grades and bagged in 50 Kg/100 Kg packing in automatic sugar net weighing machines kept at the bottom of the sugar bins, stitched by machines and conveyed to the warehouse through belt conveyors where they are stocked.

The B-massecuite and C-massecuites are cured in continuous centrifugal machines. The B-sugar after sufficient washing in centrifugals and with a purity of not less than 98% is taken back to the pan station as seed for A-massecuite some times and excess will be completely melted.

The C-sugar coming out of C-continuous centrifugal machines is magmised in a mingler beneath the machines and cured once again in a subsequent continuous centrifugal machine known as C-after worker.

The sugar from the C-after worker centrifugal which will be of about 98% purity is completely melted and taken to the pan floor for boiling with A-massecuite. Every stage of operation will be automated and integrated through DCS control system to ensure best process controls, efficient operations and quality outputs.



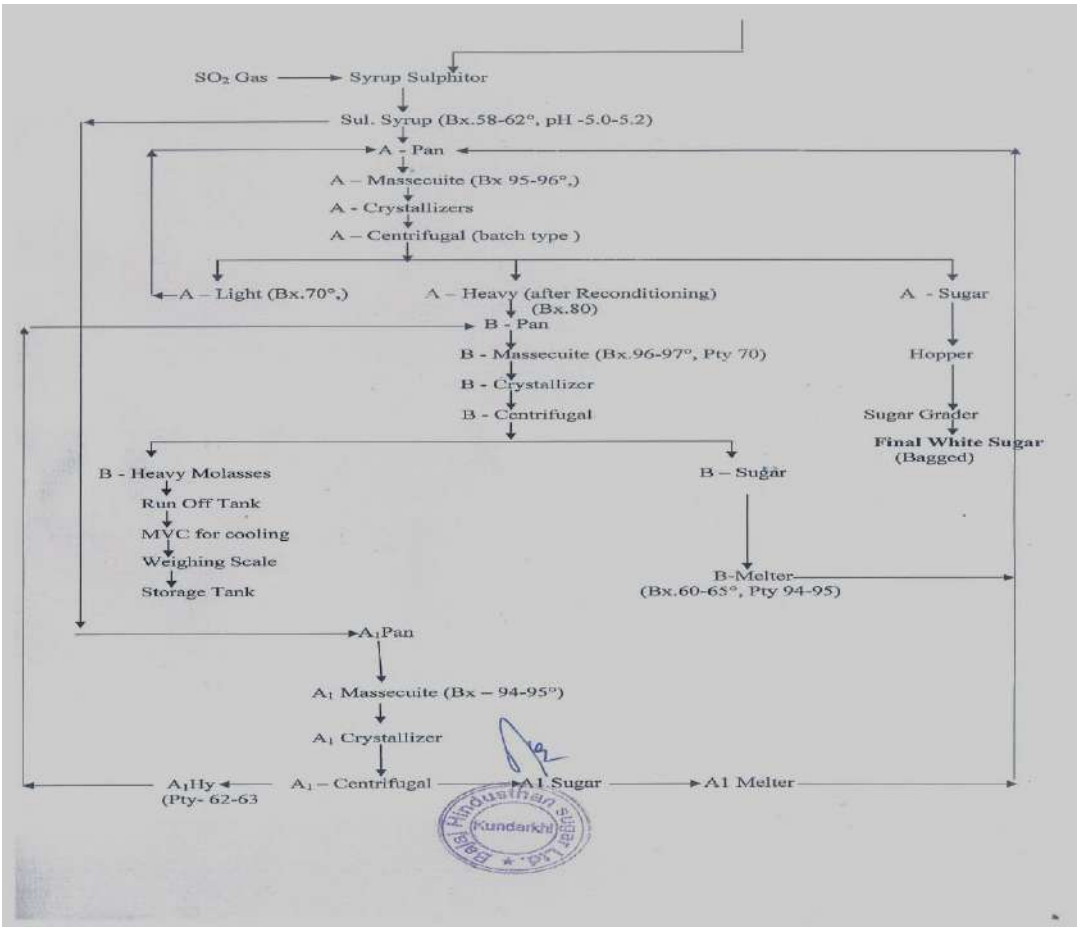


Fig: 1.5 Manufacturing Flow Diagrams

1.6 Fresh Water Requirement and Existing Bore Well Details

Fresh water requirement for existing Sugar is 2000 KLD. Fresh water requirement shall be sourced from Ground Water through 04 Bore wells which were earlier registered with CGWA New Delhi. Details of existing bore well are given in **Table – 1.3.**

Table No: 1.3; Details of the existing tube wells

Sr. No.	Type of Structure-Date	Depth (m)/ Dia	Depth to Water Level (mbgl)	Discharge (m3 /Hr)	Operational Hrs./Day	Mode of Lift	Pump Capacity (HP)	Coordinates	Piezometer Meter Installed
1	Borewell/ 01/09/2007	121/250	4.50	150	5/150	Submersible	50	27.0869° 82.0836°	Yes
2	Borewell/ 01/09/2007	121/250	4.50	150	5/150	Submersible	50	27.0846° 82.0858°	Yes
3	Borewell/ 01/09/2007	121/250	4.50	150	2/150	Submersible	50	27.082° 82.0854°	Yes
4	Borewell/ 01/09/2007	121/250	4.50	50	4/150	Submersible	10	27.0833° 82.0807°	Yes
	Logbook is available with Each Borewell								

CHAPTER - 2
DETAIL ABOUT THE STUDY AREA

2.1 GEOLOGY OF THE AREA

Geologically the district forms part of the vast Indo-Gangetic alluvial tract, of which the origin is attributed to a sag in the earth's crust formed in the Upper Eocene times between the northwardly drifting Gondwanaland and the rising Himalayan belt, and gradually filled in sediments so as to constitute a level plane with a very gentle seaward slope.

The alluvium formation of the district comprising sand, silt & clay with occasional gravel, is of the early quaternary to sub recent age. The older alluvium called bhangra, forms slightly elevated terraces usually above the flood levels. It is rather dark in colour generally rich in concretions and nodules of impure calcium carbonate, locally known as kankar. The newer alluvium called khandar forming the lowlands between the Ganga and Bhangar is light coloured, poor in calcareous contain and composed of lenticular beds of sand, gavel and clays. The economic minerals found in the district are Kankar reh and sand. Districts Gonda is located within Zone-3 (Moderate Zone) of seismic zone of India in the Tari region of U.P which is characterized by unique geological feature. Since it makes the shift where the southern Gondwana land collied with Northern Eurasian land lifting the sediments of the then existing Tethys Sea and forming the Himalayas. As the result Southern and Northern part of Nepal shows widely differing formations. One find the Archean Crystalline covered deep beneath the Alluvium of Tarai, the main sedimentary deposits that were squeezed to form the high mountain and also Siwalik formations. The region is flanked by great Indo-Gangatic alluvial plains.it is occupied by litho-assemblage of various geological formations ranging in age from the Archean to Quaternary period. The major part of the area Upstream, Greater and Lesser Himalayan is composed essentially of variegated granite and granite gneisses with enclaves of meta-sediments and meta-basics and Siwalik sand stone. The gneissic-granitic suite of rocks are overlain by ENE-WSW trending volcano-sedimentary sequence of the Bijawar Group and intracratonic platformal orthoquartzite carbonate sequence of the Vindhyan Supergroup in the southern and eastern parts. The lacustrine Lameta Group of rocks and the overlying flood basalt of the Deccan Trap Province cover the Bijawar-Vindhyan rocks at various levels. Soil and alluvium of the Quaternary Recent period is mostly confined along the banks of the major rivers.

2.2 CLIMATE & RAINFALL

The average annual rainfall is 1151.80 mm. The climate is sub-humid and it is characterized by good rainfall mainly during southwest monsoon season and a dry hot summer. About 90% of rainfall takes place from June to September. During monsoon surplus water is available for

deep percolation to ground water. January is generally the coldest month with mean daily maximum temperature at 22.9° C and means daily minimum temperature at 8.3°C. After February there is steady increase in temperature. May is generally the hottest month with the mean daily temperature is 39.9°C and means daily minimum temperature is 25.6°C, with the advance of the monsoon there is appreciable drop in temperature. The mean monthly maximum temperature is 31.70°C and the mean monthly minimum temperature is 18.5°C. In morning relative humidity is high except in summer season. The mean monthly morning relative humidity is 68% and means monthly evening relative humidity is 56%. Winds are generally high with some strengthening in the summer season. The mean wind velocity is 4.8 kmph. The potential evapo-transpiration is 1422.7 mm.

Table No. 2.1
Average Annual Rainfall

YEAR	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
2016	7.5	0.0	0.3	0.0	46.9	109.1	439.1	138.8	110.2	25.6	0.0	0.0
2017	10.5	0.0	6.0	0.0	43.0	47.7	332.2	164.3	73.1	0.0	0.0	0.0
2018	0.0	10.0	0.0	19.9	30.8	36.2	246.6	278.9	85.7	0.0	0.0	0.0
2019	20.5	48.1	4.0	4.5	0.0	90.1	348.3	128.9	297.0	2.0	0.0	15.3
2020	61.2	19.9	77.0	7.7	90.4	236.1	348.1	201.7	65.6	0.0	7.2	0.0

Source: *IMD Hydromet*

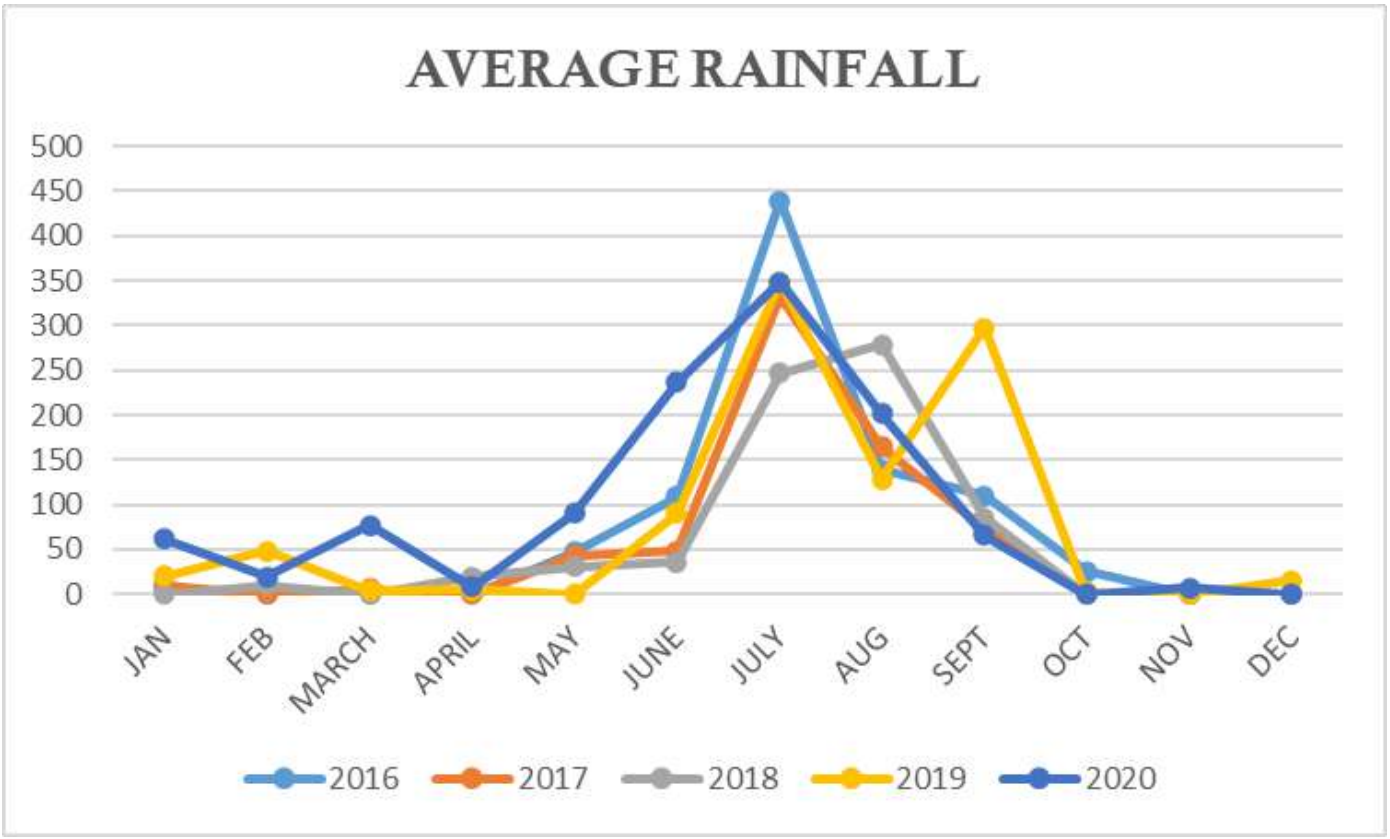


Fig No. 2.1: Average Rainfall

2.3 GEOMORPHOLOGY, TOPOGRAPHY, PHYSIOGRAPHY AND DRAINAGE

2.3.1 GEOMORPHOLOGY

Geomorphology of district Gonda falls in Central Ganga plain. General topography is flat to gentle undulation. Following geomorphic units have been demarcated in the study area:

- **Flood Plain:** It is restricted all along the river channels. The area is mostly covered by present river and its adjacent smooth plains. It is comprised of coarse to fine sand, silt, clay and gravel. The sand bar, abandoned channels levies landform are very common in the area.
- **Newer Alluvial Plain:** It refers to old flood plain cycle of deposition. It is mostly consists of unconsolidated coarse to fine sand, silt and clay of varying amounts. The fluvial landforms, like paleo-channels meander scar, back swamps etc. are observed.
- **Older Alluvial Plain:** The older alluvial plain forms the central part of the Ganga-Ghaghra interfluves. The surface water divide passes through the area. The area is flat and gently undulating due to paleochannels. It gently slopes towards east besides north and south of water divide. It is mainly constituted of coarse to fine sand, silt and clay. Paleo-channels meander lakes marshy and swampy lands are very common in this unit.
- The area is a part of the Ghaghra alluvial plains and is underlain by Quaternary alluvium comprising mainly sands of various grades with clay and kankar. The central alluvial plains extend from north to south are makeup of finer clastics comprising mainly sand, silt, clay, sandy clay with kankar and subordinate sands. The main source of irrigation in the district is state / private tube wells. Length of canal in the district is 304 km. The surface water irrigation covers an area of 14659 ha. which is about 6% only of the total irrigated area. Rest of the area irrigated by tube wells. The area chiefly drained by the river Ghaghra which form the southern and south western boundary of the district, the Rapti river which drain north area of district. Kuwano river which form the north eastern boundary of the district. Except these rivers the area also drained by the Tirhi N. and Monwar N. also. Physiographically Gonda district is divided into two units, the upland plains underlain by older alluvium and the low land plains underlain by newer alluvium. The older alluvium occupies the north & eastern part of the district and the newer alluvium covers the central, western and southern part with low lying slightly undulating tract deposited in comparatively recent times by the river Kuwano, Tirhi and Ghaghra. In general, the area forms flat to gently sloping terrain dotted with low lying areas. Flood plain (alluvium) areas are extensive, low lying flat areas adjacent Ghaghra river. The deposit is thickest near the river margins and thinning outward the valley slopes and composed of unconsolidated alluvial materials of varying lithology. The lowland of the Ghagara, Kuwano and Tirhi also known as the newer Alluvium (khaddar) lies between the main channel of the river,

and its old high bank. It varies in width from a kilometer to about 10 km wide. The Lowland is liable to frequent floods and is thinly populated. The different geomorphic units observed in the district like sand bar (River Sand) observed at river bed of Ghaghra consist of sand deposits of varying sizes produced due to the fluvial action. Flood plain (alluvium) areas are extensive, low lying flat areas adjacent Ghaghra river. The deposit is thickest near the river margins and thinning outward the valley slopes and composed of unconsolidated alluvial materials of varying lithology. Ravines, younger alluvial plain and older alluvial plain are also observed in the district. All small, narrow, deep depressions dissected and irregular surface usually produced by surface runoff.

2.3.2 SOIL

Gonda contain two varieties of the soil, which are locally known as 'Bhat' and 'banjar'. The alluvial soil is called 'dhuh'. The one described as 'mant' is loamy sandy calcareous, comparatively. However, in the vicinity of surface water bodies' large area of clay mixed soil is more prevalent and such soil may be termed as average loam. Variety of loamy soil has been encountered due to variations in the chemical constituents and underlying rock types. Alluvial soil of river valleys notably the khadhar of Ghagara were formed by related deposition of silt brought down by existing river system during flood. Gonda features sandy, loamy, and clay soils. Soil Stratigraphy Systematic soil profile study of the area has not been carried out and only tentative soil succession can be inferred on the basis of data gathered mainly on physical characteristics. The soil in older Alluvium is, in general, yellowish to brownish, loomy, fine textured with sparsely developed kankar below 10 m. depth from ground level. The low-lying ("Tarhar" as called locally) areas of Rapti river show thin veneer of soil capping as compared to older Alluvium since the areas are prone to seasonal flooding and as a result repeated erosion and deposition occurs during flood. The soil in this area is mostly in the formative stage and actual soil profile is scanty.

Water percolates downward in sandy soils, so those are not very fertile. Nevertheless, zayad crops are produced near the banks of rivers in this soil. Loamy soil, light yellow in colour, is fertile and contains fossils and minerals. It is found in the upper part of Gonda around Khorahsa, Dumariya Deeh, Gonda, Itia thok, Mankapur, etc. Clay soil can retain water, so it is suitable for crops that require more irrigation, such as rice grown in paddy fields, though it becomes hard when it dries. Clay soil is found around Colonel Ganj, Itiathok, and Mankapur.

2.3.3 TOPOGRAPHY OF THE STUDY AREA

Being a part of Indo Gangetic alluvial plain the area is almost a flat terrain with master slope towards southeast. Geomorphologically the area can be divided into younger alluvial plain.

The younger alluvial plain forms flat to gently sloping, low lying, undulating surface of large areal extent formed by river deposition and consisting of fluvial land forms such as oxbow lakes, paleochannels etc. The younger refers to later cycle of deposition and constitute unconsolidated coarse to fine sand, silt and clay. The effect of high soil moisture is observed in the vicinity of canal. The older alluvial plain is similar to younger alluvial plain but formed at earlier stage of depositional regimes, comprising older unconsolidated alluvium. The paleochannels are buried channels filled in with sand, silt and clay of varying lithology, whereas oxbow lakes are crescent shaped cutoff meander with water and composed of unconsolidated alluvial materials. The area is characterized by ravines. The ravines comprise unconsolidated alluvial material of varying lithology mainly with fine sediments and developed in older alluvium. The chief verities of soil are bhur or sand, dumat or loam and matiyar or clay. Bhur is formed along the high banks of rivers and streams, matiyar is found in depression in the upland while dumat occurs in rest of the district.

2.3.4 PHYSIOGRAPHY OF THE STUDY AREA

Physio graphically Gonda district is divided into two units, the upland plains underlain by older alluvium and the low land plains underlain by newer alluvium. The older alluvium occupies the north & eastern part of the district and the newer alluvium covers the central, western and southern part with low lying slightly undulating tract deposited in comparatively recent times by the river Kuwano, Tirhi and Ghaghra.

2.3.5 DRAINAGE

The district Gonda is a part of the Ghaghra alluvial plains and is underlain by quaternary alluvium comprising mainly sands of various grades with clay and kankar. The central alluvial plains extends from north to south are makeup of finer clastic comprising mainly clay, silt, sandy clay with kankar and subordinate sands. The area chiefly drained by the river Ghaghra which form the Sothern and south western broundary of the district , the Kuwano river which form the north eastern boundary of the district. Except these rivers the area also drained by the Tirhi N. and Monwar N. also.

Drainage map of the area is given in Fig: 2.2.

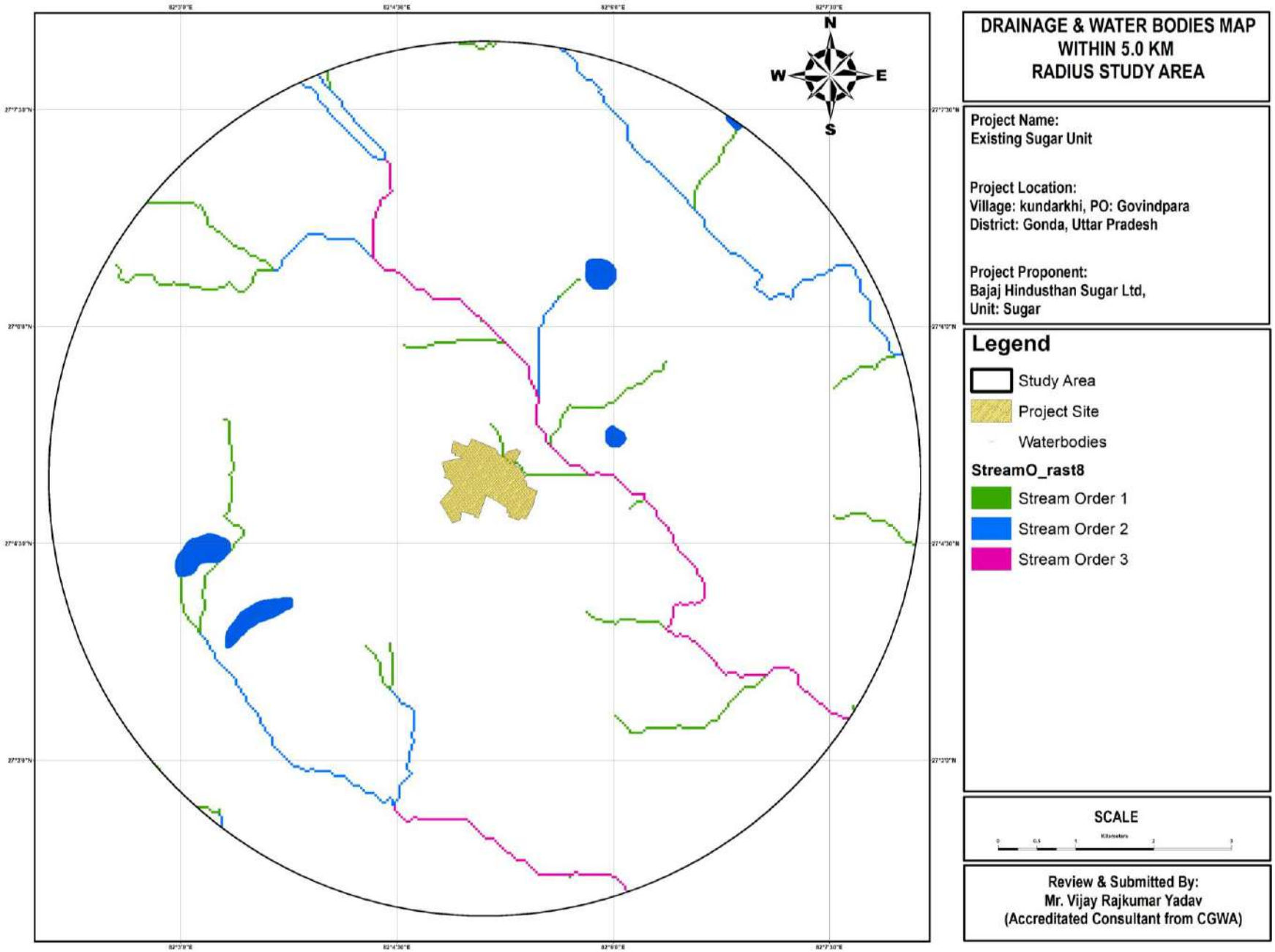


Fig No. 2.2 Drainage Map of the study area

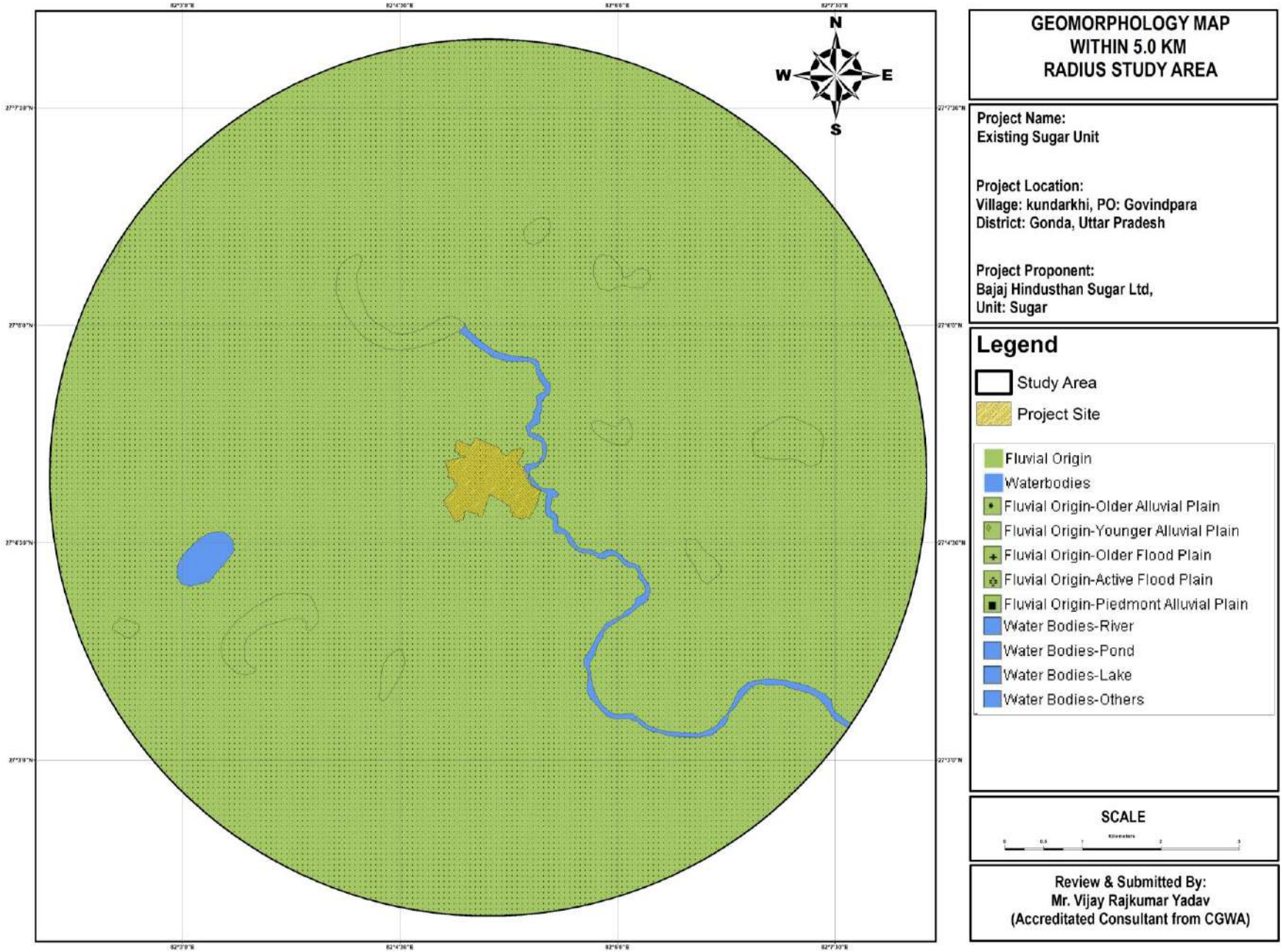


Fig No. 2.3 Geomorphology Map of the study area

2.4 LAND USE / LAND COVER OF THE SURROUNDING AREA

Land Use/Land Cover of Study Area

Satellite Image (multispectral) of latest available dates has been used for preparation of Land use/ Land cover thematic map of study area. Satellite image has been procured from National Remote Sensing Centre, Hyderabad.

Technical details

- Satellite Image - Multispectral(FCC) of latest available dates
- Satellite Data Source - NRSA, Hyderabad
- Software Used - Earth Resources Data Analysis System
- Arcgis 10.3

A hybrid technique has been used i.e. visual interpretation and digital image processing to generate output Land use / Land cover map of 10.0 km study area on 1: 50000 scale. Statistical data observed and results obtained from satellite image are given below.

2.4.1 Land Use/Land Cover details of Buffer Zone

Total study area/ buffer zone of **M/s Bajaj Hindusthan Sugar Limited, Unit: Kundarki** mainly comprises of Industry, Green-Belt, open scrub land and agricultural land.

The whole study area of 5 km radius mainly comprises of Crop Land with 89.08 %, Human Settlement (including both urban and rural) 3.56 %, and Plantation 1.19 %. The land use land cover details of 5 km radius area are given in Table-1.4 below:

Table – 2.2,

Table No. 2.2 Land Use / Land Cover details of study area

S. No	Legends	Area (sqm)	Percentage %
1.	**Crop Land**	70.38	89.08
2.	**Deciduous**	0.91	1.15
3.	**Fallow**	0.79	1.0
4.	**Inland wetland**	1.17	1.49
5.	**Mining**	0.14	0.18
6.	**Plantation**	0.94	1.19
7.	**River/Stream/Canals**	0.05	0.07
8.	**Rural**	1.81	2.30
9.	**Salt affected land**	1.0	1.26
10.	**Scrub land**	0.79	1.0
11.	**Urban**	1.0	1.26
12.	**Waterbodies**	0.02	0.02
	TOTAL	**79.0**	**100**

Source: *LU/LC Map for Study Area from Bhuvan Portal*

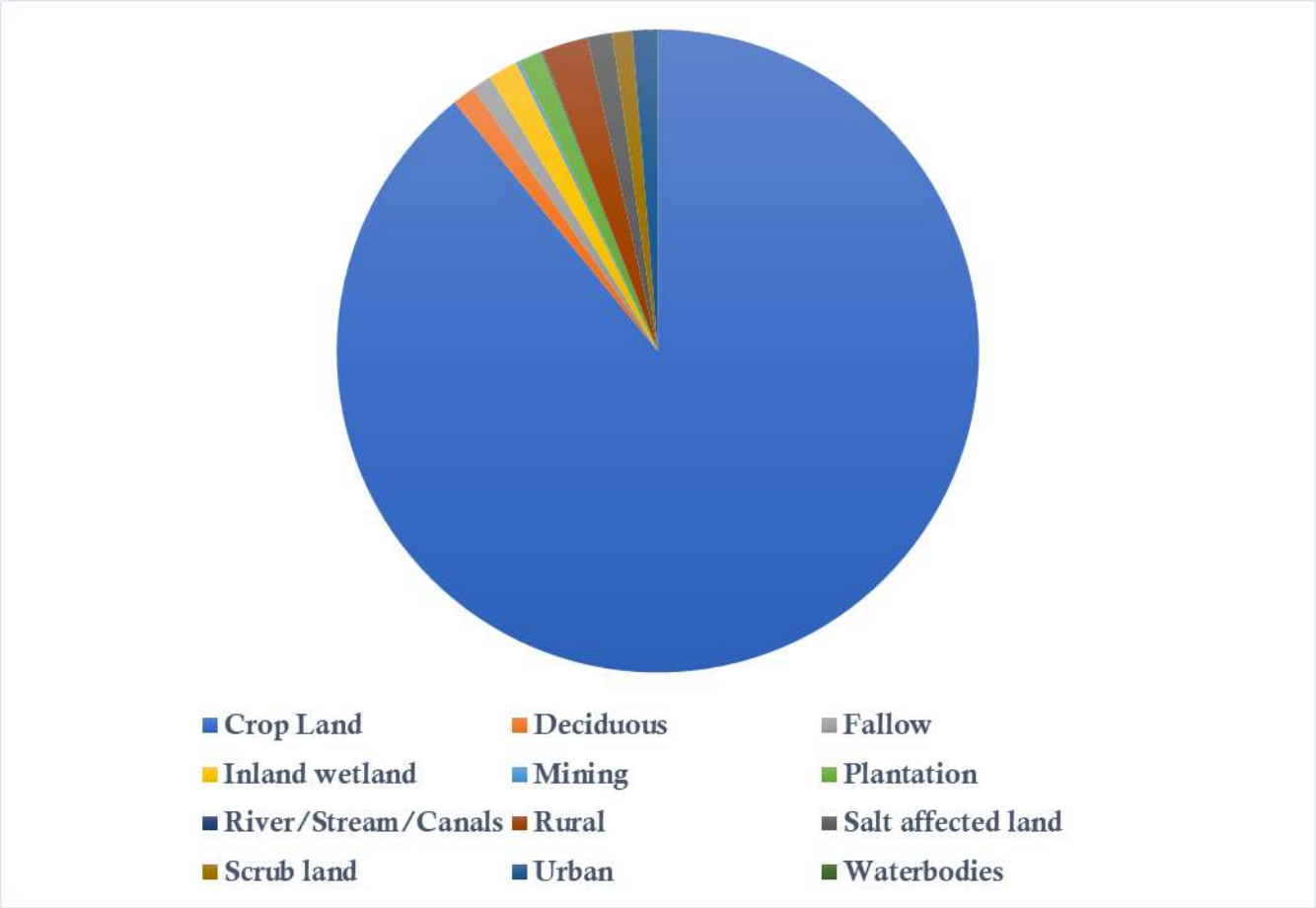


Fig No. 2.4 Land Use / Land Cover details of study area

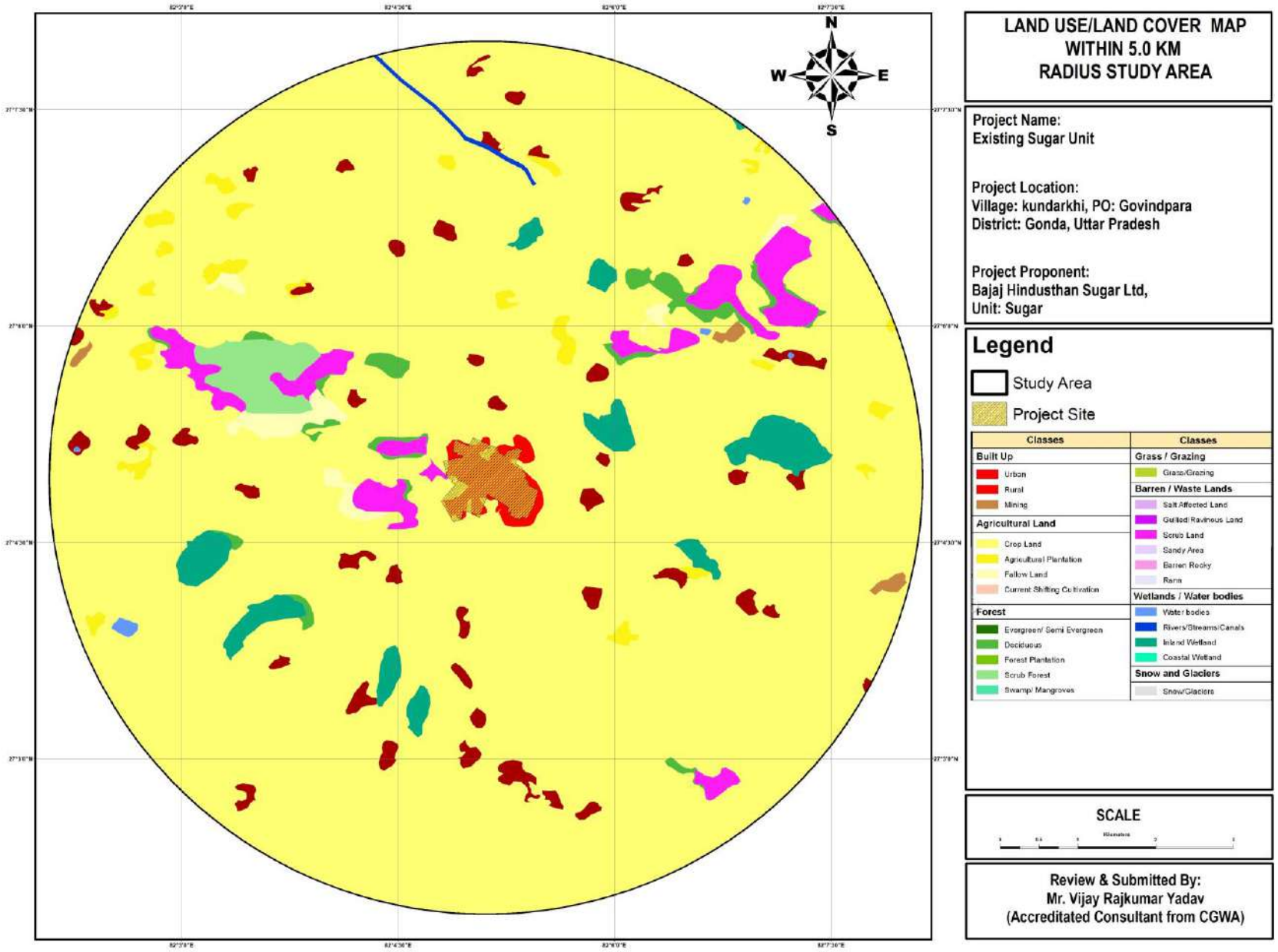


Figure No 2.5: Land Use Map of the study area

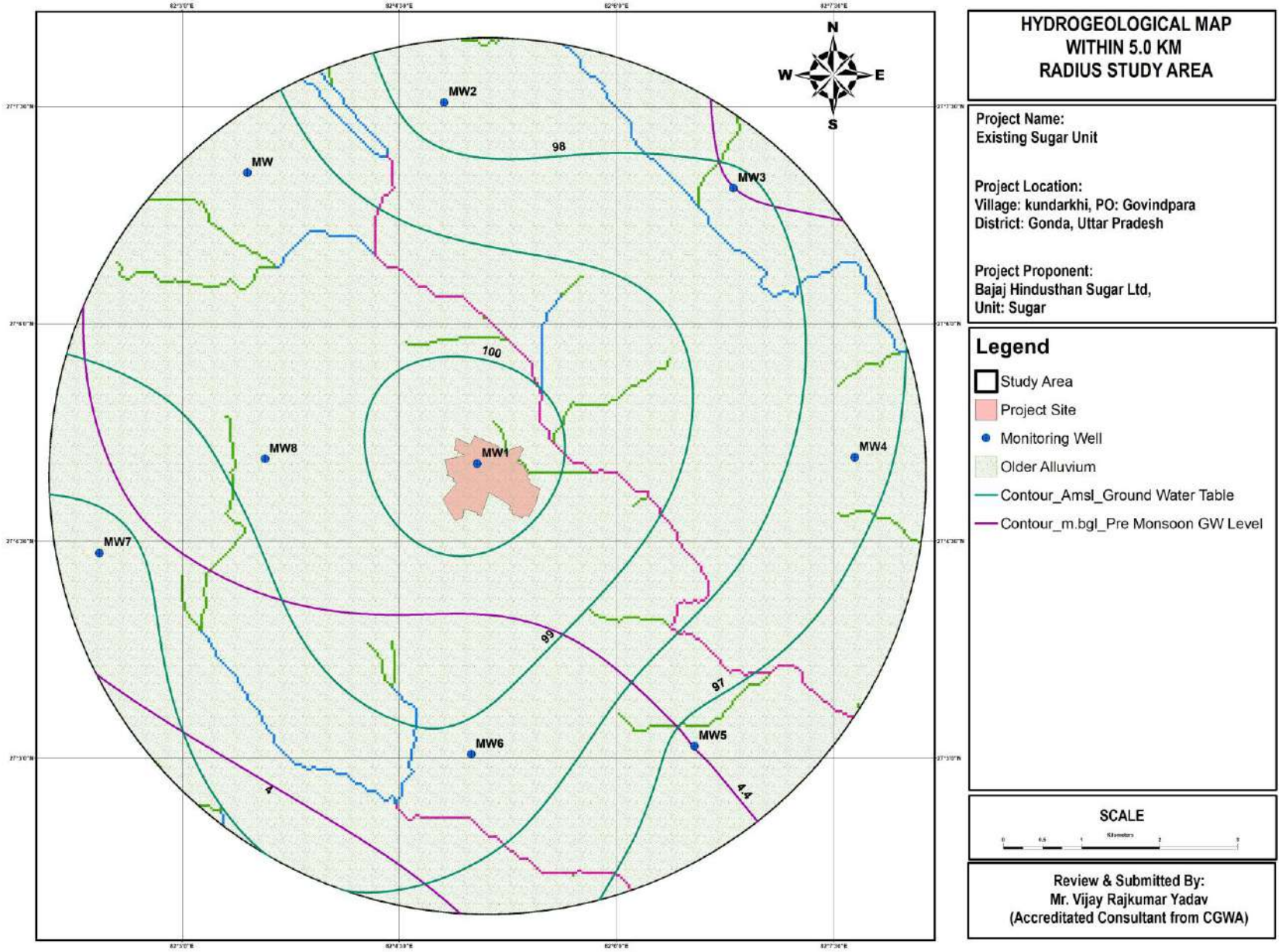


Figure No 2.6 Hydrogeological Map of the study area

2.5 Digital Elevation Model

Digital Elevation Models are data files that contain the elevation of the terrain over a specified area, usually at a fixed grid interval over the "Bare Earth". The intervals between each of the grid points will always be referenced to some geographical coordinate system. This is usually either latitude-longitude or UTM (Universal Transverse Mercator) coordinate systems. The closer together the grid points are located, the more detailed the information will be in the file. The details of the peaks and valleys in the terrain will be better modeled with small grid spacing than when the grid intervals are very large. Elevations other than at the specific grid point locations are not contained in the file. As a result, peak points and valley points not coincident with the grid will not be recorded in the file. For practical purpose this "Bare Earth" DEM is generally synonymous with a Digital Terrain Model (DTM). DEM has been prepared for M/s Bajaj Hindusthan Sugar Limited, Unit – Kundarkhi Sugar, for 5 km radius study area.

(A) DATA USED

DEM Data: Shuttle Radar Topographic Mission (SRTM) data

Data Source: http://srtm.csi.cgiar.org

Software Used: Arc GIS

(B) METHODOLOGY

Shuttle Radar Topographic Mission (SRTM) data has been used for creation of Digital Elevation Model of the study area. The SRTM data has vertical accuracy of 16m and the spatial resolution is of 90m.

1st Stage:

The first processing stage involves importing and merging the 1-degree tiles into continuous elevation surfaces in Arc GRID format.

2nd Stage:

Resampling the data at 23m is done and a contour interval of 10m through the usual process of interpolation is created.

3rd Stage:

SRTM data is converted in grid format through Arc GIS 10.3 to obtain elevation information of study area. Contours are then generated at 2.0 m interval through 3D analyst of Arc GIS and then are interpolating with raster data.

4th Stage:

Integration of DEM with contour map showing 3D view for analysis of surface is done.

(C) Interpretation

It is very clear from the DEM that the elevation varies from 102 m to 108 m in the whole study area. General Slope in study area is from North, North West to South East. Lowest elevation is found in South East of study area where elevation ranges from 102 -105 m amsl. DEM of the study area given in **Figure-2.6.**

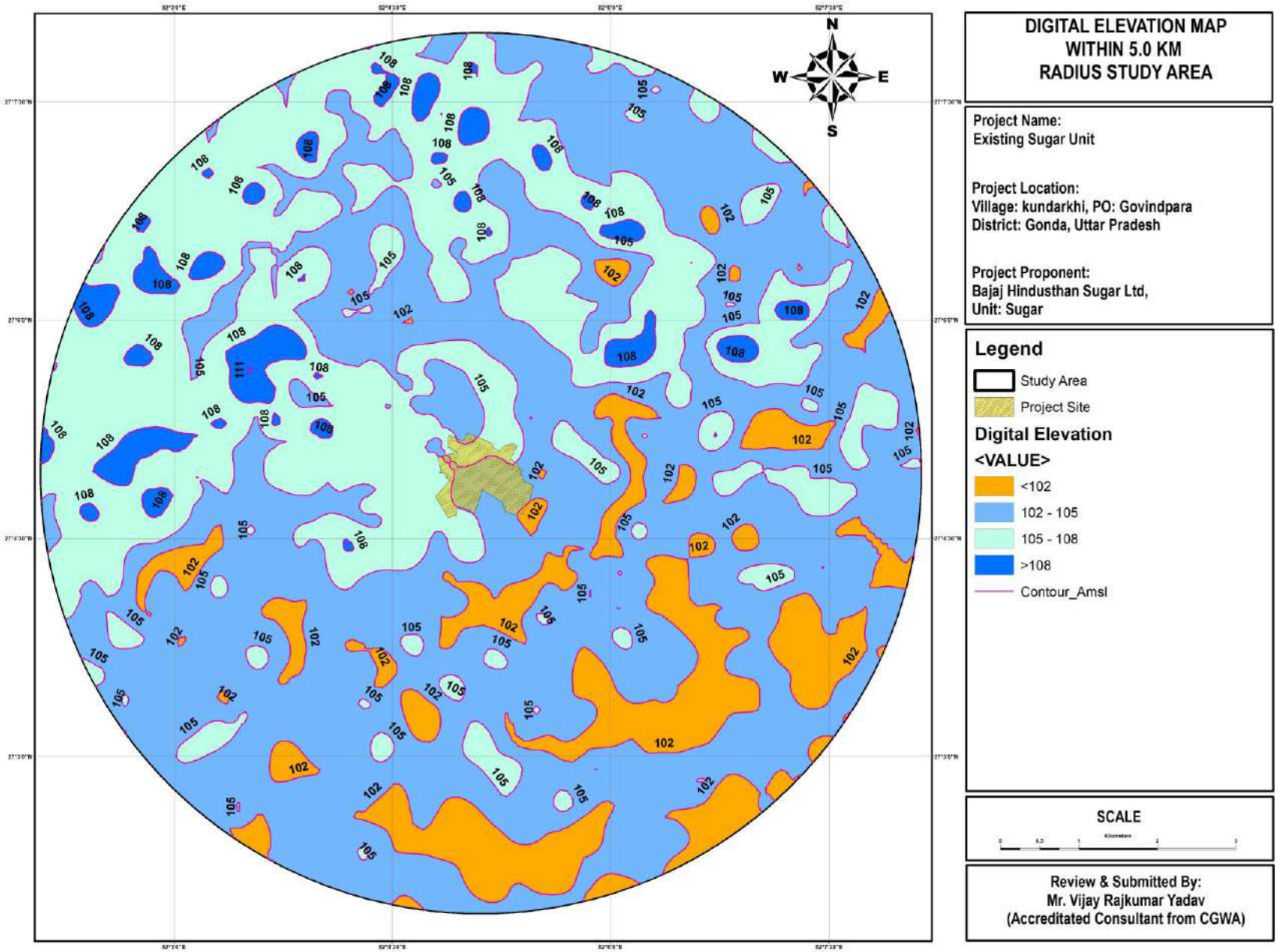


Fig: 2.7 Digital elevation map within Study area

2.6 BRIEF HYDROGEOLOGY OF THE AREA

The ground water in the area occurs both uner confined and water table conditions. It occurs in the zone of saturation within the granular zones encountered below the land surface. The principal source of replenishment to the ground water body is precipitation. The district lying south of river Ghaghra and north of river Kuwano is suitable for construction of shallow and deep tubewells. The aquifers material is comprised of fine to medium sand and coarse sand with gravel.

2.6.1 AQUIFER DESCRIPTION

The amount of the water to be absorbed by the earth depends upon the nature of the rocks or sediments for the purpose of ground water, the rocks or sediments that can hold, transmit and yield water are called aquifers. Accumulation of water in a particular place will depend upon the presence of water bearing horizons or aquifer at that particular place. Based upon permeability of the covering layers, aquifers can be particularly divided into two types, semiconfined and confined aquifers. Apart from these two types, aquifer bounded above by a semipervious layer is known as semi confined or leaky aquifer. The occurrence of ground water in a formation is largely governed by the hydro geological settings of the formation, including the degree of cementation and compaction. Unconsolidated formations are generally capable of storing and transmitting large quantity of ground water, thus forming extremely good aquifers. Gonda district is a part of the Ghaghra alluvial plains and is underlain by quaternary alluvium comprising mainly sands of various grades with clay and kankar. The central alluvial plains extend from north to south are made up of finer clastics comprising mainly clay, silt, sandy clay with kankar and subordinate sands.

2.6.2 GROUND WATER LEVEL TREND ANALYSIS (PREMONSOON & POST MONSOON) FOR 10 YEARS;

Table No. 2.3 Block Jhanjhari
(Pre-Monsoon Ground Water Level - 10 Years)

District	Block	Year-2011	Year - 2012	Year - 2013	Year - 2014	Year - 2015	Year - 2016	Year - 2017	Year - 2018	Year - 2019	Year - 2020
		PreMn	PreMn	PreMn	PreMn	PreMn	PreMn	PreMn	PreMn	PreMn	PreMn
Gonda	Jhanjhari	3.47	3.52	3.39	3.67	3.59	4.22	4.95	5.20	3.99	3.66

Table No. 2.4 Block – Jhanjhari
(Post-Monsoon Ground Water Level-10 Years)

District	Block	Year - 2011	Year - 2012	Year 2013	Year - 2014	Year - 2015	Year - 2016	Year - 2017	Year - 2018	Year - 2019	Year - 2020
		PostMn	PostMn	PostMn	PostMn	PostMn	PostMn	PostMn	PostMn	PostMn	PostMn
Gonda	Jhanjhari	2.11	2.46	2.50	2.22	3.14	4.16	4.03	3.87	2.21	2.11

2.6.3 HYDROGRAPHS OF THE WATER LEVEL FOR 10 YEARS

Ground water occurs under phreatic to semi confined and confined conditions. The near surface aquifer is under unconfined / water table condition. The shallow phreatic aquifer is tapped by dugwells. In last ten-years water level data showing the declining trends from year 2011 to year 2020. Reason of declining trends is majorly due to increase in industrial and domestic draft and decrease in rainwater recharge in comparison to draft.

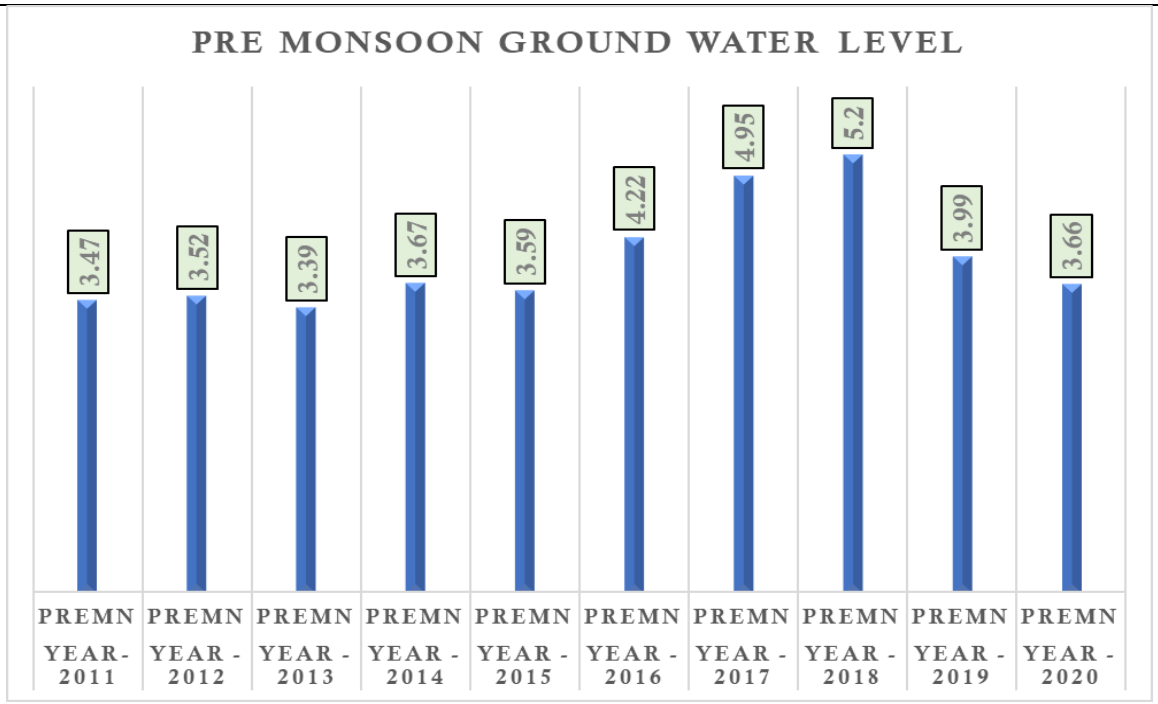


Fig No. 2.8 Hydrographs of Pre-Monsoon Ground Water Level

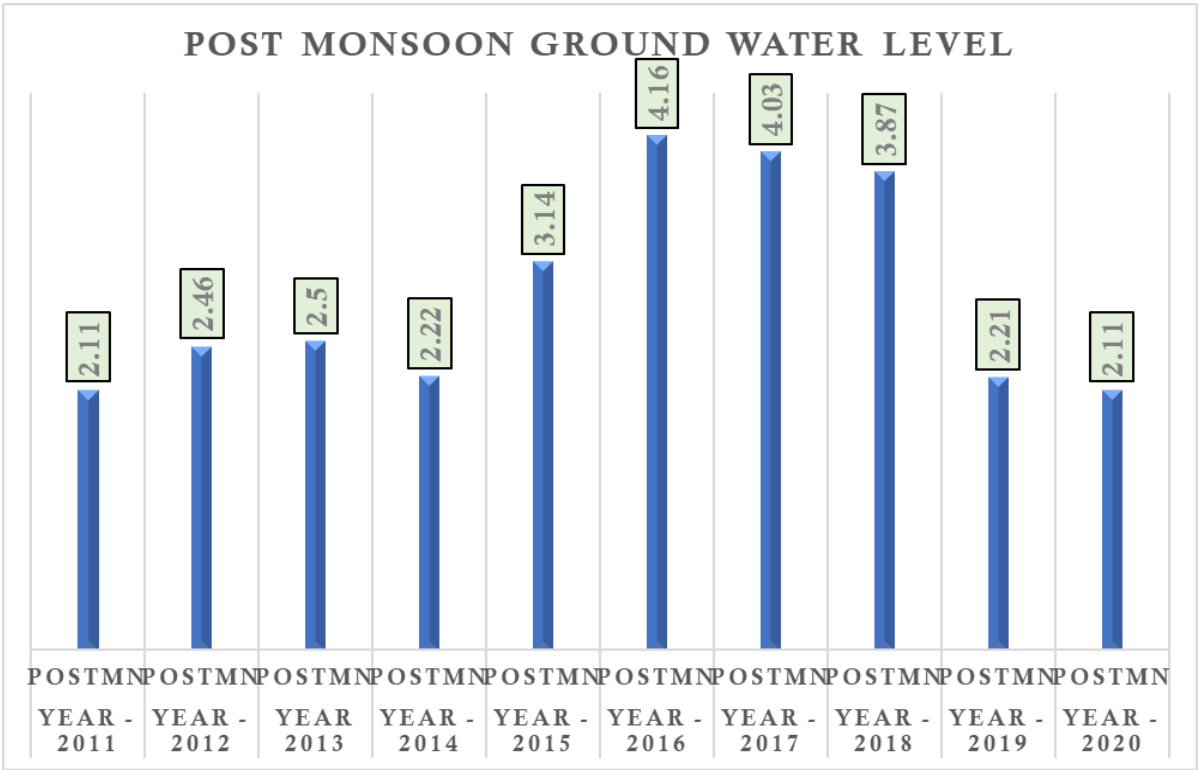


Fig No. 2.9 Hydrographs of Post Monsoon Ground Water Level

Table 2.5

Monitoring location of Ground Water

Code	Village	Latitude	Longitude	Pre Monsoon	Post Monsoon	Elevation (m)	Direction from Project Site
		(In Decimal Degree)		(mbgl)			
MW1	Within Project Site	27.083868°	82.083954°	4.5	3.6	105	
MW2	Bhamaicha	27.125460°	82.080145°	4.6	3.4	102	4.56 km, N
MW3	Imiliya Roopi	27.115597°	82.113449°	4.8	3.7	103	4.47 km, NE
MW4	Vidya Nagar	27.084604°	82.127409°	4.6	3.75	102	4.24 km, E
MW5	Dalpatpur	27.051366°	82.108963°	4.4	3.55	101	4.20 km, SE
MW6	Khutehna	27.050433°	82.083258°	4.2	3.45	103	3.74 km, S
MW7	Vishnaga	27.073593°	82.040493°	4.3	3.65	102	4.45 km, SW
MW8	Mahadaiya	27.084434°	82.059550°	4.65	3.85	104	2.40 km, W
MW9	Akma	27.117367°	82.057525°	4.55	3.45	104	4.44 km, NW

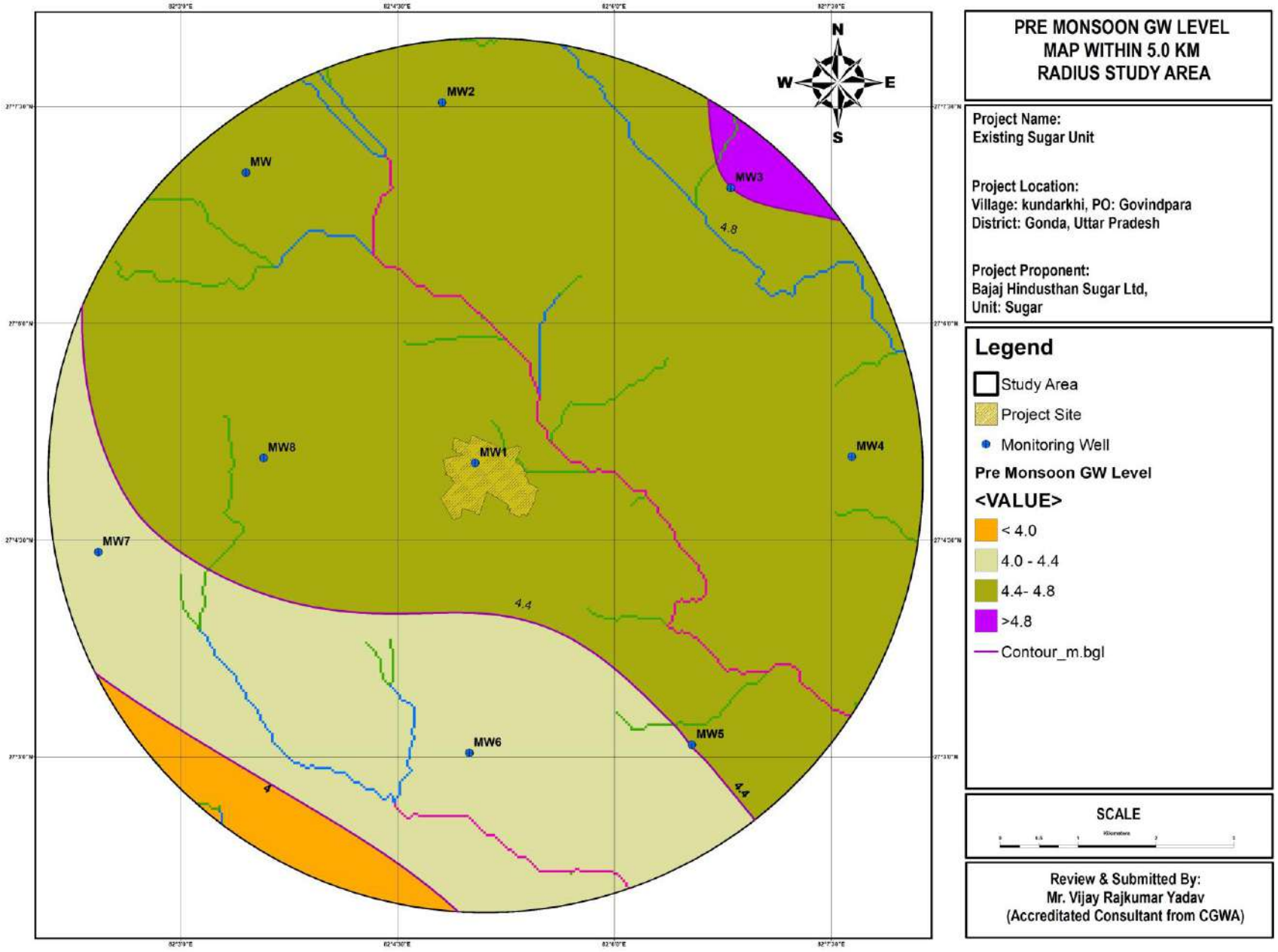


Figure No.: 2.10 Ground water level map Pre-Monsoon

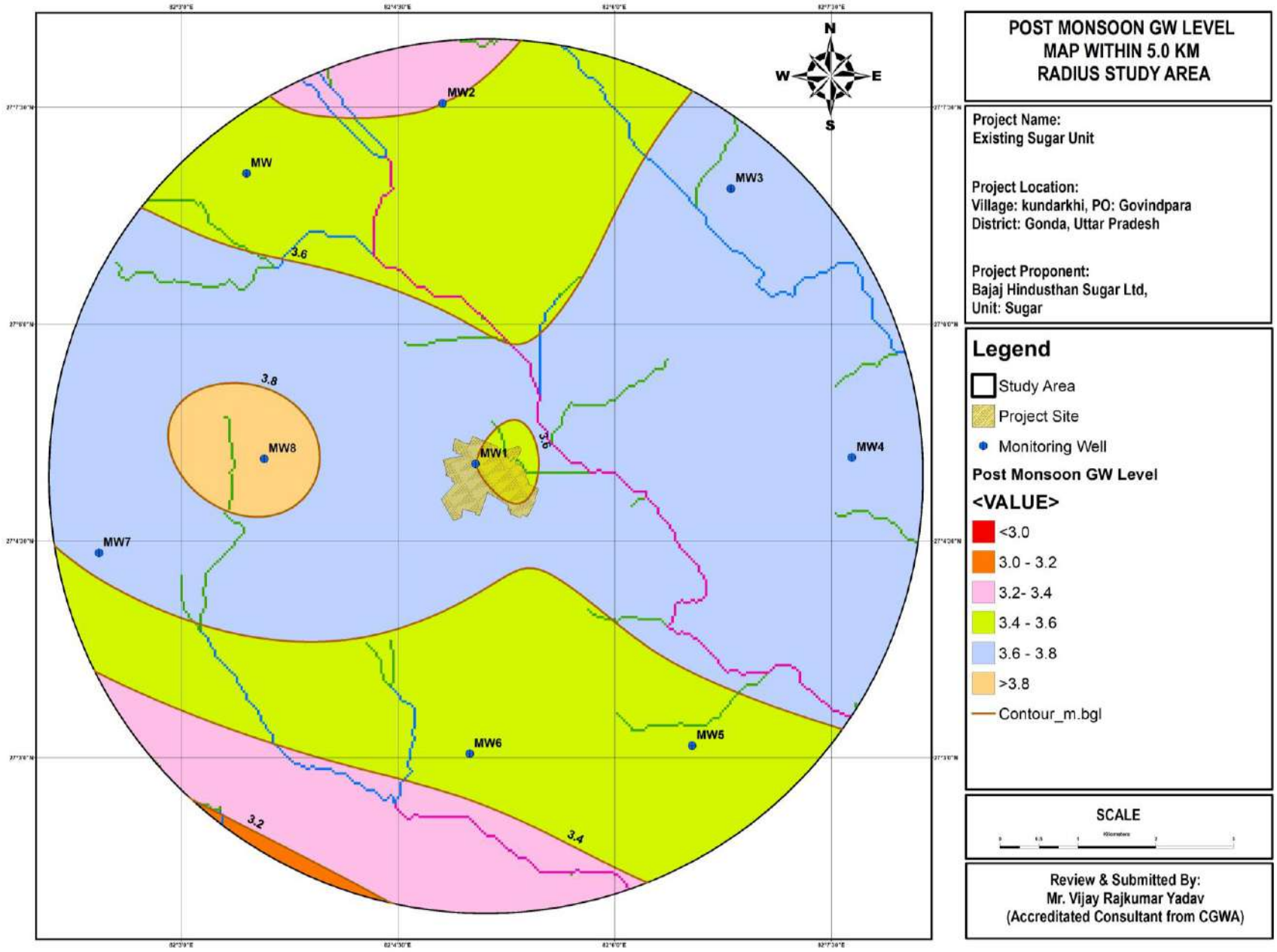


Figure No.: 2.11 Ground water level map Post monsoon

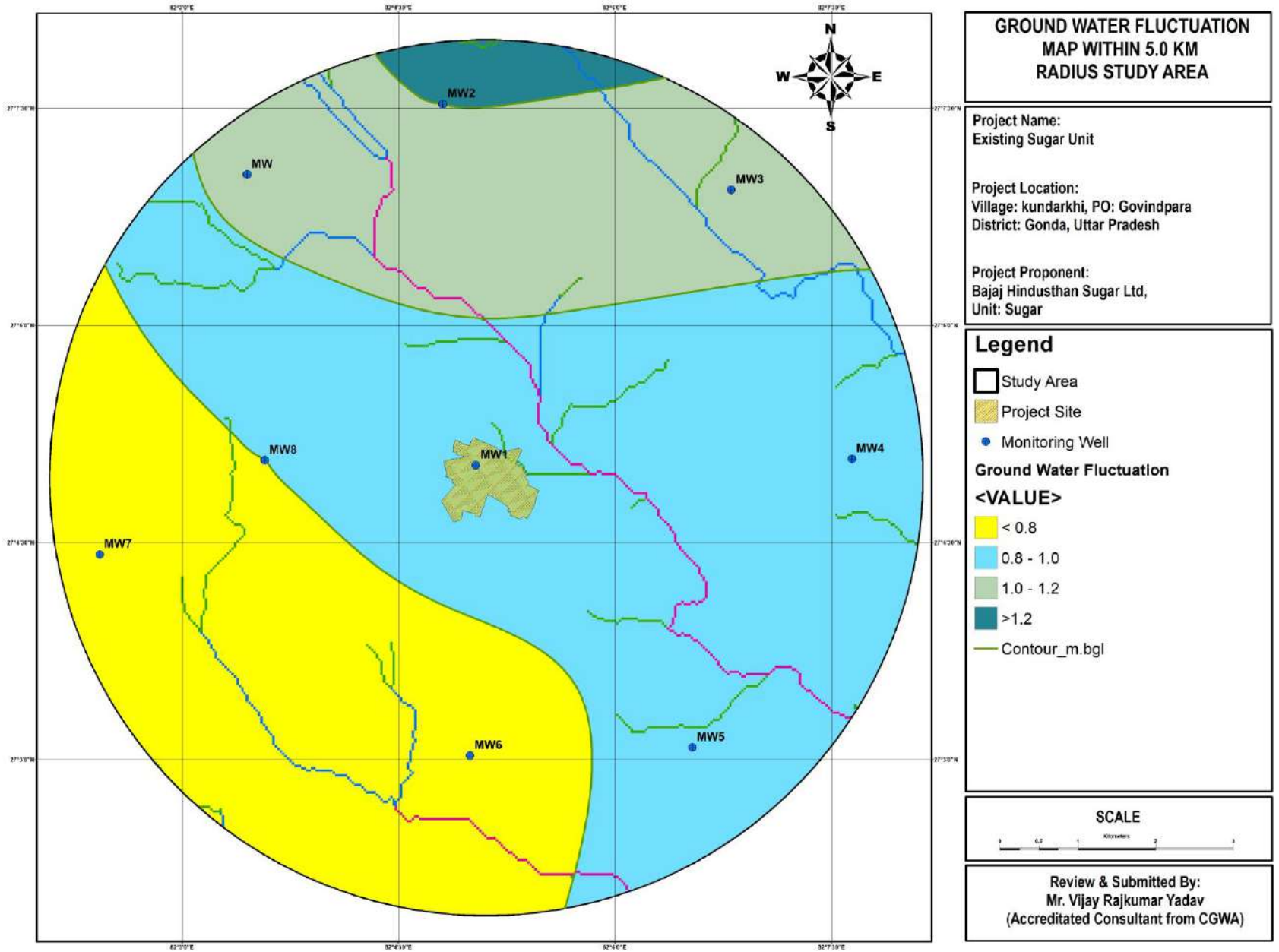


Figure No.: 2.12, Water Level Fluctuation within 5 Km Study Area

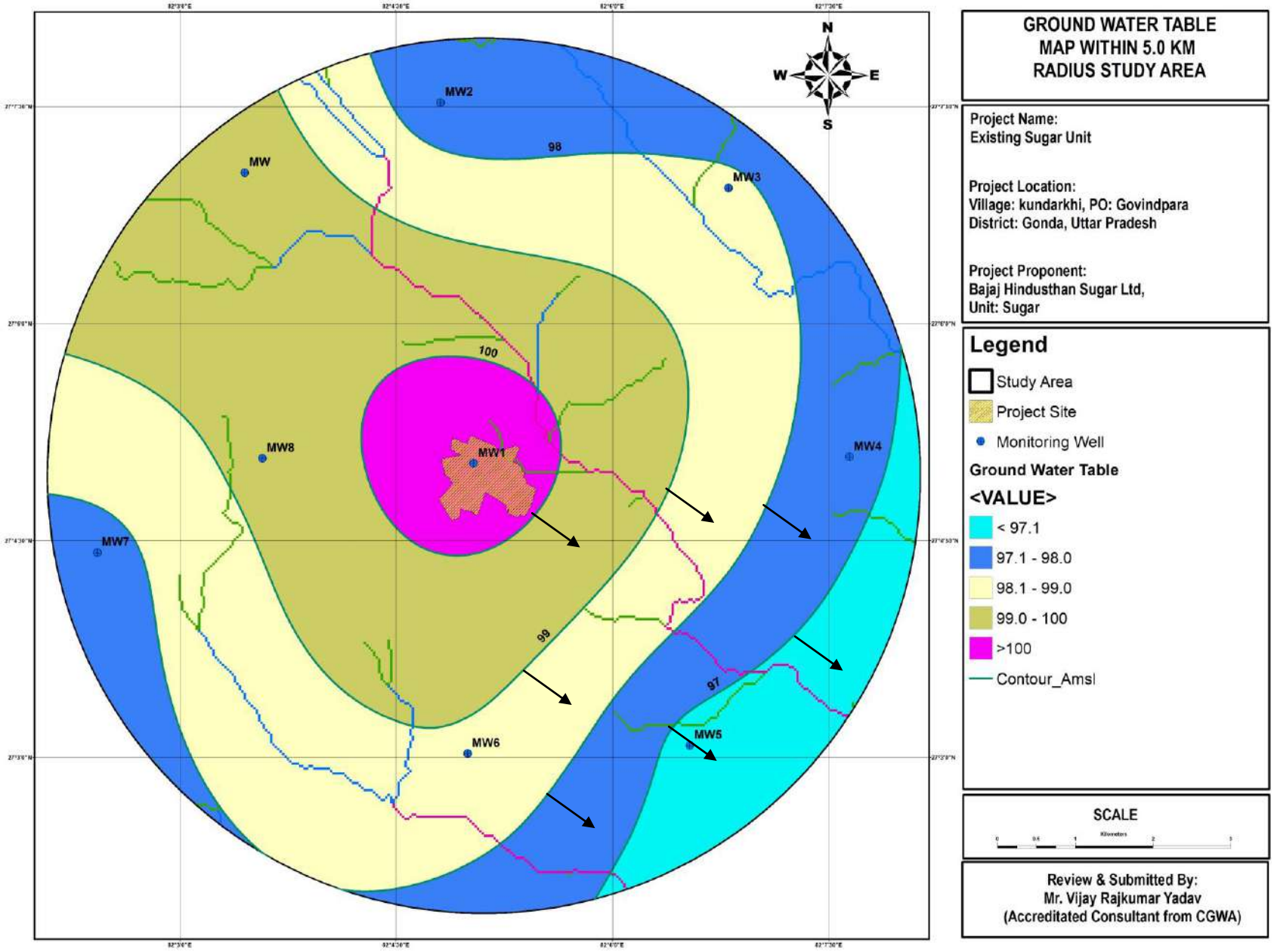


Figure No.: 2.13 Water Table Flow Maps within 5 Km Study Area

2.7 IMPACT ON GROUND WATER RESOURCES AND QUALITY

The project area is covered with rich fertile soil and underlain by a large thickness of alluvium making it one of the richest ground water repositories. Ground water is a major source of fresh water in the study area. It is the most dependable source of water, comparatively free from the vagaries of nature, easily accessible, available at the point of use and economical. Hence it is being developed indiscriminately and the ground water reservoir is stressed. Due to industrialization, urbanization and modern farming practices its quality is also at stake. The food production around the study area is commensurate with the self-sufficiency. One of the major contributors for this sufficiency is irrigation. To meet this high irrigational requirement, water resources are being increasingly developed. Ground water contributes to about 71% of the irrigation needs of the area. The indiscriminate development of ground water has resulted in depletion of groundwater storage and lowering of water level in certain areas on one hand. On other side the surface water development in areas having shallow water level has resulted in water logging and soil salinization. All these negative impacts on the resource give rise to the need for regular and continuous monitoring of the ground water regime. The monitoring data forms the base of management practices. In order to manage the water resources and plan development on scientific lines a data base needs to be generated. In view of relative importance of this valuable resource it becomes imperative to adopt sound and scientific management of ground water resources.

- **Impact on Ground Water Resources during operation of the industry:**

The requirement of project a total of **2000 KLD** of fresh ground water need to be abstracted. To meet the balance requirements for gardening etc. recycled of water from secondary effluent will be used.

Since the area falls in the Safe category and the ground water level of the area is more than 5 m bgl, hence ground water recharge proposed against anticipated groundwater draft. The annual draft is **300000 cum/year**.

- ✓ To harvest rainwater, rainwater harvesting structure will be constructed within the project area.
- ✓ Further, for ground water monitoring piezometers already installed and few more will be installed in project premises and in nearby areas.
- ✓ Water recycling is an essential component of managing our water resources efficiently and making the most of a resource that is often wasted. Water recycling cannot be adopts due to quality issue of waste water.
- ✓ In practice this means using high quality water for drinking and other personal uses, but not necessarily for purposes where alternative water sources can be safely used, such as toilet flushing, garden watering and crop irrigation.

2.7.1 GROUND WATER QUALITY

Table No 2.6: Ground Water Quality

Sr. No.	Parameter	Unit	Within Project Site	Bhamaicha	Imiliya Roopi	Vidya Nagar	Dalpatpur	Khutehna	Vishnaga	Mahadaiya	Akma	Indian Standard 10500: 2012	
												Desirable	Desirable
1	**Colour**	Hazen	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5	**15**
2	**Odour**	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	**Agreeable**
3	**pH**	-	7.4	7.5	7.4	7.5	7.5	7.5	7.4	7.5	7.4	6.5 - 8.5	**No Relaxation**
4	**Turbidity**	NTU	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1	**5**
5	**Electrical Conductivity**	µs/cm	678	667	688	712	624	726	684	654	672	-	**-**
6	**Total Dissolved Solids (TDS)**	mg/l	384.6	402.8	416.4	416.8	385.2	429.6	394.2	403.0	402.5	500	**2000**
7	**Ammonia (as total ammonia-N)**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.5	**No Relaxation**
8	**Anionic Detergents (as MBAS)**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.2	**1.0**
9	**Calcium as Ca**	mg/l	54.4	56.0	57.6	56.0	51.2	60.8	64.0	52.8	54.4	75	**200**
10	**Magnesium as Mg**	mg/l	31.10	31.10	34.02	33.48	29.16	31.10	27.21	28.18	33.048	30	**100**
11	**Chloride as Cl**	mg/l	38.0	36.0	36.0	42.0	36.0	38.0	40.0	36.0	40.0	250	**1000**
12	**Fluoride as F**	mg/l	0.36	0.37	0.42	0.42	0.42	0.39	0.38	0.42	0.40	1.0	**1.5**
13	**Free Residual Chlorine**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.2	**1.0**
14	**Nitrate as NO_3**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	45	**No Relaxation**
15	**Phenolic Compound (as C_6H_5OH)**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.001	**0.002**
16	**Sulphate as SO_4**	mg/l	34.6	34.2	30.4	32.0	24.6	28.8	30.0	24.6	32.6	200	**400**
17	**Alkalinity as $CaCO_3$**	mg/l	296.0	292.0	304.0	304.0	276.0	308.0	308.0	276.0	300.0	200	**600**
18	**Total Hardness as**	mg/l	264.0	268.0	284.0	276.0	248.0	280.0	272.0	248.0	272.0	200	**600**

	$CaCO_3$												
19	**Aluminium as Al**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.03	**0.2**
20	**Boron as B**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.5	**1.0**
21	**Copper as Cu**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.05	**1.5**
22	**Iron as Fe**	mg/l	0.10	0.11	0.13	0.08	0.18	0.09	0.07	0.11	0.08	0.3	**No Relaxation**
23	**Manganese as Mn**	mg/l	0.04	0.06	0.06	0.06	0.08	0.04	0.05	0.04	0.05	0.1	**0.3**
24	**Zinc as Zn**	mg/l	0.84	0.76	0.71	0.67	0.53	0.36	0.89	0.52	0.59	5	**15**
25	**Cadmium as Cd**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.003	**No Relaxation**
26	**Lead as Pb**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.01	**No Relaxation**
27	**Mercury as Hg**	µg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.0	**No Relaxation**
28	**Nickel as Ni**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.02	**No Relaxation**
29	**Arsenic as As**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.01	**0.05**
30	**Total Chromium as Cr**	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.05	**No Relaxation**
Microbiological Parameters													
31	**E. coli**	MPN/ 100 ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	**Shall not be detected in any 100 ml sample**	
32	**T. coli**	MPN/ 100 ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	**Shall not be detected in any 100 ml sample**	

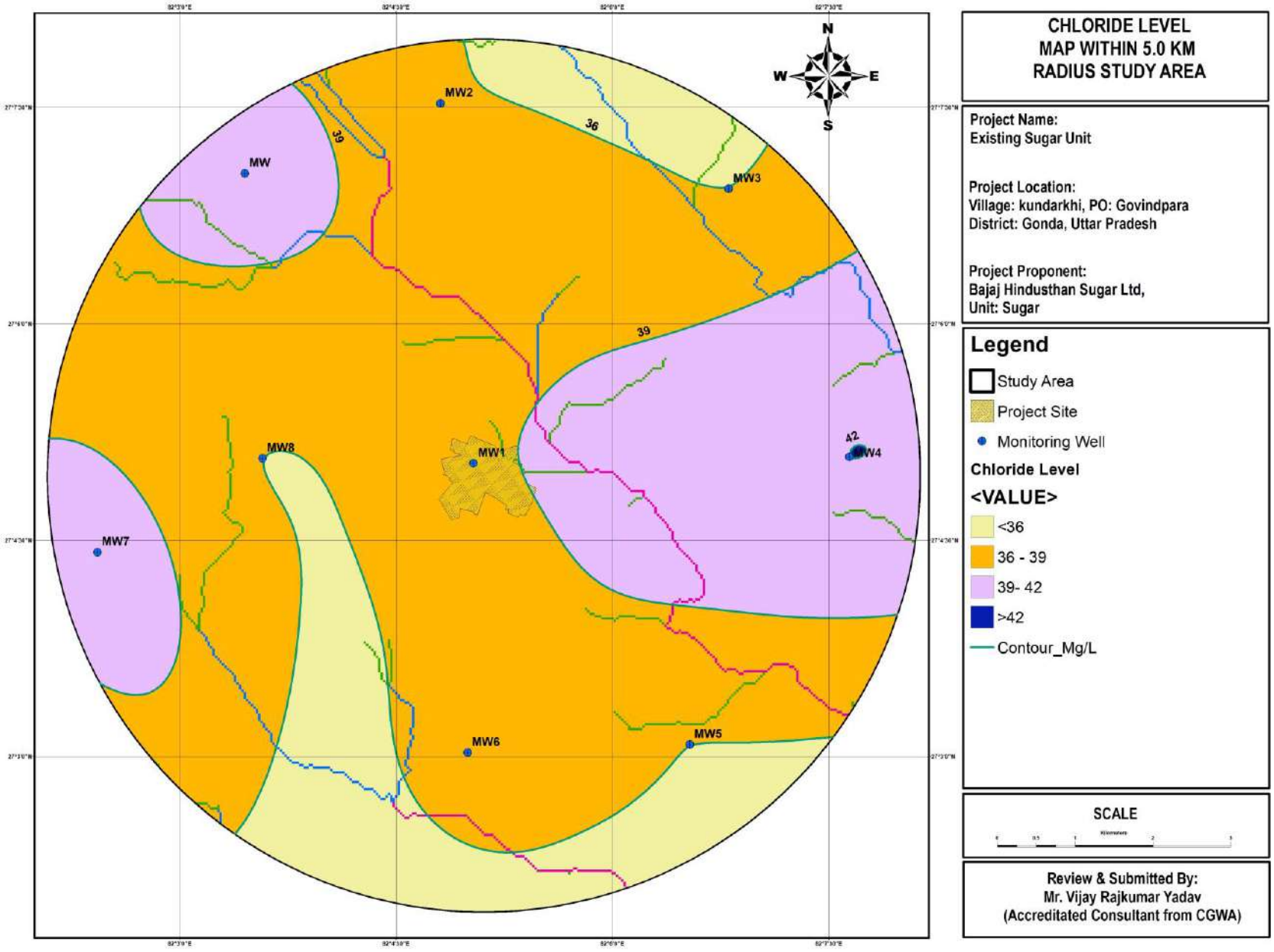


Figure No: 2.14 Chloride Level map Within 5 km of Study Area

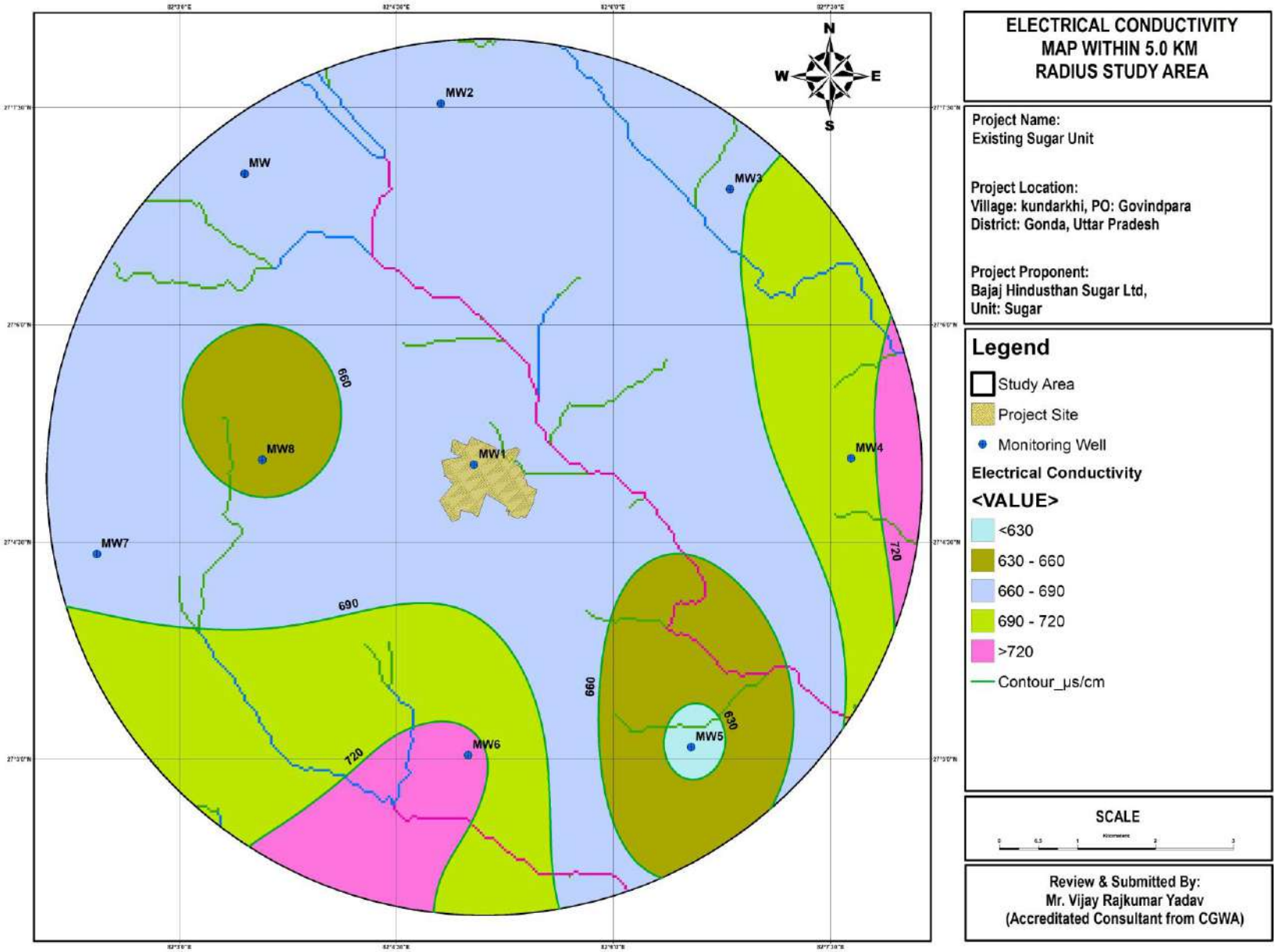


Figure No: 2.15 Electrical Conductivity Level Map Within 5 km of Study Area

2.7.2 WATER QUALITY OF NEARBY WATER BODIES

Table No.2.7 Surface Water Quality

Sr. No.	Test Parameter	Unit	Raipur Tal	Kanjra Tal	Pond (Mahadaiya Village)	Pond (Imiliya Roopi Village)
1.	**pH**	-	7.5	7.6	7.4	7.4
2.	**Turbidity**	mg/l	006	005	005	004
3.	**Electrical Conductivity**	µs/cm	628.4	586.4	562.8	612.2
4.	**Total Hardness as $CaCO_3$**	mg/l	192.0	200.0	212.0	208.0
5.	**Alkalinity as $CaCO_3$**	mg/l	208.0	212.0	228.0	220.0
6.	**Calcium as Ca**	mg/l	44.8	49.6	48.0	48.0
7.	**Magnesium as Mg**	mg/l	19.44	18.46	22.35	21.38
8.	**Chloride as Cl**	mg/l	18.0	24.0	26.0	30.0
9.	**Fluoride as F**	mg/l	0.40	0.38	0.38	0.36
10.	**Sulphate as SO_4**	mg/l	16.0	18.4	16.8	22.2
11.	**Nitrate as NO_3**	mg/l	8.4	8.8	7.2	10.2
12.	**Phosphate as P_2O_5**	mg/l	2.78	3.25	1.28	6.46
13.	**Hexavalent Chromium as Cr^{6+}**	mg/l	BDL	BDL	BDL	BDL
14.	**Total Kjeldahl Nitrogen**	mg/l	4.68	5.12	4.58	1.28
15.	**Phenolic Compound (as C_6H_5OH)**	mg/l	BDL	BDL	BDL	BDL
16.	**Total Dissolve Solid (TDS)**	mg/l	378.4	319.8	332.8	348.2
17.	**Total Suspended Solid (TSS)**	mg/l	62.9	70.4	54.0	36.9
18.	**Dissolve Oxygen**	mg/l	4.6	4.4	4.4	4.2
19.	**Biochemical Oxygen Demand**	mg/l	3.2	4.2	4.6	5.2
20.	**Chemical Oxygen Demand**	mg/l	20.0	32.0	24.0	24.0
21.	**Sodium as Na**	mg/l	36.8	40.0	36.4	44.0
22.	**Potassium as K**	mg/l	5.8	6.5	5.6	5.0
23.	**Aluminium as Al**	mg/l	BDL	BDL	BDL	BDL
24	**Boron as B**	mg/l	BDL	BDL	BDL	BDL
25	**Iron as Fe**	mg/l	0.20	0.19	0.15	0.11
26.	**Manganese as Mn**	mg/l	BDL	BDL	BDL	BDL

27.	**Lead as Pb**	mg/l	BDL	BDL	BDL	BDL
28.	**Nickel as Ni**	mg/l	BDL	BDL	BDL	BDL
29.	**Cadmium as Cd**	mg/l	BDL	BDL	BDL	BDL
30.	**Total Chromium as Cr**	mg/l	BDL	BDL	BDL	BDL
31.	**Copper as Cu**	mg/l	BDL	BDL	BDL	BDL
32.	**Zinc as Zn**	mg/l	0.65	0.48	0.75	0.58
33.	**Arsenic as As**	mg/l	BDL	BDL	BDL	BDL
34.	**Mercury as Hg**	mg/l	BDL	BDL	BDL	BDL

2.7.3 Ground water analysis result and its interpretation:

A review of the above-mentioned chemical analysis of ground water samples reveals that there a variation in chemical composition of water samples from nearby villages. Analysis results of ground water reveal the following: -

- pH varies from 7.4 to 7.5
- Total Hardness varies from 248.0 to 284.0mg/l
- Chloride varies from 36.0 to 42.0 mg/l
- Fluoride varies from 0.36 to 0.42 mg/l

All the parameters were found within the range as per drinking water standards IS - **10500:2012** hence, the ground water of the study area is potable.

