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, Balrampur)

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

INDIA NON JUDICIAL

Government of Uttar Pradesh

4568

IN-UP05405280561820X

e-Stamp

Moti Krishna Pandey
Stamp Vikreta
Licence No.-19B
E-Stamping Acc ID-UP1449440
Tahsil & Dist.-Balrampur

Certificate No.	:	IN-UP05405280561820X
Certificate Issued Date	:	18-Feb-2025 11:50 AM
Account Reference	:	NEWIMPACC (SV)/ up14494404/ BALRAMPUR SADAR/ UP-BRP
Unique Doc. Reference	:	SUBIN-UPUP144944040802336477048 2X
Purchased by	:	ABHISHEK PATEL SO PRAYAG DUTTA PATEL
Description of Document	:	Article 4 Affidavit
Property Description	:	Not Applicable
Consideration Price (Rs.)	:	
First Party	:	ABHISHEK PATEL SO PRAYAG DUTTA PATEL
Second Party	:	Not Applicable
Stamp Duty Paid By	:	ABHISHEK PATEL SO PRAYAG DUTTA PATEL
Stamp Duty Amount(Rs.)	:	10 (Ten only)

NOTARY A.K. Srivastav Distt.-H.Q. Balrampur NOTARIAL 63 (37A) 2014 Govt. of Uttar Pradesh

IN-UP05405280561820X

Please write or type below this line

Attached

NOTARY A.K. Srivastav Distt.-H.Q. Balrampur Regd. No. 63 (37A) 2014 Govt. of Uttar Pradesh

18.02.2025

Abhishek Patel age 35 yrs s/o Sri Prayag Dutt Patel

Sign affirmed Oath before me

Shri which has been identified By Sri Agar Kumar Pandey S/o

who is k me personally co[illegible] appeared

the dep o admits them to be true

Sl. No. 264 A.K. Srivastava Notary Authority

Date 18-02-2025 Distt H.Q Balrampur 18.02.2025

Statutory Alert:

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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 UPGWD (BALRAMPUR) IN COMPLIANCE OF ORDER DATED 7.11.2024

I, _Abhishek Patel S/o. Sh.__Prayag Dutta Patel aged about 35 years working as Nodel Officer office at District Balrampur do hereby solemnly state and affirm as under: -

1. I say that being the Nodal Officer, Balarmpur I am well conversant with the facts of 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: -

NOTARY A.K. Srivastav Distt.- H.Q. Balrampur Reg No. 6307 (37A) 2014 Govt. of Uttar Pradesh

[illegible] 2025

"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 dated 13.11.2019 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 under the chairmanship of the District Magistrate 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 dated 21.01.2020 is annexed herewith as **Annexure-3**

NOTARY A.K. Srivastav Distt. H.Q. Sitapur Regd. No. 68 (37A) 2014 Govt. of Uttar Pradesh

7. That in compliance with the notification dated 21.01.2020, the District Ground Water Management Council was constituted in Balrampur district vide letter No. 300/ल०सि०/भूगर्भ जल प्र०प० गठन /2019–20 Dated 10.02.2020 of office of the Chief Development officer, Balrampur. 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 dated 10.02.2020 is annexed herewith as **Annexure-4.**

8. That 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/यू०पी०रा०भू०ज०प्र०वि०प्रा०, 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 dated 25.02.2021 issued by the Director is annexed herewith as **Annexure 5**

NOTARY A.K. Srivastav Dist. H.Q. Balrampur Regd. No. 68 (3/10) 2019 Govt. of Uttar Pradesh

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 Balrampur vide order number 404/ ल0सि0/भूगर्भ जल प्र0प0 गठन /2020–21 dated 22.03.2021 a "Task Force" has been constituted to carry out on-site verification before disposal. Copy of the order of District Magistrate, District Balrampur 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 Balrampur, to represent the department regarding firms operating in Balrampur 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, Itaimaida, utraula, Balrampur, on dated 10.02.2025 and 11.02.2025.

13. That on 10.02.2025 and 11.02.2025, 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 Itaimaida, utraula,

NOTARY A.K. Srivastava Govt. of Uttar Pradesh (37A/2014)

Balrampur, 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., Itaimaida, utraula, Balrampur for Groundwater Extraction:**

M/s Bajaj Hindustan Sugar Ltd., extracts groundwater through Three (03) borewells at Itaimaida, utraula, Balrampur . The District Council, District Balrampur, has issued the necessary NOCs **(Annexures 8.1, 8.2, and 8.3)** for groundwater extraction, the details of which are as follows:

S.No.	NOC No.	Validity of NOCs	Quantity of Maximum Extraction
1	NOC040290	18-10-2021 to 17-10-2026	135000 cubic meter/year
2	NOC022896	18-10-2021 to 17-10-2026	108000 cubic meter/year
3	NOC045903	18-10-2021 to 17-10-2026	81000 cubic meter/year
03 Total Quantity of Ground water extraction through borewell			**324000 cubic meter/year**

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

The investigation into compliance with the conditions specified in 03 NOCs issued for groundwater extraction yielded the following findings:

NOTARY A.K. Srivastav

- M/s Bajaj Hindustan Sugar Ltd. situated in Itaimaida, utraula, Balrampur.
- The firm has installed three borewells, each with a depth of approximately 110 meters. Three motors operate at a capacity of 50 HP.
- During the inspection, the discharge from the three borewells was recorded at 147, 134 and 141 cubic meters per hour, respectively.
- That there is no any pipeline system for supplying purified water in Itaimaida, utraula, Balrampur.
- A rainwater harvesting system has been implemented in firm campus with an annual groundwater recharge of approximately 16640 cubic meters. The system was found to be operational during verification.
- Mr. Parmeshwar Rai who is representative of the Firm informed that the firm has acquired a pond near village itaimaida covering approximately 6.39 hectares adopted for groundwater harvesting, enabling an annual Conservation of approximately 190764 cubic meters ground water. Copy of the paper of acquisition of pond is annexed herewith as **Annexure-9**
- The firm is authorized to extract 324000 cubic meters of groundwater annually from three borewells, however, extracting only 226800 cubic meters per year. Through rainwater harvesting and the pond, the firm recharges 207404 cubic meters annually.
- Two piezometers (with DWLR) have been installed, with recorded post-monsoon groundwater levels for 2024 at 2.36 meters (Piezometer-1) and 2.44 meters (Piezometer-2).

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- That the year-wise average groundwater level of pre and post monsoon was also assessed in Shridatt Ganj Development Block of Balrampur 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 2020 to the year 2023 are as follows in Table-1:

Table -1

Year	Pre Monsoon (Meter)	Post Monsoon (Meter)
2020	3.75	1.39
2021	2.39	0.93
2022	2.79	1.56
2023	4.21	1.98

- A water audit report, prepared by the Federation of Indian Chambers of Commerce and Industry (FICCI), New Delhi, it was reviewed and found compliant with under CGWA, MoJS, GOI, standards. Copy of the Audit report is annexed herewith as **Annexure-10.**

- An impact assessment report, prepared by Shri Vijay Rajkumar Yadav (CGWA nominee representative), was examined and found compliant with CGWA standards. Copy of the assessment report is annexed herewith as **Annexure-11.**

- The firm has installed (01) one 1200 KLD Effluent Treatment Plant (ETP) and 01 (one) 50 KLD Sewage Treatment Plant (STP).

NOTARY Govt. of Uttar Pradesh

- 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 Itaimaida, utraula, Balrampur, extracts groundwater through three borewells. The District Council, District Balrampur, 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	REG024839	06-09-2021 to 05-09-2026	972000 cubic meter/year
2	REG029714	06-09-2021 to 05-09-2026	756000 cubic meter/year
3	NOC029570	18-10-2021 to 17-10-2026	378000 cubic meter/year
03 Total Quantity of Ground water extraction through borewell			**2106000 cubic meter/year**

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

- M/s Bajaj Energy Ltd. Situated in Village Itaimaida, Utraula, Balrampur

NOTARY A.K. Srivastav Regd. No. 530 (374) 2014 Govt. of Uttar Pradesh

- The firm has installed three borewells, each with a depth of approximately 121 meters, and the running motor has a capacity of 30 HP.
- During the inspection, the discharge rates of the borewells were found to be 165, 126, and 164 cubic meters per hour.
- No pipeline system for purified water supply exists in Village Itaimaida, Utraula, Balrampur
- The firm has implemented a rainwater harvesting system with annually recharging approximately 85667 cubic meters/ year of groundwater.
- Mr. Sajan Singh who is representative of the Firm reported that the firm has acquired ponds near Village Itaimaida covering approximately 26.426 hectares adopted for groundwater harvesting, contributing to an annual recharge of approximately 792390 cubic meters. Copy of the document of acquisition of pond is annexed herewith as **Annexure-14.**
- The firm has been permitted to extract 21,06,000 cubic meters of groundwater annually however, extracts only 971187 cubic meters per year. Through rainwater harvesting and pond recharge, the firm replenishes 878057 cubic meters annually.
- Two piezometers (with DWLR) have been installed, with recorded post-monsoon groundwater levels for 2024 at 4.80 meters (Piezometer-1) and 4.42 meters (Piezometer-2).
- That the year-wise average groundwater level of pre and post monsoon was also assessed in Shridatt Ganj Block development office of Balrampur district through the departmental piezometer

NOTARY A.K. Srivastav Distt. Balrampur Regd. No. 38 (37A) 2014 Govt. of Uttar Pradesh

(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 2020 to the year 2023 are as follows in Table-2

Table -2

Year	Pre Monsoon (Meter)	Post Monsoon (Meter)
2020	3.75	1.39
2021	2.39	0.93
2022	2.79	1.56
2023	4.21	1.98

- A water audit report, prepared by PHD Chambers of Commerce and Industry, it was reviewed and found compliant under CGWA, MoJS, GOI standards. Copy of the audit report is annexed herewith as **Annexure-15.**
- An impact assessment report, prepared by Shri V. Pugazhendi (CGWA nominee by GoI), was examined and found compliant with CGWA standards. Copy of the impact assessment report is annexed herewith as **Annexure-16.**
- The firm has installed (01) one 1200 KLD Effluent Treatment Plant (ETP) and 01 (one) 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

NOTARY A.K. Srivastava Distt. Unnao (U.P.) Govt. of Uttar Pradesh

31.12.2025. Copy of the CTO is annexed herewith as **Annexure-17.**

14. That after the site verification, Groundwater Assessment Report-2023 was prepared by the department, 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 Balrampur district is as follows:-

The total amount of ground water resources available	-84111.92 hectare meter
Groundwater from all sources Amount of extractable groundwater	50117.01 hectare meter
Groundwater extraction in Irrigation work	43674.41 hectare meter
Ground water extraction in industrial area	284.68 hectare meter
Ground water extraction in domestic sector	6157.91 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 Balrampur district is 50117.01 hectare meter. In the total groundwater extraction, groundwater extraction for irrigation work is 43674.41 hectare meter, and groundwater extraction in industrial area is 284.68 hectare meter. It is further submitted that the total utility of groundwater

NOTARY A.K. Srivastava (37A) 2014 Govt. of Uttar Pradesh

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 09 (nine) development blocks under Balrampur district. According to the Groundwater Resource Assessment-2023 report, block Development Balrampur and all other blocks have been classified in the Safe category.

17. That the Project Proponent is having valid NOC by the U.P. Ground Water Department and there is no Ground Water contamination. Furthermore, it was found that the above named firms is compliant of all terms and conditions of NOCs.

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

NOTARY A.K. Srivastav Govt. of Uttar Pradesh 18.02.2025

DEPONENT

Verification

Verified at Balrampur on 18 Feb. 2025 that the contents of the above affidavit are true and correct to best of my knowledge and belief and nothing material has been suppressed herewith.

DEPONENT

Signature identified by Advocate 18/2/25 (Ajay Kumar Pandey) 3022/76

Annexure (1)

क्रम-संख्या–186 (क)

रजिस्ट्रेशन नम्बर–एस0एस0पी0/एल–डब्लू/एन0पी0/91/2014–16

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, 11 सितम्बर, 2019

भाद्रपद 20, 1941 शक सम्वत्

उत्तर प्रदेश शासन

लघु सिंचाई एवं भूगर्भ जल अनुभाग–1

संख्या 1036/62-1–2019-10जी0डब्ल्यू-2014

लखनऊ, 11 सितम्बर, 2019

अधिसूचना

प0आ0–261

उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) अधिनियम, 2019 (उत्तर प्रदेश अधिनियम संख्या 13 सन् 2019) की धारा 1 की उपधारा (3) के अधीन शक्तियों का प्रयोग करके राज्यपाल 2 अक्टूबर, 2019 को ऐसा दिनांक नियत करते हैं, जिस दिनांक को उक्त अधिनियम प्रवृत्त होगा।

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. 1036/LXII-1–2019-10GW/2014, dated Lucknow September 11, 2019.

No. 1036/LXII-1–2019-10GW/2014
Dated Lucknow, September 11, 2019

IN exercise of the powers under sub-section (3) of section 1 of the Uttar Pradesh Ground Water (Management and Regulation) Act, 2019 (U.P. Act no. 13 of 2019) the Governor is pleased to appoint 2nd October, 2019 as the date on which said Act shall come into force.

By order,
ANITA SINGH,
Pramukh Sachiv.

पी०एस०यू०पी०–ए०पी० 270 राजपत्र–2019–(771)–599 प्रतियां (कम्प्यूटर/टी0/ऑफसेट)।
पी०एस०यू०पी०–ए०पी० 2 स0 लघु सिंचाई एवं भू–गर्भ जल–2019–(772)–1000 प्रतियां (कम्प्यूटर/टी0/ऑफसेट)।

270_RPH_2019

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

प०आ०–344

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.

पी०एस०यू०पी०–ए०पी० 379 राजपत्र–(हिन्दी)–2019–(998)–599 प्रतियां–(क०/टी०/ऑफसेट)।
पी०एस०यू०पी०–ए०पी० 3 सा० लघु सिंचाई–2019–(999)–1,000 प्रतियां–(क०/टी०/ऑफसेट)।

Annexure(3)

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

4583

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 है:–

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

4584

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

4585

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 मुख्य विकास अधिकारी, बलरामपुर।

पत्रांक 300 /ल0सि0/भूगर्भ जल प्र0प0गठन/2019–20 दिनॉक 19-02- 2020

समस्त सदस्य
जिला भूगर्भ जल प्रबन्धन परिषद्,
बलरामपुर।

विषयः–उत्तर प्रदेश भूगर्भ जल (प्रबन्धन एवं विनियमन) अधिनियम–2019 के सम्बन्ध में।

तद्विषयक विशेष सचिव, लघु सिचाई एवं भूगर्भ जल अनुभाग–1, उ0प्र0 शासन लखनऊ के पत्र संख्यॉ 1458/62–1–2019–10 जी0डब्लू/2014(नियामक)19 दिनॉक 23–12–2019 के कम में जिला भूगर्भ जल प्रबन्धन परिषद का गठन निम्नानुसार किया गया हैः–

1– अध्यक्ष	जिला मजिस्ट्रेट
2– सदस्य सचिव	जिला विकास अधिकारी
3– सदस्य	खान निरीक्षक, कार्या0 जिलाधिकारी, बलरामपुर।
4– सदस्य	सहायक अभियन्ता, जल निगम, बलरामपुर।
5– सदस्य	सीनियर हाइड्रोजियोलाजिस्ट,भूगर्भ जल विभाग,
6– सदस्य	उ0प्र0 प्रदूषण नियन्त्रण बोर्ड
7– सदस्य	कृषि विभाग(उप कृषि निदेशक)
8– सदस्य	लघु सिचाई विभाग (सहायक अभियन्ता)
9– सदस्य	अधिशासी अभियन्ता, जल निगम
10–सदस्य	स्थानीय निकाय (पंचारथानि चुनावालय)
11–सदस्य	जिला विकास प्राधिकरण
12–सदस्य	सिचाई एवं जल संसाधन (अधि0अभि0 सिचाई खण्ड–1)
13–सदस्य	उद्योग विभाग(प्रबन्धक)
14–सदस्य	उद्यान विभाग(जिला उद्यान अधि0)
15–सदस्य	वन एवं वन्य जीव विभाग(प्रभागीय निदेशक)
16–सदस्य	अधिशासी अधिकारी, नगर पालिका परिषद, बलरामपुर

अस्तु उपरोक्तानुसार जनपद स्तरीय जिला भूगर्भ जल प्रबन्धन परिषद गठन का विवरण एवं विशेष सचिव, लघु सिचाई एवं भूगर्भ जल अनुभाग–1, उ0प्र0 शासन लखनऊ के पत्र संख्यॉ 1458/62–1–2019–10 जी0डब्लू/2014(नियामक)19 दिनॉक 23–12–2019 मुख्य सचिव ,लघु सिचाई एवं भूगर्भ जल अनुभाग–1, उ0प्र0 शासन, लखनऊ के पत्र संख्यॉ 1075 /62–1–2019–10 जी0डब्लू/2014 दिनॉक 20–9–2019 व उसके साथ संलग्न उत्तर प्रदेश भूगर्भ जल (प्रबन्धन एवं विनियमन) अधिनियम–2019 तथा इस अधिनियम को दिनॉक 02–10–2019 उसे प्रदेश में लागू किये जाने सम्बन्धी अधिसूचना दिनॉक 11–9–2019 की प्रति सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित है।

19/2/2020

(अमनदीप डुली)
मुख्य विकास अधिकारी
बलरामपुर।

पत्रांक 300 /ल0सि0/भूगर्भ जल प्र0प0गठन/2019–20 दिनॉक 2020

प्रतिलिपिः–निम्नॉकित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु।
1–जिलाधिकारी, महोदय, बलरामपुर।

19/2/2020

मुख्य विकास अधिकारी,
बलरामपुर।

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, बलरामपुर।

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पत्रांक 404 /ल0सि0/भूगर्भ जल प्र0प0गठन/2020–21 दिनांक 22 –03– 2021

कार्यालय ज्ञाप

निदेशक, भूगर्भ, जल विभाग /सदस्य सचिव, राज्य भूगर्भ जल प्रबन्धन एवम् नियामक प्राधिकारण, उ0प्र0 9वॉ तल, इन्दिरा भवन, लखनऊ के पत्र संख्यॉ 23/यूपीराभूजप्रविप्रा दिनॉक 25–02–2021 द्वारा उत्तर प्रदेश 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 निम्नानुसार किया जाता है:–

1–सहायक अभियन्ता, लघु सिचाई (नामित नोडल अधिकारी)
2–अधिशासी अभियन्ता, जल निगम (सदस्य)
3–क्षेत्रीय अधिकारी, उ0प्र0 प्रदूषण नियन्त्रण बोर्ड (सदस्य)
4–अधिशासी अभियन्ता, नलकूप खण्ड सिचाई (सदस्य)

सूचनीय है कि उ0प्र0 भूगर्भ जल अधिनियम 2019 में निहित प्रावधानों के अन्तर्गत भूगर्भ जल निष्करण हेतु अनापत्ति निर्गमन एवं पंजीयन सेवायें जनहित गारण्टी नियम से आच्छादित है तथा आवेदन पत्रों का निस्तारण प्राप्त होने की अवधि से 30 दिवस के अन्दर किया जाना अनिवार्य है। उपरोक्त टास्कफोर्स समिति को निर्देशित किया जाता है कि प्राप्त आवेदनपत्रों का अधिनियम के प्रावधानों के अन्तर्गत समयबद्व रूप से आवश्यक कार्यवाही करते हुए निस्तारण करने का कष्ट करें।

(श्रुति)
जिलाधिकारी
बलरामपुर

पत्रांक 404 /ल0सि0/भूगर्भ जल प्र0प0गठन/2020–21 दिनॉक–उक्त।
प्रतिलिपि:–निम्नॉकित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु।
1–मुख्य विकास अधिकारी, बलरामपुर।
2–समस्त सदस्य जिला भूगर्भ जल प्रबन्धन समिति जनपद बलरामपुर।
3–अधिशासी अधिकारी, नगर पालिका परिषद/नगर पंचायत, बलरामपुर
3–समस्त खण्ड विकास अधिकारी, जनपद–बलरामपुर।

जिलाधिकारी,
बलरामपुर।

Annexure(7)

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23

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 विचाराधीन 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

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

Annexure(8.1)

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: NOC040290

VALID FROM 18/10/2021 TO 17/10/2026

Name of the Applicant	AVDESH KUMAR GUPTA		
Address of the Applicant:	VILLEGE- ITAIMAIDA,POST-SHRIGANJ,TEHSIL UTRAULA,DISTT.-BALRAMPUR, UP-271607		
Company Name:	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT UTRAULA	**Company Address**	Village Itai Maida Block Sridattganj District Balr
Serial No. of Application Form	BLMP0721NIN0007	**Date of Submission**	12/07/2021
Specimen Signature of the User:			

Location particulars:

District	Balrampur	**Block**	Sridattganj
J.L. No		**Plot No.**	Existing premises khasra detail attached
Municipality/Corporation	No	**Ward No.**	NA
Holding No.			NA
Rate of Withdrawal (m^3/hr.)	180.00	**Date of Energization (In Case of Electric Pump)**	01/06/2010

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)	34.52	**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.):	180.00	**Maximum Allowable Running Hours Per Day:**	5.00
Maximum Allowable Annual Extraction of Ground Water:	135000.00	**Recharge Required:**	67245.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at SI. (2) for extraction of ground water at a rate not exceeding that as shown at SI. (3j), for Running Hours per day as shown at SI. (3k), and for maximum allowable annual extraction of ground water as shown at SI. (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 67245.00 cubic meter, as specified under the application form within the given time period..