2.7.4 Surface water analysis result and its interpretation:

The pH water samples varied from 7.4 to 7.6 showing good productivity of water. The Dissolved oxygen content varied from 4.2 to 4.6 mg/l, which is good indicating oligotrophic water, favorable for aquatic organisms. This showed that the physical quality of river water samples was good.

Total suspended solids (36.9 to 70.4 mg/l) were fair in all water bodies. The values of BOD (3.2 to 5.2 mg/l) and COD (20.0 to 24.0 mg/l) were also low indicating very marginal pollution of surface water samples. The values of conductivity ranges from 562.8 to 628.4 µs/cm which is satisfactory due to the presence of ions in the water bodies

CHAPTER-3
DETAILS OF THE TUBEWELL/BOREWELL WITH LOCATION ON SITE PLAN AND LOCATION OF THE PIEZOMETER

3.1 DETAIL OF THE TUBEWELLS/BOREWELLS

The total water requirement of the project being met from ground water through Four existing bore well. Details of the existing tube wells are given below:

Table No. 3.1 Details of the existing tube wells

Sr. No.	Type of Structure-Date	Depth (m)/ Dia	Depth to Water Level (mbgl)	Discharge (m3 /Hr)	Operational Hrs./ Day	Mode of Lift	Pump Capacity (HP)	Coordinates	Piezometer Meter Installed
1	Borewell/ 01/09/2007	121/250	4.50	150	5/150	Submersible	50	27.0869° 82.0836°	Yes
2	Borewell/ 01/09/2007	121/250	4.50	150	5/150	Submersible	50	27.0846° 82.0858°	Yes
3	Borewell/ 01/09/2007	121/250	4.50	150	2/150	Submersible	50	27.082° 82.0854°	Yes
4	Borewell/ 01/09/2007	121/250	4.50	50	4/150	Submersible	10	27.0833° 82.0807°	Yes
	Logbook is available with Each Borewell								

3.2 DETAIL OF INSTALLED PIEZOMETER WITH COORDINATES

Table No. 3.2 Details of Piezometer

S.No	Installed Piezometer	Coordinates
1.	Piezometer One	Latitude: 27.08423° Longitude: 82.08235°
2.	Piezometer Two	Latitude: 27.08245° Longitude: 82.07987°

3.2.1 PHOTOGRAPHS OF PIEZOMETERS



Image 3.1 (A) Piezometer One



Image 3.1 (B) Piezometer Two

3.3 WATER REQUIREMENT & ITS UTILIZATION

Existing Industrial fresh water requirement is 1950 KLD. Domestic water requirement is 50 KLD. Hence total fresh water requirement is 2000 KLD, which will be sourced from ground water.

Table No.: 3.3
Breakup of Fresh Water Requirement

S.No	Particulars	Water Requirement (KLD)
1.	Domestic Activates	50
2.	Industrial	1950
	Total	2000

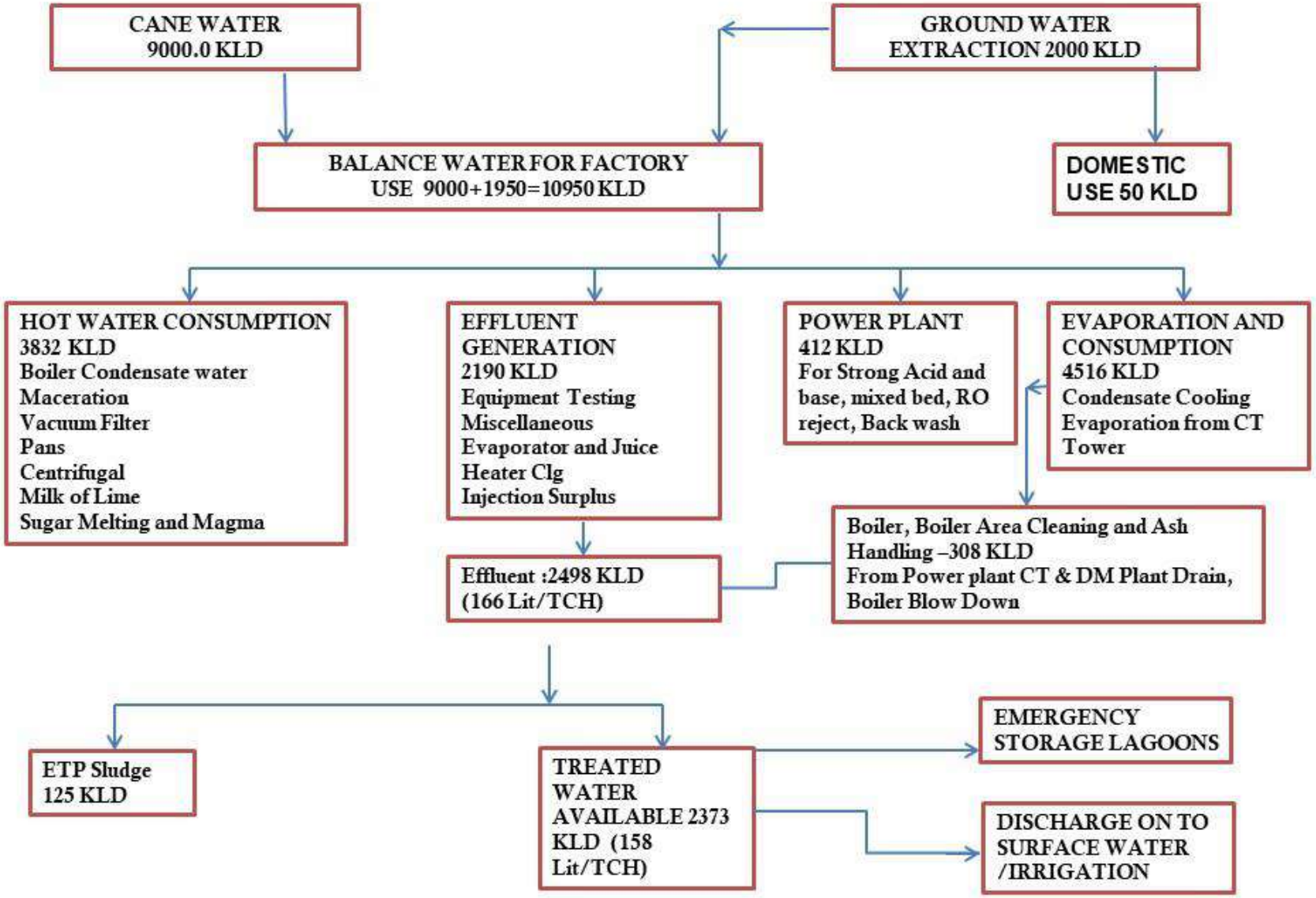


Fig No. 3.2 Water Balance of Sugar Unit

CHAPTER-4
COMPREHENSIVE ASSESSMENT OF THE IMPACT ON THE GROUND WATER REGIME IN AND AROUND THE PROJECT AREA HIGHLIGHTING THE RISKS AND PROPOSED MANAGEMENT STRATEGIES PROPOSED TO OVERCOME ANY SIGNIFICANT ENVIRONMENTAL ISSUES

4.1 SOCIAL ECONOMIC ASSESSMENT STUDY

An essential part of environmental study is socio-economic environment incorporating various facts related to socio-economic conditions in the area, which deals with the total environment. Socio economic study includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature of aesthetic significance such as temples, historical monuments etc. at the baseline level. This would help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

Socio-economic study of an area provides a good opportunity to assess the socio-economic conditions of an area. This study will possibly make a change in living and social standards of the particular area benefitted due to the Project. The gross economic production of the area will be increased substantially due to the existence of this project. It can undoubtedly be said that this project will provide direct and indirect employment and improve the infrastructural facilities and standards of living of the area.

Objectives of the Study

The objectives of this socio-economic report consist of:

- To conduct socio-economic assessment study in Project Area.
- To know the current socio-economic situation in the region to cover the sub sectors of education, health, sanitation, and water and food security.
- To recommend practical strategic interventions in the sector.
- To help in providing better living standards.

Scope of Work

- To study the Socio-economic Environmental of area from the secondary sources,
- To conduct socio-economic survey for primary data collection and to know the current socio-economic situation in the region to cover the sub sectors of education, health, sanitation, and water and food security,
- Developing a questionnaire for survey,
- Prediction of project impact and mitigation measures,
- To recommend practical strategic interventions in the sector.

4.2 BASELINE STATUS

The latest available data has been complied to generate the existing socio-economic scenario of the study area. Information on socio-economic profile was collected from the Primary Census Abstract CD 2011 including the Population details of the region. M/s Bajaj Hindusthan Sugar Limited, Unit Sugar Located at Village: Kundarkhi, Block: Jhanjhari, District: Gonda, Uttar Pradesh. Total 35 villages are found within the study area and Socio-economic data within 5 km radius of the project site which are enlisted in Table 4.1.

Table 4.1
Summary of the Socioeconomic Structure of the study Area

S. No	Particulars	Study Area
1.	Household	8013
2.	Total Population	51891
3.	Total Male Population	27124
4.	Total Female Population	24767
5.	Population (Age 0-6 years)	8432
6.	Total SC Population	9629
7.	Total Literates	27669

Table No. 4.2
Demographic Profile of the Area

S. No	Name of Village	Household	Total Population	Total Male Population	Total Female Population	Population (Age 0-6 years)	Total SC Population	Total Literates
1.	Mahadaiya	101	675	347	328	132	281	294
2.	Bharhapara	88	596	293	303	102	105	315
3.	Gobindpara	147	1034	547	487	163	320	544
4.	Sultan Jot	152	772	403	369	107	26	452
5.	Birwa Babhani	210	1277	684	593	190	629	673
6.	Beervisen	335	2214	1167	1047	312	317	1285
7.	Ruphideeh	175	1107	548	559	163	388	624
8.	Khutehna	70	615	312	303	113	56	404
9.	Belbahria	80	525	267	258	79	69	363
10.	Dandua Dasvatia	134	902	464	438	141	141	514
11.	Kastuwa	341	2205	1133	1072	407	557	1117

S. No	Name of Village	Household	Total Population	Total Male Population	Total Female Population	Population (Age 0-6 years)	Total SC Population	Total Literates
12.	Chaksad	196	1427	766	661	269	200	729
13.	Son Bharia	100	600	311	289	110	296	264
14.	Bhamaicha	118	965	509	456	150	220	519
15.	Kinki	139	949	483	466	137	73	483
16.	Gharwa Jot	171	1064	540	524	169	441	503
17.	Siswaria	504	3676	1899	1777	616	214	1964
18.	Gourwa Kanoongo	282	1878	989	889	329	297	874
19.	Noubara	431	2706	1381	1325	512	471	1374
20.	Kharai Khirwa	296	2118	1144	974	314	290	1226
21.	Mukraha	146	757	407	350	121	371	319
22.	Akma	156	1079	566	513	184	95	587
23.	Vidya Nagar	390	2709	1417	1292	442	256	1542
24.	Dalpatpur	236	1419	759	660	216	551	764
25.	Vishnaga	212	1302	697	605	220	199	717
26.	Harhava	523	3424	1813	1611	560	1017	1655
27.	Gardhi	552	3304	1744	1560	543	227	1927
28.	Kemi	216	1304	663	641	200	244	695
29.	Chisti Pur	513	3349	1755	1594	543	223	1653
30.	Kunderahwa	215	1361	701	660	210	274	743
31.	Kundrkhi	102	584	325	259	90	165	354
32.	Khiria	296	1538	793	745	208	534	786
33.	Daulatpur	211	1309	682	627	194	65	791
34.	Gopiyapur	102	623	334	289	105	12	300
35.	Newari	73	524	281	243	81	5	315
Total		**8013**	**51891**	**27124**	**24767**	**8432**	**9629**	**27669**

- Total Number of households is about 8013.
- Total population of villages within the 5 km study area is 51891 out of which males are 27124 and Females are 24767.
- Sex ratio in the study area is 913.
- Out of the total population, the population of children within the age 0-6 age-group is about 8432 (16.24 %).
- Scheduled caste population is 9629 (18.55 %).
- Out of the total population in the study area is 27669 i.e 53.32 % are literates.

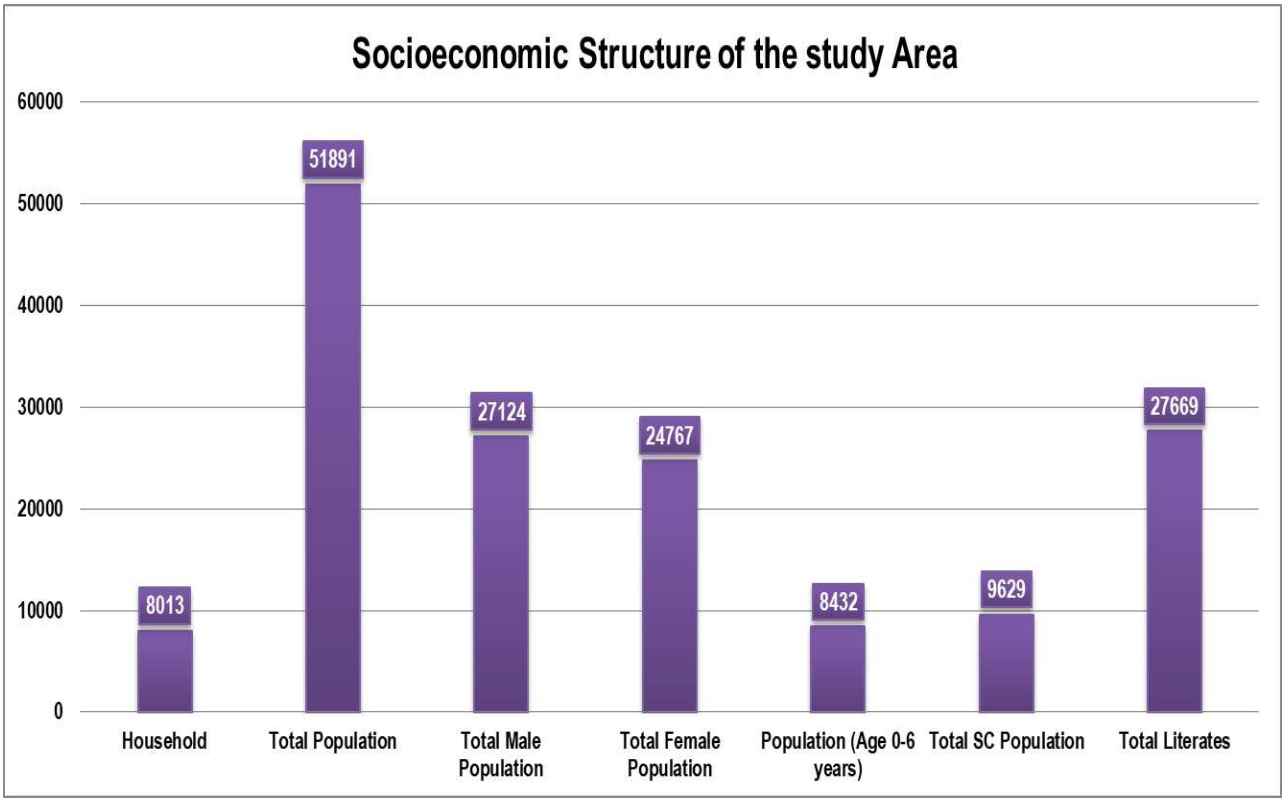


Fig No.: 4.1 - Population Details in the study area

DISTRIBUTION OF VILLAGES ACCORDING TO AVAILABILITY OF DIFFERENT AMENITIES, 2011											
Name of the Block	Number of Inhabited Village	Type of Amenity Available				Type of Amenity Available					
		Education	Medical	Improved Drinking Water	Post Office	Telephone	Transport	Banks	Agricultural Credit Societies	Approach Pucca Road	Power Supply
Jhanjhari	35	10	8	Yes	4	12	Yes	4	0	4	Yes

4.3 DEPENDENCY ON SOURCES OF WATER

Tap Water-treated: This source of drinking water refers to a source of drinking water which is provided to the villagers through pipes within their premises or to the villagers through common taps (public taps/community water points) by the Government departments, local bodies, panchayats, public or private estate agencies, etc. after treatment. Such a source is treated as 'Tap water from treated source.

Tap Water-un-treated: If the villagers are drawing drinking water through pipes either directly from a well or bore well or after pumping the well or tube well water, or the water is supplied through pipes to the households of the village or through public taps without treatment. Such a source is treated as 'Tap water from un-treated source'.

Covered Well (CW): A well that is (1) covered on sides from run-off water (i.e., excess water from rain, snowmelt or other sources flows over the land) through a wall lining or casting that is raised above ground level on a platform that diverts spilled water away from the well and (2) covered so that bird droppings and animals cannot fall down the hole. It is considered as covered well.

Un-covered Well (UW):

A well which is (1) un-covered on sides from runoff water, (2) un-covered from bird droppings and animals; or (3) both.

Hand Pump (HP):

Hand pump means where ground water is taken out manually by operating a hand pump.

Tube well / Borehole (TW):

Tube well denotes the ground water source from where ground water is taken out through electrical or diesel pump. Spring, River/Canal, Tank/Pond/Lark are self-explanatory.

The main reason for this rapid fall in groundwater level is unrestricted extraction of water through submersible pumps installed at every home. Wastage of fresh water occurs in mammoth proportions and unfortunately there is no recharging mechanism in place as heavy construction, accompanied by rising population and expansion of the city is gobbling upland.

Table No. 4.3

Availability of hand Pump and Tube Wells

Name of Block	Only tap (treated/ untreated)	Only well (covered / uncovered)	Only tubewell /borewell	Only hand pump	More than one source only from tap, well, tubewell, hand pump
JHANJHARI	Yes	10	25	20	5

4.4 INDUSTRY WITHIN THE 5.0 K RADIUS OF THE PROJECT SITE

• **M/S BAJAJ HINDUSTHAN SUGAR LIMITED, UNIT: KUNDARKHI (SUGAR DIVISION)**	Within 5.0 km of the study area

4.5 IMPACTS DUE TO GROUND WATER DRAFT

Groundwater is a valuable resource both in the India and throughout the world. Where surface water, such as lakes and rivers, are scarce or inaccessible, groundwater supplies many of the hydrologic needs of people everywhere. In the India, it is the source of drinking water for about half the total population and nearly all of the rural population. Groundwater depletion,

a term often defined, as long-term water-level declines caused by sustained groundwater pumping, is a key issue associated with groundwater use. Many areas of the India are experiencing groundwater depletion.

- Lowering of the water table.
- Reduction of water in streams and lakes.
- Land subsidence
- Increase costs for the user.
- Deterioration of water quality

❖ The main impact of ground water draft by industries is groundwater depletion, a term often defined as long-term water-level declines caused by sustained groundwater pumping is a key issue associated with groundwater use which may cause the following impacts on socio economic condition:

❖ Over pumping lowered the water level, which decline the yield and reduce its availability for irrigation as well as drinking purposes, which can directly effect to the basic need of the population

❖ Crop production decrease from lack of water availability (40% of global food production relies on groundwater)

❖ Decline in water level may lead to deterioration of water quality due to excessive ground water draft may have an adverse effect to the health of the people in the study area.

❖ When water is taken out of the soil, the chances of soil collapses, compacts, and drops and causes land subsidence due to removal of subsurface water may increase.

❖ As the depth to water increases, the water must be lifted higher to reach the land surface through pumping which require more energy. Hence it becomes prohibitively expensive.

4.6 IMPACT OF GROUND WATER SOURCES DUE TO PAST GROUND WATER ABSTRACTION

The ground water requirement is 2000 KLD. The water requirement will be met from the existing borewell. It is noted that no additional ground water structures will be constructed for this purpose without prior approval of the GWD. Therefore, the impact of ground water condition due to the present proposed is nil.

4.6.1 MITIGATION MEASURES

Over-exploitation of groundwater was found to have several socio-economic and ecological consequences. Water development decisions in the State and elsewhere in the country are primarily guided by economic objectives and criteria, which promote only those investments that are capable of giving higher direct economic returns in the water sector. As this is existing

project therefore following mitigation measures already being adopted or will be adopted after getting NOC: The project proponent in consultation with Regional Office, CGWB may provide artificial recharge through rooftop area for better percolation of rain water.

- The design and construction will be done after detailed engineering in case of requirement of recharge structure development.
- The industry will install piezometers fitted with automatic water level recorder having telemetry system at suitable location and execute ground water regime monitoring programme in and around the project area on regular basis in consultation with CGWB and as per as NOC conditions.
- The industry will take up area specific plantation program to enhance the recharge measures.
- Ground water levels in the area are shallow and in and around the industry, artesian/free flow conditions are prevailing.
- Decline in the ground water level during last decade is insignificant.
- Stage of ground water development is 62.978 % and Jhanjhari block falls under Safe.
- The district Gonda is a part of the Ghaghra alluvial plains and is underlain by quaternary alluvium comprising mainly sands of various grades with clay and kankar. The central alluvial plains extends from north to south are makeup of finer clastic comprising mainly clay, silt, sandy clay with kankar and subordinate sands.
- There is insignificant impact on ground water regime around the industry so far from the present withdrawal.
- If the pace of ground water abstraction remains same, there is no likelihood of adverse impact on the ground water regime of the area in near future.

Bajaj Hindusthan Sugar Limited falls under Safe category as per Central Ground Water Board categorization. The total freshwater requirement is 2000 KLD is sourced from two existing Borewell. Rainwater harvesting/artificial recharge measures must be practiced for augmentation, betterment and reducing stress on groundwater resources in long run.

Rainwater harvesting practices through roof-top is being/shall be carried out and the available run-off from the same will be used for green belt.

4.6.1.1 ARTIFICIAL RECHARGE

Natural replenishment of ground water storage is slow and is unable to keep pace with the excessive exploitation of ground water. With increasing urbanization, the land area for natural rain water recharge is also shrinking and large unutilized runoff carries pollution to the water bodies. Artificial recharge to groundwater aims at augmentation of the ground water storage by

modifying the natural movement of surface water, utilizing suitable civil construction techniques to increase the seepage rate exceeding that under natural conditions of replenishment. The rainfall occurrence in India is limited to about 3 months period, ranging from about 10 to 60 rainy days. The natural recharge is restricted to this period only. The artificial recharge techniques aim at increasing the recharge period in the post-monsoon for about 3 months to provide additional recharge. This would result in providing sustainability to ground water development.

In hilly areas, even though the rainfall is high, scarcity of water is felt in post-monsoon season. Due to steep gradients, a large quantity of water flows out to low lying areas as surface runoff. Springs are the major source of water in hilly areas which gets depleted after monsoon. There is a need to provide sustainability to these springs Small surface storages above the spring level are effective in providing additional recharge and sustain the spring flow for a longer period. Most of the urban areas in the country are facing water scarcity. The dependence on ground water has increased many folds and the natural recharge to ground water has decreased due to increased buildings and paved areas etc. Roof top rain water harvesting, which involves the collection of rainwater from the roof of the buildings and its storage in surface tanks or recharge to sub-surface aquifer, can play an important role in conservation of water. Thus, the need for artificial recharge of groundwater is beyond doubt and is the most powerful management strategy available to face the challenge of fast depletion in ground water storages.

Inside plant premises

Rainwater harvesting can be done by diverting the runoff that is generated from roof sheds, roads and green belt areas of recharging into ground water system. Implantation of recharge mechanism ensures the balance between the discharge vis-a-vis recharge of the aquifer system and improvement in the ground water quality. The normal annual rain fall for the said area has been taken as 970 mm. based on the site plan and land use pattern of the plot, the computation of runoff for each unit has worked out and the details are tabulated below:

Table No 4.4
Estimation of annual rainfall runoff potential

S. No	Land use type	Area (sqm)	Coefficient of runoff	Rainfall (m)	Quantity of Rainwater (cub m)
1.	Roof Top Area	14968.02	0.80	1.15	13771.0
	Total	**14968.02**			**13771.0**

From the above computation, it is evident that a total quantum of 13771 cum/year of rainwater can be fruitfully harvested & recharged from plant premises annually by constructing suitable

recharge structures against the mandatory requirement of 300000 Cum/year. In order to design the recharge structures, hourly runoff of 30 mm/hr has been taken into account and the details are tabulated below.

Hourly Computation of Runoff – (30 mm/hr)

S.No	Land use type	Area (sqm)	Coefficient of runoff	Intensity of Rainfall (m)	Quantity of Rainwater (cub m)
1.	Roof Top Area	14968.02	0.80	0.03	359.23
	Total	**14968.02**			

Structure Calculation:

STRUCTURE CALCULATION:

Thus, the total rainwater harvesting capacity of roof top area of the industry is about 359.23 Cu.mts per hour.

Assuming retention time of 0.03 hour in the recharge pit, the design volume for the recharge pit is 359.23/4 = 89.80 m^3

Let us provide recharge pit of 2 m × 2 m in size and 2.5 depth.

Volume of one pit = 10 m^3

Capacity of One Bore well recharge: 30 Cubic meter

Average Recharge Capacity of Pit with two well = 10 + 30 + 30 = 70

Required no. of pits = 89.80 / 70= 1.28 (1 appx.)

Proponent shall provide 1 nos. recharge pits each of 2 m × 2 m × 2.5 m in size at peak rainfall intensity of 25 mm.

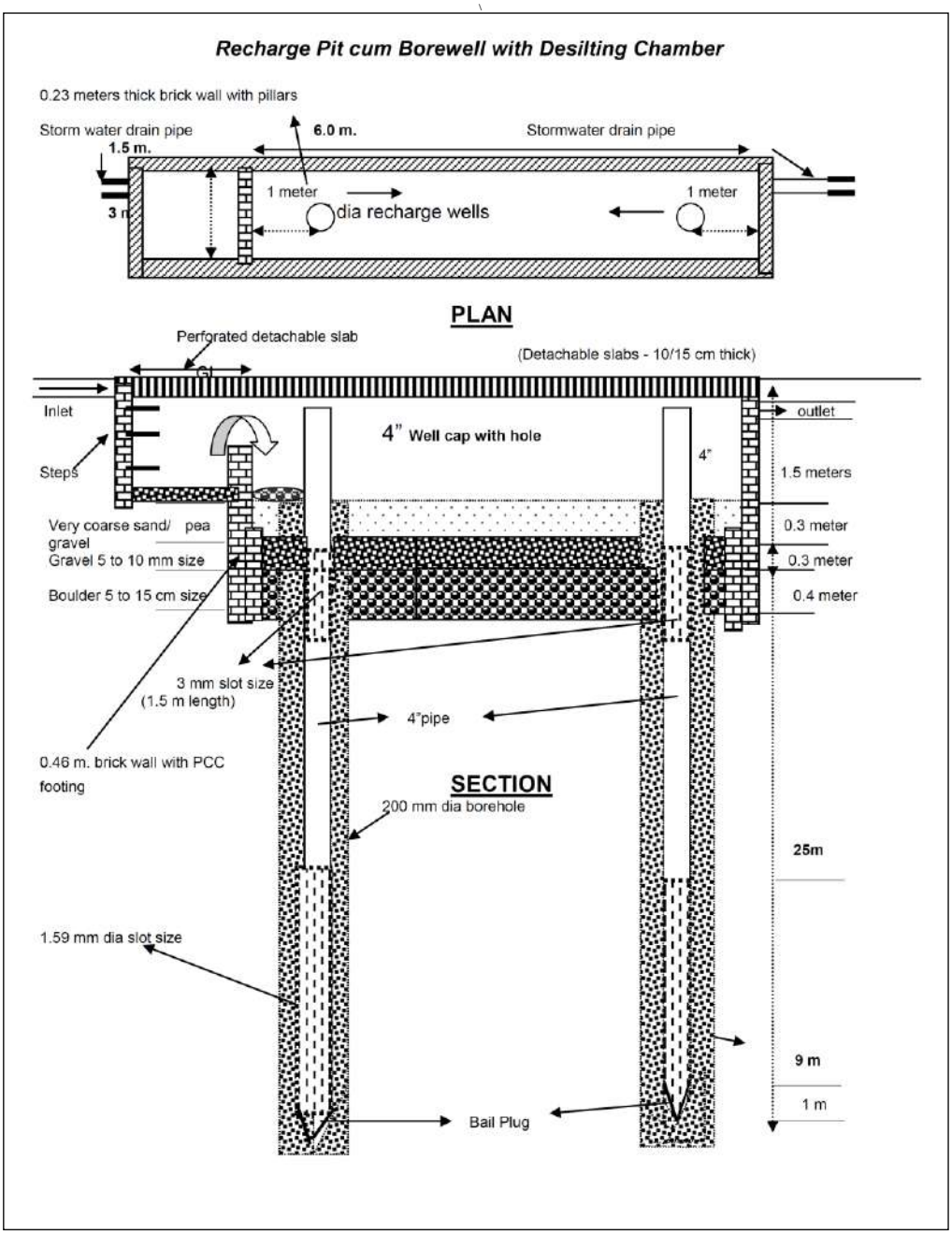


Fig No.: 4.5 Proposed designs of Double Bore Recharge structure

The location of these sites would be located as per the layout of storm water drains and the catch basins that are proposed to be constructed. Necessary precautions shall be taken to avoid any contaminated water entering into the recharge structures. The recharge structures would be so designed that these are operational only during the monsoon seasons. All the structures are to be constructed in series and the overflow from one may be accommodated to the next structure. For the plot areas having green belt necessary slopes may be given so that the rainfall runoff is channelized and diverted to the proposed recharge shafts. While implementing the recharge structures, it is suggested that the spacing between two consecutive recharge trenches may be 50 meters apart. Settling chambers may be located at suitable locations before the recharge structures so as to avoid any excess siltation to the

recharge trenches. Provision of Geo-textile mesh/ Johnson cloth on the top of the filter media is preferable to avoid frequent clogging of the filter media. Special care needs to be taken for identifying the exact locations of the recharge structures so that the ground water augmentation is optimal. The area under recharge project has hydro-geological conditions having alluvial aquifer systems, exact depth of recharge well and its slot positions would be ascertained based initial wells and subsequently tested for its intake rate. Proper type of rig deployment and construction of recharge structures warrants for strict supervision of ground water experts while implementation. It would be imperative that the recharge wells are tested and it is suggested that slug test may be conducted at selected recharge wells so as to ascertain the dissipation rate of the rainfall runoff to the aquifer systems. Such an approach shall ascertain the proper recharge mechanism at the study area. Therefore, the total annual recharge from rain water harvesting is about 213360 cub m per year against the withdrawal of 426720 cub m per annum of ground water (which is around 5 % only). The balance amount of recharge shall be made by adopting suitable village ponds in the Jhanjhari block and converting them in recharge ponds. Implementation of recharge mechanism in the study area would create a balance between the recharge vis-à-vis discharge relationships of the aquifer system. It shall also maintain the ground water quality, which may deteriorate due to prolonged pumping, and the recharge of fresh rainfall runoff shall compensate it.

4.6.1.2 Artificial Recharge of Ground water from the village Pond:

Recharge can either be natural, from precipitation that falls on the earth's surface and moves on its way underground or it can be artificial, from human activities that deliberately or inadvertently replenish an aquifer. Artificial recharge may be defined as the process of replenishing groundwater by augmenting the natural infiltration of rainwater or surface water into underground formations through various methods designed depending on the topographic, geologic and soil conditions.

Pond in the village is generally filled with water only during the rainy season and during summer they are dry. It is proposed to adopt these village ponds to take up artificial recharge artificial recharge to ground water of the pond water, which is overflowing to adjacent areas during monsoon period. The artificial recharge to ground water in the pond area will result into rise in water levels in the village tube well as wells and increase the supply of water to the land adjacent for irrigation purposes. Thus, recharge scheme in the pond will benefit the tube wells.

The industry will be adopted ponds located in nearby villages for artificial rain water harvesting are as recharge shaft and natural percolation in ponds which will result into

creation of additional recharge which will be sufficient to fulfill the mandatory requirements as per guidelines of Ministry.

Total pond area is 2.6-hectare i.e 26000 m^2.

Table No 4.5, Details of ponds

Type	Area (Hectare)	Existing Depth
Pond -I	2.6	2.5
		2.5

The details of pond and available runoff to be recharged are as under in the table:

Table No 4.6, Recharge calculation in ponds

Sr No	Village Name	Area (in Hectare)	Area (m2)	Depth in meter after Desilting	Total Storage Capacity	60%	No of Filling	Quantity of water to be recharge
1.	-	2.6	26000	3	78000	46800	3	140400
Grand Total		2.6	26000	3	78000	46800	3	140400

From pond total water available recharge will be 140400 m^3.

The total amount of recharge through adopted pond will be 140400 m^3 in a year and withdrawal will be 300000 m^3 per year.

Existing industry is situated in Safe block Jhanjhari of district Gonda as per Ground water dynamic 2020, hence we will have to recharge 50% of total withdrawal annually.

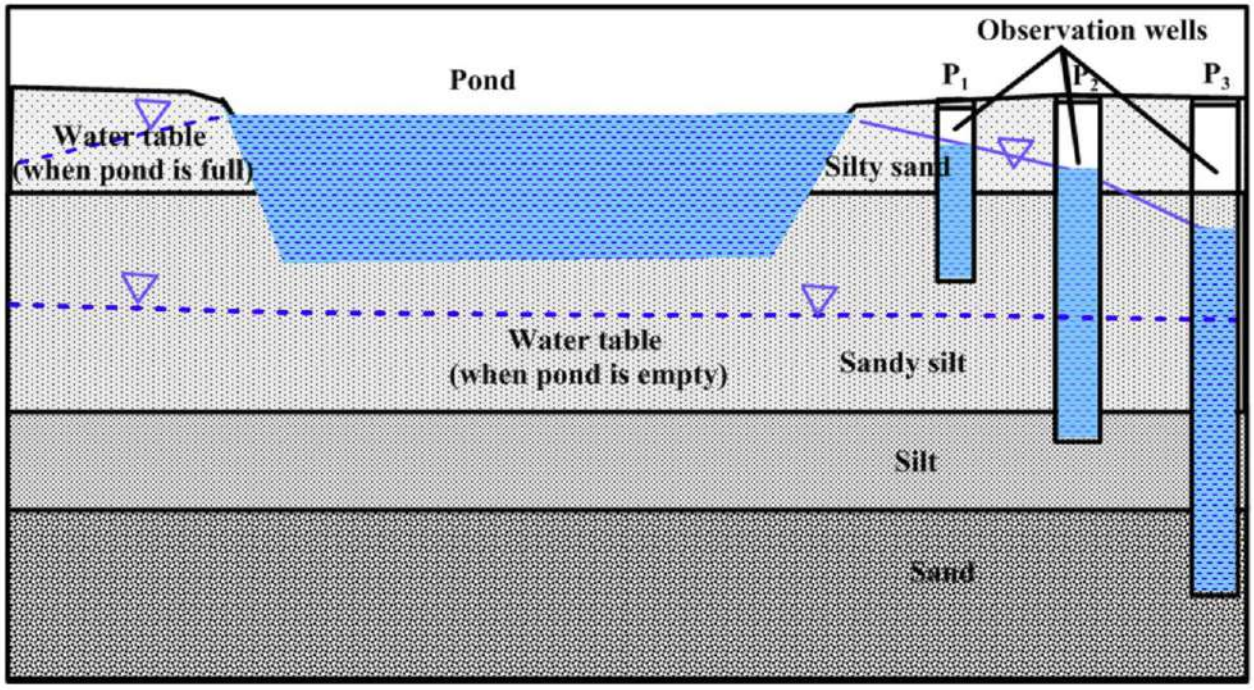
As per CGWA guidelines total amount of rainwater to recharge for the withdrawal of 300000 m3/Annum is 150000 m^3/Annum.

Against requirement of 300000 m^3/annum, the company will recharge 154171 m^3/annum through (within Premises + Pond).

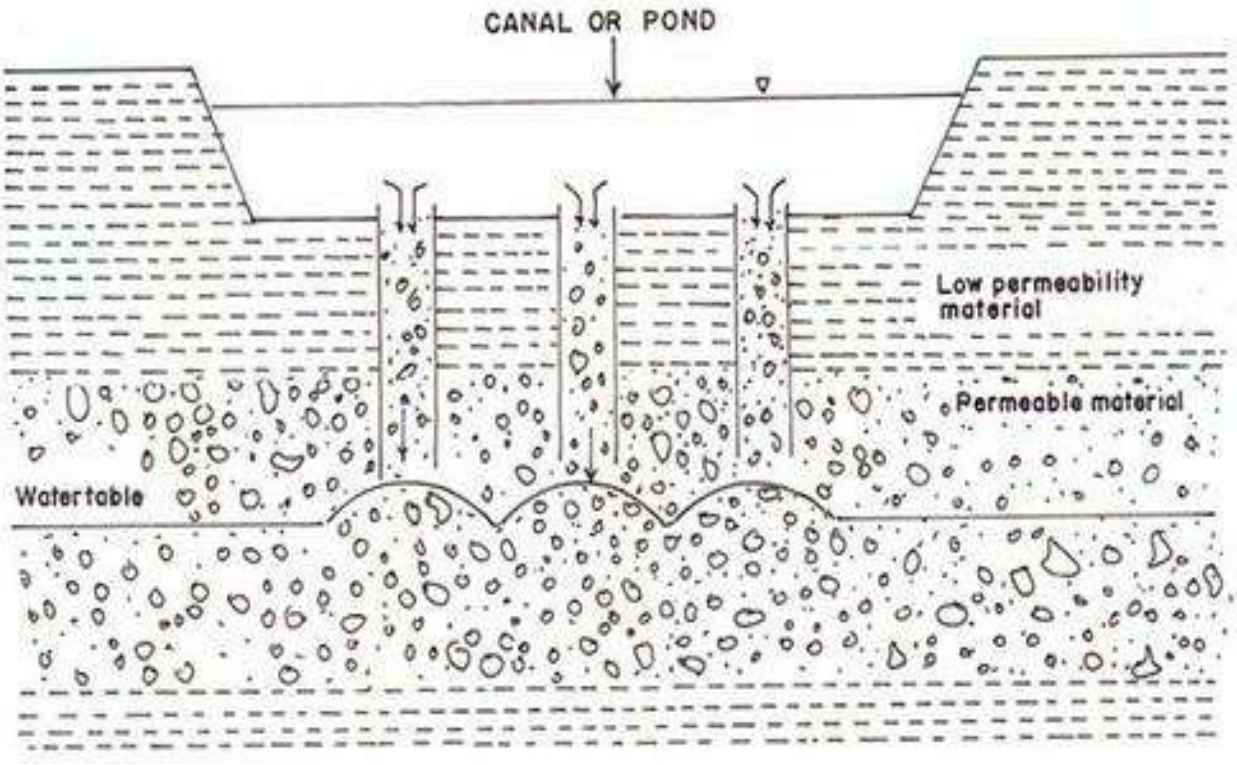
Table No 4.7,
Recharge Summary

Total Fresh Water Requirement for Sugar project	2000 KLD/300000 cum/year
Source of water for plant activates	Ground Water
RHW potential /Artificial recharge required	Maximum up to 50% recharge Criteria (Safe Zone) 150000 cum/year
Total artificial rainwater recharge outside the plant	13771 cum/year
Total artificial rainwater recharge Inside the plant	140400 cum/year
Total recharge	154171 cum/year

SCHEMATIC DIAGRAM OF POND RECHARGE TO BE CONSTRUCTED IN VILLAGES



CROSS SECTION OF POND



Recharge Shaft Cross Section

4.7 DYNAMIC GROUND WATER RESOURCES

With increasing population and development activities in Gonda district, block: Jhanjhari as a whole more and more withdrawal of ground water is taking place to meet the ever-increasing water requirement. Quantitative assessment of ground water availability in space and time is one of the vital component and pre requisite for planning ground water development in an

area. As such it requires enormous data on various parameters including water level fluctuation, specific yield, draft etc. to assess ground water availability. Periodic assessment of ground water resources is being done by Central Ground Water Board and the resources availability along with categorization of assessment units are available in the standard publications of CGWB as well as on the web site.

The dynamic ground water resource is replenished able annually by precipitation, irrigation return flow, and canal and tank seepage. The total ground water recharge includes the annual replenish able ground water recharge and potential recharge in shallow water zones. The 62.978 % of this resource can be utilized for irrigation purpose leaving 12.18 % for domestic and industrial uses.

Groundwater Resources of an area can be distinguished under two categories -

1. Dynamic Ground Water Resources
2. Static Ground Water Resources

DYNAMIC GROUNDWATER RESOURCES

Dynamic groundwater is that amount of water, which is found in the natural zone of fluctuation in an aquifer due to ground water recharge. Total Ground Water Recharge (Rt) of the area can be estimated by assessing the various component of the following equation.

Equation: Rt = Rr + Rs+ Ri + Sr +Rc

where:

Rr= Recharge from Rainfall

Rs = Recharge from irrigation due to surface water

Ri = Recharge from irrigation due to groundwater

Sr = Recharge through surface water bodies

Rc = Recharge to confined aquifer

The U.P. state ground water department after reconciliation with CGWB, has estimated block wise dynamic ground water resource for the year 2020 as per recommended methodology of GEC-1997. Since these data have been accepted by NABARD, for formulation of future irrigation development plan in the district:

The project area forms a part of administrative Block: Jhanjhari PO: Govindpara, District: Gonda. As per the reported data, (Report on Dynamic Ground Water Resources of Uttar Pradesh, CGWB, 2020) a summarized Ground Water Potential of Jhanjhari block, Gonda district is as follows: Net Annual Ground Water Availability (Ham)	5377.610 ham
Gross Ground Water Draft for All Uses (Ham)	551.155
Stage of G.W. Development (%)	62.978 %

Category	Safe

4.8 STATUS OF GROUND WATER DEVELOPMENT

The present max ground water users are nearby villages using ground water for irrigation & domestic purpose. The ground water withdrawal units are mainly tube wells, ranging in depth between 60 to 120 feet below ground level, operated by mono block pump sets.

The block wise ground water resource potential in the district has been assessed as per GEC-97. The stage of ground water development in block is 62.978 % and it is in Safe category. The total replenish able ground water resource in the district is 5660.650 ham, of which the total existing ground water draft by all means is 551.155 Ham. The net utilizable ground water resources for future irrigation development are – 2835.560 Ham.

4.9 RECOMMENDATION AND SUGGESTION

- Awareness program about the conservation of ground water resources to make the population aware.
- The crops consuming less quantity of water may be grown in place of crops requiring more water in the water stressed areas.
- The abandoned dug wells may be cleaned and should be used for recharging the ground water by utilizing the surface monsoon runoff.
- The water level monitoring network needs to be increased in the block.
- Artificial rainwater recharge must be adopted by Non-agricultural users to compensate the draft.

CHAPTER-5
MEASURES ADOPTED FOR WATER CONSERVATION, BRIEF WRITE UP ALONG WITH CAPACITY AND FLOW CHART OF STP/ETP AND WATER BALANCE

5.1 ADEQUATE METHODS OF WASTEWATER TREATMENT

Industry has already installed biological treatment having adequate capacity as per norms. A conventional mode of Activated Sludge Process is incorporated.

Nature of Waste

- Washing water
- Process Water
- C.T blow down
- Pumps & Seals
- Boiler Blow down

Following Treatments are carried out.

- Collection Tank/Buffer Tank
- Aeration Tank
- Clarifier
- Collection & Lifting sump
- MGF
- ACF
- Storage Tank
- Cartridge Filter
- Receiving Tank to cooling tower & reuse in process

5.2 DETAILS DESCRIPTION OF CAPACITY AND FLOW CHART OF EFFLUENT TREATMENT PLANTS WITHIN THE PROJECT

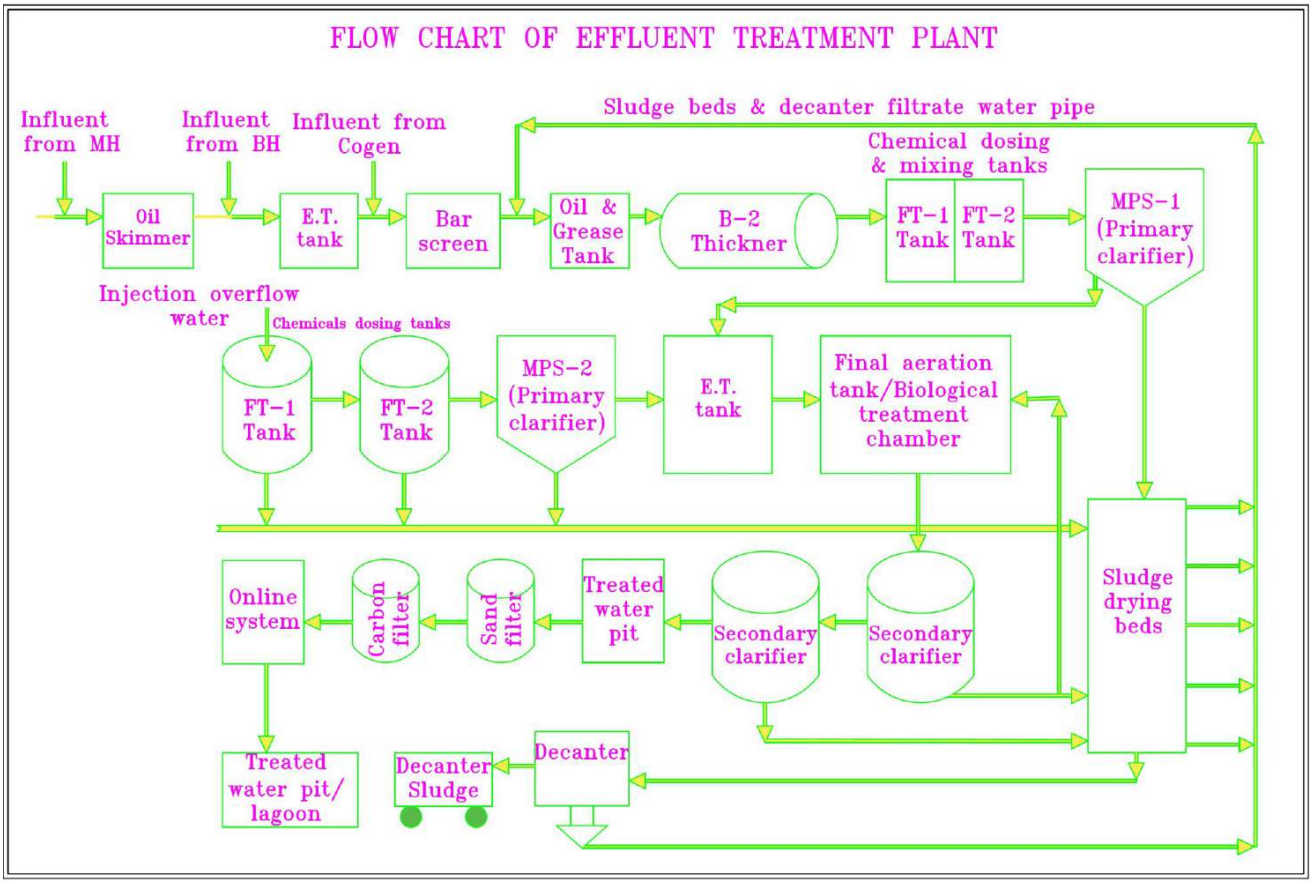


Fig: 5.1, Existing effluent treatment Plant

5.3 DETAILS OF WATER CONSERVATION MEASURES TO BE ADOPTED TO REDUCE /SAVE THE GROUND WATER THROUGH RECYCLING OF WATER

To meet the requirement of project a total of **2000 m^3/day** of fresh ground water need to be abstracted. To meet the balance requirements for gardening etc recycled of water from secondary effluent will be used.

Since the area falls in the Safe category and the ground water level of the area is less than 5 m bgl, hence ground water recharge proposed against anticipated groundwater draft. The annual draft is **30,00,00 cum/year**.

To harvest rainwater, rainwater harvesting structure will be constructed within the project area. Further, for ground water monitoring peizometers already installed and few more will be installed in project premises and in nearby areas. Water recycling is an essential component of managing our water resources efficiently and making the most of a resource that is often wasted. Water recycling cannot be adopts due to quality issue of waste water. In practice this means using high quality water for drinking and other personal uses, but not necessarily for purposes where alternative water sources can be safely used, such as toilet flushing, garden watering and crop irrigation. The water balance chart of the project is given in Fig: 5.2.

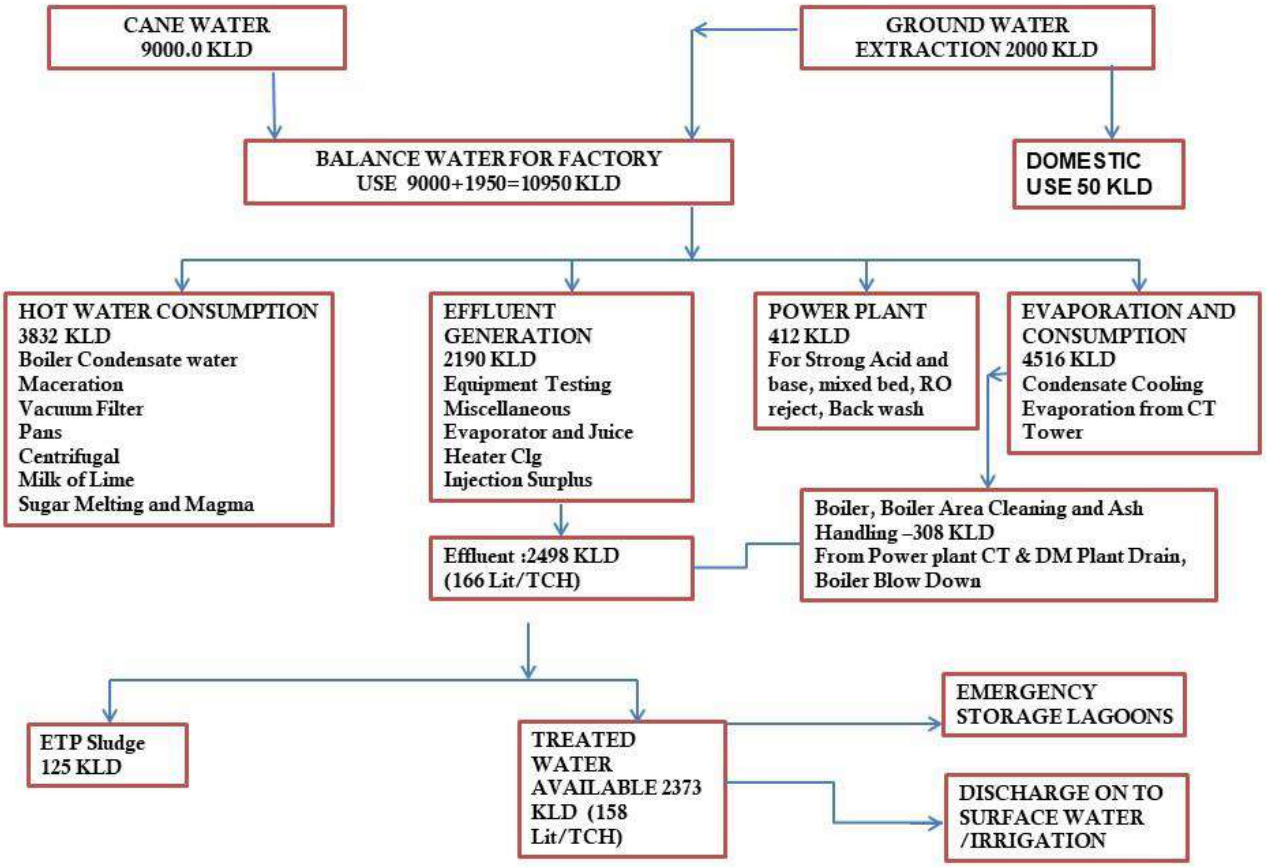


Fig: 5.2 FLOW CHART FOR WATER REQUIREMENT

5.3.1 EFFLUENT TREATMENT PLANT PROCESS

The detailed process to treat the waste water generated from the sugar industry is given below:

Table: 5.1
Typical Composition of Sugar Industry Wastewater

S.No	Parameters	Average
1	pH	5.82 mg/Lit
2	BOD	1500 mg/Lit
3	COD	3000 mg/Lit
4	TS	3450 mg/Lit
5	TDS	2430 mg/Lit
6	TSS	925 mg/Lit

(A) Bar Screen- Bar Screens or sometimes called Bar Racks are normally installed as the first line of defense to remove large objects primarily, rags, woods and rocks that manage

to escape and find their way through the sewer systems. Usually, these objects can be of extreme nuisance because if left around going to the main treatment plant, they pose a significant risk of damaging pumps and blocking valves. The racks require constant attention to clean it manually or mechanically and whatever collections of materials are stored in a waste bin before sent to sanitary landfill for disposal.

(B) Oil and grease pit (Oil skimmers)- The skimmer is a rotating cylindrical device design to remove the surface oil layer. It consists of using cohesive force between the oil and the surface of the material to be move up. The metal part must be immerged in 1cm to 3cm of the free oil layer floating on the top of the water. The oil catches in the rotatory device drop in a conveyor which evacuates oil in a container for oil recovery. After bar screen waste water will move to Oil and grease pit. Here all the oil and grease will be removed from the waste water.

(C) Equalization Tank- Effluent from the oil and grease pit comes to the equalization tank in wastewater treatment. The main function is to act as buffer. To collect the incoming raw effluent that comes at widely fluctuating rates and position to the rest of the ETP at steady (Average) flow rate. During the peak hours ETP comes at high flow rate. The equalization tank stores this effluent and lets it out during the non-peak time when there is no /little incoming effluent. In equalization tank 45% of BOD, 42%COD, TS and TDS 18%, TSS 17% will be removed.

(D) Primary Clarifier is settling tanks built with mechanical means for continuous removal of solids being deposited by sedimentation. Clarifiers work on the principle of gravity settling. The heavier suspended solids settle in the clarifier due to the quiescent conditions provided in the Clarification zone. The settled solids are swept to the centre well provided for collection of sludge with help of moving scraper blades. In clarifiers 97% of COD, 95% BOD, 77.5% TDS, 88.8% TSS and 79.23% of TS will be removed.

(E) Aeration Tank- Aeration is the most critical component of a treatment system using the activated sludge process. A well-designed aeration system has a direct impact on the level of wastewater treatment it achieves. Aeration provides oxygen to bacteria for treating and stabilizing the wastewater. Oxygen is needed by the bacteria to allow biodegradation to occur. The supplied oxygen is utilized by bacteria in the wastewater to break down the organic matter containing carbon to form carbon dioxide and water. Without the presence of sufficient oxygen, bacteria are not able to biodegrade the incoming organic matter in a reasonable time.

In the absence of dissolved oxygen, degradation must occur under septic conditions which are slow, odorous, and yield incomplete conversions of pollutants. In aeration tank 82% of BOD, 81% of COD, 20% TS and TDS, 21% TSS will be removed. During this process a mass of biologically active flocks called Activated Sludge is formed.

(F) Secondary Clarifiers (f) Secondary Clarifiers are settling tanks built with mechanical means for continuous recycling of Activated Sludge. Clarifiers work on the principle of gravity settling. The heavier suspended solids settle in the clarifier due to the quiescent conditions provided in the Clarification zone. Settled culture from secondary tank will be recycle to Aeration to maintain the MLSS in aeration tank. In clarifiers 97% of COD, 95% BOD, 77.5% TDS, 88.8% TSS and 79.23% of TS will be removed.

(G) Treated Water- Treated water will be used for green belt development, floor washing and sprinkling.

Table: 5.2
Typical Composition of Sugar Industry Treated Water

S.No	Parameters	Average
1	pH	6.5 – 7.5 mg/Lit
2	BOD	< 30.0 mg/Lit
3	COD	< 150.0 mg/Lit
4	TS	1200.0 mg/Lit
5	TDS	< 2100.0 mg/Lit
6	TSS	< 30.0 mg/Lit

Detailed Flow Diagram of existing ETP of sugar industry is enclosed below and Sulphur recovery Flow:

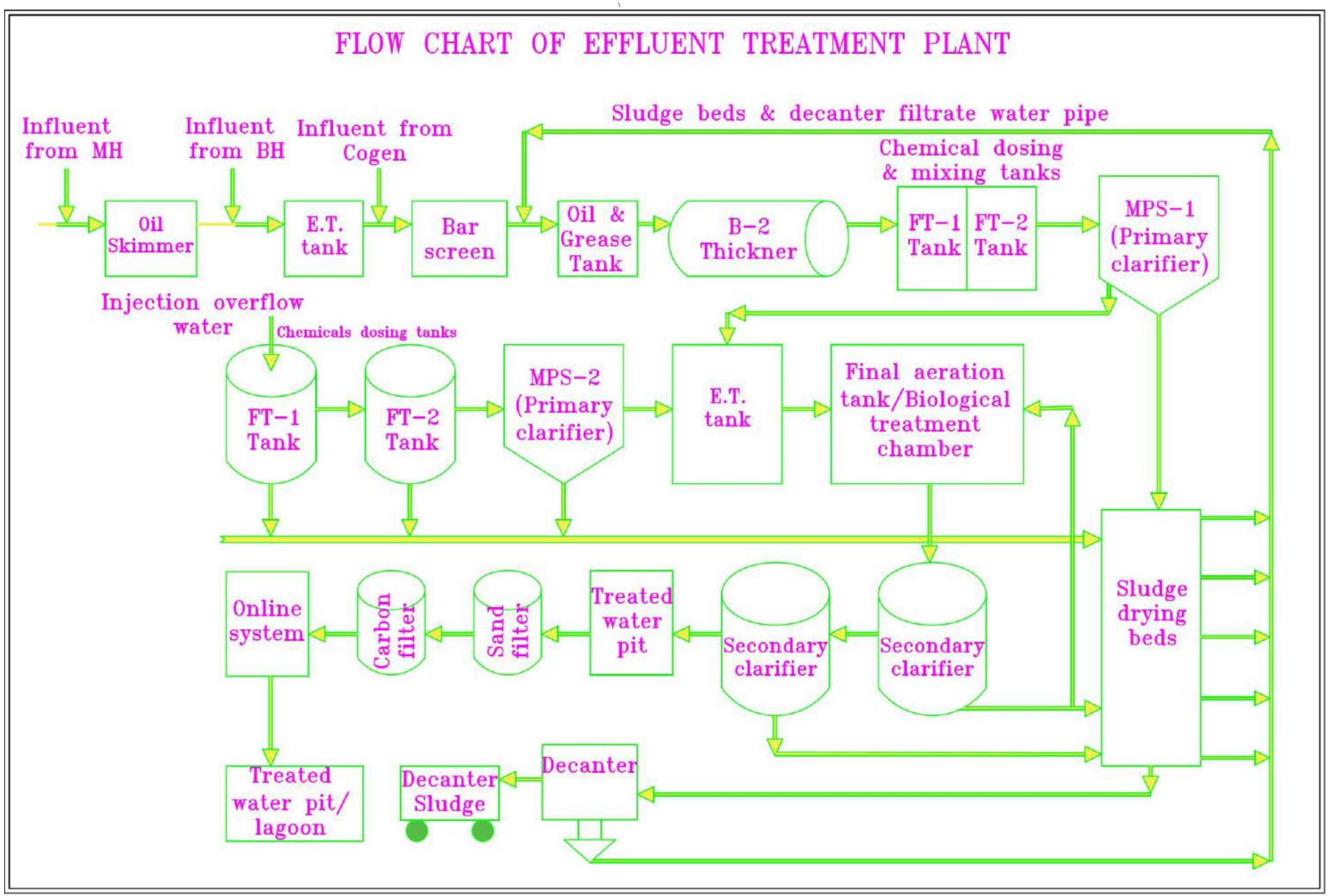


Fig 5.3, Existing Effluent Treatment Plant

6.0 CONCLUSION & SUMMARY

The premises of M/S Bajaj Hindusthan Sugar Limited, Unit: Sugar Plant is situated on Village: Kundarkhi, Block: Jhanjhari, District: Gonda, Uttar Pradesh well connected with road to major cities. The area falls in Jhanjhari Block. The total ground water requirement of plant **2000 m^3/day** or **300000 m^3** /year. Since the area is non-notified and falls in Safe category, as per CGWA guideline NOC is required for ground water withdrawal subject to adoption of artificial recharge to ground water.

- The study area theoretically covers within the circle encompassed by 5 km radius around the Plant site is classified into 4 classes - viz. Crop Land, Human Settlement & Plantation.
- The climate is sub-humid and it is characterized by good rainfall mainly during southwest monsoon season and a dry hot summer
- The district Gonda is a part of the Ghaghra alluvial plains and is underlain by quaternary alluvium comprising mainly sands of various grades with clay and kankar. The central alluvial plains extends from north to south are makeup of finer clastic comprising mainly clay, silt, sandy clay with kankar and subordinate sands.
- Based on the depth to water level of the study area, the pre monsoon depth to water level ranges between 4.0 m bgl to 4.8 m bgl. Pre monsoon depth to water level map is prepared.
- Based on the depth to water level of the study area, the post monsoon depth to water level ranges between 3.0 m bgl to 3.8 m bgl. Post monsoon depth to water level map is prepared.
- A detailed groundwater level monitoring has been carried during post-monsoon season at about 9 different locations within the buffer zone from existing open wells and bore wells.
- From secondary data available with GWD, water level fluctuation was computed.
- The water level fluctuation between pre monsoon and post monsoon period of the district varies from – 1.0 m to 1.0 m.
- The Physio-chemical quality of groundwater was compared with drinking water standard (IS: 10500- 2012). Some of the parameters of the groundwater samples showed values lower than the permissible limit. Thus, can be concluded from the sampling results for groundwater that some of the parameters are in lower range so adequate measures to be taken before consumption of the same as per standards. (IS: 10500-2012).
- Artificial recharge has been practiced within the Plant premises. Rainwater harvesting practices through roof-top is being/shall be carried out and the available run-off from the same will be used for green belt or dust suppression etc.
- There are four existing Bore-well present in the Industrial premises. The monitoring of groundwater abstraction is done on regular basis.
- Awareness program about the conservation of ground water resources to make the population aware.

ACCREDITATION CERTIFICATE of CGWA

Accreditation Board of CGWA

Certificate of Accreditation

Mr. Vijay Rajkumar Yadav

Has been accredited as a Ground Water Professionals to prepare reports in the Functional Areas of

- *Impact Assessment of Existing / Proposed GW Extraction*

Valid from : 15.02.2021
Valid thru : 14.02.2026

Certificate No. : CGWA/RGI/035
Dated : 07.07.2021

क्षेत्रीय निदेशक
Regional Director
आरजीएनजीडब्ल्यूटीआरआई
RGNGWT&RI

सदस्य
Member
आरजीएनजीडब्ल्यूटीआरआई
RGNGWT&RI

4324

Uttar Pradesh Pollution Control Board
Building. No TC-12V Vibhuti Khand, Gomti Nagar, Lucknow-226010
Phone:0522-2720828,2720831, Fax:0522-2720764, Email: info@uppcb.in, Website: www.uppcb.com

196537/UPPCB/Faizabad(UPPCBRO)/CTO/both/GONDA/2023 **Date: 28/12/2023**

To,

M/s

BAJAJ HINDUSTHAN SUGAR LIMITED, KUNDARKI

Bajaj Hindusthan Sugar limited, Village - Kundarki, PO- Govindpara, Gonda,GONDA,271301

Application Id-23513789

Consolidated Consent to Operate and Authorisation hereinafter referred to as the CCA (Consolidated Consent & authorization) (Fresh) under Section-25 of the Water (Prevention & Control of Pollution) Act, 1974 and under Section-21 of the Air (Prevention & Control of Pollution) Act, 1981

CCA is hereby granted to **BAJAJ HINDUSTHAN SUGAR LIMITED, KUNDARKI** located at **Bajaj Hindusthan Sugar limited, Village - Kundarki, PO- Govindpara, Gonda,GONDA,271301**. subject to the provisions of **the Water Act, Air Act** and the orders that may be made further and subject to following terms and conditions :-

1. This CCA BAJAJ HINDUSTHAN SUGAR LIMITED, KUNDARKI **granted for the period from 01/01/2024 to 31/12/2025** and valid for manufacturing of following products.

S No	Product	Quantity	Unit
1	Crystal Sugar	1500	Metric Tonnes/Day
2	Power Co-generation	48	Megawatt

2. Conditions under Water(Prevention and Control of Pollution) Act -1974 as amended :-

(i) The daily quantity of effluent discharge (KLD) :-

Kind of Effluent	Quantity(KLD)	Treatment facility	Discharge point
Domestic	**50 KLD**	**STP**	
Industrial	**3000 KLD**	**ETP**	

(ii) Trade Effluent Treatment and Disposal :-The applicant shall operate Effluent Treatment Plant consisting of primary/secondary and tertiary treatment as is required with reference to influent quantity and quality.

In case of stoppage of functioning of ETP, production has to be stopped immediately and this Board has to be intimated by fax/phone/email with a report in this regard to be dispatched immediately.

(iii) The treated effluent shall be recycled to the maximum extent and should be reused within the premises for gardening etc. Quality of the treated effluent shall meet to the following general and specific standards as prescribed under Environment (Protection) Rules, 1986 and applicable to the unit from time-to-time :-

Industrial Effluent Quality Standard

S.No.	Parameter	Standard
1	pH	As per E(P)A Rules, 1986

2	BOD (mg/L)	As per E(P)A Rules, 1986
3	COD (mg/L)	As per E(P)A Rules, 1986
4	TSS (mg/L)	As per E(P)A Rules, 1986
5	Oil & Grease (mg/L)	As per E(P)A Rules, 1986

(iv) Sewage Treatment and Disposal :- The applicant shall provide comprehensive STP as is required with reference to influent quantity and quality.In case of stoppage of functioning of STP, production has to be stopped immediately and this Board has to be intimated by fax/phone/email with a report in this regard to be dispatched immediately.

(v) The treated sewage shall be reused in gardening as far as possible. The STP shall be maintained continuously so as to achieve the quality of the treated sewage to the following standards.

S No.	Parameters	Standards
1	pH	As per E(P)A Rules, 1986
2	BOD (mg/L)	As per E(P)A Rules, 1986
3	TSS (mg/L)	As per E(P)A Rules, 1986
4	Fecal Coliform (MPN/100ml)	As per E(P)A Rules, 1986

3. Conditions under Air (Prevention and Control of Pollution) Act -1981 as amended :-

i) The applicant shall use following fuel and install a comprehensive control system consisting of control equipment as required with reference to generation of emissions and operate and maintain the same continuously so as to achieve the level of pollutants to the following standards.

Air Pollution Source Details

S No.	Air Pollution Source	Type of fuel	Stack no	Control Device	Height of Stack
1	1000 KVA DG Set	Diesel Oil	4	Sulphur Dioxide	As per E(P)A Rules, 1986
2	500 KVA DG Set	Diesel Oil	5	Sulphur Dioxide	As per E(P)A Rules, 1986
3	250 KVA DG Set	Diesel Oil	6	Sulphur Dioxide	As per E(P)A Rules, 1986
4	1000 KVA DG Set	Diesel Oil	3	Sulphur Dioxide	As per E(P)A Rules, 1986
5	02 Boilers having Capacity 90 TPH each	Baggasse (40 TPH each)	1	Particulate Matter	As per E(P)A Rules, 1986
6	02 Boilers having Capacity 90 TPH each	Baggasse (40 TPH each)	2	Particulate Matter	As per E(P)A Rules, 1986

Emmission Quality Standards

S No.	Stack no	Parameters	Standards

1	1	Particulate Matter	As per E(P)A Rules, 1986
2	2	Particulate Matter	As per E(P)A Rules, 1986
3	3	Sulphur Dioxide	As per E(P)A Rules, 1986
4	4	Sulphur Dioxide	As per E(P)A Rules, 1986
5	5	Sulphur Dioxide	As per E(P)A Rules, 1986
6	6	Sulphur Dioxide	As per E(P)A Rules, 1986

In case of stoppage of functioning of air pollution control equipment, production has to be stopped immediately and this Board has to be intimated by fax/phone/email with a report in this regard to be dispatched immediately

(ii) The unit will not use any type of restricted fuel.

iii) Noise from the D.G. Set and other source(s) should be controlled by providing an acoustic enclosure as is required for meeting the ambient noise standards for night and day time as prescribed for respective areas/zones (Industrial, Commercial, Residential, Silence) which are as follows :-

Day time : from 6.00 a.m. to 10.00 p.m., Night time: from 10.00 p.m. to 6.00 a.m.

Standards for Noise level in db(A) Leq	**Industrial Area**		**Commercial Area**		**Residential Area**		**Silence Zone**	
	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
	75	70	65	55	55	45	50	40

4. Essential documents to be submitted by the Industry/Unit as Applicable :-

(i) Environment Statement in Form-V of Environment (Protection) Rules, 1986.

(ii) Quarterly compliance report of the CCA, photograph of ETP/APCs/Waste Storage Area.

5. Competent Authority reserves the right to change/modify/add any time any condition of this CCA.

6. Unit has to comply with the following specific & general conditions. Non compliance of any provision of this CCA and provisions of the Water Act, Air Act and Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 will results in legal action under the aforesaid Acts and Rules.

7. In compliance to the G.O 1011/81-7-2021-09 (Writ)/2016 dated.13.10.2021 issued by Department of Environment, Forest and Climate Change, Uttar Pradesh. You are directed to develop Miyawaki Forest as per the SOP available at URL:-http://www.upecp.in/TrainingSession.aspx for ensuring timely compliance of this direction, you are hereby directed to submit a bank guarantee with minimum validity of one year of the amount equivalent to the sum of initial consent fees (Air and Water) or Rs. 50,000/- (Rs. Fifty Thousand Only) whichever is more, within 30 days from the date of issuance of this certificate. In case of non-compliance of this direction, your consent will be revoked by the Board.

8. If the unit uses the ground water and requires the permission from SGWA/CGWA for water abstraction then the industry will have to obtain No objection certificate for abstraction of ground water. It will be the responsibility of the industry to comply with the various conditions of the NOC obtained from the competent authority and submit to the Board, within 3 months time failing which CTO will be revoked.

General Conditions:-

1. The applicant shall get analysed the samples of effluent/emission/hazardous wastes at least once in a three month from the laboratory recognized by the MoEF and shall report to the UPPCB.

2. The applicant shall however, not without the prior consent of the Board bring into use any new or altered outlet for the discharge of effluent or gases emission or sewage waste from the unit.
3. Treated Industial waste water and domestic waste water shall be disposed jointly at one disposal point. The applicant shall provide discharge measurement equipment at final disposal point.
4. The applicant shall strictly comply with conditions of this CCA and submit compliance report of stipulated conditions within 30 days of receipt of this CCA. If at any point of time, it is found that the industry is not complying with stipulated conditions or any further direction/instruction issued by the Board, legal action shall be initiated against the applicant.
5. The applicant shall maintain good house keeping. All valves/pipes/sewer/drains etc. must be leak-proof
6. The industry shall provide uninterrupted entry to the STP/ETP inlet and outlet points, Air Pollution Control equipment and stack for smooth sampling/monitoring of efficiency of pollution control systems.
7. The industry shall provide Inspection Book at the time of inspection to the Board's officials.
8. Whenever due to any accident or other unforeseen act or event, such emission occurs or is apprehended to occur in excess of standards laid down, such information shall be reported to the Board's offices and all other concerned offices. In case of failure of pollution control equipment, the production process connected to it shall be stopped with immediate effect.
9. The industry shall operate in a manner so that all emissions be emitted through designated chimney/stack only.
10. In case of any damage to the agriculture productivity, human habitation etc. by the operation of industry, it shall be imperative to stop production in the industry with immediate effect and such information shall be reported to Board's offices. The industry shall be liable to pay compensation also in such cases as decided by the Competent Authority.
11. The applicant shall apply before the 60 days of expiry of CCA or any change in production types/ production capacity/manufacturing process/capacity enhancement etc. or any change in effluent discharge point or emission point
12. The Board reserves the right to revoke/add/modify any stipulated condition issued along with CCA, as may be necessary.

Specific Conditions:-

1. This consent is valid for the production of 1500 TPD Crystal Sugar by using 15000 TCD Sugar Cane Crushing and Power Cogeneration of 48 MW only.

2. The industry shall maintain strict supervision upon fluctuations in operating parameters with respect to each treatment unit of the Effluent treatment plant.

3. The E.T.P. unit operation line up Strengthening is to be maintained.

4. The industry shall ensure deployment of qualified to step up self monitoring mechanism on 24 ×7 Hours basis.

5. The industry should follow the directions issued by the Ministry of Environment Forest and Climate Change, Delhi vide Notification no. GSR 35(E) dated 14/01/2016.

6. The E.I.A. studies shall include comprehensive study of water & waste water balance in Addition to the adequacy studies of E.T.P. relating to pollution load reduction impacts after implementation of treatment technology & discharge of treated effluent completely for irrigation purposes in place of discharge on surface water body.

7. The industry shall deploy self monitoring task force to strictly observe & monitor treated effluent discharge restriction on surface water body located in its proximity.

8. The industry shall also explore treated effluent re-cycle mechanism in furtherance to the application of treated effluent on land as a significant alternative mode of re-cycle. This step shall in turn reduce hydraulic loading of effluent discharge as well as shall eliminate extraneous treated effluent discharge possibility elsewhere.

9. The Unit shall submit the point wise compliance report of the conditions imposed in the CTO issued by the Board for year 2022 and the audited balance sheet for the current year and the details of fees deposited within a month failing which consent would be deemed void.

10. This consent is valid only for products and quantity mentioned above. Industry shall obtain prior approval before making any modification in product/process/fuel/ plant machinery failing which consent would be deemed void.

11. In compliance of the provisions of the Plastic Waste Management Rules 2016 as amended, the industry shall submit the Extended Producer Responsibility (EPR) for the disposal of Plastic waste generated within a month failing which consent would be deemed void.

12. The overall noise levels in and around area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc, on all sources of noise generation. The ambient noise level shall confirm to the standards under the Environment (Protection) Act 1986.

13. The Industry shall dispose the hazardous waste through authorized recyclers/TSDF and comply with the provisions of Hazardous and Other Wastes (Management and Trans-boundary Movement) Amendment Rules, 2016 and The Plastic Waste Management Rules, 2016 as amended.

14. If closure order is issued by CPCB or UPPCB against any defaulting unit, then CTO issued earlier will suspended during the pendency of the closure period and after ensuring the compliance and after revocation of closure order, the CTO will be deemed to be restore subject to the effective date of revocation of the closure order, with imposed conditions thereof.

15. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this CTO and attract action under the provisions of Law.

RAM KARAN
Digitally signed by RAM KARAN
Date: 2024.01.17 12:22:02 +05'30'

Chief Environmental Officer, Circle-6

Copy to:

Regional Officer, U.P. Pollution Control Board, Ayodhya for information and necessary action.

Chief Environmental Officer, Circle-6

RAM KARAN
Digitally signed by RAM KARAN
Date: 2024.01.17 12:22:22 +05'30'

मिशन LiFE - पर्यावरण के लिए जीवन शैली

(Lifestyle For Environment)

जनसहभागिता का सन्देश

- स्वच्छता – देशसेवा में अपने परिवेश की स्वच्छता हेतु अपना सक्रिय योगदान सुनिश्चित करें
- संकल्प लें -एकल उपयोग प्लास्टिक उत्पाद जैसे कप, तश्तरी, चम्मच, स्ट्रॉ, ईयरबड्स आदि का उपयोग न हो एवं पर्यावरण अनुकूल विकल्पों जैसे कागज/पत्तों से बने दोने या कटलरी को प्राथमिकता दी जाय |
- एकल उपयोग प्लास्टिक उत्पाद के प्रयोग को रोकने एवं प्लास्टिक बैग के बजाय कपड़े के थैले का उपयोग करने मात्र से 375 मिलियन टन ठोस (प्लास्टिक) कचरे का उत्सर्जन बचाया जा सकता है
- चक्रीय अर्थव्यवस्था (सर्कुलर इकोनॉमी) का समुचित कार्यान्वयन वर्ष 2030 तक लगभग 14 लाख करोड़ रुपये की अतिरिक्त बचत उत्पन्न कर सकता है | वेस्ट /अपशिष्ट फेकने के पूर्व सोचें, ये किसी का संसाधन तो नहीं ...?
- अनुपयोगी इलेक्ट्रिक / इलेक्ट्रॉनिक उत्पाद को कचरे में फेकने से रुकें | इसके उपयुक्त निस्तारण हेतु इसे प्राधिकृत ई – वेस्ट रीसाइकलर को दें | प्राधिकृत ई-रीसाइक्लिंग इकाई में अनुपयोगी इलेक्ट्रिक / इलेक्ट्रॉनिक उत्पाद को देने मात्र से 0.75 मिलियन टन तक ई-कचरे का पुनर्चक्रण किया जा सकता है एवं ई-कचरे के विषम पर्यावरणीय दुष्प्रभाव से बचा जा सकता है
- बाहर जाते समय - सोचें कि क्या आपको वास्तव में परिवहन की आवश्यकता है - वह भी क्या व्यक्तिगत रूप से ? छोटी दूरी के लिए पैदल चलना पसंद करें, अथवा सम्भव हो तो कार पूल के रूप में संसाधन को साझा करें अथवा सार्वजनिक परिवहन पर विचार करें
- घरेलू स्तर पर कम से कम ठोस अपशिष्ट का उत्सर्जन करें और इनका प्रथाक्कीकरण करें
- उपयोगी शेष खाद्य सामग्री आपके स्वयं प्रयास अथवा निकटस्थ सक्रिय स्वयं सेवी संस्थाओं की सहायता से समाज के वंचित वर्ग तक पहुंचाई जा सकती है | वहीं अनुपयोगी भोजन /खाद्य सामग्री को कंपोस्ट (वर्मी कम्पोस्ट) करने से 15 अरब टन भोजन को नष्ट होने से बचाया जा सकता है
- ध्यान रखें - उपयुक्त नल और शावर के उपयोग से पानी की खपत को 30 - 40% तक कम किया जा सकता है। एवं उपयोग में न होने पर नलों को बंद रखने मात्र से 9 ट्रिलियन लीटर पानी बचाया जा सकता है
- ट्रैफिक लाइट/रेलवे क्रॉसिंग पर कार/स्कूटर के इंजन बंद करने मात्र से 22.5 बिलियन kWh तक ऊर्जा की बचत हो सकती है
- परम्परागत बल्ब के स्थान पर CFL का उपयोग बिजली की खपत में प्रभावी कमी लाते हैं | उपयोग में न होने पर बिजली उपकरणों को बंद करें | स्टार रेटेड विद्युत उपकरणों के उपयोग को प्राथमिकता दें

हमारे द्वारा अपनी जीवन शैली की प्राथमिकताओं का उचित और पर्यावरण अनुकूल पुनर्निर्धारण समाज और पर्यावरण के प्रति हमारा दायित्व है |

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC020081

VALID FROM 18/06/2021 TO 17/06/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202101000137

Name of the Owner	PRASHANT KUMAR JENA		
Designation पद	Senior Manager	**Company Name** कंपनी का नाम	Bajaj Energy Limited, Unit Kundarkhi
Company Address कंपनी का पता	Village - Kundarkhi,PO - Govindpara,District - Gon	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Village - Kundarkhi ,PO - Govindpara	**Application Form Serial No.**	GNDA0621NIN0008
Date of Submission	07/01/2021	**Specimen Signature**	

Location Particulars

District	Gonda	**Block**	JHANJHARI
Plot No./Khasra No.	6,7,8,62,63,65,546 &548	**Municipality/Corporation**	N/A
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	03/03/2011		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	106.57
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	

Strainer Position (For Tube Well)

Type of Pump Used	Submersible		
		H.P. of the Pump	30.00

Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		03/03/2011	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	19.00
Maximum Allowable Annual Extraction of Ground Water:			1026000.00

GROUND WATER DEPARTMENT

(Namami Gange & Rural Water Supply Department)

Ministry of Jal Shakti

Government of Uttar Pradesh

Form 8 (C)

[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC033164

VALID FROM 18/06/2021 TO 17/06/2026

{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202106000066

Name of the Owner	PRASHANT KUMAR JENA		
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Village - Kundarkhi ,Post _ Govindpara ,Distt - Go	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Village - Kundarkhi ,PO - Govindpara	**Application Form Serial No.**	GNDA0621NIN0009
Date of Submission	04/06/2021	**Specimen Signature**	

Location Particulars

District	Gonda	**Block**	JHANJHARI
Plot No./Khasra No.	N/A	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	10/01/2012		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	106.57
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00

Date of Energization (In Case of Electric Pump)		10/01/2012	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	14.00
Maximum Allowable Annual Extraction of Ground Water:			756000.00

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)
[See Rule 8(1)]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW / EXISTING WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC027710
VALID FROM 18/06/2021 TO 17/06/2026
{UIS10(1) of the Uttar Pradesh Ground Water Management and Regulation Act, 2019}

Registration No.: 202106000067

Name of the Owner	PRASHANT KUMAR JENA		
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited
Company Address कंपनी का पता	Village - Kundarkhl ,Post _ Govindpara ,Distt - Go	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Village - Kundarkhi ,PO - Govindpara	**Application Form Serial No.**	GNDA0621NIN0010
Date of Submission	04/06/2021	**Specimen Signature**	

Location Particulars

District	Gonda	**Block**	JHANJHARI
Plot No./Khasra No.	NA	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	10/01/2012		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	106.57
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	30.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00

Date of Energization (In Case of Electric Pump)		10/01/2012	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	7.00
Maximum Allowable Annual Extraction of Ground Water:			378000.00



उत्तर प्रदेश UTTAR PRADESH



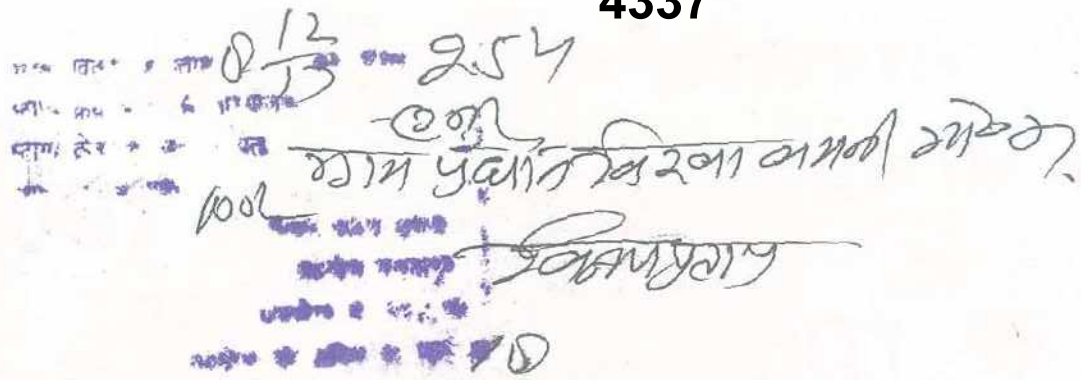
DC 678298

अनापत्ति प्रमाण पत्र

मैं गुड्डी देवी, ग्राम प्रधान बिरवा बभनी, वि0ख0 झंझरी, जनपद गोण्डा (उत्तर प्रदेश) तस्दीक करती हूँ कि पंचायत की सहमति से लिये गये निर्णय के अनुसार हमारे ग्राम में खाता सं0 0023 खसरा/गाटा सं0 25, 26, 30, 61, 76, 91, 102, 103, 114, 139, 153, 161, 173, 221, 223स, 239, 251, 263, 264, 268, 270, 277, 290, 294, 308, 327, 330, 332 एवं 371 में स्थित तालाब जिसका क्षेत्रफल 20.08 हेक्टेयर है, को मे0 बजाज इनर्जी लिमिटेड, कुन्दरखी, गोण्डा उत्तर प्रदेश को रेन वाटर हर्वेस्टिंग व रिचार्ज के लिए अधिग्रहित करती हूँ तो इस ग्राम की पंचायत को कोई आपत्ति नहीं है।

मैं यह भी दस्तीक ये तालाब किसी अन्य व्यक्ति या कम्पनी को अधिग्रहित नहीं किया गया है एवं नही भविष्य में किया जायेगा।







उद्धरण खतौनी

उद्धरण क्रमांक : 17463920181265

ग्राम क्रमांक : 174639 ग्राम का नाम / परगना : बिरवा बभनी(गोण्डा) तहसील : गोण्डा जनपद : गोंडा फसली वर्ष : 1421-1426 भाग : 1

खाता खतौनी क्रम संख्या	खातेदार का नाम / पिता पति संरक्षक का नाम / निवास स्थान	भौमिक अधिकार प्रारम्भ होने का वर्ष	खाते के प्रत्येक गाटे की खसरा संख्या	प्रत्येक गाटे का क्षेत्रफल (है.)	खातेदार द्वारा देय मालगुजारी या लगान	परिवर्तन सम्बन्धी आज्ञा या उसका सारांश उनकी संख्या तथा दिनाँक सहित और आज्ञा देने वाले अधिकारी का पद	टिप्पणी
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श्रेणी : 6-1 / अकृषिक भूमि - जलमग्न भूमि ।							
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	330	0.0400			
	371	0.1170			
	332	0.0240			
	30	28.2100	₹ 0.00	0	0

कुल गाटे- तीन शून्य कुल क्षेत्रफल- दो आठ दशमलव दो एक शून्य शून्य (हेक्टेयर) कुल भू-राजस्व - शून्य दशमलव शून्य शून्य रुपये

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सक्षम अधिकारी: SUDHAKAR GAUTAM

तहसील: गोण्डा जनपद: गोंडा

दिनांक एवं समय: 26-12-2018 04:09:17

यह उरण खतौनी इलेक्ट्रोनिक डिलीवरी सिस्टम द्वारा तैयार की गयी है तथा डाटा डिजीटल हस्ताक्षर द्वारा हस्ताक्षरित है।

भारतीय गैर न्यायिक

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कोषागार गोण्डा-50

02 MAR 2020

मुख्य कोषाधिकारी
गोण्डा

अनापत्ति प्रमाण पत्र

मैं शीतला बक्श सिंह, ग्राम कहोबा, वि0ख0 मनकापुर, जनपद गोण्डा (उत्तर प्रदेश) तस्दीक करता हूँ कि पंचायत की सहमति से लिये गये निर्णय के अनुसार हमारे ग्राम में खाता सं0 00264 खसरा/गाटा सं0 72, 120ख, 177, 207, 212, 223कमि, 263 ख, 277ख, 293, 341, 342क, 351, 357, 372, 373, 497, 500, 502, 554ख एवं 564 में स्थित तालाब जिसका क्षेत्रफल 10.228 हेक्टेयर है, को मे0 बजाज इनर्जी लिमिटेड, कुन्दरखी, गोण्डा उत्तर प्रदेश को रेन वाटर हर्वेस्टिंग व रिचार्ज के लिए अधिग्रहित करता हूँ तो इस ग्राम की पंचायत को कोई आपत्ति नहीं है।

मैं यह भी दस्तीक ये तालाब किसी अन्य व्यक्ति या कम्पनी को अधिग्रहित नहीं किया गया है एवं नही भविष्य में किया जायेगा।

प्रधान
ग्राम पंचायत-कैमी/कहोवा
न्याय पंचातय-विद्यानगर
क्षेत्र पंचायत-मनकापुर
तहसील-मनकापुर

ser/ROR_Tehsil

6585

क्रम संख्या.
स्टाम्प विक्रय का दिनांक 7-12-20
स्टाम्प क्रय करने का प्रयोजन बैनामा
स्टाम्प क्रेता का नाम व पूरा पता गणपत [illegible] हुकमी गोंड
विक्रय की धनराशि

1002

अखिलेश कुमार सिंह
लाइसेन्स नम्बर 164/18
लाइसेन्स की अवधि 31-3-2021
कार्यालय तहसील पाली

Akhilesh

उद्धरण खतौनी

उद्धरण क्रमांक : 17550220200312

ग्राम क्रमांक : 175502 ग्राम का नाम / परगना : कहोबा(मनकापुर) तहसील : मनकापुर जनपद : गोंडा फसली वर्ष : 1425-1430 भाग : 1

खाता खतौनी क्रम संख्या	खातेदार का नाम / पिता पति संरक्षक का नाम / निवास स्थान	भौमिक अधिकार प्रारम्भ होने का वर्ष	खाते के प्रत्येक गाटे की खसरा संख्या	प्रत्येक गाटे का क्षेत्रफल (हे.)	खातेदार द्वारा देय मालगुजारी या लगान	परिवर्तन सम्बन्धी आज्ञा या उसका सारांश उनकी संख्या तथा दिनाँक सहित और आज्ञा देने वाले अधिकारी का पद	टिप्पणी
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श्रेणी : 6-1 / अकृषिक भूमि - जलमग्न भूमि ।							
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			500	0.1130			

			502 554ख 564	0.1900 0.2870 0.1540			
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कुल गाटे- दो शून्य कुल क्षेत्रफल- एक शून्य दशमलव दो दो आठ शून्य (हेक्टेयर) कुल भू-राजस्व - शून्य दशमलव शून्य शून्य रुपये

Data Digitally Signed by: CHANDRA BHUSAN TIWARI

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सक्षम अधिकारी: SATYA DEV MIASHRA

तहसील: मनकापुर जनपद: गोंडा

दिनांक एवं समय: 16-03-2020 01:51:42

यह उद्धरण खतौनी इलेक्ट्रोनिक डिलीवरी सिस्टम द्वारा तैयार की गयी है तथा डाटा डिजीटल हस्ताक्षर द्वारा हस्ताक्षरित है।

WATER AUDIT REPORT

As per the guidelines of GWD

(Namami Gange & Rural Water Supply Department)

MINISTRY OF JAL SHAKTI, GOVT. OF U.P.

AT

M/s Bajaj Energy Limited
(Kundarkhi Plant)
Village- Kundarkhi, P.O- Govindpura
Dist.- Gonda, U.P



BY

PHD Chamber of Commerce and Industry
PHD House, 4/2 Siri Institutional Area
August Kranti Marg, New Delhi-110016
Email: sustainability@phdcci.in
Website: www.phdcci.in

Nov' 2023

PHD CHAMBER OF COMMERCE AND INDUSTRY VOICE OF INDUSTRY AND TRADE

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ACKNOWLEDGMENT

PHDCCI places on record its sincere thanks to the Management of M/s Bajaj Energy Limited for entrusting the task of conducting Water Audit assignment at M/s Bajaj Energy Limited, Kundarkhi Unit, Gonda in line with CGWA Notification dated 24/09/2020.

We are grateful to Dr. Amitosh Verma (Vice President- EHS), Mr. Pradeep Mishra (Energy Manager-Kundarkhi), for his continuous support and guidance during the execution of the assignment.

PHDCCI Audit Team is thankful to the Technical & EHS team of M/s Bajaj Energy Limited (BEL) for their keen interest in the water audit and the wholehearted support and cooperation during the conduct of the field study, without which the study would not have steered to its successful completion.

It is well worthy to mention that the efforts being taken and the enthusiasm shown by all the personnel towards water and energy conservation are really admirable.

PHD Chamber of Commerce and Industry

Dr. Ranjeet Mehta
(Executive Director, PHDCCI)

CERTIFICATE

We certify the following

- The report is based on the data collected at site during Audit and information provided by the at M/s Bajaj Energy Limited, Kundarkhi Unit.
- The data collection has been carried out diligently and truthfully.
- All data measuring devices used by the team are in good working condition, have been calibrated and have valid certificate from the authorized approved agencies and tampering of such devices has not occurred.
- All reasonable professional skill, care and diligence have been taken in preparing the water audit report and the contents thereof are a true representation of the facts and figures.

PHD Chamber of Commerce and Industry

Dr. Ranjeet Mehta
(Executive Director, PHDCCI)

ABBREVIATIONS

A	Ampere
AC	Alternating Current
Avg.	Average
BEL	Bajaj Energy Limited
CGWA	Central Ground Water Authority
CGWB	Central Ground Water Board
CWC	Central Water Commission
DWFM	Digital Water Flow meter
KL	Kilo Liter
KV	Kilo Volt
kVA	Kilo Volt Ampere
KVAr	Kilo Volt Ampere Reactive
kW	Kilo Watts
kWh	Kilo Watt Hour
Lit	Litres
LPCD	Litre Per Capita per Day
M or m	Meter
Max.	Maximum
mbgl	meters below ground level
Min.	Minimum
MT	Metric Ton
No.	Number
PF	Power Factor
RO	Reverse Osmosis
STP	Sewage Treatment Plant
LPS	Low Pressure Switch
HPS	High Pressure Switch
ETP	Effluent Treatment Plant
V	Voltage
WDS	Water distribution station.
WTP	Water Treatment Plant

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EXECUTIVE SUMMARY

This report is an attempt of PHDCCI to provide an overview of the water distribution system and water usage at M/s Bajaj Energy Limited, Kundarkhi Unit. The report also highlights the major water sources, consumption area, wastewater treatment facilities and available water saving opportunities in the plant. A set of recommendations which will assist in improving water efficiency has also been highlighted in this report. This report has emerged after a detailed water audit conducted by PHDCCI in plant on 26/07/2023 to 27/07/2023.

<table>
<tr><td colspan="2">Project Title:</td><td>PHDCCI Report Number:</td></tr>
<tr><td colspan="2">Water Audit at M/s Bajaj Energy Limited, Kundarkhi Unit
Village- Kundarkhi, P.O- Govindpura, Dist.- Gonda, U.P.</td><td>2023-24/PHDCCI/S/W/010</td></tr>
<tr><td colspan="3">Client:</td></tr>
<tr><td colspan="3">M/s Bajaj Energy Limited</td></tr>
<tr><td colspan="3">Contact Person:</td></tr>
<tr><td colspan="3">Dr. Amitosh Verma (Vice President- EHS)</td></tr>
<tr><td colspan="2">Date of Audit:</td><td>Source of Water:</td></tr>
<tr><td colspan="2">26/07/2023 to 27/07/2023</td><td>Groundwater</td></tr>
<tr><td colspan="2">Date of this Report:</td><td>Date of Approval:</td></tr>
<tr><td colspan="2">09/11/2023</td><td>12/01/2024</td></tr>
<tr><td>Work Carried out by:
(Team Composition)</td><td>Mohit Kumar — Team Leader
Pushpendra Yadav — Team Member
Rahul Sharma — Team Member
Akhilesh Yadav — Team Member</td><td>No Distribution without permission from the client or responsible organization or unit</td></tr>
<tr><td rowspan="2">Final Report Approved:</td><td colspan="2">  </td></tr>
<tr><td>Dr. Ranjeet Mehta
(Executive Director, PHDCCI)</td><td>Date: 12/01/2024</td></tr>
</table>

M/s Bajaj Energy Limited (BEL), Kundarkhi Unit has been granted NOC/permission from Ground Water Department (Namami Gange & Rural Water Supply Department), Ministry of Jal Shakti, Govt. of Uttar Pradesh to abstract ground water for industrial purpose through 3 Nos. of Borewells. As per GWD, Govt. of U.P, Borewell 1,2&3 are having rated capacity of 30 HP with discharge capacity of 180m3/hr. the running hrs. of each pump shall not be exceeded by 19hrs/day, 14hrs/day & 7hrs/day respectively for Borewell 1,2&3. Thus, Total withdrawal limit per day for Borewell 1,2&3 is 3420m3/day (1026000m3/year), 2520m3/day (756000m3/year) & 1260m3/day (378000m3/year) respectively. Cumulative per day withdrawal limit through 3 Nos. of Borewell for industrial purpose is about 7200m3/day (21,60,000 m3/year).
Thus, it is noticed from Historical data, Total Ground (Fresh) water intake for plant activities for FY 2020-21, FY 2021-22 & FY 2022-23 (sourced from plant data); is about 740518m3/year (2468m3/day), 811440m3/year (2705m3/day) & 928262m3/year (3094m3/year) respectively. **Thus, plant is in under compliance for yearly and daily withdrawal as per GWD**.

During Audit, Team noticed total water consumed to Plant (Ground Water + ETP Treated Water) are about 4417m3/day. Out of total, Fresh water through borewells are about 3954m3/day (89.5%) and ETP Treated Water is about 463m3/day (10.5%). **Thus, Plant is under compliance of abstracting ground water less than 7200m3/day through borewells.** Presently, three borewells are in operation to meet their water requirement. Abstracted ground water from Borewell is stored in DM Raw water storage tank & Domestic use; Secondly having provision for makeup to CT. Further, fresh water from DM Raw water storage tank has to be used in Boiler after DM treatment process.

The Fresh water consuming areas are Domestic Use (TG building, DM Plant, Security area & CHP area) of about 14m3 (0.3%), CT Makeup is around 3914m3 (88.6%), Boiler Makeup is around 20m3 (0.4%), WTP- RO Reject, Backwash & Regeneration is around 7m3 (0.16%). The treated water consuming areas are Firefighting of around 23m3 (0.5%), Ash quenching is around 69m3 (1.6%), Horticulture/Gardening is about 32m3 (0.7%), Coal Yard is around 111m3 (2.5%), Road dust suppression/sprinkling is around 46m3 (1.0%) & Balanced ETP treated water is stored in Reservoir or supplied to farmers for irrigation is about 181m3 (4.1%).

As per GWD, U.P NOC, M/s Bajaj Energy Limited (BEL), Kundarkhi Unit, has to install tamper proof digital water flow meter (DWFM) on all abstraction structure(s) with Telemetry system and also calibrate DWFM from an authorized agency once in a year. It was noticed during the audit that the plant has installed digital water flow meters with telemetry system on existing 3Nos. of Borewell on discharge line of Pump**. Thus, Plant is under compliance of installation of DWFM at discharge side of Pump before any tapping points.** In addition, plant has maintained ground water abstracted data on daily & monthly basis in a logbook. Team also noticed, plant has done the calibration of DWMF of 3 Borewells and record of same has been maintained. (Calibration certificate of DWFM are attached separately in annexure in chapter 11).

As per GWD, U.P NOC, M/s Bajaj Energy Limited (BEL), Kundarkhi Unit, has to monitor quality of ground water from the abstraction structure(s) twice in a year during pre-monsoon (May/June) & post monsoon (October/November) period. In view of above, Audit team checked and noticed testing of ground water report has been done. All of the reports related to ground water sample found in accordance to the environmental factors related to water uses. (The ground water test reports are attached separately in annexure in chapter 11)**.** Thus, the plant is under compliance of monitoring the quality of ground water.

As per GWD, U.P NOC, M/s Bajaj Energy Limited (BEL), Kundarkhi Unit, has to install Two (2) Nos. of observation well (piezometer) for ground water level monitoring in project area along with

digital water level recorder (DWLR) for ground water abstraction > 500m3/day. During onsite assessment, digital water level recorder was found operational and record of monitoring of piezometer data is maintained by the plant. Thus, plant is under compliance for ground water level monitoring.

As per GWD, U.P NOC, M/s Bajaj Energy Limited (BEL), Kundarkhi Unit, has to install Rooftop Rain water harvesting structures in the premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the plant, if industry likely to pollute ground water.
Presently, Plant has installed 3Nos. of RWH structures within plant premises each with yearly installed capacity of 2911m3/year, 7200m3/year & 960m3/year respectively. Out of 3 RWH structure, 1RWH structure near TG Building is having provision to augment the groundwater recharge through the generated runoff from TG Rooftop area & storm water line. Balance 2 RWH structure connected with storm water line; which is used to augment the ground water resources of the area. Thus, Bifurcation of drain line and storm water line needs to be done precisely. Presently, Waste water discharge through Washing & Cleaning, handwash & overflow of soak pit has been discharged to drain line further reutilized after treatment.

M/s Bajaj Energy Limited (BEL), Kundarkhi Unit, has been granted Consent to Operate (CTO) issued by Uttar Pradesh Pollution Control Board for production capacity of 90MW power production for the period up to 31/12/2023, subject to fulfilment of the terms & conditions mentioned in water & air consent letter.

Industrial wastewater generated in plant through various process activities like backwash & Regeneration of filters of WTP plant, RO Reject & Boiler blowdown, which is being collected & treated in N Pit (64m3 capacity) further passed to ETP having installed capacity of 1000KLD for further treatment along with CT blowdown. During Audit, Team noticed about 463m3/day industrial waste is being treated, thereafter reused in dust suppression near CHP, Ash silo, gardening, Firefighting & Ash quenching. In addition, Generated Domestic effluent (Flushing) is being treated in septic tank with soak pit. However, effluent generated through hand wash and other domestic washing & cleaning activities discharged to drain line/storm water line. In addition, Bajaj Management has installed 100KLD STP Plant for residential block which is common for Power Plant & Sugar Plant. STP treated water discharged to the common point.

PHDCCI has conducted a detailed Water Audit Study of the **M/s Bajaj Energy Limited (BEL), Kundarkhi Unit**. The main source of freshwater for plant is Ground water. Historical water consumption pattern per unit of generation is shown in below table.

Table: Sources of water at the plant, Effluent Discharge & Specific Water Consumption per unit of generation

Sr. No.	Description	UOM	FY 2020-21	FY 2021-22	FY 2022-23
1	Borewell 1	m3/year	404620	388931	547511
2	Borewell 2	m3/year	335898	351588	215704
3	Borewell 3	m3/year	0	70921	165047
4	**Total Ground Water Abstraction, A**	**m3/year**	**740518**	**811440**	**928262**
5	**Domestic**	m3/year	**2364**	**2161**	**2925**
6	**Industrial**	m3/year	**738154**	**809279**	**925337**
7	ETP Treated Water, B	m3/year	67301	71961	72000
8	No. of Working days, C	Nos./year	300	300	300
9	**Ground water abstraction per day, D= (A/C)**	**m3/day**	**2468**	**2705**	**3094**

Sr. No.	Description	UOM	FY 2020-21	FY 2021-22	FY 2022-23
10	**ETP treated water per day, E= (B/C)**	**m3/day**	**224**	**240**	**240**
11	Production (Generation), F	MU/year	246.56	280.026	319.319
12	**Specific Water Consumption (SWC) of Power Generation, G= [A/(F X 1000)]**	**m3/MWh**	**3.00**	**2.90**	**2.91**

**SWC per unit generation w.r.t Total Fresh water intake in FY 2022-23 has been increased from FY 2021-22.*

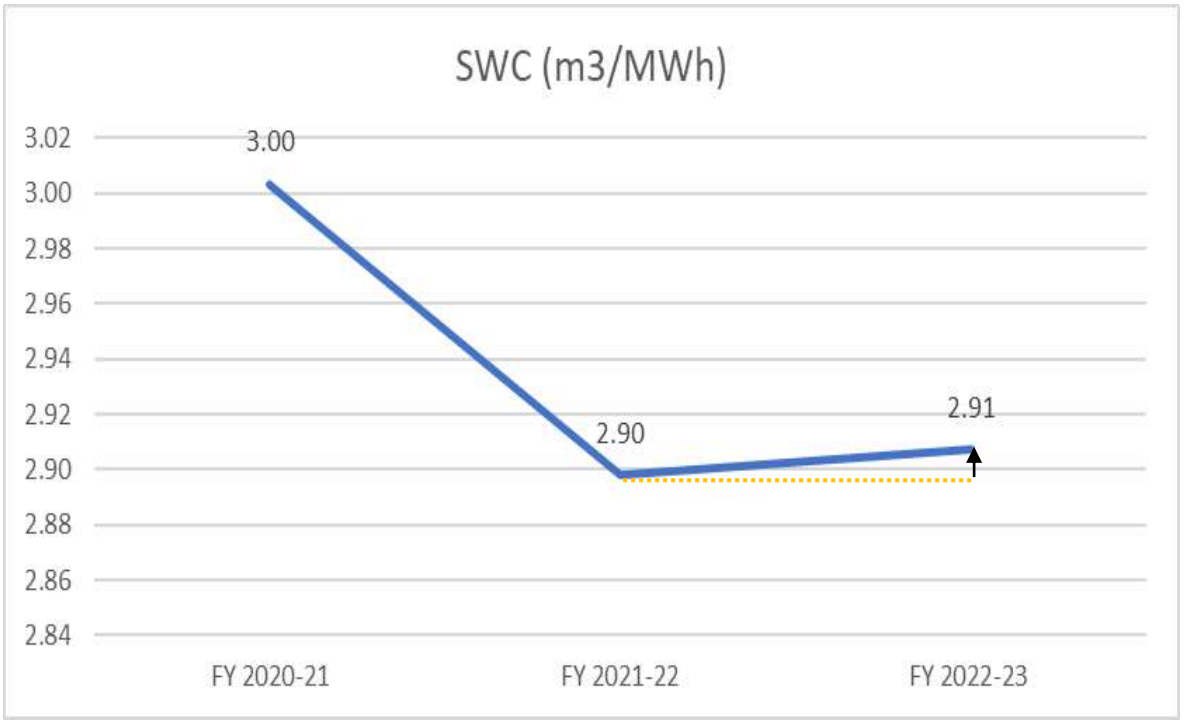


Figure: Specific water consumption per Unit of Power Generation (m3/MWh)

Thus, Specific water consumption of Power Plant are found to be in accordance with guidelines of MoEF i.e. below 3.5 m3/MWh for Power plant for existing system.

In response to growing concern over water shortage and its economic impact on plants, the Ministry of Environment, Forest and Climate Change (MoEF & CC) published the rules listed below on 7 December 2015 (MoEF & CC, 2015):

- All thermal power plants with once-through cooling[5] are expected to install cooling towers and to achieve specific water consumption[6] of 3.5 m^3 per megawatt-hour (MWh) by December 2017 (within two years of notification).
- All existing plants using cooling towers shall reduce specific water consumption down to a maximum of 3.5 m^3/MWh by December 2017 (within a period of two years of notification).
- New plants installed after 1 January 2017 must meet specific water consumption of 2.5 m^3/MWh and achieve zero water discharge.[7]

Following are the initiatives already adopted by Plant Management to reduce the fresh Water/Treated Water.

S. No.	Title of water saving Project Implemented	Year of Implementation	Annual water Saving		Investment Made	Payback Period (Months)
			m^3	Rs. Lakhs		
1	Use of Swas drain water in cooling tower	2021	1533	0.03	0.02	8
2	Reuse of Filter Backwash (MGF) water after settlement in a Settling Tank	2022	803	0.04	Minimal	Immediate

Given the above scenario of prevailing resource challenge, accelerating over time Progressive management of Bajaj Energy Limited is very keen to do water audit of premises. To get benefit of water saving projects, Plant management has awarded the task of water audit to PHDCCI.

The Audit is focused on improving water usage efficiency and identifying water Conservation opportunities. Accordingly, the field study and data collection for the said water audit was carried out by the PHDCCI Audit team. This report discusses the water balance and various water saving options derived on the basis of observation made, data collected and their analysis. Summary of Water Audit findings are presented in the below.

SUMMARY OF RECOMMENDATIONS

Description	Key Observations	Recommendations	Water savings (m3)/ day	Annual water savings (m3)/ year
Utilizing of Rooftop RWH Potential	Presently, Plant has installed 3Nos. of RWH structures within plant premises each with installed capacity of 30m3, 16m3 & 20m3 respectively. Out of 3 RWH structure, 1RWH structure near TG Building is having provision to augment the groundwater recharge through the generated runoff from TG Rooftop area & storm water line. Balance 2 RWH structure connected with storm water line which is used to augment the ground water resources of the area. Team noticed; Rooftop & green belt runoff available from the plant is about 2458 m3/year & 3340 m3/year respectively. Thus, Team noticed Plant has the potential to utilize runoff generated through rooftop.	It is recommended to utilize the Rooftop RWH potential for industrial use by constructing storage system locally for the rooftop and also divert the rooftop water to the raw water storage tank through closed network/pipeline from nearby rooftop area. This results in savings in Fresh Water. In addition, it is also recommended to clean the storm water line and maintenance of RWH structures need to be done before Pre-monsoon to effectively utilize the RWH potential through Road/paved area, open & green belt area.	3	1229
Reuse of 100KLD STP Treated water in Gardening, firefighting & Dust Suppression	Presently, STP plant having installed capacity of 100KLD used both for Power Plant & Sugar Plant Residential Block. During Audit, about 32m3/day treated STP water was noticed, thereafter Treated water from STP is discharged to common point. No effective utilization of Treated water is being done. Around 10m3/day treated water used in backwash of filters & 5m3 used in greenbelt nearby area.	It is recommended to use of STP treated water for Firefighting, Dust suppression & green belt development after proper treatment using drip irrigation system or proper pipeline infra has to be developed across boundary wall which helps in effective utilization of STP treated water in gardening.	16	4800
Regularly calibrate & maintain existing water flow meters	It was noticed that plant has calibrated the DWFM of 3 No. of borewell and Calibration record of DWFM has been maintained.	It is suggested to maintain the system.		
Maintain logbook of daily groundwater abstraction	It was noticed that the plant is maintaining data of daily groundwater abstraction & reuse of recycled water.	It is suggested to maintain the system.		
Training and Awareness of the Employees at all Levels and Placing 'Water Saving' Posters/Slogans at various Locations	Awareness at management level was noticed. However, partial awareness among the workforce about 'Water Saving & Conservation' and 'Good Housekeeping Practices' was observed.	It is suggested to Plant to conducts training and awareness of the Employees & workers annually, events to promote water conservation like celebration of world water day, world environment day.		

Description	Key Observations	Recommendations	Water savings (m3)/ day	Annual water savings (m3)/ year
Monitor quality of ground water from the abstraction structure(s)	DWLR with telemetry system installed & found operational and record of monitoring of piezometer data is maintained by the plant.	It is suggested to maintain the system.		
	Total Water consumed within Plant (Ground water + ETP Treated Water)		**4417 m3/day**	
	Total Ground water abstracted for industrial use		**3954 m3/day**	
	As per GWD NOC of 3 Nos. of Borewell, Cumulative Ground water per day withdrawal limit for industrial purpose		**7200m3/day**	
	% utilization of Ground water w.r.t per day total withdrawal limit		**55% {44% below of withdrawal limit)**	
	Total Fresh water savings potential		19 m3/day	
	Thus, Total Fresh water savings in Plant by implementation of measures		0.4%	

Remarks: It is estimated that by implementing suggested schemes, M/s Bajaj Energy Limited (BEL), Kundarkhi Unit can reduce its freshwater water consumption by about 19m3/day (0.4%).



CHAPTER 1

Introduction

1. INTRODUCTION

Human activities consume and pollute lot of water. At a global scale, most of the water use occurs in agricultural production, but there are also substantial water volumes consumed and polluted in the industrial and domestic sectors (WWAP, 2009).

Global changes like population growth, climate variability, ever-expanding industrialization and urbanization — often combined with pollution — severely affect water availability and lead to chronic water shortages in a growing number of regions. India has been successful in the past to meet such water requirements for different usages with a phenomenal development of water resources. However, preserving the quality and availability of fresh water resources has now become a pressing environment challenge.

Water is an essential precondition for life, and according to the UN it is a human right to have access to clean water. However, in India millions of people are living without direct access to safe water and based on the rapid population growth coupled with the fact that the water reserve is finite, it will be a very valuable and scarce resource within only a few years. In this light, there is an urgent need for decision makers to act in order to improve the conditions for effective use and supply of water to the Indian people now and in the future.

Under the Indian Constitution and in our federal democratic set up drinking water comes within the domain of the State Governments (Provincial Governments). In fact, the 73rd Constitutional Amendment has gone a step forward. It mandates that responsibility for drinking water and sanitation services should be with Local Governments. Various States in India are at different stages of giving effect to this Constitutional mandate.

The Ministry of Urban Development has formulated Service Level Benchmarks (SLBs) in 2008 and circulated the same to the States for adoption. The SLBs include water conservation and management practices such as continuous water supply, 100% metering of water supply, sustainable tariffs and reduction in leakages to a level of 15% to 20%.

The National Water Policy – 2012 focuses on the need for publishing water accounts and water audit reports indicating leakages and pilferages. The policy recommends systems to evolve benchmarks for water uses for different purposes, i.e., water footprints, and water auditing to ensure efficient use of water.

National Water Mission (NWM) has been established by the Government of India with the objective of "conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management".
The Government of India has also launched a Centrally Sponsored Scheme for Repair, Renovation and Restoration (RRR) of water bodies, which has multiple objectives like comprehensive

improvement and restoration of water bodies thereby increasing tank storage capacity, improved water use efficiency and increased availability of drinking water.

With its continuously declining per capita water availability (from about 5,177 m3 in 1951 to 1,654 m3 in 2007), India stands water stressed and is close to being categorized 'water scarce'. Water demand in India is expected to grow annually by 2.8 per cent to reach 1,500 bcm (by 2030) while the current supply is only about half (viz., 744 bcm). The Government of India, in its Intended Nationally Determined Contribution (INDC) submitted to UN Framework Convention on Climate Change (UNFCCC) in October, 2015, has committed to improve the water use efficiency by 20%, through regulatory mechanisms with differential entitlements and pricing. It further emphasizes the need to focus on integrated water resource management through water conservation, wastewater minimization, etc.

The notification dated 24/09/2020 from CGWA All industries abstracting ground water in excess of 100 m3/day shall be required to undertake biennial (once in two years) water audit through certified auditors of agencies as approved by CGWA and submit audit reports within three months of completion of the same to CGWA.

Water audit is an effective management tool for minimizing losses, optimizing various uses and thus enabling considerable conservation of water. Thus, M/s Bajaj Energy Limited has entrusted PHDCCI for conducting water audit in the plant premises.

This report discusses the existing water scenario at BEL, Kundarkhi Unit and its potential water savings and how the basic water audit approach has been applied to water conservation in line with the guidelines of CGWA.

1.1 RATIONALE FOR WATER AUDIT

Water audit determines the amount of water lost from the water network/distribution system due to seepage, evaporation/leakage and other reasons such as theft, unauthorized or illegal withdrawals from the systems. Water audit improves the knowledge and documentation of the distribution system, and better understanding of what is happening to the water after it leaves the source point. Comprehensive water audit gives a detailed profile of the distribution system and water users, thereby facilitating easier and effective management of the resources with improved reliability. It helps in correct diagnosis of the problems faced in order to suggest optimum solutions. This leads to reduced water losses; improved financial performance; improved reliability of supply system; enhanced knowledge of the distribution; efficient use of existing supplies; better safeguard to public health and property; improved public relations; reduced legal liability and reduced disruption etc. thereby improving level of service to customers. It is thus an effective tool for realistic understanding and assessment of the present performance level and efficiency of the service and the adaptability of the system for future expansion & rectification of faults during modernization.

1.2 STEPS OF WATER AUDIT

Water Audit includes water supply and usage study, process study, system audit, discharge analysis and preparation of water audit report.

1.2.1 Water Supply and Usage Study

Water audit comprises preparation of layout of water sources, distribution network, and service/delivery points to water users and return flow of waste or excess water. The layout should contain locations and capacities of flow measurement devices installed at key points, sizes of different channels, and fittings in the water supply system, locations and particulars of flow control devices and history sheets of all measuring and control devices including pipes and fittings etc.

PHDCCI has carried out the water supply and usage studies at M/s Bajaj Energy Limited (BEL), Kundarkhi Unit to understand the present water utilization pattern and projecting future requirement. PHDCCI also carried out a review of sustainable sources of water through rainwater harvesting and possible wastewater recycling.

1.2.2 Process Study

Flow measurement devices were installed at all strategic points to calculate the water consumption at BEL in various activities such as Borewells, Inlet to MGF, ETP inlet & Outlet.

Water quality of the distribution system needs to be monitored regularly at strategic points to find out the level and nature of contaminants present in the supplied water. The BEL has conducted the water quality test reports for ground water. Audit team reviewed all test reports and found acceptable as the results are in compliance to various standards as required by SPCB.

PHDCCI has carried out flow, pressure and power measurement of all Borewells, Water Treatment Plant to calculate the total water supplied to the different areas of the plant to understand the quantity of water received from ground & surface water and feed to the plant area.

1.2.3 System Audit

The current water usages and systems for water use under various sectors such as building, green belt/horticulture, domestic water supply & industry use needs to be studied to check their operational efficiency and level of maintenance. The scope for any modification or up-gradation will depend on the status of existing systems. Measurement methodology from the intake point of the system through various sub-systems to the ultimate user points needs to be verified periodically for its suitability, efficiency and accuracy. Metering has been done for surface water intake & for borewell pumps. This will help in identifying the reaches of undue water wastage. The domestic wastewater return flows and effluents from the industries need to be studied for conformity to environment standards, possibility of recovery of valuable by-products and the opportunity for recycling of waste water.

PHDCCI has carried out physical inspection of water distribution network/system of borewells, supply to various areas of the Plant like WTP, Boiler, CT, office building to get their per day drinking and sanitary water consumption to arrive at per capita water consumption in BEL, Kundarkhi Unit.

1.2.4 Discharge Analysis

The wastewater generated from the plant premises, need to be studied for conformity to environment standards, possibility of recovery of valuable by-products and the opportunity for recycling of waste water. The BEL, Kundarkhi Unit has installed an N Pit & ETP to treat the wastewater generated from industrial process.

1.2.5 Water Audit Report

A water audit can be accomplished on the basis of water allotted for a service and water actually utilized for that service. After assessing the loss of water and the efficiency of the system, steps needed for utilization of recoverable water loss and reuse may be listed.

An effective water audit report may be purposeful in detection of water losses and improve efficiency of the system. Water audit of the system should be undertaken at regular intervals, at least on an annual basis. PHDCCI water audit report explains the losses of water in system and various management approaches for BEL, Kundarkhi Unit.

1.3 Brief Description about the plant:

M/s Bajaj Energy Limited, Kundarkhi Unit has installed 90 MW (2 X 45MW) Power Plant with Water Cooled condenser for Power Plant. BEL has commissioned Unit #1 in year 31st March 2012 & Unit #2 in year 21st April 2012.

Kundarkhi Unit is a responsible technological leader in power generation since it does so by prioritizing environment safety at the top most level. Company has arranged its neutralizing pit water for various important uses like plantation, housekeeping etc.

Process flow diagram of Kundarkhi Unit is shown below;

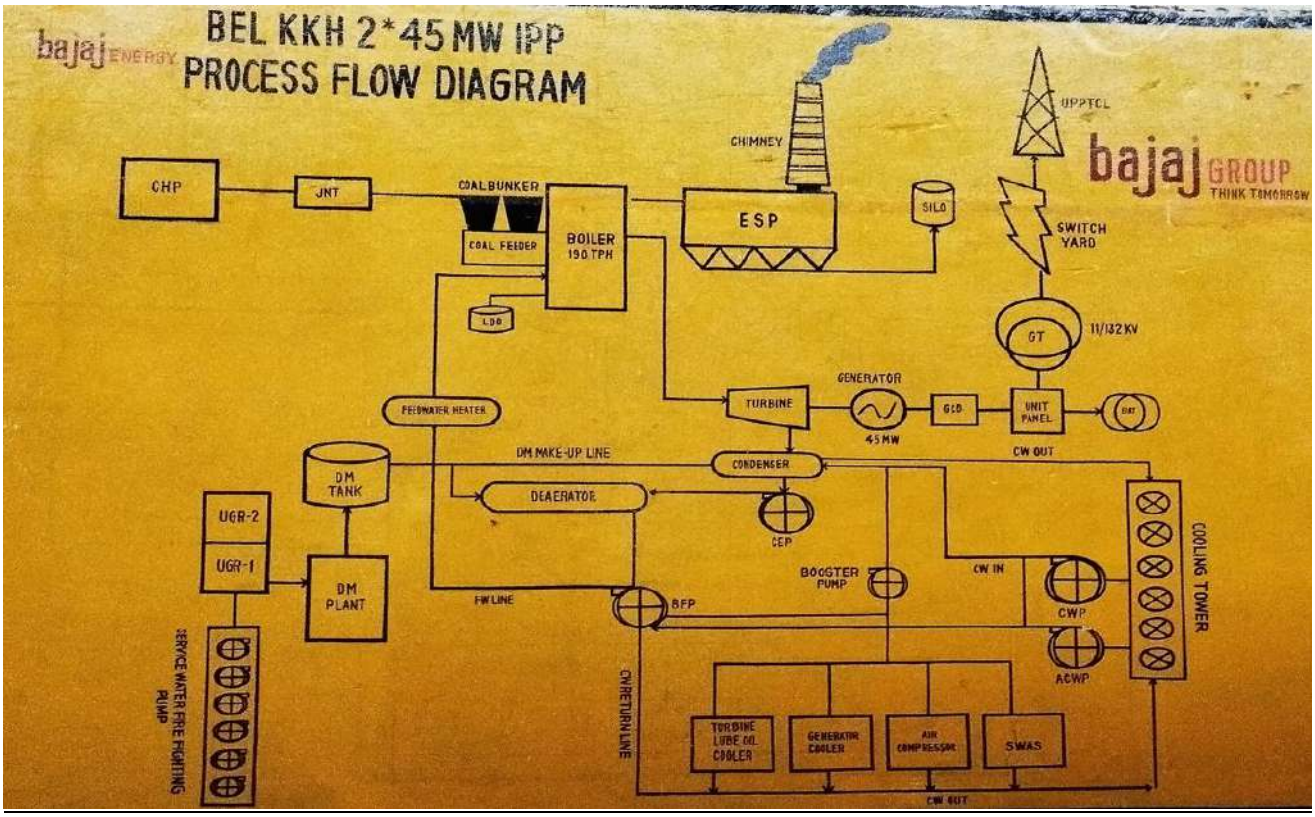




Figure 1: Process Flow chart & Location of Plant



CHAPTER 2

Scope of Work

2. SCOPE OF WORK

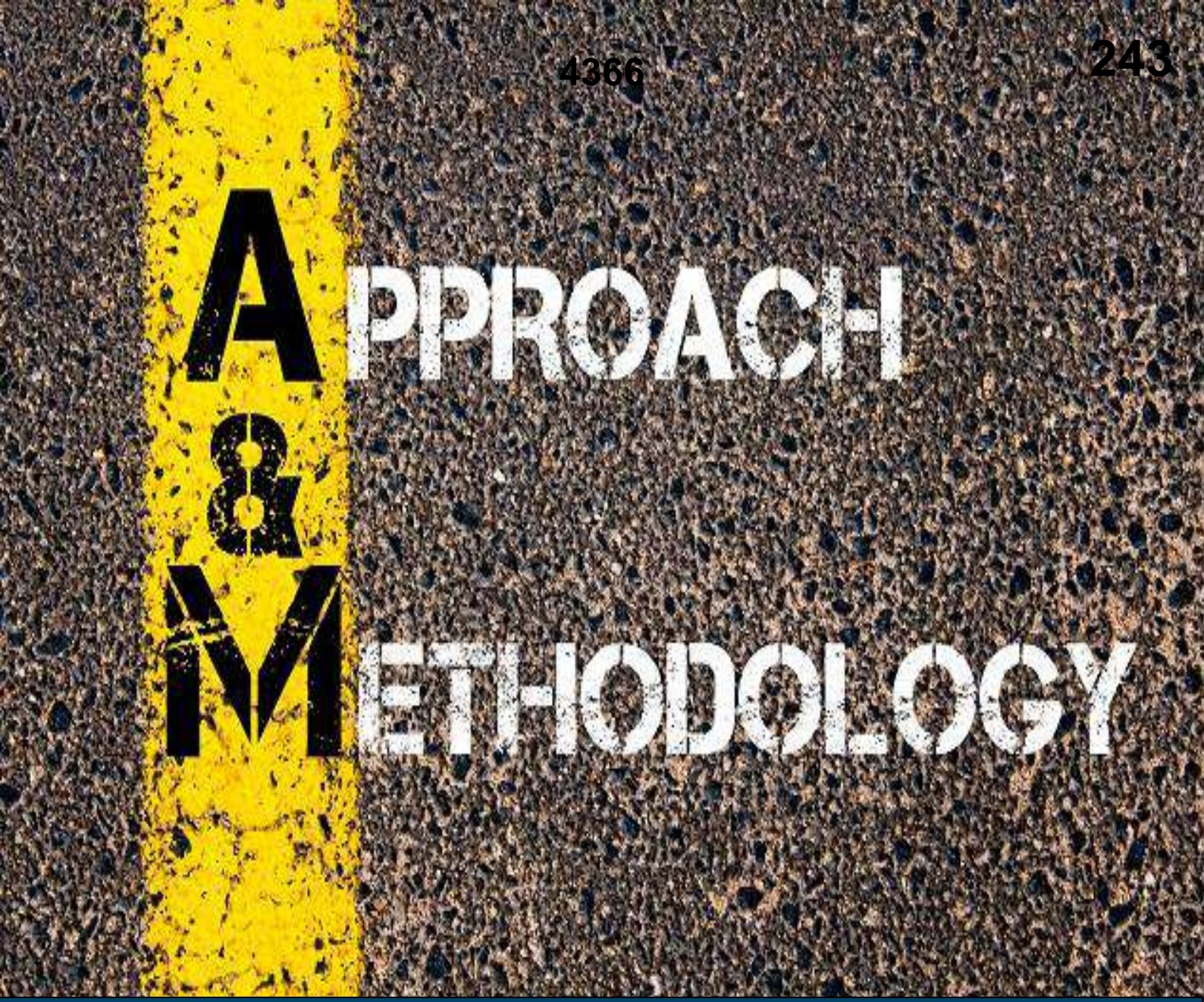
The main objective of the study was to identify the water uses & water saving opportunities and to demonstrate water conservation at BEL, Kundarkhi Unit. Scope of work of the study includes the following:

- Water system analysis
- Quantification of baseline water map
- Monitoring and measurements using pressure and flow meters and various other devices
- Quantification of inefficiencies and leaks
- Quantification of water quality loads and discharges
- Quantification of variability in flows and quality parameters
- Strategies for water treatment and reuse or direct use
- Water balance of the whole System
- Mapping of Water quality requirement at various user areas
- Compliance of last audit report

The detailed water audit report contains the following:

- Water consumption and wastewater generation pattern
- Specific water use and conservation
- Complete water balance of the facility
- Water saving opportunities
- Method of implementing the proposals
- Full description and figures
- Investment required
- Assessment of existing water sources and actual water consumption of the Plant.
- Identify the loss of water if any during transit and water distribution network and provide suggestion to eliminate these water losses.
- Identify the opportunities to reduce the water consumption by various activities and to establish specific water consumption in the premises.
- To study the performance of existing water circulating pumps/motors and recommend energy and water fixtures.
- Assessment of adequacy and efficacy of existing treatment system and recommend feasible technological option for treatment of water and waste water.
- Identify the loss of water if any during transit and to provide suggestions to eliminate the losses.
- To analyze areas of water conservation, waste water generation and recycle.
- Preparation of detailed water balance schematic diagram.
- Evolve techno-economic feasible solutions for recommended measure for implementation along with annual financial savings/payback periods.

PHDCCI has been entrusted to conduct Water Audit of Bajaj Energy Limited, Kundarkhi Unit. In determining the water audit scope, PHDCCI has considered the extent and boundaries of the Installations. This report aims at portraying the water audit details and the outcome along with recommendations for the Company.



CHAPTER 3

Methodology of the Study

3. METHODOLOGY OF THE STUDY

The following step by step methodology and approach were adopted while carrying out the Water Audit at Bajaj Energy Limited, Kundarkhi Unit. PHDCCI team visited plant on 26/07/2023 to 27/07/2023. Audit at BEL, Kundarkhi Unit is furnished below.

- Preliminary discussions with plant personnel and observations in all water consuming areas.
- Data collection through discussions, past records, specifications.
- Field studies in each of the areas involving:
  - Performance trials.
  - Measurement of flow parameters, pressure, power wherever possible using portable instruments such as ultrasonic flow meter, pressure gauge and power analyser.
- Identification of water conservation options on short, medium & long terms.
- Identification of Investment grade projects in the plant for detailed analysis towards implementation
- Preparation, discussion and submission of report to the management.

The study focused on improving water use efficiency and identifying water saving opportunities. The analysis included simple payback calculations where investments are required to be made to implement recommendations, to establish their economic viability.

The audit study made use of various portable instruments for carrying out various measurements and analyses. PHDCCI has a wide array of latest, sophisticated, portable, diagnostic and measuring instruments to support our energy audit investigations and analyses. The specialized instruments that were used during the water audit include:

- Ultrasonic water flow meter
- Thermo couples & Indicators
- Pressure Gauge
- Load Manager

During the audit, there was continuous interaction between the audit team and facility personnel, to ensure that the suggestions made are realistic, practical and implementable to allow for possible concurrent implementation.

The broad methodology adopted for the Water Audit at BEL, Kundarkhi Unit is furnished below.

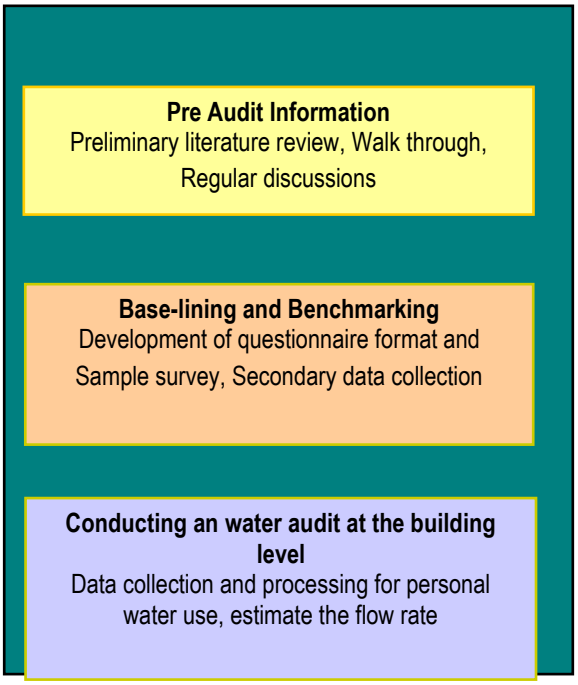
3.1 Pre Audit Information

- Preliminary literature review of concepts and methodologies related to water audit for utility, facilities and households.
- Walk through the entire Plant, water receiving pump stations, building to understand the nature of water uses and the systems installed in the building.
- Discussion with the administrative officers, pump operators, ETP staff and DM plant officer on the various water uses during the day and the source of water.
- Previous Audit Report

3.2 Establishing baseline and benchmarking

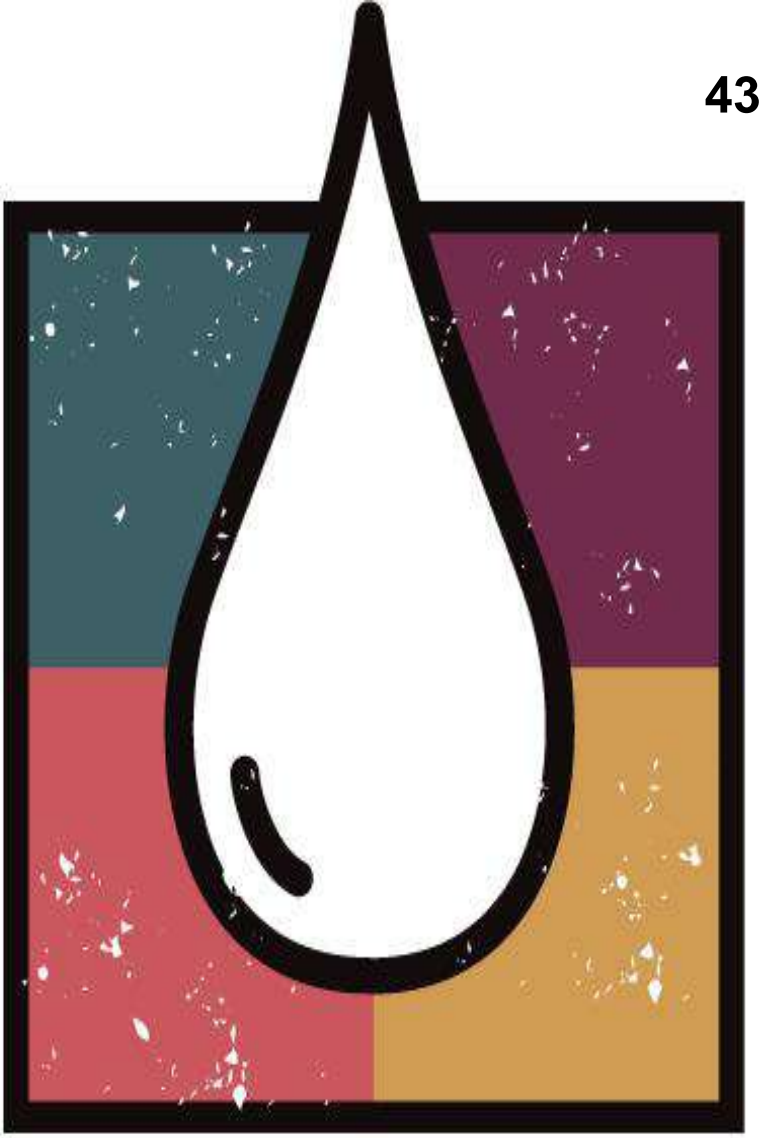
The water audit for Bajaj Energy Limited, Kundarkhi Unit included both primary and secondary data collection for various identified water uses. Primary data collection included the following components:

- Development of questionnaire format for individual water use, gardening etc.
- Sample survey of BEL office staff to estimate individual water consumption on sanitary and drinking purposes based on questionnaire format.
- Flow rate calculation from the taps flow rates and number of all water using fixtures/ equipment was also undertaken.
- Secondary data collection included compilation of number of staff along with their duration of stay.
- Collecting records of water pumped to the overhead and underground tanks and average running hours of all pumps etc. to estimate actual supply.



3.3 Conducting a water audit at the Plant Level

- The data collection and processing for personal water use including drinking, supply to the office buildings, administrative building, etc. was done on the basis of actual consumption.
- As part of the survey, treated waste water in ETP and reuse of treated water
- The data for all the above uses was calculated for varying time period for Bajaj Energy Limited, Kundarkhi Unit to calculate per capita use.



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CHAPTER 4

Assessment of Water Usage

4. ASSESSMENT OF PRESENT WATER USAGE

4.1 PLANT WATER CONSUMPTION TRENDS (LAST 3 YEARS)

M/s Bajaj Energy Limited (BEL), Kundarkhi Unit has been granted NOC/permission from Ground Water Department (Namami Gange & Rural Water Supply Department), Ministry of Jal Shakti, Govt. of Uttar Pradesh to abstract ground water for industrial purpose through 3 Nos. of Borewells. As per GWD, Govt. of U.P, Borewell 1,2&3 are having rated capacity of 30 HP with discharge capacity of 180m3/hr. the running hrs. of each pump shall not be exceeded by 19hrs/day, 14hrs/day & 7hrs/day respectively for Borewell 1,2&3. Thus, Total withdrawal limit per day for Borewell 1,2&3 is 3240m3/day (1026000m3/year), 2520m3/day (756000m3/year) & 1260m3/day (378000m3/year) respectively. Cumulative per day withdrawal limit through 3 Nos. of Borewell for industrial purpose is about 7200m3/day (21,60,000 m3/year).

The source of water to the plant is meet through Ground Water supplied from 3 Nos. of existing Borewells to meet the water demand of Plant. Abstracted ground water from Borewell is being stored in DM Raw Water Storage tank, further raw water passed through MGF followed with RO & DM process. Treated water thereafter stored in DM water storage tank. Further, DM Water is being utilized in Boiler as a makeup. Secondly, Raw water is being supplied to office buildings & CT makeup. The water withdrawal and consumption pattern for three financial years are shown in below tables:

Table 1: Fresh Water Withdrawal Pattern for Last 3 FY

	FY 2020-21					
Year	Borewell- 1 (m3/month)	Borewell- 2 (m3/month)	Borewell- 3 (m3/month)	Total Fresh Water Intake to Plant (m3/month)	Domestic (m3/month)	Industrial (m3/month)
April	802	635		1437	210	1227
May	13444	11879		25323	246	25077
June	45205	29053		74258	252	74006
July	73018	59091		132109	278	131831
August	63683	62028		125711	234	125477
September	70217	64591		134808	196	134612
October	48011	38374		86385	101	86284
November	54	1856		1910	88	1822
December	23394	15159		38553	120	38433
January	44882	34818		79700	151	79549
February	12823	14756		27579	164	27415
March	9087	3658		12745	324	12421
Total	404620	335898	0	740518	2364	738154

Year	FY 2021-22					
	Borewell- 1 (m3/month)	Borewell- 2 (m3/month)	Borewell- 3 (m3/month)	Total Fresh Water Intake to Plant (m3/month)	Domestic (m3/month)	Industrial (m3/month)
April	68072	57695		125767	282	125485
May	39827	32416		72243	160	72083
June	65237	57679	1748	124664	214	124450
July	54977	62185	9435	126597	135	126462
August	48287	63611	24278	136176	151	136025
September	54424	47697	24524	126645	230	126415
October	21597	9479	4946	36022	170	35852
November	11279	5563	3981	20823	161	20662
December	210	0	0	210	156	54
January	12099	9023	1307	22429	138	22291
February	369	14	56	439	102	337
March	12553	6226	646	19425	262	19163
Total	388931	351588	70921	811440	2161	809279

Year	FY 2022-23					
	Borewell- 1 (m3/month)	Borewell- 2 (m3/month)	Borewell- 3 (m3/month)	Total Fresh Water Intake to Plant (m3/month)	Domestic (m3/month)	Industrial (m3/month)
April	59514	41391	17560	118465	321	118144
May	39656	25131	13683	78470	364	78106
June	66521	17700	17202	101423	250	101173
July	67530	29330	20255	117115	238	116877
August	73126	20875	24251	118252	203	118049
September	19836	2494	3220	25550	258	25292
October	10044	3198	4574	17816	66	17750
November	727	0	231	958	43	915
December	13715	7077	1069	21861	218	21643
January	78747	22812	22503	124062	682	123380
February	70881	29631	22845	123357	109	123248
March	47214	16065	17654	80933	173	80760
Total	547511	215704	165047	928262	2925	925337

Note: Information sourced from plant data

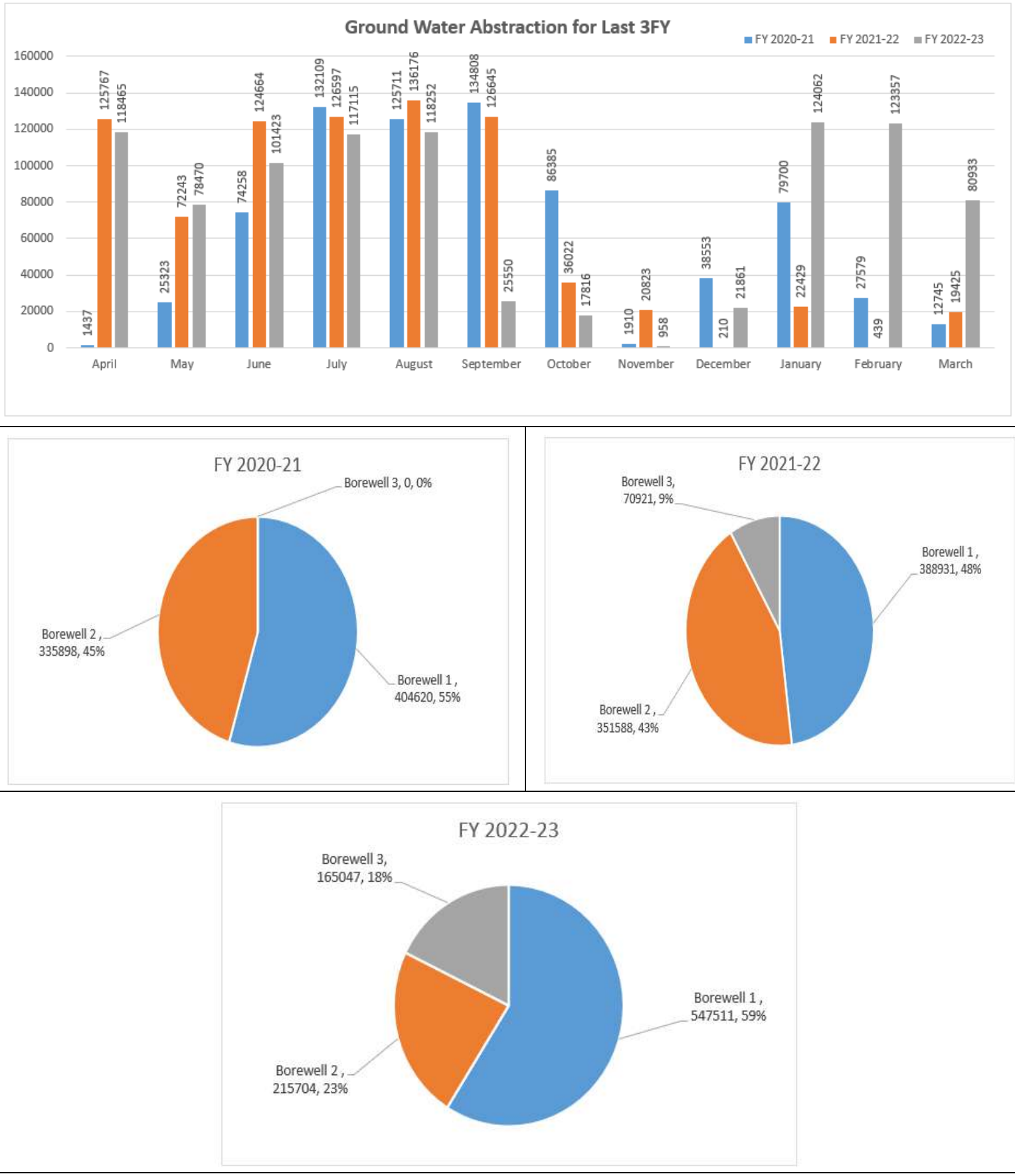


Figure 2: Graphical representation of abstracted ground water for last 3 FY

It is noticed from Historical data, Total Ground (Fresh) water intake for plant activities for FY 2020-21, FY 2021-22 & FY 2022-23 (sourced from plant data); is about 740518m3/year (2468m3/day), 811440m3/year (2705m3/day) & 928262m3/year (3094m3/year) respectively. **Thus, plant is in under compliance for yearly and daily withdrawal as per GWD**.

Power Generation details of the Plant for last 3 Financial Year is shown below;

Table 2: Production Details (MU's) for Last FY

Year	FY 2020-21	FY 2021-22	FY 2022-23
April	0	42.156	39.3
May	5.194	23.699	25.3
June	22.704	43.814	34.4
July	43.921	44.469	39.6
August	42.795	49.519	40.0
September	47.682	43.992	7.6
October	30.12	12.493	6.1
November	0	6.884	0.0
December	13.586	0	6.3
January	29.521	7.649	48.7
February	9.856	0	44.9
March	1.179	5.351	27.1
Total	246.558	280.026	319.319

Note: Information sourced from plant data

Plant has provided the Generation & ground water abstraction data for last 3 FY. Thus, Audit team calculated specific water consumption (m3) per MWh of Power Generation;

Table 3: Specific Water Consumption (SWC) of Power Generation (m3/MWh) for Last 3 FY

Sr. No.	Description	UOM	FY 2020-21	FY 2021-22	FY 2022-23
1	Borewell 1	m3/year	404620	388931	547511
2	Borewell 2	m3/year	335898	351588	215704
3	Borewell 3	m3/year	0	70921	165047
4	**Total Ground Water Abstraction, A**	**m3/year**	**740518**	**811440**	**928262**
5	**Domestic**	m3/year	**2364**	**2161**	**2925**
6	**Industrial**	m3/year	**738154**	**809279**	**925337**
7	ETP Treated Water, B	m3/year	67301	71961	72000
8	No. of Working days, C	Nos./year	300	300	300
9	**Ground water abstraction per day, D= (A/C)**	**m3/day**	**2468**	**2705**	**3094**
10	**ETP treated water per day, E= (B/C)**	**m3/day**	**224**	**240**	**240**
11	Production (Generation), F	MU/year	246.56	280.026	319.319
12	**Specific Water Consumption (SWC) of Power Generation, G= [A/(F X 1000)]**	**m3/MWh**	**3.00**	**2.90**	**2.91**

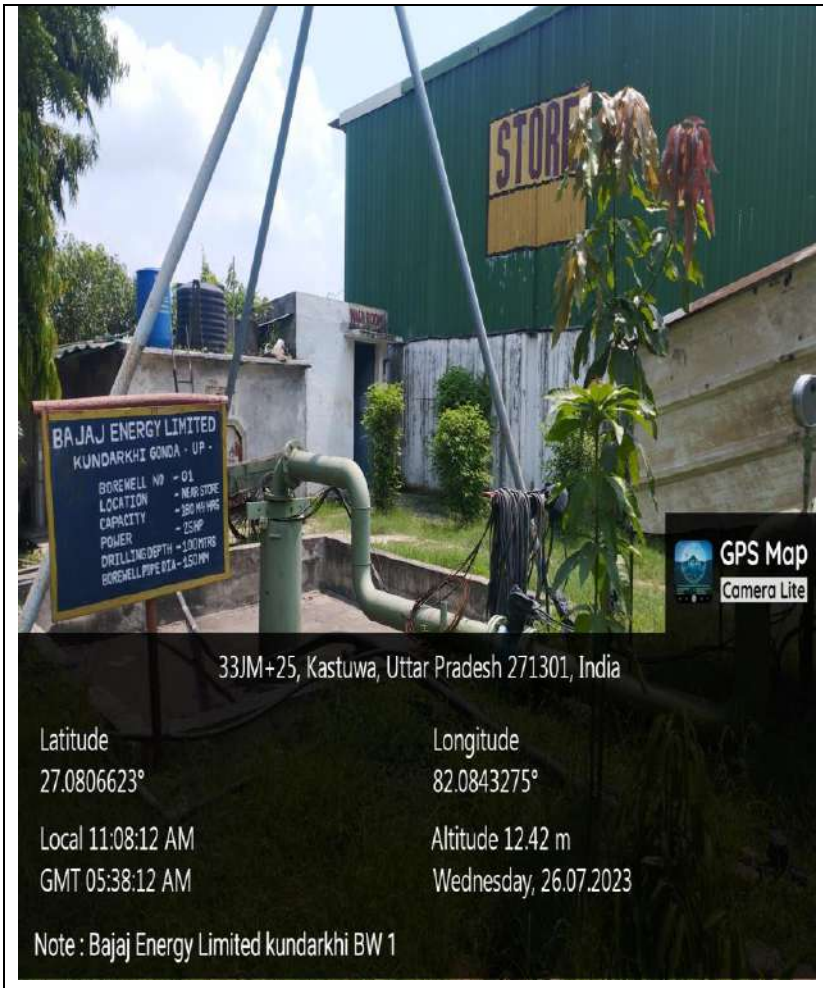
**It is noticed from above table that SWC per unit generation w.r.t Total Fresh water intake in FY 2022-23 has been increased from FY 2021-22.*

4.2 WATER SOURCES

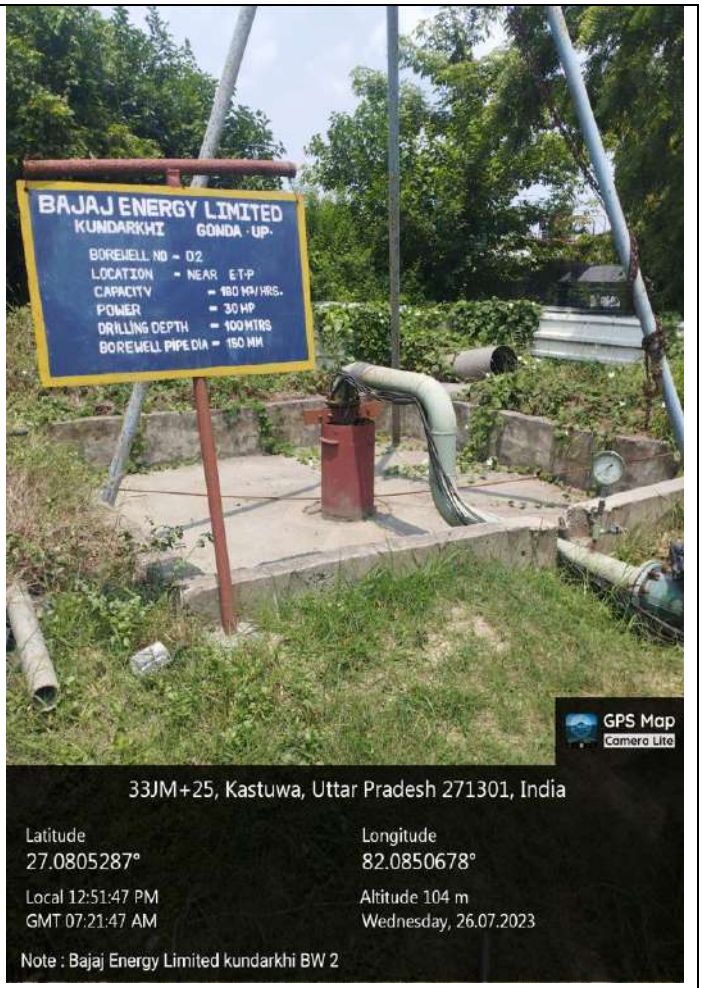
The main source of process and domestic water usage at Bajaj Energy Limited, Kundarkhi Plant is water received from ground water through 3 bore-wells (submersible pump) located in plant area. The details of borewells and their location are mentioned below:

Table 4: Details of Borewells

Sr. No.	Type of Structure	Borewell 1	Borewell 2	Borewell 3
1	Location of Structure	Near DM plant	Near Store Area	Near TG building
2	Depth (meter)/ Diameter (millimeter)	100/350	100/350	100/350
3	Metered (Yes/No)	yes	yes	yes
4	Meter No	S5L307461/110	S5L307462/110	S5L307465/110
5	Metered Condition (Analog/Digital)	Digital	Digital	Digital
6	TDS (mg/l)	432	432	432
7	Rated Capacity (m3/hr)	180	180	180
8	Rated Pump Power (HP)	25	25	25
9	Rated Running Hrs (Hrs./day)	19	14	7



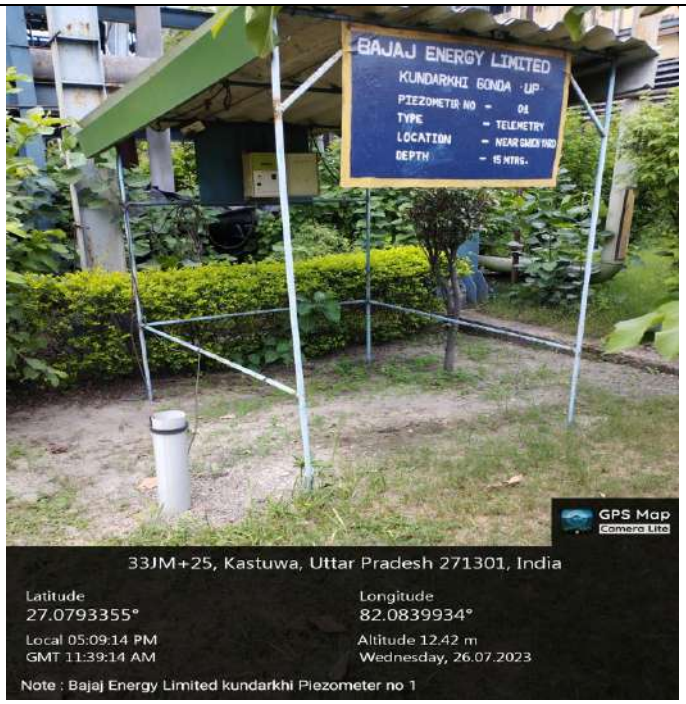
Borewell-1 (Near DM plant)



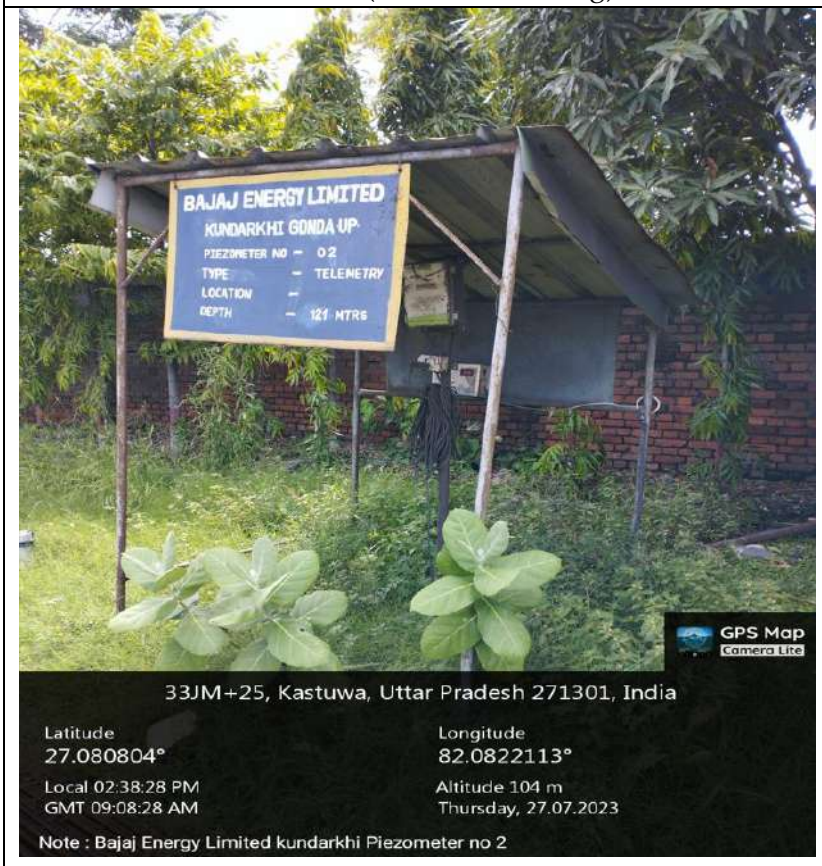
Borewell-2 (Near Store Area)



Borewell-3 (Near TG building)



Piezometer 1 (Near JNT-3)



Piezometer 2 (Near CHP)



Measured Condition

4.3 WATER SUPPLY & DISTRIBUTION DETAILS

A water network diagram provides a schematic (simplified) representation of facility's water distribution system from the water or point of entry (to the facility) to points of water consumption. In BEL, Kundarkhi, 3 Borewells are the only source which is used to supply entire plant to different location and serves the purpose of water consumption to the process and domestic use. Water received through Borewell after treatment is used for CT makeup & Boiler makeup after treatment. ETP treated water is used in green belt development and other areas like firefighting, Ash Quenching, dust suppression etc.

The water withdrawal from borewells and subsequently supplied in the plant is mentioned in water distribution network of Bajaj Energy Limited, Kundarkhi Unit provided below:

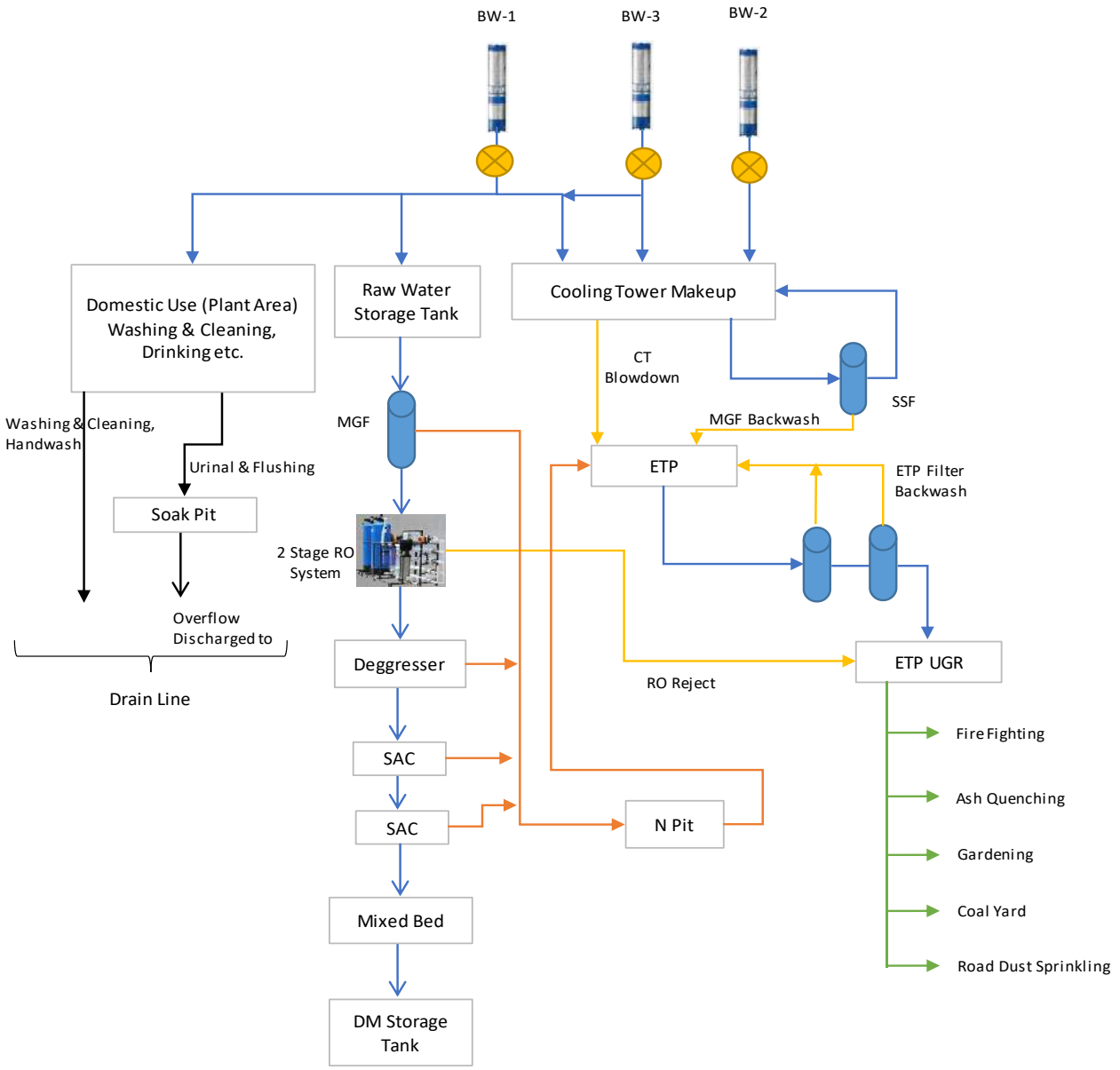


Figure 3: Water Distribution Network of Bajaj Energy Limited, Kundarkhi Unit

4.4 WATER BALANCE

A water balance compares the total water supplied to the site, the actual water consumed within all the water end uses in the site, and the total water leaving the site. This will help to identify areas of significant water usage and problem areas, including leaks and uncontrolled losses.

During Audit, Team noticed total water consumed to Plant (Ground Water + ETP Treated Water) are about 4417m3/day. Out of total, Fresh water through borewells are about 3954m3/day (89.5%) and ETP Treated Water is about 463m3/day (10.5%). **Thus, Plant is under compliance of abstracting ground water less than 7200m3/day through borewells.** Presently, three borewells are in operation to meet their water requirement. Abstracted ground water from Borewell is stored in DM Raw water storage tank & Domestic use; Secondly having provision for makeup to CT. Further, fresh water from DM Raw water storage tank has to be used in Boiler after DM treatment process.

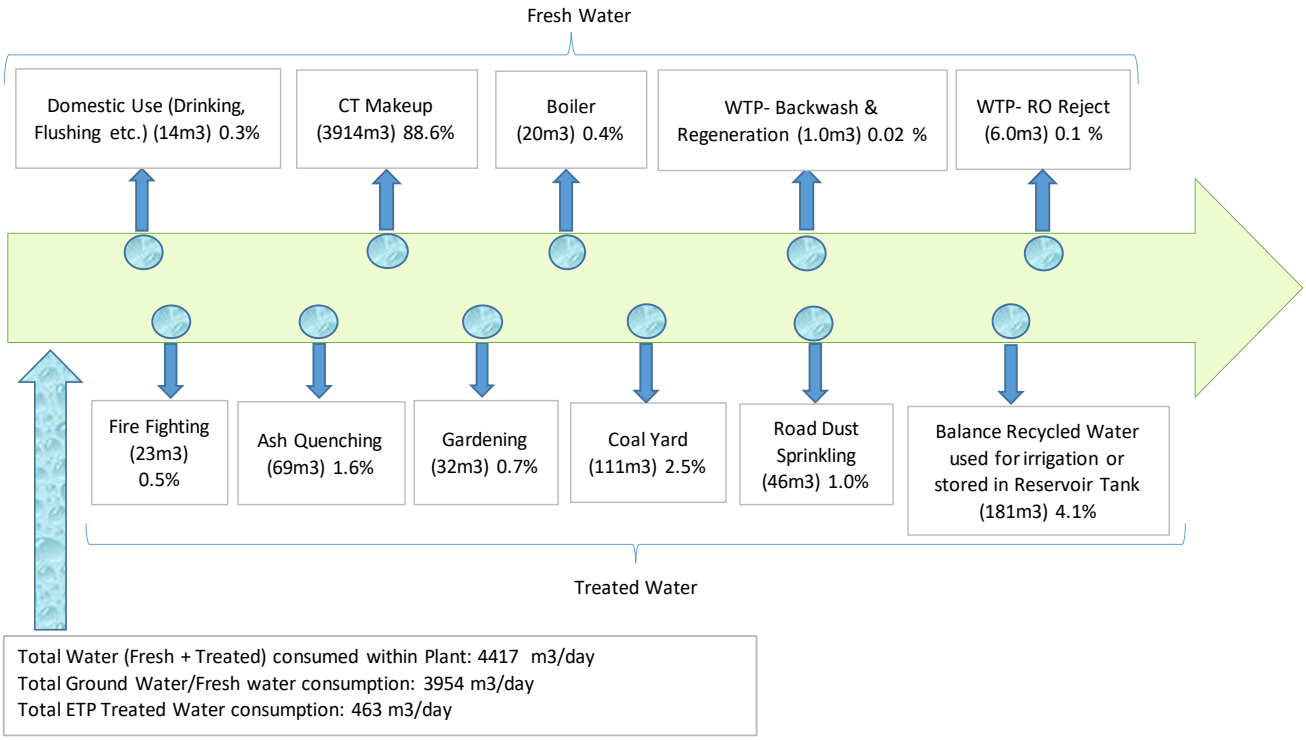


Figure 4: Water Balance Diagram

The Fresh water consuming areas are Domestic Use (TG building, DM Plant, Security area & CHP area) of about 14m3 (0.3%), CT Makeup is around 3914m3 (88.6%), Boiler Makeup is around 20m3 (0.4%), WTP- RO Reject, Backwash & Regeneration is around 7m3 (0.16%). The treated water consuming areas are Firefighting of around 23m3 (0.5%), Ash quenching is around 69m3 (1.6%), Horticulture/Gardening is about 32m3 (0.7%), Coal Yard is around 111m3 (2.5%), Road dust suppression/sprinkling is around 46m3 (1.0%) & Balanced ETP treated water is stored in Reservoir or supplied to farmers for irrigation is about 181m3 (4.1%).

4.5 WATER METERING & MONITORING SYSTEM

Monitoring is the most important prerequisite for efficient water management. Thus, in the water supply network, it is necessary to have a robust system of monitoring. During the audit, the available flow meters were identified, and their working conditions were checked.

Measurement at source through Ultrasonic Flow meter:

Table 5: Measurement at source through Ultrasonic Flow meter

Sr. No.	Type of Structure/ Year of Construction	Operation Pattern	Mode of lift	Metered (Yes/No)	Metered Condition (Analog/Digital)	Discharge (m3/hr)	Total water Consumed (m3/day)
1	Borewell 1 (Near DM plant)	Working	Submersible Pump	Yes	DWFM	145	2255
2	Borewell 2 (Near Store Area)	Working	Submersible Pump	Yes	DWFM	147	927
3	Borewell 3 (Near TG Building)	Working	Submersible Pump	Yes	DWFM	131	772
	Total						3954

Total quantity of fresh water + ETP Treated water which is being used in plant as mentioned in following table;

Table 6: Total Water Consumed within Plant

Sr. No	Description	Type of Water	Quantum of Water (m3/day)	Percentage (%)
	Source to Plant			
1	Borewell 1	Fresh Water	2255	51%
2	Borewell 2	Fresh Water	927	21%
3	Borewell 3	Fresh Water	772	17%
4	ETP Treated Water	Recycled Water	463	10%
5	Total Water Consumed within Plant		4417	100%

From above it is observed that the total ground water withdrawal is about 3954 m3/Day which complies with the total daily limit of 7200 m3/Day as per GWD NOC.

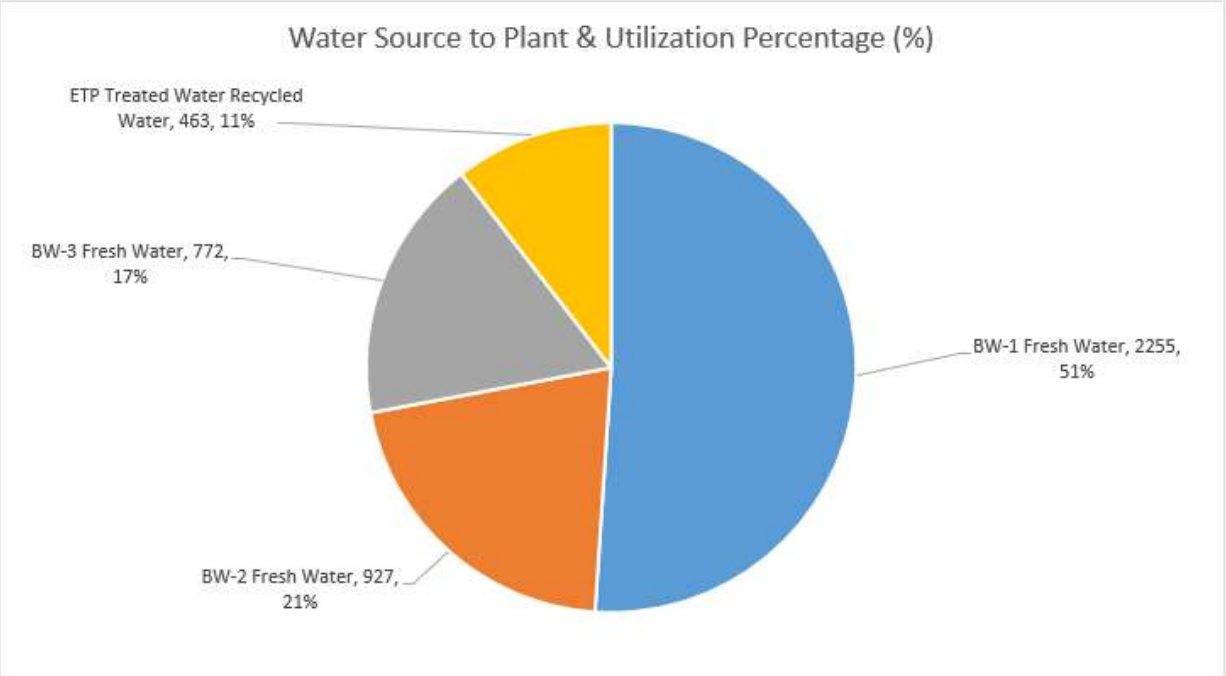


Figure 5: Source of Plant & their utilization percentage

The break up for water consumption in different area is provided in below tables and pie charts:

Table 7: Area Wise Water Consumption in the Plant

Sr. No	Description	Type of Water	Quantum of Water (m3/day)	Percentage (%)
1	Domestic Use	Fresh Water	14	0.3%
2	Cooling Tower Makeup	Fresh Water	3914	88.6%
3	Boiler	Fresh Water	20	0.4%
4	WTP- Backwash & Regeneration	Fresh Water	1.0	0.02%
5	WTP- RO Reject	Fresh Water	6.0	0.1%
6	Fire Fighting	Recycled Water	23	0.5%
7	Ash Quenching	Recycled Water	69	1.6%
8	Horticulture/Gardening	Recycled Water	32	0.7%
9	Coal Yard	Recycled Water	111	2.5%
10	Road Dust Sprinkling	Recycled Water	46	1.0%
11	Balance Recycled Water used for irrigation or stored in Reservoir Tank	Recycled Water	181	4.1%
	Total		4417	100.0%

As evident from the area wise water consumption table, the major water consumption in Plant is shown below in Pie chart.