GENERAL CONDITIONS

- Holder of this NOC is hereby directed to fill from 1(A) for registering his/her well within 90 days as mentioned in application form shall only started after registration of his/her NOC.
- 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 SI. (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 I 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.
- 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	Monitiring 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 I 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)/ PHD Chamber of Commerce & Industries 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 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /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 50 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 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**17/11/2021**

Place:**Balrampur**

This certificate is electronically generated and does not require digital signature

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: NOC022896

VALID FROM 18/10/2021 TO 17/10/2026

Name of the Applicant	AVDESH KUMAR GUPTA		
Address of the Applicant:	VILLEGE- ITAIMAIDA,POST-SHRIGANJ,TEHSIL UTRAULA,DISTT.-BALRAMPUR, UP-271607		
Company Name:	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT UTRAULA	**Company Address**	Village Itai Maida Block Sridattganj District Balr
Serial No. of Application Form	BLMP0721NIN0008	**Date of Submission**	12/07/2021
Specimen Signature of the User:			

Location particulars:

District	Balrampur	**Block**	Sridattganj
J.L. No		**Plot No.**	Existing premises khasra detail attached
Municipality/Corporation	No	**Ward No.**	NA
Holding No.			NA
Rate of Withdrawal (m^3/hr.)	180.00	**Date of Energization (In Case of Electric Pump)**	01/06/2010

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)	34.52	**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.):	180.00	**Maximum Allowable Running Hours Per Day:**	4.00
Maximum Allowable Annual Extraction of Ground Water:	108000.00	**Recharge Required:**	53745.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at SI. (2) for extraction of ground water at a rate not exceeding that as shown at SI. (3j), for Running Hours per day as shown at SI. (3k), and for maximum allowable annual extraction of ground water as shown at SI. (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 53745.00 cubic meter, as specified under the application form within the given time period..

GENERAL CONDITIONS

- Holder of this NOC is hereby directed to fill from 1(A) for registering his/her well within 90 days as mentioned in application form shall only started after registration of his/her NOC.
- 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 SI. (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 I 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.
- 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	Monitiring 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 I 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)/ PHD Chamber of Commerce & Industries 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 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /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 50 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 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**17/11/2021**

Place:**Balrampur**

This certificate is electronically generated and does not require digital signature

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: NOC045903

VALID FROM 18/10/2021 TO 17/10/2026

Name of the Applicant	AVDESH KUMAR GUPTA		
Address of the Applicant:	VILLEGE- ITAIMAIDA,POST-SHRIGANJ,TEHSIL UTRAULA,DISTT.-BALRAMPUR, UP-271607		
Company Name:	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT UTRAULA	**Company Address**	Village Itai Maida Block Sridattganj District Balr
Serial No. of Application Form	BLMP0721NIN0009	**Date of Submission**	12/07/2021
Specimen Signature of the User:			

Location particulars:

District	Balrampur	**Block**	Sridattganj
J.L. No		**Plot No.**	Existing premises khasra detail attached
Municipality/Corporation	No	**Ward No.**	NA
Holding No.			NA
Rate of Withdrawal (m^3/hr.)	180.00	**Date of Energization (In Case of Electric Pump)**	01/06/2010

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)	34.52	**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.):	180.00	**Maximum Allowable Running Hours Per Day:**	3.00
Maximum Allowable Annual Extraction of Ground Water:	81000.00	**Recharge Required:**	40245.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at SI. (2) for extraction of ground water at a rate not exceeding that as shown at SI. (3j), for Running Hours per day as shown at SI. (3k), and for maximum allowable annual extraction of ground water as shown at SI. (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 40245.00 cubic meter, as specified under the application form within the given time period..

GENERAL CONDITIONS

- Holder of this NOC is hereby directed to fill from 1(A) for registering his/her well within 90 days as mentioned in application form shall only started after registration of his/her NOC.
- 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 SI. (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 I 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.
- 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	Monitiring 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 I 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)/ PHD Chamber of Commerce & Industries 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 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /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 50 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 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**17/11/2021**

Place:**Balrampur**

This certificate is electronically generated and does not require digital signature



उत्तर प्रदेश UTTAR PRADESH

अनापत्ति प्रमाण पत्र

EU 726206

मै श्रीमती शाहिनबेगम सरपंच/प्रधान, ग्राम पुरैना बाजिद तहसील उतरौला जिला- बलरामपुर उ0प्र0 का निवासी हूँ बजाज हिन्दुस्थान शुगर लि0, इकाई मैदा उतरौला जनपद- बलरामपुर के समीप ग्राम -------- मे स्थित तालाब जिसका खाता सं0 455 ,309, ,554 फसली वर्ष 1426-1431 व जिसका क्षेत्रफल 0.380, 0.890 ,5.2910 हे0 है। को कृत्रिम भूजल पुर्नभरण मे उपयोग करना चाहते है, बजाज हिन्दुस्थान शुगर लि0 इस तालाब को कृत्रिम भूजल पुर्नभरण के लिये प्रयोग कर सकते है, इसमे हमे कोई आपत्ति नही है।

न्याय पंचायत सिपरा बारी
ग्राम पंचायत पुरैना बाजिद



उत्तर प्रदेश UTTAR PRADESH EU 725853

अनापत्ति प्रमाण पत्र

मै आजाराम--- सरपंच/ प्रधान ग्राम शलिबपुर-----तहसील उतरौला, जनपद-बलरामपुर (उत्तर प्रदेश) का निवासी हूँ। बजाज हिन्दुस्थान शुगर लिमिटेड, इटई मैदा, उतरौला, बलरामपुर के समीप ग्राम शलिबपुर--- मे स्थित तालाब, जिसका गाटा सं०-193/0.23, 244/0.286 फसली वर्ष --1428-1431 व जिसका क्षेत्रफल---0.6285--हे० है। को कृतिम भूजल पुर्नभरण मे उपयोग करना चाहते है, बजाज हिन्दुस्थान शुगरलिमिटेड इस तालाब को कृतिम भूजल पुर्नभरण के लिये प्रयोग कर सकते है। इससे हमे कोई आपत्ति नही है।

दि. 2/12/21



उत्तर प्रदेश UTTAR PRADESH EU 725853

अनापत्ति प्रमाण पत्र

मै अशोराम--- सरपंच/ प्रधान ग्राम शिलबुर----तहसील उतरौला, जनपद-बलरामपुर (उत्तर प्रदेश) का निवासी हूँ। बजाज हिन्दुस्थान शुगर लिमिटेड, इटई मैदा, उतरौला, बलरामपुर के समीप ग्राम शिलबुर--- मे स्थित तालाब, जिसका गाटा सं०-193/0.23, 244/0.386 फसली वर्ष 1427-1431 व जिसका क्षेत्रफल 0.6285 हे० है। को कृतिम भूजल पुर्नभरण मे उपयोग करना चाहते है, बजाज हिन्दुस्थान शुगरलिमिटेड इस तालाब को कृतिम भूजल पुर्नभरण के लिये प्रयोग कर सकते है। इससे हमे कोई आपत्ति नही है।

ग्राम पंचायत [illegible] प्रधान

दि. 2/12/21

4601

Annexure(10)

REPORT
On
Water Audit Study

Bajaj Hindusthan sugar Limited, Unit-Utraula,
Utraula, Balrampur, UP-271607



by

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

(January 2023)

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Federation of Indian Chambers of Commerce & Industry (FICCI) places on record its sincere thanks to **Bajaj Hindusthan Sugar Limited, Unit-Utraula,** for entrusting the task of conducting "Water Audit Study" as per CGWA guidelines at **Bajaj Hindusthan Sugar Limited, Unit-Utraula** Plant during January 2023.

We hereby express our sincere thanks to JGM- EHS; AGM HR & ADMIN; Sr. Manager EHS and Dy. Manager EHS and Dy. Manager HR & ADMIN From **Bajaj Hindusthan Sugar Limited, Unit- Utraula** for their proactive support and courtesy extended to the FICCI team during field study. We also thank other officials from **Bajaj Hindusthan Sugar Limited, Unit- Utraula** 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

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Executive Summary

FICCI has conducted a detailed Water Audit Study of the **Bajaj Hindusthan Sugar Ltd., Sugar unit - Utraula plant during January 2023.** The study estimated that the total Water use by the plant in Season (November to April) is about **3855 m^3/day** out of which about 17.5 % is freshwater; 69.5 % is Cane Sugar water, 12.3 % is ETP treated water and 0.7 % is STP treated water. The main source of freshwater for plant is groundwater. The plant consumes about **177671 m^3** of groundwater per annum. The water is mainly used for utilities, process, fire hydrant and domestic use in buildings like handwashing, toilet flushing etc. The main water sources and their uses are given in Table below.

Table A: Total Water Requirement by plant on season (Nov. to April)

S.N.	Source of Water	m^3/day	Water Quality	Major Usage Area	Water Use (%)
1	Bore wells	676	Fresh water	DM water & cooling Tower makeup, Utilities, Backwashing, Potable water, Domestic activities, Process Line	17.5%
2	Cane Sugar Water	2680	Cane Sugar water	Process water use	69.5%
3	ETP Treated water	473	Recycle Treated Water	Gardening, Dust Suppression ,Ash quenching	12.3%
4	STP Treated Water	26	Recycle Treated Water	Gardening & green Development	0.7%
Total		**3855**			100%

The study estimated that the total Water use by the plant in Off Season (May to October) is about **333 m^3/day** out of which about 93.3 % (311 m3/day) is freshwater and 6.7 % (22 m3/day) is STP treated water.

Table B: Water Sourcing Off Season (May to October)

S.N.	Source of Water	m^3/day	Water Quality	*Major Usage Area*	*Water Use (%)*
1	Bore wells	311	Fresh water	Domestic activities in colony & Plant	93.3%
2	STP Treated Water	22	Recycle Treated Water	Gardening & green Development	6.7%
		333			100%

The total wastewater generation in the plant in Season is about **449 m^3/day,** out of which about 12.3 % is the process water 0.7 % is the generated by domestic use in Plant building consumption, 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 **90578 m^3/Annum**, which around **51 %** 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 216 m3/day (70 % of domestic water use) and having potential upto 188 m3/day sewage water .	188	68474
2	Installation of water efficient taps /aerator/ dual toilets and water less urinal	61	22104
	Total	249	90578

Table D: Summary of Water Savings

S. No.	Description Unit	Value
1	Annual Total Fresh water Consumption m^3/annum	177671
2	Annual water saving m^3/annum	90578
3	Saving %	51%

Water Management Summary:

Table 1: Fact File- **Bajaj Hindusthan Sugar Ltd., Sugar unit - Utraula plant**	
Plant Name and Location	Bajaj Hindusthan Sugar Ltd., Sugar unit - Utraula plant
Plant zone	Safe Zone
Depth of ground water table (Mtr.)	1.5
Type of products	Sugar
No. of working days/year	80
Annual Production (2021-2022)	Total Production – 29481 Tones per Year
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–676 m^3/day in season and 311 m^3/day in off season Rs. 0.85/ m^3 (Pumping Cost) Rs. 0.8m^3/ day (CGWA Ground water abstraction Charges)
Total annual Fresh Water consumption (2021-22)	177671 m^3/year
Total Water Use (Freshwater, Recycled RO Reject Water, ETP Treated Water) for Plant	• Freshwater- 676 m^3/day in season and 311 m^3/day in off season. • ETP Treated Water- 473 m^3/day • STP Treated Water 26 m^3/day in season and 22 m^3/day in off season

Table 1: Fact File- Bajaj Hindusthan Sugar Ltd., Sugar unit - Utraula plant	
Plant Name and Location	Bajaj Hindusthan Sugar Ltd., Sugar unit - Utraula plant
Cost of Water at various water use areas	• Water pumping cost- Rs 0.85/ m^3 • Cost of Softening water Rs 1.8/ m^3 • Cost of Water for ETP treated water Rs 9.4 /m3
Annual water cost	**20.10 Lakh Rs/year**
Average Effluent Generation in the ETP & generated and STP Reuse (m^3/day)	473 m^3/day is treated in ETP and reused for gardening and dust suppression. 22 m^3/day STP treated reuse in gardening.
Power Supply Cost FY 2021-2022 (Rs. /kWh)	3.19
Average Specific Water Consumption in terms of Freshwater Use (2021-22)	SWC for Industrial water – 2.5 m^3/Ton SWC for Domestic water – 541 liter per person per day in colony SWC for Domestic water – 51 liter per person per day in plant domestic

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.

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 and also installed Dual flushing system to save around 30-50 % fresh water	22104	35588	116500	3
2	ETP treated water use	It was observed fresh water used in vehicle washing in plant and Colony and ETP treated water quality was very good.	It is suggested that the plant should use ETP treated water in vehicle washing application in plant and Colony to reduce fresh water in plant premises and colony.				
3	Installation of drip irrigation for landscaping/ horticulture	It was observed around 473 m3/day 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 abstraction	The plant is suggested to record the water abstraction data, maintain logbook of daily groundwater abstraction and submit the data to CGWA periodically			**Minimum**	**Immediate**

S. No.	Particular	Key Observations	Recommendations	Annual water savings (m3)/ Energy saving	Annual monetary savings (Rs)	Investment (Rs)	Pay-back period (Years)
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 CGWA notification.	It is suggested to maintain the system				
B. MEDIUM COST SCHEMES (INR 1-10 lakh)							
9	To enhance sewage water collation and treated at STP plant	Presently domestic water use around 308 m3/day for domestic use in colony and plant, and actual STP treated 28 m3/day	it is recommended to collect sewage water and treated at STP around 216 m3/day (70 % of domestic water use) and having potential upto 188 m3/day sewage water .	68474 m3/year (188 m3/day)	110243	320000	3
10	ETP treated water use in toilet flushing	It was observed 308 KLD water used domestic use in Colony, which is used in toilet and flushing also,	It is suggested that the plant should use ETP treated water in toilet and flushing application in plant premises and colony.				
Remarks: It is estimated that by implementing suggested low & medium cost schemes, plant, can easily reduce its freshwater consumption by 51%							

CHAPTER-1: INTRODUCTION

1.1 About the Plant: General Plant Details

Bajaj Hindusthan Sugar Limited, Unit-Utraula, is located at Village- Itali Maida Post-Sriduttaganj, Tehsil-Utraula, Balrampur. Pin 271607 of 9000 TCD of cane crushing with Co- Generation Power Plant.

1.2 Process description

1.2.1 Product flow diagram of Sugar Cane

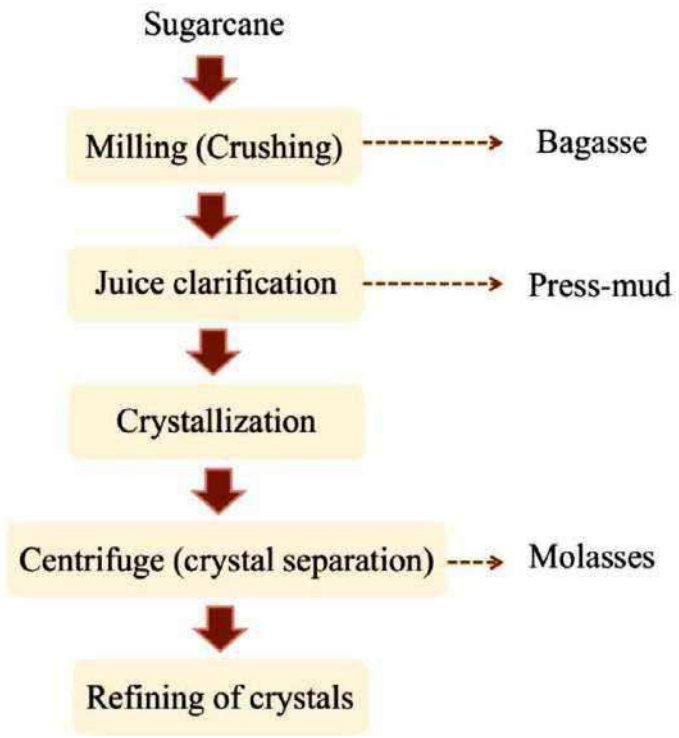


Figure 1: Details of process flow diagram

1.2.2 Details of Cold-water circuit diagram of Sugar Cane

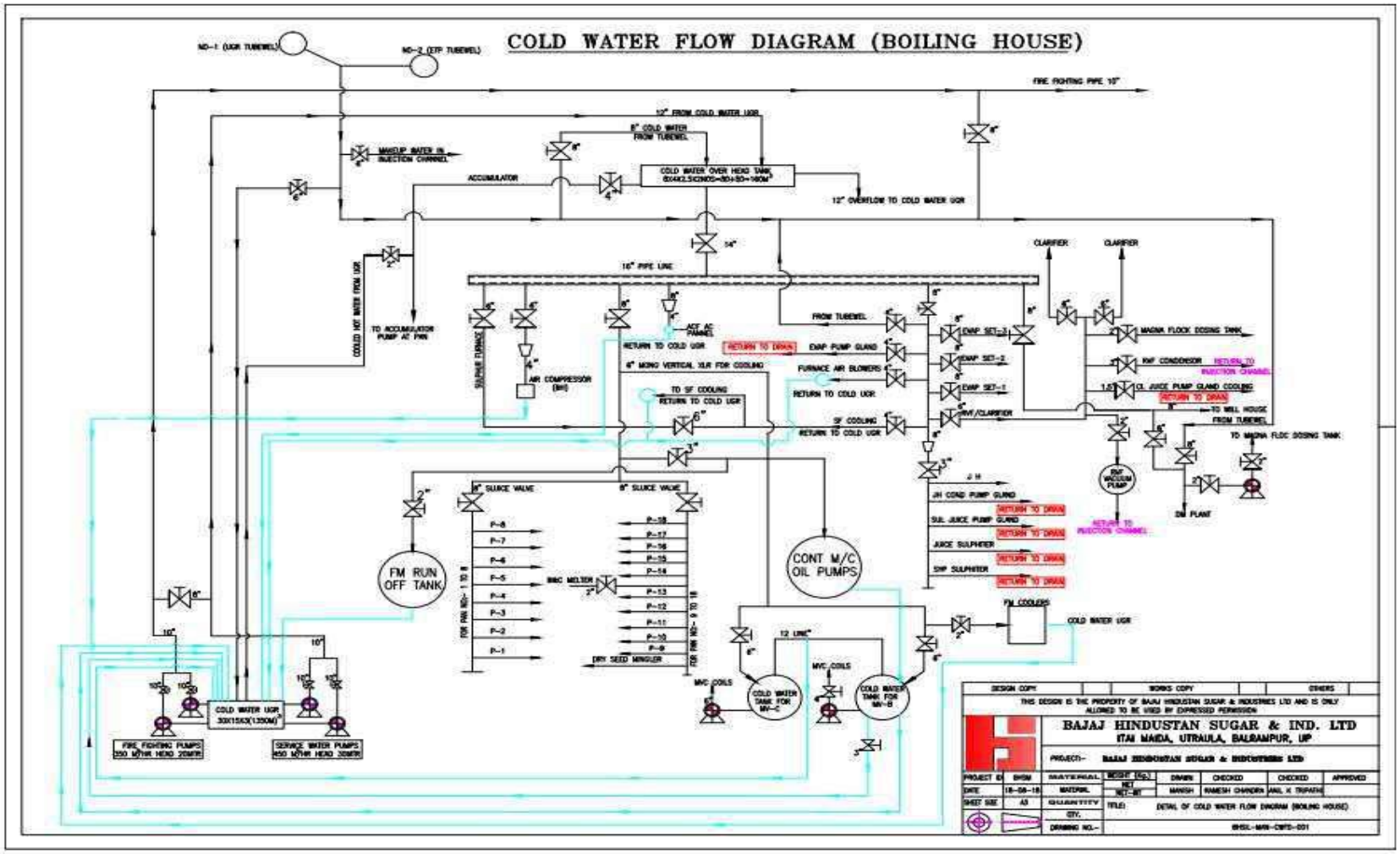


Figure 2: Details of cold-water circuit diagram of Sugar Cane

1.2.3 Sugar Manufacturing Process: -

The follow double sulphuration 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 a crystallizer.