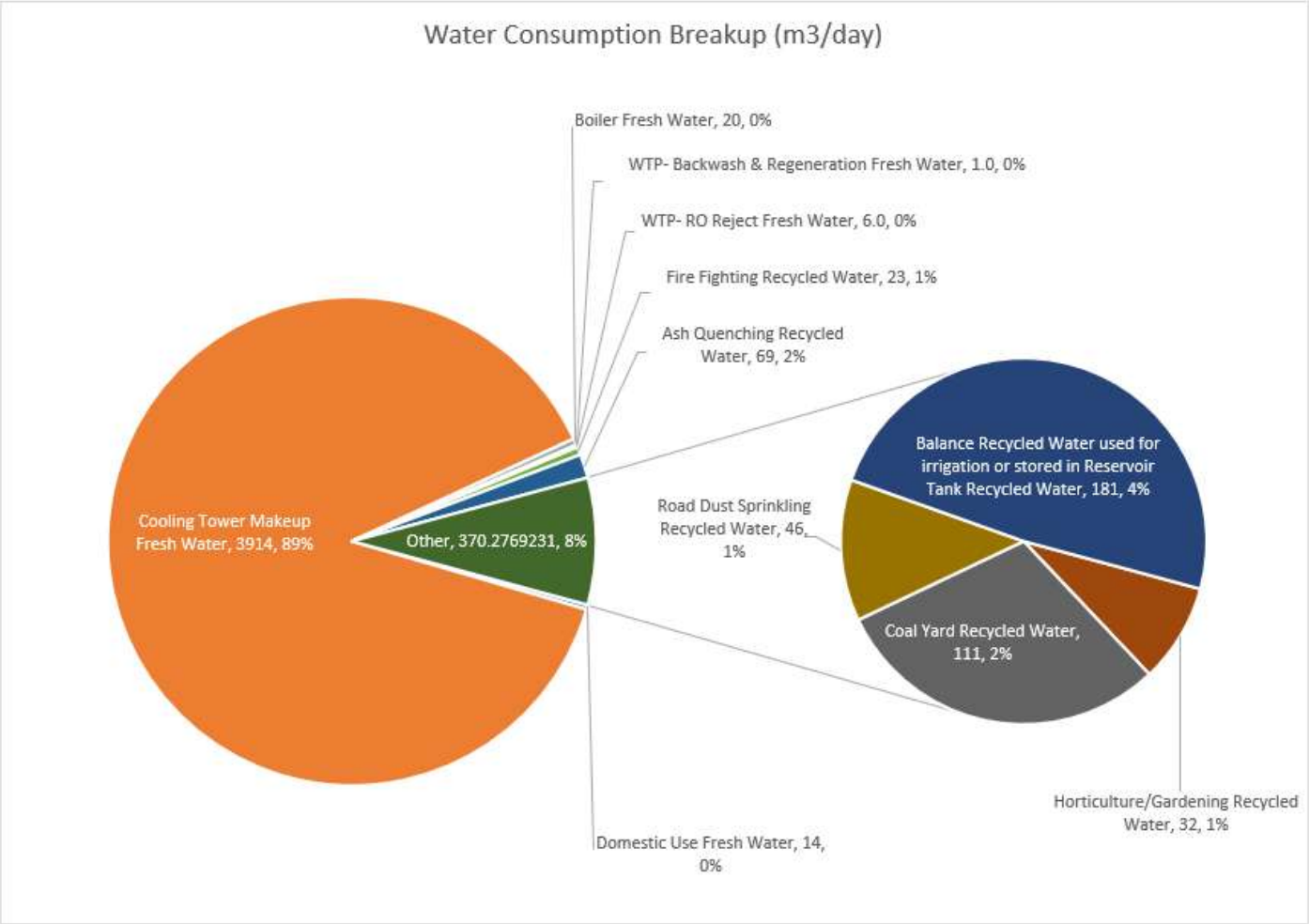


Figure 6: Source of Plant & their utilization percentage

4.6 WATER COSTING:

Data pertaining to evaluation of per m3 cost of Raw water has been provided from plant like expenses towards energy consumption at borewell, Manpower cost, and maintenance cost to evaluate Raw water cost. Thus, Per m3 cost of Raw water for FY 2020-21, FY 2021-22 & FY 2022-23 is calculated to be about Rs. 1.55/m3, Rs. 1.55/m3 and Rs. 1.59/m3 respectively. The detail of raw water per m3 cost is provided in below table.

Table 8: Per m3 cost of Raw Water withdrawal

Sr. No.	Description	UOM	Ground Water Abstraction Cost		
			FY 2020-21	FY 2021-22	FY 2022-23
1	Total Ground water	m3	740518	811440	928262
2	Man Power Cost	Rs.	1,85,130	2,02,860	2,32,066
3	Maintenance Cost	Rs.	20,000	22,000	28,000
4	Energy Cost (Rs.)	Rs.	2,76,460	3,02,938	3,85,057
5	Ground Water Pumping Cost, A	Rs./m3	0.7	0.7	0.7
6	Ground Water Abstraction Cost, B	Rs./m3	0.9	0.9	0.9

Thus, Total Ground water cost includes Abstraction & pumping cost is calculated to be about Rs. 1.59/m3 for FY 2022-23.

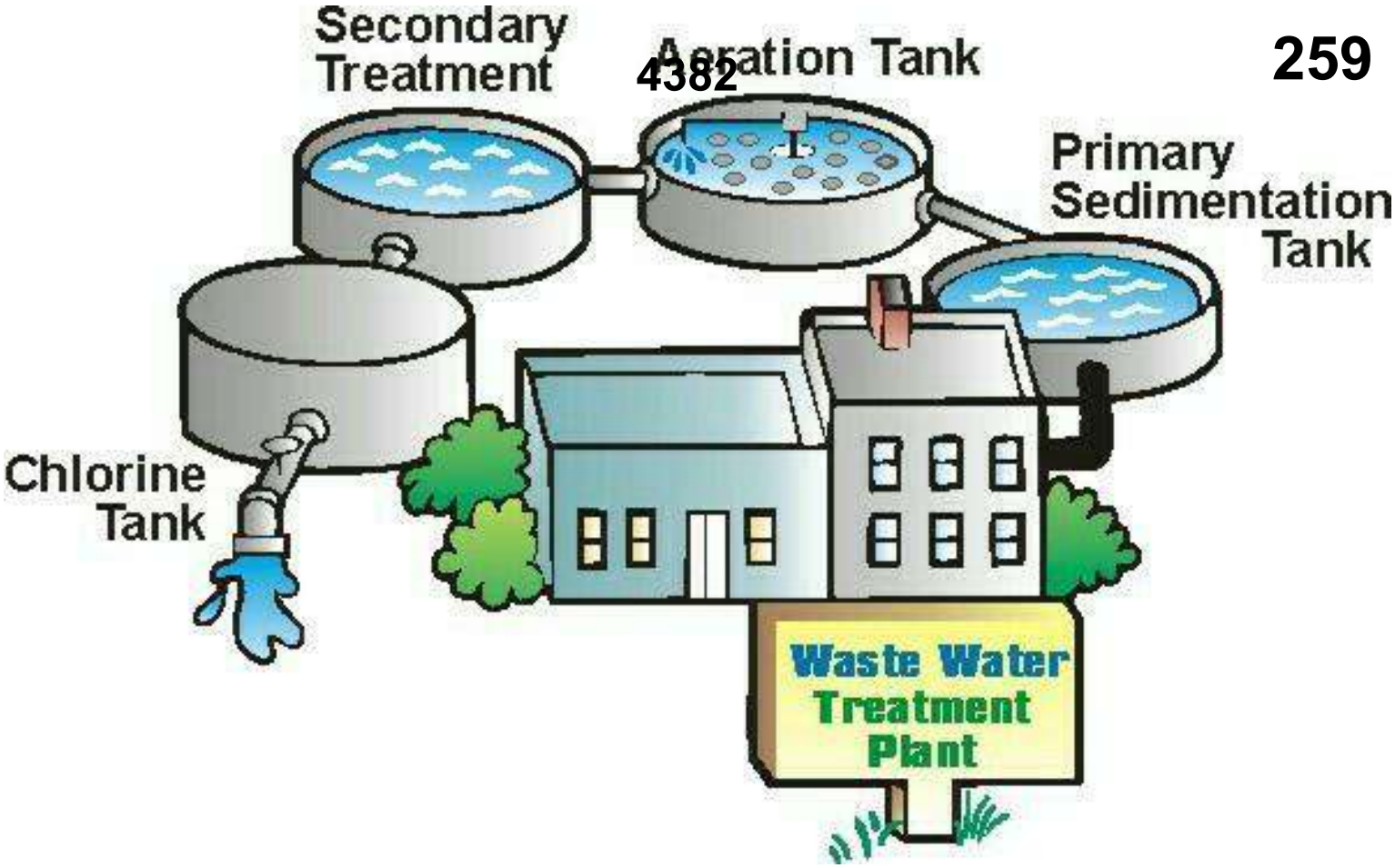
4.7 CALIBRATION CERTIFICATES

The Bajaj Energy Limited (BEL), Kundarkhi Unit has installed digital water meters on existing borewells in line with GWD NOC and maintained the daily water withdrawal from each borewell and maintaining monthly and yearly data. Thus, complying the GWB requirement.

Further, the BEL, Kundarkhi Unit has conducted calibration of all water meters and provided certificates to the audit team. The calibration frequency of the water meters is yearly basis. The water meters details are provided in below table and the copy of calibration certificate of borewells are provided in the Annexure of the report).

Table 9: Calibration Detail of Digital Meters installed on Borewell

Sr. No.	Type of Structure (w.r.t installed flowmeter)	Meter Sr. No/ Id. No.	Date of Calibration	Due Date of Calibration
1	Borewell No. 1	S5L307461/110	06-10-2022	05-10-2023
2	Borewell No. 2	S5L307462/110	07-10-2022	06-10-2023
3	Borewell No. 3	S5L307465/110	08-10-2022	07-10-2023
4	RO Permeate	06031903/06131905		
5	ETP inlet	18005074		
6	ETP Outlet	12151057A		



CHAPTER 5

Water Treatment Practices

5 WATER TREATMENT PRACTICES

The main source of Process & domestic water usage at M/s Bajaj Energy Limited (BEL), Kundarkhi Unit is meet through fresh water supplied from 3 No. of existing Borewells. N Pit (64m3 capacity) followed with ETP has been installed with installed capacity of 1000KLD to treat generated industrial effluent from Plant thereafter supplied to dust suppression nearby CHP, Ash Silo system, firefighting, gardening etc.

5.1 RAW/FRESH WATER TREATMENT:

M/s BEL Kundarkhi has installed 1No. of Water Treatment Plant (WTP) to treat the raw water from surface water supplied from Borewell. Treated water thereafter stored in DM storage tank further supplied to Boiler.

The schematic of the Water Treatment Plant is shown below.

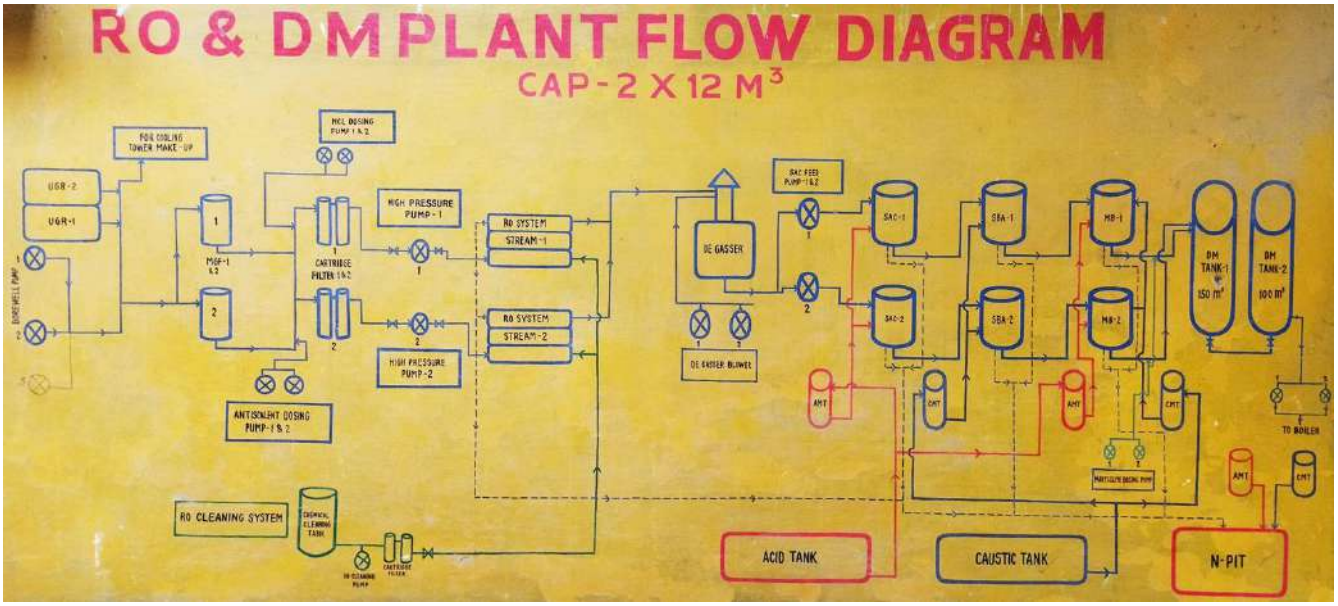


Figure 7: Water Treatment Plant process flow chart

The Plant has installed flowmeters to measure & monitor the treated water supplied from WTP. Thus, The Plant has maintained historical data of water treatment for last 3 FY is shown in below;

Table 10: WTP treated water data for last 3 FY

	FY 2020-21			
Year	Total Raw Water Intake for Treatment (m3/month)	Total DM Water for Process (m3/month) OR RO Production	RO Reject Water (m3/month)	Total Backwash & Regeneration Water (m3/month)
April	564	381	163	20
May	896	617	239	40
June	1651	1161	410	80
July	1537	1103	394	40
August	1167	854	283	30
September	1478	1060	378	40
October	665	465	156	44

	FY 2020-21			
Year	Total Raw Water Intake for Treatment (m3/month)	Total DM Water for Process (m3/month) OR RO Production	RO Reject Water (m3/month)	Total Backwash & Regeneration Water (m3/month)
November	427	292	116	19
December	1279	896	324	59
January	1300	925	317	58
February	489	341	119	29
March	1175	830	268	77
Total	12628	8925	3167	536

	FY 2021-22			
Year	Total Raw Water Intake for Treatment (m3/month)	Total DM Water for Process (m3/month) OR RO Production	RO Reject Water (m3/month)	Total Backwash & Regeneration Water (m3/month)
April	1058	649	357	52
May	780	549	192	39
June	1664	1190	418	56
July	1650	1154	421	75
August	1404	990	360	54
September	1140	792	300	48
October	1100	783	268	49
November	400	281	102	17
December	40	24	8	8
January	937	661	238	38
February	332	225	93	14
March	1334	943	345	46
Total	11839	8241	3102	496

	FY 2022-23			
Year	Total Raw Water Intake for Treatment (m3/month)	Total DM Water for Process (m3/month) OR RO Production	RO Reject Water (m3/month)	Total Backwash & Regeneration Water (m3/month)
April	1264	888	332	44
May	1425	1000	371	54
June	990	684	264	42
July	1410	1009	358	43
August	737	518	185	34
September	1968	1361	519	88
October	498	346	132	20
November	210	144	49	17
December	1013	721	253	39
January	969	675	253	41
February	683	484	171	28
March	1380	967	360	53
Total	12547	8797	3247	503

Data pertaining to evaluation of per m3 cost of Water Treatment Plant has been provided from plant like expenses towards energy consumption at WTP, Manpower cost, and maintenance cost to evaluate WTP cost. Thus, Per m3 cost of WTP for FY 2020-21, FY 2021-22 & FY 2022-23 is calculated to be about Rs. 11.1/m3, Rs. 11.9/m3 and Rs. 12.1/m3 respectively. The detail of raw water per m3 cost is provided in below table.

Table 11: Per m3 cost of WTP Treated Water

Sr. No.	Description	UOM	Water Treatment Plant (DM Plant)		
			FY 2020-21	FY 2021-22	FY 2022-23
1	Total Raw water Intake to DM Plant for Treatment	m3	8925	8527	8797
2	Man Power Cost	Rs.	37,187	35,529	36,654
3	Maintenance Cost	Rs.	24,343	31,291	33,456
4	Chemical Cost	Rs.	13,031	11,256	12,140
5	Energy Cost (Rs.)	Rs.	24,726	23,624	24,372
6	Water Treatment Plant (DM Plant) Cost	Rs./m3	11.1	11.9	12.1

5.2 WASTE WATER TREATMENT & DISPOSAL:

Recycling of process water, reuse of treated wastewater and rainwater harvesting are the important measures of reducing/saving groundwater and conservation on the premises. M/s BEL, Kundarkhi has commissioned state-of-the-art technology in manufacturing facilities to use water efficiently and the unit is equipped with recycling and reuses arrangements.

BEL, Kundarkhi has installed N Pit for treatment of Industrial effluent with capacity of 64m3 further supplied to ETP having 1000KLD capacity for further treatment. ETP Treated Water thereafter stored in lagoon;

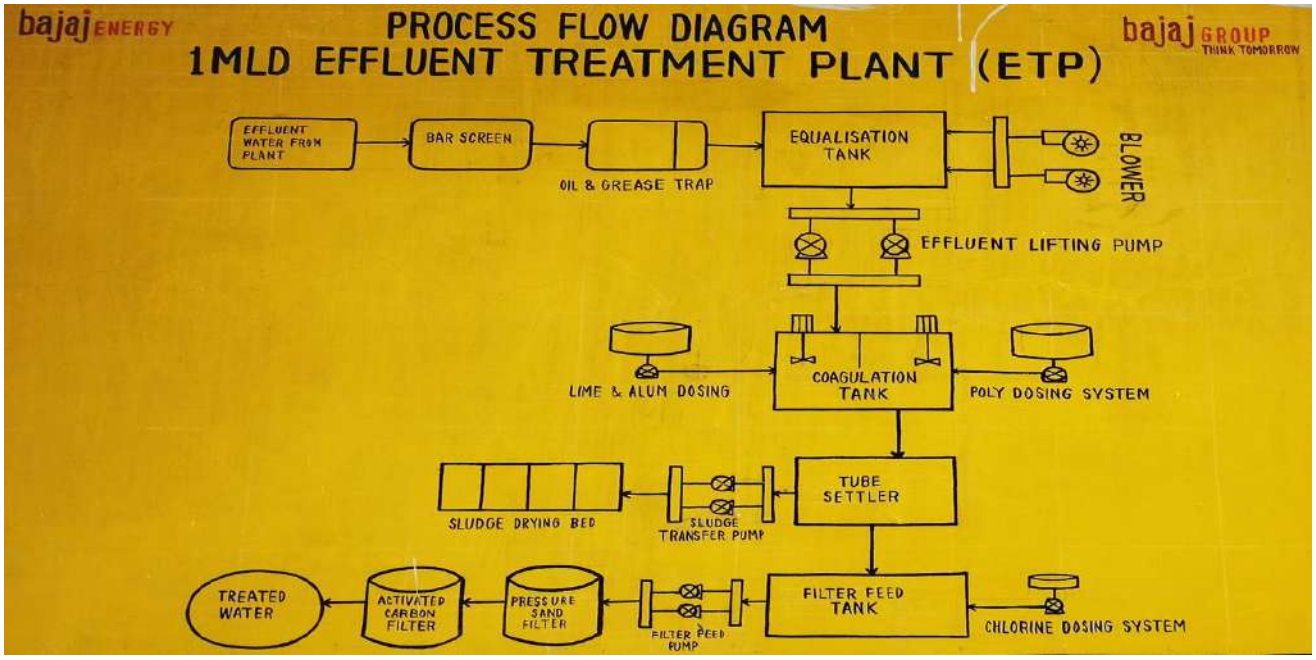


Figure 8: Effluent Treatment Process (ETP)

In addition to ETP, Plant has installed 100KLD STP. However, STP is used for colony of both Power Plant & Sugar Plant. In Power Plant, Septic tank has been installed for generated domestic effluent through flushing.

The water generated and consumption pattern of ETP treated water is shown in below table for last 3 FY:

Table 12: Effluent Discharge in last 3 FY

	FY 2020-21					
	Industrial			Domestic		
	Industrial Generated Waste water (m3)	Industrial Reuse Water (m3)	Industrial Water Stored in UGR (m3)	STP Generated waste water (m3)	STP Treated Waste water (m3)	Reutilized STP Treated Water (m3)
April	0	1109	-1109			
May	0	2342	-2342			
June	8042	6543	1499			
July	15750	12798	2952	462	462	362
August	11921	10136	1785	684	684	723
September	10445	9898	547	876	876	854
October	6513	7129	-616	894	894	903
November	0	986	-986	910	910	923
December	1467	1011	456	1117	1117	1130
January	7776	5632	2144	1302	1302	1323
February	3927	2943	984	1176	1176	1196
March	1460	2860	-1400	693	693	700
Total	67301	63387	3914	8114	8114	8114

	FY 2021-22					
	Industrial			Domestic		
	Industrial Generated Waste water (m3)	Industrial Reuse Water (m3)	Industrial Water Stored in UGR (m3)	STP Generated waste water (m3)	STP Treated Waste water (m3)	Reutilized STP Treated Water (m3)
April	6652	5231	1421	889	889	821
May	6203	5101	1102	944	944	910
June	10678	6759	3919	1161	1161	1203
July	12940	8896	4044	1313	1313	1300
August	15330	10878	4452	1448	1448	1403
September	15350	14980	370	1124	1124	1210
October	1290	3786	-2496	859	859	832
November	2310	3098	-788	645	645	648
December	0	657	-657	461	461	512
January	270	812	-542	2085	2085	2080
February	0	769	-769	1900	1900	1910
March	938	3420	-2482	2184	2184	2184
Total	71961	64387	7574	15013	15013	15013

	FY 2022-23					
	Industrial			Domestic		
	Industrial Generated Waste water (m3)	Industrial Reuse Water (m3)	Industrial Water Stored in UGR (m3)	STP Generated waste water (m3)	STP Treated Waste water (m3)	Reutilized STP Treated Water (m3)
April	8188	5671	2517	2049	2049	1891
May	3662	3390	272	1466	1466	1419
June	7339	6809	530	603	603	701
July	8846	8120	726	873	873	880
August	11983	9109	2874	1176	1176	1193
September	3125	6421	-3296	1429	1429	1402
October	1660	2652	-992	1603	1603	1587
November	0	676	-676	1601	1601	1605
December	292	119	173	2158	2158	2143
January	8373	6002	2371	1259	1259	1307
February	12155	10098	2057	897	897	953
March	6377	5610	767	723	723	756
Total	72000	64677	7323	15837	15837	15837

Note: Information sourced from plant data

It is noticed from above table that, ETP waste water treated in FY 2020-21, FY 2021-22 & FY 2022-23 is about 67301 m3/year, 71961 m3/year & 72000 m3/year respectively. Thereafter, ETP treated water stored in UGR Tank (2 X 8000KL).

Data pertaining to evaluation of per m3 cost of Effluent Treatment Plant has been provided from plant like expenses towards energy consumption at Effluent Treatment system, Manpower cost, and maintenance cost to evaluate Industrial & Domestic Treatment cost. Thus, Per m3 cost of Effluent Treatment Cost (ETP) for FY 2020-21, FY 2021-22 & FY 2022-23 is calculated to be about Rs. 3.08/m3, Rs. 3.11/m3 and Rs. 3.15/m3 respectively. Similarly, Per m3 cost of Domestic Treatment Cost (STP) for FY 2020-21, FY 2021-22 & FY 2022-23 is calculated to be about Rs. 13.7/m3, Rs. 13.9/m3 and Rs. 14/m3 respectively. The details of raw water per m3 cost is provided in below table.

Table 13: Per m3 cost of Effluent Treated Water

Sr. No.	Description	UOM	Effluent Treatment Cost		
			FY 2020-21	FY 2021-22	FY 2022-23
A	**Industrial Effluent Treatment Cost (ETP)**				
1	**Capacity of ETP Plant**	KLD	**1000**		
2	Industrial Effluent for Treatment at ETP	m3	67301	71961	72000
4	Man Power Cost	Rs.	1,03,012	1,10,144	1,10,204
5	Maintenance Cost	Rs.	12,000	14,780	17,654
6	Chemical Cost	Rs.	3,903	4,318	3,960
7	Energy Cost	Rs.	88,465	94,590	94,641
8	Industrial Effluent Treatment Cost	Rs./m3	3.08	3.11	3.15
B	**Domestic Effluent Treatment Cost (STP)**				
1	**Capacity of STP Plant**	KLD	**100**		
2	Domestic Effluent for Treatment at STP	m3	8114	15013	15837

Sr. No.	Description	UOM	Effluent Treatment Cost		
			FY 2020-21	FY 2021-22	FY 2022-23
4	Man Power Cost	Rs.	57,957	1,07,236	1,13,121
5	Maintenance Cost	Rs.	0	3,120	4,309
6	Chemical Cost	Rs.	10,548	19,517	20,588
7	Energy Cost	Rs.	42,480	78,599	82,913
8	Domestic Effluent Treatment Cost	Rs./m3	13.7	13.9	14.0

*Note: Installed 100KLD STP is common for residential domestic effluents generated from Power Plant & Sugar Plant.

*Treated STP water discharged to nearby horticulture area within plant premises.



CHAPTER 6

Rain Water Harvesting

6 RAIN WATER HARVESTING

The concept of rain water harvesting is an ancient one and has become popular in recent times because of the vagaries of the monsoon, depleting water resources, its user friendliness. It has become an important and eco-friendly tool to protect ground water, useful and cost-effective method to boost water resources in any area. Rainwater harvesting is the technique of collection and storage of rainwater at surface or in sub-surface aquifers, before it is lost as surface run-off.

6.1 About Rain Water Harvesting

Today's scenario, Water scarcity is a major concern. Thus, Rainwater harvesting is one of the best methods practiced and also a sustainable process that helps in preserving water for future needs. It requires a simple technique of collection and storage of rainwater at the surface or in the subsurface aquifer before it is lost as surface runoff from rooftops, parks, roads, open grounds, etc., for later use. There are two ways of Rainwater harvesting:

a) Storage of rainwater in collection tank for direct use
b) Recharge ground water aquifers from Roof top runoff & run off from ground/open area.

Rainwater harvesting systems consists of the following components:

- Catchment- Used to collect and store the captured Rainwater.
- Conveyance system – It is used to transport the harvested water from the catchment to the recharge zone.
- Filter – Used for filtering the collected Rainwater and remove pollutants.
- Tanks and the recharge structures: Used to store the filtered water which is ready to use.

The benefits of rainwater harvesting system are listed below.

- Helps in reducing the water bill.
- Decreases the demand for water.
- Improves the quality & Promotes adequacy of underground water.
- Improves groundwater table, thus saving energy (to lift water).
- Does not require a filtration system for landscape irrigation.
- This technology is relatively simple, easy to install and operate.
- It is an excellent source of water for landscape irrigation with no chemicals and dissolved salts and free from all minerals.

6.2 Rain Water Harvesting at M/s Bajaj Energy Limited, Kundarkhi Unit

As per CGWA NOC, M/s Bajaj Energy Limited (BEL), Kundarkhi Unit, has to install Rooftop Rain water harvesting structures in the premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the plant, if industry likely to pollute ground water.

Presently, Plant has installed 3Nos. of RWH structures within plant premises each with yearly installed capacity of 2911m3/year, 7200m3/year & 960m3/year respectively. Out of 3 RWH structure, 1RWH structure near TG Building is having provision to augment the groundwater recharge through the generated runoff from TG Rooftop area & storm water line. Balance 2 RWH structure connected with storm water line; which is used to augment the ground water resources of the area. Thus, Bifurcation of drain line and storm water line needs to be done precisely. Presently, Waste water discharge through Washing & Cleaning, handwash & overflow of soak pit has been discharged to drain line further reutilized after treatment.

Photos of Some RWH Structures are shown below;



RWH 1- TG Building



RWH 3- Near Store



RWH 2- Near CT

Figure 9 Photos of RWH Structures

Audit team also calculated the RWH potential of Plant as per information received from plant officials. RWH potential of Plant is calculated below.

Table 14: RWH utilization potential

S. No.	Particulars	Area (Sqm)	Rain fall (m)	Runoff Coefficient*	Quantum of Run off available (m3/Year)
1	Roof Top of building/Shed/	5164	0.56	0.85	2458
2	Green Belt	39759.77	0.56	0.15	3340
3	Total (sqm)	44923.77			5798

** Plant has provided the Rooftop area of the building.*
** Rooftop potential is calculated to be about 2458 m3/year.*
** RWH water can be used in Industrial process, flushing & cleaning activities of Plant.*

6.3 Environmental Compliance (related to water)

M/s Bajaj Energy Limited (BEL), Kundarkhi Unit has been granted NOC/permission from Ground Water Department (Namami Gange & Rural Water Supply Department), Ministry of Jal Shakti, Govt. of Uttar Pradesh to abstract ground water for industrial purpose through 3 Nos. of Borewells. As per GWD, Govt. of U.P, Borewell 1,2&3 are having rated capacity of 30 HP with discharge capacity of 180m3/hr. the running hrs. of each pump shall not be exceeded by 19hrs/day, 14hrs/day & 7hrs/day respectively for Borewell 1,2&3. Thus, Total withdrawal limit per day for Borewell 1,2&3 is 3240m3/day (1026000m3/year), 2520m3/day (756000m3/year) & 1260m3/day (378000m3/year) respectively. Cumulative per day withdrawal limit through 3 Nos. of Borewell for industrial purpose is about 7200m3/day (21,60,000 m3/year).
Thus, it is noticed from Historical data, Total Ground (Fresh) water intake for plant activities for FY 2020-21, FY 2021-22 & FY 2022-23 (sourced from plant data); is about 740518m3/year (2468m3/day), 811440m3/year (2705m3/day) & 928262m3/year (3094m3/year) respectively. **Thus, plant is in under compliance for yearly and daily withdrawal as per GWD**.

As per GWD, U.P NOC, M/s Bajaj Energy Limited (BEL), Kundarkhi Unit, has to install tamper proof digital water flow meter (DWFM) on all abstraction structure(s) with Telemetry system and also calibrate DWFM from an authorized agency once in a year. It was noticed during the audit that the plant has installed digital water flow meters with telemetry system on existing 3Nos. of Borewell on discharge line of Pump**. Thus, Plant is under compliance of installation of DWFM at discharge side of Pump before any tapping points.** In addition, plant has maintained ground water abstracted data on daily & monthly basis in a logbook. Team also noticed, plant has done the calibration of DWMF of 3 Borewells and record of same has been maintained. (Calibration certificate of DWFM are attached separately in annexure in chapter 11).

As per GWD, U.P NOC, M/s Bajaj Energy Limited (BEL), Kundarkhi Unit, has to monitor quality of ground water from the abstraction structure(s) twice in a year during pre-monsoon (May/June) & post monsoon (October/November) period. In view of above, Audit team checked and noticed testing of ground water report has been done. All of the reports related to ground water sample found in accordance to the environmental factors related to water uses. (The ground water test reports are attached separately in annexure in chapter 11)**.** Thus, the plant is under compliance of monitoring the quality of ground water.

As per GWD, U.P NOC, M/s Bajaj Energy Limited (BEL), Kundarkhi Unit, has to install Two (2) Nos. of observation well (piezometer) for ground water level monitoring in project area along with

digital water level recorder (DWLR) for ground water abstraction > 500m3/day. During onsite assessment, digital water level recorder was found operational and record of monitoring of piezometer data is maintained by the plant. Thus, plant is under compliance for ground water level monitoring.

As per GWD, U.P NOC, M/s Bajaj Energy Limited (BEL), Kundarkhi Unit, has to install Rooftop Rain water harvesting structures in the premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the plant, if industry likely to pollute ground water.
Presently, Plant has installed 3Nos. of RWH structures within plant premises each with yearly installed capacity of 2911m3/year, 7200m3/year & 960m3/year respectively. Out of 3 RWH structure, 1RWH structure near TG Building is having provision to augment the groundwater recharge through the generated runoff from TG Rooftop area & storm water line. Balance 2 RWH structure connected with storm water line; which is used to augment the ground water resources of the area. Thus, Bifurcation of drain line and storm water line needs to be done precisely. Presently, Waste water discharge through Washing & Cleaning, handwash & overflow of soak pit has been discharged to drain line further reutilized after treatment.

M/s Bajaj Energy Limited (BEL), Kundarkhi Unit, has been granted Consent to Operate (CTO) issued by Uttar Pradesh Pollution Control Board for production capacity of 90MW power production for the period up to 31/12/2023, subject to fulfilment of the terms & conditions mentioned in water & air consent letter.

Industrial wastewater generated in plant through various process activities like backwash & Regeneration of filters of WTP plant, RO Reject & Boiler blowdown, which is being collected & treated in N Pit (64m3 capacity) further passed to ETP having installed capacity of 1000KLD for further treatment along with CT blowdown. During Audit, Team noticed about 463m3/day industrial waste is being treated, thereafter reused in dust suppression near CHP, Ash silo, gardening, Firefighting & Ash quenching. In addition, Generated Domestic effluent (Flushing) is being treated in septic tank with soak pit. However, effluent generated through hand wash and other domestic washing & cleaning activities discharged to drain line/storm water line. In addition, Bajaj Management has installed 100KLD STP Plant for residential block which is common for Power Plant & Sugar Plant. STP treated water discharged to the common point.



DATA ANALYSIS

CHAPTER 7

Data Analysis and Results

7 DATA ANALYSIS & RESULTS

The source of Fresh Water for domestic use & other activities to the plant area is meet through ground water through 3 Nos. of borewell. The water consumption pattern within plant premises for last three financial years has been maintained by the plant. Thus, the water consumption to the plant is provided in below table;

Table 15: Fresh water abstraction data in Last 3 Financial Year

Ground Water Abstraction (m3/month)			
Year	FY 2020-21	FY 2021-22	FY 2022-23
April	1437	125767	118465
May	25323	72243	78470
June	74258	124664	101423
July	132109	126597	117115
August	125711	136176	118252
September	134808	126645	25550
October	86385	36022	17816
November	1910	20823	958
December	38553	210	21861
January	79700	22429	124062
February	27579	439	123357
March	12745	19425	80933
Total	740518	811440	928262

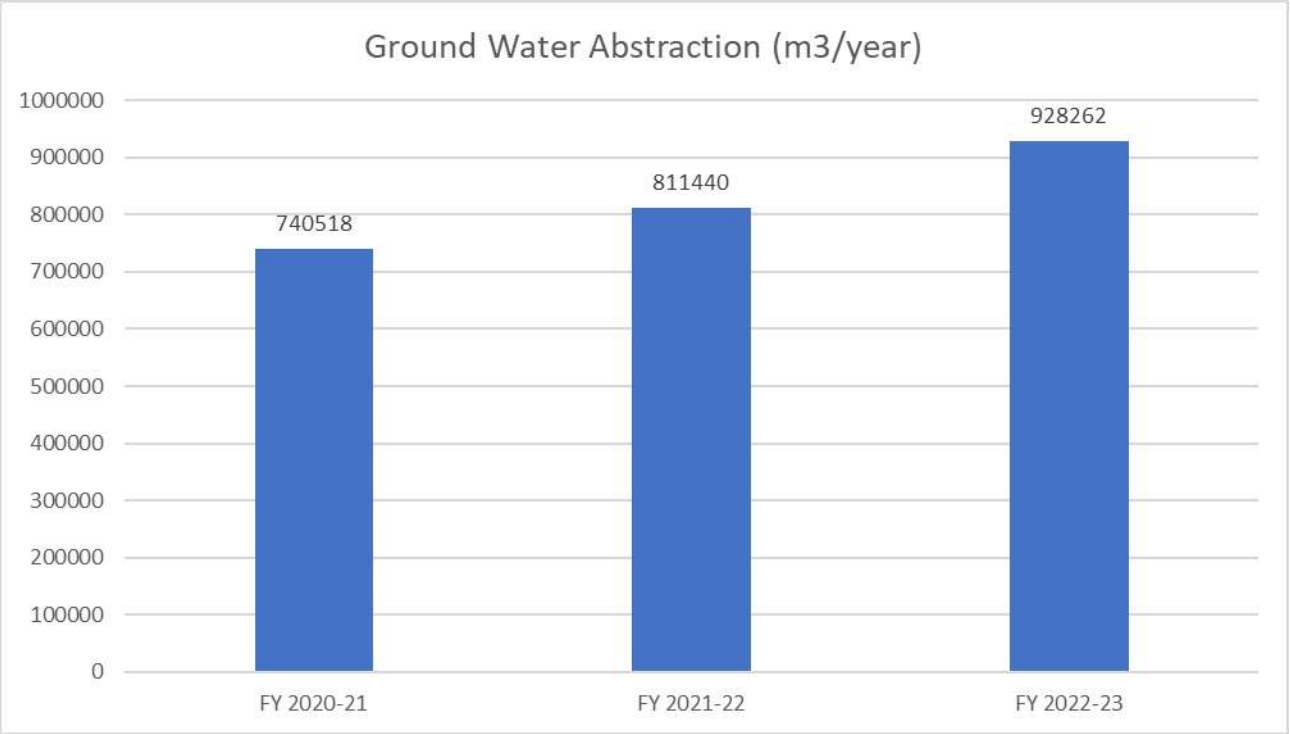
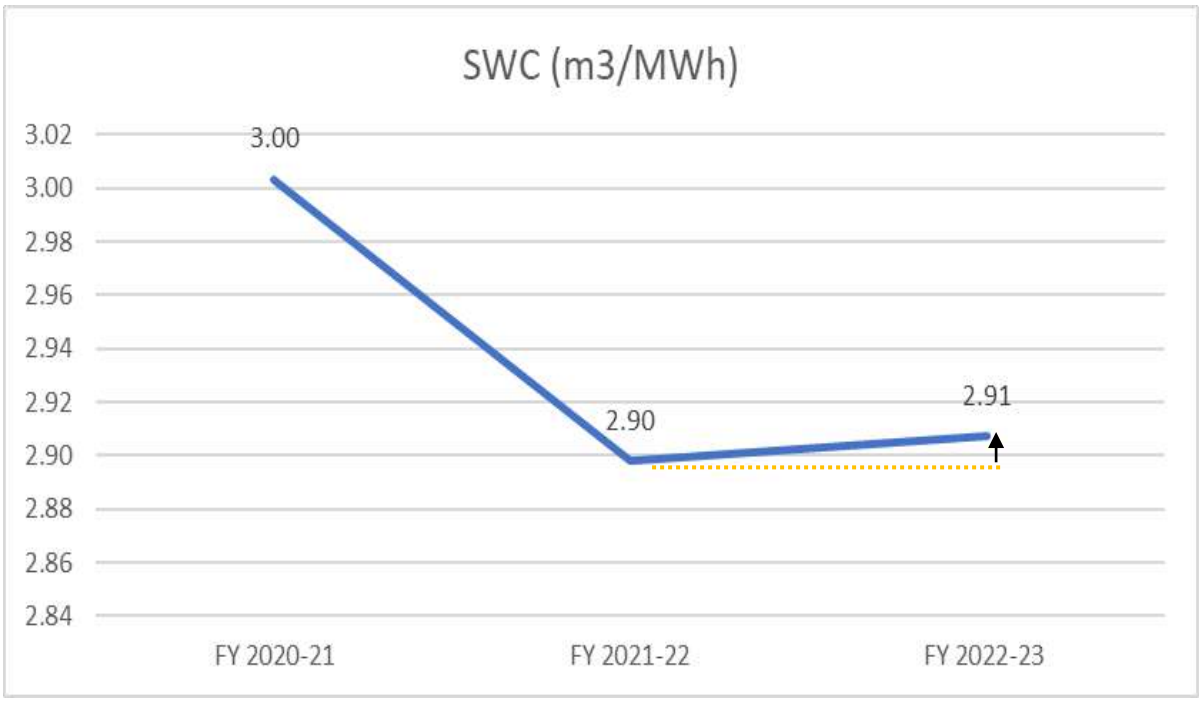


Figure 10: Fresh water consumption in Plant in Last 3 Year

Table 16: Historical Specific water consumption

Sr. No.	Description	UOM	FY 2020-21	FY 2021-22	FY 2022-23
1	Borewell 1	m3/year	404620	388931	547511
2	Borewell 2	m3/year	335898	351588	215704
3	Borewell 3	m3/year	0	70921	165047
4	**Total Ground Water Abstraction, A**	**m3/year**	**740518**	**811440**	**928262**
5	**Domestic**	m3/year	**2364**	**2161**	**2925**
6	**Industrial**	m3/year	**738154**	**809279**	**925337**
7	ETP Treated Water, B	m3/year	67301	71961	72000
8	No. of Working days, C	Nos./year	300	300	300
9	**Ground water abstraction per day, D= (A/C)**	**m3/day**	**2468**	**2705**	**3094**
10	**ETP treated water per day, E= (B/C)**	**m3/day**	**224**	**240**	**240**
11	Production (Generation), F	MU/year	246.56	280.026	319.319
12	**Specific Water Consumption (SWC) of Power Generation, G= [A/(F X 1000)]**	**m3/MWh**	**3.00**	**2.90**	**2.91**

**SWC per unit generation w.r.t Total Fresh water intake in FY 2022-23 has been increased from FY 2021-22.*





CHAPTER 8

Water Conservation Opportunities

8. WATER CONSERVATION OPPORTUNITIES

M/s. Bajaj Energy Limited (BEL), Kundarkhi Unit Management has shown keen interest to implement various measures to reduce water consumption.

Following are the initiatives already adopted by Plant Management to reduce the fresh Water/Treated Water.

Table 17: Water conservation initiatives

S. No.	Title of water saving Project Implemented	Year of Implementation	Annual water Saving		Investment Made	Payback Period (Months)
			m^3	Rs. Lakhs		
1	Use of Swas drain water in cooling tower	2021	1533	0.03	0.02	8

Best management practices (BMPs) are a set of hands-on recommendations that help to identify opportunities and implement programs to save water in the plant. BMPs are developed for the various water-use categories in the office buildings and for monitoring and operational procedures. They are grouped according to indoor water use, outdoor water use, and monitoring and operational procedures. We can tailor water-saving program by using part or all the BMPs depending on budget and environmental requirements. Tips and information are provided on water-saving amounts and cost recovery to help in prioritizing measures and make the most knock for buck.

Based on the information collected and observations, the following can be recommended to reduce water use and increase its efficiency.

Table 18: Inventory details

Building name	No. of employees in building	Total no. of washrooms	No. of taps	No. of urinals
TG Building	34	1	4	4
DM Plant	10	1	1	1
Security Office	18	1	1	2
Boiler Area	16	1	3	6

8.1 FAUCETS

Water efficient faucets and fixtures are available in the market now days to reduce water consumptions in wash basins by reducing flow without compromising comfort level of user. Plant has installed with normal faucets. Thus, Audit team recommends to install water efficient Faucets which can easily reduce water use without affecting the comfort of the water user by using appropriate flow regulator technology for these fixtures. This will result in impressive savings of around 50 percent over conventional tap. Flow regulators, especially the aerators are inexpensive and are easy to install and maintain. This is why they are often considered as the low hanging fruits of water saving programs.





Figure 11 Water Efficient Faucets

8.2 TOILETS

Audit team recommend use of dual type flush cisterns with tank capacity of 3/6 liters per flush instead of single flush cistern (10 Liters capacity/flush) results in savings in domestic water.

8.3 SAVING WATER THROUGH MONITORING AND OPERATIONAL PROCEDURES

8.4.1 Identifying and Fixing Leaks

The hidden water leaks can cause loss of considerable water and energy without anyone being aware of it. A small leak can amount to large volumes of water loss. Leaks become larger with time, and they can lead to other equipment failure. Fix that leaky pipe, toilet, faucet, or roof top tank to save considerable amount of money and water. The establishment of a leak detection and repair program would be a most cost-effective way to save money and water in the Plant premises. Following are some best practices to identify and fixing leaks:

The Management must be committed for providing the staff and resources needed to maintain plumbing fixtures and equipment on a regular basis and assuring prompt identification and repair of leaks.

- Repair staff is given the tools needed and is trained to make leak repair a priority activity.
- Staffs are taught to report leaks and other water-using equipment malfunctions promptly.
- Staffs are rewarded for success.
- Rooftop tank overflow or leakage water should flow to rainwater gutter system not to sewage system to allow detection of rooftop water loss.
- Records of the type, location, number, and repair of leaks are kept in a central location.

8.4.2 Water Metering and Sub-metering

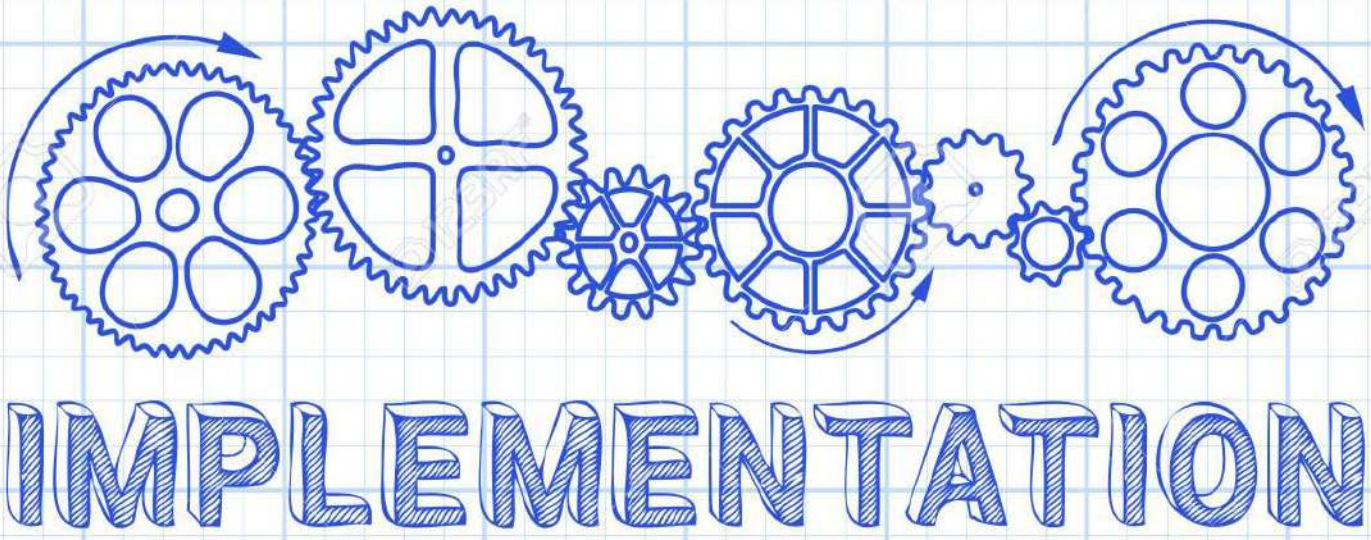
The metering and sub-metering of the Plant's water use is essential to understand the water consumption pattern inside the Plant. The accurate measurements enable management to understand maximum and minimum consumption area in the Plant and improve water efficiency in the Plant. Monitoring the water use allows management to know where and when water is being used and where the best opportunities for water savings exist. The Plant had installed meters inlet to raw water tank only, however it is recommended to install the digital flow meter at the outlet of the Borewell pump before any tapping of line.

8.4 RAIN WATER HARVESTING STRUCTURES

Plant has a potential of utilizing Rain water harvesting by construction of adequate capacity of surface storage system at plant premises. The collected water can be used in meeting domestic

requirement after proper treatment. Therefore, this will result in saving in fresh/raw water abstracted from the ground for domestic use.

- Filter chambers must have cleanliness, hygiene to help practice best management for harvesting rainwater.
- Iron coverings must be replaced to avoid any kind of contamination even in future.
- Any Change of water meter and pump sets must be immediately informed with photo to CGWA.
- Permission must be sought from CGWA to construct new abstraction structures
- Report CGWA if planning more harvesting structures in future outside the premises.



CHAPTER 9

Implementation Plan

9. IMPLEMENTATION PLAN

The audit team has conducted detail audit of Water Sources, Consumption Area and Discharge side of the M/s BEL, Kundarkhi. The recommendation/implementation plan are provided below:

9.1 Effective Utilization Of Roof Top RWH Potential

As per CGWA NOC, M/s BEL, Kundarkhi, has to install Rooftop Rain water harvesting structures in the premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the plant. Thus, it is recommended to utilize the Rooftop RWH potential for industrial use by constructing storage system locally for the rooftop and also divert the rooftop water (TG Building & DM Plant) to the raw water storage tank through closed network/pipeline from nearby rooftop area. Collected Rooftop can be utilized in various activities like flushing, CT makeup & further use after Treatment in WTP plant. In addition, Storm water line needs to be cleaned before pre-monsoon.

Roof Top RWH potential of Plant is calculated below;

Table 19: Fresh Water savings by utilization of RWH potential

Sr. No.	Description	UOM	Value
1	Total Plant Area	m2	44924
2	Rooftop area of building/Shed	m2	5164
3	Open Land & Green Belt area	m2	39760
4	Average rainfall	mm	560
5	Total Quantum of Runoff Available for RWH Potential	m3/year	5798
6	Total Quantum of Rooftop Runoff Available for RWH Potential	m3/year	2458
7	Considering effective Annual Rooftop Runoff Available for RWH utilization @ 50%	m3/year	1229
8	Yearly RWH potential is extrapolated on a daily basis savings in Fresh water intake	m3/day	3

**Above savings is being calculated for rooftop RWH potential.*
**Plant may utilize Rooftop potential of TG & DM Plant Building.*
**Play may use Road/Paved area, Open Land & Green Belt area for ground water recharge through installed RWH structure.*

9.2 Reuse of 100KLD STP treated Water In Gardening, Firefighting & Dust Suppression

Presently, STP plant having installed capacity of 100KLD used both for Power Plant & Sugar Plant Residential Block. During Audit, about 32m3/day treated STP water was noticed. Out of 32m3/day, around 10m3/day is used in filter backwash & around 6m3/day used in greenbelt nearby area. Balance around 16m3/day, treated water from STP is discharged to common point. No effective utilization of Treated water is being done. Thus, it is recommended to use of STP treated water for Firefighting, Dust suppression & green belt development after proper treatment.

9.3 Training and awareness programs would be done regularly at all levels i.e., from management to operator level. Posters/slogans should be pasted wherever possible

The plant has a workforce includes (employees + contractual staff) and major water usage in domestic, washing & cleaning activities. It is suggested that the plant employees at all levels should be made aware and trained on 'Water Saving & Conservation' and 'Good Housekeeping Practices'. Therefore, it is recommended to periodically organize Awareness Programs for office employees including canteen & shop floor workers on Water Conservation. It is also suggested that prominent

water saving labels/posters should be placed/located in the plant at noticeable locations like process area; near handwashing taps; washrooms, admin office etc. This will create awareness & sense of responsibility among staff/employees/visitors.



CHAPTER 10

Annexure

10. ANNEXURES (MEASURED DATA)

Sr. No.	Type of Structure/Location	Unit	Borewell 1 (Near DM plant)	Borewell 2 (Near Store Area)	Borewell 3 (Near TG building)
	Rated Parameters				
1	Flow	m3/hr	180	180	180
2	Power	HP	25	25	25
	Measured Parameters				
3	Volt	V	425.0	424.3	426.1
4	Current	A	28.5	28	26
5	PF	pf	0.80	0.82	0.80
6	Power	kW	16.8	16.9	15.3
7	Flow	m3/hr	145	147	131

Sr. No.	Description	Value
1	MGF feed flowrate	14.5
2	RO Reject	4.1
3	RO Permeate	11.2
5	MGF backwash flowrate	30
7	ETP outlet	26

11. ANNEXURES (DATA PROVIDED BY PLANT)

A. NOC for ground water withdrawal to Bajaj Energy Limited, Kundarkhi as per CGWA guidelines

Borewell 1

6/18/2021 NOC Application Form

GROUND WATER DEPARTMENT
(Namami Gange & Rural Water Supply Department)
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (C)

AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER

[Under Section 14 of the Uttar Pradesh Ground Water Management and Regulation Act, 2019.]

AUTHORIZATION/ NO-OBJECTION CERTIFICAT NO:

VALID UP TO : 17/06/2026

Name of the Applicant	PRASHANT KUMAR JENA		
Address of the Applicant:	Village - Kundarkhi ,PO - Govindpara		
Company Name:	Bajaj Energy Limited, Unit Kundarkhi	Company Address	Village - Kundarkhi,PO - Govindpara,District - Gon
Serial No. of Application Form	GNDA0621NIN0008	Date of Submission	07/01/2021
Specimen Signature of the User:			

Location particulars:

District	Gonda	Block	JHANJHARI
Plot No.	6,7,8,62,63,65,546 &548		
Municipality/Corporation	N/A	Ward No.	N/A
Holding No.			N/A
Rate of Withdrawal (m3/hr.)	180.00	Date of Energization (In Case of Electric Pump)	03/03/2011

Particulars of the Proposed Well and Pumping Device:

Type of the Well	Tube Well/Boring	Purpose of the Well	Industrial
Assembly Size (For Tube Well)	0.00	Approx. Strainer Length (For Tube Well)	0.00
Diameter (For Dug Well)	0.00	Type of Pump to be Used:	Submersible
H.P. of the Pump:	30.00	Operational Device	Electric Motor
Maximum Allowable Rate of Withdrawal (m3/hr.):	180.00	Maximum Allowable Running Hours Per Day:	19.00
Maximum Allowable Annual Extraction of Ground Water:			1026000

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (2) for extraction of ground water at a rate not exceeding that as shown at Sl. (3j), for Running Hours I day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

1/2

Conditions

- (1) In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- (2) No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization.
- (3) For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters(conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters.
- (4) The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands.
- (5) In case of any change of ownership of the existing well, fresh registration has to be obtained.
- (6) No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration.
- (7) In case, any of the particulars / information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage, this registration is liable for cancellation.
- (8) The Certificate of Authorization/ NOC shall be valid for a period of three years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- (9) Construction of piezometers and installation of digital water level recorders with telemetry shall be mandatory for user. Depth and zone tapped of piezometer should be commensurate with that of the pumping well. The data, obtained from digital water level recorders shall be made available to this office on monthly basis.
- (10) Guidelines for Installation of Piezometers and their Monitoring

Piezometer is a borewell /tube well used only for measuring the water level by lowering the tape/ sounder or automatic water level measuring equipment. It is also used to take water sample for water quality testing whenever needed. General guidelines for installation of piezometers are as follows for compliance of NOC.

- The piezometer is to be installed/constructed at the minimum of 50 m distance from the pumping well through which ground water is being withdrawn. The diameter of the piezometer should be about 4" to 6".
- The depth of the piezometer should be same as is case of the pumping well from which ground water is being abstracted. If, more than one piezometer are installed the second piezometer should monitor the shallow ground water regime. It will facilitate shallow as well as deeper ground water aquifer monitoring.
- No. of piezometers to be constructed & Type of water level monitoring mechanism shall be as per below table:

S.No	Quantum of Ground water withdrawal (cum/day)	No.of piezometers required	Monitring Mechanism	
			Manual	DWLR with Telemetry
1	< 10	0	0	0
2	11 - 50	1	1	0
3	50- 500	1	0	1
4	> 500	2	0	2

- The measuring frequency should be monthly and accuracy of measurement should be up to cm. the reported measurement should be given in meter up to two decimals.

2/3

/3/2021

NOC Application Form

- For measurement of water level sounder or automatic water level recorder (AWLR)/ Digital Automatic water level recorder (DWLR) with telemetry system should be used for accuracy.
- The measurement of water level in piezometer should be taken, only after the pumping from the surrounding tube wells has been stopped for about four to six hours.
- All the details regarding coordinates, reduced level (with respect to mean level), depth, zone taped and assembly lowered should be provided for bringing the piezometer into the Hydrograph Monitoring System for Ground Water Department, Uttar Pradesh, and for its validation.
- The ground water quality has to be monitored twice in a year during pre-monsoon (May/June) and post-monsoon (October/November) periods. Quality may be got analyzed from NABL approved lab. Besides, one sample (1 lt. capacity bottle) to the concerned Director, Ground Water Department, Uttar Pradesh, for chemical analysis.
- A Permanent display board should be installed at piezometer/Tube wells site for providing the location, piezometer/ tube well number, depth and zone tapped of piezometer/tube well for standard referencing and identification.
- Any other site-specific requirement regarding safety and access for measurement may be taken care off.
- (11) Any other condition(s) that may be imposed by the concerned Authority.
- (12) In case, any of the particulars / information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
- (13) Any other condition imposed by the concerned Authority

- SPECIFIC CONDITIONS:
- (A) For Industrial User: No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no 10 shall be mandatory for industries drawing/ proposing to draw more than 10 m3/day of ground water and. Monitoring of water level shall be done by the project proponent. The piezometer (observation well) shall be constructed at a minimum distance of 15 m from the bore well/production well. Depth and aquifer zone tapped in the piezometer shall be the same as that of the pumping well/ wells. Monthly water level data shall be submitted online to the Ground Water Department, UP.
- v) The proponent shall be required to adopt roof top rain water harvesting/ recharge in the project premises. Industries which are likely to pollute ground water (chemical, pharmaceutical, dyes, pigments, paints, textiles, tannery, pesticides/ insecticides, fertilizers, slaughter house, explosives etc.) shall store the harvested rain water in surface storage tanks for use in the industry.
- vi) Injection of treated/ untreated waste water into aquifer system is strictly prohibited.
- vii) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution.
- (B) Infrastructural User: The No Objection Certificate for ground water abstraction will be granted subject to the following specific conditions.
- i) In case of infrastructure projects that require dewatering, proponent shall be required to carry out regular monitoring of dewatering discharge rate (using a digital water flow meter) and submit the data online to Ground Water Department, UP as applicable. Monitoring records and results should be retained by the proponent for two years, for inspection or reporting as required by District Ground Water Management Council.
- ii) Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 m3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc.

This NOC is not authorized by any Official. This should only be used for Preview purpose.
यह अनापत्ति प्रमाणपत्र किसी प्राधिकारी द्वारा प्रमाणित नहीं है। इसे मात्र पूर्वावलोकन के उद्देश्य से प्रयोग किया जाना चाहिए।

B. Piezometer Data

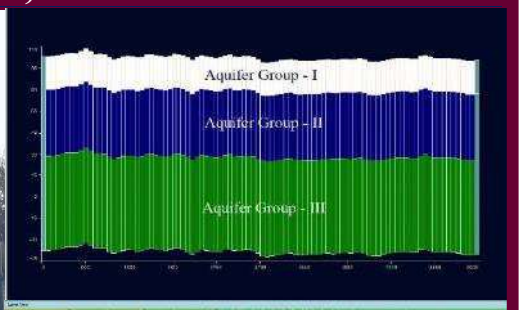
Sr. No.	Description	Piezometer 1	Piezometer 2
1	Location of piezometer	Near JNT-3	Near CHP
2	Depth (meter)/ Diameter (millimeter)	15	121
3	Distance from the existing borewell (meter)	>50 mtr	>100 mtr

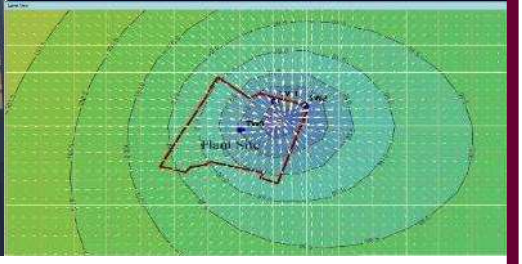
		Piezometer 1			Piezometer 2		
Sr. No.		FY 2020-21	FY 2021-22	FY 2022-23	FY 2020-21	FY 2021-22	FY 2022-23
1	April	4.9	5.45	4.07	5.2	5.45	5.05
2	May	5.6	6.1	5.75	5.9	6.15	5.77
3	June	5.6	6.05	6.08	5.75	6.03	6.07
4	July	4.15	4.2	4.00	4.15	4.28	4.03
5	August	2.8	3.2	3.32	2.97	3.17	3.87
6	September	3.27	3.17	3.10	3.27	3.25	3.25
7	October	3.35	3.1	2.80	3.38	3.10	3.03
8	November	3.43	3.17	3.17	3.43	3.15	3.20
9	December	3.92	3.31	4.30	3.9	3.27	3.27
10	January	4.58	3.31	4.69	4.53	3.42	3.58
11	February	4.78	3.45	4.03	4.7	4.55	4.68
12	March	5.10	3.5	4.93	5.125	4.95	4.78
	Average	4.29	4.00	4.19	4.36	4.23	4.21

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Impact Assessment Report with Groundwater Modeling as per CGWA Guidelines for BAJAJ ENERGY LIMITED, KUNDARKHI UNIT, Village – Kundarki, Block- Jhanjhri, Tehsil- Sadar, District- Gonda, Uttar Pradesh State, India







APPLICANT

BAJAJ ENERGY LIMITED

Application No.	
Report Prepared by	V. Pugazhendi
Accredited By	CGWA / RGI / 003 CGWA / RGI / 042
Date of Accreditation	15-Feb-2021
Validity up to	14-Feb-2026
Work Order Date	29.12.2021
New/ Existing Project	Existing
EC & CTE Issued Date	CTE -31-05-2010
Alluvium/ Non-alluvium	Alluvium
Block Name & Category (GWRA, 2020)	Jhanjhri – Safe (62.98%)
Ground water requirement	6984 cu.m/day
Modeling Required (Yes/No)	Yes

BAJAJ ENERGY LIMITED
Kundarki Unit, Kundarki,
District. Gonda
Uttar Pradesh – 271 607.

V.PUGAZHENDI
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140- Arcot Road, Virugambakkam,
Chennai – 600 092.
Mobile: 9443192134 & 9003766358
Email – vprenviro@gmail.com

February - 2022

Certificate

It is certified that the report *"Impact Assessment Report with Groundwater Modeling as per CGWA Guidelines for BAJAJ ENERGY LIMITED, KUNDARKHI UNIT, Village- Kundarki, Block- Jhanjhri, Tehsil- Sadar, District- Gonda, Uttar Pradesh State, India"* has been prepared by the undersigned. The report is prepared in line with the format given by CGWB guidelines in NOCAP website by following best possible scientific practices.

Signature with Seal

V. PUGAZHENDI, M.Sc., M.Phil., PGDCA, (Ph.D)
CGWA ACCREDITED GROUND WATER PROFESSIONAL.
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V. Pugazhendi
CGWA ACCREDITED GROUND WATER PROFESSIONAL
(Qualified for Impact Assessment Report, Modelling Studies and Hydrogeological Report for Mining Projects)

(Serial Number – 12 of CGWA Accreditation &
Additional Accreditation List. Serial Number – 4 of CGWA)

http://cgwa-noc.gov.in/LandingPage/UserAssistance/Results_Accreditation_with_Contact_Details%2017-03-2021.pdf

http://cgwa-noc.gov.in/LandingPage/UserAssistance/SecondAccreditationList.pdf

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Impact Assessment Report with Groundwater Modeling as per CGWA Guidelines for BAJAJ ENERGY LIMITED, KUNDARKHI UNIT, Village – Kundarki, Block- Jhanjhri, Tehsil- Sadar, District- Gonda, Uttar Pradesh State, India

1. Brief about the proposed project giving location details, co-ordinates, google / topo sheet maps, etc., Demarcating the project area.

Introduction

Bajaj Energy Limited belongs to the renowned "Bajaj Group" which was founded by the country's foremost industrial pioneers, Jamnalal Bajaj nearly a century ago. The Group comprises of Bajaj Hindusthan Sugar Ltd., Bajaj Consumer Care Ltd. and Bajaj Corp Ltd. The registered/corporate office of these Group Companies is situated in Mumbai.

Bajaj has installed Independent Power Plant of capacity - 90 MW coal based, along with 2x45 MW turbines & 2 x190 TPH CFBC boilers.

To avoid the dependency on erratic grid power during peak production period, The Project proponent has installed 2x45 MW coal based thermal power plant. To meet the steam requirement of the 90 MW power plant, Bajaj Group installed a CFBC boiler of 2 x 190 TPH capacity where Indian coal is being used. The quantity of coal requirement is estimated to be about 67 tonnes/hour

Project Details

The power plant is designed based on Circulating Fluidized Bed Combustion (CFBC) Boiler design, which is Environment Friendly Technology. This CFBC design allows burning of high ash content coals, multi-fuel operation, low stack gas temperatures and low fly ash generation. The boiler is designed for a rated steam output of 2x190 TPH TPH at a pressure of 110 and 540 deg. C. As in the case of any other thermal power plant the process involves production of super-heated steam. The enthalpy of the steam is converted into

mechanical energy in a condensing the turbines, which drives turbo-generator system to produce alternative current.

Power generation process is based on Rankine Steam cycle. The steam generated in the boiler when expanded through a turbine, turns the turbine shaft, which is tandem coupled to an electric power generator.

The Consent to Establishment letter is given in **Annexure -1**

Need for the Study

As per the guidelines issued on 24-09-2020 and subsequent amendment for ground water withdrawal, it is mandatory to study the detailed Impact assessment report along with ground water modeling for the projects drawing ground water more than 500 cu.m/day. In order to adhere to the CGWA guidelines, for obtaining the NOC, the Impact assessment with ground water modeling in buffer zones 5 km radius for Industrial and infrastructure projects.

The amendment also states that Impact assessment reports along with modelling study shall also be required to be submitted in Semi Critical, Critical category, over exploited category where ground water withdrawal is >500 cu.m/day in hard rock and >1000 cu.m/day in soft rock/alluvium. In Saft category, the ground water withdrawal >500 cu.m/day in hard rock and >2000 cu.m/day in soft rock/alluvium, the impact assessment report along with modeling is mandatory.

A Detailed project report for rainwater harvesting and ground water recharge plan in the project premise and / or same watershed/ assessment unit, should accompany the request for ground water withdrawal prepared by an accredited consultant.

Bajaj Energy Limited Kundarki unit is located in Jhanjhri Block which is **Safe block** as per the assessment of **CGWA 2020**. Geologically the area is underlain by the Holocene and Middle to Late Pleistocene age of Newer and Older Alluvium.

The Holocene and Middle to Late Pleistocene age of Newer and Older Alluvium are consolidated Alluvium (As per CGWA Classification). Since the Plant site is falling in Safe Block as per 2020 assessment and the Plant falls in Alluvial formation and the Tube well yield is from sedimentary formation and the ground water drawal quantity is more than **2000 cu.m/day**, it is mandatory to undertake Impact assessment report along with ground water modeling study as per CGWB Guidelines.

Accordingly, the company entrusted the work of "Impact assessment report along with ground water modeling study" as per CGWA Guidelines to **V. Pugazhendi** (CGWA Accredited Consultant- Ground Water Modeling - **Annexure -2**)

Scope of Study

Hydrological, Hydrogeological and Modeling Studies as per the CGWA guidelines. The study is also focuses on the sub-surface lithology, aquifer characteristics, ground water level, ground water quality, long term ground water level and quality changes, availability of ground water in and around the Plant area (Buffer zones of 5 Km radius from the Plants boundary), socio-economic aspects of the study area and corporate social responsibility, Sewage and Effluent treatment process, study the ground water recharge possibility in and around the area and outside the Plant.

Ground Modeling Studies include ground water mass balance (input and output from various sources), the ground water heads changes, and impact of the withdrawal of ground water for the plant purpose. The specific scope is as follows:

- To study the aquifer geometry
- To study the ground water flow pattern
- To study the Hydraulic Head gradient
- To simulate the impacts on water table due to pumping
- The Prediction Model includes

- Short – term drawdown interference between pumping wells and in the aquifer – 5 Year
- Long – term drawdown interference between pumping wells and in the aquifer – 10 Year

- Water Mass Balance – 5st and 10th year

Methodology

To achieve the above scope the following methodology has been adopted

- Collection of satellite data, maps and literature about the aquifer characteristics etc.,
- Collection for rainfall data for a period of 25 years.
- Collection of legacy pre and post monsoon ground water level data for period of 10 years.
- Preparation of base map, drainage and water body map, topography map, geology map, geomorphology & structure map, land use map using satellite imagery, from the field data and from available literature.
- Pumping test to understand the aquifer characteristics.
- Field verification of rock type, lithology, type of aquifer such as shallow / deep aquifer, ground water withdrawal.
- Field verification of land use pattern, geomorphic features and structures such as fold, fault, fractures and fissures.
- Collection of well inventory data & measurement of well depth, water level, yield and ground water quality.
- Preparation of maps based on the well inventory data such as, ground water level zone, fluctuation, ground water table contour (pre and post monsoon) and ground water flow pattern, ground water quality.
- Interpolation and superimposition of the observed data using statistical and standard hydrogeological methods.
- Ground water impact assessment due to the pumping of water for Plant requirement.
- Conceptual model to generate aquifer geometry.

- Run numerical model based on the above data / information to arrive the impact of pumping from the Plant pit and the wells located in the study area.
- Estimation of runoff from the plant site based on CGWA runoff co-efficient.
- Suggest suitable rain water harvesting structures with in the plant site based on the estimated runoff.
- Suggest measures for ground water recharge outside the plant site.
- impact of the recharge structures already created by the Project proponent.

Location of the Project

Bajaj Energy limited Kundarki Plant is located in Village - Kundarki, Block – Jhanjhri, Tehsil – Sadar, District - Gonda, State- Uttar Pradesh. Power Plant has **17.88 acres (72,344 Sq.m)** of land within existing premises**.**

The Plant is located about 15 kms from District headquarter Gonda which is located in the Northwest of the Plant. The area is accessible in all seasons. The nearest railway station is in Gonda Railway Station which is about 15 kms from the Plant.

The administrative units within the study area from the project boundary (5 Km radius) comprises of **30 Villages.** No major Town in the study area of 5 Km radius.

The study area (covering 5 Km radius) lies in between North Latitude 27° 02’00” and 27°07’30” and East Longitude of 82°03’30” and 82°08’00”.

The study area of 5 Km from Plant boundary covers in **G44E4** (1 Survey of India Topo sheets).

The Plant site falls in **G44E4.** The total aerial extent of the study area covering 5 Km radius from the Plant site boundary is **78.61 Sq.km.** The details of Plant area are given in **Table-1.**

Table 1: The details of Plant area

Feature	Details
Site Location	Village - Kundarki, Block – Jhanjhri, Tehsil – Sadar, District - Gonda, State- Uttar Pradesh
Latitude	27° 02'00" to 27°07'30"
Longitude	82°03'30" to 82°08'00"
Area of the Plant	**17.88 acres (72,344 Sq.m)**
Topography	Site is located in Fallow land. Crop is predominant in 5 km radius area
SOI Toposheet	**G44E4**
Above Mean Sea level	5 Km Buffer Zone elevation: **Highest point 118 m amsl and Lowest point 96 m amsl** **Plant Site elevation: Maximum and Minimum elevation 106 m amsl and 103 m amsl respectively**
Nearest habitation	Kundarki in the South East (0.47 Km)
Nearest Water body	No Major water body / Dam / Reservoir nearby the Plant site
Nearest River	Chamdai Nalla flows at a distance of ~ 700 m in East direction.
Protected wetlands	No Protected wetlands (Certificate Enclosed) Limestone
Geology of the Area	**Oxidised Silt-clay with Kankar and Micaceous Sand**

Index map, High resolution satellite imagery showing the Plant site and the SOI topo maps are presented in **Plates 1, 2 & 3**:

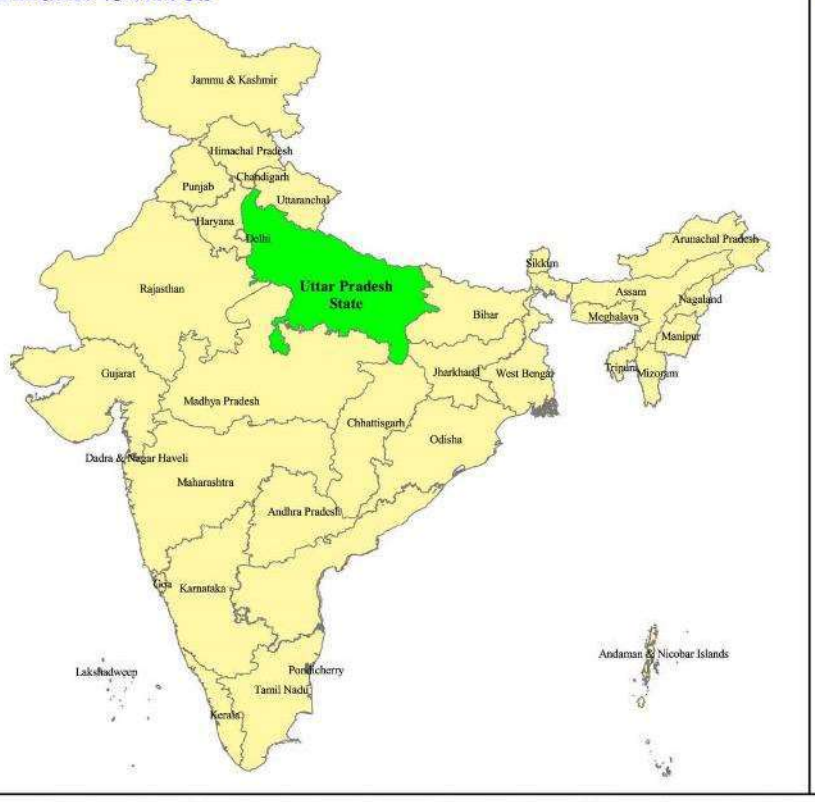
Study Area - Index Map

BAJAJ ENERGY LIMITED, UNIT - KUNDARKHI

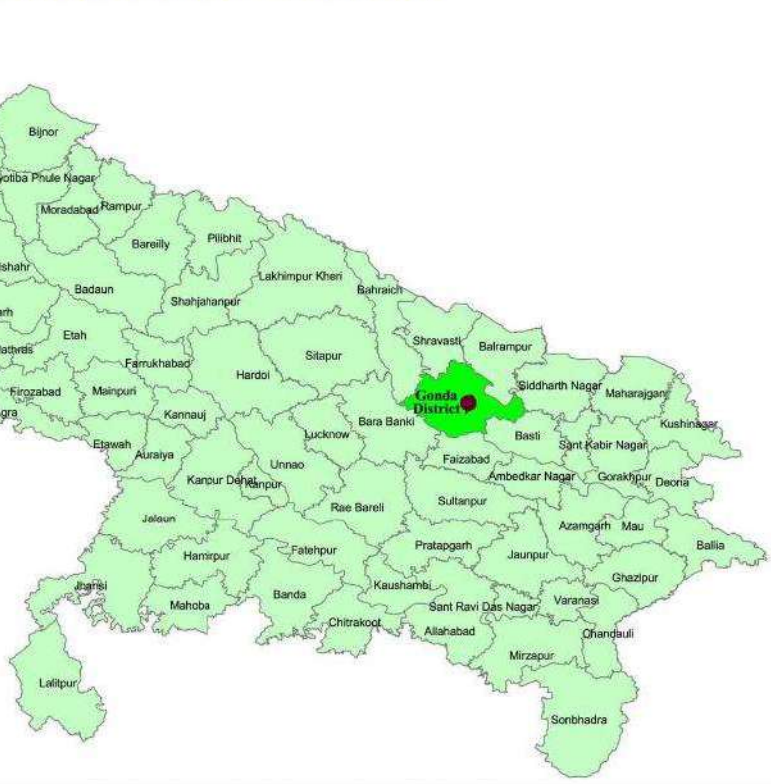
Village- Kundarki, Block- Jhanjhri, Tehsil- Sadar, District- Gonda, Uttar Pradesh State, India



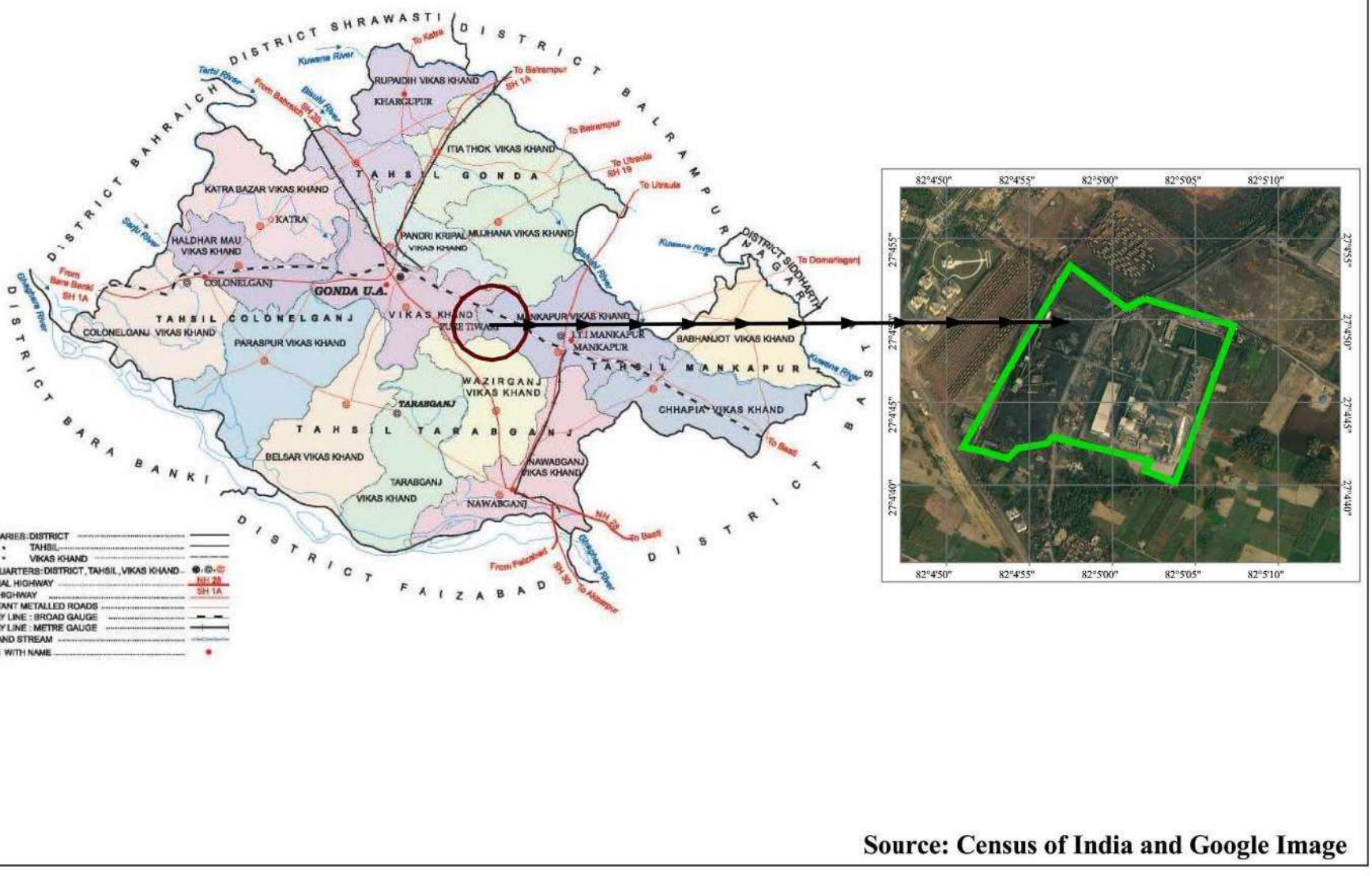
India States



Uttar Preadesh State - Districts



Gonda District, showing the Blocks and Bajaj Energy Limited, Kundarkhi Unit Location



Source: Census of India and Google Image

Plate 1: Study area – Index Map

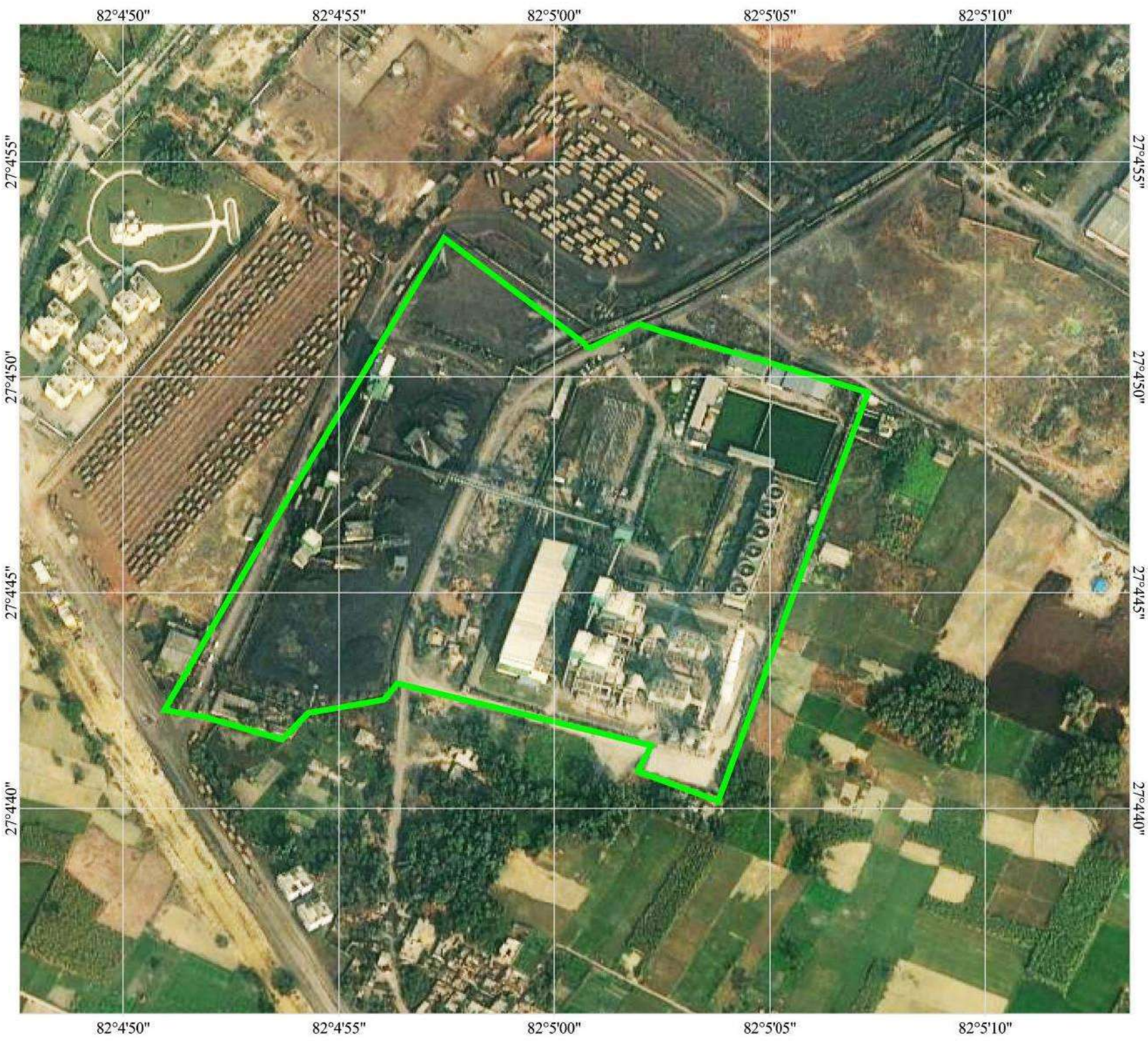
Google Image - High Resolution Stellite Imagery of Mines Site

BAJAJ ENERGY LIMITED, UNIT - KUNDARKHI

Village- Kundarki, Block- Jhanjhri, Tehsil- Sadar, District- Gonda, Uttar Pradesh State, India

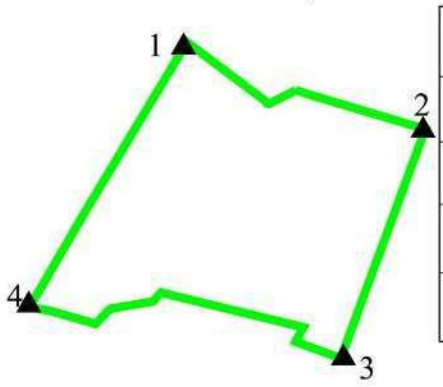
N W E S

20 0 20 Mts



Source: Google Image - High Resolution Image & Field Survey

Plant Boundary



Sl.No	Latitude	Longitude
1	27°04'53.10"N	82°04'57.37"E
2	27°20'58.74"N	82°05'07.13"E
3	27°04'40.20"N	82°05'03.79"E
4	27°04'42.10"N	82°04'51.66"E

Plate 2: High Resolution Satellite Imagery – Plant Site

Survey of India Topo Sheet of Study Area

BAJAJ ENERGY LIMITED, UNIT - KUNDARKHI

Village- Kundarki, Block- Jhanjhri, Tehsil- Sadar, District- Gonda, Uttar Pradesh State, India

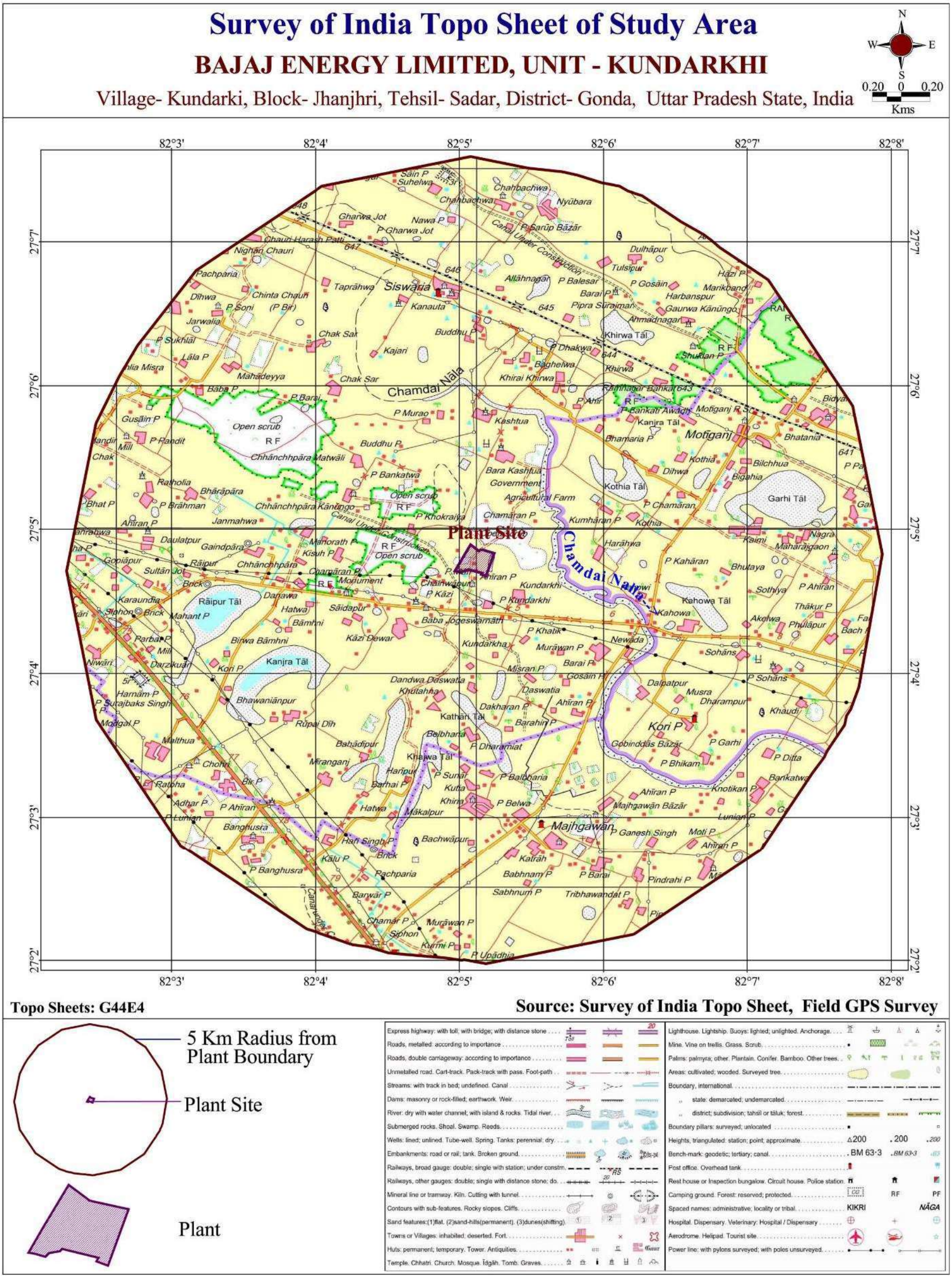


Plate 3: Survey of India Topo map

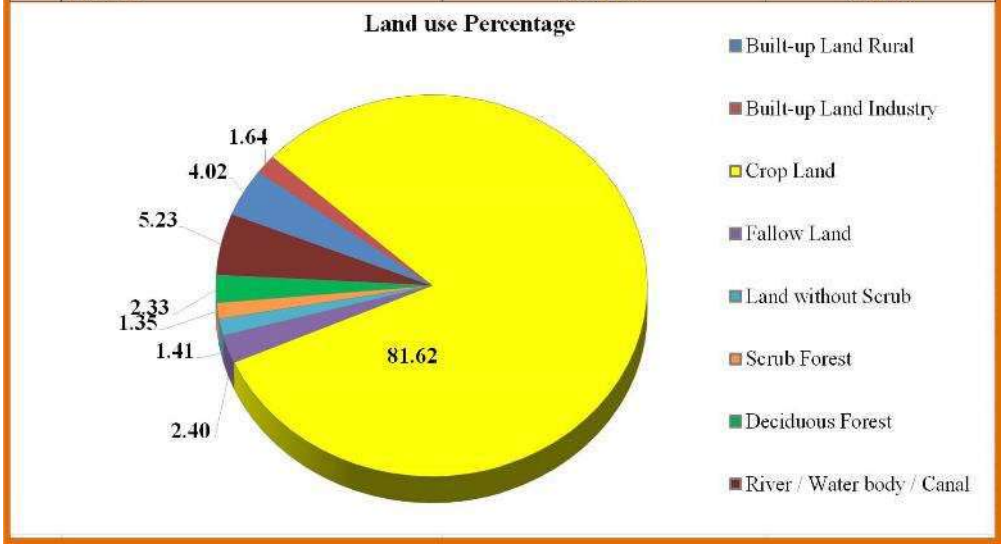
1.1 Land use Land cover of the surrounding area, Percentage of LULC Category

The land use in the village reflects the socio-economic conditions of the people in addition to the natural environmental factors. The land use is also one of the prime parameters to be considered for the ground water estimation. Primarily, 5 Km radius from the Plant site forms part of **crop land (about 81.62 %).** The second major land use is rivers and water bodies. Majority of the area is irrigated by bore well. River and canal-based irrigation was also noticed in the study area. Some of the area is temporary fallow land.

The land use and percentage of coverage in the study are is presented in **Table-2.** The Satellite imagery and the Land use map are presented in **Plate – 5** and **Plate – 6.** The following land use has been depicted from the satellite imagery and compared and updated with NRSA interpreted land use available in Bhavan web site.

Table 2: Land use Classification

S.No	Land use	Percentage	Area in Sq.m
1	Built-up Land Rural	4.02	3.16
2	Built-up Land Industry	1.64	1.29
3	Crop Land	81.62	64.16
4	Fallow Land	2.40	1.89
5	Land without Scrub	1.41	1.11
6	Scrub Forest	1.35	1.06
7	Deciduous Forest	2.33	1.83
8	River / Water body / Canal	5.23	4.11
	Total	**100.00**	**78.61**



Land use Photographs outside the Plant Boundary- within 5 Km radius



Built-up Land - Industry



Crop Land



Forest Land



Fallow Land



Canal near the Plant area

Land Use of Plant area

The Land use of the Plant area is presented in **Table-3.** The Plants layout Plants is present in **Plate-4**

Table 3: Plant area details

S. No	Particulars	Area (Sq.m)
1	Green Belt Area	12000
2	Open Land	46544
3	Road / Paved Area	3800
4	Roof area of Building / Sheds	10000
	Total	**72344**



Green Belt Area in the Plant Site

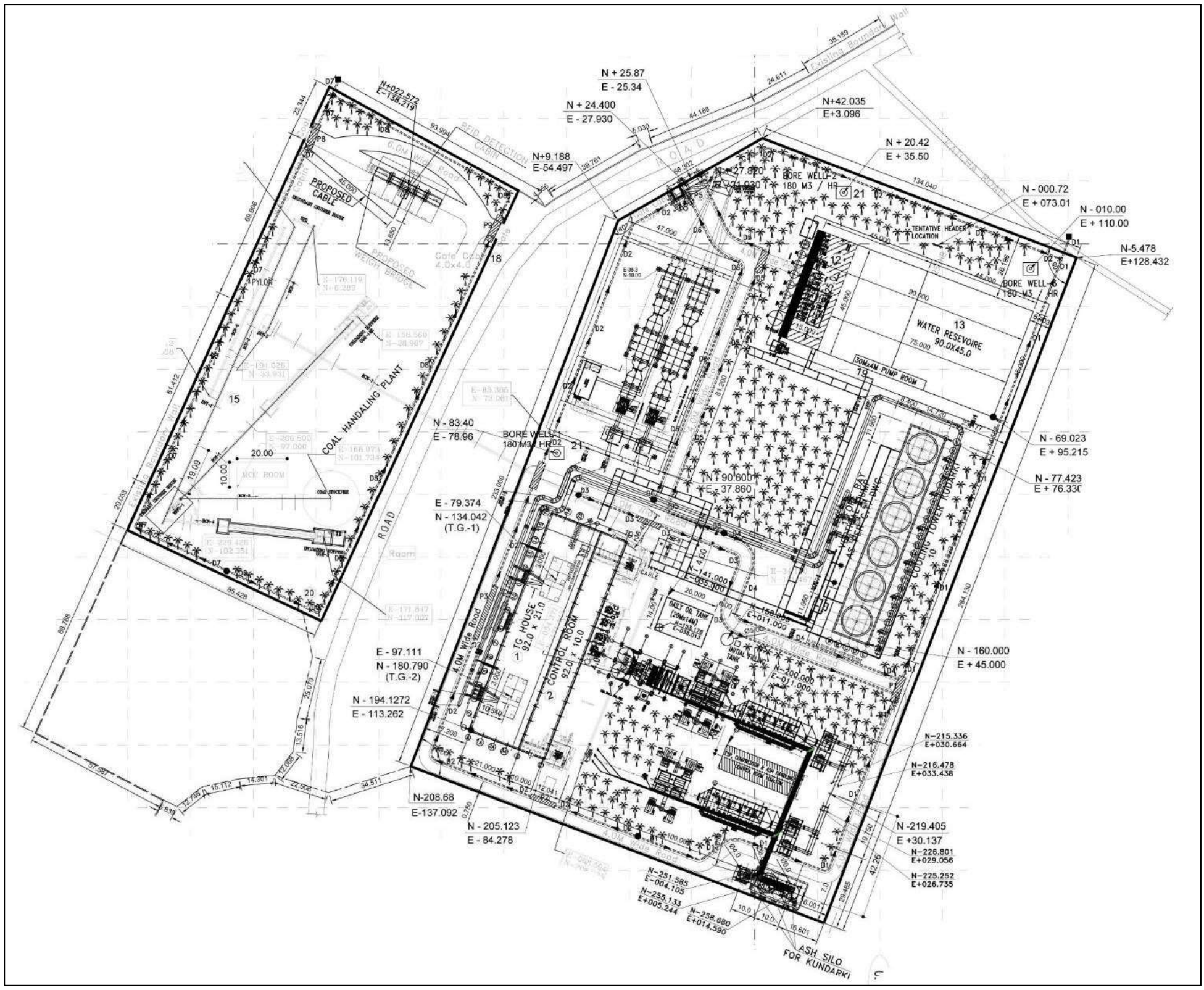


Plate 4: Plant Layout Plan

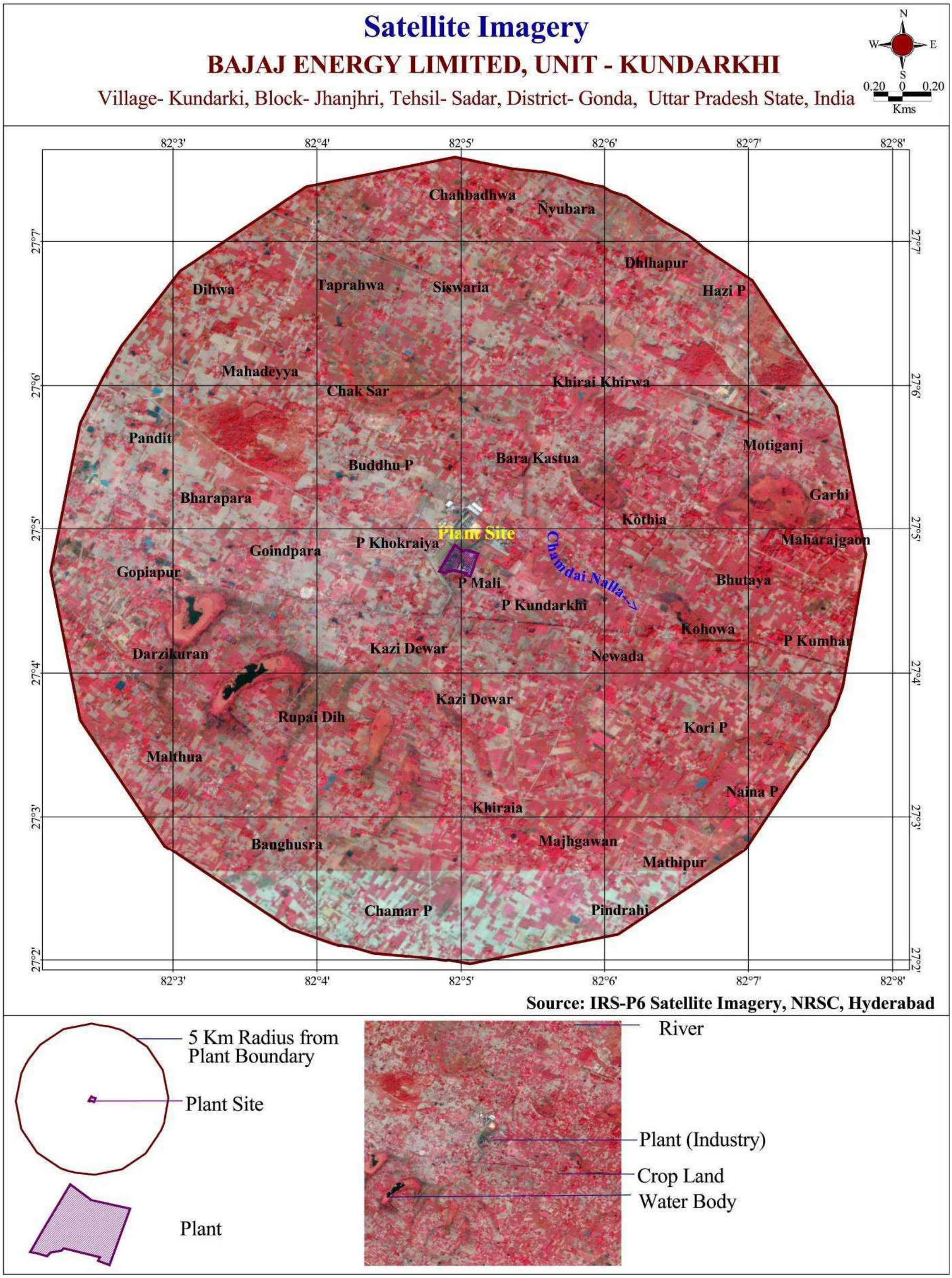


Plate 5: Satellite Imagery

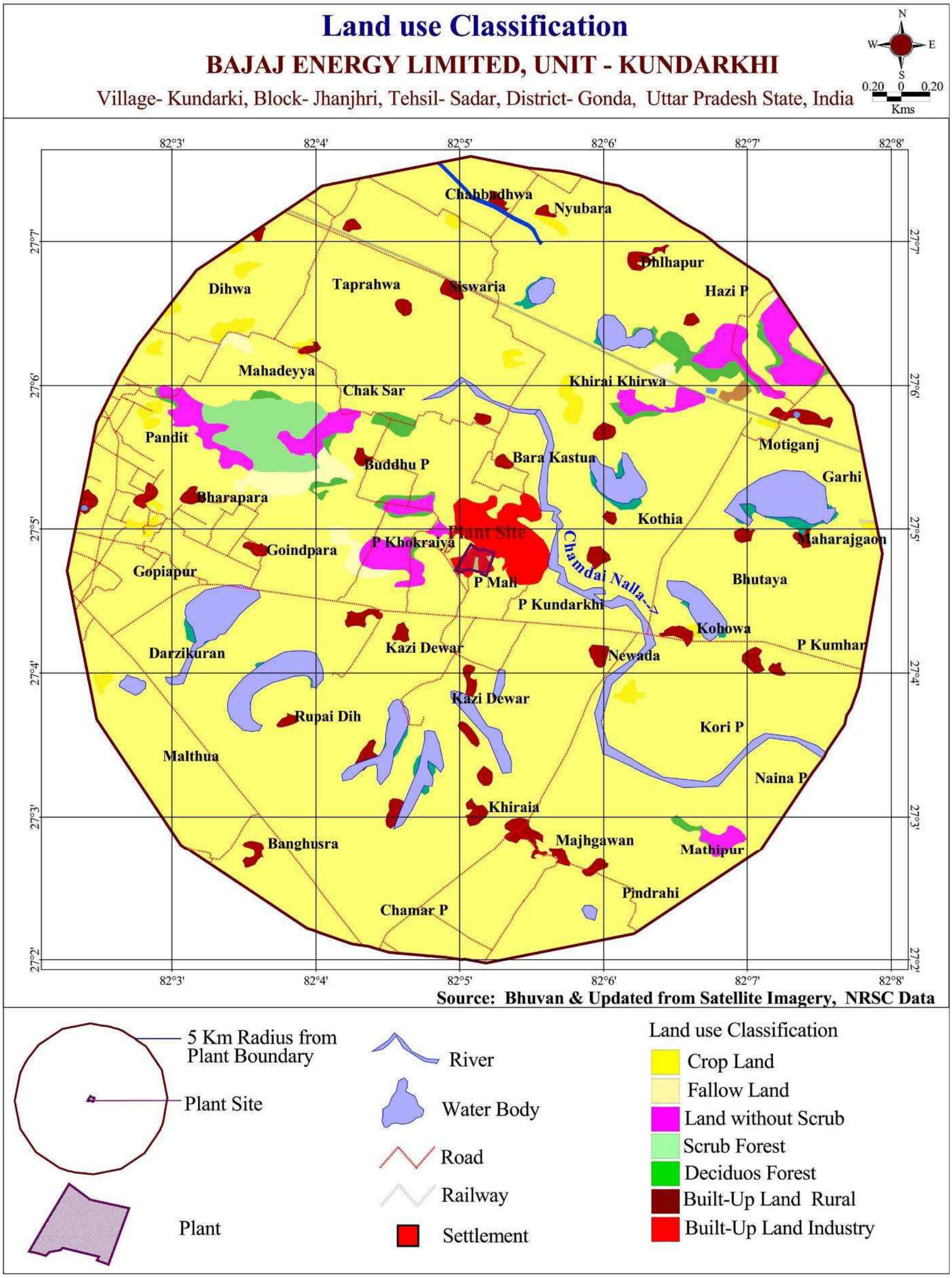


Plate 6: Land use Classification

1.2 Topography and Drainage

Physiographically Gonda District is divided into two units viz.

1) The upland plains underlain by older alluvium and
2) The low land plains underlain by newer alluvium.

The older alluvium occupies the north & eastern part of the district, and the newer alluvium covers the central, western and southern part with low lying slightly undulating tract deposited in comparatively recent times by the river Kuwano, Tirhi and Ghaghra.

The Terrain elevation (Topography) is derived from the Carto-DEM data. The maximum elevation is observed in the western part of the study area.

The Study area (5 Km radius from the Plant site boundary – buffer zone) elevation ranges from **96 m to 118 m amsl**. The maximum elevation is observed in the South eastern part of the study area.

The maximum and minimum elevation of the Plant site is **103 m and 106 m amsl** respectively. The Plant site is sloping towards east.

Topography map of the study area is presented in **Plate-7**

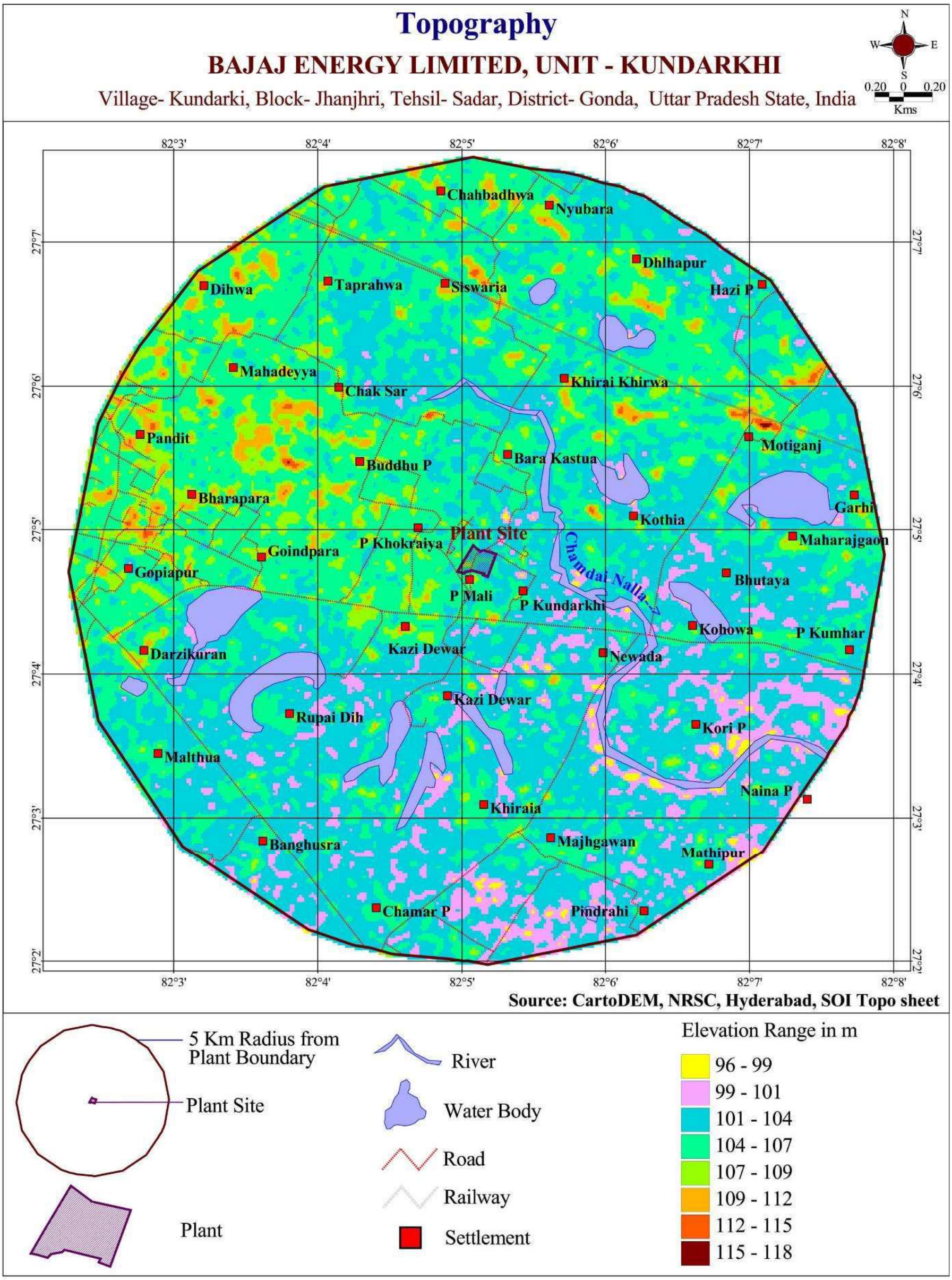


Plate 7: Topography of the Study area

Drainage and Water Bodies

The district chiefly drained by the river Ghaghra which form the southern and south western boundary of the district, the Kuwano river which form the north eastern boundary of the district. Except these rivers the area also drained by the Tirhi N. and Monwar N.

The following seasonal nalla are noticed in the study area of 5 Km radius. **Table-4**

Table 4: Streams in the Study area

Sl.No	Name of Nalla	Distance from Plants boundary	Direction from Plants boundary	Flow direction
1	Chamdai Nalla	700 m	East	South

The development of stream is very less as the runoff flows as overland flow towards the river / nalla. The Chamdai Nalla is seasonal. The river system is the main recharge source for the study area.

1) From the plant site the surface water flow towards east and joins with Chamdai Nalla. Portion of the surface water from the plant flows towards south.

There are no major reservoirs / Dam or irrigation tanks in the 5 Km radius study area. However, number of small to medium water bodies are noticed in the study area. Inland wetland also noticed in the study area.

The study area is irrigated by bore well. River and canal-based irrigation is also observed in the study area. The return flow from the irrigation land maintains the ground water level at moderately deeper depth in the bore well. The Drainage map is presented in **Plate-8**

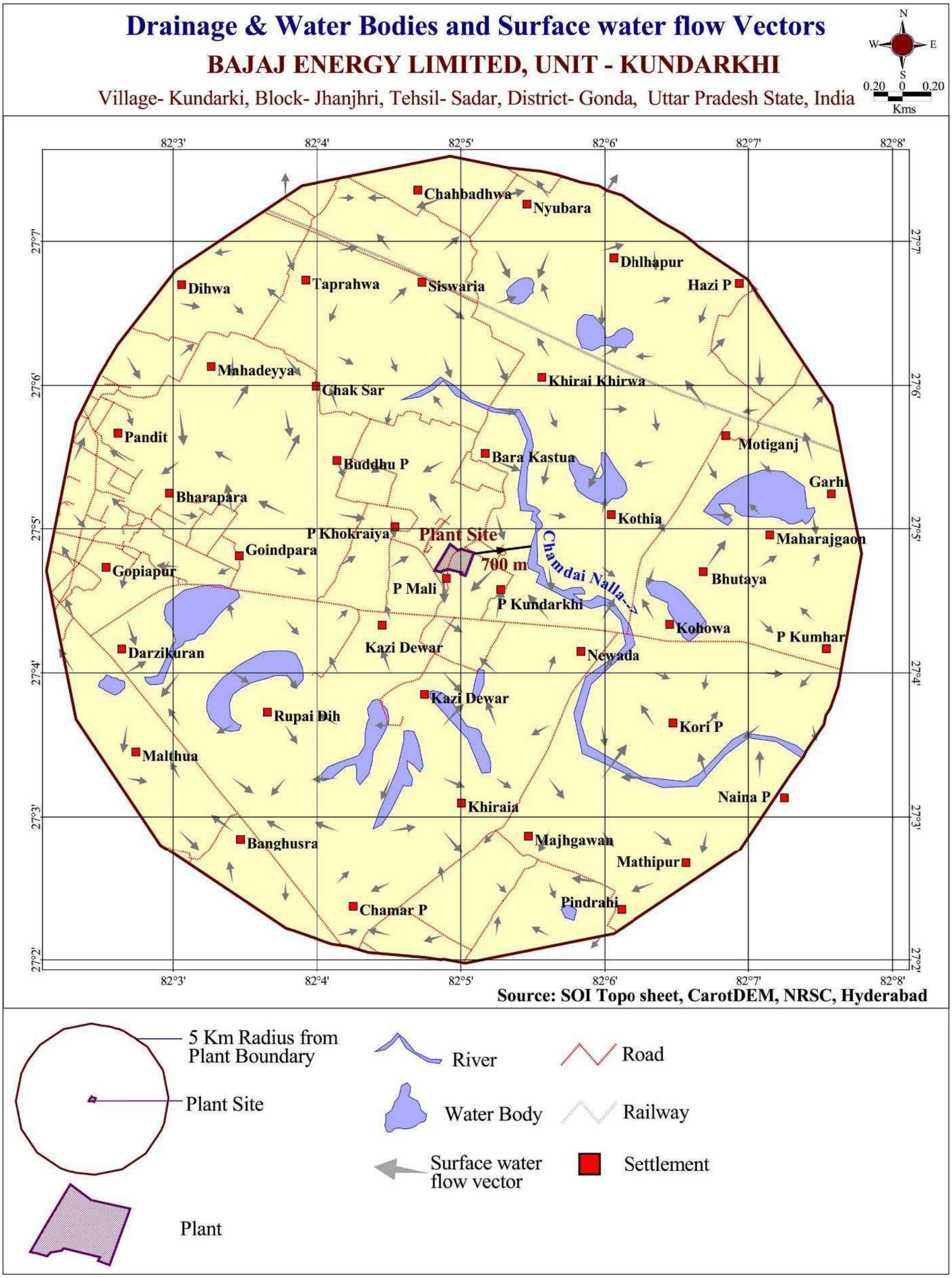


Plate 8: Drainage and Water bodies and surface water flow vectors

Climate and Rainfall

The normal annual rainfall of Gonda district is **925.9 mm (25 year Normal)**. District received maximum rainfall during south west monsoon period i.e., June to September. About **88 %** of the annual rainfall received during south west monsoon season. Only **12 %** of the annual rainfall takes place between October to May period. The Yearly for the period 1997 -2021 is given in **Table-5** and Monthly Rainfall in **Table-6**

Table 5: Yearly Rainfall for 25 Years

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Rainfall in mm	645	455	739	1321	903	539	984	840	1004	680	1142	1275	938	1032	849	1038	1180	777	623	843	668	776	1078	1319	1498

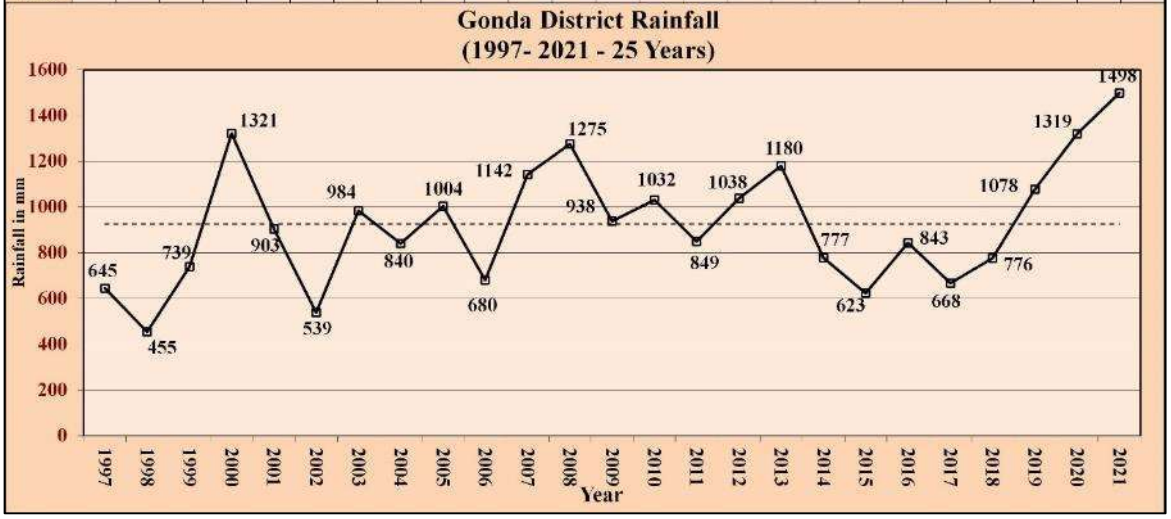
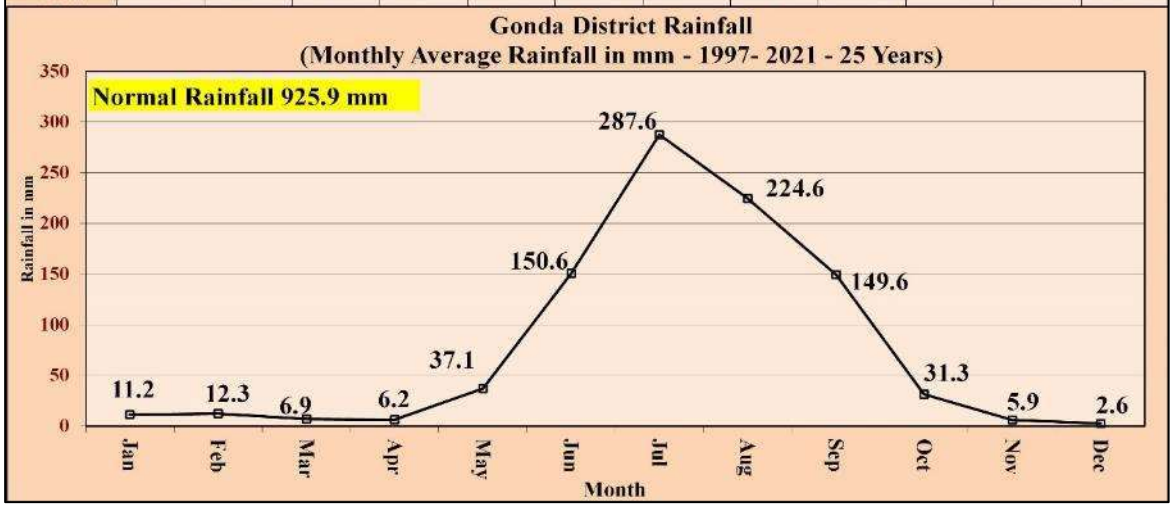


Table 6: Monthly average Rainfall

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall in mm	11.2	12.3	6.9	6.2	37.1	150.6	287.6	224.6	149.6	31.3	5.9	2.6



1.3 Details of wetlands [Highlight protected wetlands / Ramsar Site / NLCP Lakes / other important wetlands in terms of dependences of local communities if any]

A wetland is a distinct ecosystem that is flooded by water, either permanently or seasonally, where oxygen-free processes prevail. Any wetland site which has been listed under the Ramsar Convention that aims to conserve it and promote sustainable use of its natural resources is called a Ramsar Site. The total number of Ramsar sites in India is **46**. The nearest Wetland is located in **Parvati Agra Bird Sanctuary** which is about **18 Km in the South east from the Plant's boundary.** The Plant site is located away from **500 m**. The Ramsar site map is given in **Plate - 9.**

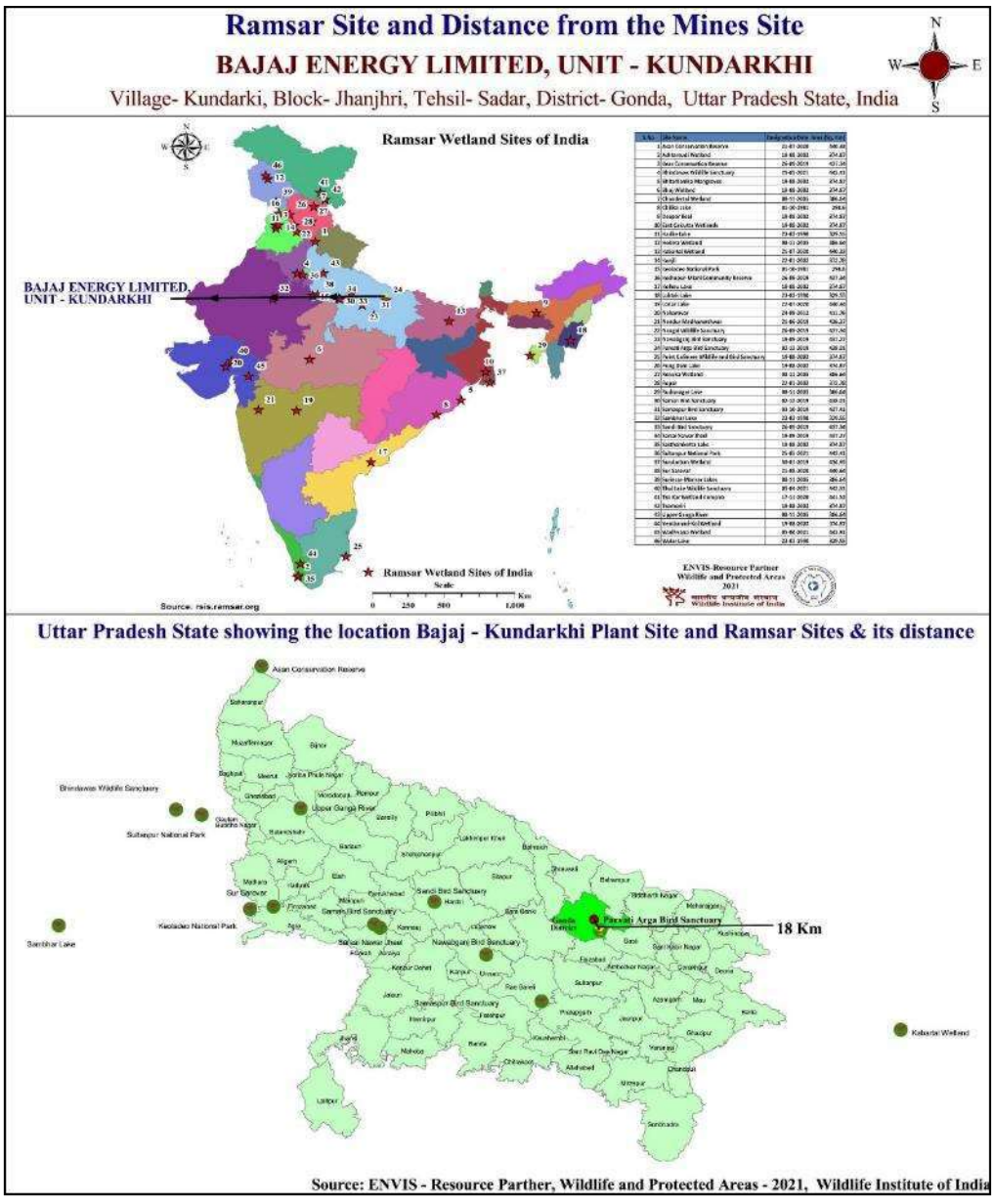


Plate 9: Ramsar sites and distance from the Plant

2. Ground water situation in and around the project area including water level and quality data and maps along with quality issues, if any. In case of Plants, ground water conditions in both core and buffer zone should be described

2.1 Brief geology of the area

The district Gonda is a part of the Ghaghra alluvial plains and is underlain by quaternary alluvium comprising mainly sands of various grades with clay and kankar. The central alluvial plains extend from north to south are makeup of finer clastics comprising mainly clay, silt, sandy clay with kankar and subordinate sands. On the basis of geology, the district is sub-divided into the following four sub-micro regions.

1. Gonda Tarai
2. Rapti Flood Plain
3. Gonda Plain
4. Ganga Khadar

Gonda Tarai : It is situated in the northern part of the district covering major portion of Gonda tahsil. The northern limit of the region concedes with Indo-Nepal International boundary whereas southern limit extends to the high bank of the Rapti river. There are numerous rivulets which drain from north to south direction. These rivulets are wide and change their courses. It is difficult to define the channel of the streams. The surface along these streams is eroded. The extent of such erosion decreases as the streams drain southward. During the rains all these streams are flooded and water drain as a shoot rather than gully.

Rapti Flood Plain: The region is situated on both sides of the river Rapti in east-west direction. The north-west extent of this plain coincides with the raised surface which is the limit of the food water. Rapti flood is a common feature every year. The river enters the district from the west and drains out in the east. Suwawan is the old channel of Rapti which drains in the southern part of the region parallel to it. Pera and Kharjhar are the right bank tributaries. Some natural depressions or tals are also situated here. There are embankments to protect and divert the flood water. s. The region has Alluvium and Dun gravels (Recent) geological formations.

Gonda Plain: The region is situated in the centre of the district covering major parts of **Kundarki** and Gonda tahsils. It is a flat plain locally known as Uparhar. The north and south limits of the region is marked by the old high bank of the Rapti and the Ghaghra rivers. The master slope is from north-west to south-east direction. There are numerous streams flowing in the above slope direction and join Ghaghra beyond the region. Geologically this region is endowed with Alluvium and Dun gravels (Recent).

Ganga Khadar: It is a flood plain locally known as Tarhar. The region is delimited by the extent of flood water of Ghaghra. The area nearby the river is also called Manjha. In this zone numerous rivulets are situated which are flooded with the back flow of water from the Ghaghra river during rains and cause flood in the entire area. Geology of this region is marked by Alluvium and Dun gravels.

A generalized stratigraphic sequence observed in the area is as **Table - 7.**

Table 7: Stratigraphy Succession

Age	Formation	Lithology
Recent	Newer Alluvium	Find Sand silt, Clay Admixed with Gravel
	Older Alluvium	
Classification of Siwalik Group (Based on Pilgrim, 1913, Colbert,1934,1942)		
----------Gradational----------		
Upper (Upper Pliocene to Lower Pleistocene)	Upper Conglomerate	Coarse boulder conglomerate, Clay Sands grits
	Pinjor Formation	Conglomerate, Sandstone, Clays
	Taiort Formation	Sandstones, Clays, Conglomerates
Middle (Upper Miocene to Lower Pliocene)	Dhokapathan Formation	Sandstones, Shales, Clays pebbly at the top
	Nagri Formation	Massive Sandstones, Shales, Red Clays
Lower (Middle Miocene)	Chinji Formation	Nodular Shales,Clays,Sandstones
	Kamlial Formation	Dark hard Sandstones, red and purple Shales

Source: GROUND WATER YEAR BOOK OF UTTAR PRADESH 2017-18

Geology of the Study Area

The study area (5 Km buffer) including the Plant site is comprising of Oxidized Silt-clay with Kankar and Micaceous Sand of Holocene and Middle-Late Pleistocene age. The availability of ground water in this formation is high to very high. The geology map generated from GIS data base is presented **Plate - 10.** The geological formation of as per Geological Survey of India (GSI) is given in **Table-8.**

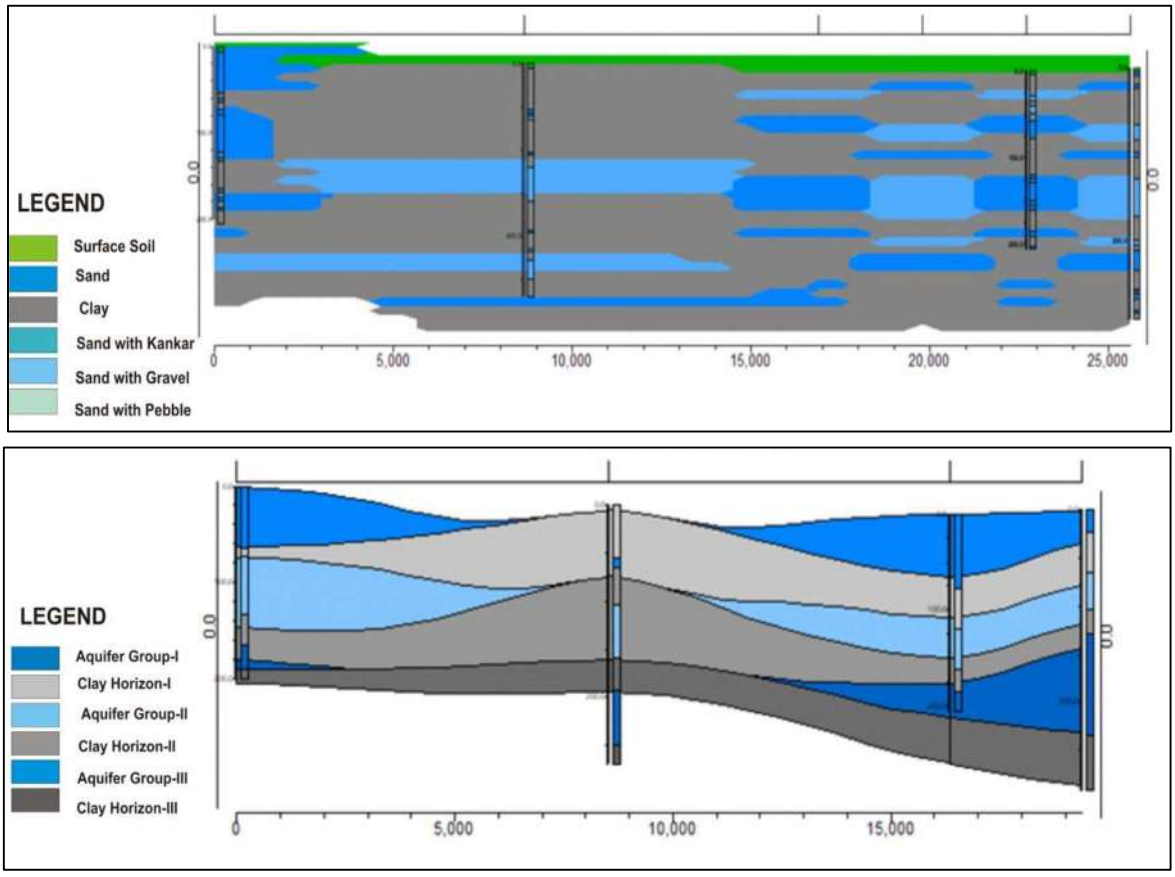
Table 8: Geological Formation of the study area

Geological Notation as per GSI	Geological Formation
Q1oahz	Oxidised Silt-clay with Kankar and Micaceous Sand

Geology of the Plant area

The Plant area is underlined by Silt-clay with Kankar and Micaceous Sand. In general, the top soil of the plant area 3 – m. The generalized lithology of the study area is presented in **Figure-1**

This aquifer group is separated from the overlying aquifer group by thick clay and occurs between the depth range of 250 m bgl and below. The thickness of granular zone varies between 19-105 m with an average of 40 m.



Source: CGWB- NAQUM Report (SHRAVASTI DISTRICT)

Figure 1: lithology cross section of the study area

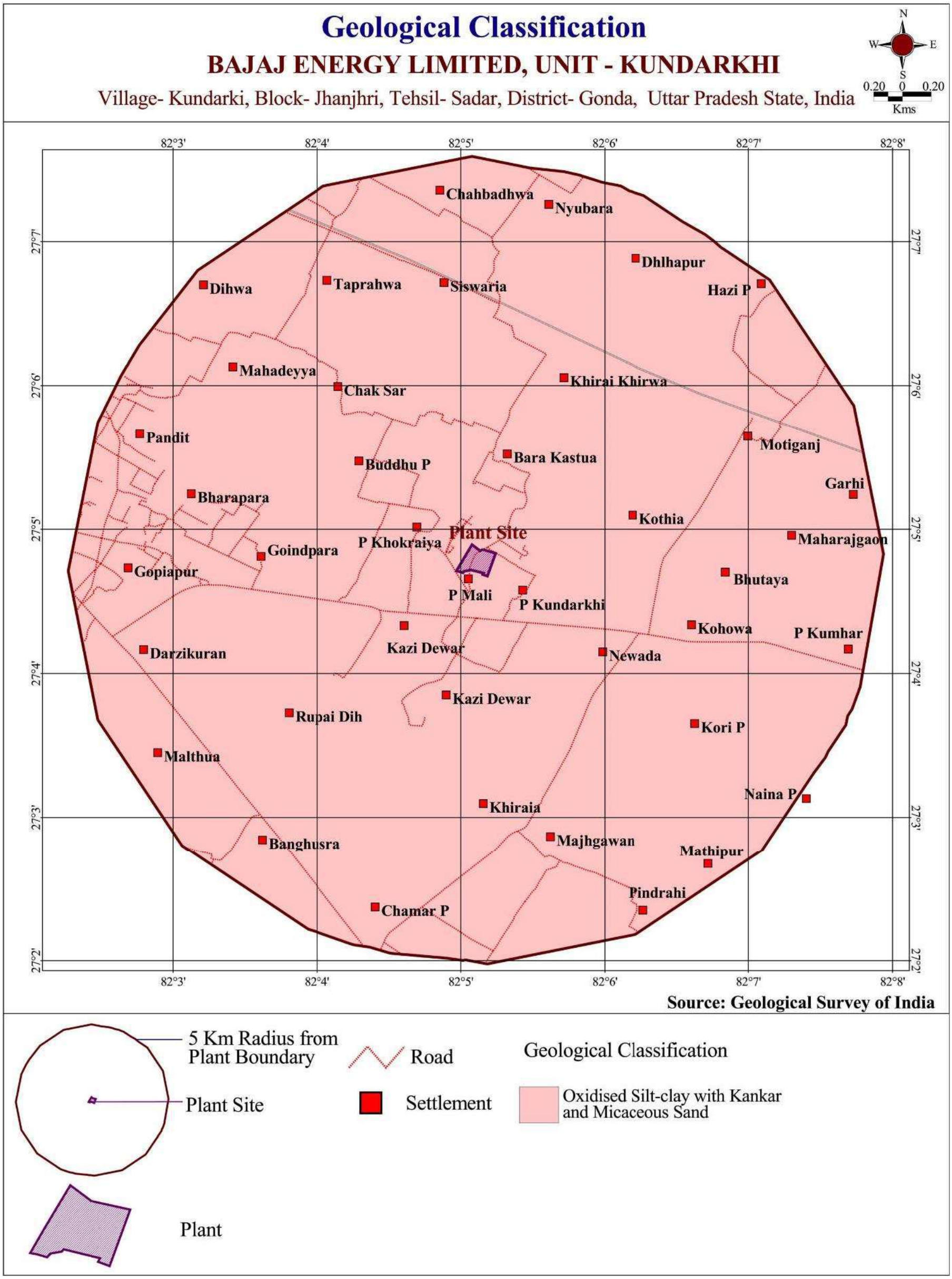


Plate 10: Geological Classification

Geomorphology and Structure

The land forms / geomorphic units and structures such as fractures, fissures and faults have been interpreted from the recent satellite image. All the landform / geomorphic units and structures occurring in the study area are mapped.

The geomorphology and structures of the area plays the vital role in identifying the ground water potential zones. The entire study area covering 5 km radius from the plant boundary underlined by older Alluvial Plain

Older Alluvial Plain: A flat to gentle sloping undulating terrain formed by extensive deposition of alluvium at early slope of depositional regimen, comprising older unconsolidated alluvium. It also includes back swamp and water bodies known as Talao. Several palaeochannels can be seen in plain throughout the district which are the results of meandering river.

Geomorphologically, the study area has been divided into following unit

1. Older Alluvial Plain

The occurrence and movement of ground water is controlled by the primary porosity. The Plant is located in older flood plain.

In the east of the plant area the river is noticed. The ground water availability is more in the banks of River. The Geomorphology and structure maps are presented in **Plate 11.**

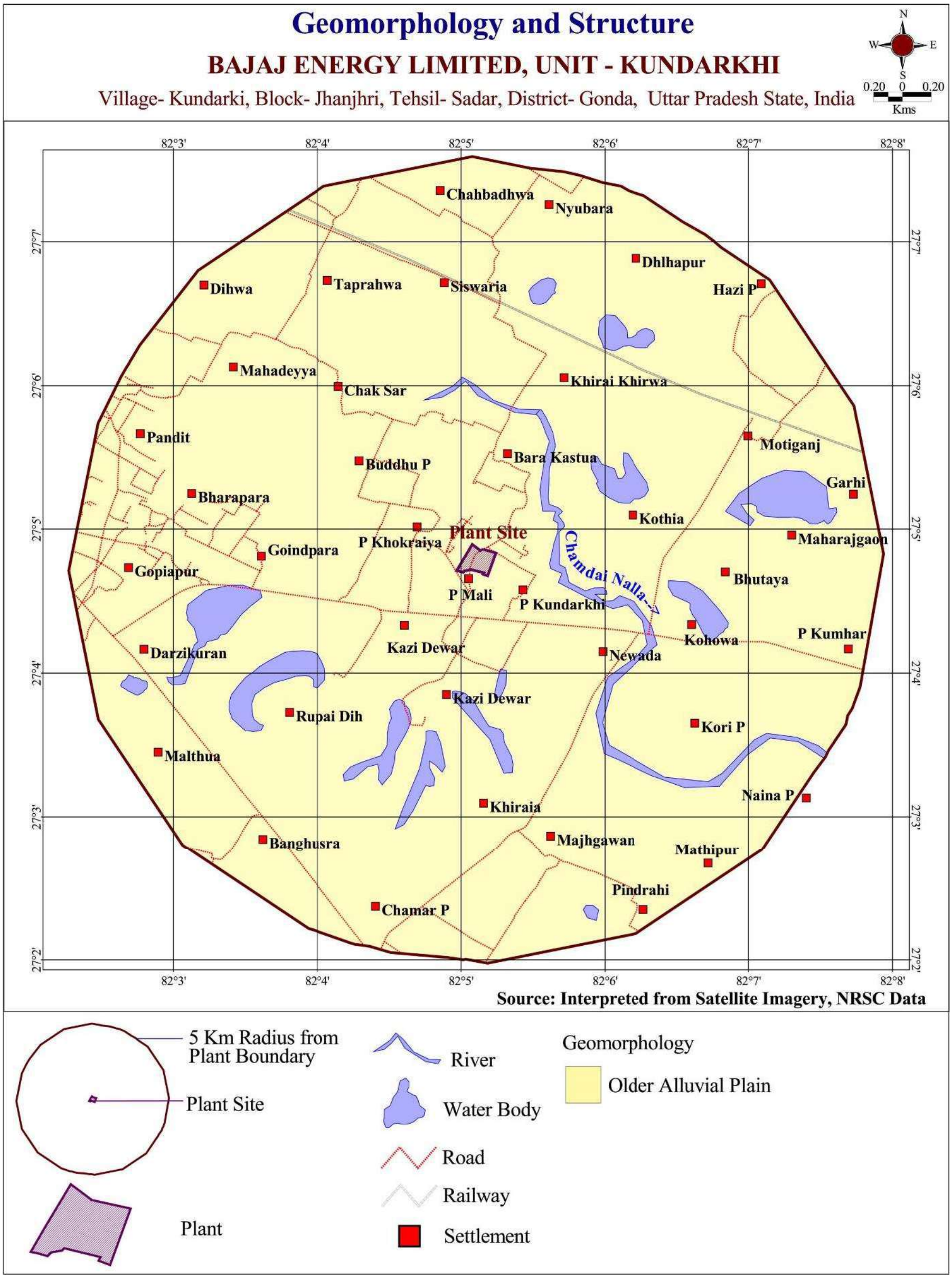


Plate 11: Geomorphology and Structure

2.2 Hydrogeology of the area

The ground water in the Gonda district occurs both under confined and water table conditions. It occurs in the zone of saturation within the granular zones encountered below the land surface. The principal source of replenishment to the ground water body is precipitation. The district lying south of river Ghaghra and north of river Kuwano is suitable for construction of shallow and deep tubewells. The aquifer material is comprised of fine to medium sand and coarse sand with gravel.

Broadly, a three (3) tier aquifer system can be inferred in the area down to a depth of 350 m bgl. The sticky and yellowish clay marks the boundary between these aquifers at 120 m bgl and 210 m bgl. Ground water in the topmost aquifer occurs under phreatic or water table conditions while in intermediate and deeper aquifer it occur under semi confined to confined condition.

Aquifer Group- I: Below the top soil is the Aquifer group-I and occurs generally at the depth of 150 mbgl. This aquifer group is unconfined/phreatic in nature and ground water occurs under water table condition. This aquifer is mostly tapped by shallow Tube well s, dug wells and hand pumps. Generally, the water level is shallow and depth to water level varies between 3 to 6 metres below ground level in the first aquifer. This aquifer group comprises of sand, kankar, gravel and pebble. The thickness of granular zone varies between 11-180 m with an average of 90 m. Most of the state tubewells and public wells tapped this aquifer.

Aquifer Group- II: This aquifer group lies below the first Aquifer unit and is separated with the confining clay layer. It occurs generally between the depths of 160- 240 mbgl. The aquifer material is generally sand and kankar. The thickness of granular zone varies between 36-168 m with an average of 83 m. The storativity ranges from **1.37×10^{-04} to 6.78×10^{-05}** and transmissivity ranges from **837 to 3083 m2 /day**. Most of the departmental exploratory wells are tapped in this aquifer with precaution of cement sealing at the bottom of 1st aquifer. The quality of this aquifer group is fresh and good.

Aquifer Group- III: This aquifer group is separated from the overlying aquifer group by thick clay and occurs between the depth range of 250 m bgl and below. The thickness of granular zone varies between 19-105 m with an average of 40 m. The storativity ranges from 1.98×10-04 to 6.18×10-04 and transmissivity ranges from 318 to 1766 m 2 /day. The quality of this aquifer group is fresh and good.

Hydrogeology / Ground water prospects of the Study Area

Hydrogeology / Ground water prospects of the study area have been assessed. Based on the NRSA ground water prospects mapping, 5 Km radius details have been collected and presented in **Plate -12.**

The ground water prospects of the study area covering 5 km radius are classified in the 5 zone. The zones of ground water prospects depict the depth and yield range is given in the **Table-9**

Table 9: Ground water prospects

Depth range	Yield range (LPM- Liters / Minutes)
Zone with >80 m Depth well	> 800 LPM Yield
Zone with <30 m Depth well	> 800 LPM Yield

Source: Ground water prospects map, NRSA, Hyderabad.

The Plant site falls in >80 m Depth well > 800 LPM Yield. The occurrence of ground water is relatively very high in these zones as it forms part of Gangetic plains (Ghaghra alluvial plains).

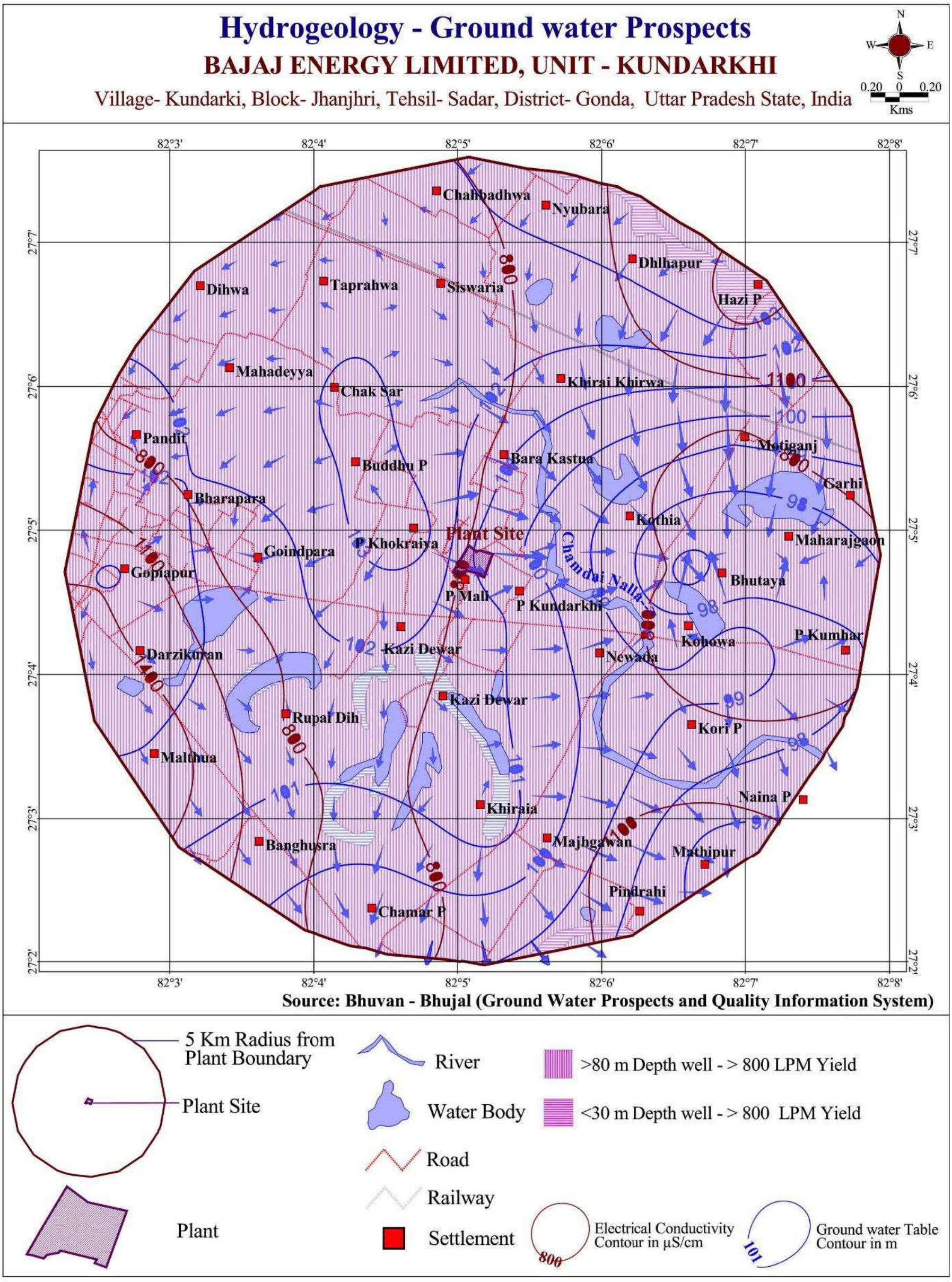


Plate 12: Ground Water Prospects

2.2.1 Aquifer description [type, depth, storativity, permeability and porosity]

The principal aquifers in the study area have been delineated by grouping the sand, kankar, gravelly sand and pebbly sand as aquifers separated by confining clay layers as aquiclude. The granular zones (the aquifers). The depth range of the Tube well in the district and study area varies from 40-305 m bgl.

The storativity ranges from 1.37×10-04 to 6.78×10-05 and transmissivity ranges from 318 to 3083 m^2 /day. Storativity (S): 1.21×10-0^4 to 6.78×10-0^5. Discharge (Yield) of ranges from 1903 to 2950 lpm

The exploratory Tube well details for Shravasti District with same hydrogeological Environs have been collected from CGWB and analysed. The following are interpreted from the exploratory Tube well results. **Table-10**

Table 10: Details of CGWB Exploratory Tube well *(SHRAVASTI DISTRICT)*

Description	Detail
Depth (Minimum and Maximum)	**40 m – 305 m**
Zone encountered	**Range Varies between 22m to 132 m**
Static Water level (Minimum and Maximum)	**20 m 190 m**
Yield in LPS (Range)	**1903 to 2950 lpm**
Drawdown in m (Range)	**1.2-5.2 m**
Transmissivity (m^2/day)	**318 to 3083 m^2/day**
Storativity	**1.21×10-0^4 to 6.78×10-0^5**
Electrical Conductivity µS/cm	**300 - 3000 µS/cm**

In the study the depth of the Tube well is 45-121 m and the formation encountered is older flood plains of sand silt dominant. The water bearing zone struck at 20 and 70 m. The yield of the Tube well is **1500 -3000 lpm**.

2.2.2 Ground water flow and aquifer interaction [flow direction, Ground water – surface water connectivity

To understand the ground water situation of the study area covering 10 km radius, ground water level monitoring was carried out in **20 wells** located in different places of the **buffer zones (5 km radius)** of the study area during post-monsoon season. At the time of well inventory public enquiry was made and recorded the pre-monsoon ground water level and the same is confirmed with the nearest CGWB observation wells. A customized Mobile App was developed for navigation system, covering the villages where the monitoring / well inventory was under taken in the core and buffer zone.

The App will guide to the locations of the villages. The field expert, will identify the open well or bore well in the village and the ground water monitoring is under taken. While, monitoring of the ground water level, the well inventory has also been taken up. The Electrical Conductivity (EC) has also been recorded for the ground water using (Potable EC meter). The snap shot of the mobile app is presented in **Figure – 6.**

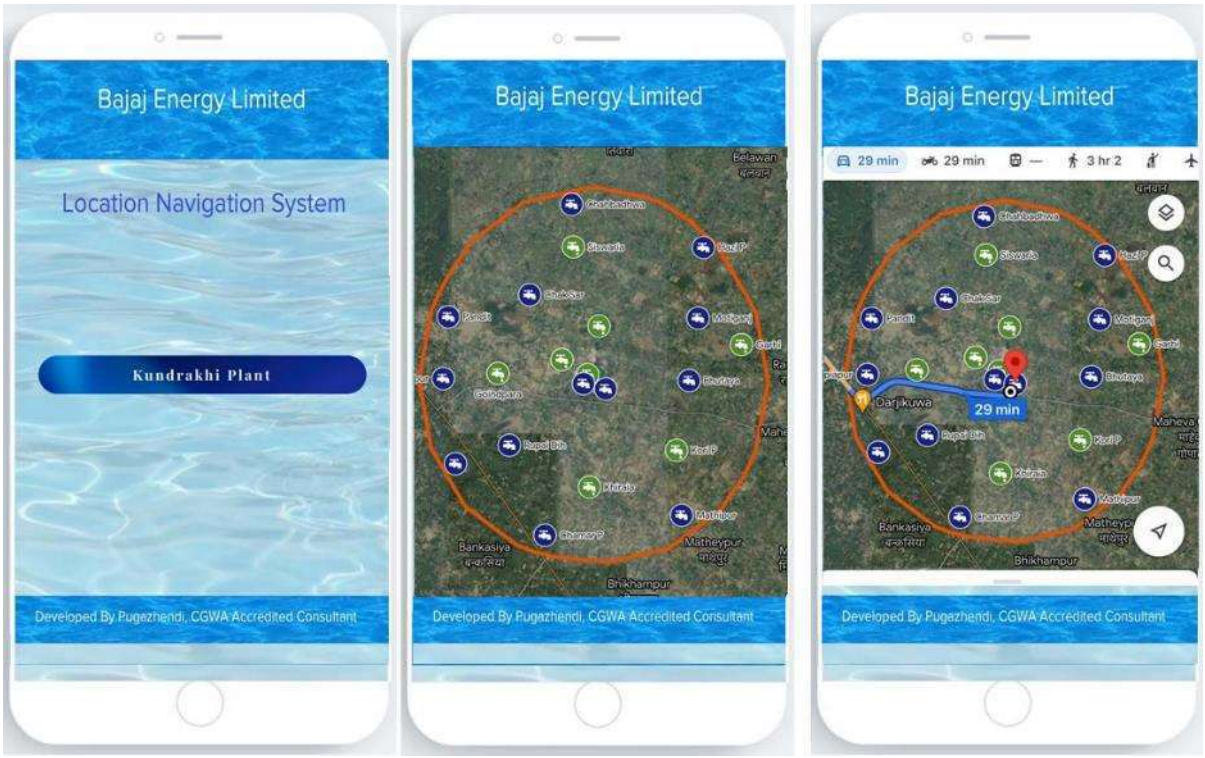


Figure 2: Snap shot of Mobile APP

Since there is no open well in the study area, all the 20 Tube well are established as key observation wells in the core and buffer zone (5 Km radius) for monitoring purposes.

The minimum and maximum depth is **78 m to 105 m** respectively. Yield varies from **180 - 390 m³ /day for 8 hours of Pumping**. Post-monsoon water level varies from **2.0 m to 5.9 m** below ground level. In Pre-monsoon period it varies from **3.1 m to 6.8 m** below ground level. Seasonal fluctuation in water level in these Tube well varies from **0.3 m to 1.2 m**.

Tube well are being used for drinking purpose (Hand pump) and majority are used for irrigation purposes and facilitated with 7.5 to 10 HP electrical submersible pumps and running 5 to 8 hrs daily.

The recorded spring depth (tapped zone) varies from **20 m to 85 m** below ground level.

The Tube well have been selected for the construction of ground water level zones and ground water elevation contour (ground water table - (Ground water table = Mean Sea Level – water level below ground level).

The Key well data for the core and buffer zones are presented in the following **Table 11 and 12**.

Table 11:Bore well- Core zone, Pre, Post Monsoon ground water level and fluctuation

No	Location	Latitude	Longitude	Depth in m	Ground Water Level in m (Pre-Monsoon)	Ground Water Level in m post-Monsoon)	Ground Water Level Fluctuation in m
1	Plant Site	27° 4' 49.76" E	82° 5' 6.864" N	100	4.80	3.90	0.90
2	Kundarkhi	27° 4' 28.362" E	82° 5' 19.723" N	98	4.20	3.20	1.00
3	Khokhariya	27° 4' 57.598" E	82° 4' 33.193" N	90	4.20	3.20	1.00
4	Chaksar	27° 5' 48.185" E	82° 4' 6.704" N	105	4.80	3.80	1.00
5	Suhelwa	27° 7' 26.344" E	82° 4' 44.144" N	90	4.10	3.10	1.00
6	Siswariya	27° 6' 46.393" E	82° 4' 40.422" N	86	3.10	2.00	1.10
7	Hazi .P.	27° 6' 33.16" E	82° 6' 51.304" N	90	4.20	3.07	1.13
8	Motiganj	27° 5' 33.821" E	82° 6' 47.714" N	80	4.10	3.01	1.09
9	Kori P.	27° 4' 10.967" E	82° 6' 50.461" N	82	5.20	4.20	1.00
10	Bhutayya	27° 4' 41.538" E	82° 6' 28.418" N	83	5.40	4.60	0.80

No	Location	Latitude	Longitude	Depth in m	Ground Water Level in m (Pre-Monsoon)	Ground Water Level in m post-Monsoon)	Ground Water Level Fluctuation in m
11	Garhi	27° 4' 45.887" E	82° 7' 13.865" N	78	5.80	4.87	0.93
12	Mathipura	27° 2' 43.53" E	82° 6' 40.554" N	90	5.60	4.57	1.03
13	Khiraiya	27° 2' 56.944" E	82° 5' 8.038" N	90	4.50	3.65	0.85
14	Chamar P.	27° 2' 21.822" E	82° 4' 15.636" N	93	6.80	5.90	0.90
15	Malthua	27° 3' 22.334" E	82° 2' 45.161" N	88	4.10	3.04	1.06
16	Rupai Dih	27° 3' 38.97" E	82° 3' 44.312" N	94	3.60	2.43	1.17
17	Goindpara	27° 4' 49.627" E	82° 3' 28.516" N	96	6.70	5.80	0.90
18	Gopai Pur	27° 4' 41.333" E	82° 2' 29.296" N	94	3.90	2.74	1.16
19	Pandit	27° 5' 42.133" E	82° 2' 29.119" N	92	6.40	5.60	0.80
20	Bara Kastua	27° 5' 25.44" E	82° 5' 14.118" N	87	4.10	3.80	0.30

The summarized ground water level of the open well and Tube well for the core and buffer zone are given in the **Table 12. 20 Tube well are considered to arrive minimum, maximum water level and fluctuation.**

Table 12: Summarized ground water levels in Tube well in core and buffer zone.

Ground water level	5 Km radius ground water level (Based on 21 Key wells)		
	Pre-Monsoon	**Post-Monsoon**	**Season wise Fluctuation in m**
Minimum in m	**3.1**	**2.0**	**0.3**
Maximum in m	**6.8**	**5.9**	**1.2**

Geotagged Photograph of the bore wells in the study area





The above geo-tagged photographs of the bore wells are capture during the field visit performed on 13-14-January-2022

Ground water level zones

In order to study the spatial distribution of ground water level for the pre and post monsoon periods, the Tube well ground water level considered which is reflecting the aquifer properties.

Pre-Monsoon

The pre monsoon depth to ground water level depict that relatively deepest of ground water level zone of **5-6 m** falls in the North west and south of the study area near Pandit, Goindpara and Chamar P villages.

The shallowest ground water level zone of **2-3 m** occupies in the North and south west of the study area near Rupi Dih, Khira Khirwa and Siswaria villages.

The Plants falls in **3-4 m** zone. Pre-monsoon ground water level zone map is presented in **Plate-13.**

Post Monsoon

The post monsoon depth to ground water level depict that relatively deepest of ground water level zone of **5-6 m** falls in the North west and south of the study area near Pandit, Goindpara and Chamar P villages.

The shallowest ground water level zone of **2-3 m** occupies in the North and south west of the study area near Rupi Dih, Khira Khirwa, Gopiapur and Siswaria villages. The Plant site falls in **3-4 m** zone.

During the post monsoon period there is considerable rise in the ground water level. It is observed that there is increase of ground water level in the throughout the study area where the ground water level is deep during the pre-monsoon period.

It clearly indicates that rainfall recharge is taking place considerably. Post-monsoon ground water level zone map is presented in **Plate-14.**

Ground water level Fluctuation

Based on the pre and post monsoon ground water level data of the study area, the ground water fluctuation is generated in presented in **Plate – 15.**

The ground water level fluctuation of the study area indicates that the ground water level fluctuation ranges from **<0.5 – 1.5 m** which indicates that the aquifer of the study area has moderate recharge potential. The Plant site falls in **0.5-1.0** m fluctuation zone.

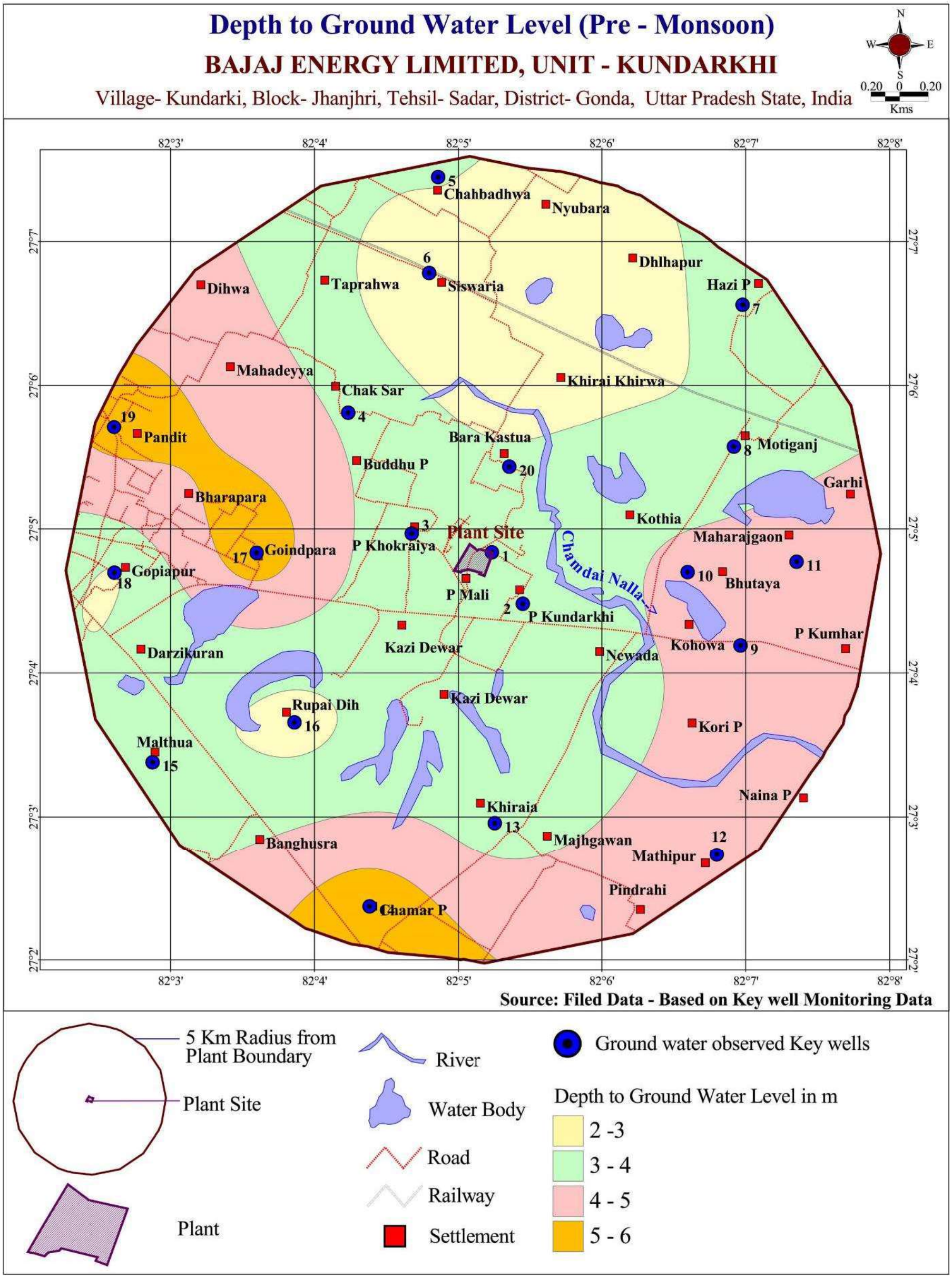


Plate 13: Ground water level zone (Pre-Monsoon)

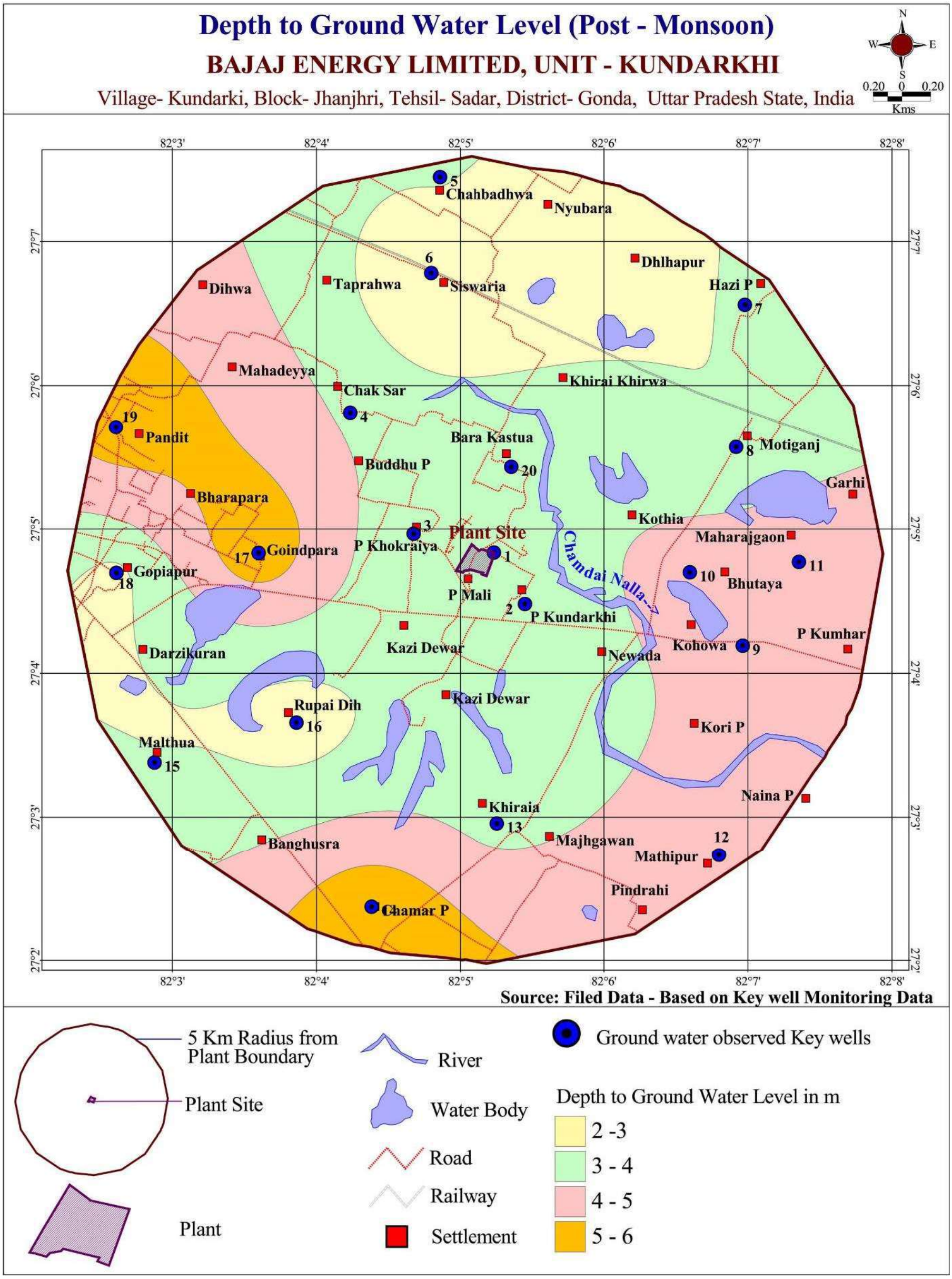


Plate 14: Ground water level zone (Post-Monsoon)

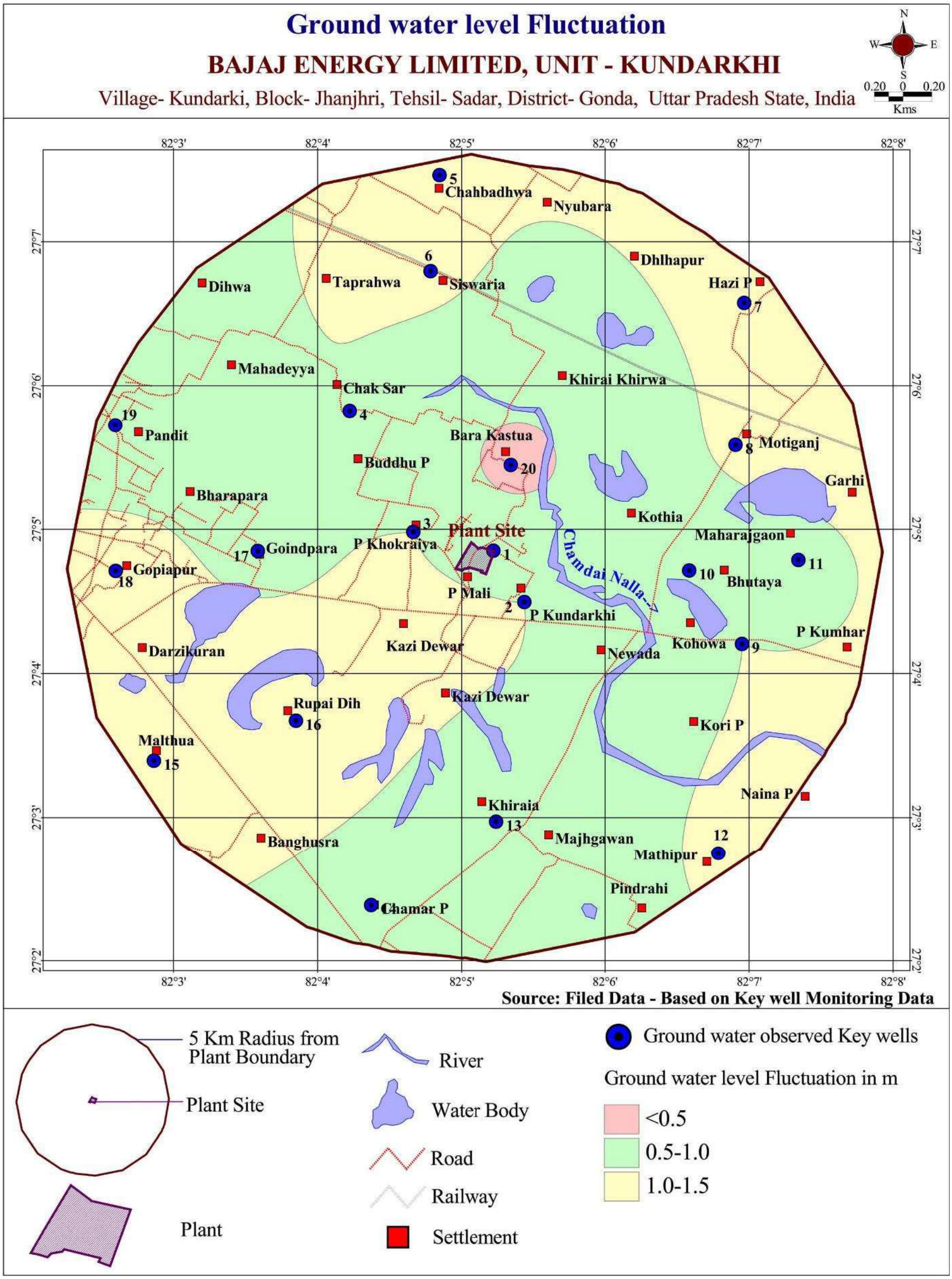


Plate 15: Ground water level fluctuation

Ground water Flow and Aquifer Interaction

The ground water table generated using the pre and post monsoon data indicates that there is 2 different flow pattern is observed in the study area.

1) Ground water flow towards east
2) Ground water mound (Divergent flow of ground water) and westerly flow direction.

From the plant site the ground water flow towards east. North west near Buddhu P village ground water mound was observed. Pre monsoon ground water table map is presented in **Plate-16.**

The same flow pattern is observed during the post monsoon period. However, that there is change in the hydraulic gradient. Post monsoon ground water table map is presented in **Plate-17.**

During both pre- and post-monsoon periods, ground water mound (divergent flow of ground water) noticed in the of study area.

The ground water level fluctuation and the ground water table clearly indicate that there is surface (rainfall) and ground water interaction.

The main source of recharge in the study area is from rainfall as well as from the river and canal system.