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 sparging facility.

1.3 Water Conservation Initiatives taken by Plant.

FICCI took up a detailed Water Audit Study at **Bajaj Hindusthan Sugar Ltd., Sugar unit - Utraula 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.

S. No.	Water Conservation/Saving Measure Undertaken	Annual Water Saving (cubic meter)	Annual Monetary Saving (Rs)	Investments (Rs)	Pay Back Period (Year/s)
1	Water for Hydraulic testing of various bodies is taken from injection channel in plave of fresh/Second condensate water				
2	Arrangement has been made to cool the bearing water in closed loop of various pumps in cooling tower				
3	Top up for dript losses of turbine cooling Tower is made up from Second condensate Water				
4	Hot Water is taken into calendria testing & is again reused in Hot water tank.				
5	Boiler make up water is being top up from Second condensate water after proper chemical treatment				
6	Exhaust Drain from PRDS line is collected and taken to feed tank boiler				

FICCI is pleased to offer its services for conducting Water Audit Study at **Bajaj Hindusthan Sugar Ltd., Sugar unit - Utraula plant.** as per CGPA 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 CPU and STP treated water and various other steps are takento reduce the daily water requirement of the plant.

CHAPTER-2 SCOPE OF WORK

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 wastewater 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 fivefold reduction in blow down whencompared to traditional chemical treatment
    - Reduction in reuse of de-ionized water by eliminating some plenum flushes, converting from a continuous flow to an intermittent flow system and improving control on the use
    - Use of wastewater for gardening
    - Proper processing of effluents to adhere to the norms of disposal

CHAPTER-3 METHODOLOGY OF THE WATER AUDIT STUDY

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
- Wastewater 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
- Wastewater 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
- Wastewater 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
- Projects and procedures to maximize water savings and minimize/eliminate water losses
- Water Metering and Accounting System
- Opportunities for Water Conservation based on Reduce/ Recycle/ Reuse/ Regeneration/ Recharge optionswith 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 ofthe pumps or any suitable location. The step wise methodology is given below,

a. A suitable location for measurement of flow 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 inch tape and the pipethickness 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 traducers to bepositioned on the pipe while measuring the flow

e. The traducers are placed on the surface of the pipe (filed surface) at the same distance given by flowmeter

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 pipeline. 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 rate in m^3/hr
P	density of water i.e., 1000 kg/m^3
H	Total Head developed (m of water column), Discharge + Suction
kW	Actual power measured at motor input.

CHAPTER-4 : ASSESSMENT OF PRESENT WATER USAGE

4.1 Water sourcing and major water use areas.

Details of Source of Water: The main source of freshwater for the plant is 3 no. of borewells. The depth of the Borewells is about 121 meters. The TDS of borewell water is about less than 302-386 ppm.

No. of Borewells and location: The 3 no. of borewells is in the common area of the plant. The rated yield of all borewell is 180 m^3/hr. Which concurred with the measurements done by FICCI team using ultrasonic flow meters, at a time 03 no of bore well is used to abstract ground water. The borewells have installed digital type flow meters.

Table 3: Details of bore well

Borewells	Location of Bore-wells	Depth of Bore-well	Type of Pump (mono-block/ Submersible etc.)	Pump Rated Capacity (HP)	Rated yield (m^3/hr)	TDS (mg/l)
1	Near UGR	121 m	**Submersible**	50	180	386
2	Near ETP	121 m	**Submersible**	50	180	345
3	Boiling House	121 m	**Submersible**	12.5	180	302

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



Borewel-01 Borewel-02 Borewel-03

Picture 2: individual digital telemetry flow meters.



Flow meter of Borewel-01 Flow meter of Borewel-02 Flow meter of Borewel-

		03

There are installed 2 telemetry-based piezometers , which used to measure pressure via the rise of fluid column and estimate the ground water level. It is installed at 100 and 150 m depth and 100 to 500 m distance.

Table 4: Details of piezometer wells (observation well)

Piezometer	Location of piezometer	Depth of piezometer	Distance from the existing borewell (meter)	Total Dissolved Solids (mg/l)
1	Near ETP	100 m	Approx 100 m	380
2	Near Gate No.1	150 m	Approx.500 m	410

The total estimated water requirement of the plant is about 3855 in Season and 333 in off season m^3/day (freshwater, treated, reuse and recycled water) in various sections of the plant as shown in table below:

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

Piezometer No. 1



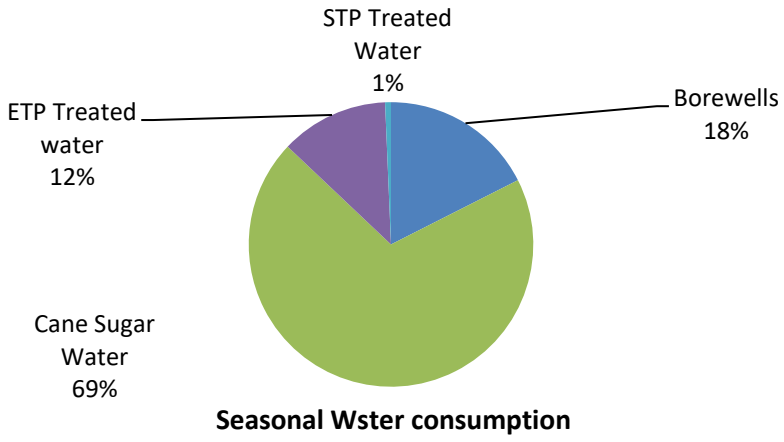
Piezometer No. 2





Table 5: Total Water Requirement by plant in Season

S.N.	Source of Water	m^3/day	Water Quality	*Major Usage Area*	*Water Use (%)*
1	Bore wells	676	Fresh water	DM water & cooling Tower makeup, Utilities, Backwashing, Potable water, Domestic activities, Process Line	17.5%
2	Cane Sugar Water	2680	Cane Sugar water	Process water use	69.5%
3	ETP Treated water	473	Recycle Treated Water	Gardening, Dust Suppression ,Ash quenching	12.3%
4	STP Treated Water	26	Recycle Treated Water	Gardening & green Development	0.7%
Total		**3855**			100%



Seasonal Wster consumption

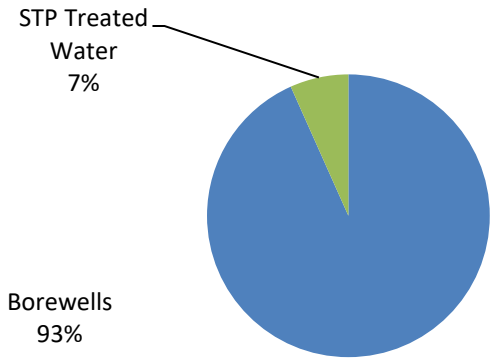
Figure 3: Sources of Water (Freshwater, recycled water)

During Season (November to April), Out of the 3855 m^3/day, about 17.5 % water is freshwater; 82.5 % is recycled water and reuse water.

Table 6: Total Water Requirement during OFF season by plant

Source of Water	**m^3/day**	**Water Quality**	***Major Usage Area***	***Water Use (%)***
Bore wells	311	Fresh water	Domestic activities in colony & Plant	93.3%
STP Treated Water	22	Recycle Treated Water	Gardening & green Development	6.7%
	333			100%

Figure 4: Sources of Water during OFF season (Freshwater, recycled water)



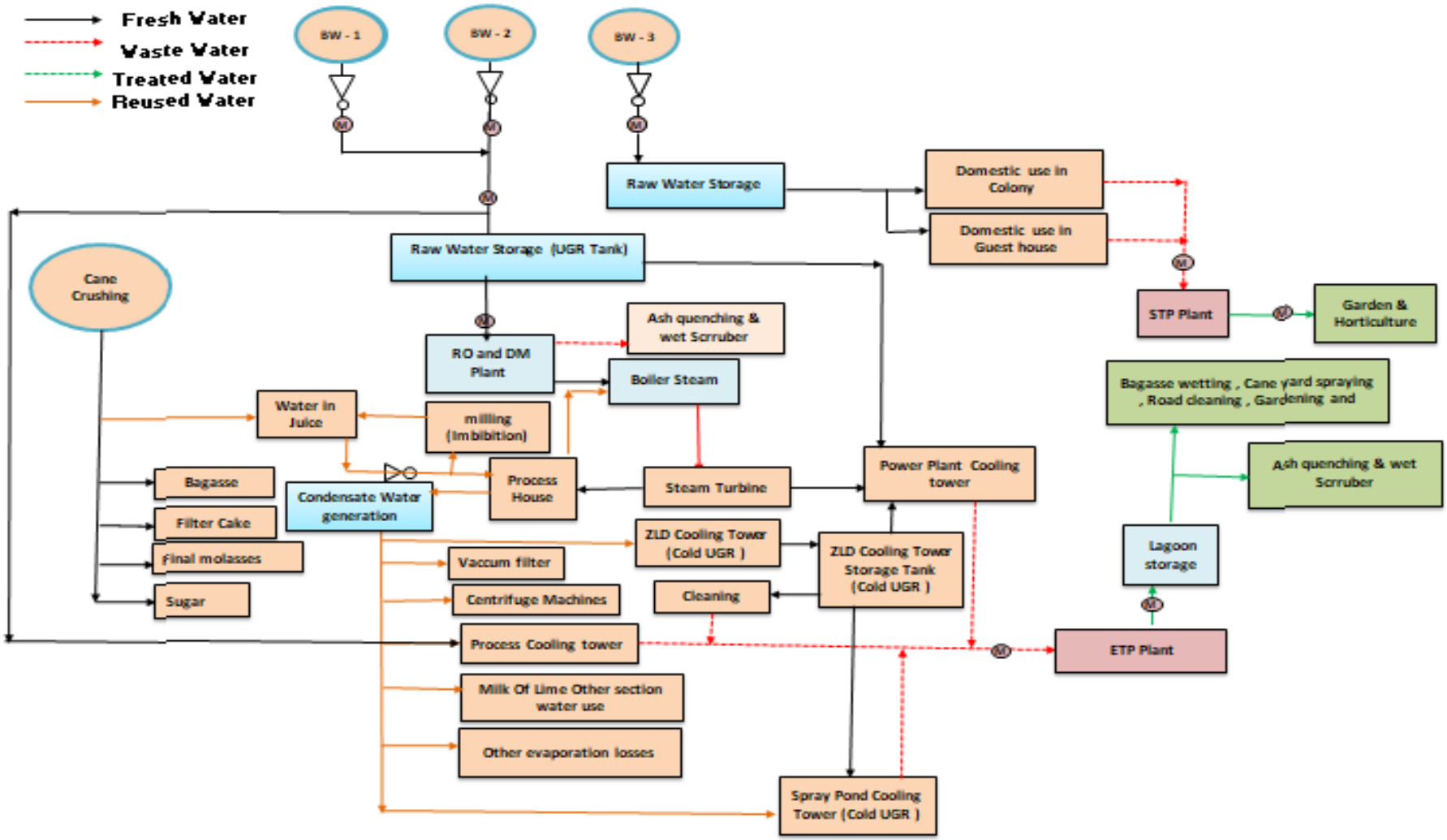
OFF Sesonal Water consumption

During Off Season (May 2021 to October 2022) Out of the 333 m^3/day, about 93 % water is freshwater; 7 % 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 2.

Figure 5: Existing water circuit diagram of the plant



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 CGWA notification.

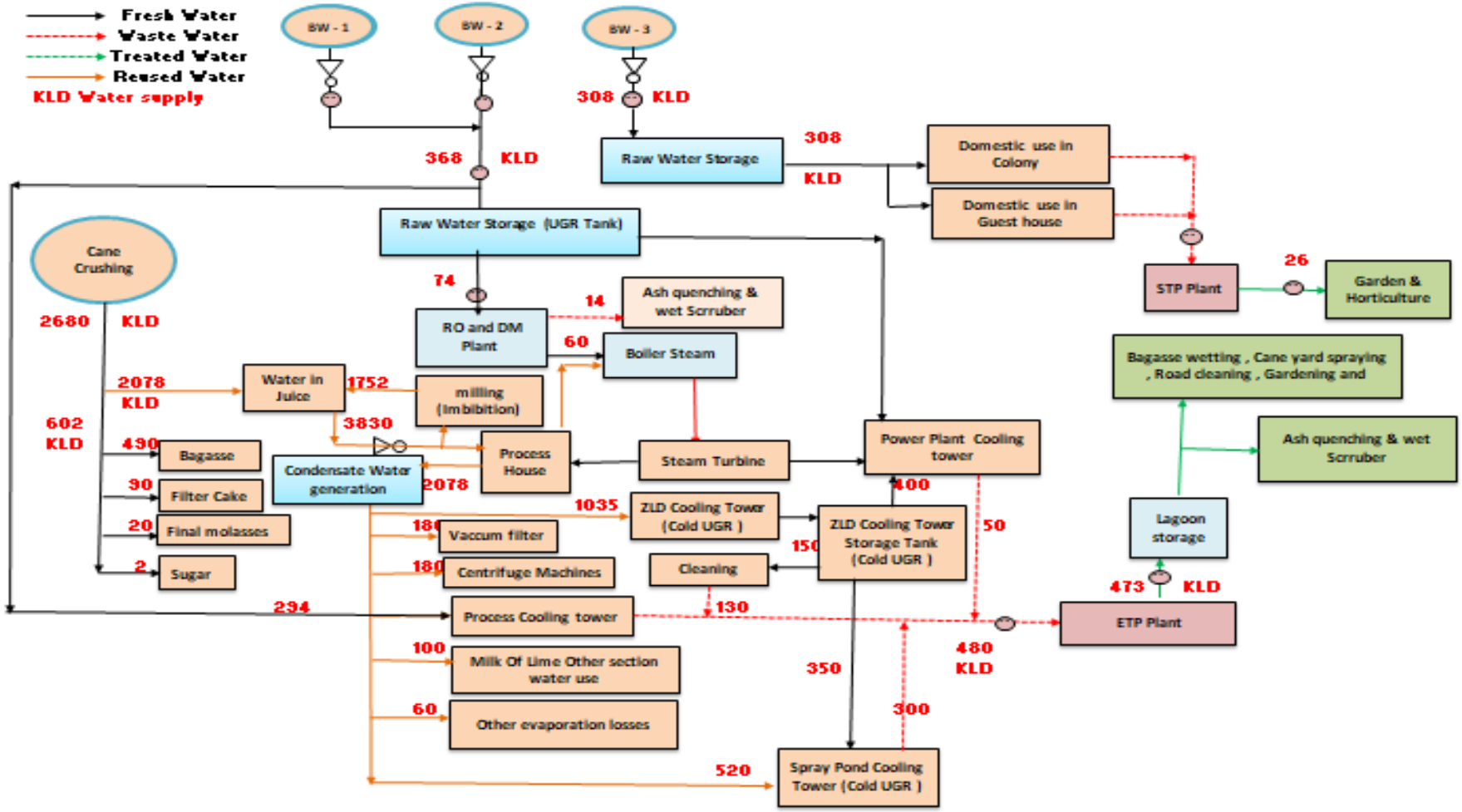
As per the measurements conducted by FICCI team, water distribution and water balance were prepared for the plant.

The plant abstracts about 3855 m^3/day of groundwater in season and 333 m3/day in OFF season from 3 no. of bore wells. Instantaneous water flow was measured using ultrasonic flowmeters. The measured flow of borewell 1, 2 and 3 is 203 m^3/hr. and 144.5 m^3/hr. and 38.1 m^3/hr. respectively. The bore well no. 1, 2 and 3 has 50, 50 and 12.5 HP respectively motor that runs for about 1 to 7 hours daily respectively, Abstracted borewell water is pumped to raw water tank.

Table 7: List of Water Storage Tanks

Type of Storage System (Over Head Tank, Underground Tanks, Reservoir etc.)	Location	Storage Capacity (m^3)	Dimensions (meter)	Level from ground (meter)
Cold water overhead tank	Boiling House	160	8 X 4 X 2.5 MTR -2 Nos.	22
Hot water overhead tank	Boiling House	80	8 X 4 X 2.5 MTR – 1 No	22
Cold water UGR	Boiling House	1323	29.4 x 15 x 3 Mtr – 1 No.	Under Ground
Hot water UGR	Boiling House	2100	20 x 35 x 3 Mtr – 1 No.	Under Ground

Figure 6: Existing water circuit diagram with water consumption (KLD) at Bajaj sugar Ltd. Unit – Utraula



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4.4 Water Metering System

There are 6 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)
1	UGR Borewell	Electromagnetic	Yes	Yes
2	BH Borewell	Electromagnetic	Yes	Yes
3	ETP Borewell	Electromagnetic	Yes	Yes
4	ETP Inlet	Electromagnetic	Yes	Yes
5	ETP outlet	Electromagnetic	Yes	Yes
6	Irrigation	Electromagnetic	Yes	Yes

4.5 Water Use Baseline 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 bore wells

(m^3/month)	Bore well Water withdrawn	Domestic water use Colony	Industrial water use
21-Apr	*10789*	*9962*	827
21-May	*8854*	*7568*	1286
21-Jun	*9854*	*8597*	1257
21-Jul	*8965*	*7958*	1007
21-Aug	*9658*	*8697*	961
21-Sep	*7858*	*6586*	1272
21-Oct	*18046*	*13302*	4744
21-Nov	*14564*	*10632*	3932
21-Dec	*23351*	*8758*	14593
22-Jan	*26351*	*8004*	18347
22-Feb	*23953*	*7809*	16144
22-Mar	*15428*	*6979*	8449
Total water in KL	***177671***	*104852*	*72819*
Season (Oct to March)	***676***	***308***	***368***
OFF season (April to September)	**311**	**274**	**37**

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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 1.65 /m³ (Pumping cost is Rs 0.85 m3 and Ground water abstraction charges is Rs 0.8 /m³ as per UPGWA), Cost of softening water cost is Rs 1.8 / m³, the cost ETP is estimated to be about Rs 9.4 /m³**

4.6.1 Cost of abstraction of Bore well Water as per UP GWA

The plant needs to pay applicable groundwater abstraction charges as per UP GWA notification. The applicable rates of Ground Water abstraction charges for the plant are **0.80** per m³ as per the table given below:

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

Sr. No.	Category of area ↓ Ground water use →	Quantum of ground water withdrawal			
		< 200 m³/day	200 to <1000 m³/day	1000 to <5000 m³/day	5000 m³/day and above
1.	Safe	-	-	0.80	-
2.	Semi-critical	-	-	-	-
3.	Critical	-	-	-	-
4	Over exploited	-	-	-	-

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. 598.8 /day and Rs 172685 /year**.

Table 11: Cost of pumping

Estimation of Efficiencies of Pumps							
Pump Name	Measured	Pump					
	Flow	Head	Operation		Pumping cost		
	m³/hr	m	hr/day	days/year	Rs/m3	Rs. /Day	Rs. /Year
Bore Well No -1482	203.0	42.8	3	365	0.72	438.6	160103
Bore Well No -1481	144.5	41.8	1	84	1.05	121.6	10218
Bore Well No -1480	38.1	35.7	1.0	80	0.78	29.5	2364
Total water use						589.8	172685

4.6.3 Cost of Softening Treated Water

About 480 m^3/day water is treated daily by Softening plant. The average cost of treatment from softening is Rs. 1.8 /m^3 as shown in table below:

Table 12: Cost of Softening treated Water(chemical)

Softening Plant		
Installed Capacity (m^3/hr)	60TPH	
Average Quantity of treated water (m^3/day)	20-30 TPH	
Chemical Details		
Name of Chemical/s	**Quantity kg/month**	**Price Rs/Kg**
Common Salt	6000	4
Power Consumption (Units/day)	24	
Total Cost of treatment (Rs/m^3)	1.8	

4.6.4 Cost of ETP Treated Water

About 500 m^3/day water is treated daily by Effluent treatment plant at **Bajaj Hindusthan Sugar Ltd., Sugar unit - Utraula plant**. The average cost of treatment from softening plant is Rs. 9.4 /m^3 as shown in table below:

Table 13: Cost of ETP treated Water(chemical)

Effluent Treatment Plant		
Installed Capacity (m^3/hr)		1800
Average Quantity of treated wastewater (m^3/day)		500
Chemical Details		
Name of Chemical/s	**Quantity kg/month or litres/month**	**Price (Rs/Kg or Rs/liters)**
Lime	Approx 12000 Kg	6
Power Consumption (Units/day)		Approx.600
Is treated effluent reused or discharged?		Ferti-irrigation
If reused, provide area of its application & reused quantity (m3/day)		460
Total Cost of treatment (Rs/m^3)		9.4

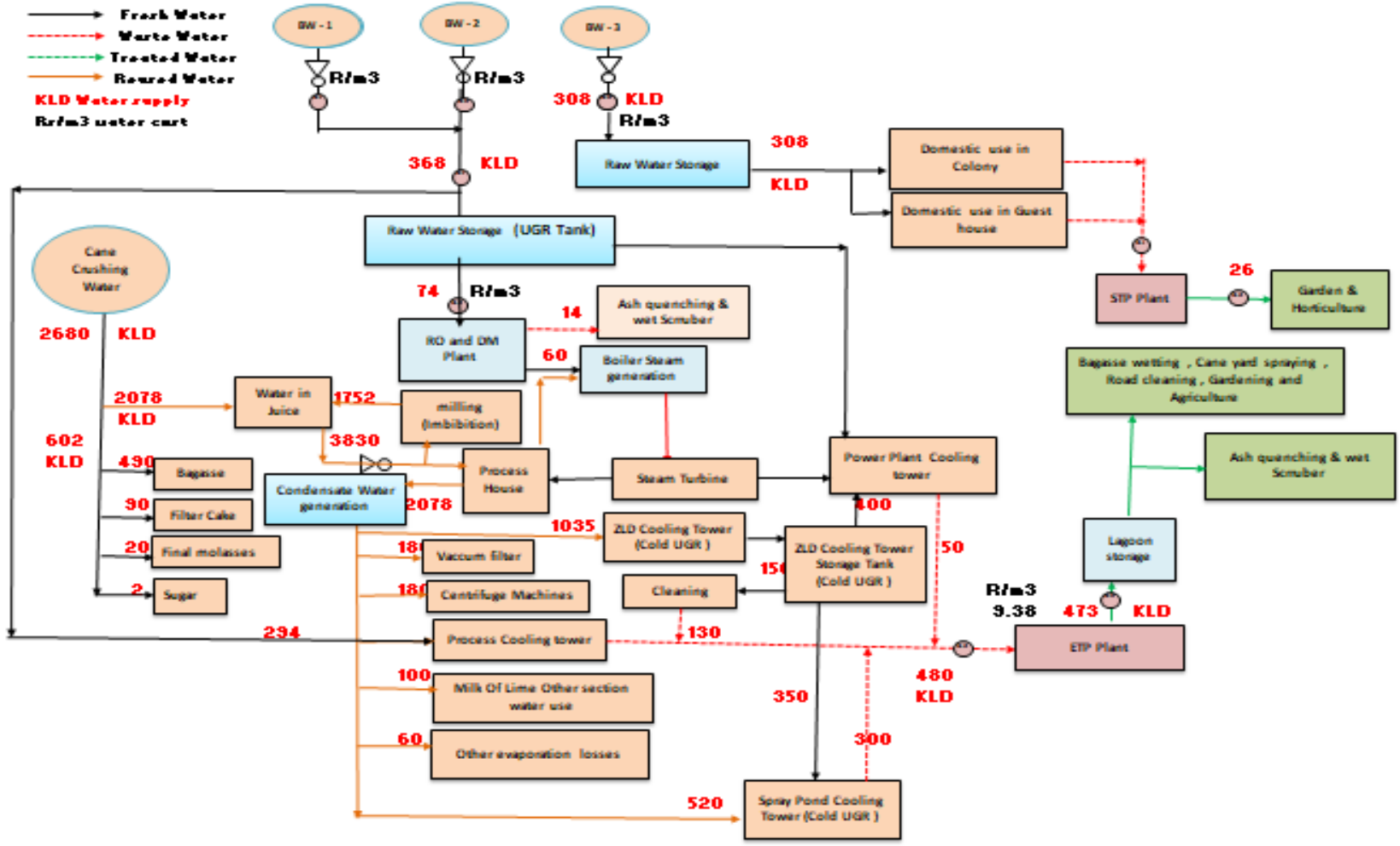
4.6.5 Annual Water & Wastewater Management Cost of the Plant

The total annual water and wastewater cost is calculated by the sum of Total Water abstracted, Total Pumping cost and Total Water Treatment costs as mentioned in the previous part. The total annual water cost for the plant is **Rs 10.20 Lakh/year** as shown below in Table 14.

Table 14: Total Annual Water Cost of at Bajaj Hindusthan Sugar Ltd., Sugar unit - Utraula plant

S. No.		Cost	Total cost	Total Annual Cost
		Rs/m^3	(Rs/day)	(Rs/year)
1	**Pumping Cost**			
	Bore well Pumps	0.85	590	172685
2	**Softening Cost**	1.8	864	315360
3	**ETP Treated water**	9.4	4700	705000
	Total Water Cost			**1020360**

Figure 7: 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)
- Condensing Polishing Unit (CPU)
- STP Sewage Treatment Plant

5.1 Effluent Treatment Plant (ETP)

There is installed **1800 m^3/day** capacity effluent treatment plant, which was treated about **473 m^3/day** ETP treated water and supplied to lagoon storage system, which used in irrigation application.
The ETP consists of bar screen, equalization tank, coagulation and flocculation tank, Primary Tube Settler, Submerged Air Fixed Film Reactor (SAFFR). Waste water from confectionary unit is drained to ETP. The bar screens are present before the equalization tank to separate settle able solids from the wastewater. Lime is dosed to coagulation tank and alum and polyelectrolyte are added to flocculation that facilitates floc formation. Provision of air-line by air blowers for aeration. Primary tube settler, SAFF and secondary tube facilitates the solid liquid separation and settling of suspended solids as primary sludge which is sent to sludge handling tank while the clarified effluent is supplied to Chlorine Contact Tank**.**

Partially treated wastewater ETP is supplied to Chlorine Contact tank which is then pumped to Multigrade Sand Filter and then to Activated Carbon Filter. The filtered water is passed through UV and then stored in treated water tank. ETP Treated water is used for gardening and toilet flushing.

Picture 4 : Details of Effluent Treatment 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 a 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 SVCPU (Condensate Polishing Unit)

The unit has a CPU plant, during the cane crushing process juice is extracted, this juice when heated in juice heaters, evaporators & pans form vapours, these vapours when condensed are known as the process condensate. The process condensate contains higher parameters such as COD, BOD, TSS, TDS etc. To decrease the value of these parameters the condensate is treated in condensate polishing unit in order to reuse in cooling tower makeup & in the process area.
In CPU the major input is from boiling house in the form of process condensate. The Description installed CPU is given below.

5.2.1 Unit Description

Condensate Collection Tank
The function of this tank is to collect the cold condensate obtained from the cooling tower as the hot condensate is obtained directly from the boiling house & first it is cooled in cooling towers. 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 a storage for condensate.

Anoxic Tank
Anoxic conditions involve environments in which molecular or free oxygen (O2) is absent, though bound oxygen may be present. "Anoxic" refers to the state of the environment rather than microorganisms and their processes.
In wastewater treatment, anoxic conditions differ from anaerobic conditions based on the presence or absence of nitrogen. Though anoxic conditions do not contain molecular oxygen, they may contain nitrates or nitrites. Nitrates (NO3) and nitrites (NO2) both contain bound oxygen because they include oxygen molecules as part of their structures. An anoxic environment may include these compounds as long as it does not include free oxygen.
Anoxic Tank is unit Process used in wastewater and sewage treatment plant. An Anoxic Process is used for the Conversion for Nitrate to Nitrogen Gas. When deprived of readily available oxygen, as in an anoxic environment, bacteria will use nitrate as an oxygen source to break down carbon, their source of food. During denitrification, the tank is agitated but not aerated, thereby starving the bacteria of readily available oxygen.

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 sulphide, 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.

Settler
Sedimentation tank, also called settling tank or clarifier, component of a modern system of water supply or wastewater treatment. A sedimentation tank allows suspended particles to settle out of water or wastewater as it flows slowly through the tank, thereby providing some degree of purification. Settler is Incorporated after 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 Aeration Tank to clarifier. All the above actions occur due to gravity. The thick biomass is re-circulated back to the aeration tank.

Tube Settler

Tube settlers utilize multiple adjacent tubular channels that are sloped at a nominal 60° angle and combine to form an increased effective settling area. The size and shape of the tubular channels vary by manufacturer. Brentwood's tube settler design features a trapezoidal shape created by thermoforming PVC sheets. It 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 blended out of the system and disposed of 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.

Multi Grade Filter

An MGF is used in water and wastewater treatment to remove suspended solids, dust and dirt present in the water. The MGF is a depth filter that makes use of course and fine media to create pore dimensions that retain large and small suspended particles. Function of the filter is to act 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 filter is passed on to the next stage in the CPU chain: The Iron Removal Filter.

Iron Removal Filter

Iron Removal Filter is used to remove Iron from water. IRF consists of a Manganese Dioxide layer, which works as a catalyst in converting Ferrous to ferric, which can be easily precipitated and filtered physically. The raw water flows down from the filter inlet through the filter media. When the raw water passes through the media, the iron and manganese particles are oxidized thereby killing the bacteria present in the water. The filtered water can be collected at the outlet of the filter. As per the SOP, the filter media has to be cleaned periodically using the back wash method.

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), colour and odour.

Filter Water Storage Tank

Filter water tank is a simple storage system for final treated water obtained from activated carbon filter & disinfection. The treated water can is then passed through UF & RO to be used in DM plant for DM water production for boiler makeup.

Collection Tank

Collection tank is a simple storage system for reject, backwash & flushing water generated from MGF, IRF, ACF & UF. This water is then sent to condensate collection tank for treatment.

UF (Ultra Filtration Plant)

Ultrafiltration (UF) is a type of membrane filtration in which hydrostatic pressure forces a liquid against a semipermeable membrane. A semipermeable membrane is a thin layer of material capable of separating substances when a driving force is applied across the membrane. Ultrafiltration is one membrane filtration process that serves as a barrier to separate harmful bacteria, viruses, and other contaminants from clean water. An ultrafiltration water system forces water through a 0.02-micron membrane. Suspended particles that are too large to pass through the membrane stick to the outer membrane surface. Only fresh water and dissolved minerals pass through.

RO (Reverse Osmosis Plant)

Reverse Osmosis (RO) filters use a multi-stage filtration process to purify water. The filters use a combination of active carbon particle filtration processes to remove the impurities. The filters have a membrane with very small pores that helps in removing micro-organisms. The inlet feed is directly from UF filtered water. The treated water from RO i.e., the permeate is sent to DM water to further lower its TDS. RO Reject water is used for spraying at wet scrubber.

5.3 Sewage Treatment Plant

There is installed **100 m^3/day** capacity Sewage treatment plant, which was treated about **21 m^3/day** STP treated water which used in gardening application, Plant treats Domestic Sewage in well-designed existing sewage treatment plants.



Figure 8: Detail Scheme of STP Plant

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 in season (**3855 m^3/day**) about 48 % is used by utilities make up cooling tower; about 12 % is used for Process use; about 8 % is used in Domestic like toilet, drinking & canteen (Fresh water); about 17 % is other process losses recycled water and 2% in Boiler it is used for Power plant. The major water utilization areas are mentioned below in table.

Table 15: Water Consumption for Different Applications in the Plant in Season

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	308	**8%**
2	Boiler (DM Make up Water)	Fresh Water	Boiler Feed and Steam Generation	60	**2%**
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	1849	**48%**
4	Process water use	Recycle Water	Process in Vacuum Filter , Pan Boiler , Centrifuge machines , Process Cooling Tower	460	12%
5	Other Process Losses	Recycle Water	Evaporate and other losses	665	17%
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	513	**13%**
	Total			**3855**	**100%**

The water consumption pattern in off season shows that out of total water (**333 m^3/day**) about 93.3 % is used by Domestic application likes (Domestic like toilet, drinking & canteen) and about 6.7 % is used for gardening.

Table 16: Water Consumption for Different Applications in the Plant

S.N.	Source of Water	m^3/day	Water Quality	*Major Usage Area*	*Water Use (%)*
1	Bore wells	311	Fresh water	Domestic activities in colony & Plant	93.3%
2	STP Treated Water	22	Recycle Treated Water	Gardening & green Development	6.7%
		333			100%

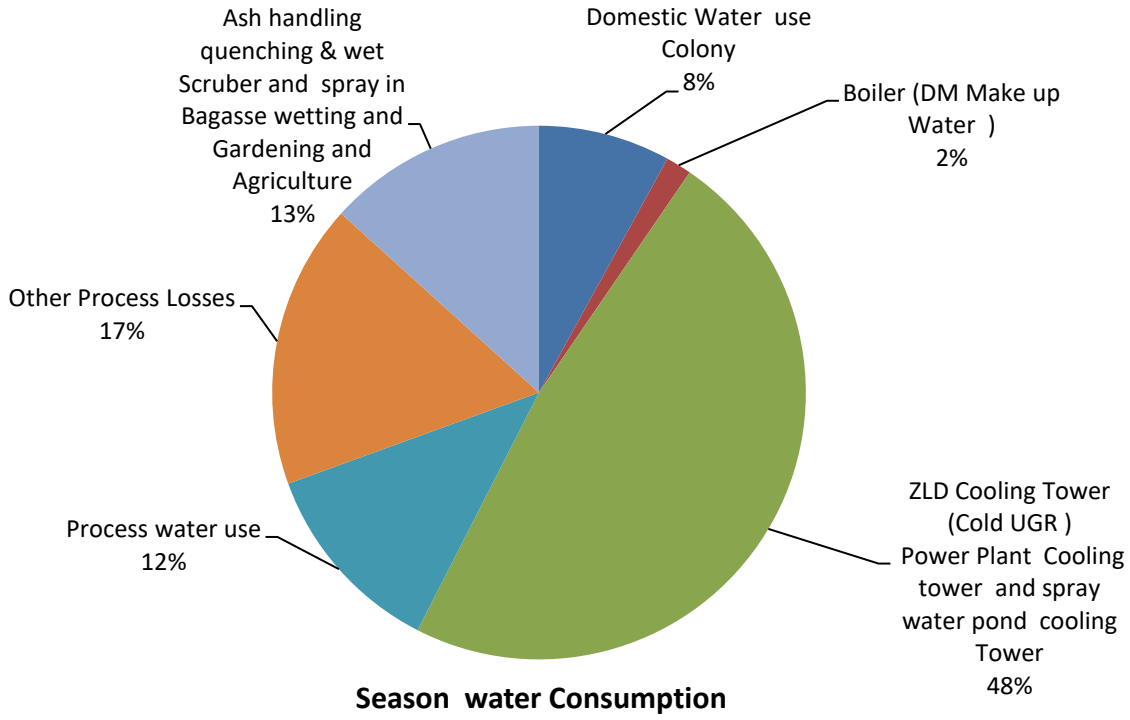


Figure 9: Percentage of water consumption area at Utraula plant

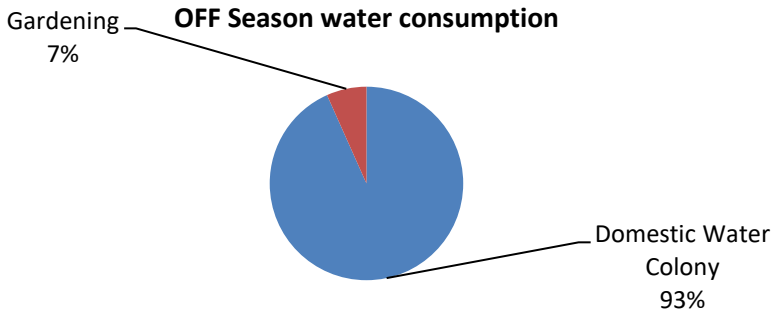


Figure 10: Percentage of water consumption area at utraula plant

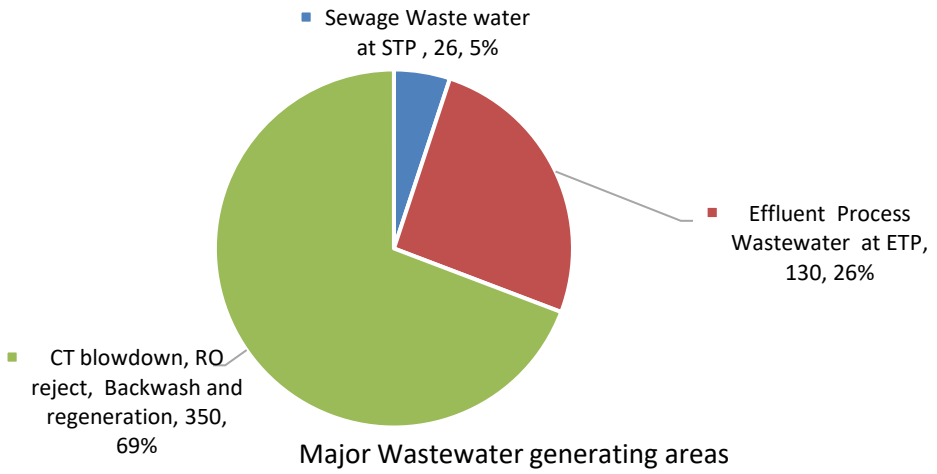
6.1.2 Wastewater generation & mapping at Bajaj Hindusthan Sugar Ltd., Sugar unit - Utraula plant.

The total wastewater generation in the plant is about 506 m^3/day, out of which about 5 % is generated by domestic use; 26 % is generated by process use; 69% is generated by CT blow down, reject from boiler industrial as given below:

Table 17: Major Wastewater generating areas at Bajaj Hindusthan sugar unit Utraula

S. No.	Major Sections	Wastewater discharged (m^3/day)	Percentage
1	Sewage Waste water at STP	26	5%
2	Effluent Process Wastewater at ETP	130	26%
3	CT blow down, RO reject, Backwash and regeneration	350	69%
		506	100%

Figure 11: Percentage of wastewater generation at utraula plant



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 **2.5 m^3 of water/tons** of the product , which is high due to low production , Colony Domestic Specific Water Consumption (SWC) comes out to be 541 litres **per person per day and Plant** Domestic Specific Water Consumption (SWC) comes out to be 51 litres **per person per day,** Details of SWC were observed and discussed below.