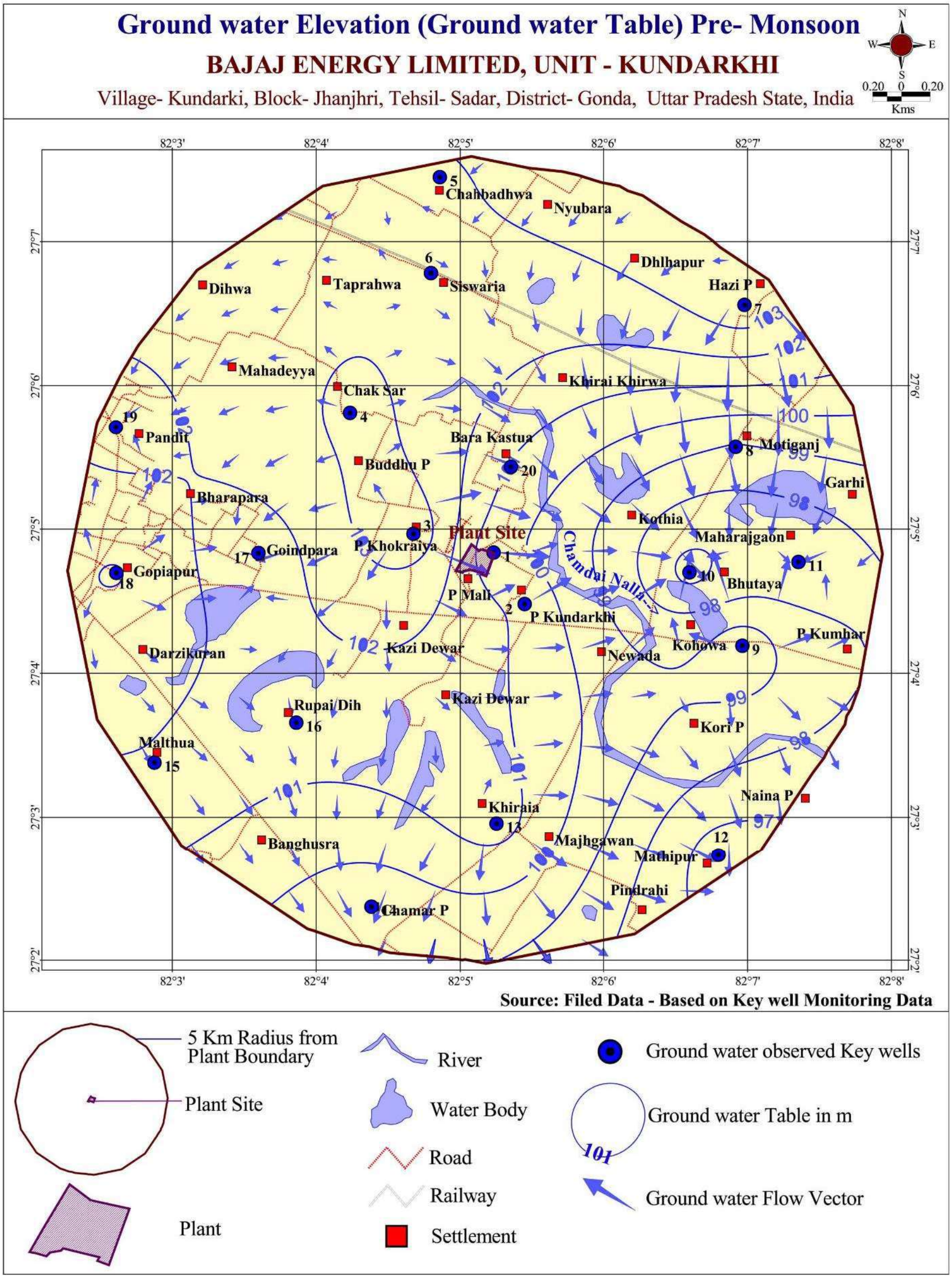


Plate 16: Ground water Table (Pre-Monsoon)

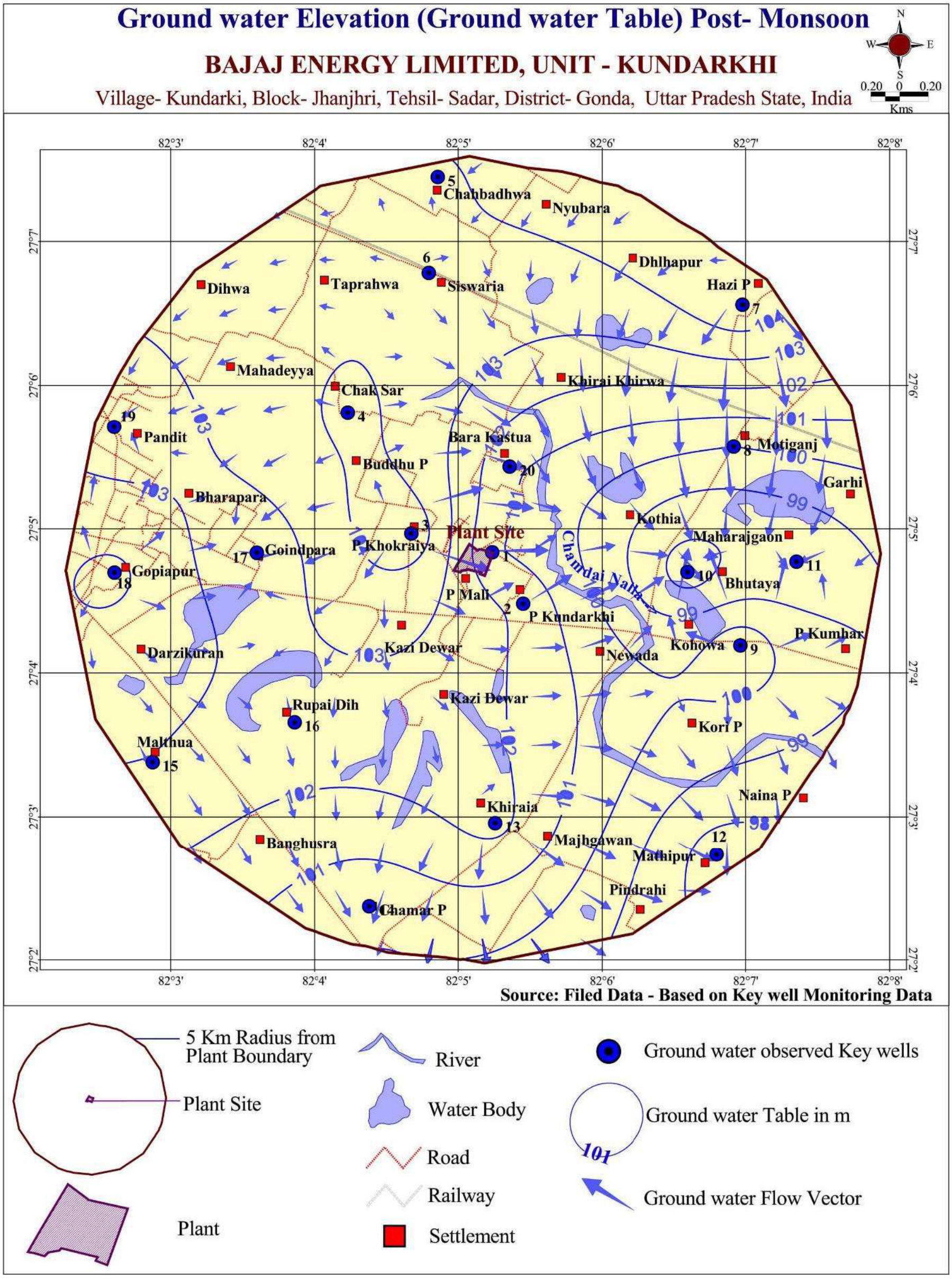


Plate 17: Ground water Table (Post-Monsoon)

2.2.3 Ground water level trend analysis [pre – monsoon and post – monsoon] for 10 years

In order to understand the long term (10 years) ground water level changes, the CGWB observation wells located in and around the study area has been downloaded from INDIAWRIS web site and plotted on the SOI topo map. The nearest continuous monitoring well (with less data gap) has been chosen for the long-term trend analysis. The locations of the CGWB observation in and around the study area is presented **Plate 18**:

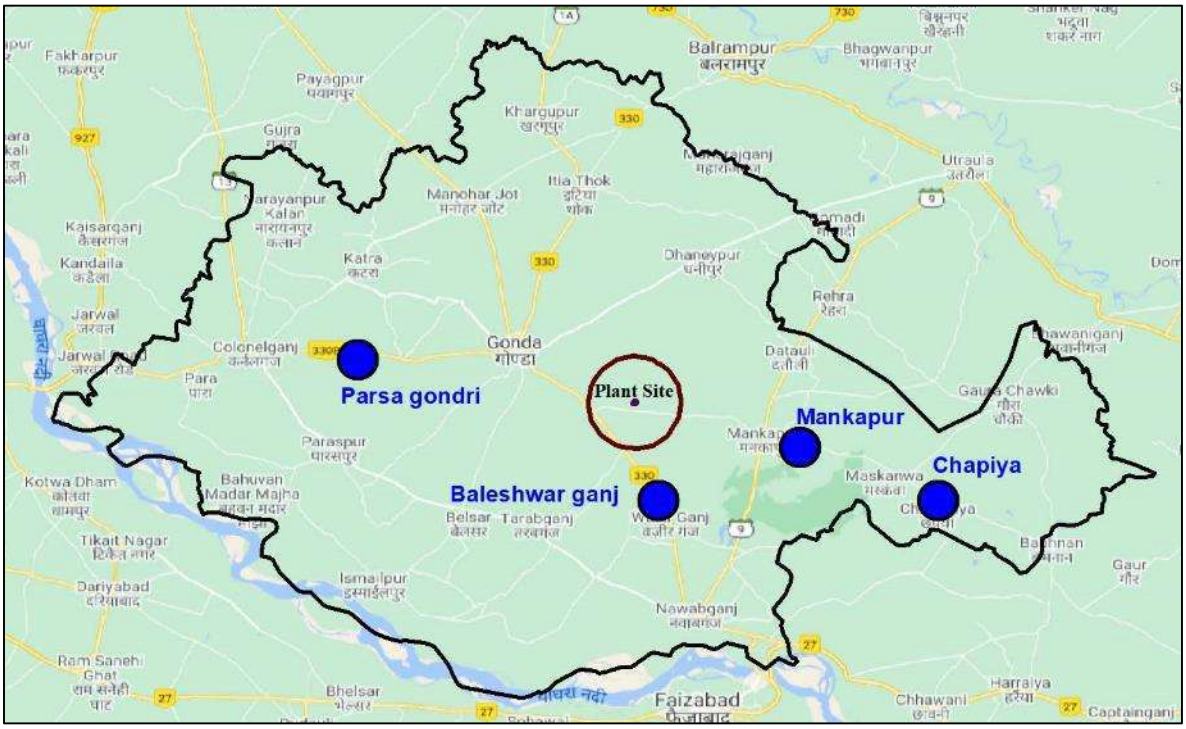


Plate 18: Location of CGWB Observation well

The continuous monitoring data available for location of **Parsa Gondri, Baliswar Ganj, Mankapur and Chapiya** which are about **8 to 25 km radius** in west, east and south direction with same hydrogeological environs. The above observation wells have been considered for the long term alalysis.

Ground water observation well data for a period of 10 Years has been collected from CGWB for the above 4 locations. The geographic coordinate of the monitoring well is given in **Table-16.**

Table 13: CGWB monitoring well location

Sl.No	Location	Monitoring Agency	Latitude	Longitude
1	**Baleshwar Ganj**	CGWB	26° 58' 48" E	82° 6' 28" N
2	**Chapiya**	CGWB	26° 58' 48" E	82° 23' 22" N
3	**Mankapur**	CGWB	27° 1' 60" E	82° 15' 0" N
4	**Parsa Gondri**	CGWB	27° 7' 20" E	81° 48' 18" N

Ground water observation was done by CGWB to monitor the shallow ground water level in the study area. The ground water level data from 2011 to 2020 has been collected from INDIAWRIS Website.

2.2.4 Hydrograph of water level for 10 years

Decadal Trend of water levels for pre monsoon and post monsoon periods for the last ten years (2011-2020) have been computed for CGWB Ground Water Monitoring Wells. The Season wise hydrograph was constructed for the 4 Monitoring well is presented in **Figure – 2 to 5.**



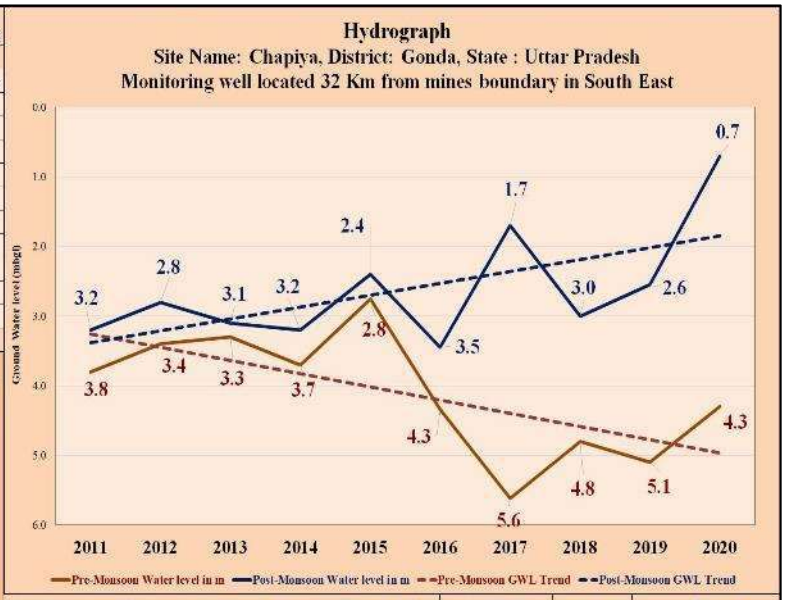
Figure 3: Hydrograph of **Baleshwar Ganj** CGWB Monitoring well

Chapiya Monitoring well - 10 Years Ground water level
CGWB Monitoring well, Gonda District, Uttar Pradesh State
Latitude and Longitude : 26° 58' 48" E - 82° 23' 22" N

Year	January	May	August	November
2011	4.3	3.8	3.2	2.1
2012	4.2	3.4	2.8	2.3
2013	4.8	3.3	3.1	2.8
2014	1.5	3.7	3.2	3.1
2015	3.4	2.8	2.4	3.9
2016	3.2	4.3	3.5	3.3
2017	3.9	5.6	1.7	2.8
2018	3.8	4.8	3.0	3.6
2019	4.0	5.1	2.6	2.4
2020	2.9	4.3	0.7	1.7
Average	3.6	4.1	2.6	2.8



Note: Under lined are missing data. Filled based on Interpolation



Post Monsoon Water level Trend - y = -0.1709x + 3.55	0.1538	m / Year	Rise
Pre Monsoon Water level Trend - y = 0.1894x + 3.0693	-0.1705	m / Year	Fall

Figure 4: Hydrograph of **Chapiya** CGWB Monitoring well

Mankapur Monitoring well - 10 Years Ground water level
CGWB Monitoring well, Gonda District, Uttar Pradesh State
Latitude and Longitude : 27° 1' 60" E - 82° 15' 0" N

Year	January	May	August	November
2011	3.3	4.4	2.4	2.9
2012	3.1	4.7	2.6	1.9
2013	3.9	4.6	4.3	1.7
2014	2.9	4.3	4.0	2.1
2015	4.2	4.9	4.2	3.1
2016	4.4	5.4	4.8	2.0
2017	5.4	6.0	5.6	1.8
2018	5.9	6.3	5.8	2.6
2019	6.1	6.4	6.1	1.6
2020	5.3	5.6	2.3	1.7
Average	4.4	5.2	4.2	2.1

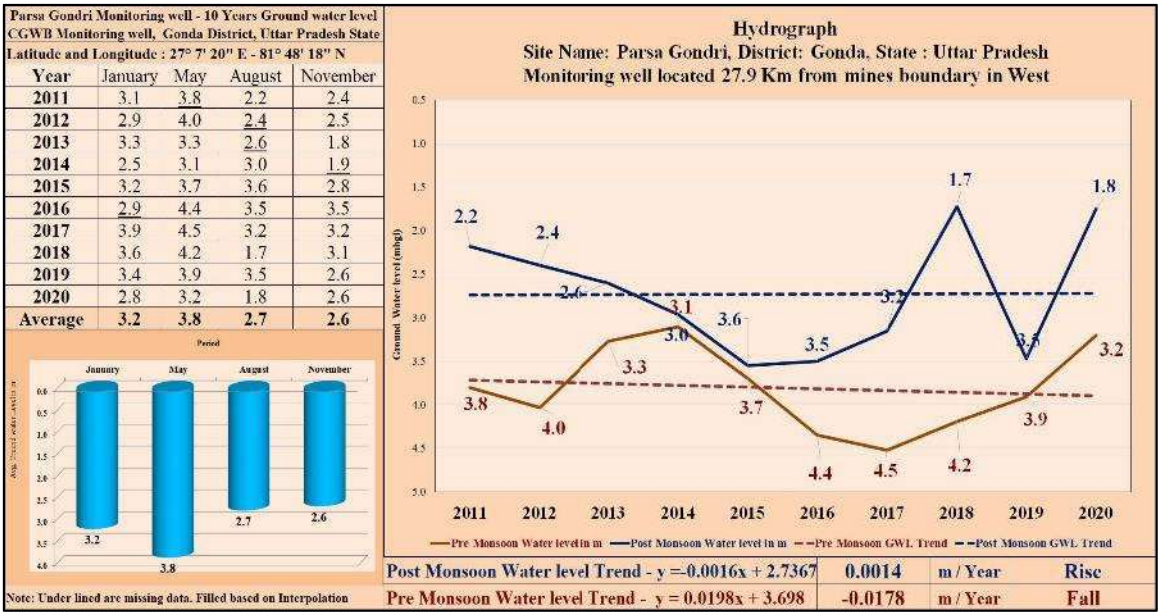


Note: Under lined are missing data. Filled based on Interpolation



Post Monsoon Water level Trend - y =0.2179x + 3.0007	-0.1961	m / Year	Fall
Pre Monsoon Water level Trend - y = 0.2242x + 4.0107	-0.2018	m / Year	Fall

Figure 5: Hydrograph of **Mankapur** CGWB Monitoring well



Parsa Gondri Monitoring well - 10 Years Ground water level
CGWB Monitoring well, Gonda District, Uttar Pradesh State
Latitude and Longitude : 27° 7' 20" E - 81° 48' 18" N

Year	January	May	August	November
2011	3.1	3.8	2.2	2.4
2012	2.9	4.0	2.4	2.5
2013	3.3	3.3	2.6	1.8
2014	2.5	3.1	3.0	1.9
2015	3.2	3.7	3.6	2.8
2016	2.9	4.4	3.5	3.5
2017	3.9	4.5	3.2	3.2
2018	3.6	4.2	1.7	3.1
2019	3.4	3.9	3.5	2.6
2020	2.8	3.2	1.8	2.6
Average	3.2	3.8	2.7	2.6

Note: Under lined are missing data. Filled based on Interpolation

Post Monsoon Water level Trend - y =-0.0016x + 2.7367	0.0014	m / Year	Rise
Pre Monsoon Water level Trend - y = 0.0198x + 3.698	-0.0178	m / Year	Fall

Figure 6: Hydrograph of **Parsa Gondri** CGWB Monitoring well

The abstract of the long-term ground water level trend is given in **Table-14.**

Table 14: Long term Ground water level trend

Trends for the Hydrograph (Mentoring Well)	Trend – Rise		Trend - Fall		Trend - No Change	
	Pre-Monsoon Rate of Rise(m/yr)	Post-Monsoon Rate of Rise(m/yr)	Pre-Monsoon Rate of Fall(m/yr)	Post-Monsoon Rate of Fall(m/yr)	Pre-Monsoon (m/yr)	Post-Monsoon (m/yr)
Baleshwar Ganj	0.0866			-0.0428		
Chapiya		0.1538	-0.1705			
Mankapur			-0.2018	-0.1961		
Parsa Gondri		0.0014	-0.0178			
Average	**0.0866**	**0.0776**	**-0.1300**	**-0.1195**		

The long-term ground water level trend for the 4 CGWB wells indicates there is increasing trend in 3 seasons (1 Pre- Monsoon and 2 Post-monsoon periods). The falling trend observed in 5 seasons (3 Pre- Monsoon and 2 Post-monsoon periods).

The average Rise in the Pre and post-monsoon period are 0.0866 and 0.0776 m/year respectively.

The average Fall in the Pre and post-monsoon period are -0.1300 and -0.1195 m/year respectively.

The long-term trend in around the study area clearly indicates that there is no stress in the ground water.

2.2.5 Predicted water level declines for affected aquifers [Ground water modeling]

The Total ground water requirement for the plant is **6,984 cu.m/day.** The requirement is being met out from 3 tube wells located in the plant site.

In order to estimate impact of ground water drawl for industrial and domestic purpose, a detailed Ground Modeling Studies include ground water mass balance (input and output from various sources), the ground water head changes, and impact of the withdrawal of ground water for the irrigation purpose has been attempted and the same is presented below. Flow simulation using conceptual model followed by Numeric model is attempted. In general, MODFLOW, which is the Finite Difference method, is used for ground water flow and transport model. **Visual MODFLOW Flex 6.1** version is used for the Ground water modeling studies of the project area by regional approach followed by local area approach. The DEM and the terrain profile are given in **Figure: 6**

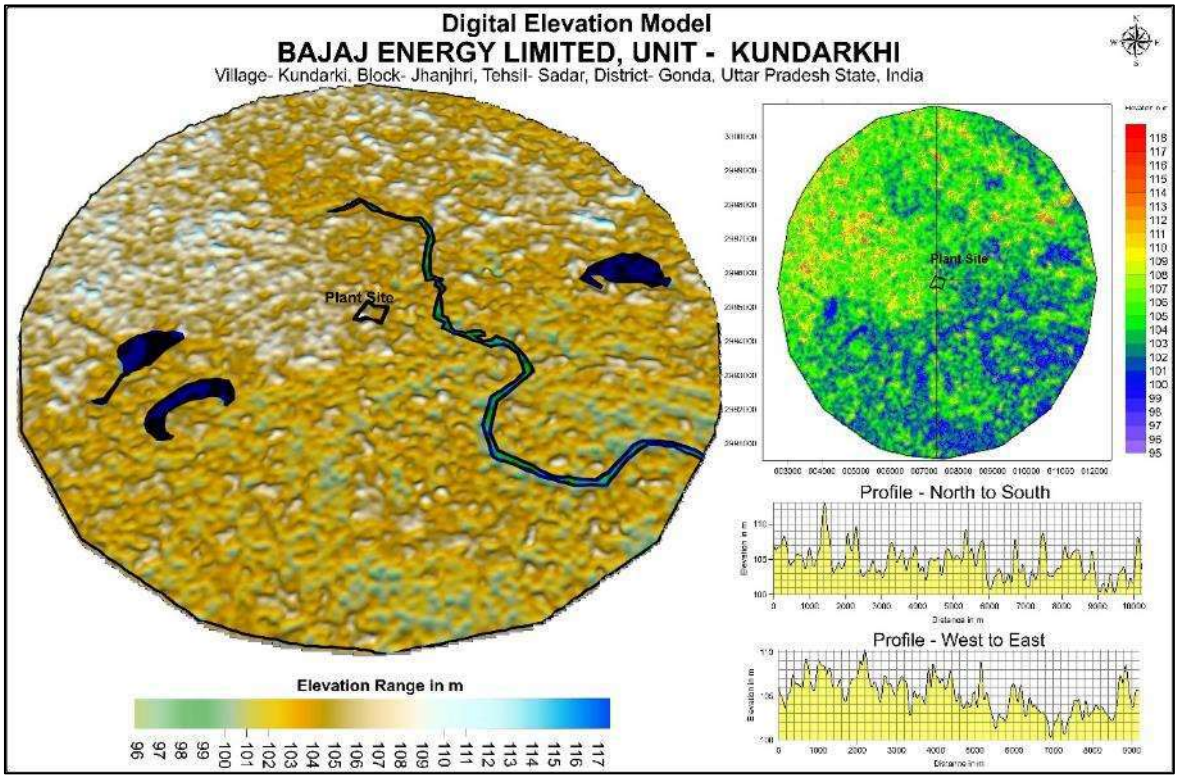


Figure 7: Digital Elevation Model (DEM) of the Model area

2.5.2.1 Model Conceptualization

The Occurrence & movement of ground water in sedimentary formation is controlled by the secondary porosity. Ground water in general occurs under unconfined; Semi confined conditions.

The entire study area forms part of sedimentary formation of alluvium (sand silt dominant). Three aquifer system are explored by CGWB. The aquifers have high transmissivity.

For the purpose of ground water modeling, the 3 aquifer systems are considered as a single domain in the region and appropriate layers and aquifer parameters are provided for understanding the prevailing flow regime.

2.5.2.2 Description of Aquifer

The spatial variation of the thickness of the top aquifer layer lies mostly within 30-60 m in major part of the area. The disposition of aquifers of different layers be summarized below and the aquifer geometry is presented in **Table: 15** in the form of 3D aquifer model generated using Visual Modflow Flex **Figure: 7.**

Table 15: Aquifer Characteristics (Source: CGWB)

Number of Aquifer	Type of Aquifer	Aquifer Condition
Aquifer Group I	Unconfined aquifer of sand and silt	Below the top soil is the Aquifer group-I and occurs generally between the depth of 25 to 150 mbgl. This aquifer group is unconfined/phreatic in nature and ground water occurs under water table condition.
Aquifer Group II	Semi- confined to confined aquifer	This aquifer group lies below the first Aquifer unit and is separated with the confining clay layer. It occurs generally between the depths of 160.00- 240.00 mbgl. The aquifer material is generally sand and kankar
Aquifer Group III	Semi- confined to confined aquifer	This aquifer group is separated from the overlying aquifer group by thick clay and occurs between the depth range of 250 m bgl and below. The thickness of granular zone varies between 19-105 m with an average of 40 m

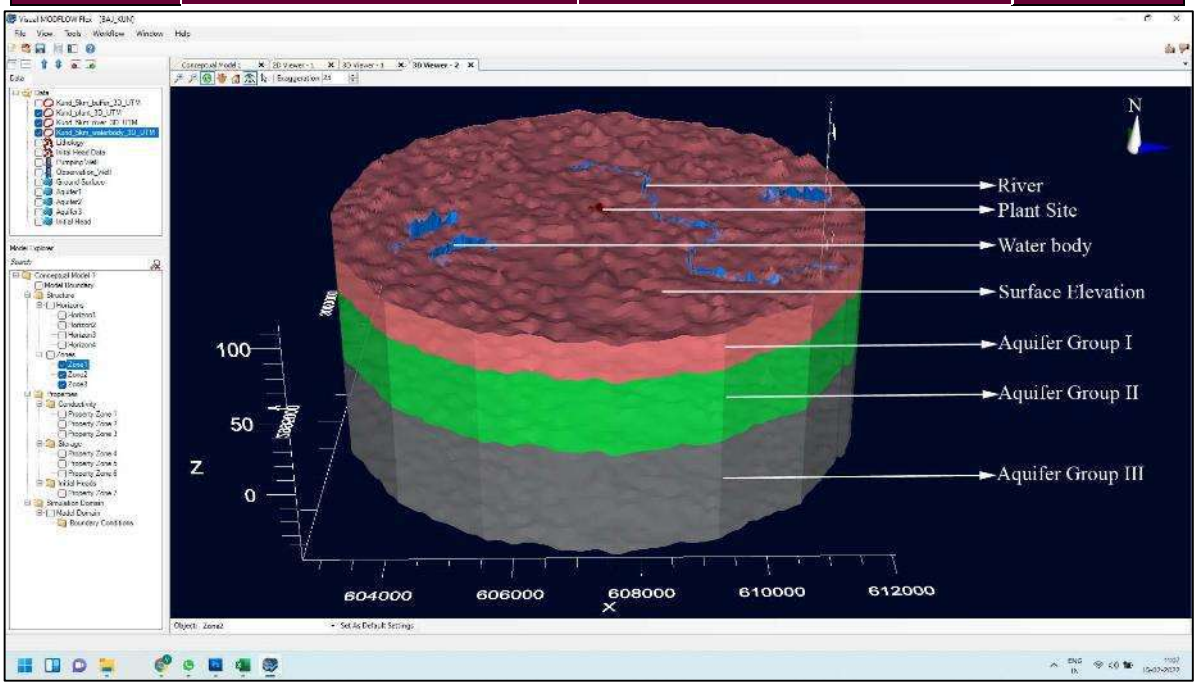


Figure 8: Aquifer geometry of Plants Model area

2.5.2.3 Aquifer Piezometry

To study the aquifer piezometry, 20 wells were established for monitoring in the model area. All the wells are tapping the weathered and fractured aquifer. The location, depth, water level of the key wells is presented in the **Table: 16.** The initial head for the different aquifer has been extracted from the Key wells.

Table 16: Details of the Key wells in the buffer zone

NO	Location	X-UTM	Y-UMT	MSL	Water Table in m amsl
1	Kundarakhi - Plant	607599	2995814	105	100.20
2	Kundarkhi Village	607959	2995159	104	99.80
3	Khokhariya Village	606670	2996047	110	105.80
4	Chaksar	605927	2997598	109	104.20
5	Suhelwa	606932	3000627	108	103.90
6	Siswariya	606840	2999397	106	102.90
7	Hazi .P.	610448	2999021	108	103.80
8	Motiganj	610365	2997194	102	97.90
9	Kori P.	610463	2994645	104	98.80
10	Bhutayya	609848	2995581	102	96.60
11	Garhi	611098	2995726	103	97.20
12	Mathipura	610214	2991953	102	96.40
13	Khiraiya Vilage	607662	2992343	107	102.50
14	Chamar P.	606227	2991250	107	100.20
15	Malthua	603719	2993091	108	103.90
16	Rupai Dih	605344	2993617	104	100.40
17	Goindpara	604891	2995787	109	102.30
18	Gopai Pur	603262	2995518	107	103.10
19	Pandit	603241	2997389	108	101.60
20	Bara Kastua	607790	2996914	103	98.90

2.5.2.4 Ground water flow modeling

Ground water Modeling of the area has been carried out using VISUAL MODFLOW FLEX which is a computer program that numerically solves the three-dimensional ground-water flow equation for a porous medium by using a finite-difference method (Waterloo Hydrogeologic Inc).

In the finite difference method (FDM), a continuous medium is replaced by a discrete set of points called nodes and various hydrogeological parameters are assigned to each of these nodes. Based on the available information as discussed above, a conceptual ground water model has been framed. A conceptual model is a simplified representation of the ground water flow system depicting the hydro stratigraphic unit of interest along with the system boundaries.

2.5.2.5 Ground water Model area

The model area is created covering 5 Km radius from the Plant boundary (as per CGWA Guide lines). The below figure shows the model area covering the Plant boundary, water body. No major river in the study area. The model area and the components of the model is given **Figure:8**

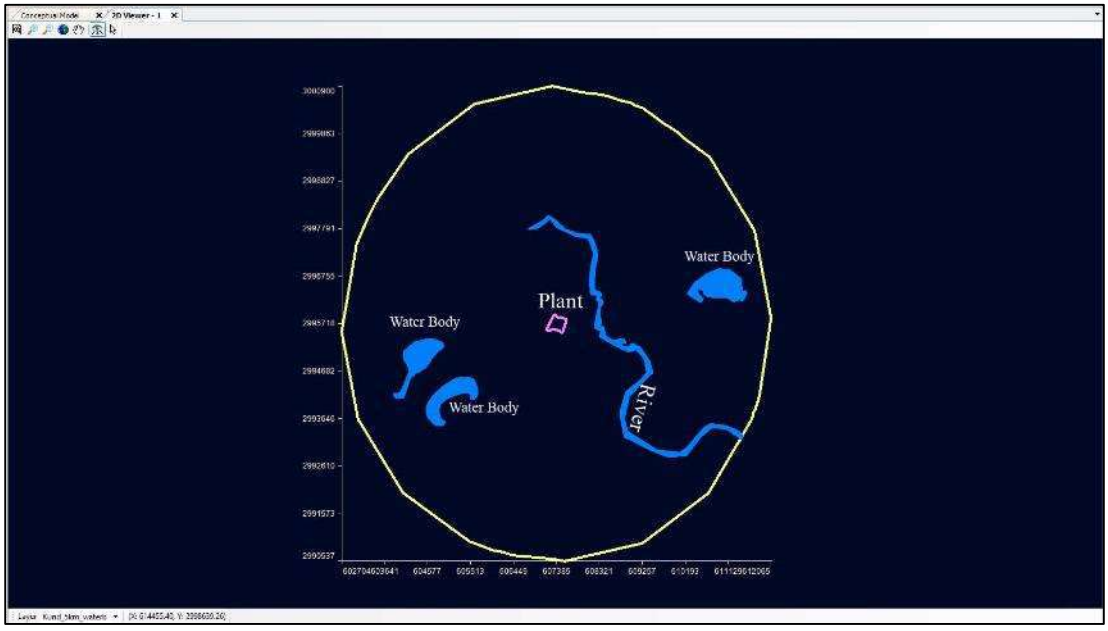


Figure 9: Model showing the Model Boundary, River and Plant site

2.5.2.6 Aquifer Geometry

The ground elevation has been generated using Carto-DEM data for the model area. From the surface elevation, the layer thickness is generated based on interpolation of the well inventory data and geophysical survey interpreted results.

The reduced level surface has been generated and the same is used as input for the model. The aquifer geometrical distribution for each layer is presented **Figures – 9-12**

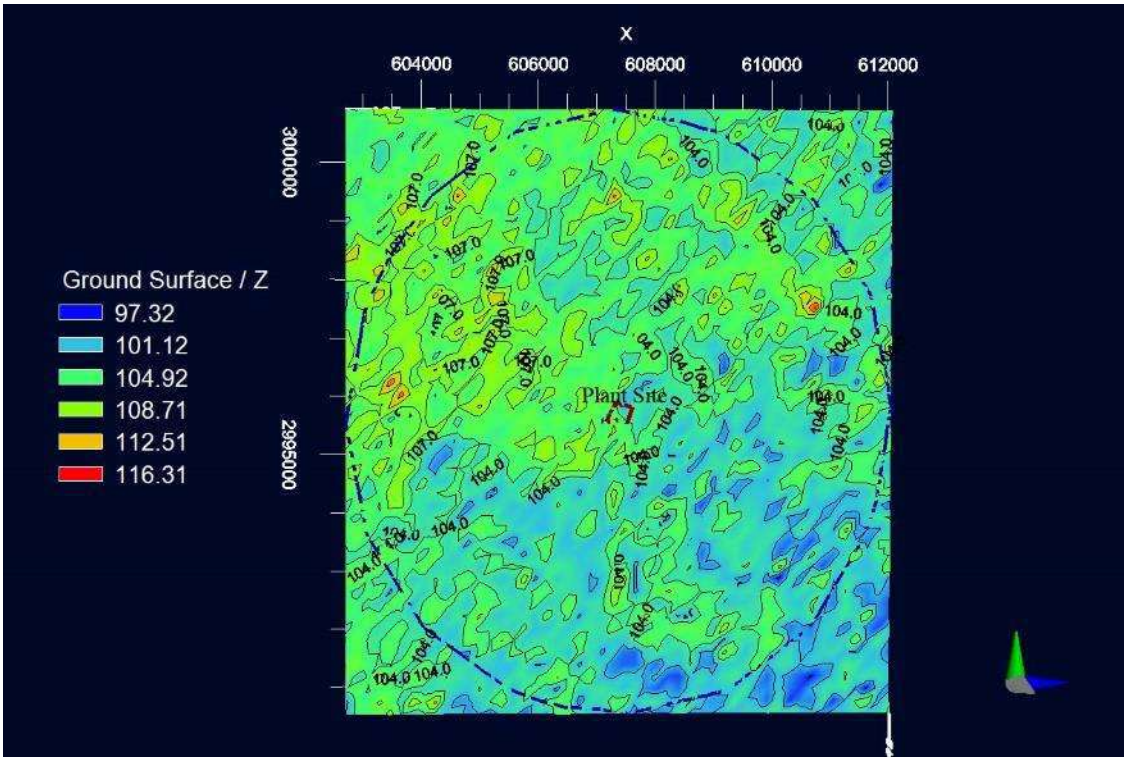


Figure 10: Top Elevation (Ground) of the Model Area

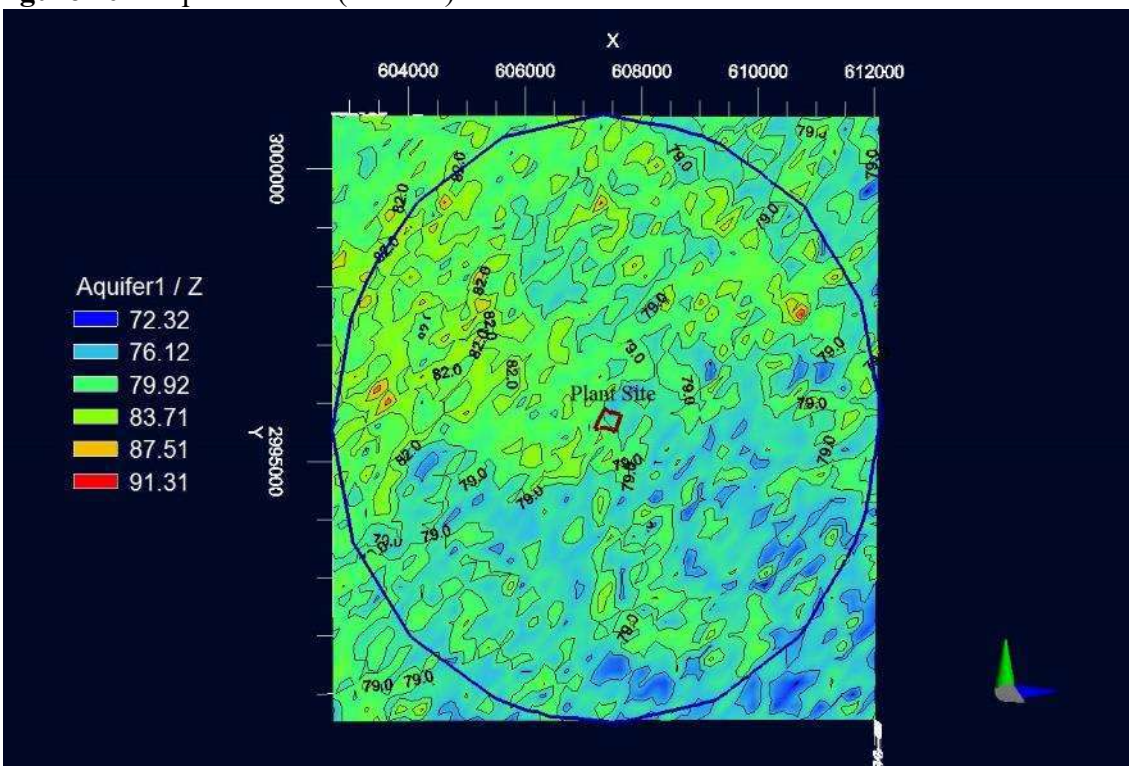


Figure 11: Bottom Elevation (m, amsl) of the Top Layer (Weathered zone)

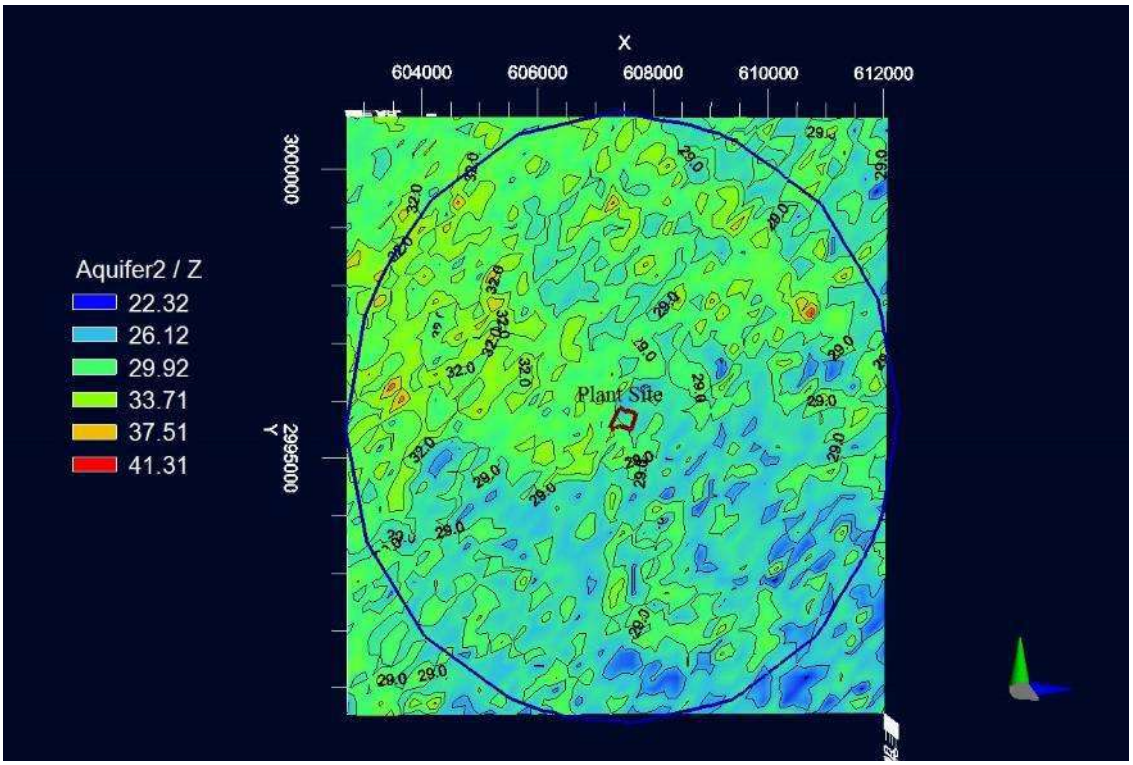


Figure 12: Bottom Elevation (m, amsl) of the Fractured Zone

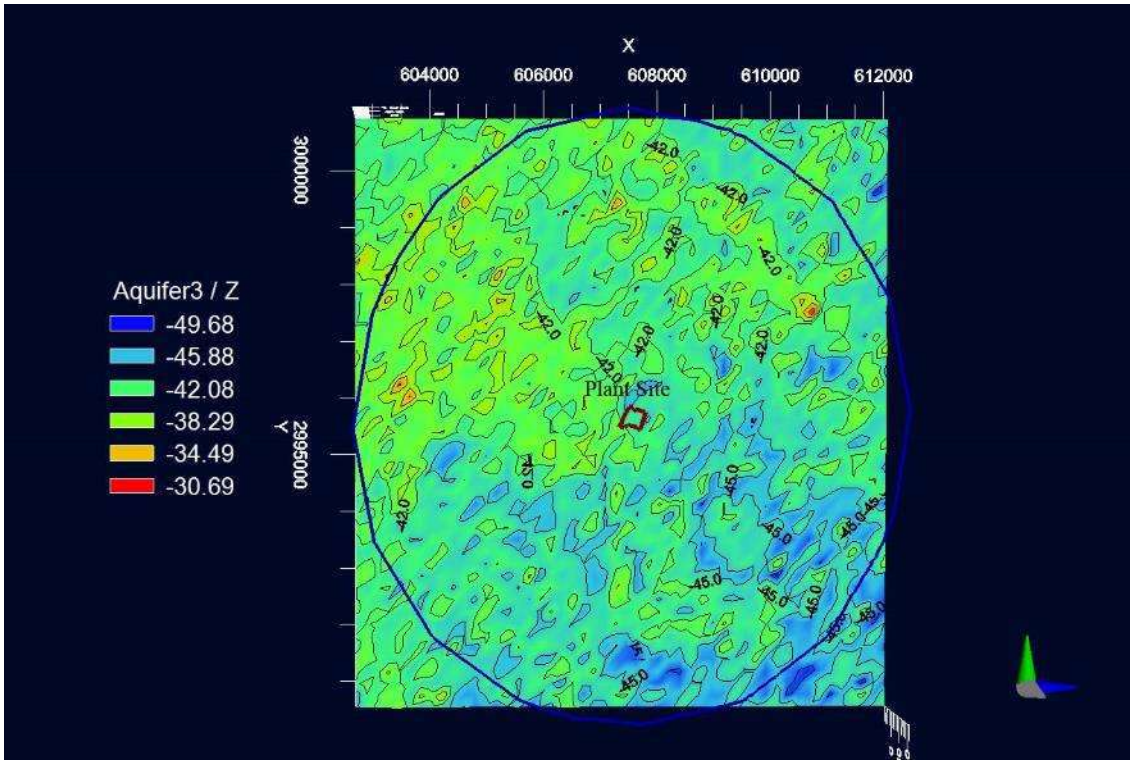


Figure 13: Bottom Elevation (m, amsl) of the Massive Formation

2.5.2.7 Grid Design

The area has been divided into 104 rows and 94 columns with a uniform grid size of 100 m X 100 m covering **78.61 Sq.km area.** The total area **78.61 Sq.km** is considered for Modeling as there is no hill or runoff zone.

The grid has been grouped into 3 layers containing 3 main aquifers (Aquifer layer group 1, 2, 3). The bottom layer is considered as base of confining layer. The bottom of layer 3 has been considered as the base of modeling depth. Spatial and vertical variations in hydrologic characteristics in the aquifer framework were represented by discrete values in each of the model cells.

Model cells extend vertically into the aquifer and divide the aquifer into discrete volumes of aquifer material that are assumed to have uniform hydrologic characteristics. The model grids are shown in **Figure: 13**. The hill area is not considered for modeling. The green colour in the numerical grid are inactive cell. The layer thickness model is given in **Figures: 13-16**

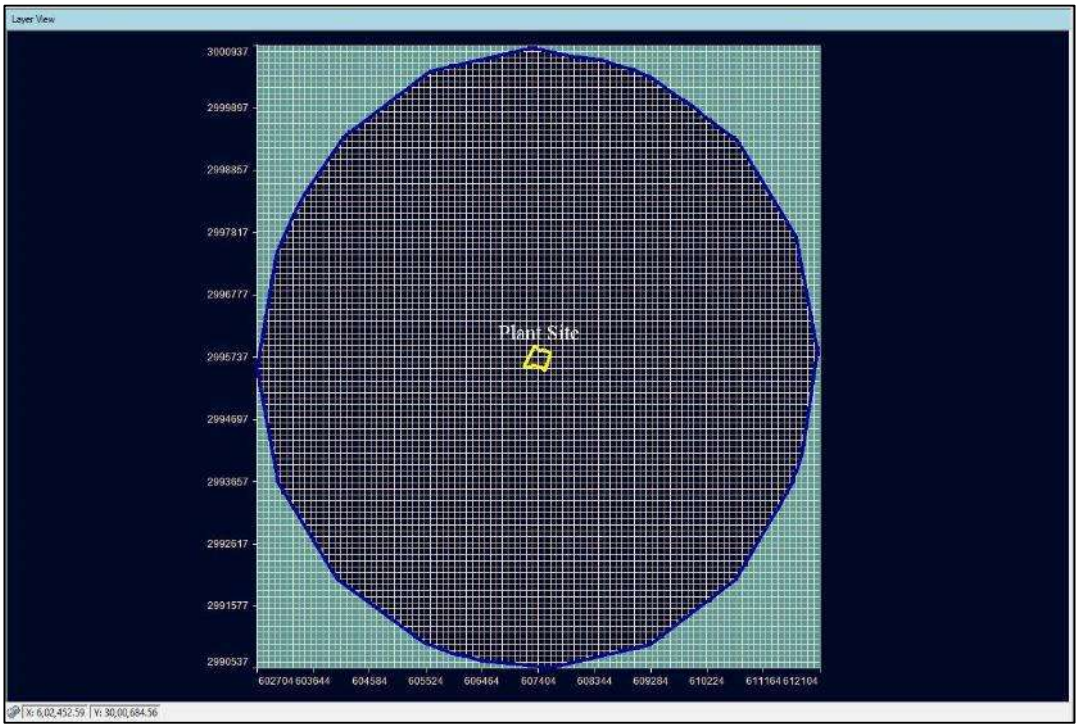


Figure 14: Numerical Grid

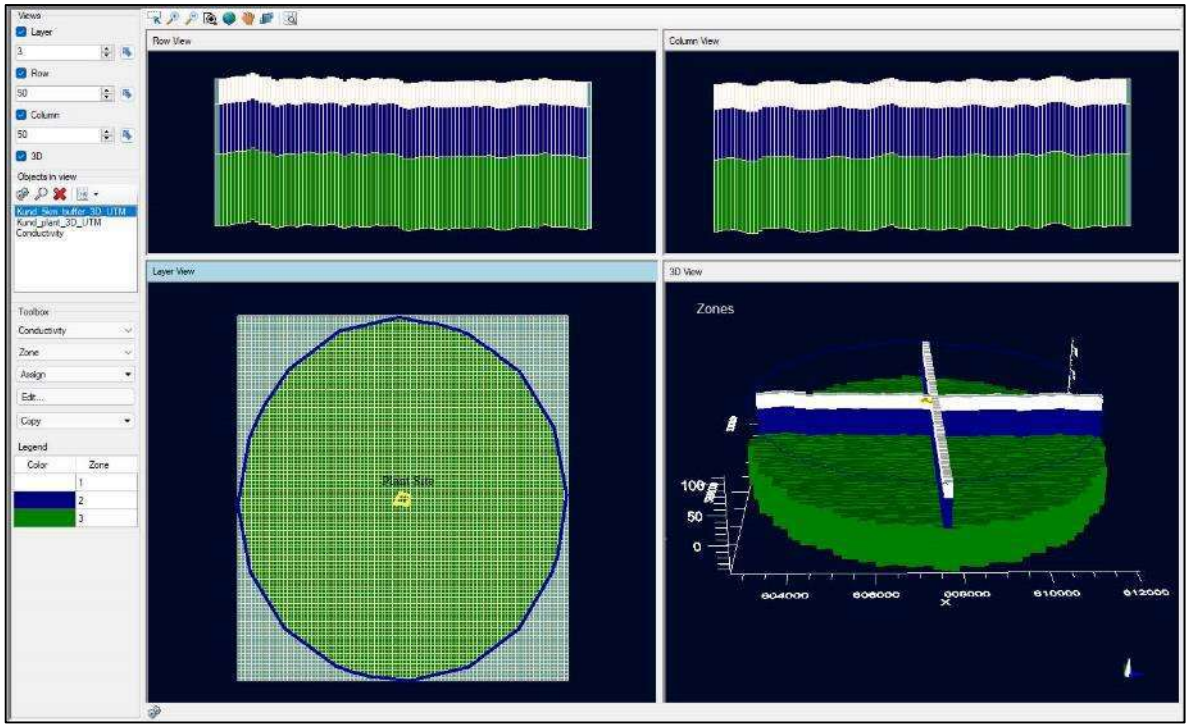


Figure 15: Hydrogeological cross section along row 50 and column 50 (Plant site)

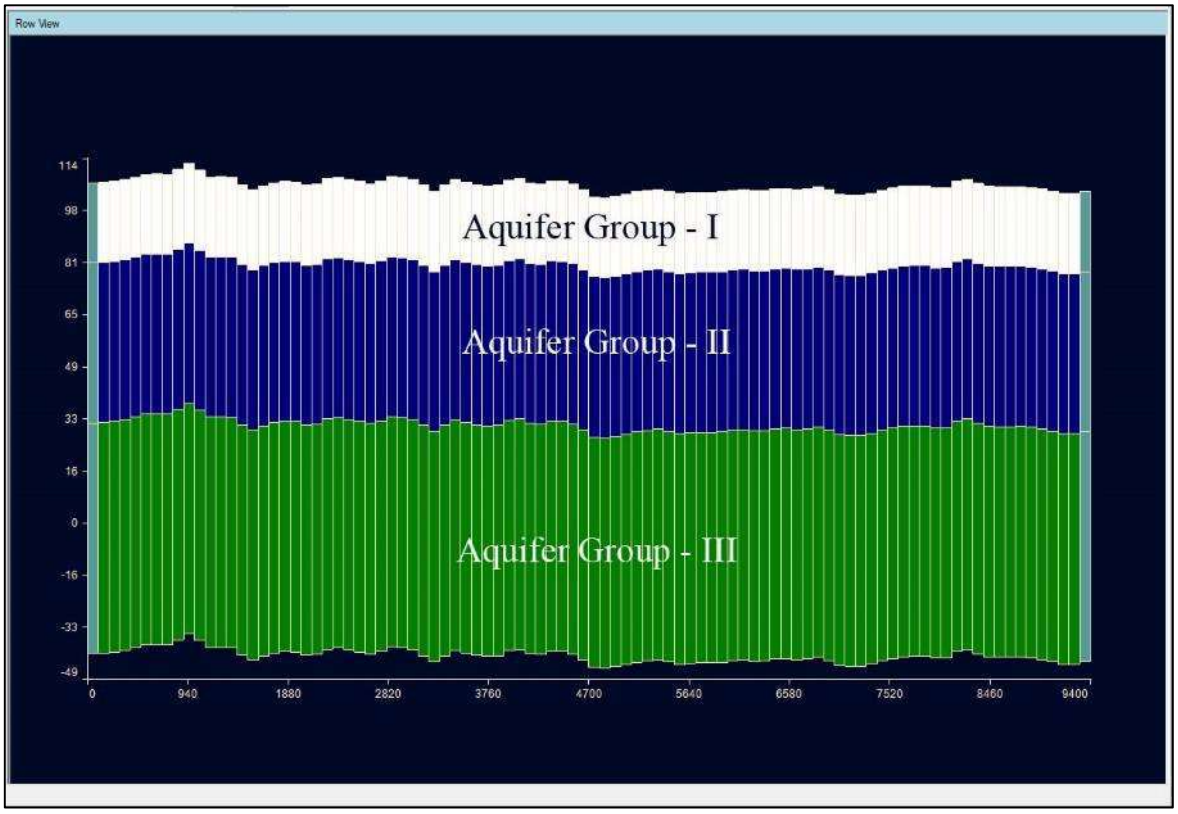


Figure 16: Hydrogeological cross section along row 50 showing 3 layers

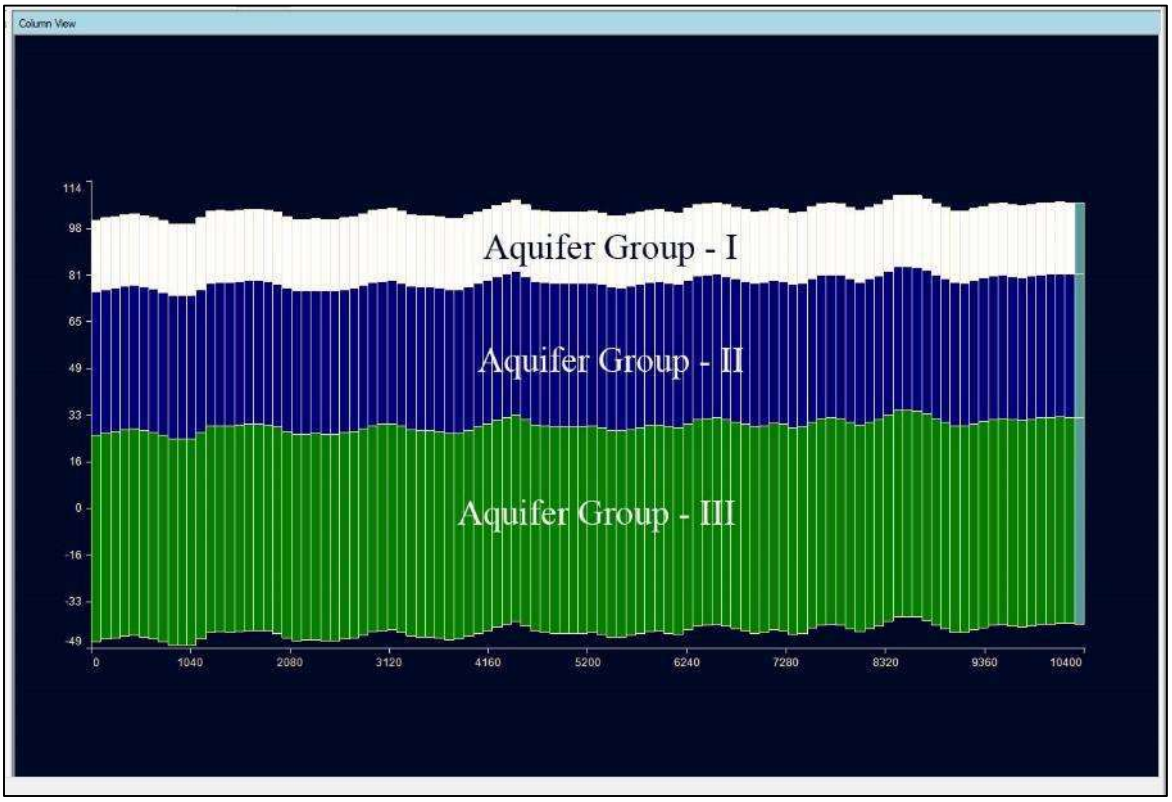


Figure 17: Hydrogeological cross section along column 50 showing 3 layers

2.5.2.8 Assumptions used in the conceptual model

The major simplifying assumptions in the present modeling study include

1. All pumpages in a model cell has been simulated as coming from the cell center;
2. The pumpages throughout a stress period is applied equally
3. Recharge is invariant over large periods of time
4. Small scale variations of hydraulic conductivity within cells are negligible.

2.5.2.9 Boundary Conditions

Boundary conditions are defined along the edges of the simulation domain including the top and the bottom. Their main function is to separate the model region from the rest of the world and are required for solution of the ground water flow equation. Model boundaries are either physical (real) and hydraulic (artificial). While the physical boundaries are well defined geologic and hydrologic features that permanently influence the pattern of groundwater flow hydraulic boundaries are artificial and are derived from groundwater flow nets (Kresic, 1997).

The river flow in the south, north west and west of the study area has been assigned river boundary condition. The inland wetland with water throughout the year is considered as constant head boundary. Based on the geological formation and infiltration characteristics of the formation the rainfall recharge boundary condition defined.

The rainfall recharge values of 10-15 % have been assigned in the recharge boundary condition. Apart from the above the project proponent has converted recharge reservoir in the back filled Plant pits. The above recharge quantity is considered in the model.

The plant drilled **3 number of tube wells** within the plant area to meet out the industrial requirement. However, 2 tube wells are operational to meet out the requirement of **6,984 cu.m/day**. Apart from the above **20 Tube well used for irrigation / drinking** are there in the model area. All the wells have been assigned pumping well boundary condition. The boundary condition in the model is presented **Figures:17-18**

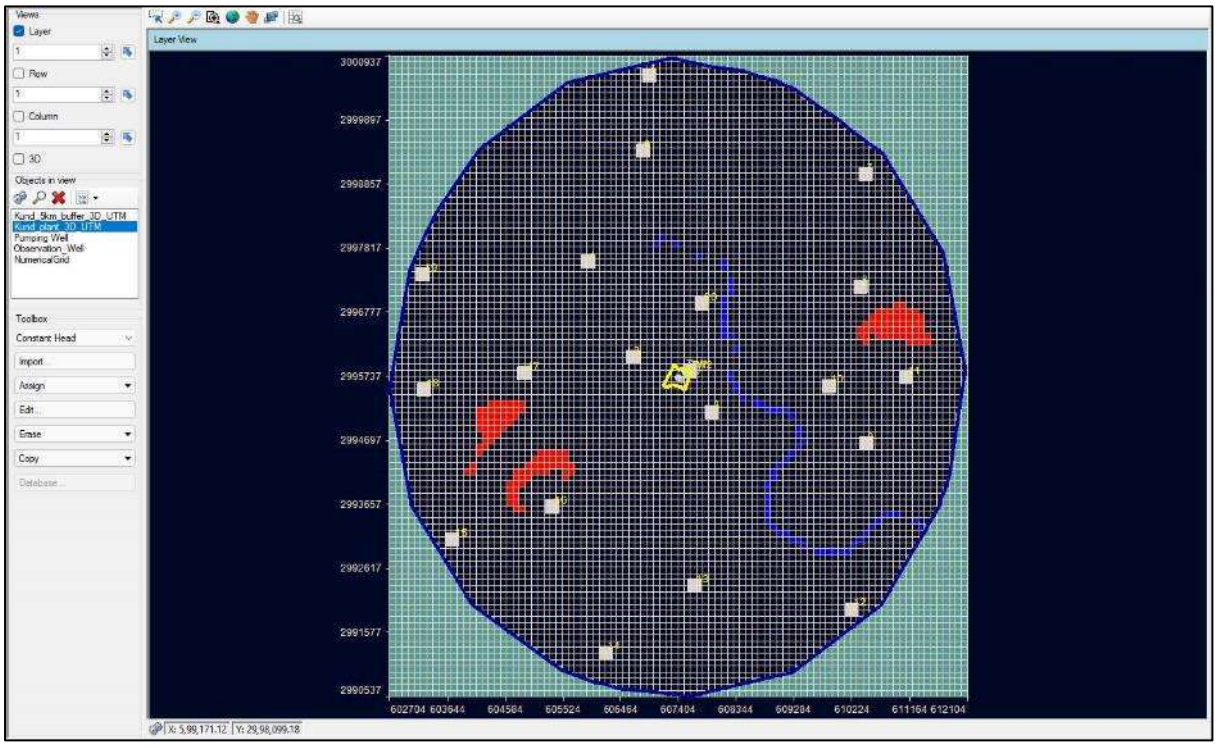


Figure 18: Boundary Conditions

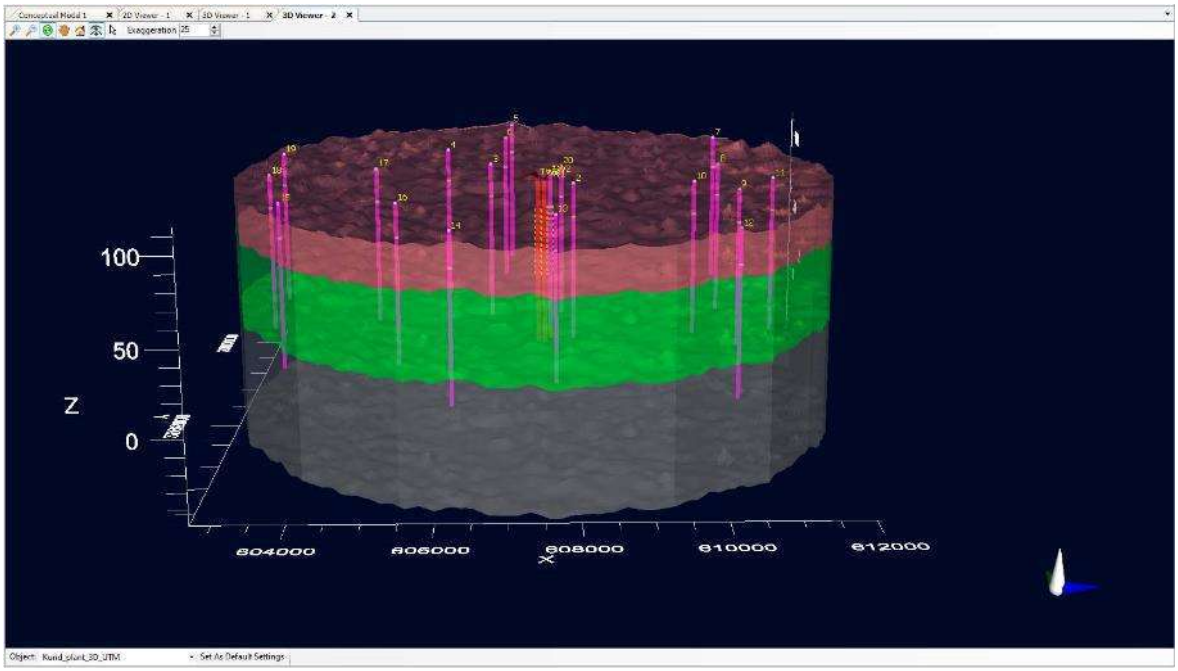


Figure 19: Pumping well (Red are Plant pumping well, violet is irrigation tube wells)

2.5.2.10 Distribution of conductivity and storage parameter values

The hydraulic conductivity data obtained from pumping test were utilized in the preparation of model. Vertical hydraulic conductivity has been taken as 10% of the horizontal hydraulic conductivity.

Layer wise hydraulic conductivity is assigned depending of the pumping test results. The values of specific storage have been computed by dividing the field determined storativity values with the thickness of the aquifer. (Given in Pumping test chapter). The values assigned to run the model has been confirmed with CGWB exploratory Tube well and found to be matching.

2.5.2.11 Initial Head

Initial head for all the aquifer are generated based on the ground water level data collected during the field study. Also, the long-term ground water level data from CGWB has been compared and initial heads are generated.

The ground water level of the Tube wells is considered for initial head of Layer 1 and the Tube well with deeper depth water level is considered as initial head for Layer 2. The initial head is presented in **Figure- 19**

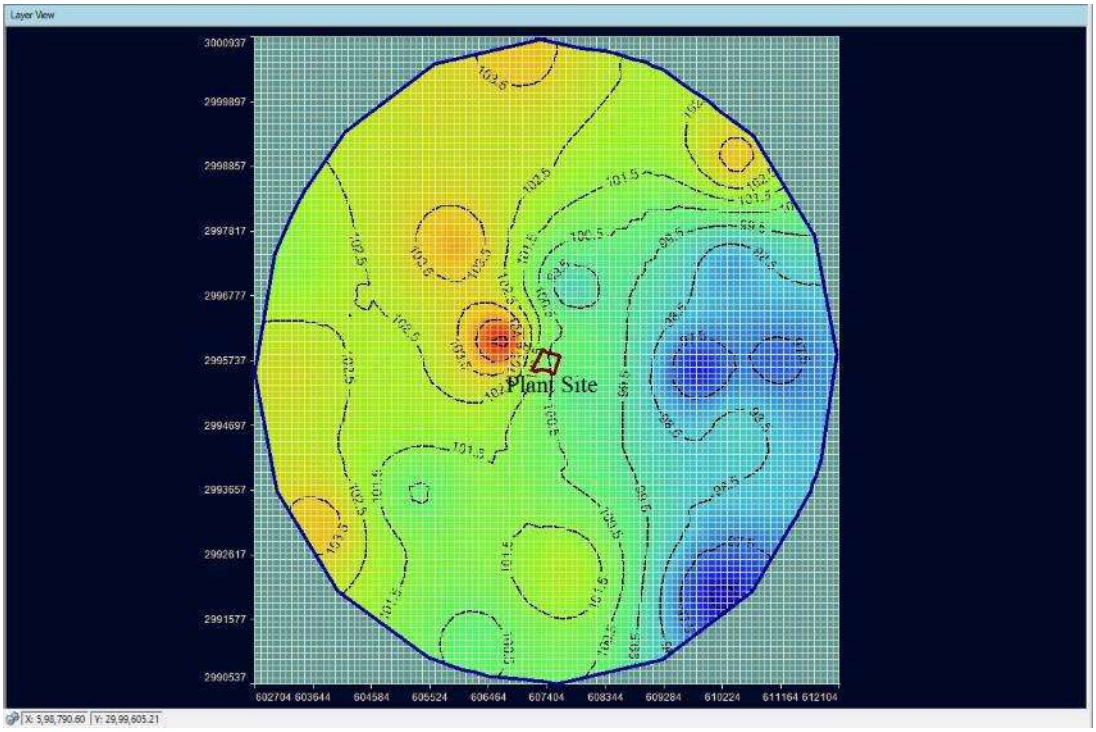


Figure 20: Initial Head

2.5.2.12 Model Validation

To evaluate the validity of the updated flow model, the groundwater heads simulated by the updated flow model were compared to observed hydraulic heads.

The groundwater head observations for the period of 2022 have been used for validating the model.

The scatter plot showing the statistics for 3650 days for aquifers produced in exhibits the **root mean squared (RMS) of the residuals for aquifers as 0.91 m** indicating a reasonably good fit of the observed and simulated levels with majority of the data lying close to the 1:1 line. **(The accepted RMS error as per CGWA Guidelines (Webinar Presentation) is less than 3.5 m)**

The calculated and observed head is presented in **Figure: 20**

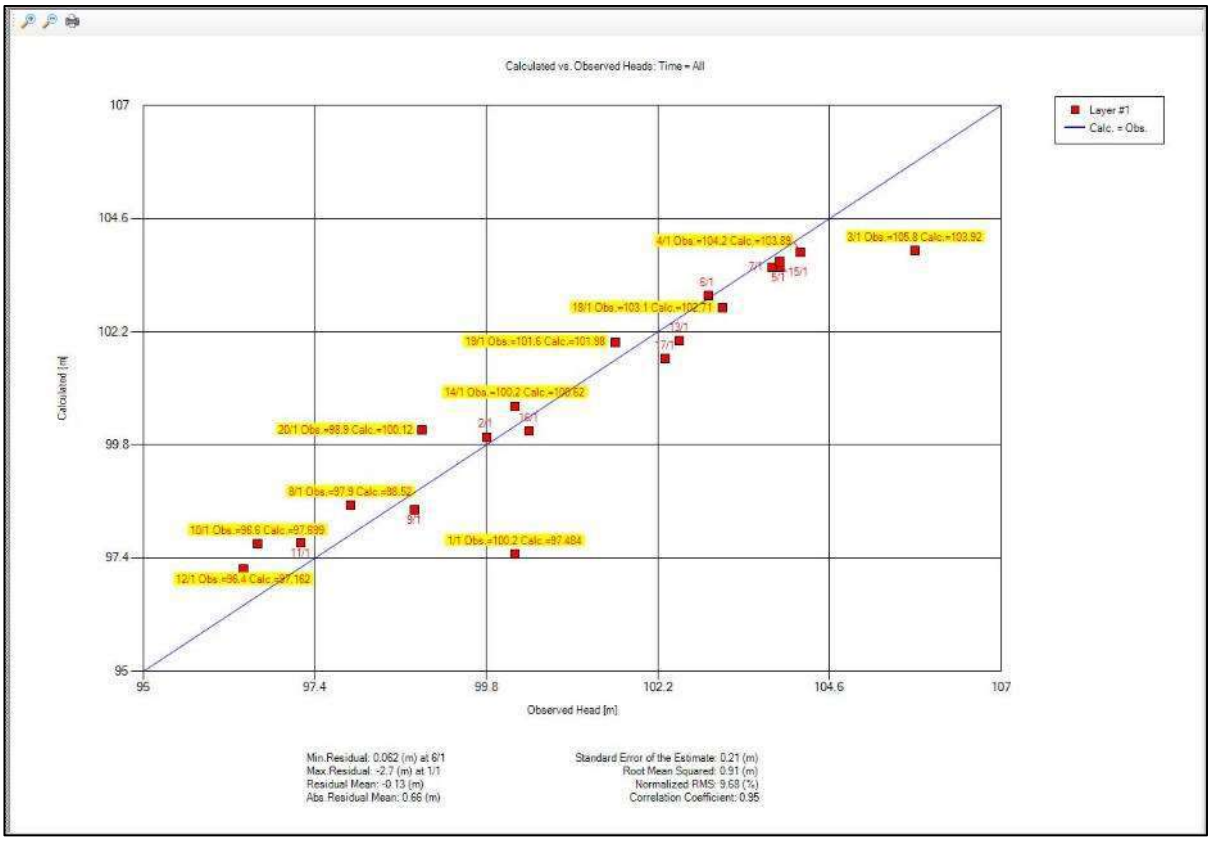


Figure 21: Calculated Vs observed head of the aquifers

2.5.2.13 Model Run

The boundary conditions and aquifer properties are defined for the model and also pumping well and observation well objects are added in the model. Then data from conceptual model is translated to Numerical model.

The above input for the Numerical model is entered and then VISUAL MODFLOW FLEX module with flow budget is estimated. The model convergence is obtained after number of trial run by changing errors in the initial heads and aquifer parameters entry.

The model could not be simulated in steady state condition as it is a fully homogenous area where there will never be the inflows and outflows are equal. Hence only Transient Simulation is attempted. The model was run in transient state.

The prerequisite data requirement for running the model in transient state is initial heads and stress periods. The year is divided into twelve stress periods i.e. every month. Each stress period is divided into one time step to have monthly heads and flow. The prediction model was run for 5 and 10 years.

2.5.2.14 Predictive Model Results

Considering the above-mentioned facts, the calibrated model has been used to assess the impact of groundwater withdrawal for industrial purpose on the groundwater system for a period of five and ten years.

Change in the ground water head at the end 5th year and end of 10th years has been simulated. **There is change of head in and around the Plant site observed and the head change is about 2.5 to 3.5 m. (Initial Head 100.5 m and the observed head 98.0 m at the end of 5th year and 97 m at the end of 10th year in the Plant lease area).**

The above change in the head is due to the industrial pumping and it is found to be less. The simulated head at the end of 5th and end of 10th year is presented below.

Though the predicted change in the head and the drawdown is moderately less, the recharge from the rainfall and the recharge imitative taken by the project proponent has ameliorated the ground water scenario.

The predicted change in head for end of 5th year and end of 10th year is presented in **Figures: 21-22.**

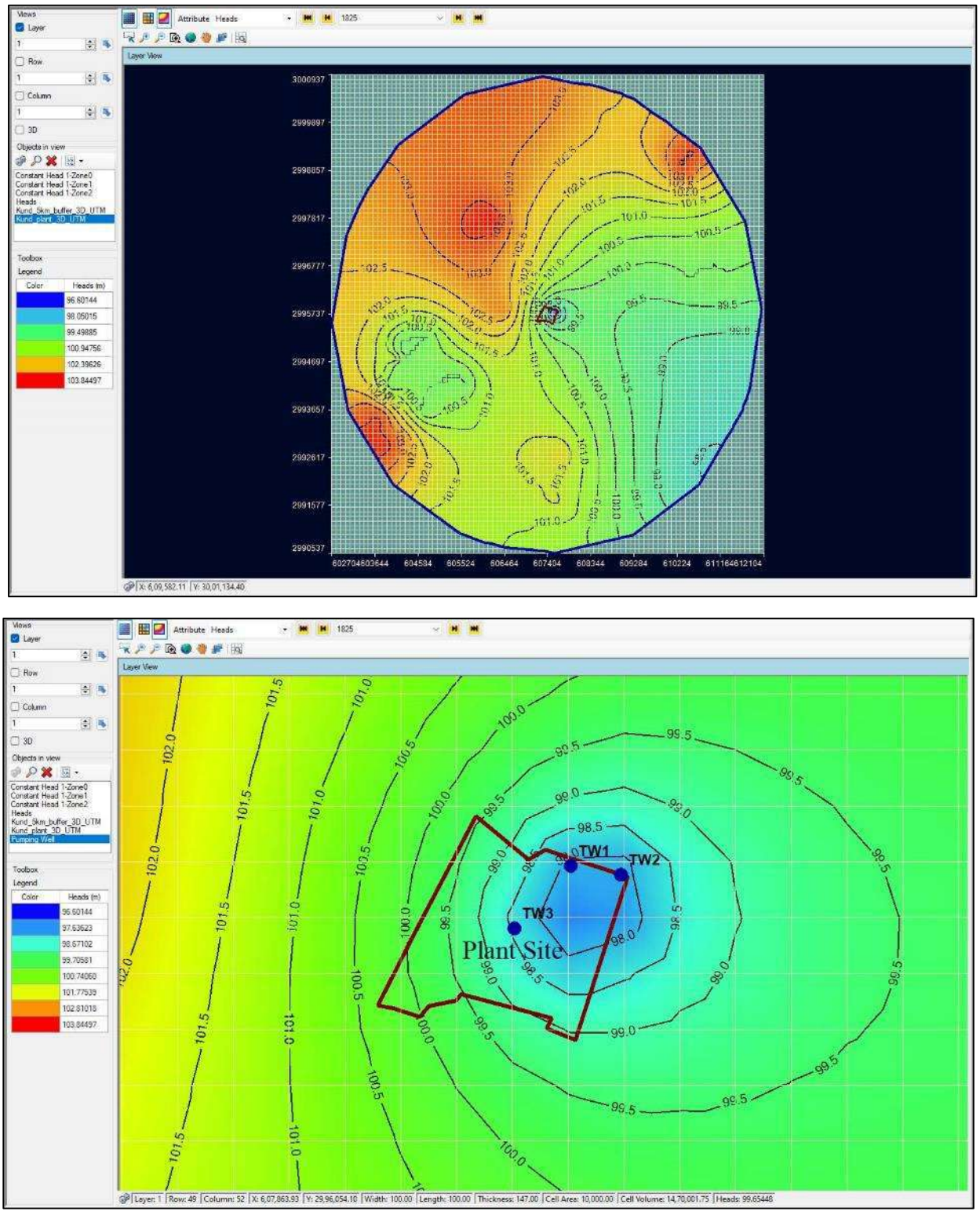


Figure 22: Predicted Head – End of 5th year

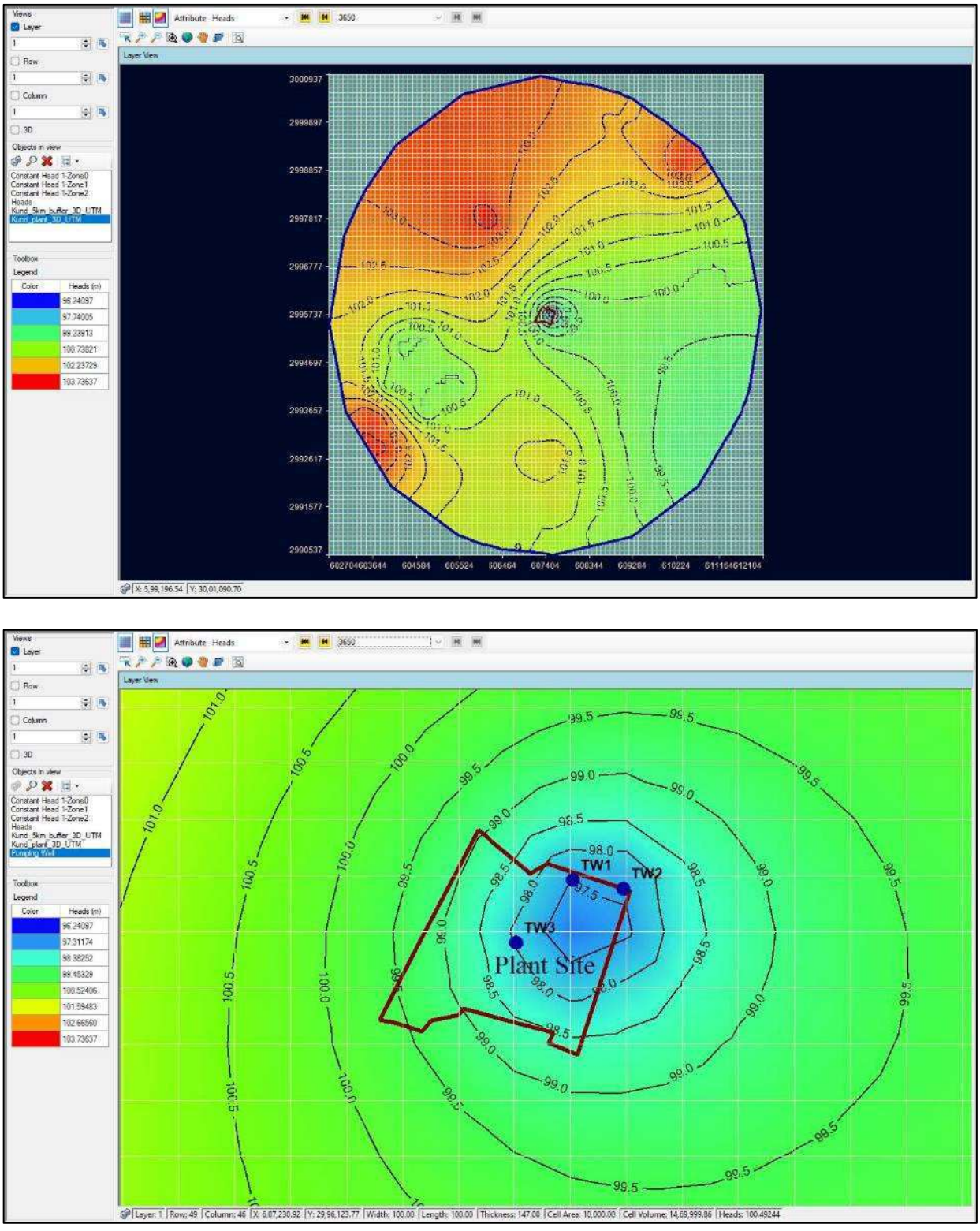


Figure 23: Predicted Head – End of 10th year

The main benefit of using the VISUAL MODFLOW FLEX code is that its mass balance calculations provide a very useful way to examine the source of water provided to a system of pumping wells.

Table 17: Statement showing the Mass Balance

Inflow and Outflow from various boundaries in Fifth Year (2026)		
Heads	**Inflow**	**Outflow (Sink)**
	Volume in Cu.m	**Volume in Cu.m**
Storage	81266752	64884620
Constant Head	10015081	49966900
Wells		12745800
River Leakage	23392	952
Recharge	36292264	
Total	**127597489**	**127598272**

Inflow and Outflow from various boundaries in Tenth Year (2031)		
Heads	**Inflow**	**Outflow (Sink)**
	Volume in Cu.m	**Volume in Cu.m**
Storage	119762608	98026760
Constant Head	10851924	78549424
Wells		25491600
River Leakage	41016	2524
Recharge	71413808	
Total	**202069356**	**202070308**

From the mass balance graph for 5th year and the cumulative mass balance for 10th year, the changes in the contribution from various sources have been computed. From the table below, it can be seen how the contribution from various sources changes in the projected scenario for year 2026 from that of year 2031.

The most important changes are in the Recharge boundary which contributes major part of the pumping of for the industrial needs and the surround wells in 2026 and 2031.

The mass balance clearly indicates that the ground water drawl of the study area is only from the constant head and recharge quantity.

The Mass balance graphs at the end of 5th year (2025), end of 10th year (2030) is presented in **Figures**: **23& 24.**

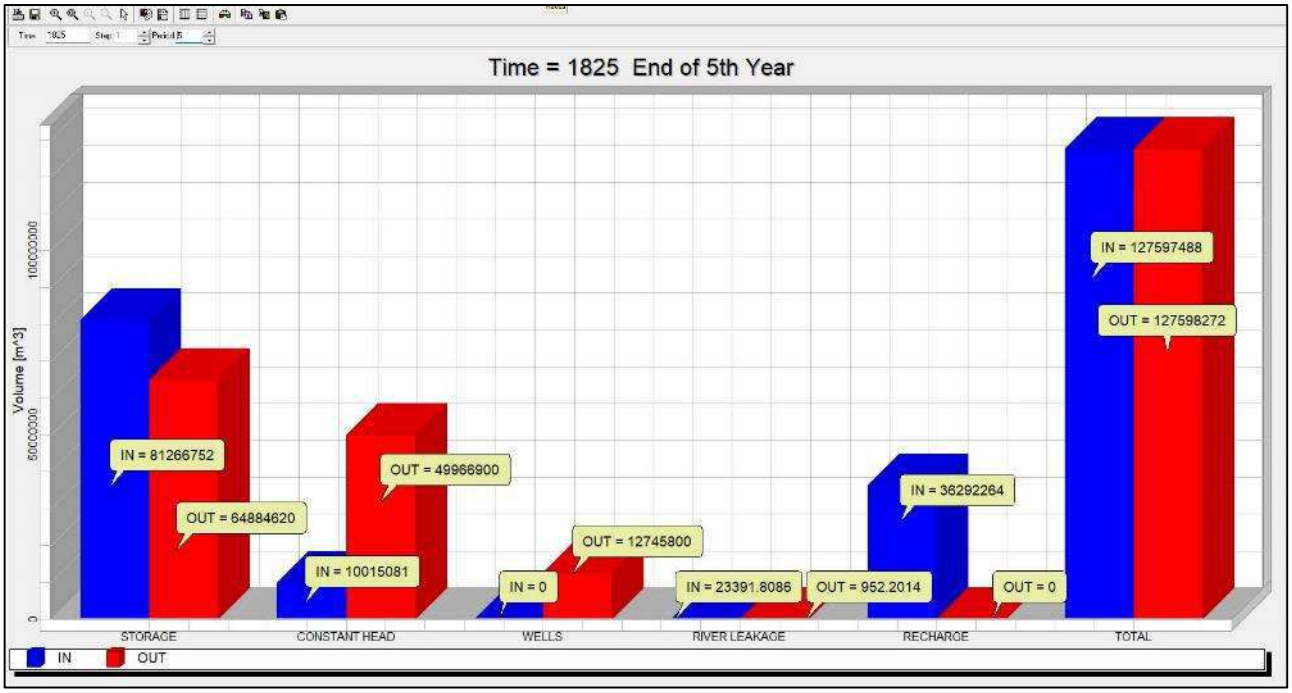


Figure 24: 5th Year Mass balance

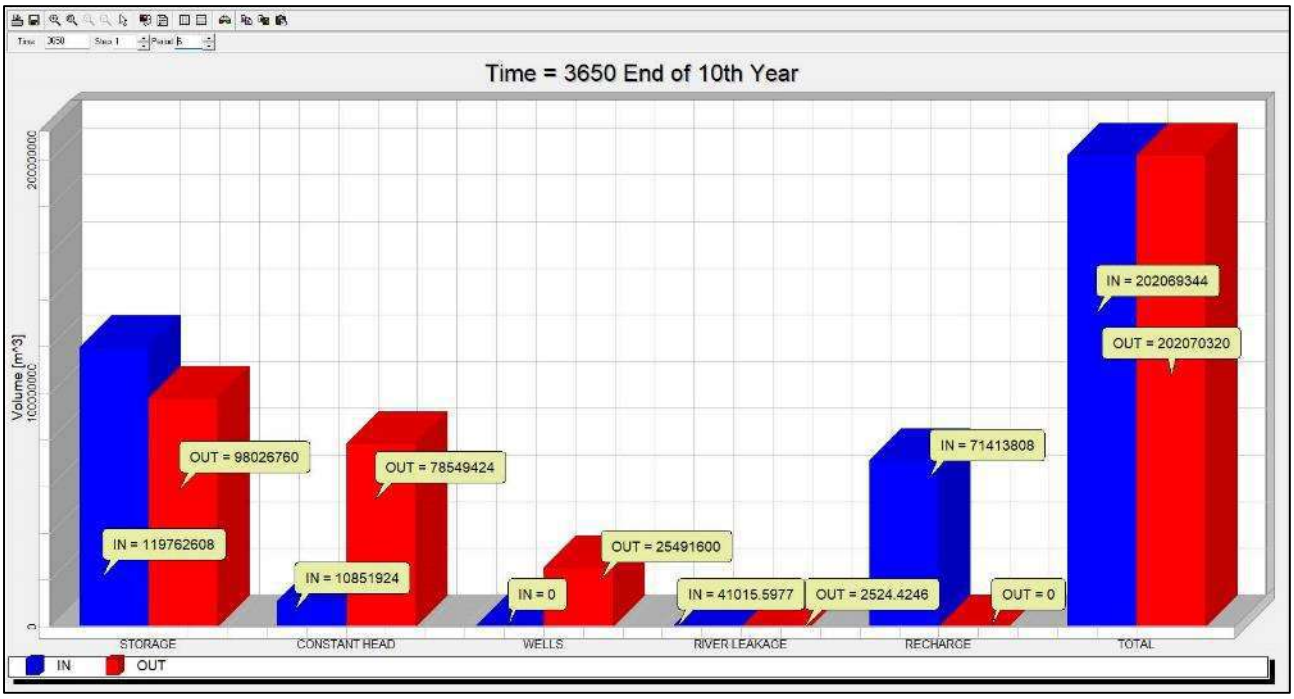


Figure 25: 5th Year Mass balance

2.5.2.15 Inference of the Modeling Results

- The results of mathematical modeling have thrown light on the overall scenario of the ground water condition of the model area. Ground water modeling study reveals that the pumping in the second layer has very less effect on Unconfined Aquifer.
- The Plant water requirement is being met out from the first and second aquifer group. The pumping quantity of **6,984 cu.m/day** for the Plant would not make adverse impact in the ground water system of the model area.
- Change in the ground water head at the end 5th year and end of 10th years has been simulated. **There is change of head in and around the Plant site observed and the head change is about 2.5 to 3.5 m. (Initial Head 100.5 m and the observed head 98.0 m at the end of 5th year and 97 m at the end of 10th year in the Plant lease area)**.
- The predicted radius of influence is **330 m**.

The most important changes are in the constant head and recharge quantity which contributes major part of the Plant drawl and pumping of surround wells in 2026 and 2031.

2.2.6 Ground water quality [Pre - monsoon and Post – monsoon]

As part of ground water quality assessment stipulated in the CGWA Guidelines, Groundwater samples have been collected from 6 No of Tube well of different locations in and around the project area and analyzed by adopting standard method of chemical analysis. The water quality sample results will be submitted after drilling of Tube well for industrial purpose with in the plant site. The samples were collected during January – 2022.

The samples are tested in the NABL Certified Lab The results obtained from the lab is presented in **Annexure - 3**.

The test results are presented in **Table-19.** The analysis reveals that the quality of water is within the permissible limits of CPHEEO.

Table 18: Ground water sampling Results

SNo	Parameter	Units	Khokhariya Village	Siswariya Village	Korip Village	Garhi Village	Khiraiya Village	Goindpara Village
1	pH	-	7.3	7.47	6.68	6.62	7.27	7.5
2	Colour	Hazen	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Conductivity	µs/cm	689	570	539.3	638	1020	593
5	Turbidity	NTU	12.80	1.40	4.10	<0.5	1.00	6.80
6	Total Hardness (as $CaCO_3$)	mg/l	276.00	264.00	252.00	280.00	404.00	276.00
7	Calcium (as Ca)	mg/l	49.60	65.60	64.00	67.20	96.00	44.80
8	Sodium (as Na)	mg/l	5.48	4.11	3.91	12.72	42.07	3.52
9	Potassium (as K)	mg/l	1.37	1.03	0.98	3.18	10.52	1.76
10	Carbonate (as CO_3)	mg/l	Nill	Nill	Nill	Nill	Nill	Nill
11	Bicarbonate (as HCO3)	mg/l	400.16	312.32	292.80	302.56	405.04	326.96
12	Magnesium (as Mg)	mg/l	36.94	24.30	22.36	27.22	39.85	39.85
13	Chloride (as Cl)	mg/l	7.83	5.87	7.83	25.44	84.14	11.74
14	Fluoride (as F)	mg/l	0.72	0.25	<0.1	0.12	0.66	0.26
15	Alkalinity (as $CaCO_3$)	mg/l	328.00	256.00	240.00	248.00	332.00	268.00
16	Total Dissolved Solid	mg/l	448.10	370.53	350.53	414.68	662.99	385.50
17	Nitrate (as NO_3)	mg/l	2.35	0.98	0.66	9.85	8.26	1.26
18	Sulphate (as SO_4)	mg/l	1.26	1.10	<1.0	8.16	30.14	<1.0

Apart from the above on site Total Dissolved Solids are tested in the field during the well inventory (January 2022) using potable EC meter. The EC values are presented in **Table-20**

Table 19: EC in Selected Well

No	Village	Latitude	Longitude	Well Type	Depth in m	EC Mmhos /cm
1	Plant Site	27° 4' 49.76" E	82° 5' 6.864" N	TW	100	844
2	Chandrabhusan Mishra	27° 4' 28.362" E	82° 5' 19.723" N	TW	98	905
3	Govt. Handpump	27° 4' 57.598" E	82° 4' 33.193" N	HP	90	689
4	Govt. Handpump	27° 5' 48.185" E	82° 4' 6.704" N	HP	105	594
5	Govt. Handpump	27° 7' 26.344" E	82° 4' 44.144" N	HP	90	750
6	Abdul Lateef	27° 6' 46.393" E	82° 4' 40.422" N	TW	86	570
7	Foujdar Shankar	27° 6' 33.16" E	82° 6' 51.304" N	TW	90	1502
8	Sachin Singh	27° 5' 33.821" E	82° 6' 47.714" N	HP	80	703
9	Uttam Kumar	27° 4' 10.967" E	82° 6' 50.461" N	HP	82	539

No	Village	Latitude	Longitude	Well Type	Depth in m	EC Mmhos /cm
10	Ram Verma	27° 4' 41.538" E	82° 6' 28.418" N	TW	83	789
11	Adya Singh	27° 4' 45.887" E	82° 7' 13.865" N	HP	78	638
12	Govt Primary School	27° 2' 43.53" E	82° 6' 40.554" N	HP	90	1281
13	Kanhaiya Singh	27° 2' 56.944" E	82° 5' 8.038" N	HP	90	1020
14	Govt. Handpump	27° 2' 21.822" E	82° 4' 15.636" N	HP	93	580
15	Govt. Handpump	27° 3' 22.334" E	82° 2' 45.161" N	HP	88	1686
16	Rajendra Jaiswal	27° 3' 38.97" E	82° 3' 44.312" N	HP	94	750
17	Hari Prasad Yadav	27° 4' 49.627" E	82° 3' 28.516" N	HP	96	593
18	Rampal Yadav	27° 4' 41.333" E	82° 2' 29.296" N	HP	94	1363
19	Ramnath	27° 5' 42.133" E	82° 2' 29.119" N	TW	92	763
20	Govt. Handpump	27° 5' 25.44" E	82° 5' 14.118" N	HP	87	844

The maximum and minimum EC concentration in ground water is **1686 and 539** µmhos/cm which is potable as per the CPHEEP Standards. Based on the above results of EC, the spatial distribution of EC concentration has been generated and presented in **Plate – 19**

The higher concentration of EC is observed in the easter part of the study area. Majority of the area falls under **500-800 µmhos/cm** EC zone. The Plant is located in 800-1100 µmhos/cm zone. The spatial distribution of EC concentration reveals that the area is not in the ground water quality affected zone.

On perusal of results of chemical analysis of ground water sample collected and analyzed shows that ground water in general is potable and majority of the constituents are within acceptable limits. where few are well within the permissible limit. Hence, it is concluded that ground water is suitable for drinking, industrial and agricultural purposes.

pH: pH value of ground water indicates that water is in general a bit alkaline in nature. The range of pH is 6.62 to 7.50. The pH values of all analyzed samples remain within the standard norm.

Conductivity: Conductivity varies from 539 µS/ cm to 1020 µS/ cm with an average value of **675** micromho/cm in Tube well which indicates its most suitability for all purposes.

Total Dissolved Solids: To ascertain the suitability of groundwater for any purposes, it is essential to classify the groundwater depending upon their hydro-chemical properties based on their TDS values. The ground water of the area is fresh water. Most of the groundwater samples are within the maximum permissible limit for drinking as per CPHEEO standard. TDS concentration varies from **350 to 663 mg/L** with an average value of **439 mg/ L**.

Nitrate: The concentration of nitrogen in groundwater is derived from the biosphere. Nitrogen is originally fixed from the atmosphere and then by soil bacteria into ammonium. Under aerobic conditions nitrogen is finally converted into nitrate by nitrifying bacteria.

All samples show nitrate concentration within the permissible limit. Nitrate concentration varies from **0.66 to 9.8 mg/L** with an average value of **3.89 mg/ L**. As the nitrate is a point pollution, Nitrate concentration map showing as point and its value has been generated and presented in **Plate – 20**

Fluoride: Fluoride concentration in ground water is of geo-genic nature. The fluoride concentration of the study area is within permissible limits of the drinking water standards. Fluoride concentration varies from **0.12 to 0.70 mg/L** with an average value of **0.40 mg/ L**. The fluoride concentrate ion as point map is presented in **Plate - 21**

Photograph showing EC Testing at field



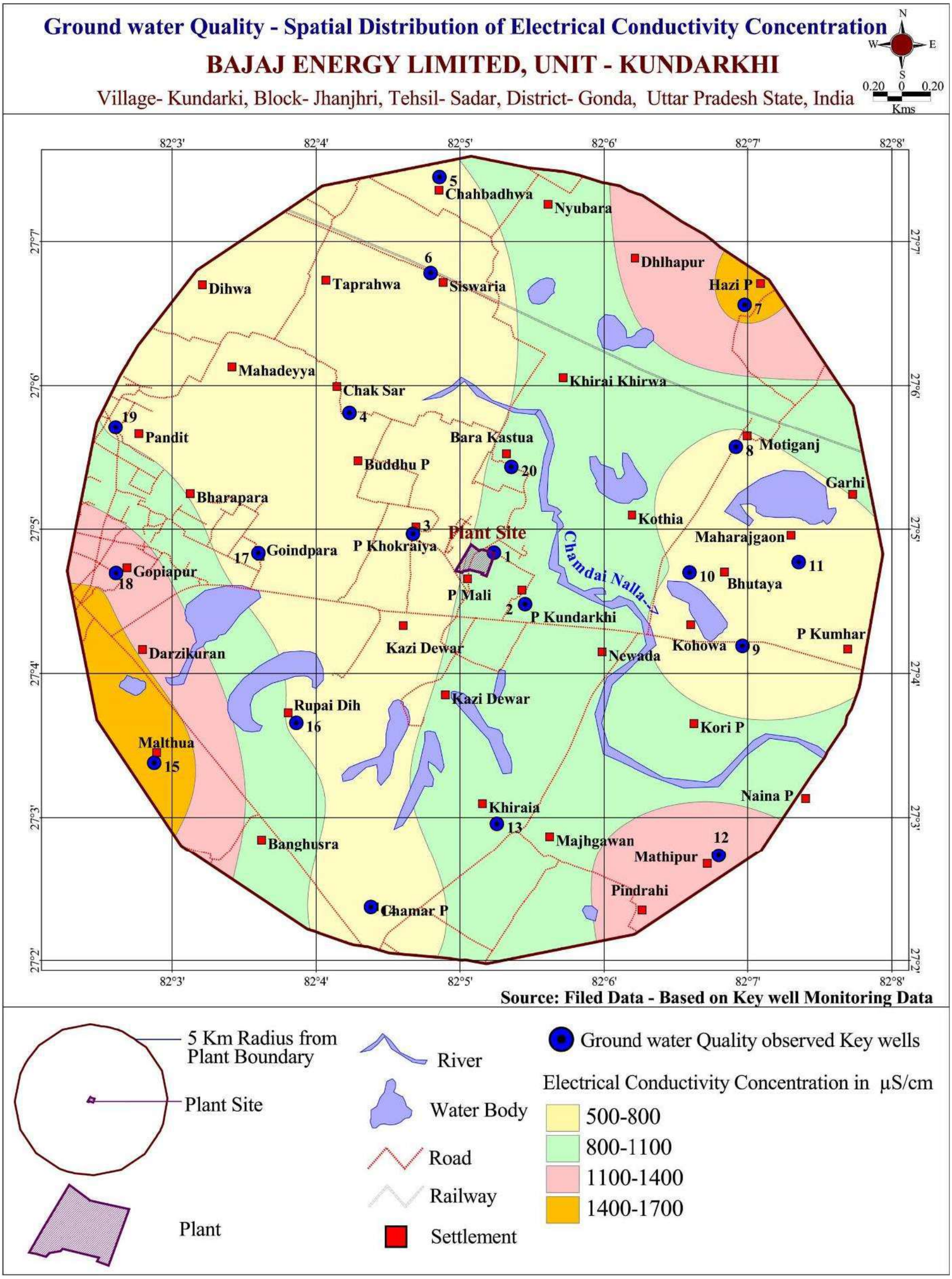


Plate 19: Spatial Distribution of TDS concentration in Ground water

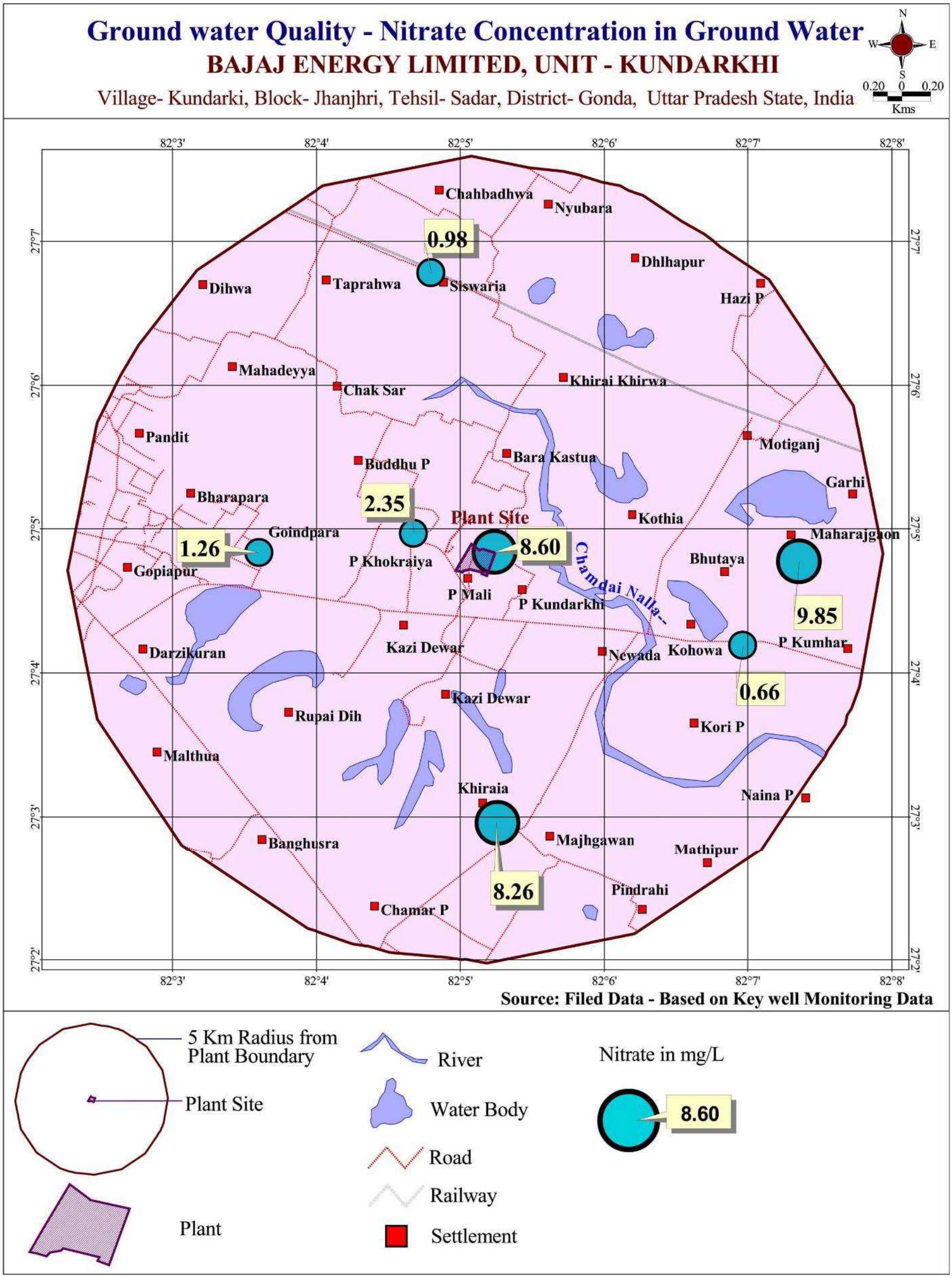


Plate 20: Nitrate concentration in Ground water

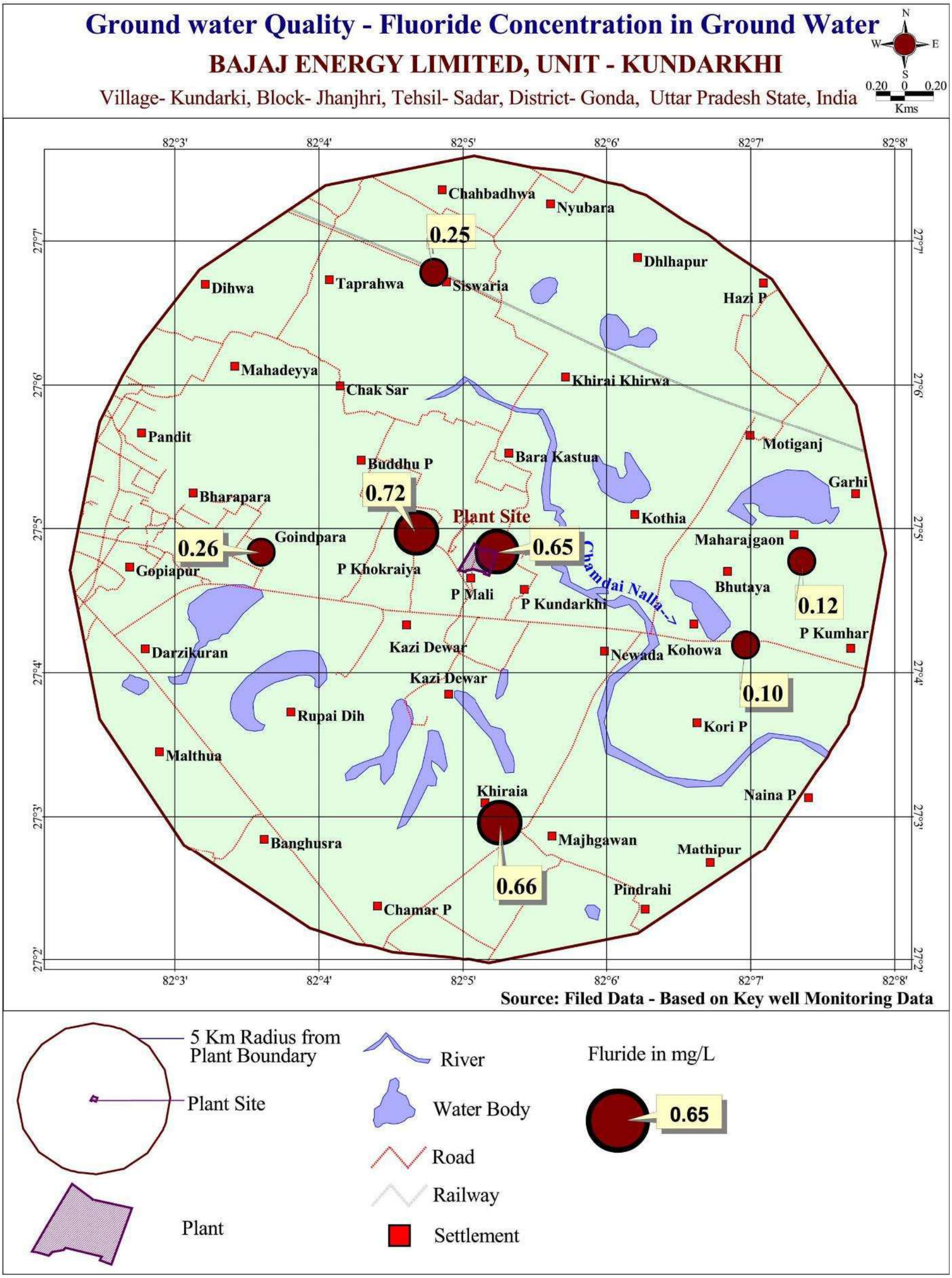


Plate 21: Fluoride concentration in Ground water

2.2.7 Water quality of nearby water bodies

The river sample has been collected in the study area and tested. The tested results reveals that the quality is with the permissible limit. The STP and ETP samples are tested. The surface water, STP and ETP sample Results are presented in **Annexure- 4**

3. Details of the bore wells/ borewells proposed to be constructed. This includes the aquifer parameters, drilling depth, diameter, tentative lithological log, details of pump to be lowered, H.P. of pump, tentative discharge of bore wells/ borewells, etc. Locations to be marked on the site plan / map. Location of proposed piezometers

Aquifer Parameters

Pumping test is the most accurate, reliable and commonly used method to evaluate the hydraulic parameters of an aquifer, efficiency of a well / bore well, safe operational rates of pumping and selection of suitable pump. The methods of a pumping test are highly varying in its application. The main objective of pumping test is to determine the aquifer parameters such as Transmissivity (T), Storage co-efficient (S) Hydraulic Conductivity (K), well performance and safe yield for execution of water supply.

In order to evaluate the aquifer characteristics and safe yield to match the ground water requirement, constant discharge test has been conducted in the Tube well located within the plant site.

Pumping test Methodology

- The constant discharge test has been carried out with the help of the motors fitted in the Tube well & electronic water level indicator etc.,
- During the pumping test, discharge has been measured by volumetric methods and ground water level has been measured using electronic indicator.
- Draw down and recovery have been measured from the pumping well.

In order to assess the aquifer parameter, the recovery data has been used. Both drawdown and recovery measurement have been taken in the wells. After stopping the pump recovery measurements were taken, the principle behind the estimation of Transmissivity of deeper aquifer of a Tube well is that the recovery of water level in a well after the pump is shut off can be simulated by continuing pumpage as before, and recharging by an imaginary recharge well at the same rate during the recovery period. Under such conditions the

residual drawdown s', i.e. the difference between the drawdown component due to continued pumpage and the recovery component due to recharge is given by Theis (1935):

$$s = \frac{Q}{4\pi T}\left[\log_e\left(\frac{4Tt}{r_w^2 S}\right) - \log_e\left(\frac{4Tt'}{r_w^2 S'}\right)\right]$$

Where Q = constant discharge, s' = residual drawdown

rw = effective radius of well in which the water level recovery is measured.

t = time since pumping started and t' = time since pumping stopped

If storage coefficient remains constant and equal (S during pumping = S' during recovery) and $u = r^2S/4Tt'$ is sufficiently small, the above equation is simplified to

$$s = \frac{2.303Q}{4\pi T}\log_{10}\frac{t}{t'}$$

The procedure for data analysis is to plot s against t/t' in semi- logarithmic paper, with s^1 on the arithmetic scale and t/t' on the log scale. After the value of t' becomes sufficiently large, the observed data should fall on a straight line. The slope of this line gives the value of $\log_{10}$ t/t'. For convenience, the value of t/t' is chosen on log cycle apart, so that its logarithm becomes unity. The above equation is simplified to:

$$T = \frac{2.303Q}{4\pi\Delta s'}$$

Where Q = constant discharge, in cu.m/day and

Δs' = change in residual drawdown in meters per log cycle of t/t'.

Storage coefficient is calculated based on equation

$$S = \frac{2.25Tt^0}{r^2}$$

Where T = Transmissivity,

t^0 = intercept of the straight line at zero drawdown in days

r = radius of the well / distance from observation well in m

Pumping tests carried out in Bore well-constructed in the consolidated formation of Limestone. The data and graphs pertaining to pumping tests are shown as below;

Results of the Pumping test

The drawdown and recovery data have been fed in to **AqiferTest-2016** Software and the same is presented in **Table – 20,21**. The Time vs Drawdown Plot is given in **Figure-25 &**

Table 20: Results of Pumping Test – Tube well 1

Particulars	Details	Particulars	Details
Location	Kundarki	Pumping water level in m	5.36
Formation	Gangetic Plain – Sand	Drawdown in m	1.46
Depth in m	106	Residual Drawdown in m	4.0
Water level in m (bgl)	3.9		
Duration of pumping in min	360	Transmissivity m^2/day	3990
Discharge cu.m/hr	2200 lpm 132 cu.m/hr	Storage Coefficient	1.54×10^{-04}

Table 21: Tube well 1 – Drawdown and Recovery data

BAJAJ ENERGY LIMITED, , KUNDARKHI UNIT - Pumping Test

District	Gonda	Hamlet	Plant Site		Depth in m	106	Static Water level in m	3.9
Block	Jhanjhri	Location	Plant Site		Size of well LXW in m	400 mm	Pumping Rate in LPM	2200
Village	Kundarki	Well Type BW / OW / TW	Tube Well (TW)		Draw down s1	1.46	Date	12-01-2022
Time	11:00 Latitude	27° 4' 49.76" E	Longitude	82° 5' 6.864" N	Name of Well Owner	Bajaj Energy Ltd.,		

Pumping				Recuperation				
t, time in minutes since pumping started	Water level in m bmp	Drawdown in m	Remarks	Time since pump started t (min)	Time since pump stopped t' (min)	t/t'	Water level in m	RDD
0	3.90			360	0		5.36	1.460
1	5.19	1.29		361	1	361.00	4.90	1.000
2	5.20	1.30		362	2	181.00	4.81	0.910
3	5.21	1.31		363	3	121.00	4.56	0.660
4	5.22	1.32		364	4	91.00	4.53	0.630
5	5.23	1.33		365	5	73.00	4.48	0.580
6	5.24	1.34		366	6	61.00	4.41	0.510
7	5.24	1.34		367	7	52.43	4.38	0.480
8	5.25	1.35		368	8	46.00	4.36	0.460
9	5.25	1.35		369	9	41.00	4.32	0.420
10	5.26	1.36		370	10	37.00	4.30	0.400
12	5.26	1.36		371	11	33.73	4.29	0.390
14	5.27	1.37		372	12	31.00	4.25	0.350
16	5.27	1.37		373	13	28.69	4.23	0.330
18	5.28	1.38		374	14	26.71	4.20	0.300
20	5.28	1.38		375	15	25.00	4.18	0.280
25	5.28	1.38		376	16	23.50	4.17	0.270
30	5.29	1.39		377	17	22.18	4.16	0.260
35	5.29	1.39		378	18	21.00	4.16	0.260
40	5.30	1.40		379	19	19.95	4.16	0.260
45	5.30	1.40		380	20	19.00	4.14	0.240
50	5.31	1.41		385	25	15.40	4.10	0.200
55	5.31	1.41		390	30	13.00	4.00	0.100
60	5.32	1.42						
70	5.32	1.42						
80	5.32	1.42						
90	5.33	1.43						
100	5.33	1.43						
110	5.34	1.44						
120	5.34	1.44						
140	5.34	1.44						
160	5.35	1.45						
180	5.35	1.45						
210	5.35	1.45						
240	5.35	1.45						
270	5.36	1.46						
300	5.36	1.46						
330	5.36	1.46						
360	5.36	1.46						

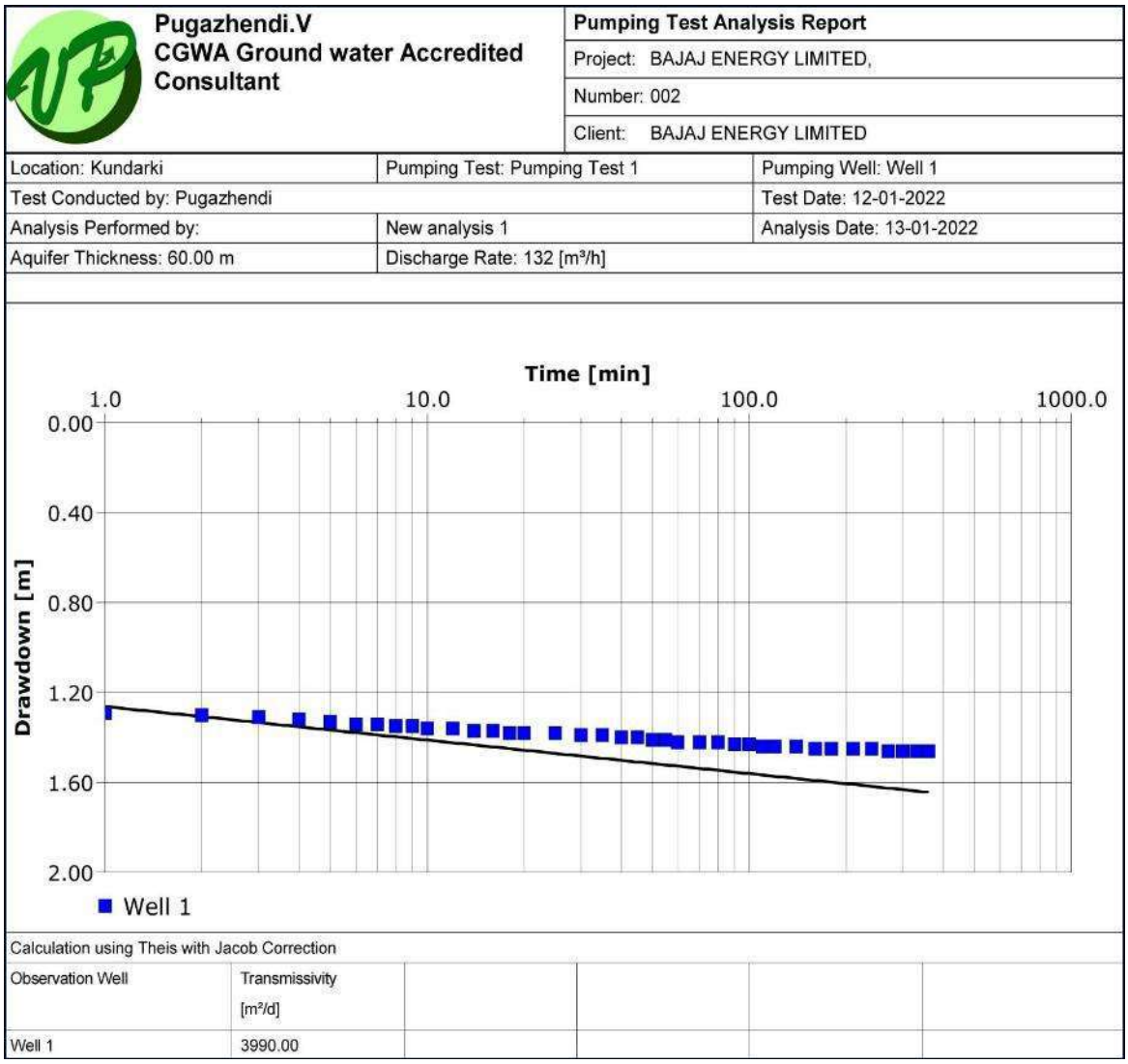


Figure 26: Time vs Drawdown Plot – Tube well

Inference of Pumping Test

Based on the pumping test the following aquifer parameters area derived.

Transmissivity of the study area	**3990**	**m^2/day**
Storativity Average of the study area	**1.54×10^{-04}**	**m/day**
Average Hydraulic Conductivity of the study area	**66.5**	**m/day**

The above values are compared with CGWB exploratory Tube well drilled for Gonda district and found to be matching.

The above Aquifer parameters are used for ground water modeling.

Safe Yield of the Bore well

Table 22: Safe yield of bore wells

Safe yield of the Tube well	
TUBE WELL DEPTH in m	106
Discharge (Q) in lpm	2200
Time of Pumping in min	320
Drawdown in m	1.46
Assigned / Desired drawdown in m	21
Designed hours of pumping in hour	15
Safe Yield 2675 lpm / 21 m Draw Down 15 Hours of Pumping	
Safe Yield Cum/day = 2407	

The optimum yield of the Tube well is **2407 cu.m/day**. If the pump runs for **15 hours**, with a discharge of **2675 lpm / 21 m Drawdown**, the Tube well can yield **2407 cu.m/day.** **The estimation based on the pumping test results conducted in the Tube well located within the Plant site. It is indicative that the required quantity of 6,984 cu.m/day can be drawn through 3 Tube wells.**

In order to meet the water requirement of the industry, 3 Tube well are drilled within the plant site. Out to 3 tube wells, 1 tube well is kept as stand by. **(NOC obtained for 3 tube wells).** The details of the Existing Tube well are presented below:

Table 23: Tube well within the plant site

No.	Type of Structure	Geographic Coordinates / Location	Depth in m	Diameter in mm	Tentative Lithology	Pump Lowered depth in m	Horse Power	Discharge of the borewells cu.m/hour
TW-1	Tube well	27° 4'50.27"N 82° 5'3.55"E	106	400	Alluvium Sand Silt Dominant	30	30	180 cu.m/hour
TW-2	Tube well	27° 4'49.76"N 82° 5'6.85"E	106	400	Alluvium Sand Silt Dominant	30	30	180 cu.m/hour
TW-3	Tube well	27° 4'46.69"N 82° 4'59.85"E	106	400	Alluvium Sand Silt Dominant	30	30	180 cu.m/hour

The location of the Tube wells with in the plant are presented below



Figure 27 : Location of Existing Tube wells

The Photographs of the tube wells are presented below







Location of Piezometers

As per the Guidelines CGWA, 2 Tube well have to be drilled for installing piezometer (as per CGWA guidelines, the drawl or dewatering quantity exceeding 500 cu.m/day, 2 Piezometers have been installed. (One DWLR and 1 DWLR with Telemetry). The project

proponent drilled 2 Tube well and installed piezometers. The Location of the existing piezometer is presented in **Figure- 27**

The location information such as latitude and longitude of the existing Piezometers, is presented **Table -24**.

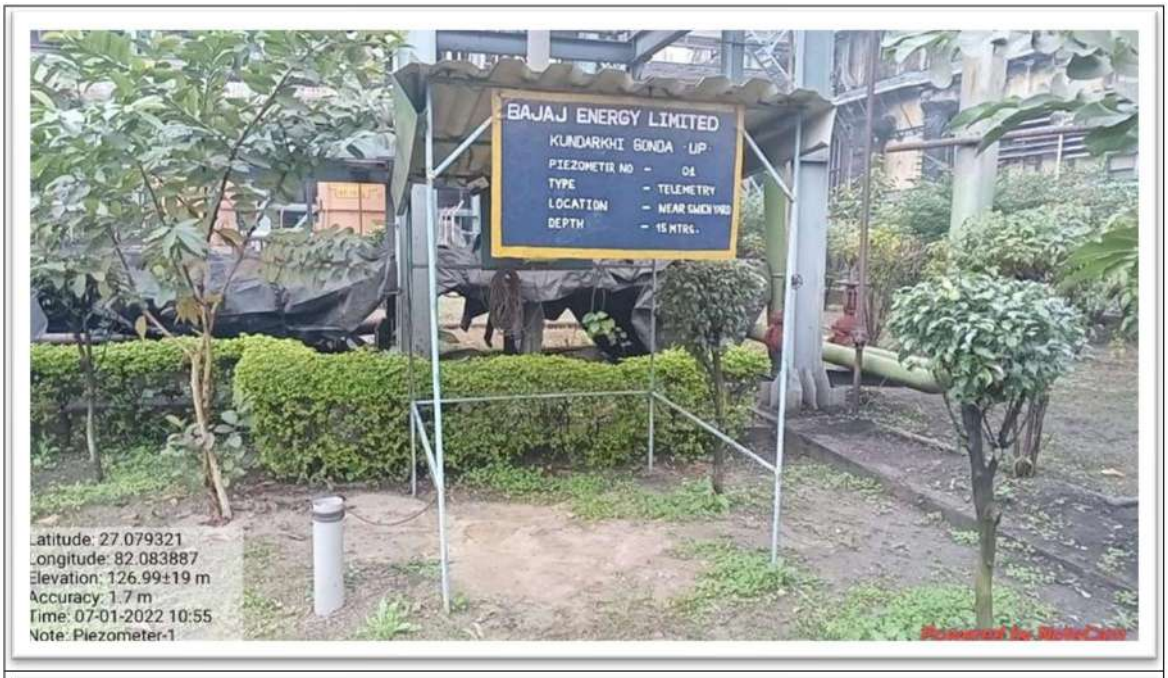
Table 24: Location of exiting Piezometers

PZ No.	Location	Coordinate	Depth in m	Diameter in mm
PZ-1	Near Switch Yard	27° 4.759'N 82° 5.033'E	27.40	152
PZ-2	Near Chimney Road	27° 4.842'N 82° 4.935'E	76.20	152



Figure 28 : Location of Existing Piezometers

Photograph of Piezometers

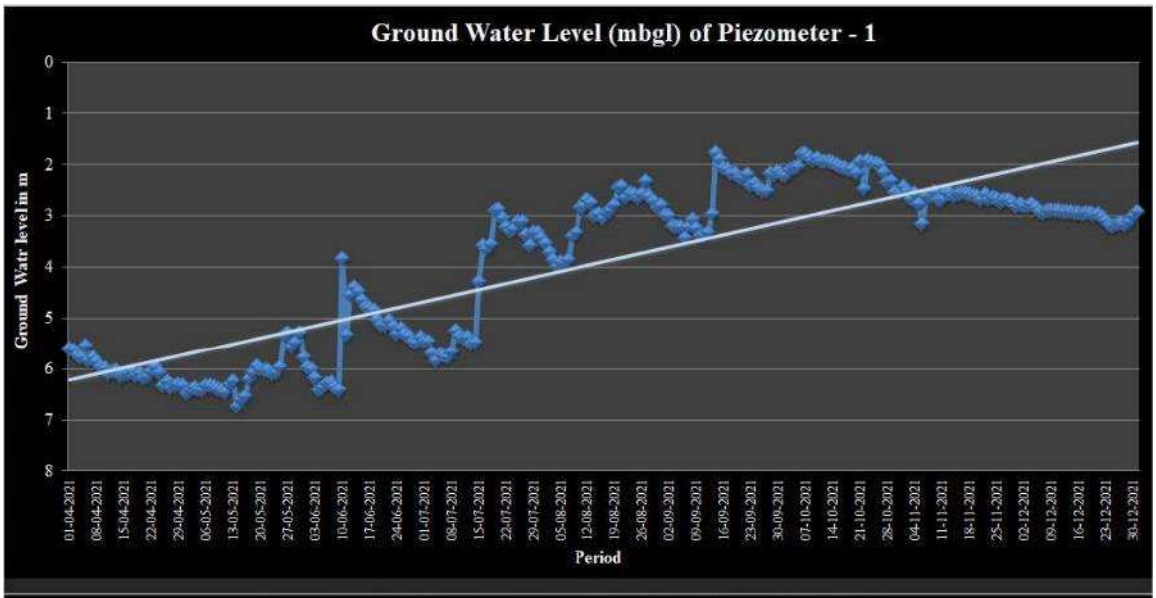




The hydrograph has been generated for the Piezometer observed data for the piezometers are presented below.

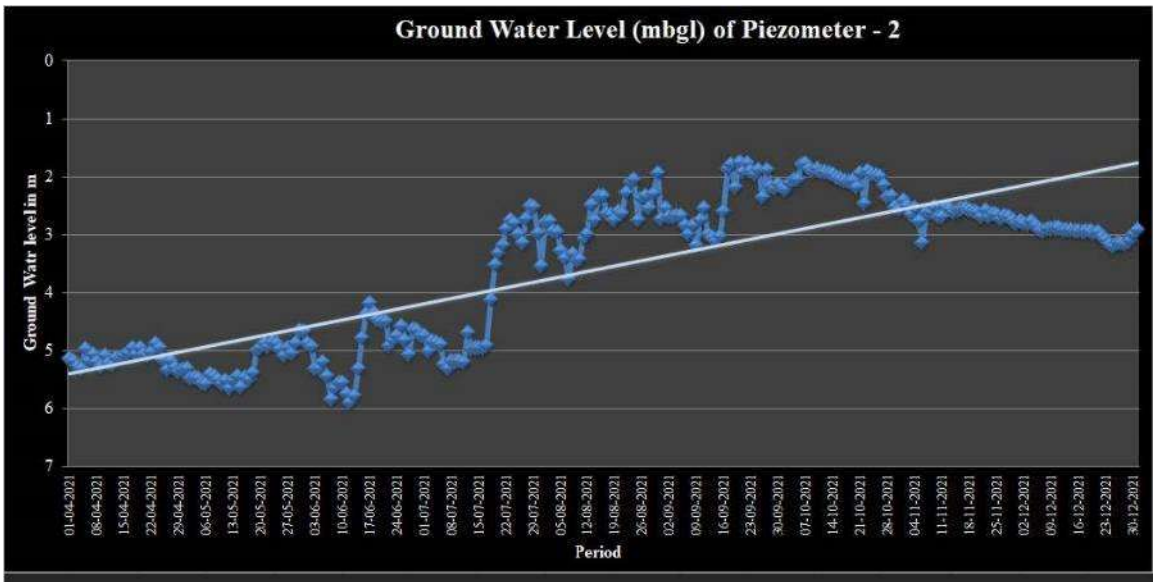
The raising trend **(0.017 & 0.013 m /Year)** of ground water level observed in the past 1 year.

Figure 29: Water Level Trend Analysis for Piezometer -1



Ground Water level Trend Based on the Piezometer Data		
Period	Trend in m / Year	Trend (Rise / Fall)
01-04-2021 - 31-12-2021	0.017	Rise

Figure 30: Water Level Trend Analysis for Piezometer -2



Ground Water level Trend Based on the Piezometer Data		
Period	Trend in m / Year	Trend (Rise / Fall)
01-04-2021 - 31-12-2021	0.013	Rise

Water Requirement for the Plant site

The net water requirement is **7,970 = 6,984 cu.m/day Ground water + 986 cu.m/day Treated water cu.m/day**, The fresh water requirement for industrial purpose is **6974 cu.m/day**, domestic use **10 cu.m/day**. (The Water balance charge is given in Chapter-9)

It is noted that there is no water supply scheme available in the village Itai Maida (Certificate of nonavailability of water supply is enclosed as **Annexure-5**). Hence, the water requirement of the project is dependent on the groundwater through Tube well only. The split-up details are given in **Table: 25**

Table 25: Water requirement format as per CGWB format

Activity	Existing requirement (cu.m/day)	Proposed requirement (cu.m/day)	Total requirement (cu.m/day)	No. of Operational Days in a year	Annual requirement (cu.m/year)
Industrial activity	**6974**	-	**6974**	**300**	**20,92,200**
Residential / Domestic	**10**	-	**10**	**365**	**3,650**
Greenbelt development / Environmental maintenance	**124**	-	**124**	**300**	**37,200**
Other use	**862**	-	**862**	**300**	**2,58,600**
Grand total	**7970**	**-**	**7970**	**-**	**23,91,650**

Table 26: Various usages of Treated waste water

Particulars	Waste water cu.m/day	No. of Days	(cu.m/year)
Quantity of treated water available	986		
1. Reuse in Industrial activity	-	-	-
2. Reuse in Green Belt Development & Environmental Management	124	300	**37,200**
3. Other usages (Ash water, Service and General Cleaning, Fire & others)	862	300	**2,58,600**
Total waste water utilized	**986**		**2,95,800**

Ground water requirement after the use of treated waste water is **6,984 cu.m/day**. This quantity is required for NOC from CGWA. The Split-up details of the above quantity is given below:

Table 27: Ground water requirement and its use

Activity	Existing requirement (cu.m/day)	Proposed requirement (cu.m/day)	Total requirement (cu.m/day)	No. of Operational Days in a year	Annual requirement (cu.m/year)
Industrial activity	**6974**	-	**6974**	**300**	**20,92,200**
Residential / Domestic	**10**	-	**10**	**365**	**3,650**
Greenbelt development / Environmental maintenance	-	-	-	-	-
Other use (Toilet)	-	-		-	
Grand total	**6,984**	**-**	**6,984**		**20,95,850**

The Ground water requirement is 6,984 cu.m/day. The treated water of 986 cu.m/day from ETP / STP is used for process and other uses.

NOC for 3 borewell for drawing the above quantity has been obtained from Ground water Department of Uttar Pradesh.

The flow meters for all the three Tube wells are installed. All the 3 Tube wells are being used to meet the industrial needs.

The pumping test data reveals that the drawdown is less. The above clearly indicates that the drawl of 6,984 cu.m/day would not create any adverse impact on the ground water regimen.

Photograph of Flow meters







4. Nil

5. Approved Plant Plan in case

The Bajaj Energy Limited is not a mining project.

6. Proposed usage of pumped water in case of infrastructure dewatering projects

No dewatering involved in the industrial operation during the construction phase and in operational phase.

6.1 For Drinking, irrigation etc.,

Nil

6.2 Recharge

Nil

6.3 Runoff to Stream

Nil.

6.4 Benefitted area

Nil

7. Comprehensive assessment of the impact on the ground water regime in and around the project area highlighting the risks and proposed management strategies proposed to overcome any significant environmental issues

The drawl quantity is **6,984 cu.m/day**. In order to protect the water environment, the project proponent has implemented rainwater harvesting within the Plant and outside as per the CGWA guidelines.

7.1. Nil

7.2. Impact on Ground water sources

As discussed in the chapter 4, it is clear that the draw down in the wells is **1.46 m.** Aquifer performance reveals that the **98 %** recovery attained less than 1 hour after pumping stopped.

It is clear that the aquifer replenishes quickly. Considering all the above, there would not be any adverse impact on ground water system surrounding the Plant area.

7.2.1 A description of the impacts on environmental values that have occurred, or are likely to occur, because of any past ground water abstraction

As per the ground water resource estimation (CGWB Report) 2020, the **JHANJHRI** Block has been categorized as **Safe**, since the stage of ground water development is **62.98%**

The **Jhanjhri** block area is 2**3,673 Hectares**. The total estimated ground water recharge of Jhanjhri block is **5660 ha.m**. The natural discharge is in the order of **283.04 ha.m**. The total ground draft is **3386 ha.m**. The ground water stage of extraction in **JHANJHRI** block **62.98 %** as per the report of CGWB 2020. The area of 5 Km radius buffer zone is **78.61 sq.km** (Radius from the Plant site boundary). Based on the **pro rata calculation**, the estimated ground water draft for all uses for the study area covering **78.66 sq.km** is **1124 ha.m.**

In order to augment the ground water, the Plants proponent implemented ground water recharge structures with in the plant, deepening of village ponds as corporate social responsibility. It is estimated, about **14,487 cu.m/year** is being recharged into the aquifer which is about 1 **%** of the Plant ground water drawl quantity of **20,95,850** cu.m/**year**). The details of the rain water harvesting is presented in chapter 10. Considering the above there would not be negative impact on ground water regime in and around the Plants.

7.2.2 An assessment of the likely impacts on environment that will occur, or are likely to occur, because of the ground water abstraction for a five years period starting on the consultation day for the report; and over the projected life of the resource project area, affected area and radius of influence in case of dewatering

Based on the aquifer characteristics and the drawl of water for the Mine, the impact model of pumping in the surrounding areas has been attempted using Visual MODFLOW Flex Software.

The following assumptions has been considered for the model:

- The industrial drawl quantity is **6,984** cu.m/day
- The rainfall recharge is same all the years considered
- Surrounding irrigation wells pumping considered

The Initial head of the mines lease area has been derived based on the ground water level data collected for the per-and post monsoon periods.

The Initial head has been considered for the ground water modeling and the predicted head due to the mine dewatering has been projected using the Visual Modflow software for the periods of 1,2,3,4,5 and 10 Years **(As per recent CGWA webinar presentation – 5- and 10-years prediction).** Initial head in and around the mine lease area is given in **Figure-30**

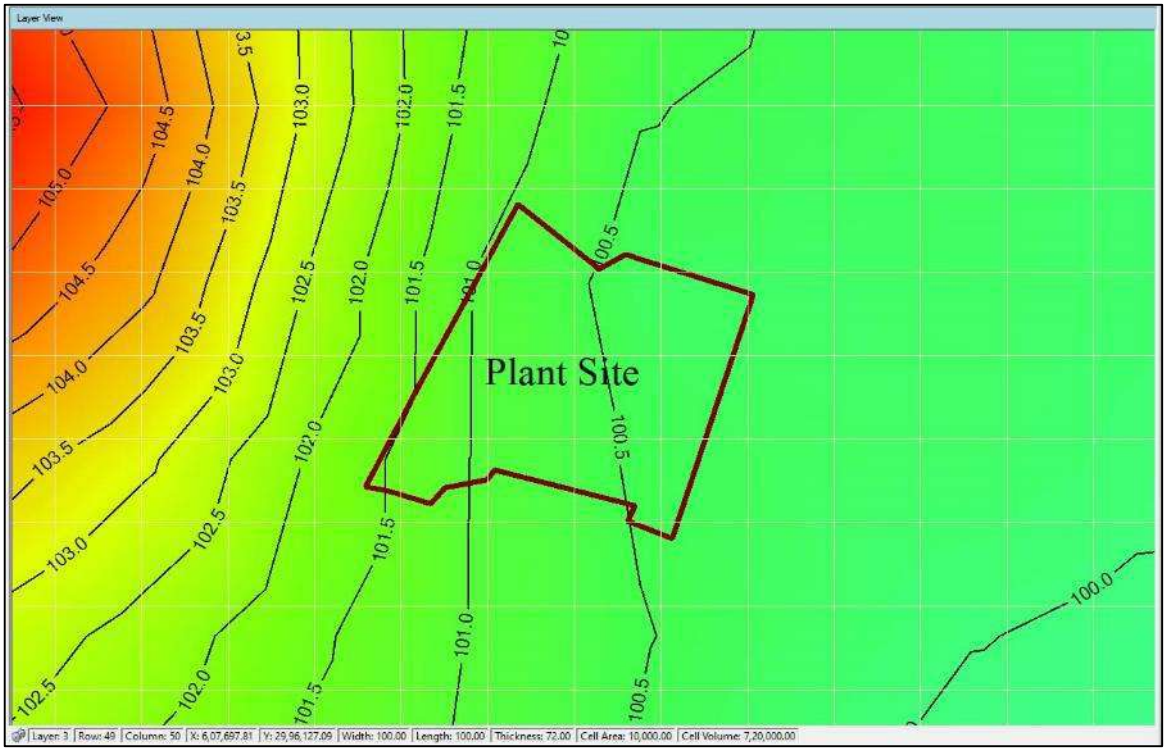


Figure 31: Initial Head in and around the Plant lease area

Prediction Scenario 1 –First year pumping Scenario:	
First Year	
Predicted Maximum Down in m	**2.79**

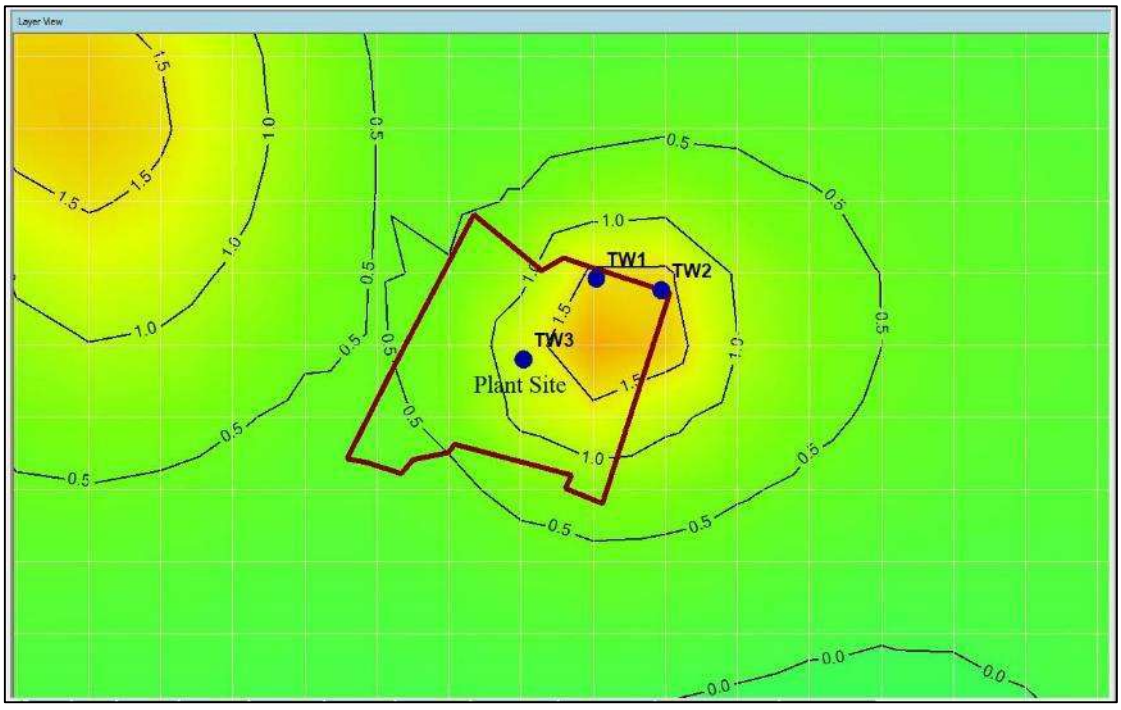


Figure 32: Drawdown in the Plant pit at end of 1st Year

Prediction Scenario 2–Second year pumping Scenario:

Second Year	
Predicted Maximum Down in m	**3.25**

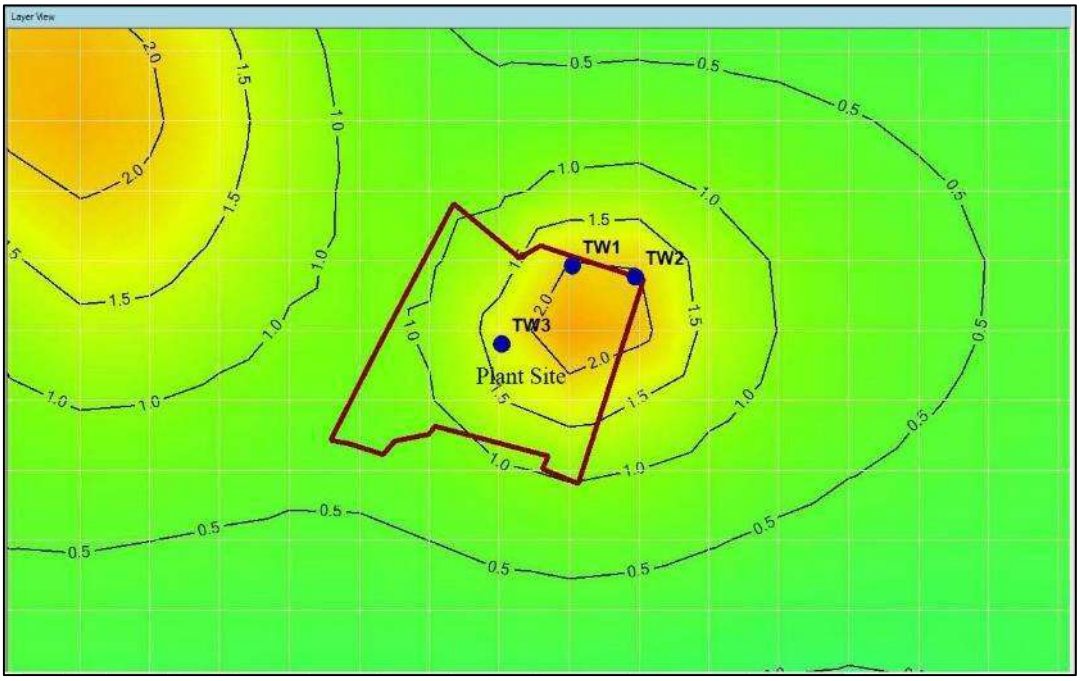


Figure 33: Drawdown in the Plant pit at the end of 2nd Year

Prediction Scenario 3–Third year pumping Scenario:

Third Year	
Predicted Maximum Down in m	**3.45**

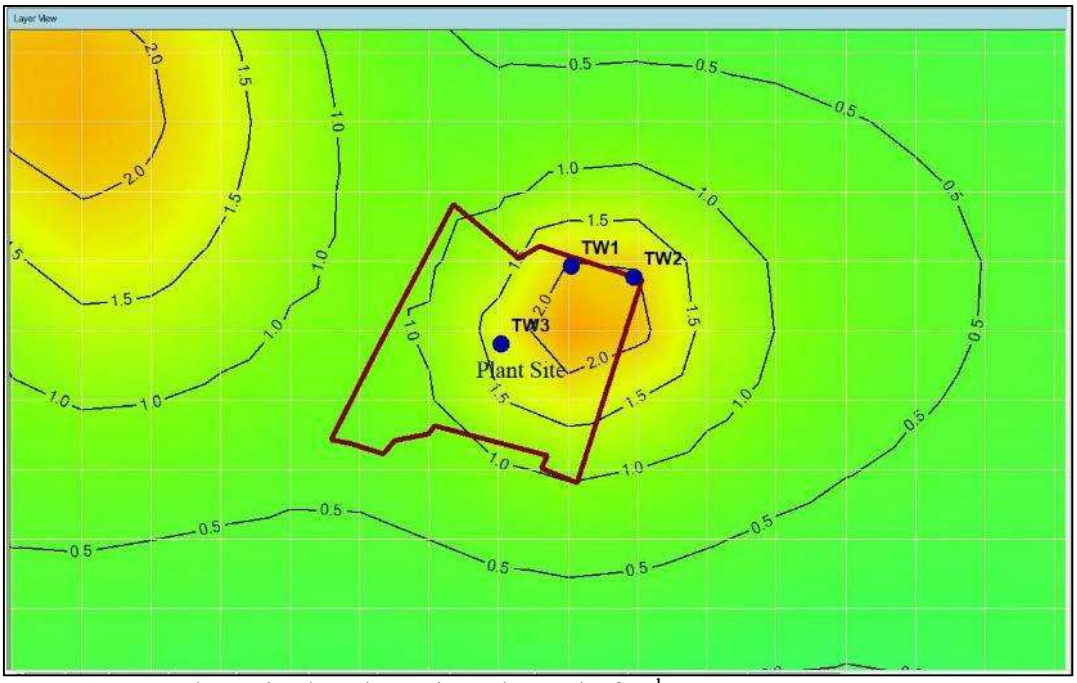


Figure 34: Drawdown in the Plant pit at the end of 3rd Year

Prediction Scenario 4–Fifth year pumping Scenario:

Fourth Year	
Predicted Maximum Down in m	**3.56**

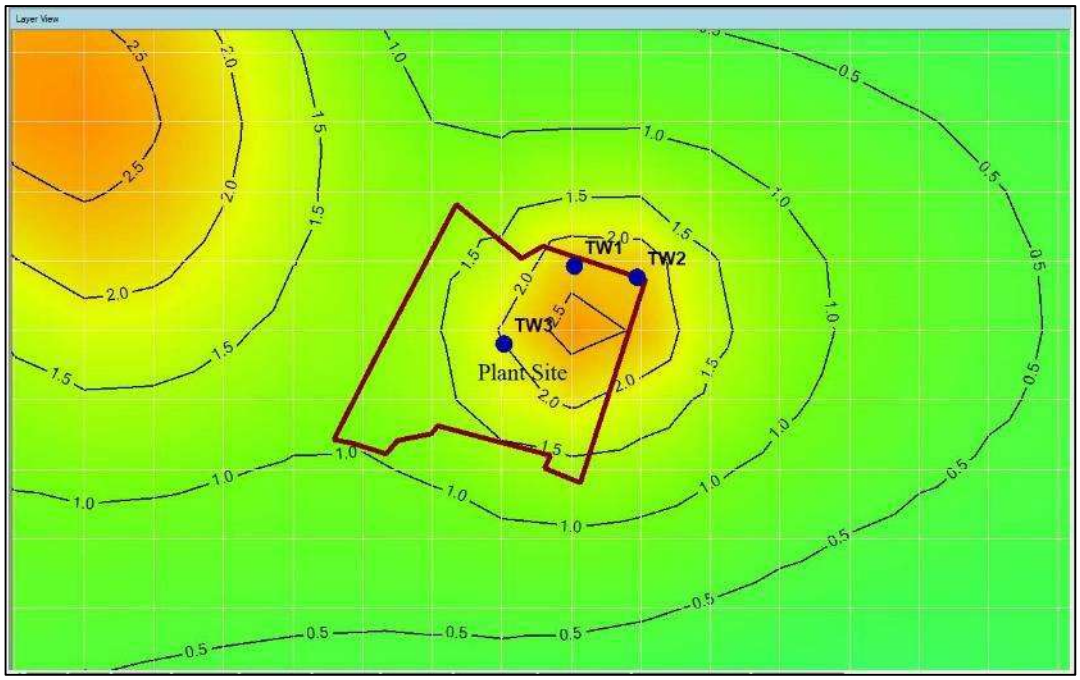


Figure 35: Drawdown in the Plant pit at end of 4th Year

Prediction Scenario 5–Fifth year pumping Scenario:

Fifth Year	
Predicted Maximum Down in m	**3.67**

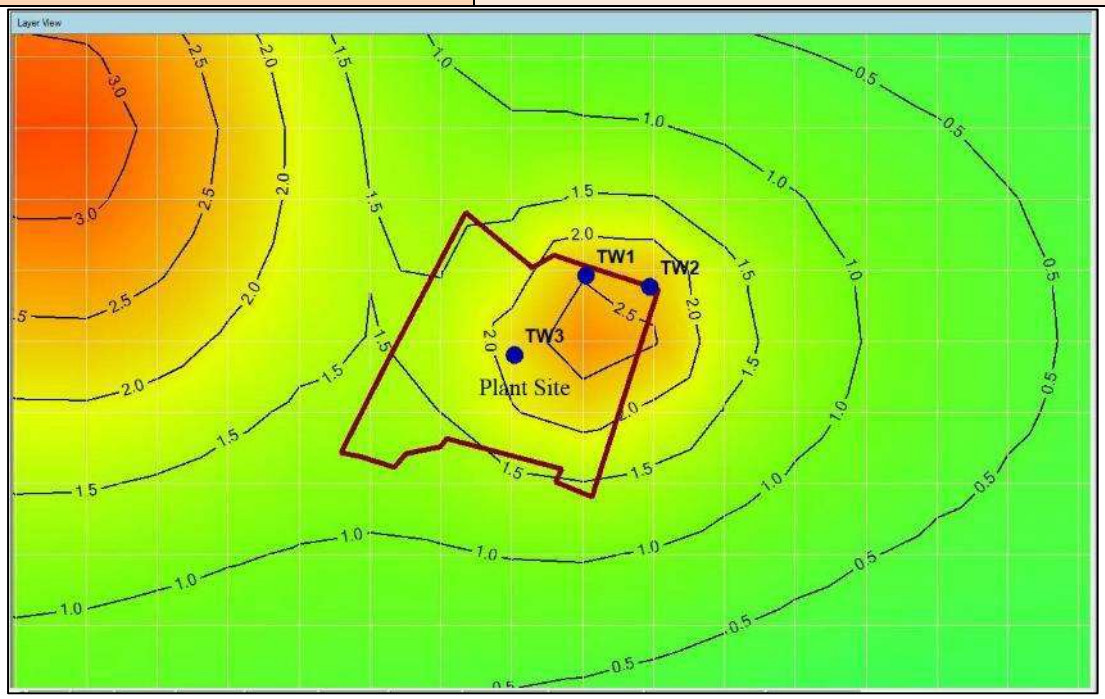


Figure 36: Drawdown in the Plant pit at end of 5th Year

Prediction Scenario 6 – Tenth year pumping Scenario:

Tenth Year	
Predicted Maximum Down in m	**4.03**

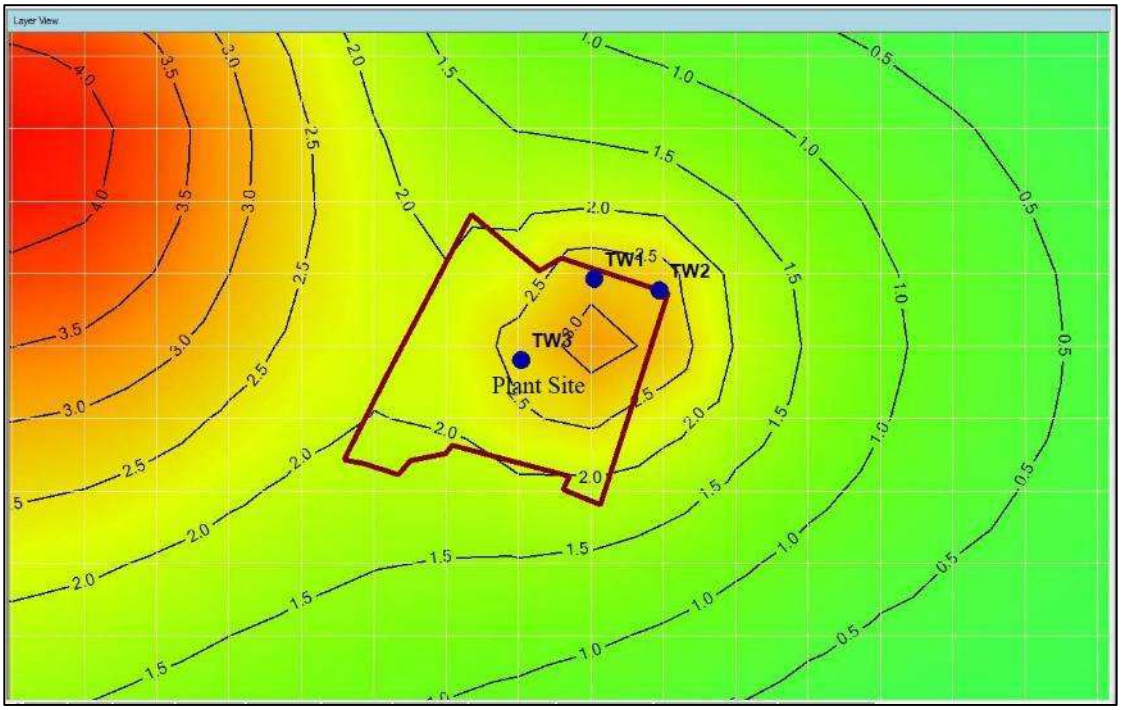


Figure 37: Drawdown in the Plant pit at end of 10th Year

Inference:

- The predicted drawdown in Plant site **3.67 m in the fifth year.**
- The predicted drawdown in Plant pits **4.03 m in the Tenth year,**
- The predicted drawdown is at the time of pumping. During the monsoon period and non-mining period the water level raise to the original water level in the monsoon period.

The drawdown is very less as the tube well are located in the alluvial formation.

Hence the pumping of ground water for industrial and domestic needs of 6,984 cu.m/day would not make any adverse impact in the ground water regime.

<u>The model output reveals that the impact of pumping would not affect the surrounding pumping wells as the radius of influence confines to the Plants area.</u>

7.3 Socio-Economic Aspects

Any developmental activity exerts a direct impact on the socio-economic environment of the region. Usually, the beneficial impacts such as better job opportunities, improved education, communication, energy, housing, health, transportation facilities etc. outweighs the adverse impacts, if any. The study of socio-economic component of environment is incorporating various facets, viz. demographic structure, availability of basic amenities such as housing, education, health and medical services, occupation, water supply, sanitation, communication and power supply, prevailing diseases in the region as well as features such as places of tourist attraction and monuments of archaeological importance. The study of these parameters helps in identifying predicting and evaluating the likely impacts due to project activity in the surrounding region.

7.3.1 Settlements and population dynamics around project area

The latest available data has been complied to generate the existing socioeconomic scenario of the study area. Information on socio-economic profile was collected from the **Primary Census Abstract CD 2011** including the population details of the region.

The Socio-economic report of Bajaj Energy limited Kundarki Plant – Village Kendari, District - Gonda, State- Uttar Pradesh. Power Plant. The Total 30 villages and urban area are coming within the 5 kms radius of the project site and the villages are from Kundarki tehsil of Gonda District, Uttar Pradesh state.

Demographic Structure

Demographic structure of the study area was estimated for the selected parameters as households, population, sex ratio, scheduled caste, scheduled tribes, literacy from primary census abstract, CD 2011 of Jharkhand State. The summarized demographic structure of the study area is presented in below Table, while the details of the parameters of demographic structure of the villages are shown in below **Table-28**

Table 28: Demographic structure

Sr.No	Parameter	Study Area
1.	No. of Villages	30
2.	Household	5657
3.	Total Population	36173
4.	Male Population (%)	18881
5.	Female Population (%)	17292
6.	Scheduled Caste %	7609
7.	Scheduled Tribes %	1

Demographic Profile of the villages

Total number of households are about 5657

- Total population of villages under the study area is 36173 out of which males are 18881 (52%) and females are 17292 (48%)
- The average family size is about 5.3 persons per family
- Scheduled caste population is 7609 and Scheduled tribes' population is 1 in the study area.

From the Census of India 2011 data, it has been noticed that the requirement of drinking water is being met out by well water and hand pumps. All the villagers are availing drinking water facility from ground water source such as hand pumps, although some other water sources like tanks, ponds area also available in some village. In majority of the villages hand pumps are the main source of drinking water supply.

The availability of drinking facility with different structures is given **Table: 29**

Table 29: Availability of drinking water sources

Village Name	Tap Water-Treated	Hand Pump	Tube Wells/Borehole
Kalandarpur Teer	Available	Available	Available
Chisti Pur	Not Available	Available	Not Available
Vishnaga	Not Available	Available	Not Available
Newari	Not Available	Not Available	Available
Mahadaiya	Available	Available	Available
Rathwalia	Available	Available	Not Available
Bharhapara	Not Available	Available	Available
Gobindpara	Not Available	Available	Not Available
Rampur Chachpara	Not Available	Available	Not Available
Birwa Babhani	Not Available	Available	Available

Village Name	Tap Water-Treated	Hand Pump	Tube Wells/Borehole
Beervisen	Not Available	Available	Available
Khutehna	Available	Available	Available
Dandua Dasvatia	Not Available	Available	Available
Kunderahwa	Not Available	Available	Available
Kundrkhi	Not Available	Available	Available
Chaksad	Available	Available	Available
Pipri Surajman	Not Available	Available	Available
Kharai Khirwa	Not Available	Available	Available
Ramnagar Bankat	Available	Available	Available
Chetpur	Not Available	Available	Not Available
Koeli Biran	Not Available	Available	Available
Bankasiya	Not Available	Available	Available
Banghusara	Not Available	Available	Available
Bhatbabhni	Not Available	Available	Available
Khiria	Not Available	Available	Available
Majhganwa	Not Available	Available	Not Available
Paderahi	Available	Available	Available
Harhava	Available	Available	Available
Kahova	Not Available	Available	Available
Kemi	Available	Available	Available

During the field visit the villagers were interacted and ascertained the source of drinking water. The villagers explained that the only drinking water source is hand pump and some village pond. Less number of piped water supply in the study area. The water supply through individual power pump schemes in the study area would improve the health and economic status.

7.3.2 Dependency on sources of water [surface or sub-surface]

The project area is irrigated by wells and bore wells. For assured water, supply surface water and groundwater become the two major sources. The dependable source for the irrigation is bore well. Water availability is abounded in the study area. Hence, the irrigation water supply is a major issue.

7.3.3 Ground water uses [e.g., irrigation (irrigation method, number of watering) water supply etc.]

There are sufficient drinking water facilities available in the study area. As per visual perception 2021, in many villages the tap water supplies are available. Most of the villagers are having wells, Tube wells. The Tube well based irrigation is noticed in the study area.

7.3.4 Improvement / decline in agricultural yield in last 5 years and likely impact after NOC

Farmers are growing cash crop in summer season also due to additionality of ground water. The energy consumption for lifting the water also reduces. In piezometers of the CGWB well water level in general and during pre-monsoon season and during post monsoon season showing fluctuation trend of rise and fall which depends on the monsoon rainfall. So, there is a no adverse impact on ground water regime within the Plant and outside of Plant.

7.3.5 Impact of proposed / existing project on local communities [based on local interactions (interactions must be with stakeholders like fishermen community, farmers etc.]

The main impact of ground water draft by industries is groundwater depletion, a term often defined as long-term water-level declines caused by sustained groundwater pumping is a key issue associated with groundwater use which may cause the following impacts on socio economic condition:

1. Over pumping lowered the water level which decline the yield and reduce its availability for irrigation as well as drinking purposes which can directly effect to the basic need of the population.

3. Decline in water level may lead to deterioration of water quality due to excessive ground water draft may have an adverse effect to the health of the people in the study area.

4. When water is taken out of the soil, the soil collapses, compacts, and drops and causes land subsidence due to removal of subsurface water.

8. Proposed measures for disposal of waste water by the industries drawing saline water

The Plant is not drawing any saline water for the industrial use. The Plant is using only ground water and the treated waste water.

9. Measures to be adopted for water conservation which include recycling, reuse, treatment, etc. This includes the water balance chart being adopted by the firm along with details of water conservation methods to be adopted

Brief write up along with capacity and flow chart of Sewage Treatment Plants / Effluent Treatment Plants / Combined Effluent Treatment Plants existing/ proposed within the project.

As per the MINISTRY OF JAL SHAKTI (Department of Water Resources, River Development and Ganga Rejuvenation) (CENTRAL GROUND WATER AUTHORITY NOTIFICATION issued on 24th September, 2020 states that Installation of Sewage Treatment Plants (STP) shall be mandatory for new projects, where ground water requirement is more than 20 cu.m /day.

The plant is using only 1 cu.m/day of water for its domestic needs. However, the firm installed STP to treat the waste water.

Photograph of STP installed in the Plant.



Cooling tower blowdown and "N" pit water are sent to ETP for treatment and after treatment the clean water is pumped into the UGR tank. UGR water is used for:

1. Horticulture water;
2. Ash water;

3. Service water and
4. Fire water

Table 30: ETP - Water Consumption and Balancing

Sl. No.	Item Ref.	Avg. Discharge of Pump / Line (m^3/hr).	Avg. Pump / Line Operating hrs per day (as per discussion)	Avg. no. of pumps / line operating during the day	Avg. flow (m^3/hr) (@24hrs / day).	Avg. Flow (m^3/day)	%	Remarks
1	**Inflow of Effluent Treatment Plant (ETP)**							
1.1a	ETP inlet (CT blowdown)	56	4.0	1	9	224		* CT B/D - Side filter-CT cold basin flow 130 m3/hr for turbidity control (continuous flow) against design flow 117m^3/hr for one stream.
1.1b	CT blowdown (Tanker filling)					78		
1.1	Total CT blowdown					302		
1.2	ETP inlet (N-Pit)			1	1	13		
	Inflow of ETP				9	237		
2	**Outflow of ETP to UGR tank**							
2.1	ETP Outlet	51	4.3	1	9	220		
	Outflow of ETP				9	220		
	Difference				0.17	17.00		Storage in equalisation tank
1	**Inflow of underground reservoir (UGR) tank**							
1.1	UGR inlet				9	220		
	Inflow of UGR				**9**	**220**		
2	**Outflow of underground reservoir (UGR) tank**							
2.1	Horticulture Pump (Potable Water)	25	5.0	1	5	125		
2.2	Ash Water Pump	26	1.5	1	2	39		
2.3	Service Water	95	0.3	1	1	29		
	Outflow of UGR				8	193		
	Difference				1.14	27		Storage in UGR tank

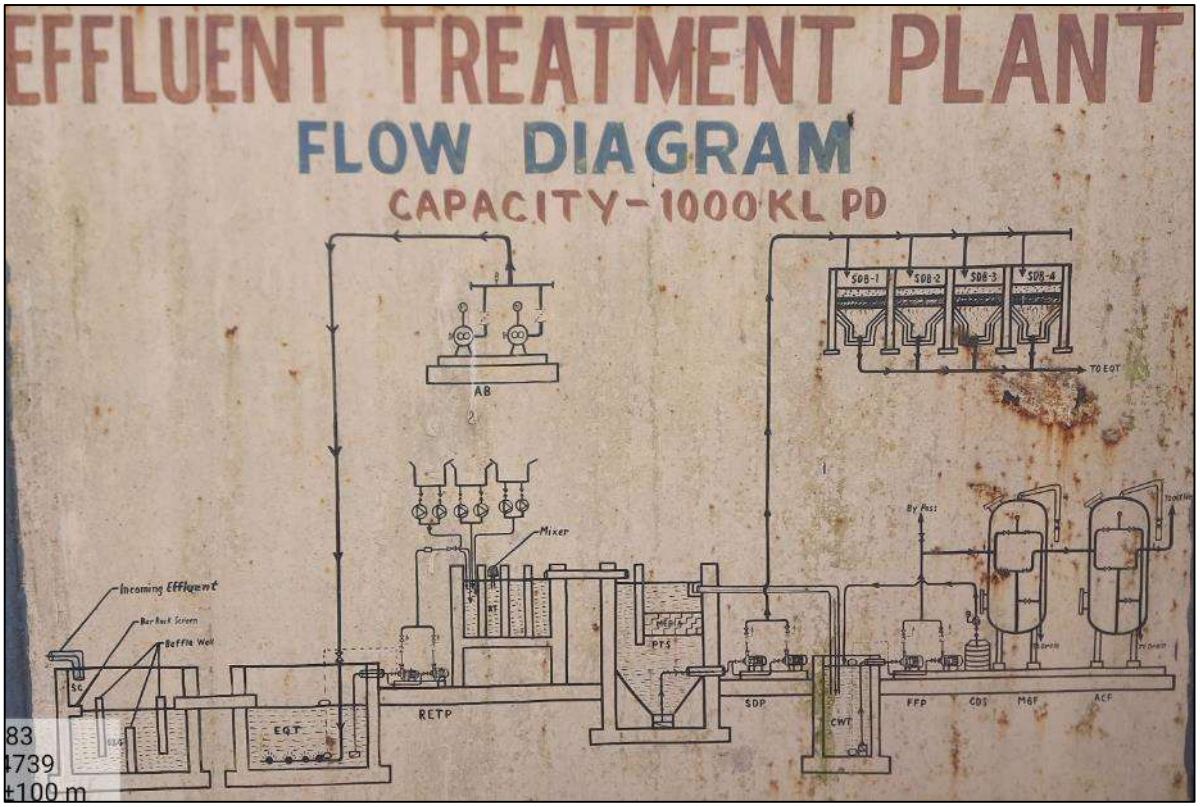
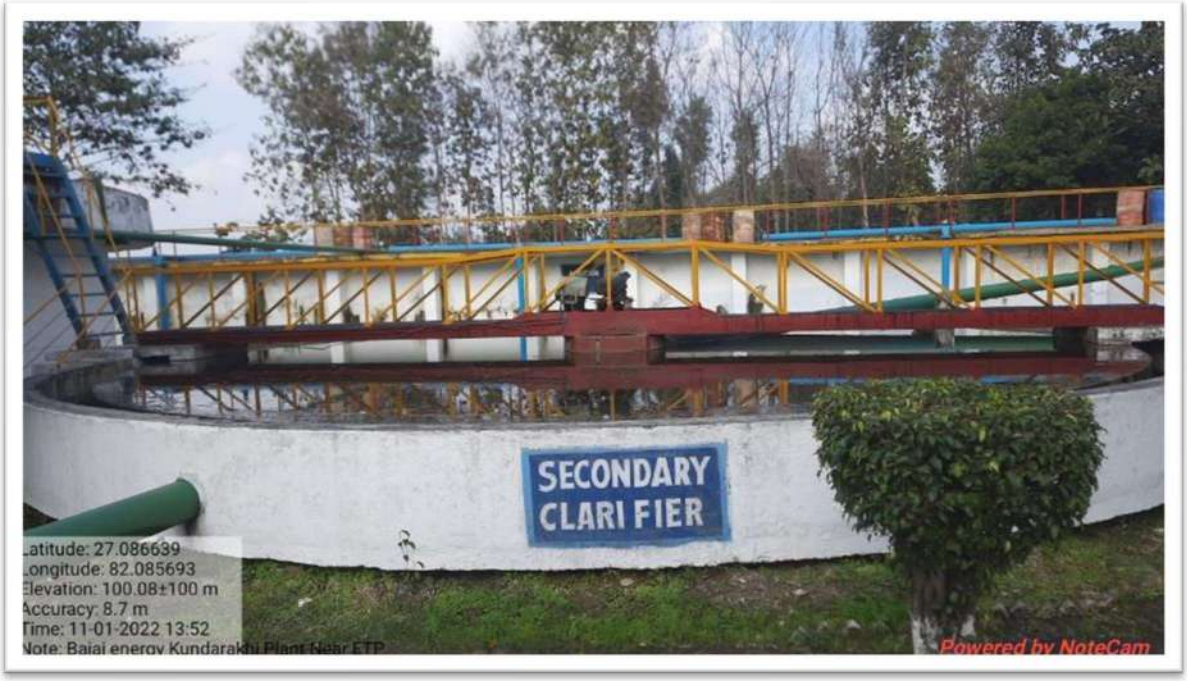


Figure 38: ETP Flow Diagram

Photograph showing the ETP




SECONDARY
CLARI FIER
Latitude: 27.086639
Longitude: 82.085693
Elevation: 100.08±100 m
Accuracy: 8.7 m
Time: 11-01-2022 13:52
Note: Bajaj energy Kundarakhi Plant Near ETP
Powered by NoteCam


PUMP HOUSE
Latitude: 27.0865
Longitude: 82.08567
Elevation: 99.08±100 m
Accuracy: 11.8 m
Time: 11-01-2022 13:52
Note: Bajaj energy Kundarakhi Plant Near ETP
Powered by NoteCam

Details of water conservation measures to be adopted to reduce/ save the ground water

Lots of surface and subsurface recharging measures are possible depending upon the site conditions. The specific recharge measures are to be selected depending on the soil characteristics, lithology and nature of the aquifer material, pre- and post-monsoon, ground water level and rainfall, and so on.

The average ground water level in the plant site clearly indicates that the ground water level in the study area is moderately deep.

Since, the industry is power plant, Surface storage techniques such as roof water harvesting (sump collection) pond with recharge well has been suggested in the plant site. Apart from the above Cleaning of pond located in the north eastern side of the plant has been suggested to increase the capacity which will enhance the ground water recharge.

Based on vacant, roof top area and the monthly rainfall and Run-Off has been estimation of Run-Off from the Plant site has been assessed and the recharge quantity has been assessed.

Rainfall Frequency Analysis

Rainfall of varying intensities and varying duration occurs from time to time. In order to understand this, it is necessary to determine the probability of occurrence of a particular rainfall event. This is achieved through frequency analysis of rainfall data.

Monthly Rainfall Data for the past 25 years in respect of the plant site was analysed and the probability of rainfall occurrence for 50%, 70% and 90% dependability were also analysed using **Weibull's method**. The rainfall frequency analysis results are given below.

(i)	50 % dependable rainfall	:	902.9 mm, 2001
(ii)	70 % dependable rainfall	:	776.4 mm, 2018
(iii)	90 % dependable rainfall	:	662.9 mm, 2015

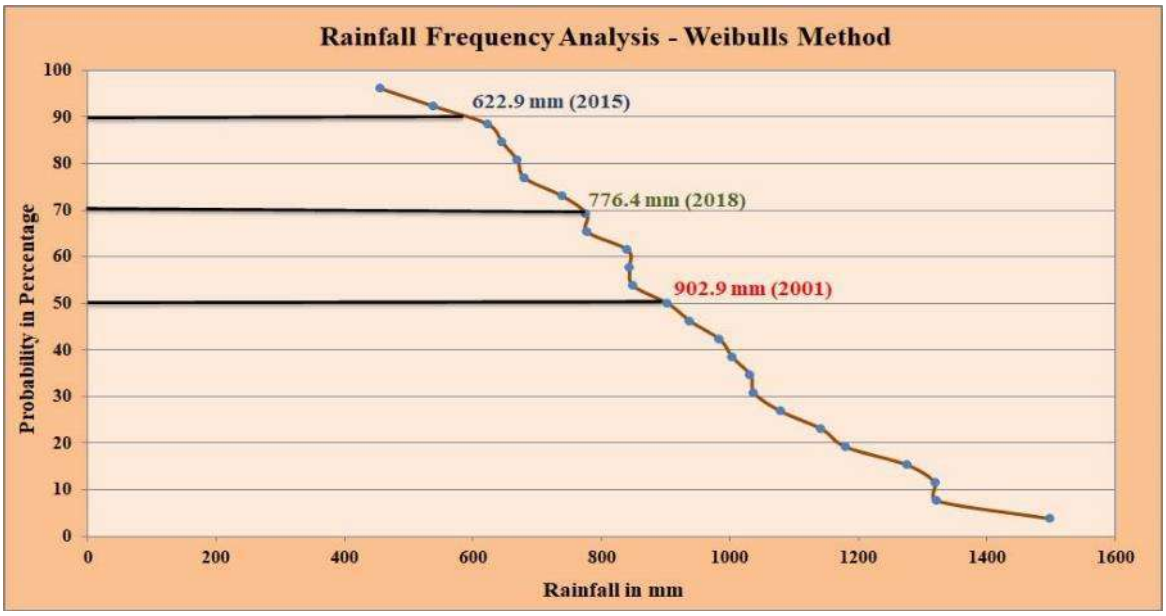


Figure 39: Rainfall Frequency graph

The 70% rainfall dependability is considered for runoff calculation from the plant site. The 70% dependable monthly rainfall of the year 2001 has been taken up for the runoff estimation. Monthly rainfall in mm for the year 2001 (70% rainfall dependable year) is as follows.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total mm
0.1	4.6	0.0	21.0	26.2	66.9	330.5	253.6	73.6	0.0	0.0	0.0	**776.4**

Estimation of Monthly Run-Off from the Plant site

For the estimation, 25 years monthly normal rainfall has been considered. The run-Off from the plant site has been estimated based on Rational method. The co-efficient used to estimate the Run-Off from the different surfaces is as follows. The co-efficient are considered as per the CGWA guidelines.

Roof Area - 0.85
Asphalted and Paved Area - 0.65
Green Belt Area - 0.15
Open and Vacant Area - 0.20
(Source: CGWA Web Site)

- Volume of rainwater that can be collected from the plant site has been estimated from the monthly normal rainfall.