Table 18: Industrial Specific Water Consumption for FY 2021-22

Industrial Water utilization FY 21-22	Sugar Production FY 21-22	Industrial Specific Water Consumption for FY 21-22
m3/ Year	Ton/Year	m3/Ton
72819	**29481**	2.5

Table 19: Specific Water Consumption of Domestic in colony Consumption for FY 2021-22

Average Domestic Water Uses in Colony FY 21-22	No. of person in colony FY 21-22	Colony Domestic Specific Water Consumption for FY 2021-22
m3/day	No.	liter per person per day
308	570	541

Average Domestic Water Uses in plant FY 21-22	No. of employee /Staff FY 21-22	Plant Domestic Specific Water Consumption for FY 2021-22
m3/day	No.	liter 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 **2.5 m^3 of water/tons** of the product and For comparison the various 'International Benchmarks' and best achieved SWC were observed and discussed below.

Table 20: SWC Best Practice (European Commission)

	Balrampur Chini mill Gularia Unit, SWC	Balrampur Chini mill BCML Kumbhi Unit, SWC	International Best Practice SWC
Present FY 2021-2022	1.4 m^3 of water/tons	1.03 m^3 of water/tons	

CHAPTER-7 WATER CONSERVATION OPPORTUNITIES AND UP-GWD/UP GWA COMPLIANCES

7.1 Water Savings in the Buildings for Domestic Use

Existing Scenario: The plant uses about 308 m^3/day of fresh water as domestic water in Colony and in plant domestic. Which is around 8 % directly used for domestic activities like drinking, hand-washing, toilet flushing in the colony and plant area.

Picture 5: Pictures taken during taps flow measurements at different areas of plant



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.

Table 21: 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	guest house	1	500	5.85	5.13
2	laboratory	1	500	4.29	6.99
3	Canteen	1	500	8.88	3.38
4	DM plant	1	500	3.5	8.57
5	boiling house	1	500	3.7	8.11

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 3.3 – 8.57 lpm; however, about 80 % 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 22: 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**	**4**	**80%**

- **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 6: 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 7: Tank Bank (For Flush Tanks) and Dual flush Cistern 3-6 liters



Table 23: 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 24: Suggested Water Efficient Fixtures and Estimated Investment

Water consuming equipment	Scheme/ Options	Cost (Rs/ Piece)	Water Consumption by existing flushes / taps)	Water Consumption by water efficient fixture (litre/flush)	Estimated freshwater saving (%)	Estimated No. of fixture replacements / retrofits	Estimated Expenditure (Rs)
Dual Flushing	Retrofitting high water flow from flush tank	1000	10 litre per flush	3 & 6 Litre per flush	45-50%	100	100000
Hand washing and other Taps	Retrofitting high flow washbasin taps with flow restrictors and aerators	100	3.3 to 8.57 lpm	3-5 lpm	10-15%	165	16500
Total investment (Rs)							**116500**

Table 25: Water & Cost Savings of the Proposed System

Details	Existing System	Proposed System	Fresh Water Saving	Water Cost	Annual Water Saving	Annual Monetary Saving
			(m^3/day)	(Rs/m^3)	(m^3)	(Rs)
Install water efficient fixtures in the buildings	Inefficient water fixtures at many locations leading to water wastages	Install flow restrictors in the existing hand washing taps; about 30-50% of freshwater will be saved	92	1.61	16560	26662
Install water efficient fixtures in the buildings	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	31	1.61	5544	8926

Table 26: Simple Payback period

Investment	Annual Monetary savings (Rs)	Pay Back period (years)
116500	35588	3

7.2 To enhance sewage water collation and treated at STP plant

Existing Scenario: Presently domestic water use around 308 m^3/day for domestic use in colony and actual STP treated water around 28 m^3/day.

Recommendation: it is recommended to collect sewage water and treated at STP around 216 m3/day (70 % of domestic water use) and total amount of water saving potential around 188 m3/day and 68474 m3/year.

Particular	Unit	Value
Average amount of domestic water used in colony and plant	m3/day	308
	m3/Year	112420
Average cost of raw water including water charges as per CGWA notification	Rs./m3	1.61
Actual Amount of Sewage water and treated upto 70% potential	m3/Year	216
Presently Actual Amount of STP water treated by STP	m3/Year	28
Amount of water saving potential at STP	m3/day	188
	m3/Year	68474
	Rs./year	110243
Investment	Rs	320000
Simple Payback period	Months	35

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 **603780**-meter square. The plant uses a total of about **473m3/day** of water 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

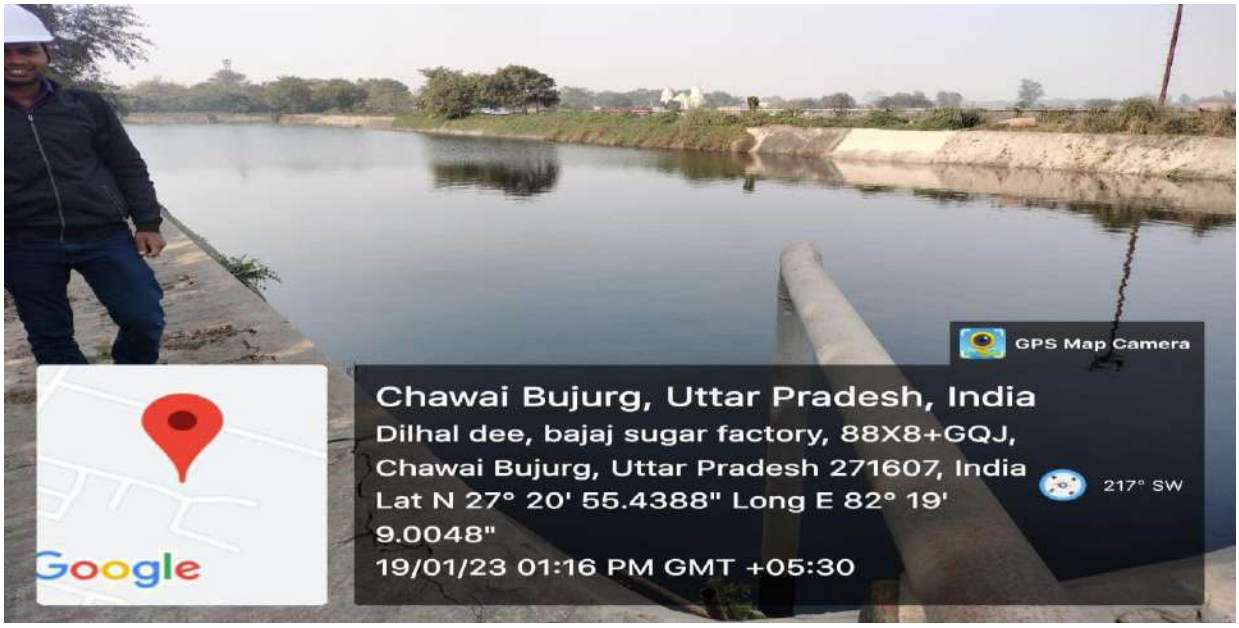
Harvesting rainwater reduces storm-water runoff volume and velocity and can provide an alternative water source to help conserve potable water supplies. There are typically three components in a rainwater harvesting system: 1) collection; 2) transport; and 3) infiltration or storage and use. If rainwater 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 storm water 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 Utraula is located in safe zone specified by CGWA, the unit has to use at least 1159 mm rain water per year, Plant have rain water storage tank and also adapted rain water harvesting pond near village.



Picture 8: RWH Lagoon areas of plant



Picture 9: RWH Lagoon areas of plant

Estimated Rainwater Harvesting Potential of the Plant

It is estimated that the Plant has total area of about **474575** -meter square consisting of green area, paved area, roads, build up area, storm water channels etc. The average annual rainfall of the area is **1159 mm.** The estimated Rainwater Harvesting Potential for the Plant from the total plant area is estimated to be abou**t 467527.56 m^3/year** as calculated below:

RWH Potential = Rainfall (m) x Area of catchment (m^2) x Runoff coefficient

Table 27: RWH Potential of the Plant

Land Use Type	Area (SQM)	Runoff coefficient	Avg. annual Rainfall (m)	RWH Potential m^3/year
Total area	474575	0.85	1.159	**467527.56**
		Total Annual RWH Potential		**467527.56**

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 Training and awareness of the employees at all levels and placing 'water saving' Posters/slogans at various locations:

The plant has a workforce of about 294 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; washrooms, reception office etc. This will create awareness & sense of responsibilityamong staff/employees/visitors.



Picture 10: Water saving posters in plant premises

7.6 Periodically conduct 'water & wastewater 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 in a 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/ construction of additional groundwater abstraction structures 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 freshwater 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 into the aquifer system. Note: In addition to penalty, the proponent shall bear the cost of aquifer remediation as per the provisions of Environment (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 photograph 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	Nonregistration of water supply tankers.	500000
15	Submission of false information/ undertaking.	100000

CHAPTER-8 : IMPLEMENTATION PLAN

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 and also installed Dual flushing system to save around 30-50 % fresh water	22104	35588	116500	3	
2	ETP treated water use	It was observed fresh water used in vehicle washing in plant and Colony and ETP treated water quality was very good.	It is suggested that the plant should use ETP treated water in vehicle washing application in plant and Colony to reduce fresh water in plant premises and colony.					
3	Installation of drip irrigation for landscaping/ horticulture	It was observed around 473 m3/day 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.					

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
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 abstraction and submit the data to CGWA periodically			**Minimum**	**Immediate**	
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 CGWA notification.	It is suggested to maintain the system					
B. MEDIUM COST SCHEMES (INR 1-10 lakh)								

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
9	To enhance sewage water collation and treated at STP plant	Presently domestic water use around 308 m3/day for domestic use in colony and plant, and actual STP treated water around 28 m3/day	it is recommended to collect sewage water and treated at STP around 216 m3/day (70 % of domestic water use) and having potential upto 188 m3/day sewage water .	68474 m3/year (188 m3/day)	110243	320000	3	
10	ETP treated water use in toilet flushing	It was observed 308 KLD water used domestic use in Colony, which is used in toilet and flushing also, and ETP treated water quality was very good as per site visit	It is suggested that the plant should use ETP treated water in toilet and flushing application in plant premises and colony.					
Remarks: It is estimated that by implementing suggested low & medium cost schemes, plant, can easily reduce its freshwater consumption by 51 %								

CHAPTER-9 : CONCLUSION

Bajaj Sugar Unit Utraula 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 **90578 m^3/Annum**, which around 51 **%** 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 216 m3/day (70 % of domestic water use) and having potential upto 188 m3/day sewage water .	188	68474
2	Installation of water efficient taps /aerator/ dual toilets and water less urinal	61	22104
	Total	249	90578

Table 30: Summary of Water Savings

S. No.	Description Unit	Value
1	Annual Total Fresh water Consumption m^3/annum	177671
2	Annual water saving m^3/annum	90578
3	Saving %	51%

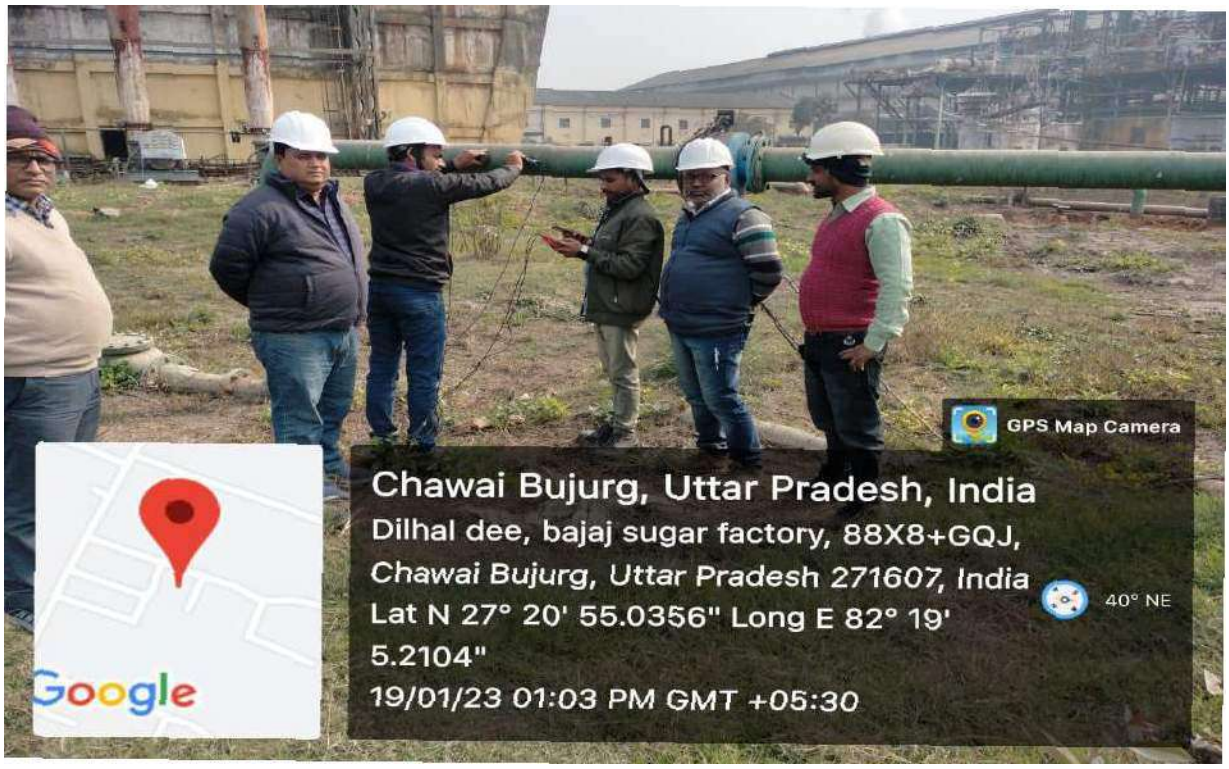
ANNEXURES (MEASURED DATA)

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 -1482	203.0	42.8	39.6	59.8%
Bore Well No -1481	144.5	41.8	41.2	39.9%
Bore Well No -1480	38.1	35.7	8.0	46.2%



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.					
	Flow	Head	Operation		Pumping cost		
	m^3/hr	m	hr/day	days/year	Rs/m3	Rs. /Day	Rs. /Year
Bore Well No -1482	203.0	42.8	3	365	0.72	438.6	160103
Bore Well No -1481	144.5	41.8	1	84	1.05	121.6	10218
Bore Well No -1480	38.1	35.7	1.0	80	0.78	29.5	2364
						589.8	172685

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	guest house	1	500	5.85	5.13
2	laboratory	1	500	4.29	6.99
3	Canteen	1	500	8.88	3.38
4	DM plant	1	500	3.5	8.57
5	boiling house	1	500	3.7	8.11



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 CGWA 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
V A Global AdityaPrakash +91 9953047767 **Vikrant Mehla** **For VA Global** **Mob. 8397066370** **vikrant@vaglobal.co.in** vaglobal88@gmail.com **Web. www.vaglobal.co.in**	Water and Wastewater treatment

Vikrant Mehla[**vikrant@vaglobal.co.in**](mailto:vikrant@vaglobal.co.in) vaglobal88 <vaglobal88@gmail.com>; AdityaPrakash<aditya@vaglobal.co.in>	
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	***10789***	***9962***	827
21-May	***8854***	***7568***	1286
21-Jun	***9854***	***8597***	1257
21-Jul	***8965***	***7958***	1007
21-Aug	***9658***	***8697***	961
21-Sep	***7858***	***6586***	1272
21-Oct	***18046***	***13302***	4744
21-Nov	***14564***	***10632***	3932
21-Dec	***23351***	***8758***	14593
22-Jan	***26351***	***8004***	18347
22-Feb	***23953***	***7809***	16144
22-Mar	***15428***	***6979***	8449
Total water in KL	***177671***	*104852*	*72819*
Season (Oct to March)	***676***	***308***	***368***
OFF season (April to September)	**311**	**274**	**37**

b. Borewell-1, 2 and 3 UP-GWD NOC Certificate

Logo

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: NOC045903

VALID FROM 18/10/2021 TO 17/10/2026

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

Registration No.: 202107000315			
Name of the Owner	AVDESH KUMAR GUPTA		
Designation पद	Vice President	**Company Name** कंपनी का नाम	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT UTRAULA
Company Address कंपनी का पता	Village Itai Maida Block Sridattganj District Balr	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	VILLEGE- ITAIMAIDA,POST-SHRIGANJ,TEHSIL UTRAULA,DISTT.-BALRAMPUR, UP-271607	**Application Form Serial No.**	BLMP0721NIN0009
Date of Submission	12/07/2021	**Specimen Signature**	
Location Particulars			
District	Balrampur	**Block**	Sridattganj
Plot No./Khasra No.	Existing premises khasra detail attached	**Municipality/Corporation**	No
Ward No./Holding No.			NA
Particular of the Existing Well and Pumping Device			
Date of Construction/Sinking of the Well	01/06/2010		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
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.)**	180.00
Date of Energization (In Case of Electric Pump)		01/06/2010	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	3.00
Maximum Allowable Annual Extraction of Ground Water:			81000

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. (3l) and is valid subject to the observance of the conditions stated overleaf.