- Vacant &green belt area, roof top area and paved area of the plant site have been considered for the run off estimation and conservation measures.

The details of various areas are as follows:

Table 31: Area considered for Rain water harvesting

S No	Facility	Area in Sq.m
1	Roof area of the buildings	**10,000**
2	Road with Asphalt and Parking area	**3,800**
3	Green Belt area	**12,000**
4	Vacant and open area – Unpaved open area	**46,544**
	Total Area	**72,344**

Pre-Plant Run-Off

- Rational method has been used to estimate the Run-Off for the plant site.
- Run-Off after commissioning of the plant has been estimated.
- The volume of water that is being generated after natural recharge before commissioning has been estimated as **11,166 Cu.m/Year.**

The predicted Pre–Plant Run-Off is as follows:

Table 32: predicted Pre–project Run-Off

Predicted Pre Project-Runoff from the Plant site				
Type of Area	Area in Sq.m		Runoff co-efficient	Runoff from Different Land surface in cu.m
Total area (m²)	72344		0.20	11166
Total Runoff	In Million liters / Year	**11.17**	In cu.m	**11166**
Month	Monthly rainfall (mm)	Number of Rainy days	Pre- Project Runoff in cu.m	
January	0.1	1	0	
February	4.6	2	0	
March	0.0	0	0	
April	21.0	3	304	
May	26.2	3	379	
June	66.9	8	967	
July	330.5	16	4782	
August	253.6	14	3669	
September	73.6	8	1065	
October	0.0	0	0	
November	0.0	0	0	
December	0.0	0	0	
Total	**776.4**	**55**	**11166**	
In ML/YR			**11.17**	
Note: More than 10 mm of Rainfall is considered for runoff estimation due to initial interception				
Runoff Co-efficient: Manual of Artificial Recharge of Ground Water, (CGWB,2007)				

Post-construction Run off

The same rainfall and the land area have been taken up for the estimation of Run-Off for the prediction from the plant site after construction. As the vacant exposed land would be converted in to build up land, the natural recharge that had taken place during the pre-construction period would not occur and hence there would be meager infiltration. The losses such as, percolation, evaporation and other unforeseen losses have been considered.

Predicted Post Plant Run-Off from different surfaces:

Table 33: predicted Post project Run-Off

Predicted Post Project Runoff from the Plant site						
Type of Area	Area in Sq.m		Runoff co-efficient		Runoff from Different Land surface in cu.m	
Roof Area (m²)	10000		0.85		6561	
Road and Paved area m²)	3800		0.65		1906	
Green Belt area (m²)	12000		0.15		1389	
Vacant and Open Land (m²)	46544		0.20		7185	
Total Runoff	In Million liters / Year		**17.04**	In cu.m	**17,041**	
Month	Monthly rainfall (mm)	Number of Rainy days	Runoff from Roof area in cu.m	Runoff from Asphalt and paved area cu.m	Runoff from Green Belt area in cu.m	Runoff from Vacant area in cu.m
January	0.1	1	0	0	0	0
February	4.6	2	0	0	0	0
March	0.0	0	0	0	0	0
April	21.0	3	179	52	38	196
May	26.2	3	223	65	47	244
June	66.9	8	568	165	120	622
July	330.5	16	2809	816	595	3077
August	253.6	14	2156	626	456	2361
September	73.6	8	626	182	133	685
October	0.0	0	0	0	0	0
November	0.0	0	0	0	0	0
December	0.0	0	0	0	0	0
Total	**776.4**	**55**	**6561**	**1906**	**1389**	**7185**
In ML/YR			**6.56**	**1.91**	**1.39**	**7.19**
Note: More than 10 mm of Rainfall is considered for runoff estimation due to initial interception						
Runoff Co-efficient: Manual of Artificial Recharge of Ground Water, (CGWB,2007)						

Predicted Post Plant Run-Off from the Plant area– **17,041 Cu.m/Year**

The estimated pre- and post-Plant Run-Off is as follows:

Estimated Pre Project-Runoff from the Plant site	**11166**	**Cu.m/Year**
Estimated Post Project Runoff from the Plant site	**17041**	**Cu.m/Year**
Difference in Pre and Post Project Runoff	**5875**	**Cu.m/Year**

Excess Run-Off of 5875 cu.m/year is being generated in the Plant site during post Plant period.

As per the CGWA guidelines, it is mandatary to harvest rainwater harvesting within the plant site.

Conservation measures

In order to harvest the rain water with in the plant site, the following recharge structures (Roof water harvesting Structures) have been suggested.

1) Roof top rain water harvesting through sump
2) Recharge trench with bore well

Roof top collection:

- The roof water collection is estimated as **1194 Cu.m/Year**

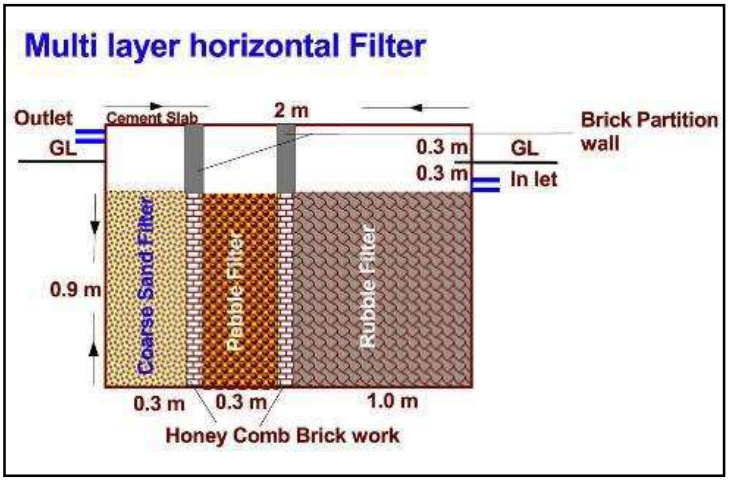
Harvesting measures in Plant Site:

- 10 sumps (Size 1.5 m length X 3 m width X 4.5 m depth) with a total capacity of **202.5 Cu.m** have been suggested to capture the roof water.

The rainwater that is being collected from the roof is being passed through a filter media. The filter media is multilayer vertical filters. The size of the filter media is as follows:

- The size of the multilayer vertical filter is 2m X 2m X 1.2m

The outlet pipes from the roof area will be connected with 115 mm dia PVC pipe allowing the water to pass through the filter media before storing in the sump



Calculation of Rainwater Harvesting – Sump Collection

Estimation of Roof Water Harvesting						
Description	Depth in m	Length in m	Width in m	Number of Sump	Total Capacity of Sump in CUM	Estimated Roof Water Harvesting in CUM/Year
Roof Top collection Sump Details	1.5	3	4.5	10	202.5	**1194**
Total Estimated Roof Water Harvesting in CUM/Year						**1194**
Total Roof Area in Sq.m	10000		Runoff co-efficient	0.85		
Month	Monthly rainfall (mm)	Number of Rainy days	Runoff from the Site in CUM	Estimated Roof Water Harvesting (Sump) in CUM/Month	Surplus runoff after Sump collection in CUM	
January	0.1	1	0	0	0	
February	4.6	2	0	0	0	
March	0.0	0	0	0	0	
April	21.0	3	179	179	0	
May	26.2	3	223	203	20	
June	66.9	8	568	203	365	
July	330.5	16	2809	203	2606	
August	253.6	14	2156	203	1953	
September	73.6	8	626	203	423	
October	0.0	0	0	0	0	
November	0.0	0	0	0	0	
December	0.0	0	0	0	0	
Total	**776.4**	**55**	**6561**	**1194**	**5367**	
In ML/YR			**6.56**	**1.19**	**5.37**	
Note: More than 10 mm of Rainfall is considered for runoff estimation due to initial interception						

In order to harvest the runoff from different surfaces Storage Pond cum draw well with filter media has been constructed. The stored water in the pond can be drawn from the draw well. The detailed monthly rainwater harvesting is presented in the below table.

The Run-Off after roof top collection and from the green belt, asphalt area has been estimated.

1) Run-Off from roof top (after sump collection) : **5367** CUM/Year
2) Run-Off from Asphalt paved area : **1906** CUM/Year
3) Run-Off from Green belt and Vacant area : **8574** CUM/Year
4) Total Run-Off (1+2+3) : **15847** CUM/Year

Portion of runoff water is being diverted to the recharge shaft with bore well.

Estimated recharge through recharge pits with recharge wells:

3 numbers of recharge pits with recharge bore wells of 4" diameter and 35 m depth have been constructed in the project premises.

These structures are feasible to recharge the ground water resources of the area. Water collected from paved and asphalt area is diverted to the recharge pit with recharge bore well.

The estimated ground water recharge through 3 recharge pits with recharge bore wells and is **13,293 cu.m / year.** The monthly estimated recharge is as follows:

Table 34: Estimated well recharge

Estimation of Recharge through Rain water Harvesting - Recharge pit with Recharge bore well							
Description		Depth in m	Dia in m	aquafer thickness in m	Trasmissivity Sq.m / Day	Estimated Recharge Volume in CUM	
Recharge pit with Recharge well and recharge bore well		35	0.1016	10	300	**3000**	
Total paved and asphalt and Green Belt Area in Sq.m	15800		Runoff co-efficient		0.65	Number Storm water Recharge well	**3**
Month	Monthly rainfall (mm)	Number of Rainy days	Runoff from the paved and asphalt area in CUM	Runoff from Roof top in CUM	Total Runoff available recharge structures in Cum	Estimated recharge Volume (Based on Rainy days) in Cum	Surplus runoff after recharge in CUM
January	0.1	1	0	0	0.0	0.0	0
February	4.6	2	0	0	0.0	0.0	0
March	0.0	0	0	0	0.0	0.0	0
April	21.0	3	216	0	216.0	216.0	0
May	26.2	3	269	20	289.0	289.0	0
June	66.9	8	687	365	1052.0	1052.0	0
July	330.5	16	3394	2606	6000.0	6000.0	0
August	253.6	14	2604	1953	4557.0	4557.0	0
September	73.6	8	756	423	1179.0	1179.0	0
October	0.0	0	0	0	0.0	0.0	0
November	0.0	0	0	0	0.0	0.0	0
December	0.0	0	0	0	0.0	0.0	0
TOTAL	**776.4**	**55**	**7926**	**5367**	**13293.0**	**13293.0**	**0**
In ML/YR					**13.29**	**13.29**	**0.00**
Note: More than 10 mm of Rainfall is considered for runoff estimation due to initial interception							

Since the aquifer has high transmissivity (Gangetic Plain) the recharge through 3 recharge pits with recharge bore will is high (13,293 cu.m/year).

Photograph of recharge pits with recharge bore will







The firm has adopted village pond and increased the storage capacity by way of Cleaning and recharge shafts have been created to accelerate the recharge. The surplus flow from the plant site is diverted to the village pond. **Apart from the above the runoff generated outside the plant site are also diverted to the village ponds.**

The pond size and capacity are given below:

Description	Length in m	Width in m	Depth in m	Water Spread area in Sq.m	Capacity of Pond in CUM
Pond 1 at Kahoba	**400.0**	**255.0**	**3.0**	**102000**	**306000**
Pond 2 at Birwa Babhani	**590.0**	**340.0**	**3.0**	**200600**	**601800**
Total Water spread area in Sq.m				**302600**	**907800**

Ground water recharge from the Recharge Structures (Check Dam / Percolation Pond - 40 % of the Stored Volume as per CGWB Norms -2015).

The recommended monsoon recharge is 20 % of the gross storage. 2 times filling is expected in monsoon period.

The non-monsoon recharge due to pond is also recommended as 20 % of the Gross storage. It is expected 1 filling in the non-monsoon period as there is less rainfall during non-monsoon period.

Number of fillings in a Monsoon	Number of fillings in a non-Monsoon	Recharge Factor 20 % of stored volume	Monsoon Recharge in cu.m	Non-Monsoon Recharge in cu.m	Annual Recharge in cu.m
2	**1**	**20**	**122400**	**61200**	**183600**
2	**1**	**20**	**240720**	**120360**	**361080**
Total Recharge					**5,44,680**

The abstract of rainwater harvesting is as follows:

Table 35: Rainwater harvesting abstract

Rain water Harvesting - Abstract		
Rain water Harvesting - Ground water recharge		
Estimated Recharge from the rain water collected in the Sump	**1,194**	**cu.m/Year**
Estimated Ground water recharge through recharge pits with recharge bore wells	**13,293**	**cu.m/Year**
Estimated water harvested through Cleaning of water bodies (Outside the plant)	**5,44,680**	**cu.m/Year**
Estimated Total Ground water recharge Volume	**5,59,167**	**cu.m/Year**

Analytical comparison has been made based on the ground water recharge in the project site.

- **Ground water drawl Vs Estimated ground water recharge**

The analysis reveals the following

Estimated Total Ground water recharge Volume	**5,59,167**	**cu.m/Year**
Ground water drawl for Industrial Use	**20,95,850**	**cu.m/Year**
The Estimated percentage Rain water Harvesting Vs NOC Ground water drawl for Industrial Use	27	**Percentage**

As the study area falls under Safe category, RWH has been implemented.

The estimated rainwater harvesting is more than the CGWB recommended quantity (as per the guidelines). Hence the drawl of ground water is replenished by the rainwater harvesting and there would not be any adverse impact on the ground water regimen of the study area.

Total water balance chart showing the usage of water for various processes

The flow chart for the water balance of Plant is prepared. The water balance chart is presented in **Figure 36.**

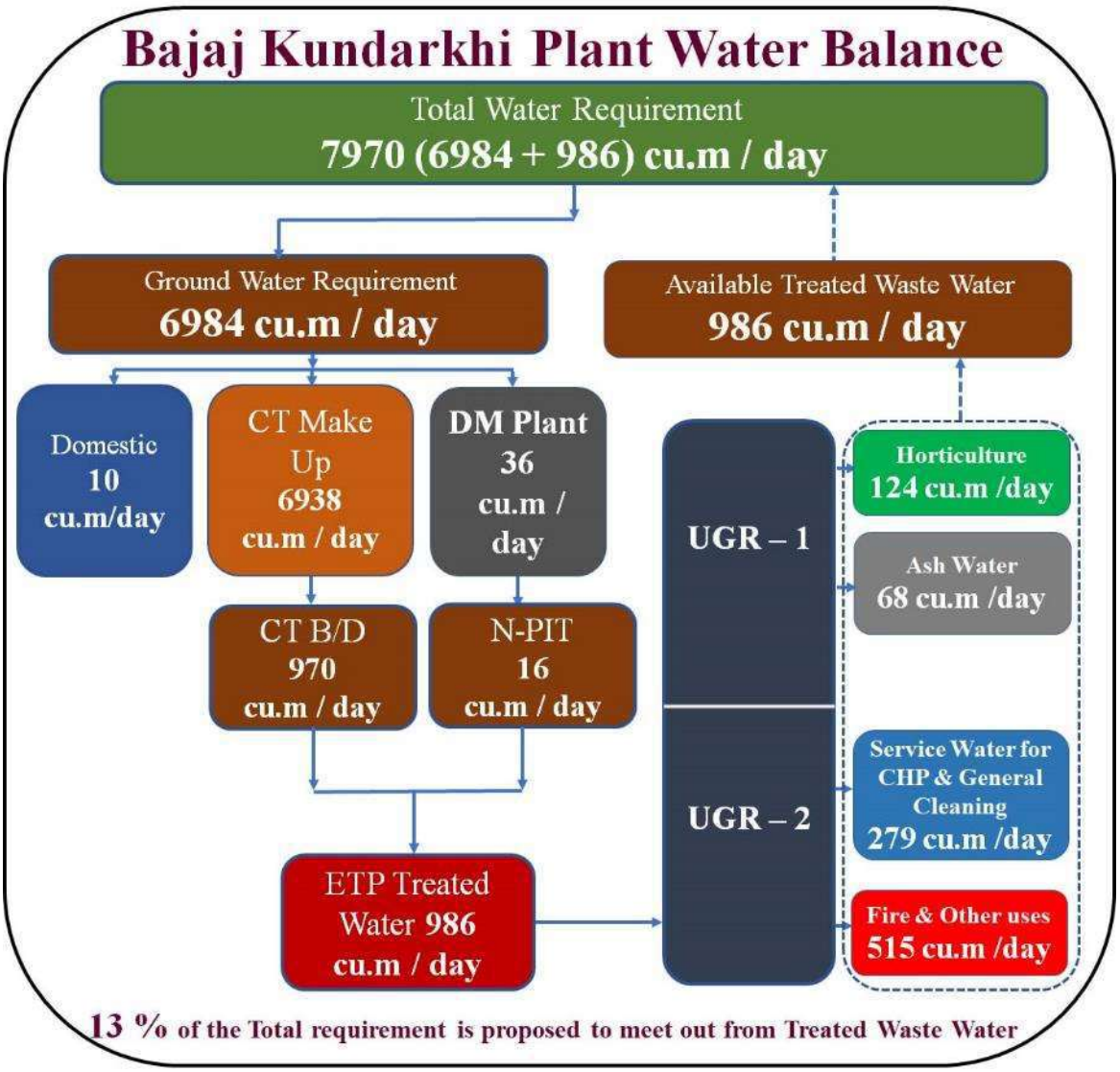


Figure 40: Water Balance Chart

10. Any other details pertaining to the project

The firm has planted more than hundred saplings in the green belt area and the road side. The saplings are selected based on the soil condition.



Conclusion and Recommendation

The study area (covering 5 Km radius) lies in between North Latitude 27° 02'00" and 27°07'30" and East Longitude of 82°03'30" and 82°08'00". The Plant site falls in **G44E4.**

The total aerial extent of the study area covering 5 Km radius from the Plant site boundary is **79.61 Sq.km.**

Primarily, 5 Km radius from the Plant site forms part of crop land (about 81.62 %). The second major land use is rivers and water bodies.

Majority of the area is irrigated by bore well. River and canal-based irrigation was also noticed in the study area.

The Terrain elevation (Topography) is derived from the Carto-DEM data. The Study area (5 Km radius from the Plant site boundary – buffer zone) elevation ranges from **96 m to 118 m amsl**. The maximum elevation is observed in the South eastern part of the study area

The maximum and minimum elevation of the Plant site is **103 m and 106 m amsl** respectively. The Plant site is sloping towards east**.**

Chamdai Nalla noticed in the eastern side in the study area and towards south.

The development of stream is very less as the runoff flows as overland flow towards the river / nalla. The Chamdai Nalla is seasonal. The river system is the main recharge source for the study area

The study area is irrigated by bore well. River and canal-based irrigation is also observed in the study area. The return flow from the irrigation land maintains the ground water level at moderately deeper depth in the bore well

The normal annual rainfall of Gonda district is **925.9 mm (25 year Normal)**. District received maximum rainfall during south west monsoon period i.e., June to September. About **88 %** of the annual rainfall received during south west monsoon season. Only **12 %** of the annual rainfall takes place between October to May period

The project is located more than 500m away from the periphery of any demarcated wetland areas. The nearest Wetland is located in **Parvati Arga Bird Sanctuary** which is about **18 Km in the South west from the Plant's boundary**

The study area (5 Km buffer) including the Plant site is comprising of Oxidized Silt-clay with Kankar and Micaceous Sand of Holocene and Middle-Late Pleistocene age. The availability of ground water in this formation is high to very high.

The Geomorphology and structures of the area play a vital role in identifying the ground water potential zones. Geomorphologically, the study area forms part of Older Flood Plain.

The occurrence and movement of ground water is controlled by the primary porosity. The Plant is located in older flood plain

A ground water prospect prepared by NRSA has been assessed. The Plant site falls in >80 m Depth well > 800 LPM Yield. The occurrence of ground water is relatively very high in these zones as it forms part of Gangetic plains (Ghaghra alluvial plains).

The principal aquifers in the study area have been delineated by grouping the sand, kankar, gravelly sand and pebbly sand as aquifers separated by confining clay layers as aquiclude. The granular zones (the aquifers). The depth range of the Tube well in the district and study area varies from 40-305 m bgl.

The storativity ranges from 1.37×10-04 to 6.78×10-05 and transmissivity ranges from 318 to 3083 m^2 /day. Storativity (S): 1.21×10-0^4 to 6.78×10-0^5. Discharge (Yield) of ranges from 1903 to 2950 lpm

The minimum and maximum depth is **78 m to 105 m** respectively. Yield varies from **180 - 390 m^3 /day for 8 hours of Pumping**. Post-monsoon water level varies from **2.0 m to 5.9 m** below ground level. In Pre-monsoon period it varies from **3.1 m to 6.8 m** below ground level. Seasonal fluctuation in water level in these Tube well varies from **0.3 m to 1.2 m**.

Tube well are being used for drinking purpose (Hand pump) and majority are used for irrigation purposes and facilitated with 7.5 to 10 HP electrical submersible pumps and running 5 to 8 hrs daily.

The pre monsoon depth to ground water level depict that relatively deepest of ground water level zone of **5-6 m** falls in the North west and south of the study area near Pandit, Goindpara and Chamar P villages.

The shallowest ground water level zone of **2-3 m** occupies in the North and south west of the study area near Rupi Dih, Khira Khirwa and Siswaria villages. The Plants falls in **3-4 m** zone.

The post monsoon depth to ground water level depict that relatively deepest of ground water level zone of **5-6 m** falls in the North west and south of the study area near Pandit, Goindpara and Chamar P villages.

The shallowest ground water level zone of **2-3 m** occupies in the North and south west of the study area near Rupi Dih, Khira Khirwa, Gopiapur and Siswaria villages. The Plant site falls in **3-4 m** zone.

The ground water level fluctuation of the study area indicates that the ground water level fluctuation ranges from **<0.5 – 1.5 m** which indicates that the aquifer of the study area has moderate recharge potential. The Plant site falls in **0.5-1.0** m fluctuation zone.

The ground water table generated using the pre and post monsoon data indicates that there is 2 different flow pattern is observed in the study area.

1) Ground water flow towards east
2) Ground water mound (Divergent flow of ground water) and westerly flow direction

From the plant site the ground water flow towards east. North west near Buddhu P village ground water mound was observed.

The ground water level fluctuation and the ground water table clearly indicate that there is surface (rainfall) and ground water interaction. The main source of recharge in the study area is from rainfall as well as from the river and canal system.

Decadal Trend of water levels for pre monsoon and post monsoon periods for the last ten years (2011-2020) have been computed for CGWB Ground Water Monitoring Wells.

The long-term ground water level trend for the 4 CGWB wells indicates there is increasing trend in 3 seasons (1 Pre- Monsoon and 2 Post-monsoon periods). The falling trend observed in 5 seasons (3 Pre- Monsoon and 2 Post-monsoon periods).

The average Rise in the Pre and post-monsoon period are 0.0866 and 0.0776 m/year respectively.

The average Fall in the Pre and post-monsoon period are -0.1300 and -0.1195 m/year respectively

The long-term trend in around the study area clearly indicates that there is no stress in the ground water.

Change in the ground water head at the end 5th year and end of 10th years has been simulated. **There is change of head in and around the Plant site observed and the head change is about 2.5 to 3.5 m. (Initial Head 100.5 m and the observed head 98.0 m at the end of 5th year and 97 m at the end of 10th year in the Plant lease area). The above change in the head is due to the industrial pumping and it is found to be less.**

- The results of mathematical modeling have thrown light on the overall scenario of the ground water condition of the model area. Ground water modeling study reveals that the pumping in the second layer has very less effect on Unconfined Aquifer.

- The Plant water requirement is being met out from the first and second aquifer group. The pumping quantity of **6,984 cu.m/day** for the Plant would not make adverse impact in the ground water system of the model area.
- The predicted radius of influence is **360 m**.

The most important changes are in the constant head and recharge quantity which contributes major part of the Plant drawl and pumping of surround wells in 2026 and 2031.

The chemical analysis results of ground water quality reveal that the quality of ground water in the Tube well is within the permissible limits of drinking water standards.

The maximum and minimum EC concentration in ground water is 1686 and 539 µmhos/cm which is potable as per the CPHEEP Standards.

The higher concentration of EC is observed in the easter part of the study area. Majority of the area falls under **500-800 µmhos/cm** EC zone.

The Plant is located in **800-1100** µmhos/cm zone. The spatial distribution of EC concentration reveals that the area is not in the ground water quality affected zone.

Based on the pumping test the following aquifer parameters area derived.

Transmissivity of the study area	**3990**	**m^2/day**
Storativity Average of the study area	**1.54×10^{-04}**	**m/day**
Average Hydraulic Conductivity of the study area	**66.5**	**m/day**

The above values are compared with CGWB exploratory Tube well drilled for Gonda district and found to be matching.

The optimum yield of the Tube well is **2407 cu.m/day**. If the pump runs for **15 hours**, with a discharge of **2675 lpm / 21 m Drawdown**, the Tube well can yield **2407 cu.m/day.**

The estimation based on the pumping test results conducted in the Tube well located within the Plant site. It is indicative that the required quantity of 6,984 cu.m/day can be drawn through 3 Tube wells.

The net water requirement is **7,970 = 6,984 cu.m/day Ground water + 986 cu.m/day Treated water cu.m/day**, The fresh water requirement for industrial purpose is **6974 cu.m/day**, domestic use **10 cu.m/day**. (The Water balance charge is given in Chapter-9)

As per the Guidelines CGWA, 2 Piezometers have been installed. (One DWLR and 1 DWLR with Telemetry). The project proponent drilled 2 Tube well and installed piezometers.

The hydrograph has been generated for the Piezometer observed data and it reveals that there is raising trend **(0.017 & 0.013 m /Year)** of ground water level observed in the past 1 year.

The Ground water requirement is 6,984 cu.m/day. The treated water of 986 cu.m/day from ETP / STP is used for process and other uses.

NOC for 3 borewell for drawing the above quantity has been obtained from Ground water Department of Uttar Pradesh.

The flow meters for all the three Tube wells are installed. All the 3 Tube wells are being used to meet the industrial needs.

The pumping test data reveals that the drawdown is less. The above clearly indicates that the drawl of 6,984 cu.m/day would not create any adverse impact on the ground water regimen.

As per the ground water resource estimation (CGWB Report) 2020, the **JHANJHRI** Block has been categorized as **Safe**, since the stage of ground water development is **62.98%**

- The predicted drawdown in Plant site **3.67 m in the fifth year.**
- The predicted drawdown in Plant pits **4.03 m in the Tenth year,**
- The predicted drawdown is at the time of pumping. During the monsoon period and non-mining period the water level raise to the original water level in the monsoon period.

The drawdown is very less as the tube well are located in the alluvial formation.

Hence the pumping of ground water for industrial and domestic needs of 6,984 cu.m/day would not make any adverse impact in the ground water regime.

<u>The model output reveals that the impact of pumping would not affect the surrounding pumping wells as the radius of influence confines to the Plants area..</u>

Total number of households are about 5657

- Total population of villages under the study area is 36173 out of which males are 18881 (52%) and females are 17292 (48%)
- The average family size is about 5.3 persons per family
- Scheduled caste population is 7609 and Scheduled tribes' population is 1 in the study area.

From the Census of India 2011 data, it has been noticed that the requirement of drinking water is being met out by well water and hand pumps. All the villagers are availing drinking water facility from ground water source such as hand pumps, although some other water sources like tanks, ponds area also available in some village. In majority of the villages hand pumps are the main source of drinking water supply.

During the field visit the villagers were interacted and ascertained the source of drinking water. The villagers explained, that the only drinking water source is hand pump and some village pond. Less number of piped water supply in the study area. The water supply through individual power pump schemes in the study area would improve the health and economic status

The ETP and STP installed within the plant and the treated water is being used for the industry.

Since, the industry is power plant, Surface storage techniques such as roof water harvesting (sump collection) pond with recharge well has been suggested in the plant site. Apart from the above Cleaning of pond located in the north eastern side of the plant has been suggested to increase the capacity which will enhance the ground water recharge.

In order to harvest the rain water with in the plant site, the following recharge structures (Roof water harvesting Structures) have been suggested.

Roof top rain water harvesting through sump

Recharge trench with bore well

The roof water collection is estimated as **1194 Cu.m/Year**

The firm has adopted village pond and increased the storage capacity by way of Cleaning and recharge shafts have been created to accelerate the recharge. The surplus flow from the plant site is diverted to the village pond.

The estimated rain water harvesting quantity due the recharge structures are as follows:

Rain water Harvesting - Abstract		
Rain water Harvesting - Ground water recharge		
Estimated Recharge from the rain water collected in the Sump	**1,194**	**cu.m/Year**
Estimated Ground water recharge through recharge pits with recharge bore wells	**13,293**	**cu.m/Year**
Estimated water harvested through Cleaning of water bodies (Outside the plant)	**5,44,680**	**cu.m/Year**
Estimated Total Ground water recharge Volume	**5,59,167**	**cu.m/Year**

Analytical comparison has been made based on the ground water recharge in the project site.

- **Ground water drawl Vs Estimated ground water recharge**

The analysis reveals the following

Estimated Total Ground water recharge Volume	**5,59,167**	**cu.m/Year**
Ground water drawl for Industrial Use	**20,95,850**	**cu.m/Year**
The Estimated percentage Rain water Harvesting Vs NOC Ground water drawl for Industrial Use	**27**	**Percentage**

As the study area falls under Safe category, RWH has been implemented.

The estimated rainwater harvesting is more than the CGWB recommended quantity (as per the guidelines). Hence the drawl of ground water is replenished by the rainwater harvesting and there would not be any adverse impact on the ground water regimen of the study area.

Annexure 1: Consent to Establishment letter

उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड
UTTAR PRADESH POLLUTION CONTROL BOARD

संदर्भ सं० F74327 /UPPCB/NOC/74/Fzd.
Ref. No.

दिनांक 13-10-10
Date

सेवा में,
मेसर्स बजाज हिन्दुस्तान लि०
(बजाज हिन्दुस्तान शुगर एण्ड इंडस्ट्रीज लि)
ग्राम–कुन्दरकी, तहसील सदर गोण्डा
जिला गोण्डा

विषय पर्यावरणीय प्रदूषण की दृष्टि से/नई इकाई की स्थापना हेतु/कार्यरत इकाई की उत्पादन क्षमता में विस्तार/संयंत्रों के नवीनीकरण हेतु अनापत्ति प्रमाण पत्र में नाम परिवर्तन के सम्बन्ध में।

महोदय,

कृपया उपरोक्त विषयक अपने पत्र दिनॉक २.८.१० का अवलोकन करने का कष्ट करें। इस सम्बन्ध में आप द्वारा उपलब्ध कराये गये अभिलेखो के आधार पर पूर्व में बोर्ड द्वारा दिनॉक ३१.५.१० को निर्गत सशर्त अनापत्ति प्रमाण पत्र मे अंकित नाम मेसर्स मेसर्स बजाज हिन्दुस्तान लि० (बजाज हिन्दुस्तान शुगर एण्ड इंडस्ट्रीज लि) ग्राम– कुन्दरकी, तहसील सदर गोण्डा, जिला गोण्डा को परिवर्तित करके मेसर्स बजाज इनर्जी प्रा०लि० अंकित किया जाता है। उद्योग का प्रस्तावित स्थल, उत्पाद, उत्पादन क्षमता आदि तथा उल्लिखित शर्ते पूर्ववत रहेगी।

भवदीय,

(डा० सी०एस०भटट)
सदस्य सचिव

प्रतिलिपि

क्षेत्रीय अधिकारी, उ० प्र० प्रदूषण नियंत्रण बोर्ड, फैजाबाद को सूचनार्थ प्रेषित ।

सदस्य सचिव

पिकप भवन, तृतीय तल, बी-ब्लाक, विभूति खण्ड,
गोमती नगर, लखनऊ - 226 010
दूरभाष : 2720831, 2720828, 2720691, 2720681
फैक्स : 0522-2720764
ई-मेल : info@uppcb.com
वेब साइट : www.uppcb.com

Picup Bhawan, 3rd Floor, B-Block, Vibhuti Khand,
Gomti Nagar, Lucknow - 226 010
Phone : 2720831, 2720828, 2720691, 2720681
Fax : 0522-2720764
e-mail : info@uppcb.com
Web Site : www.uppcb.com

उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड

'पिकप भवन' तृतीय तल, बी–ब्लाक, विभूति खण्ड,
गोमती नगर, लखनऊ

संदर्भ संख्या F67695/सी-६/एनओसी/७४/फैजा० दिनांक 31-5-10

सेवा में,

मे० बजाज हिन्दुस्थान लि०
(बजाज हिन्दुस्तान शुगर एंड इंडस्ट्रीज लि०)
ग्रसम-कुन्दरकी, तहसील-सदर गोण्डा,
जिला- गोण्डा।

विषय : पर्यावरणीय प्रदूषण की दृष्टि से /नई इकाई की स्थापना हेतु/कार्यरत इकाई की उत्पादन क्षमता में विस्तार /संयंत्रों के नवीनीकरण हेतु अनापत्ति प्रमाण पत्र निर्गमन

महोदय,

कृपया उपरोक्त विषयक अपने आवेदन पत्र दिनाँक ७.१.२०१० का संदर्भ लें। आपके आवेदन पर विचार किया गया है तथा कृपया अवगत हो कि उद्योग को पर्यावरणीय प्रदूषण के दृष्टिकोण से निम्नलिखित विशिष्ट शर्तों एवं सामान्य शर्तों (संलग्नक) के समुचित अनुपालन के साथ सशर्त अनापत्ति स्वीकृत की जाती है।

1. अनापत्ति प्रमाण–पत्र निम्नलिखित विशिष्ट विवरणों के लिए ही निर्गत किया जा रहा है :–

(क) स्थल : पूर्व से कार्यरत इकाई
मै० बजाज हिन्दुस्तान शुगर एंण्ड इंण्ड०लि०,
कुन्दरकी, गोण्डा।

(ख) उत्पादन :
पावर - ४८ मेगावाट से बढ़ाकर १३८ मेगावाट
(९० मेगावाट थर्मल पावर प्लांट)

(ग) मुख्य कच्चे माल :

कोयला- १,६०० मैट्रिक टन/दिन

(घ) औद्योगिक उत्प्रवाह की मात्रा :

१८२४ किलोलीटर प्रतिदिन

(ड.) प्रयुक्त ईंधन :

कोयला- १६०० मैट्रिक टन/दिन

उपर्युक्त विषय वस्तु में किसी भी प्रकार से परिवर्तन करने पर पुनः अनापत्ति प्रमाण–पत्र प्राप्त करना आवश्यक होगा।

2. उद्योग में सभी आवश्यक यंत्र, संयंत्र, हरित पट्टिका, उत्प्रवाह शुद्धिकरण संयंत्र तथा वायु प्रदूषण नियंत्रण व्यवस्था की स्थापना में की गयी प्रगति रिपोर्ट इस कार्यालय में प्रत्येक माह की दसवीं तारीख तक निरंतर प्रेषित करें।

3. उद्योग इकाई में परीक्षण उत्पादन तब तक प्रारम्भ नहीं करें जब तक कि वह बोर्ड से जल एवं वायु अधिनियमों के अन्तर्गत सहमति प्राप्त न कर लें। जल एवं वायु सहमति प्राप्त करने हेतु इकाई ने उत्पादन प्रारम्भ करनें की तिथि से कम से कम 2 माह पहले निर्धारित सहमति आवेदन पत्रों को उत्पादन पूर्व प्रथम आवेदन का उल्लेख करते हुए इस कार्यालय में अवश्य ही जमा कर दिया जाए। यदि उद्योग उपरोक्त का अनुपालन नहीं करता है तो उक्त अधिनियमों के वैधानिक प्राविधानों के अर्न्तगत उद्योग के विरूद्ध बिना किसी पूर्व सूचना के विधिक कार्यवाही की जा सकती है।

4. उद्योग में परीक्षण उत्पादन के पूर्व हमारे क्षेत्रीय कार्यालय द्वारा इकाई का निरीक्षण सुनियोजित किया जाए।

5. धरेलू उत्प्रवाह, जिसकी मात्रा .....२४ केएलडी..... से अधिक नहीं होगी। सेप्टिक टैंक एवं सोक पिट के माध्यम से बोर्ड द्वारा निर्धारित मानकों के अनुरूप शुद्धिकृत कर निस्तारित किया जाए।

6. प्रदूषण नियन्त्रण हेतु प्रस्तावित शुद्धिकरण संयंत्र तथा निर्माण कार्य आपूर्ति के लिये दिये गए आदेश की प्रति इस कार्यालय में दिनांक .....३०.६.१०..... तक अवश्य प्रस्तुत की जाए।

७. चीनी उत्पादन की क्षमता पूर्ववत रहेगी।

८. उद्योग में दिये गये प्रस्ताव के अनुसार जल एवं वायु प्रदूषण नियंत्रण की स्थापना क्षमता विस्तार से पूर्व करना अनिवार्य होग ।

९. क्षमता विस्तार के उपरान्त बोर्ड से ट्रायल संचालन हेतु सहमति प्राप्त कर ही उद्योग का संचालन करें।

१०. उद्योग में क्षमता विस्तारणीकरण के पश्चात क्रशिंग सीजन के दौरान उत्प्रवाह के शुद्धिकरण हेतु पूर्व में स्थापित उत्प्रवाह शुद्धिकरण के अतिरिक्त आवश्यकतानुसार व्यवस्था की जाये।

११. उद्योग से जनित फ्लाई ऐश को पुनः प्रयोग हेतु सीमेंट उद्योग अथवा अन्य किसी उद्योग से अनुबन्ध प्राप्त कर योजना प्रस्ताव तीन माह में राज्य बोर्ड को प्रषित करें।

१२. कोल क्रसिंग प्लांट पर समुचित वायु प्रदूषण नियंत्रण व्यवस्था की जाये।

१३. उद्योग द्वारा कूलिंग तथा ओवर फ्लो आदि से जनित उत्प्रवाह को पुनः चक्रित किया जाये।

१४. उद्योग द्वारा स्थल पर नियमानुसार ३३/. भाग पर वृक्षरोपण किया जाये।

१५. उद्योग द्वारा कोल वेस्ट स्लेप ब्वायलर की स्थापना के पश्चात ई.आर.ए. कराया जाये।

१६. उद्योग द्वारा वन एवम् पर्यावरण मंत्रालय भारत सरकार की अधिसूचना दिनांक-१४.९.०८ के अनुपालन में पर्यावरणीय स्वीकृति प्राप्त की जाये।

१७. उद्योग में वायु प्रदूषण नियंत्रण व्यवस्था की स्थापना एवं संचालन इस प्रकार से किया जाये कि आस-पास के क्षेत्रों में प्रदूषण की समस्या न हो।

१८. उपरोक्त शर्तो का पूर्णतया अनुपालन किया जाये अन्यथा जारी एन.ओ.सी. निरस्त कर बैंक गारंटी जब्त करने की कार्यवाही की जायेगी।

१९. अन्य शर्ते पूर्ववत रहेंगी।

कृपया ध्यान दें कि उपर्युक्त लिखित विशिष्ट शर्तों एवं सामान्य शर्तों का प्रभावी एवं संतोषजनक अनुपालन न करने पर बोर्ड द्वारा निर्गत अनापत्ति प्रमाण–पत्र निरस्त कर दिया जाएगा। बोर्ड का अधिकार सुरक्षित है कि अनापत्ति की शर्तों में संशोधन किया जाय अथवा निरस्त कर दिया जाय। उपर्युक्त विशिष्ट एंव सामान्य शर्तों के सम्बन्ध में उद्योग द्वारा इस कार्यालय में दिनांक ....३०.६.१०..... तक प्रथम अनुपालन आख्या अवश्य प्रेषित की जाए। अनुपालन आख्या नियमित प्रेषित की जाए अन्यथा अनापत्ति निरस्त कर दी जाएगी।

भवदीय

सदस्य सचिव

पृष्ठांकन सं. /एन. ओ. सी. तद दिनांक

प्रतिलिपि :

1. महाप्रबन्धक, जिला उद्योग केन्द्र :.....

2. उपकर अधिकारी, उ. प्र. प्रदूषण नियंत्रण बोर्ड, लखनऊ।

3. क्षेत्रीय अधिकारी, उ. प्र. प्रदूषण नियंत्रण बोर्ड :.....गोंडा.....

4. .....

मुख्य पर्यावरण अधिकारी

(सर्किल– ६)

Annexure 2 CGWA Accreditation Certificate



Accreditation Board of CGWA

Certificate of Accreditation

Mr. V. Pugazhendy

Has been accredited as Ground Water Professional to prepare reports in the Functional Areas of

- Impact Assessment Report with Modelling.
- Hydrogeological Report for mining projects.

Valid from : 01.10.2021 | Certificate No. : CGWA/RGI/042

Valid thru : 30.09.2026 | Dated : 30.11.2021

क्षेत्रीय निदेशक
Regional Director
आरजीएनजीडब्ल्यूटीआरआई
RGNGWT&RI

सदस्य
Member
आरजीएनजीडब्ल्यूटीआरआई
RGNGWT&RI



Accreditation Board of CGWA

Certificate of Accreditation

Mr. V. Pugazhendi

Has been accredited as a Ground Water Professionals to prepare reports in the Functional Areas of

- *Impact Assessment of Existing / Proposed GW Extraction*

Valid from : 15.02.2021

Valid thru : 14.02.2026

Certificate No. : CGWA/RGI/012

Dated : 07.07.2021

क्षेत्रीय निदेशक
Regional Director
आरजीएनजीडब्ल्यूटीआरआई
RGNGWT&RI

सदस्य
Member
आरजीएनजीडब्ल्यूटीआरआई
RGNGWT&RI

Annexure 3: Ground water Quality report

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 (EMS) Certified)
Laboratory: C-43, Sector-88, Phase-II, Noida, U.P.
Ph.: No.: +91-9971912476, 9350952231
E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-17012022-01 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE- KUNDARKHI , P. O.- GOVINDPARA
DISTRICT-GONDA (U.P.) INDIA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Khokhariya Village
Sample Quantity : 1.0 Litre
Analysis Duration : 17/01/2022 to 19/01/2022

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results	Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
1	pH	IS:3025(Part-11)	7.26	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	-	Agreeable	Agreeable
4	Conductivity	IS:3025(Part-14)	689.4	µs/cm	-	-
5	Turbidity	IS-3025(Part-10)	12.8	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	276	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	49.60	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	5.48	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	1.37	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nill	mg/l	-	-
11	Bicarbonate(as HCO3)	IS:3025(Part-51)	400.16	mg/l	-	-
12	Magnesium(as Mg)	IS:3025(Part-46)	36.94	mg/l	30	100
13	Chloride(as Cl)	IS:3025(Part-32)	7.83	mg/l	250	1000
14	Fluoride(as F)	IS:3025(Part-60)	0.72	mg/l	1	1.5
15	Alkalinity(as $CaCO_3$)	IS:3025(Part-23)	328	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	448	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	2.35	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	1.26	mg/l	200	400

End Of Report

Note:
1 The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2 This test report will not be used for any publicity/legal purpose.
3 The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.
4 The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

Checked By (Authorized Signatory)

Assuring you of best our services at all times.

ULTRA TESTING & RESEARCH LABORATORY
(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015(EMS) Certified)
Laboratory: C-43, Sector-88, Phase-II, Noida, U.P.
Ph.: No.: +91-9971912476, 9350952231
E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com
TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-17012022-02 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE- KUNDARKHI , P. O.- GOVINDPARA
DISTRICT-GONDA (U.P.) INDIA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Siswariya Village
Sample Quantity : 1.0 Litre
Analysis Duration : 17/01/2022 to 19/01/2022

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results	Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
1	pH	IS:3025(Part-11)	7.47	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	-	Agreeable	Agreeable
4	Conductivity	IS:3025(Part-14)	570.0	µs/cm	-	-
5	Turbidity	IS-3025(Part-10)	1.4	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	264	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	65.60	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	4.11	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	1.03	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nill	mg/l	-	-
11	Bicarbonate(as HCO3)	IS:3025(Part-51)	312.32	mg/l	-	-
12	Magnesium(as Mg)	IS:3025(Part-46)	24.30	mg/l	30	100
13	Chloride(as Cl)	IS:3025(Part-32)	5.87	mg/l	250	1000
14	Fluoride(as F)	IS:3025(Part-60)	0.25	mg/l	1	1.5
15	Alkalinity(as $CaCO_3$)	IS:3025(Part-23)	256	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	371	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	0.98	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	1.10	mg/l	200	400

End Of Report

Note:
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4. The Report can not be used as evidence in a court of law without the written approval of the lab.

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E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-17012022-03 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE- KUNDARKHI , P. O.- GOVINDPARA
DISTRICT-GONDA (U.P.) INDIA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Korip Village
Sample Quantity : 1.0 Litre
Analysis Duration : 17/01/2022 to 19/01/2022

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results	Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
1	pH	IS:3025(Part-11)	6.68	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	-	Agreeable	Agreeable
4	Conductivity	IS:3025(Part-14)	539.3	µs/cm	-	-
5	Turbidity	IS-3025(Part-10)	4.1	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	252	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	64.00	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	3.91	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	0.98	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nill	mg/l	-	-
11	Bicarbonate(as HCO3)	IS:3025(Part-51)	292.80	mg/l	-	-
12	Magnesium(as Mg)	IS:3025(Part-46)	22.36	mg/l	30	100
13	Chloride(as Cl)	IS:3025(Part-32)	7.83	mg/l	250	1000
14	Fluoride(as F)	IS:3025(Part-60)	<0.1	mg/l	1	1.5
15	Alkalinity(as $CaCO_3$)	IS:3025(Part-23)	240	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	351	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	0.66	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	<1.0	mg/l	200	400

End Of Report

Note:
1 The results given above are related to the tested sample, for various parameters, as observed at the time of sampling.
2 The customer asked for the above tests only.
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E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-17012022-04 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE- KUNDARKHI , P. O.- GOVINDPARA
DISTRICT-GONDA (U.P.) INDIA

Sample Received On	: 17/01/2022
Sample Given By	: Customer
Sample Description	: Ground Water
Sampling Location	: Sample Collected from Garhi Village
Sample Quantity	: 1.0 Litre
Analysis Duration	: 17/01/2022 to 19/01/2022

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results	Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
1	pH	IS:3025(Part-11)	6.62	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	-	Agreeable	Agreeable
4	Conductivity	IS:3025(Part-14)	638.0	µs/cm	-	-
5	Turbidity	IS-3025(Part-10)	<0.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	280	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	67.20	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	12.72	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	3.18	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nill	mg/l	-	-
11	Bicarbonate(as HCO3)	IS:3025(Part-51)	302.56	mg/l	-	-
12	Magnesium(as Mg)	IS:3025(Part-46)	27.22	mg/l	30	100
13	Chloride(as Cl)	IS:3025(Part-32)	25.44	mg/l	250	1000
14	Fluoride(as F)	IS:3025(Part-60)	0.12	mg/l	1	1.5
15	Alkalinity(as $CaCO_3$)	IS:3025(Part-23)	248	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	415	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	9.85	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	8.16	mg/l	200	400

End Of Report

Note:
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E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com
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TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-17012022-05 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE- KUNDARKHI , P. O.- GOVINDPARA
DISTRICT-GONDA (U.P.) INDIA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Khiraiya Village
Sample Quantity : 1.0 Litre
Analysis Duration : 17/01/2022 to 19/01/2022

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results	Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
1	pH	IS:3025(Part-11)	7.27	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	-	Agreeable	Agreeable
4	Conductivity	IS:3025(Part-14)	1020	µs/cm	-	-
5	Turbidity	IS-3025(Part-10)	1.0	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	404	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	96.00	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	42.07	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	10.52	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nill	mg/l	-	-
11	Bicarbonate(as HCO3)	IS:3025(Part-51)	405.04	mg/l	-	-
12	Magnesium(as Mg)	IS:3025(Part-46)	39.85	mg/l	30	100
13	Chloride(as Cl)	IS:3025(Part-32)	84.14	mg/l	250	1000
14	Fluoride(as F)	IS:3025(Part-60)	0.66	mg/l	1	1.5
15	Alkalinity(as $CaCO_3$)	IS:3025(Part-23)	332	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	663	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	8.26	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	30.14	mg/l	200	400

End Of Report

Note:
1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
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E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com
TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-17012022-06 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE- KUNDARKHI , P. O.- GOVINDPARA
DISTRICT-GONDA (U.P.) INDIA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Goindpara Village
Sample Quantity : 1.0 Litre
Analysis Duration : 17/01/2022 to 19/01/2022

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results	Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
1	pH	IS:3025(Part-11)	7.50	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	-	Agreeable	Agreeable
4	Conductivity	IS:3025(Part-14)	593.1	µs/cm	-	-
5	Turbidity	IS-3025(Part-10)	6.8	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	276	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	44.80	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	3.52	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	1.76	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nill	mg/l	-	-
11	Bicarbonate(as HCO3)	IS:3025(Part-51)	326.96	mg/l	-	-
12	Magnesium(as Mg)	IS:3025(Part-46)	39.85	mg/l	30	100
13	Chloride(as Cl)	IS:3025(Part-32)	11.74	mg/l	250	1000
14	Fluoride(as F)	IS:3025(Part-60)	0.26	mg/l	1	1.5
15	Alkalinity(as $CaCO_3$)	IS:3025(Part-23)	268	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	385	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	1.26	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	<1.0	mg/l	200	400

End Of Report

Note:
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Annexure 4 Surface Water, STP, ETP Quality results

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Surface Water	SW-060821-023	14/08/2021

Issued To: **M/S. Bajaj Energy Limited.**
Village- Kundarkhi, P.O-Govind Para, Distt- Gonda (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On : 06/08/2021
Sample Drawn By : Mr. Umashankar Sharma (NTL)
Sample Description : Surface Water Collected from Kahoba Nala
Sample Quantity/Packing detail : 1lt/Plastic Cane
Analysis Duration : 06/08/2021 To 14/08/2021

Surface Water				
S.No	**Parameter**	**Test Method**	**Results**	**Units**
1.	pH	IS:3025(Part-11):1983	6.62	-
2.	Total Suspended Solid	IS:3025(Part-17):1984	18.0	mg/l
3.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	62.0	mg/l
4.	Biological Oxygen Demand (as O_2)	IS:3025(Part-44):1993	10.1	mg/l
5.	Oil & grease	IS:3025(Part-39):1984	<1.0	mg/l

Notes:

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NTL TESTING LABORATORIES

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Branch Office : Gayatri Nagar. Katgodam, Haldwani, Uttrakhand
E. : noida.laboratory@gmail.com, info@noidalabs.com W.: www. noidalabs.com

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-071021-010	12/10/2021

Issued To: **M/S. Bajaj Energy Limited.**
Village- Kundarkhi, P.O-Govind Para, Distt- Gonda (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On	:	06/10/2021
Sample Drawn By	:	Mr. Umashankar Sharma (NTL)
Sample Description	:	ETP Inlet
Sample Quantity/Packing detail	:	1lt/Plastic Cane
Analysis Duration	:	07/10/2021 TO 12/10/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11):1983	7.27	-
2.	Total Suspended Solid	IS:3025(Part-17):1984	89	mg/l
3.	Chemical Oxygen Demand(as O_2)	APHA 5220 B:2005	112	mg/l
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44):1993	54	mg/l
5.	Oil & grease	IS:3025(Part-39):1984	1.4	mg/l

Notes:

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-071021-012	12/10/2021

Issued To: **M/S. Bajaj Energy Limited.**
Village- Kundarkhi, P.O-Govind Para, Distt- Gonda (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On	:	06/10/2021
Sample Drawn By	:	Mr. Umashankar Sharma (NTL)
Sample Description	:	STP Inlet
Sample Quantity/Packing detail	:	1 lit/Plastic Cane
Analysis Duration	:	07/10/2021 TO 12/10/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11)	7.47	-
2.	Total Suspended Solid	IS:3025(Part-17)	65	mg/l
3.	Chemical Oxygen Demand (COD)	IS:3025(Part-58)	218	mg/l
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44)	74	mg/l
5.	Oil & Grease	IS: 3025 (P- 39)	1.1	mg/l
6.	Total Dissolve Solid (TDS)	IS: 3025 (P- 39)	320	mg/l
7.	Faecal Coliform (MPN/100ML)	IS: 1622:1981	$1.1x10^4$	-

Notes:

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-071021-013	12/10/2021

Issued To: **M/S. Bajaj Energy Limited.**
Village- Kundarkhi, P.O-Govind Para, Distt- Gonda (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On	:	06/10/2021
Sample Drawn By	:	Mr. Umashankar Sharma (NTL)
Sample Description	:	STP Outlet
Sample Quantity/Packing detail	:	1 lit/Plastic Cane
Analysis Duration	:	07/10/2021 TO 12/10/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units	Limit as per CPCB norms
1.	pH	IS:3025(Part-11)	7.30	-	5.5-9.0
2.	Total Suspended Solid	IS:3025(Part-17)	12.6	mg/l	100 max
3.	Chemical Oxygen Demand (COD)	IS:3025(Part-58)	58.0	mg/l	No limit Specified
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44)	7.6	mg/l	30max
5.	Oil & Grease	IS:3025(Part-39)	<1.0	mg/	No limit Specified
6.	Total Dissolve Solid (TDS)	IS:3025(Part-16)	223		No limit Specified
7.	Faecal Coliform (MPN/100ML)	IS: 1622:1981	110	-	<1000 MPN/100ML

Notes:

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CHECKED BY **AUTHORIZED SIGNATORY**

Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-071021-010	12/10/2021

Issued To: **M/S. Bajaj Energy Limited.**
Village- Kundarkhi, P.O-Govind Para, Distt- Gonda (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On	:	06/10/2021
Sample Drawn By	:	Mr. Umashankar Sharma (NTL)
Sample Description	:	ETP Inlet
Sample Quantity/Packing detail	:	1lt/Plastic Cane
Analysis Duration	:	07/10/2021 TO 12/10/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11):1983	7.27	-
2.	Total Suspended Solid	IS:3025(Part-17):1984	89	mg/l
3.	Chemical Oxygen Demand(as O_2)	APHA 5220 B:2005	112	mg/l
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44):1993	54	mg/l
5.	Oil & grease	IS:3025(Part-39):1984	1.4	mg/l

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

CHECKED BY **AUTHORIZED SIGNATORY**

NOIDA TESTING LABORATORIES (NTL)

Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
Branch Office : IP-2, Haridwar, Uttrakhand
Branch Office : Gayatri Nagar. Katgodam, Haldwani, Uttrakhand
E. : noida.laboratory@gmail.com, info@noidalabs.com W.: www. noidalabs.com

Annexure 5: Certificate of nonavailability of water supply from Village

दिनांक : 02 / 06 / 2021

सरकारी संस्थानों से पानी की अनु–उपलब्धता

''बजाज इनर्जी लि0, इकाई ग्राम – कुन्दरखी, विकास खण्ड – झंझरी, सदर – गोण्डा, जिला – गोण्डा, उत्तर प्रदेश में स्थित है।

प्रमाणित किया जाता है कि इस क्षेत्र में नगरपालिका या किसी भी सरकारी विभाग से पानी की आपूर्ति प्रदाय नहीं है।

रेखा

हस्ताक्षर

ग्राम पंचायत–कुन्दरखी

वि0 ख0 झंझरी–गोण्डा

ग्राम प्रधान



BAJAJ ENERGY LIMITED,
KUNDARKHI UNIT,

Village- Kundarki,
Block- Jhanjhri,
Tehsil- Sadar,
District- Gonda,
Uttar Pradesh State,
India

4553

Uttar Pradesh Pollution Control Board
Building. No TC-12V Vibhuti Khand, Gomti Nagar, Lucknow-226010
Phone:0522-2720828,2720831, Fax:0522-2720764, Email: info@uppcb.in, Website: www.uppcb.com

194908/UPPCB/Faizabad(UPPCBRO)/CTO/both/GONDA/2023 **Date: 02/01/2024**

To,
M/s
BAJAJ ENERGY LIMITED,
Village - Kundarkhi , PO - Govindpara,GONDA,271301

Application Id-23192659

Consolidated Consent to Operate and Authorisation hereinafter referred to as the CCA (Consolidated Consent & authorization) (Fresh) under Section-25 of the Water (Prevention & Control of Pollution) Act, 1974 and under Section-21 of the Air (Prevention & Control of Pollution) Act, 1981

CCA is hereby granted to **BAJAJ ENERGY LIMITED,** located at **Village - Kundarkhi , PO - Govindpara,GONDA,271301**. subject to the provisions of **the Water Act, Air Act** and the orders that may be made further and subject to following terms and conditions :-

1. This CCA BAJAJ ENERGY LIMITED, **granted for the period from 01/01/2024 to 31/12/2025** and valid for manufacturing of following products.

S No	Product	Quantity	Unit
1	Power	90	Megawatt

2. Conditions under Water(Prevention and Control of Pollution) Act -1974 as amended :-

(i) The daily quantity of effluent discharge (KLD) :-

Kind of Effluent	Quantity(KLD)	Treatment facility	Discharge point
Domestic	**20 KLD**	**STP**	
Industrial	**980 KLD**	**ETP**	

(ii) Trade Effluent Treatment and Disposal :-The applicant shall operate Effluent Treatment Plant consisting of primary/secondary and tertiary treatment as is required with reference to influent quantity and quality.

In case of stoppage of functioning of ETP, production has to be stopped immediately and this Board has to be intimated by fax/phone/email with a report in this regard to be dispatched immediately.

(iii) The treated effluent shall be recycled to the maximum extent and should be reused within the premises for gardening etc. Quality of the treated effluent shall meet to the following general and specific standards as prescribed under Environment (Protection) Rules, 1986 and applicable to the unit from time-to-time :-

Industrial Effluent Quality Standard

S.No.	Parameter	Standard
1	pH	As per E(P)A Rules, 1986
2	BOD (mg/L)	As per E(P)A Rules, 1986

3	COD (mg/L)	As per E(P)A Rules, 1986
4	TSS (mg/L)	As per E(P)A Rules, 1986
5	Oil & Grease (mg/L)	As per E(P)A Rules, 1986

(iv) Sewage Treatment and Disposal :- The applicant shall provide comprehensive STP as is required with reference to influent quantity and quality.In case of stoppage of functioning of STP, production has to be stopped immediately and this Board has to be intimated by fax/phone/email with a report in this regard to be dispatched immediately.

(v) The treated sewage shall be reused in gardening as far as possible. The STP shall be maintained continuously so as to achieve the quality of the treated sewage to the following standards.

S No.	Parameters	Standards
1	pH	As per E(P)A Rules, 1986
2	BOD (mg/L)	As per E(P)A Rules, 1986
3	TSS (mg/L)	As per E(P)A Rules, 1986
4	Fecal Coliform (MPN/100ml)	As per E(P)A Rules, 1986

3. Conditions under Air (Prevention and Control of Pollution) Act -1981 as amended :-

i) The applicant shall use following fuel and install a comprehensive control system consisting of control equipment as required with reference to generation of emissions and operate and maintain the same continuously so as to achieve the level of pollutants to the following standards.

Air Pollution Source Details

S No.	Air Pollution Source	Type of fuel	Stack no	Control Device	Height of Stack
1	02 Boilers having Capacity 190 each	Coal (1600 TPD)	1	Particulate Matter	As per E(P)A Rules, 1986

Emmission Quality Standards

S No.	Stack no	Parameters	Standards
1	1	Particulate Matter	As per E(P)A Rules, 1986

In case of stoppage of functioning of air pollution control equipment, production has to be stopped immediately and this Board has to be intimated by fax/phone/email with a report in this regard to be dispatched immediately

(ii) The unit will not use any type of restricted fuel.

iii) Noise from the D.G. Set and other source(s) should be controlled by providing an acoustic enclosure as is required for meeting the ambient noise standards for night and day time as prescribed for respective areas/zones (Industrial, Commercial, Residential, Silence) which are as follows :-

Day time : from 6.00 a.m. to 10.00 p.m., Night time: from 10.00 p.m. to 6.00 a.m.

Standards for Noise level in db(A) Leq	Industrial Area		Commercial Area		Residential Area		Silence Zone	
	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
	75	70	65	55	55	45	50	40

4. Essential documents to be submitted by the Industry/Unit as Applicable :-

(i) Environment Statement in Form-V of Environment (Protection) Rules, 1986.

(ii) Quarterly compliance report of the CCA, photograph of ETP/APCs/Waste Storage Area.

5. Competent Authority reserves the right to change/modify/add any time any condition of this CCA.

6. Unit has to comply with the following specific & general conditions. Non compliance of any provision of this CCA and provisions of the Water Act, Air Act and Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 will results in legal action under the aforesaid Acts and Rules.

7. In compliance to the G.O 1011/81-7-2021-09 (Writ)/2016 dated.13.10.2021 issued by Department of Environment, Forest and Climate Change, Uttar Pradesh. You are directed to develop Miyawaki Forest as per the SOP available at URL:-http://www.upecp.in/TrainingSession.aspx for ensuring timely compliance of this direction, you are hereby directed to submit a bank guarantee with minimum validity of one year of the amount equivalent to the sum of initial consent fees (Air and Water) or Rs. 50,000/- (Rs. Fifty Thousand Only) whichever is more, within 30 days from the date of issuance of this certificate. In case of non-compliance of this direction, your consent will be revoked by the Board.

8. If the unit uses the ground water and requires the permission from SGWA/CGWA for water abstraction then the industry will have to obtain No objection certificate for abstraction of ground water. It will be the responsibility of the industry to comply with the various conditions of the NOC obtained from the competent authority and submit to the Board, within 3 months time failing which CTO will be revoked.

General Conditions:-

1. The applicant shall get analysed the samples of effluent/emission/hazardous wastes at least once in a three month from the laboratory recognized by the MoEF and shall report to the UPPCB.

2. The applicant shall however, not without the prior consent of the Board bring into use any new or altered outlet for the discharge of effluent or gases emission or sewage waste from the unit.

3. Treated Industial waste water and domestic waste water shall be disposed jointly at one disposal point. The applicant shall provide discharge measurement equipment at final disposal point.

4. The applicant shall strictly comply with conditions of this CCA and submit compliance report of stipulated conditions within 30 days of receipt of this CCA. If at any point of time, it is found that the industry is not complying with stipulated conditions or any further direction/instruction issued by the Board, legal action shall be initiated against the applicant.

5. The applicant shall maintain good house keeping. All valves/pipes/sewer/drains etc. must be leak-proof

6. The industry shall provide uninterrupted entry to the STP/ETP inlet and outlet points, Air Pollution Control equipment and stack for smooth sampling/monitoring of efficiency of pollution control systems.

7. The industry shall provide Inspection Book at the time of inspection to the Board's officials.

8. Whenever due to any accident or other unforeseen act or event, such emission occurs or is apprehended to occur in excess of standards laid down, such information shall be reported to the Board's offices and all other concerned offices. In case of failure of pollution control equipment, the production process connected to it shall be stopped with immediate effect.

9. The industry shall operate in a manner so that all emissions be emitted through designated chimney/stack only.

10. In case of any damage to the agriculture productivity, human habitation etc. by the operation of industry, it shall be imperative to stop production in the industry with immediate effect and such information shall be

reported to Board's offices. The industry shall be liable to pay compensation also in such cases as decided by the Competent Authority.
11. The applicant shall apply before the 60 days of expiry of CCA or any change in production types/ production capacity/manufacturing process/capacity enhancement etc. or any change in effluent discharge point or emission point
12. The Board reserves the right to revoke/add/modify any stipulated condition issued along with CCA, as may be necessary.

Specific Conditions:-
1. This consent is valid for producing maximum 45 x 2 (90) Megawatt Thermal Power by using coal & water as raw material.

2. The industry shall utilized maximum portion of industrial/domestic treated effluent in Horticulture, Ash Quenching and Process.

3. The industry shall submit the analysis report of treated effluent from STP and ETP within one month after startup of plant by NABL approved lab.

4. The industry shall operate its production in such manner not harm to the local residents/nearby Population and Environment too.

5. The industry shall maintain proper logbook for used water, effluent generation and recycled effluent.

6. The unit shall installed web camera and final discharge point in the industry premise.

7. Effective operation & maintenance of installed effluent treatment plant should be done so that effluent meets norms/standards as prescribed.

8. The industry shall develop green belt as per the protocol attached with the board's office order no. H16405/220/2018/02 dated 16-02-2018 which is available on board's website.

9. Maintain logbook for electric meter reading to record daily electric usage by ETP and send logbook details to board on monthly basis.

10. The industry shall make proper arrangement for safe and scientific handling, storage, transportation and disposal of all solid wastes, sludge etc. generated.

11. The industry shall provide adequate arrangement for control of odour nuisance. All internal roads shall be made pucca. Industry shall maintain good housekeeping within factory premises, around effluent treatment facilities etc.

12. Industry shall ensure regular working of Continuous Online Effluent Monitoring System for monitoring of discharged treated effluent. Industry shall also ensure regular online transfer of data (Online Effluent Monitoring System and web camera) to the CPCB and UPPCB servers.

13. Industry shall submit Environment Statement to this Board as per provision of Environment (Protection) amendment Rule, 1993 for the previous year ending 31st March on or before 30th September every year.

14. The industry shall submit analysis report from NABL accredited laboratory of treated effluent within a month to the Board.

15. The industry shall submit the monitoring report of stack attached with both the boilers and Ambient Air Quality within one month after startup of plant by NABL approved lab.

16. The industry shall submit ambient air quality and stack monitoring report from NABL accredited laboratory within a month to the Board.

17. Industry shall strictly comply with conditions mentioned in CREP issued by CPCB to Thermal Power Plants.

18. The industry shall submit Ash Management Plan within 01 month.

19. The industry shall comply all the rules and regulations mentioned in the Environment (Protection) Act, 1986.

20. The industry will comply all the directions/guidelines/orders issued by CPCB & Hon'ble NGT to Thermal Power Plants time to time.

21. The industry will take all the preventive measures to prevent any fugitive dust emission from coal yard, ash handling area and storage site.

22. Ash generated by the industry should be stored and disposed off as per the notification issued by Ministry of Environment, Forest & Climate Change, Government of India.

23. The industry shall use at least 20% of total fuel as bio briquettes in boiler, as per availability.

24. Audited Balance Sheet/ C.A. Certificate should be submitted within one month from the date of issue of this Certificate for verification of Consent fee payable.

25. The industry must be follow the rules mentioned in Hazardous Waste and Other Waste Management and Transboundary Movement Rules, 2016.

26. The industry shall comply with the notification no. 3187(E) dated 07-10-2016 issued by the Ministry of Water Resources, River Development and Ganga Rejuvenation.

27. The industry shall comply with the provision of MSW Management Rules, 2016.

28. The industry shall comply the provision of E(P)A 1986.

29. If closure order is issued by CPCB or UPPCB against any defaulting unit, then CTO issued earlier will suspended during the pendency of the closure period and after ensuring the compliance and after revocation of closure order, the CTO will be deemed to be restore subject to the effective date of revocation of the closure order, with imposed conditions thereof.

30. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this CTO and attract action under the provisions of

RAM KARAN Digitally signed by RAM KARAN Date: 2024.01.02 15:36:41 +05'30'

RAM KARAN
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Date: 2024.01.02 15:36:20 +05'30'

Law.

Chief Environmental Officer, Circle-6

Copy to:

Regional Officer, U.P. Pollution Control Board, Ayodhya for information and necessary action.

RAM KARAN
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Date: 2024.01.02 15:36:56 +05'30'

Chief Environmental Officer, Circle-6

मिशन LiFE - पर्यावरण के लिए जीवन शैली

(Lifestyle For Environment)

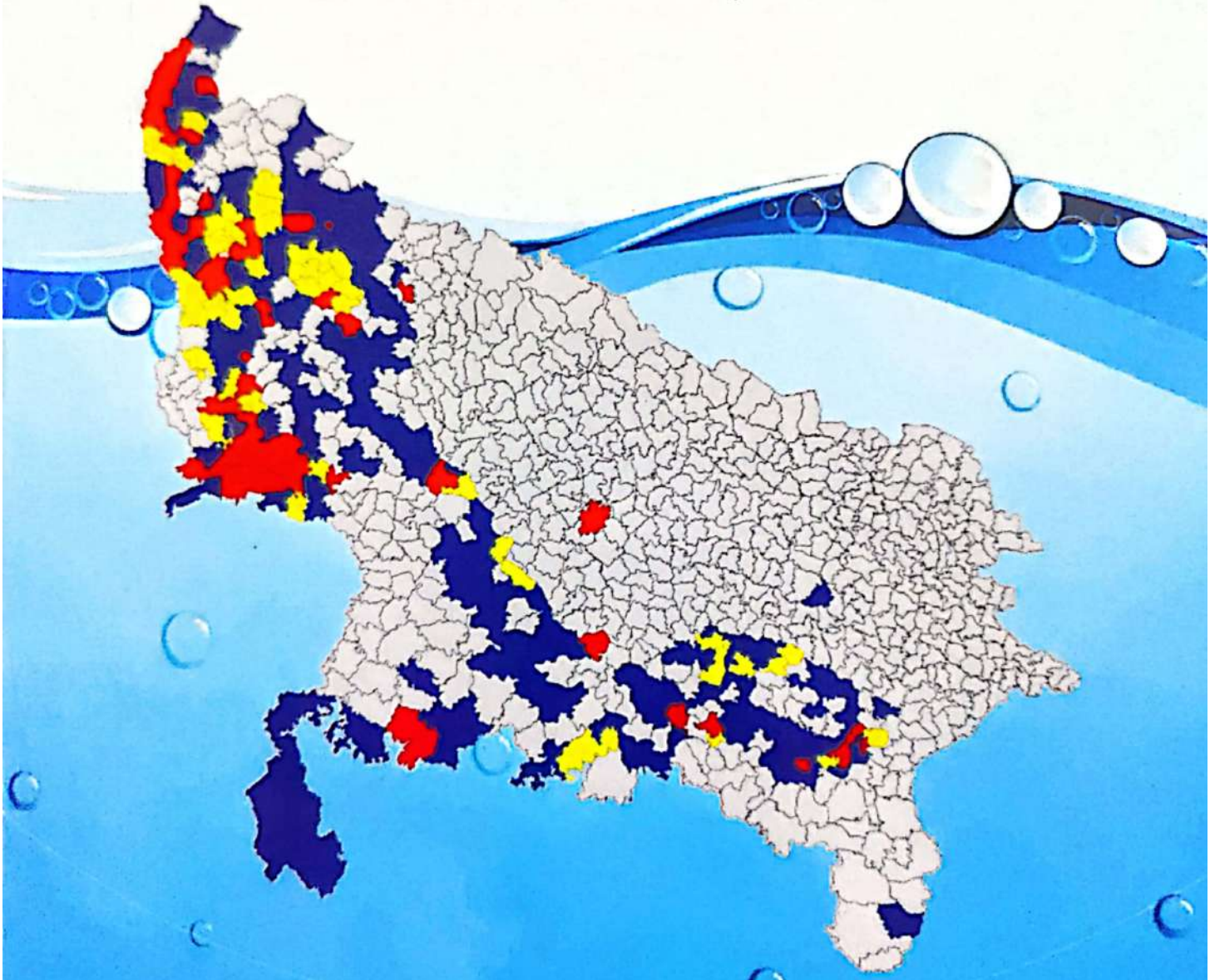
जनसहभागिता का सन्देश

- स्वच्छता – देशसेवा में अपने परिवेश की स्वच्छता हेतु अपना सक्रिय योगदान सुनिश्चित करें
- संकल्प लें -एकल उपयोग प्लास्टिक उत्पाद जैसे कप, तश्तरी, चम्मच, स्ट्रॉ, ईयरबड्स आदि का उपयोग न हो एवं पर्यावरण अनुकूल विकल्पों जैसे कागज/पत्तों से बने दोने या कटलरी को प्राथमिकता दी जाय |
- एकल उपयोग प्लास्टिक उत्पाद के प्रयोग को रोकने एवं प्लास्टिक बैग के बजाय कपड़े के थैले का उपयोग करने मात्र से 375 मिलियन टन ठोस (प्लास्टिक) कचरे का उत्सर्जन बचाया जा सकता है
- चक्रीय अर्थव्यवस्था (सर्कुलर इकोनॉमी) का समुचित कार्यान्वयन वर्ष 2030 तक लगभग 14 लाख करोड़ रुपये की अतिरिक्त बचत उत्पन्न कर सकता है | वेस्ट /अपशिष्ट फेकने के पूर्व सोचें, ये किसी का संसाधन तो नहीं ...?
- अनुपयोगी इलेक्ट्रिक / इलेक्ट्रॉनिक उत्पाद को कचरे में फेकने से रुकें | इसके उपयुक्त निस्तारण हेतु इसे प्राधिकृत ई – वेस्ट रीसाइकलर को दें | प्राधिकृत ई-रीसाइक्लिंग इकाई में अनुपयोगी इलेक्ट्रिक / इलेक्ट्रॉनिक उत्पाद को देने मात्र से 0.75 मिलियन टन तक ई-कचरे का पुनर्चक्रण किया जा सकता है एवं ई-कचरे के विषम पर्यावरणीय दुष्प्रभाव से बचा जा सकता है
- बाहर जाते समय - सोचें कि क्या आपको वास्तव में परिवहन की आवश्यकता है - वह भी क्या व्यक्तिगत रूप से ? छोटी दूरी के लिए पैदल चलना पसंद करें, अथवा सम्भव हो तो कार पूल के रूप में संसाधन को साझा करें अथवा सार्वजनिक परिवहन पर विचार करें
- घरेलू स्तर पर कम से कम ठोस अपशिष्ट का उत्सर्जन करें और इनका प्रथाक्कीकरण करें
- उपयोगी शेष खाद्य सामग्री आपके स्वयं प्रयास अथवा निकटस्थ सक्रिय स्वयं सेवी संस्थाओं की सहायता से समाज के वंचित वर्ग तक पहुंचाई जा सकती है | वहीं अनुपयोगी भोजन /खाद्य सामग्री को कंपोस्ट (वर्मी कम्पोस्ट) करने से 15 अरब टन भोजन को नष्ट होने से बचाया जा सकता है
- ध्यान रखें - उपयुक्त नल और शावर के उपयोग से पानी की खपत को 30 - 40% तक कम किया जा सकता है। एवं उपयोग में न होने पर नलों को बंद रखने मात्र से 9 ट्रिलियन लीटर पानी बचाया जा सकता है
- ट्रैफिक लाइट/रेलवे क्रॉसिंग पर कार/स्कूटर के इंजन बंद करने मात्र से 22.5 बिलियन kWh तक ऊर्जा की बचत हो सकती है
- परम्परागत बल्ब के स्थान पर CFL का उपयोग बिजली की खपत में प्रभावी कमी लाते हैं | उपयोग में न होने पर बिजली उपकरणों को बंद करें | स्टार रेटेड विद्युत उपकरणों के उपयोग को प्राथमिकता दें

हमारे द्वारा अपनी जीवन शैली की प्राथमिकताओं का उचित और पर्यावरण अनुकूल पुनर्निर्धारण समाज और पर्यावरण के प्रति हमारा दायित्व है |

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DYNAMIC GROUND WATER RESOURCES OF UTTAR PRADESH, 2023



LUCKNOW
JANUARY – 2024

No	District	Assessment Unit Name	Ground Water Extraction (Ham)				Stage of Ground Water Extraction (%)	Categorization (Over-Exploited/Critical/Semi-Critical/Safe/Saline)
			Irrigation	Industrial	Domestic	Total		
	GHAZIPUR	JAKHANIA	2284.10	0.10	596.60	2880.80	57.09	Safe
	GHAZIPUR	KARANDA	2073.90	0.00	379.67	2453.57	65.09	Safe
	GHAZIPUR	KASIMABAD	2422.42	0.37	651.56	3074.34	56.64	Safe
	GHAZIPUR	MANIHARI	5905.72	0.00	57.41	5963.13	68.62	Safe
	GHAZIPUR	MARADH	2720.80	0.00	499.28	3220.08	67.17	Safe
	GHAZIPUR	MOHAMMADABAD	1777.20	0.00	591.82	2369.02	69.59	Safe
	GHAZIPUR	REVATIPUR	3375.74	0.00	478.86	3854.60	57.48	Safe
	GHAZIPUR	SADAT	3615.96	0.00	562.30	4178.27	57.21	Safe
	GHAZIPUR	SAIDPUR	5190.00	0.00	59.34	5249.34	80.53	Semi Critical
	GHAZIPUR	VARACHAKWAR	3728.98	0.00	584.82	4313.80	62.68	Safe
	GHAZIPUR	ZAMANIA	2424.16	0.00	74.69	2498.84	29.30	Safe
	GONDA	BABHANJOT	2774.48	0.00	602.20	3376.68	65.95	Safe
	GONDA	BELSAR	3343.35	0.15	584.71	3928.20	61.86	Safe
	GONDA	CHHAPIA	2974.00	100.22	548.53	3622.75	62.16	Safe
	GONDA	COLONELGANJ	2352.00	0.44	501.10	2853.53	53.09	Safe
	GONDA	HALDHARMAU	2269.44	20.08	537.86	2827.38	56.90	Safe
	GONDA	ITIA THOK	4329.60	0.00	1076.52	5406.13	58.28	Safe
	GONDA	JHANJHRI	3573.16	113.27	583.96	4270.39	63.82	Safe
	GONDA	KATRA BAZAR	3160.40	0.00	617.14	3777.53	55.20	Safe
	GONDA	MANKAPUR	4064.60	254.09	658.39	4977.08	60.45	Safe
	GONDA	MUJHANA	3910.72	0.00	589.72	4500.44	58.92	Safe
	GONDA	NAWABGANJ	3876.80	0.00	570.41	4447.21	54.81	Safe
	GONDA	PANDRI KRIPAL	2983.20	0.27	368.46	3351.93	62.53	Safe
	GONDA	PARASPUR	4116.69	0.00	759.52	4876.20	64.03	Safe
	GONDA	RUPAIDIHA	5385.60	0.00	735.03	6120.63	61.72	Safe
	GONDA	TARABGANJ	4168.00	0.00	475.55	4643.54	59.80	Safe
	GONDA	WAZIRGANJ	3118.27	0.00	544.06	3662.33	63.43	Safe

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A REPORT ON
DYNAMIC GROUND WATER RESOURCES OF UTTAR PRADESH
(as on 31 March, 2020)
DISTRICT – GONDA



GROUND WATER DEPARTMENT U.P

(Namami Gange and Rural Water Supply Department)

Ministry of Jal Shakti

Government of Uttar Pradesh

S.No	DISTRICT	BLOCK	Annual Ground water Recharge (ham)	Environmental Flows (ham)	Annual Extractable Ground water Resource (ham)	Ground Water Extraction for all uses (ha.m)			Stage of Ground Water Extraction (%)	Categorization of Assessment Unit	Allocation of Ground Water Resource for Domestic Utilisation for projected year 2025 (ham)	Net Annual Ground Water Availability for Future Use (ham)	Total Ground Water Availability in the area (ham)
						Domestic & Industrial	Irrigation	TOTAL					
1	GONDA	BABHANJOT	6007.15	300.36	5706.79	569.33	3213.16	3782.49	66.28	Safe	652.61	1841.02	5706.79
2	GONDA	BELSAR	6201.93	620.19	5581.74	551.20	2988.00	3539.20	63.41	Safe	637.80	1955.94	5581.74
3	GONDA	CHHAPIA	4970.17	248.51	4721.66	515.55	2670.09	3185.64	67.47	Safe	602.66	1448.91	4721.66
4	GONDA	COLONELGANJ	4791.17	239.55	4551.62	471.07	2131.88	2602.95	57.19	Safe	550.25	1869.49	4551.62
5	GONDA	HALDHARMAU	3924.88	196.24	3728.64	513.68	1882.80	2396.48	64.27	Safe	571.01	1274.83	3728.64
6	GONDA	ITIA THOK	8645.59	432.28	8213.31	1011.46	3971.20	4982.65	60.67	Safe	1183.72	3058.40	8213.31
7	GONDA	JHANJHRI	5660.65	283.04	5377.61	551.16	2835.56	3386.71	62.98	Safe	635.22	1906.84	5377.61
8	GONDA	KATRA BAZAR	5937.06	296.85	5640.21	583.47	2927.82	3511.29	62.25	Safe	668.73	2043.66	5640.21
9	GONDA	MANKAPUR	7557.38	377.87	7179.51	625.92	3854.02	4479.94	62.40	Safe	705.17	2620.32	7179.51
10	GONDA	MUJHANA	6797.76	339.88	6457.88	556.03	3017.52	3573.54	55.34	Safe	643.02	2797.35	6457.88
11	GONDA	NAWABGANJ	7221.41	722.15	6499.26	538.23	2933.90	3472.13	53.42	Safe	620.84	2944.52	6499.26
12	GONDA	PANDRI KRIPAL	4920.91	246.05	4674.86	346.68	2746.00	3092.68	66.16	Safe	403.77	1525.09	4674.86
13	GONDA	PARASPUR	7391.71	369.59	7022.12	709.05	3363.49	4072.54	58.00	Safe	849.28	2809.35	7022.12
14	GONDA	RUPAIDIHA	8886.27	444.31	8441.96	693.41	4272.62	4966.03	58.83	Safe	800.43	3368.91	8441.96
15	GONDA	TARABGANJ	6548.49	327.42	6221.07	449.61	3299.04	3748.66	60.26	Safe	515.28	2406.74	6221.07
16	GONDA	WAZIRGANJ	5347.63	267.39	5080.24	509.09	2867.31	3376.39	66.46	Safe	604.53	1608.41	5080.24

उत्तर प्रदेश के गतिशील भूजल संसाधन

(मार्च, 2022 तक)

केन्द्रीय भूमि जल बोर्ड
उत्तरी क्षेत्र
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
जल शक्ति मंत्रालय
भारत सरकार

भूगर्भ जल विभाग
नमामि गंगे एवं ग्रामीण जलापूर्ति विभाग
उत्तर प्रदेश सरकार

लखनऊ
दिसम्बर, 2022

Sl.No	District	Assessment Unit Name	Annual Extractable Ground Water Resource (Ham)	Total Extraction (Ham)	Stage of Ground Water Extraction (%)	Categorization (OE/Critical/Semicritical/Safe)
			8			
320	GHAZIABAD	RAZAPUR	6677.77	8661.13	129.70	Over Exploited
321	GHAZIABAD	GAZIABAD CITY	2949.91	6530.09	221.37	Over Exploited
322	GHAZIPUR	BHADAURA	7295.62	3223.01	44.18	safe
323	GHAZIPUR	BHANWARKOL	5018.62	3397.67	67.70	safe
324	GHAZIPUR	BIRNO	4901.24	3383.89	69.04	safe
325	GHAZIPUR	DEOKALI	7110.83	4902.83	68.95	safe
326	GHAZIPUR	GHAZIPUR	3884	2295.72	59.11	safe
327	GHAZIPUR	JAKHANIA	5145.47	2871.55	55.81	safe
328	GHAZIPUR	KARANDA	4075.81	2761.53	67.75	safe
329	GHAZIPUR	KASIMABAD	5608.33	3562.86	63.53	safe
330	GHAZIPUR	MANIHARI	8519.41	5951.83	69.86	safe
331	GHAZIPUR	MARADH	4823.83	3212.49	66.60	safe
332	GHAZIPUR	MOHAMMADABAD	3424.83	2360.13	68.91	safe
333	GHAZIPUR	REVATIPUR	6701.16	3847.62	57.42	safe
334	GHAZIPUR	SADAT	7936.86	4370.66	55.07	safe
335	GHAZIPUR	SAIDPUR	6250.99	4953.43	79.24	Semi Critical
336	GHAZIPUR	VARACHAKWAR	6686.49	4658.07	69.66	safe
337	GHAZIPUR	ZAMANIA	8532.93	3156.71	36.99	safe
338	GONDA	BABHANJOT	5214.23	3629.41	69.61	safe
339	GONDA	BELSAR	6049.06	3594.27	59.42	safe
340	GONDA	CHHAPIA	5113.27	3356.3	65.64	safe
341	GONDA	COLONELGANJ	4682.19	2637.12	56.32	safe
342	GONDA	HALDHARMAU	4296.42	2615.64	60.88	safe
343	GONDA	ITIA THOK	9177.28	5072.44	55.27	safe
344	GONDA	JHANJHRI	6598.64	3856.37	58.44	safe
345	GONDA	KATRA BAZAR	6107.66	3549.01	58.11	safe
346	GONDA	MANKAPUR	8202.08	4731.76	57.69	safe
347	GONDA	MUJHANA	7669.39	4269.85	55.67	safe
348	GONDA	NAWABGANJ	7387.23	4223.85	57.18	safe
349	GONDA	PANDRI KRIPAL	5304.08	3165.87	59.69	safe
350	GONDA	PARASPUR	7686.08	4604.98	59.91	safe
351	GONDA	RUPAIDIHA	9968.87	5855.24	58.74	safe
352	GONDA	TARABGANJ	7464.01	4328.3	57.99	safe
353	GONDA	WAZIRGANJ	5484	3437.23	62.68	safe
354	GORAKHPUR	BANSGAON	7889.28	4683.55	59.37	safe
355	GORAKHPUR	BARAHALGANJ	10338.47	6414.84	62.05	safe
356	GORAKHPUR	BELGHAT	9979.37	6918.83	69.33	safe
357	GORAKHPUR	BHATAHAT	7150.99	4405.54	61.61	safe
358	GORAKHPUR	BRAHMPUR	9987.13	5655.24	56.63	safe
359	GORAKHPUR	CAMPIERGANJ	10816.13	7310.64	67.59	safe
360	GORAKHPUR	CHIRGAWAN	6074.5	3476.1	57.22	safe
361	GORAKHPUR	GAGAHA	6942.15	4773.92	68.77	safe
362	GORAKHPUR	GOLA	7237.24	4742.61	65.53	safe
363	GORAKHPUR	JANGAL KAUDIA	7610.78	4900.68	64.39	safe