GENERAL CONDITIONS:

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: NOC022896

VALID FROM 18/10/2021 TO 17/10/2026

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

Registration No.: 202107000325

Name of the Owner	AVDESH KUMAR GUPTA		
Designation पद	Vice President	**Company Name** कंपनी का नाम	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT UTRAULA
Company Address कंपनी का पता	Village Itai Maida Block Sridattganj District Balr	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	VILLEGE- ITAIMAIDA,POST-SHRIGANJ,TEHSIL UTRAULA,DISTT.-BALRAMPUR, UP-271607	**Application Form Serial No.**	BLMP0721NIN0008
Date of Submission	12/07/2021	**Specimen Signature**	
Location Particulars			
District	Balrampur	**Block**	Sridattganj
Plot No./Khasra No.	Existing premises khasra detail attached	**Municipality/Corporation**	No
Ward No./Holding No.			NA

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	01/06/2010		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
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.)**	180.00
Date of Energization (In Case of Electric Pump)		01/06/2010	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	4.00
Maximum Allowable Annual Extraction of Ground Water:			108000

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

GENERAL CONDITIONS:

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: NOC040290

VALID FROM 18/10/2021 TO 17/10/2026

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

Registration No.: 202107000327

Name of the Owner	AVDESH KUMAR GUPTA		
Designation पद	Vice President	**Company Name** कंपनी का नाम	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT UTRAULA
Company Address कंपनी का पता	Village Itai Maida Block Sridattganj District Balr	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	VILLEGE- ITAIMAIDA,POST-SHRIGANJ,TEHSIL UTRAULA,DISTT.-BALRAMPUR, UP-271607	**Application Form Serial No.**	BLMP0721NIN0007
Date of Submission	12/07/2021	**Specimen Signature**	
Location Particulars			
District	Balrampur	**Block**	Sridattganj
Plot No./Khasra No.	Existing premises khasra detail attached	**Municipality/Corporation**	No
Ward No./Holding No.			NA

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	01/06/2010		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	110.00
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.)**	180.00
Date of Energization (In Case of Electric Pump)		01/06/2010	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	5.00
Maximum Allowable Annual Extraction of Ground Water:			135000

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

GENERAL CONDITIONS:

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

Borewell Water Quality Test Report, Borewell UGR Location

NOIDA TESTING LABORATORIES

(A Government of India Approved Testing Laboratory)

(An ISO : 9001 : 2015, ISO 45001 : 2018 (OH&S) Certified & NABL Accredited Laboratory)

MoEF & CC (Ministry of Environment, Forest & Climate Change), UPPCB Recognized Laboratory

☎ +91-9313611642, 8510081921, 7503031145, 8527870572, 7503031146, 9999794369

TEST CERTIFICATE

Issued To:	**M/s. Bajaj Hindusthan Sugar Ltd.**
Address:	**Village- Itaimaida Utraula, P.O. Sri Duttganj, District- Balrampur (U.P) India**

Report Code	**: W-101222-080**
ULR No.	**: TC681422000000016619 F**
Test Report of	**: Water**
Service Request No	**: NTL/SRF/12/22-080**
Service Request Date	**: 07/12/2022**
Report Issue Date	**: 16/12/2022**

SAMPLING & ANALYSIS DATA

Sample Drawn By	:	NTL Representative
Sample Drawn On	:	09/12/2022
Sample Quantity	:	2.0 Lt. + 500 ml.
Analysis Duration	:	10/12/2022 to 16/12/2022
Sampling Location	:	UGR
Sample Description	:	Bore well Water

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-15185	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-15185	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.58	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	340	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2

Laboratory : GT-20, Sector-117, NOIDA, Gautam Budh Nagar – 201301
Branch Office :
HARIDWAR | RUDRAPUR | CHANDIGARH | DEHRADUN | PUNE
E.: noida.laboratory@gmail.com, info@noidalabs.com *W.:* www.noidalabs.com

NOIDA TESTING LABORATORIES

(A Government of India Approved Testing Laboratory)

(An ISO : 9001 : 2015, ISO 45001 : 2018 (OH&S) Certified & NABL Accredited Laboratory)
MoEF & CC (Ministry of Environment, Forest & Climate Change), UPPCB Recognized Laboratory

+91-9313611642, 8510081921, 7503031145, 8527870572, 7503031146, 9999794369

TEST CERTIFICATE

2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS-13428	<0.10	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	mg/l	0.5	2.4
6.	Calcium (as Ca)	IS: 3025 (P- 40)	38.50	mg/l	75	200
7.	Chloramines (as Cl_2)	IS: 3025 (P- 26)	<1.00	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P- 32)	41.50	mg/l	250	1000
9.	Copper (as Cu)	IS : 3025 (P-42)	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	0.32	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	BDL	mg/l	0.2	1.0
12.	Iron (as Fe)	IS: 3025(P-53)	0.138	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	17.60	mg/l	30	100
14.	Manganese (as Mn)	IS: 3025 (P-59)	<0.10	mg/l	0.1	0.3
15.	Mineral Oil	Clause 6 of IS: 3025	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO_3)	IS: 3025 (P- 34)	3.12	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P- 56)	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P- 24)	38.40	mg/l	200	400
20.	Sulphide(as H_2S)	IS-3025 (P-29)	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as Ca CO_3)	IS: 3025 (P- 23)	210.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	189.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P- 49)	<0.2	mg/l	5.0	15

Parameters Concerning Toxic Substances:

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	IS-3025(P-47)	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as Ni)	IS-3025(P-54)	<0.01	mg/l	0.02	No Relaxation
7.	Poly nuclear Aromatic Hydro Carbons	APHA 6440	<0.0001	mg/l	0.0001	No Relaxation
8.	Poly chlorinated biphenyl	APHA 6630	<0.0001	mg/l	0.0005	No Relaxation
9.	Total Arsenic (as As)	IS-3025(P-37)	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	IS-3025(P-52)	<0.05	mg/l	0.05	No Relaxation

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.
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Borewell Water Quality Test Report, Borewell near ETP

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TEST CERTIFICATE

Issued To: M/s. Bajaj Hindusthan Sugar Ltd.	**Report Code** : W-101222-081
Address: Village- Itaimaida Utraula, P.O. Sri Duttganj, District- Balrampur (U.P) India	**ULR No.** : TC681422000016620 F
	Test Report of : Water
	Service Request No : NTL/SRF/12/22-081
	Service Request Date : 07/12/2022
	Report Issue Date : 16/12/2022

SAMPLING & ANALYSIS DATA

Sample Drawn By	:	NTL Representative
Sample Drawn On	:	09/12/2022
Sample Quantity	:	2.0 Lt. + 500 ml.
Analysis Duration	:	10/12/2022 to 16/12/2022
Sampling Location	:	Near ETP
Sample Description	:	Bore well Water

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-15185	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-15185	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.26	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	360	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2

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2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS-13428	<0.10	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	mg/l	0.5	2.4
6.	Calcium (as Ca)	IS: 3025 (P- 40)	41.20	mg/l	75	200
7.	Chloramines (as Cl_2)	IS: 3025 (P- 26)	<1.00	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P- 32)	38.60	mg/l	250	1000
9.	Copper (as Cu)	IS : 3025 (P-42)	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	0.26	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	BDL	mg/l	0.2	1.0
12.	Iron (as Fe)	IS: 3025(P-53)	0.132	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	18.40	mg/l	30	100
14.	Manganese (as Mn)	IS: 3025 (P-59)	<0.10	mg/l	0.1	0.3
15.	Mineral Oil	Clause 6 of IS: 3025	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO_3)	IS: 3025 (P- 34)	3.01	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P- 56)	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P- 24)	28.50	mg/l	200	400
20.	Sulphide(as H_2S)	IS-3025 (P-29)	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as Ca CO_3)	IS: 3025 (P- 23)	197.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	180.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P-49)	<0.2	mg/l	5.0	15

Parameters Concerning Toxic Substances:

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	IS-3025(P-47)	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as Ni)	IS-3025(P-54)	<0.01	mg/l	0.02	No Relaxation
7.	Poly nuclear Aromatic Hydro Carbons	APHA 6440	<0.0001	mg/l	0.0001	No Relaxation
8.	Poly chlorinated biphenyl	APHA 6630	<0.0001	mg/l	0.0005	No Relaxation
9.	Total Arsenic (as As)	IS-3025(P-37)	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	IS-3025(P-52)	<0.05	mg/l	0.05	No Relaxation

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 presented 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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Borewell Water Quality Test Report, Borewell Near Boiling House:

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TEST CERTIFICATE

Issued To:	**M/s. Bajaj Hindusthan Sugar Ltd.**
Address:	**Village- Itaimaida Utraula, P.O. Sri Duttganj, District- Balrampur (U.P) India**

Report Code	**: W-101222-082**
ULR No.	**: TC681422000016621 F**
Test Report of	**: Water**
Service Request No	**: NTL/SRF/12/22-082**
Service Request Date	**: 07/12/2022**
Report Issue Date	**: 16/12/2022**

SAMPLING & ANALYSIS DATA

Sample Drawn By	:	NTL Representative
Sample Drawn On	:	09/12/2022
Sample Quantity	:	2.0 Lt. + 500 mL
Analysis Duration	:	10/12/2022 to 16/12/2022
Sampling Location	:	Near Boiling House
Sample Description	:	Bore well Water

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-15185	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-15185	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test Method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.00	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.00	NTU	1	5
5.	pH value	IS-3025(P-11)	7.68	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	315	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminum (as Al)	IS: 3025 (P- 55)	<0.01	mg/l	0.03	0.2

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TEST REPORT

2.	Total Ammonia	IS: 3025 (P-34)	<0.16	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS-13428	<0.10	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P-57)	<0.10	mg/l	0.5	2.4
6.	Calcium (as Ca)	IS: 3025 (P-40)	35.80	mg/l	75	200
7.	Chloramines (as Cl_2)	IS: 3025 (P-26)	<1.00	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P-32)	17.06	mg/l	250	1000
9.	Copper (as Cu)	IS : 3025 (P-42)	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	0.24	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	BDL	mg/l	0.2	1.0
12.	Iron (as Fe)	IS: 3025(P-53)	0.155	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	20.18	mg/l	30	100
14.	Manganese (as Mn)	IS: 3025 (P-59)	<0.10	mg/l	0.1	0.3
15.	Mineral Oil	Clause 6 of IS: 3025	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO_3)	IS: 3025 (P-34)	2.89	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P-56)	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P-24)	23.40	mg/l	200	400
20.	Sulphide(as H_2S)	IS-3025 (P-29)	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as Ca CO_3)	IS: 3025 (P-23)	192.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P-21)	176.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P-49)	<0.2	mg/l	5.0	15

Parameters Concerning Toxic Substances:

S.No.	Parameter	Test method	Result	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	IS-3025(P-47)	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as Ni)	IS-3025(P-54)	<0.01	mg/l	0.02	No Relaxation
7.	Poly nuclear Aromatic Hydro Carbons	APHA 6440	<0.0001	mg/l	0.0001	No Relaxation
8.	Poly chlorinated biphenyl	APHA 6630	<0.0001	mg/l	0.0005	No Relaxation
9.	Total Arsenic (as As)	IS-3025(P-37)	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	IS-3025(P-52)	<0.05	mg/l	0.05	No Relaxation

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.
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ETP Inlet Water Quality test report

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TEST CERTIFICATE

Issued To: M/s. Bajaj Hindusthan Sugar Ltd.	**Report Code** : WW-101222-074
Address: Village- Itaimaida Utraula, P.O. Sri Duttganj, District- Balrampur (U.P) India	**ULR No.** : TC681422000016613 F
	Test Report of : Waste Water
	Service Request No : NTL/SRF/12/22-074
	Service Request Date : 07/12/2022
	Report Issue Date : 16/12/2022

SAMPLING & ANALYSIS DATA

Sample Drawn On	:	09/12/2022
Sample Drawn By	:	NTL Representative
Sample Description	:	ETP Inlet
Sample Quantity/Packing detail	:	1 litre pet bottle
Weather Conditions	:	Normal
Analysis Duration	:	10/12/2022 to 16/12/2022

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11):1983	7.60	-
2.	Total Suspended Solid (TSS)	IS:3025(Part-17):1984	212.0	mg/l
3.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	650.0	mg/l
4.	Biological Oxygen Demand (as O_2) (3 days at 27^{0C})	IS:3025(Part-44):1993	380.0	mg/l
5.	Oil & grease	IS:3025(Part-39):1984	3.2	mg/l

Notes:

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ETP Outlet Water Quality test report

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TEST CERTIFICATE

Issued To: M/s. Bajaj Hindusthan Sugar Ltd.	Report Code : WW-101222-075
Address: Village- Italmaida Utraula, P.O. Sri Dattganj, District- Balrampur (U.P) India	ULR No. : TC681422000000166l4 F
	Test Report of : Waste Water
	Service Request No : NTL/SRF/12/22-075
	Service Request Date : 07/12/2022
	Report Issue Date : 16/12/2022

SAMPLING & ANALYSIS DATA

Sample Drawn On	:	9/12/2022
Sample Drawn By	:	NTL Representative
Sample Description	:	ETP Outlet
Sample Quantity/Packing detail	:	1 litre per bottle
Weather Conditions	:	Normal
Analysis Duration	:	10/12/2022 to 16/12/2022

TEST RESULTS

S.No.	Parameter	Test Method	Results	Limit as per CPCB Norms
1.	pH	IS:3025(P-11)	7.38	5.0-9.0
2.	Total Suspended Solid (TSS)mg/l	IS:3025(P-17)	21.0	100
3.	Chemical Oxygen Demand (as O_2) mg/l	APHA 5220 B-2005	85.0	250
4.	Biological Oxygen Demand (as O_2) mg/l	IS:3025(P-44)	16.0	30
5.	Oil & Grease (mg/l)	IS:3025(P-39)	<1.0	10

EPA- Environmental Protection Act-1986

Notes:

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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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STP Inlet Water Quality Test Report

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TEST CERTIFICATE

Issued To:	**M/s. Bajaj Hindusthan Sugar Ltd.**
Address:	**Village- Itaimaida Utraula, P.O. Sri Duttganj, District- Balrampur (U.P) India**

Report Code	**: WW-101222-070**
ULR No.	**: TC681422000016689 F**
Test Report of	**: Waste Water**
Service Request No	**: NTL/SRF/12/22-070**
Service Request Date	**: 07/12/2022**
Report Issue Date	**: 16/12/2022**

SAMPLING & ANALYSIS DATA

Sample Drawn On	: 09/12/2022
Sample Drawn By	: NTL Representative
Sample Description	: STP Inlet
Sample Quantity/Packing detail	: 1 ltr/Plastic Cane
Analysis Duration	: 10/12/2022 to 16/12/2022

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11)	7.80	-
2.	Total Suspended Solid	IS:3025(Part-17)	156.0	mg/l
3.	Chemical Oxygen Demand (COD)	IS:3025(Part-58)	280.0	mg/l
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44)	94.0	mg/l
5.	Oil & Grease	IS: 3025 (P- 39)	1.5	mg/l
6.	Faecal Coliform (MPN/100ML)	IS: 1622:1981	1.8×10^4	-

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
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4. The test samples will be disposed off after two weeks from the date of issue of test report, unless asked specified by the customer.

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AUTHORIZED SIGNATORY

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STP Outlet Water Quality Test Report

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TEST CERTIFICATE

Issued To: M/s. Bajaj Hindusthan Sugar Ltd.	**Report Code** : WW-101222-071
Address: Village- Itaimaida Utraula, P.O. Sri Duttganj, District- Balrampur (U.P) India	**ULR No.** : TC681J220000016610 F
	Test Report of : Waste Water
	Service Request No : NTL/SRF/12/22-071
	Service Request Date : 07/12/2022
	Report Issue Date : 16/12/2022

SAMPLING & ANALYSIS DATA

Sample Drawn On	:	09/12/2022
Sample Drawn By	:	NTL Representative
Sample Description	:	STP Outlet
Sample Quantity/Packing detail	:	1 ltr/Plastic Cane
Analysis Duration	:	10/12/2022 to 16/12/2022

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)	6.4	mg/l	100 max
3.	Chemical Oxygen Demand (COD)	IS:3025(Part-58)	25.0	mg/l	No limit Specified
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44)	4.1	mg/l	30max
5.	Oil & Grease	IS:3025(Part-39)	<1.0	mg/	No limit Specified
6.	Faecal Coliform (MPN/100ML)	IS: 1622:1981	80	-	<100 MPN/100ML

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

Laboratory : GT-20, Sector-117, NOIDA, Gautam Budh Nagar - 201301
Branch Office :
HARIDWAR | RUDRAPUR | CHANDIGARH | DEHRADUN | PUNE
E: noida.laboratory@gmail.com, info@nocdelabs.com W.: www.nocdelabs.com

d. Calibration Certificate

SCHEDULE-VIII

[See rule 19-(3)]

Government of Uttar Pradesh, Office of the Controller, Legal Metrology
Certificate of Verification

Verification Certificate No: 221652135FMV0001 User ID No: 2252TRD00000002_1

Name of Legal Metrology officer: VIJAY KUMAR SINGH

I hereby certify that I have on 18/07/2022 verified and stamped the under mentioned weights, measures, etc.

Belonging to: Bajaj Hindusthan Sugar Limited
Locality: NA,Itai Maida,Utraula Balrampur Road,Utraula,Balrampur, U.P.-271607

S.No.	Measuring Systems for Liquids other than water (Flow Meter)							Verification Fee(with additional fee, if any) (Rs.)	Carriage, conveyance charges etc.(Rs.)
	Meter Sr.No.	User defined identification no.	Make	Model No.	Maximum Flowrate (lpm)	Product	K-factor		
1	2	3	4	5	6	7	8	9	10
1	1709931	279447349975	Mag flow	6410 Adept	5000	Water	0.813211	5,000.00	1,000.00
2	1709924	279447349975	Mag flow	6410 Adept	5000	Water	0.781578	5,000.00	1,000.00
3	1904020	279447349975	Mag flow	6410 Adept	5000	Water	0.815722	5,000.00	1,000.00

Total Rs 18000 [Eighteen Thousand Only] deposited vide Treasury Receipt/Money receipt no. 220005633(18000.00) dated 15/07/2022,

Repaired/Produced by Self

Next verification due ON or BEFORE:

1. Items at S.No. 1,2,3 18/07/2023

Digitally Signed By
VIJAY KUMAR SINGH
#25AD92FD8D7D

Place: Balrampur

Date: 18/07/2022

VIJAY KUMAR SINGH[Inspector]
Legal Metrology officers
[Utraula],[Balrampur]

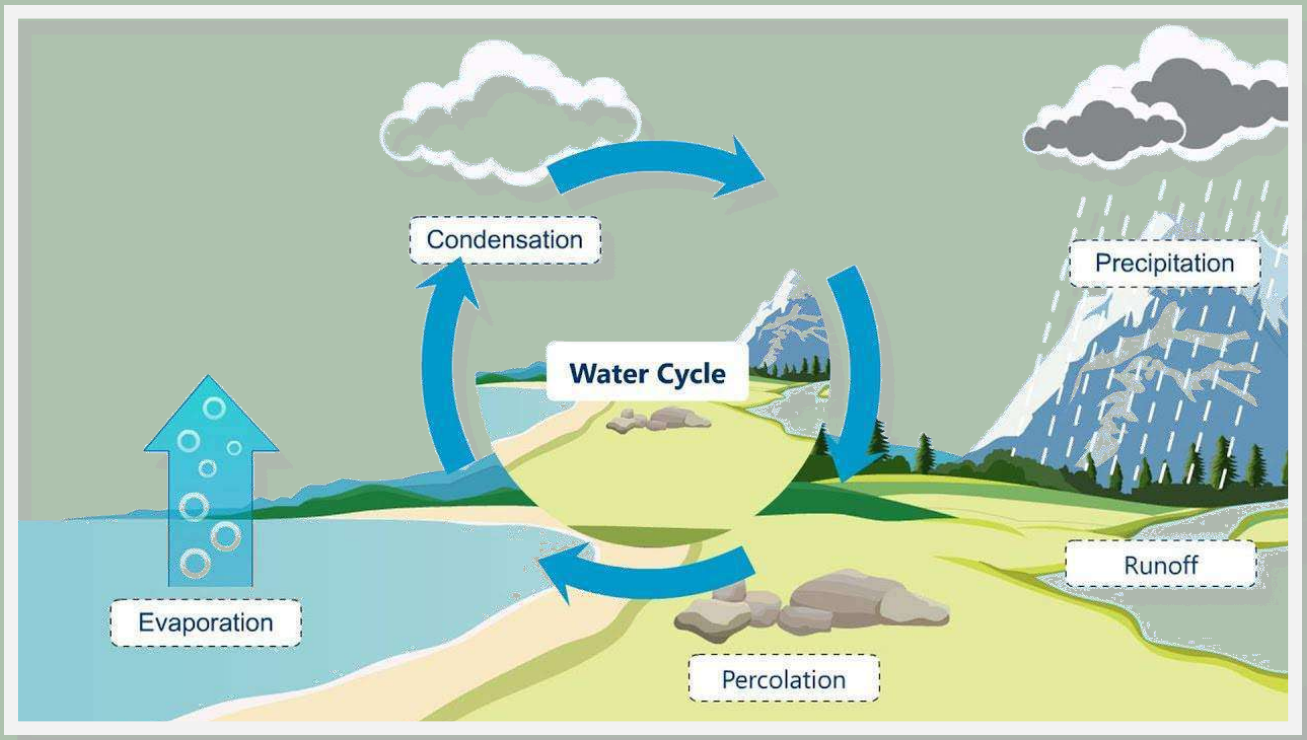
HYDROGEOLOGICAL AND IMPACT ASSESSMENT REPORT

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

FOR

UNIT: SUGAR

AT



VILLAGE: ITAI MAIDA, TEHSIL: UTRAULA,

DISTRICT: BALRAMPUR, UTTAR PRADESH

OF

M/S BAJAJ HINDUSTHAN SUGAR LIMITED,

UNIT: UTRAULA, SUGAR PLANT

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: Itai Maida, Tehsil: Utraula, District: Balrampur, Uttar Pradesh by M/s Bajaj Hindusthan Sugar Limited, Unit: Utraula, (Sugar Plant).

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 October 2021. 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 producer. 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 LOCATION OF THE PROJECT

M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula is located at vill – Itaimaida, Tehsil-Utraula, Distt.: Balrampur (Uttar Pradesh), 271607. The company has hired Mr. Vijay Rajkumar Yadav (CGWA accredited Individual Consultant) to evaluate Impact Assessment Report for detailed Hydro-geological evaluation studies in and around the project area in order to obtain NOC for Groundwater abstraction from Ground Water Department (GWD) of Uttar Pradesh.

1.3 NEED AND PURPOSE OF THE PROJECT

The Application for obtaining NOC for ground water abstraction in the tune of 2160 KLD has been submitted Vide Application Serial No: BLMP0721NIN0007, BLMP0721NIN0008, BLMP0721NIN0009 dated 12/08/2021 against 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.

1.4 PROJECT LOCATION

Existing Sugar Unit located at village – Itai Maida, Tehsil – Utraula, Distt. Balrampur (Uttar Pradesh). It has shown on SOI Topo sheets no. 63I/7 in the map below **Fig: 1.2.**

Table No.: 1.1
Salient features of the Project

S. No	Particulars	Details
1.	District and State	Balrampur, Uttar Pradesh
2.	Taluka	Utraula
3.	Village/Town	Itai Maida
4.	Project Area	48.70 Ha.
5.	Coordinates	Latitude: 27.348131° Longitude: 82.317679°

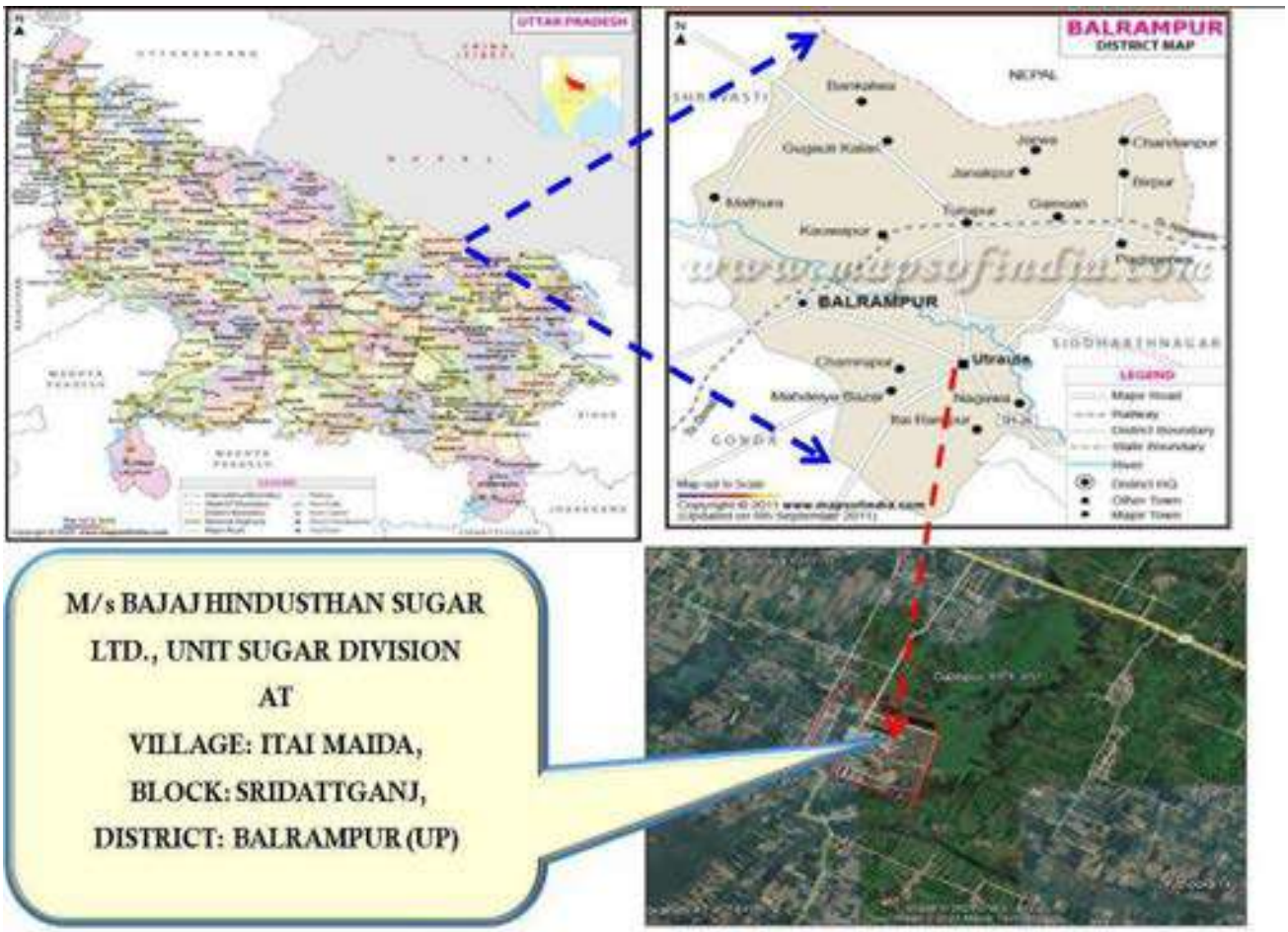


Fig No. 1.1 Location of the Project Site

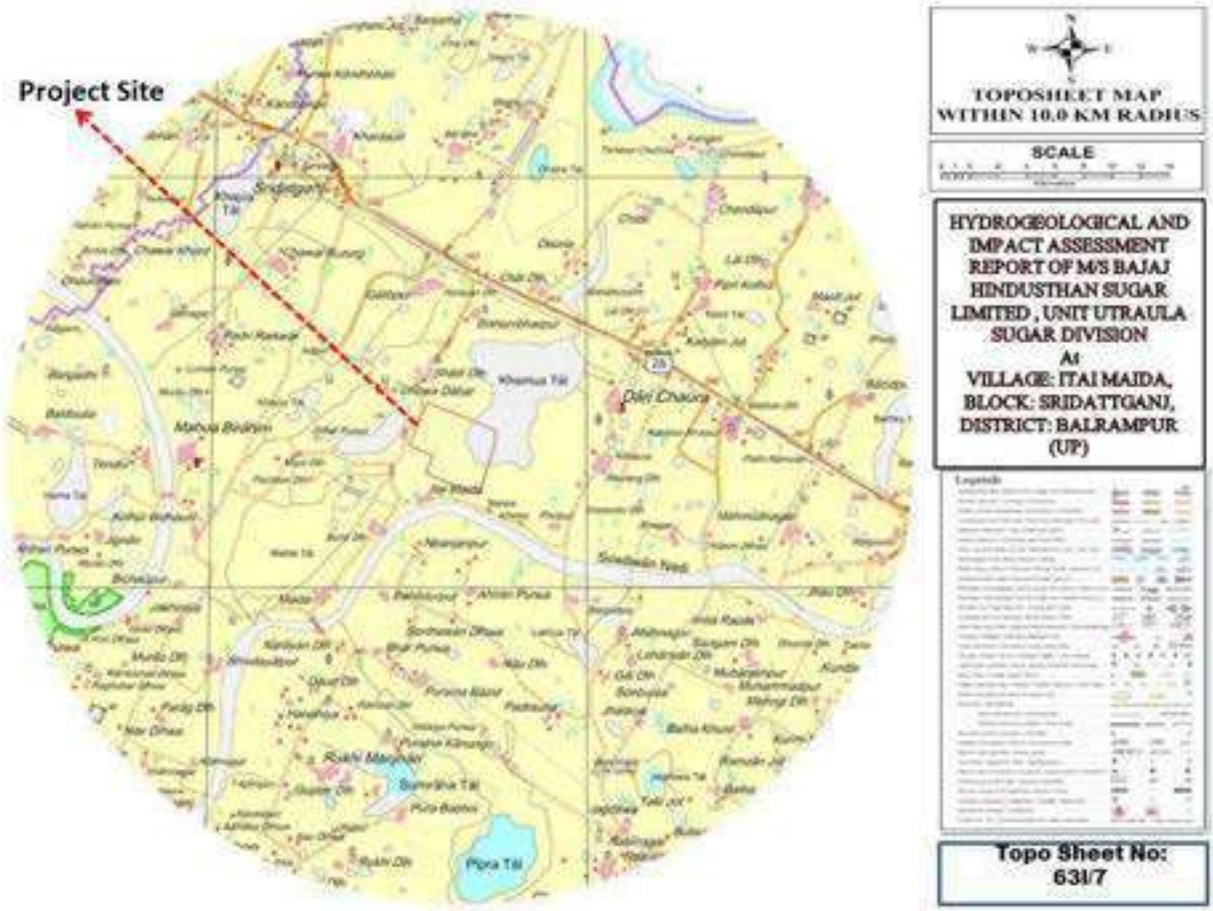


Fig No. 1.2 Topo sheet Map of the project site

1.5 LAND USE DETAIL:

Total plant area is 48.70 Hectares (120.34 Acres). Out of the total plant area of 48.70 Ha, 16.07 hectares (39.70 acres) (~ 33% of the total plant 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**	49754	10.21
2.	**Roads & Paved**	19936	4.10
3.	**Green Area**	160700	32.69
4.	**Open Area/Green Area**	256697	52.70
	Total	**487087**	**100**

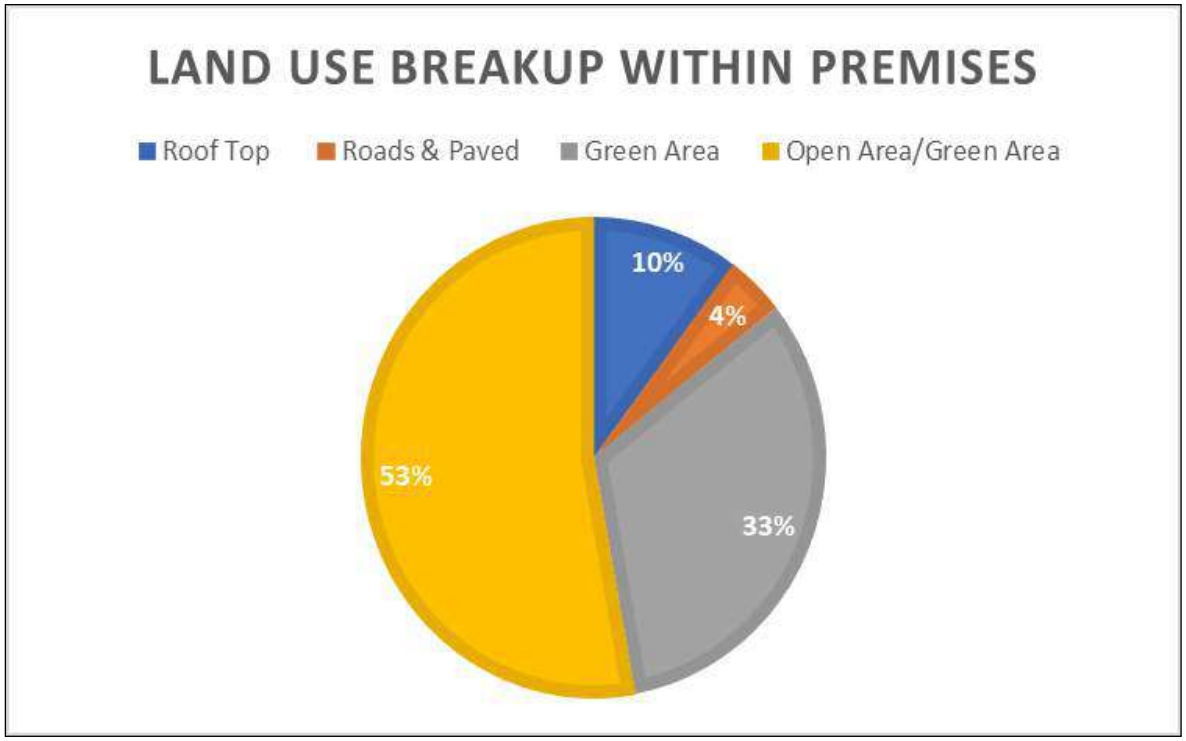


Fig No. 1.3: Land use Breakup

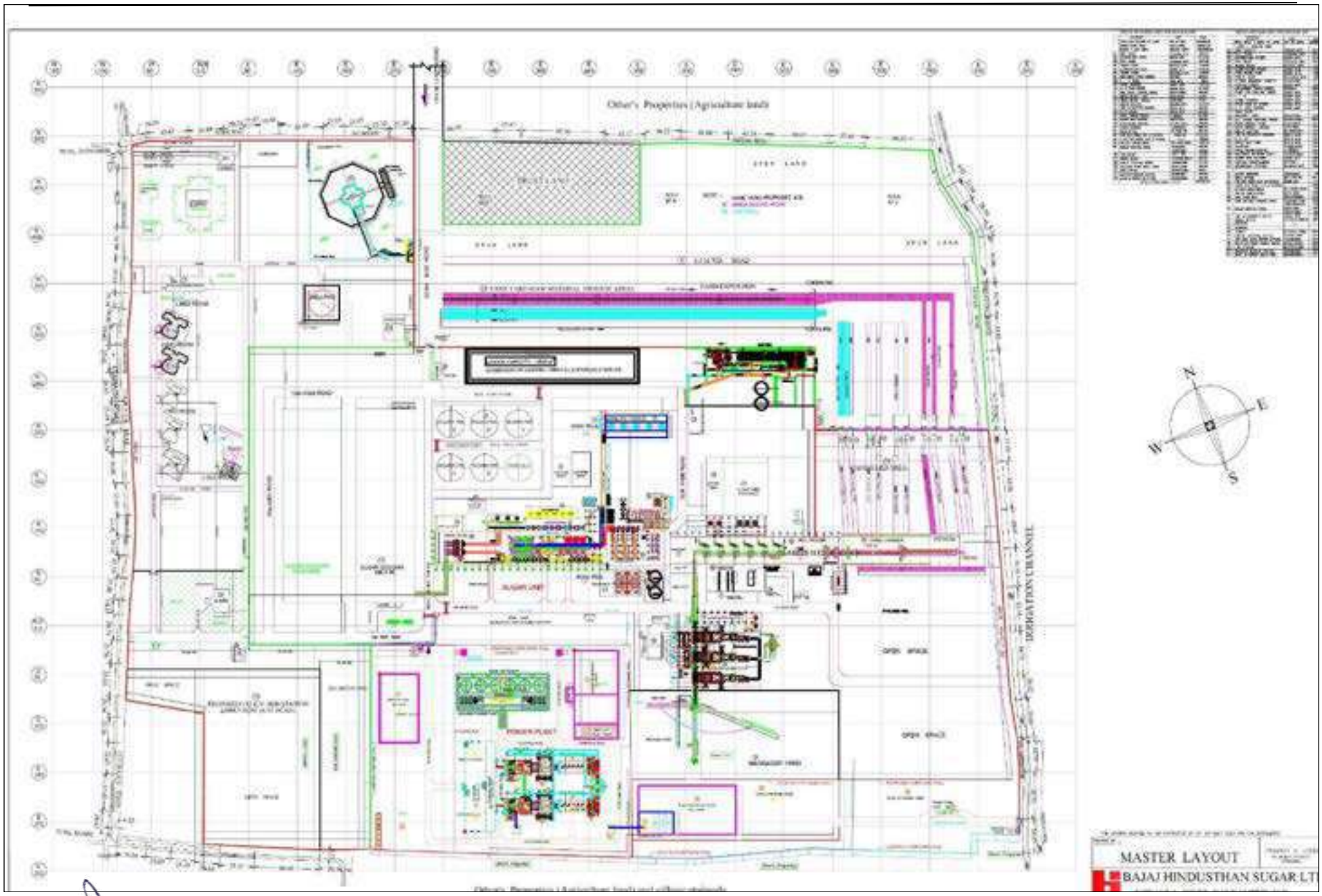


Fig No 1.4. Plant Layout

1.6 TECHNOLOGY AND PROCESS DESCRIPTION

Indian sugar industry is engaged mainly in the production of direct consumption commercial plantation white sugar (99.8% pure) sugar is produced in vacuum pan factories. Sugar production process mainly comprises of following 08 operations given below:

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

Cane receiving:

The sugar cane in the field is examined for its quality before harvesting and harvesting permits are given after its quality and maturity is found satisfactory. The sugar cane is then manually harvested and transported to factory by tractor trailers, trucks and bullock carts. The farmers are supplied with steel wire rope slings to be placed below the cane in the vehicles to enable unloading by cranes. The vehicles bringing sugar cane are received at the factory cane yard.

Sugarcane Weighment:

The vehicles carrying the sugar cane are weighed on the platform type electronic weighbridges and released for unloading. The gross weight is recorded and printed. After unloading the vehicles are once again weighed for the tare weight. These weights are printed on the weighment slips, which also carry the details of the farmer, cane etc.

Sugarcane Unloading:

The cart cane is manually unloaded directly to the cane carrier. The cane from the trucks and tractor- trailers are unloaded with the help of cane un-loader crane. The cane is unloaded on to the feeder table.

Sugarcane Conveying:

The cane from the feeder table is then dumped to the main cane carrier, which conveys the cane to the cane preparatory devices. Electronic devices, depending on the cane-crushing rate control the speed of the cane carrier, and level in the cane carrier etc.

Sugarcane preparation:

The sugar cane is passed through the cane preparatory devices called leveler, cutter and fibriser where in the cane is cut into small pieces to expose the juice cells for extraction. The preparatory index is about 85-90 %.

Milling:

The prepared cane then passes through the milling tandem having 4 mills of three roller & necessary feeding device. The mills run at about 4.5 to 6.0 RPM driven through hydraulic motors or DC variable speed drives. The mills loaded hydraulically extract juice from the cane and is subjected for the extraction of juice aided by maceration water and compound imbibition. The cane is conveyed between mills with the help of rake type mechanical conveyors. Screens then filter the extracted juice and filtered juice is pumped for further processing. The fibrous residue after juice extraction known as bagasse is withdrawn from the last mill and conveyed through drag type steel conveyors to boiler for steam generation. Surplus bagasse is withdrawn from the conveyor and stored for reuse when necessary. The bagasse conveyor also has return conveyor to feed the stored bagasse.

Juice clarification:

The mixed juice received from milling after filtration is weighed in a juice weighing scale or by a mass flow meter to know the quantity of juice flowing. The juice contains certain undesirable impurities, which are removed before it is taken for concentration in evaporators. The juice is first heated to a temperature of 70°C in a tubular type vertical heater by using heat of vapours from the third effect of a quintuple effect evaporator. The use of third effect vapours resulted in steam economy. The hot juice is then mixed with lime and sulphur dioxide gas maintaining a pH of 7.0. This process is carried out in a reaction vessel known as juice sulphiter. Any SO_2 gas coming out of the vessel is again scrubbed though juice and no gas is allowed to atmosphere. The treated juice is again heated to a temperature of 105°C in a similar tubular type heater using vapours from second and first effect of evaporators. The heated sulfated juice is then sent to a gravity settler known as clarifier wherein the mud flocs and settles. Chemical settling aids like "Magnafloc, Sedipur or Separan" may be added to improve settling rate. The mud settled at bottom of each of the four compartments in the clarifier is withdrawn continuously and is filtered in a rotary vacuum filter. The filtered mud after washing and removing residual juice in the filter is scraped from the filter drum and sent out. Fine bagasse is mixed with muddy juice as filter aid. The filtrate juice is returned to the raw juice tank and re-circulated. The mud is used as manure in fields because of its nutrient value.

Evaporation:

The clarified clear juice is withdrawn from the clarifier continuously & sent to evaporators after heating the juice further to 115°C in a plate type heater. The evaporators consist of five evaporator bodies arranged to work in series as a quintuple effect. The exhaust steam or the bled steam from steam turbines at powerhouse is supplied to the first body of the evaporator for heating. The vapours from second body are bled to pans for boiling. The raw juice heating is done with the vapours bled from 3rd effect, sulfated juice with vapours from 2nd and 1st effects of the evaporators. This type of quintuple effect evaporation and vapour bleeding achieves good steam economy. The exhaust steam condensate from the first body is withdrawn & sent to boiler condensate storage tank for use as boiler feed water. The condensate from all other evaporators is withdrawn individually and sent to hot water storage tank for use in various processes. The clear juice gets concentrated from a brix of 15 to 60 % and is withdrawn continuously from 5th body of the evaporators. The syrup thus, obtained from evaporators is passed through a continuous syrup sulphiter wherein SO2 gas is bubbled through syrup for bleaching purpose. The spurted syrup is then sent to pan floor storage tanks for further boiling.

Pan boiling:

A three-stage boiling scheme is adopted to produce quality sugar with minimum sugar loss. The first massecuite (A-massecuite, sugar plus mother liquor) is boiled on hopper seed footing, syrup, melt, and A-light molasses. A-heavy molasses is used for boiling B- massecuite & A-light molasses is taken for A-massecuite boiling. C- Massecuite is boiled using true seed along with B-heavy molasses and C-light molasses for complete exhaustion. B-massecuite is boiled using double cured C-sugar magma. This sugar is taken as seed for A-boiling and surplus is melted and used along with A-light molasses and syrup to boil A- massecuite. The pans used for A-boiling are low head calandria type batch pans and for B and C boiling are fully automated continuous pans.

Cooling and curing:

The process of crystallization initiated in the pan is completed in the crystallizer (storage tank with mechanical stirring arrangement and air- or water-cooling arrangement). Air-cooled crystallizers are used for A-massecuite and water- cooled continuous type vertical crystallizers are used for B and C massecuites.

A- Massecuite is centrifuged in a fully automated high-speed batch type centrifugal machine to separate sugar and molasses.

The sugar is washed with super-heated water in the machine to get good quality white crystal sugar. The sugar is then discharged by a plough in the machine and dropped to a grasshopper

conveyor. The hopper is provided with facility to dry and cool the sugar before graining. The heavy and light molasses separated in the centrifugal are sent back for reprocessing at pans.

Continuous centrifugal machines are used for centrifuging B and C massecuites. The B-massecuite is cured in continuous centrifugal machines to separate B- heavy molasses and B-sugar. B-sugar thus obtained (B-fore sugar) is again made into magma with water and cured in a continuous centrifugal machine to separate B-light molasses and B- after sugar.
Similarly C-massecuite is double cured in continuous centrifugal machines. The fore-worker molasses is the final molasses, which is sent to steel storage tanks. C-double cured sugar is melted and used for boiling B-massecuite.

The sugar discharged from A- centrifugal machines is conveyed through grasshopper conveyors wherein drying and cooling arrangements are provided. Sugar then passes through mechanical graders where the sugar is graded as per their sizes to confirm to the IS standard. The graded sugar is then sent to sugar storage bins with the help of bucket elevators. **Flow diagram of Sugar industry process is enclosed at Fig: 1.5.**

Sugar drying grading and bagging:

At centrifugal machines sugar and molasses have been separated sugar crystals are discharged into the hopper for drying by the use of hot and cold air to bring down the moisture in the range of 0.04 +- 0.01%, after drying sugar crystals of various sizes are separated for fused bagging having grading as L (Large) M (Medium) and S (Small), weighment process is automatic and stitching is manual through belt conveyers sugar bags are shifted to sugar godown for stocking as per grade.

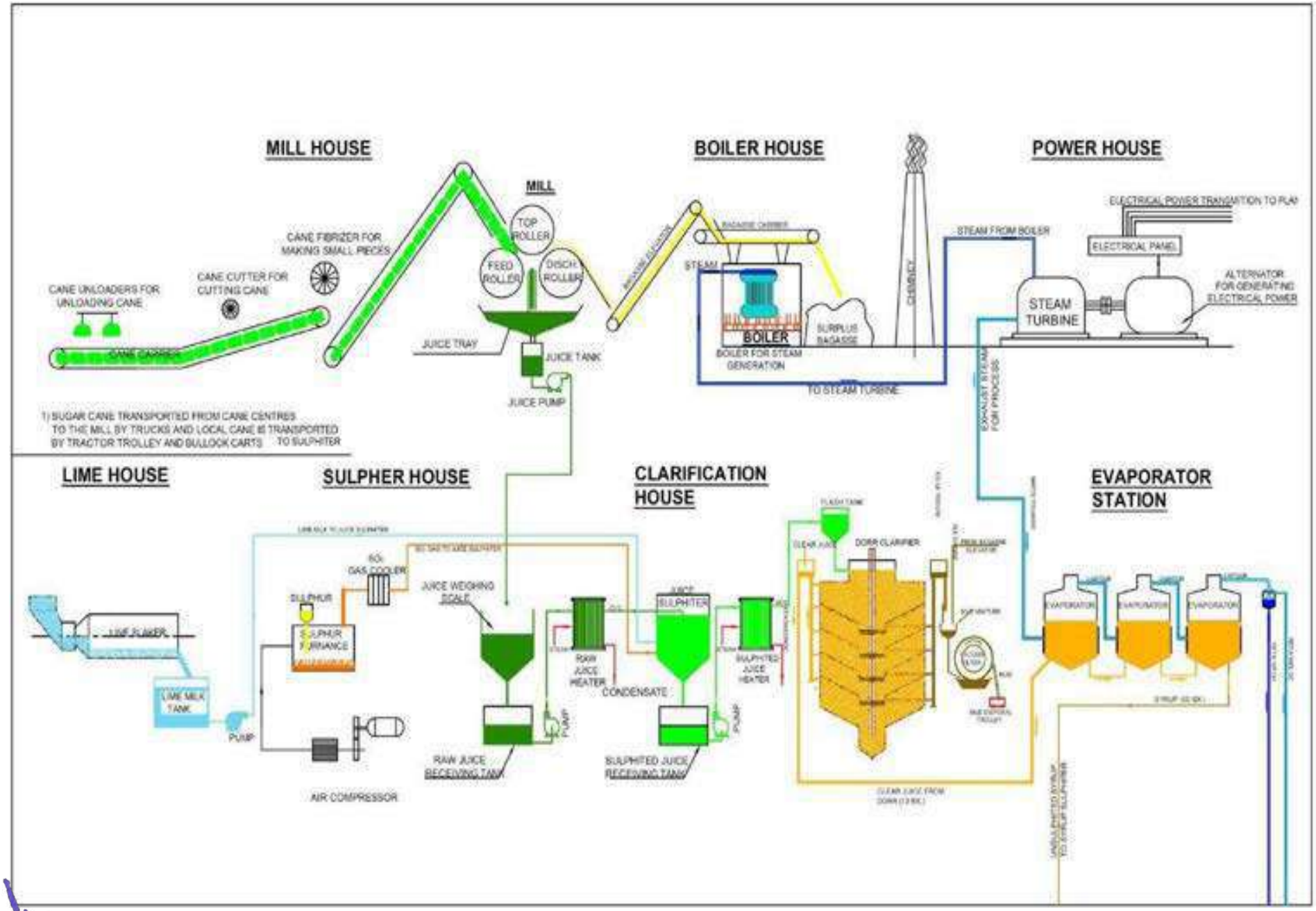


Fig: 1.5 Manufacturing Flow Diagrams

1.7 Fresh Water Requirement and Existing Bore Well Details

Fresh water requirement for Sugar unit is 2160 KLD. Fresh water requirement shall be sourced from Ground Water through 03 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)	Depth to Water Level (mbgl)	Discharge (m3 /Hr)	Operational Hrs. (Day)	Mode of Lift	Pump Capacity (HP)	Coordinates
1	Bore Well 01/06/2010	110	3 - 2	180	5.0	Submersible	50	27.348648 ° N 82.319570 ° E
2	Bore Well 01/06/2010	110	3 - 2	180	4.0	Submersible	50	27.348517 ° N 82.318077 ° E
3	Bore Well 01/06/2010	110	3 - 2	180	3.0	Submersible	50	27.347084 ° N 82.317644 ° E

CHAPTER - 2
DETAIL ABOUT THE STUDY AREA

2.1 GEOLOGY OF THE AREA

Geology plays an important role in the occurrence and distribution of ground water in time and space and also in shaping the groundwater scenario of an area and its imperative to understand the regional as well as local geological set up of the area.

2.1.1 REGIONAL GEOLOGY

The general geological sequence of formation in the district is as follows:

GEOLOGICAL SUCCESSION WITHIN BALRAMPUR

SYSTEM	AGE	FORMATION	LITHOLOGY
Quaternary	Recent to Upper Pleistocene	Lower Piedmont Plain (Tarai)	Clay-sandy, sand, gravel and clay
	Recent to Upper Pleistocene	Younger Alluvium	Fine sand, silt clay mixed with gravel
	Upper Pleistocene	Older Alluvium	Clay with kankar & sand

2.2 CLIMATE & RAINFALL

The district experiences sub-humid climate and three distinct seasons' viz. summer, rainy and winter seasons. The climatological data gives an idea of the hydro-meteorological condition in the district. The hottest month is May with average mean temp. of 34.8 ºC followed by June with 34.3ºC. The coldest month is January with average mean temperature of 16.15 ºC followed by December with 16.95ºC. The relative humidity is highest in month of August with normal relative humidity of 81%, followed by July & Sept. with normal value of 75.5%. The normal annual mean wind speed of the district is 5.16 km/h. The maximum normal wind speed is 8.0 km/h in the month of June and minimum winds peed is observed in winters as 2.6 km/h in the month of November. The annual normal Rainfall of the district comes to 976.73mm. The maximum rainfall occurs during the monsoon period i.e. June to Sept. having the normal value of 870.67 mm, which is 89.14% of annual rainfall. July is the wettest month having the normal rainfall of 306.73mm followed by August with Normal rainfall of 297.77 mm.

Table No. 2.1
Average Annual Rainfall

YEAR	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
2016	0.0	0.0	0.0	0.0	31.1	97.3	377.5	136.9	65.5	43.0	0.0	0.0
2017	7.0	0.0	6.0	0.0	13.5	50.2	243.3	260.0	52.8	15.9	0.0	0.0
2018	0.0	1.0	0.0	6.0	7.4	65.4	359.0	254.6	28.7	0.0	0.0	0.0
2019	15.7	21.4	1.0	0.0	4.0	330.3	520.0	142.4	277.0	0.0	0.0	0.0
2020	74.4	32.6	74.1	0.0	49.3	428.4	251.3	280.7	150.8	0.0	0.0	0.0

Source: *IMD Hydromet*

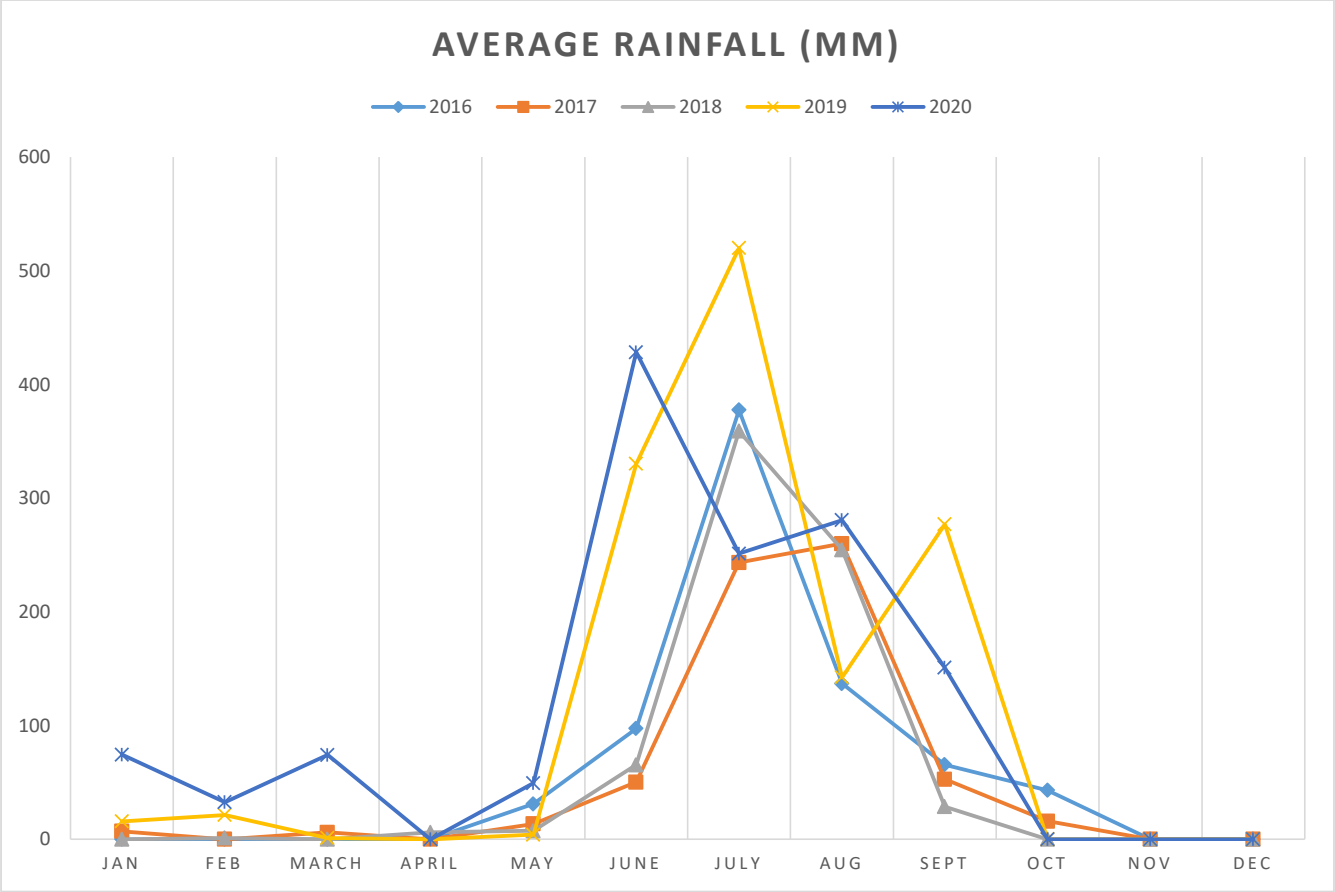


Fig No. 2.1: Average Rainfall

2.3 GEOMORPHOLOGY, TOPOGRAPHY AND DRAINAGE

2.3.1 GEOMORPHOLOGY

The geomorphology of an area plays a very significant role in the groundwater movement and occurrence, on a regional scale the entire district represents a typical physiographic set up occupied by sediments of fluvial origin with mild altitudinal variations except at the river courses and broadly covered under older and younger alluvial plains. The district in general, comprises of undulating plains. The district can be almost identifiably divided into two units,

the upland plains underlain by Older Alluvium and the low land plains under lain by Newer Alluvium. The study area falls into lowlands plains underlain by newer alluvium. The elevation of the land surface varies from about 160 m AMSL in the north-western part of the district to 96.5m AMSL in the south-east. The general slope of the tract is from north-west to south-east. The topography is largely influenced or modified by the existing network of rivers and streams.

Area around the sugar mill comprises of Younger Alluvium and has a comparatively gentler slope. The drainage is well developed. Rapti River flows through the Low land Plain sand is characterized by several and bar sand vast alluvial tracts. The meander flood plains occur in the central part of the district, all along the Rapti River as well as the other perennial nalas.

2.3.2 SOIL

The soils of the district consist broadly of "Matiyar" or clay, "Dumat" or loam. The hard clay soil or Matiyari side alforrice cultivation and very fertile. The Dumator loam is also fertile soil, ideal for cultivation of various types of crops. This is the reason for high crop yields in the district. The soil cover is generally shallow and moderate in the northern part while in the southern part the soil cover is thick.

2.3.3 TOPOGRAPHY OF BALRAMPUR

The general slope of the tract is from northwest to southeast. The topography is largely influenced or modified by the existing network of rivers and streams.

2.3.4 DRAINAGE

The drainage is well developed. Rapti River flows through the Low land Plain sand is characterized by several and bar sand vast alluvial tracts. The meander flood plains occur in the central part of the district, all along the Rapti River as well as the other perennial nalas. These plains are low lying river areas.

Drainage Pattern in Study Area:

Dendritic drainage pattern found in the study area. Natural slop in the study area is from North-South to East - West. Drainage map of the area is given in Fig: 2.2.

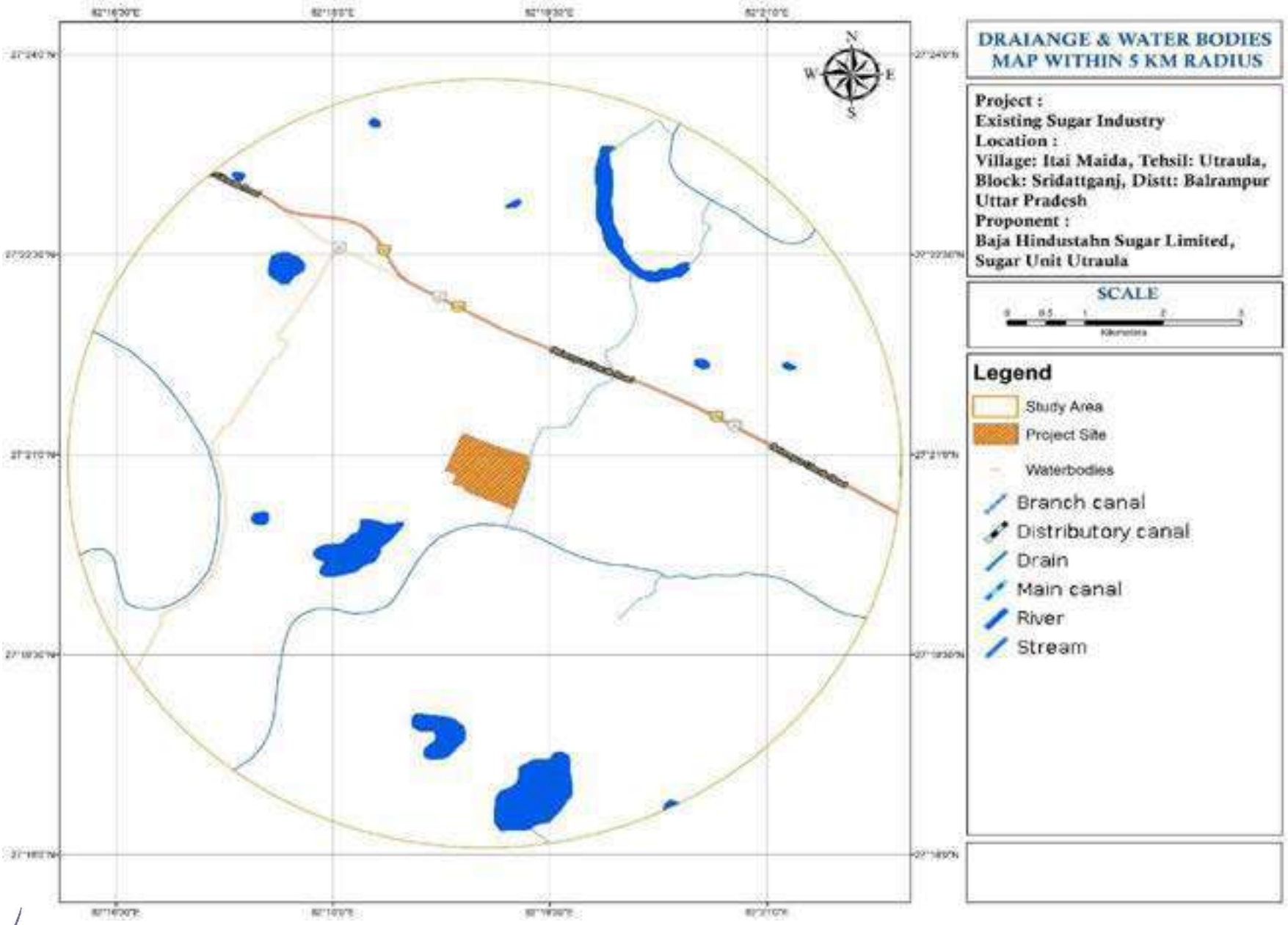


Fig No. 2.2 Drainage Map of the study area

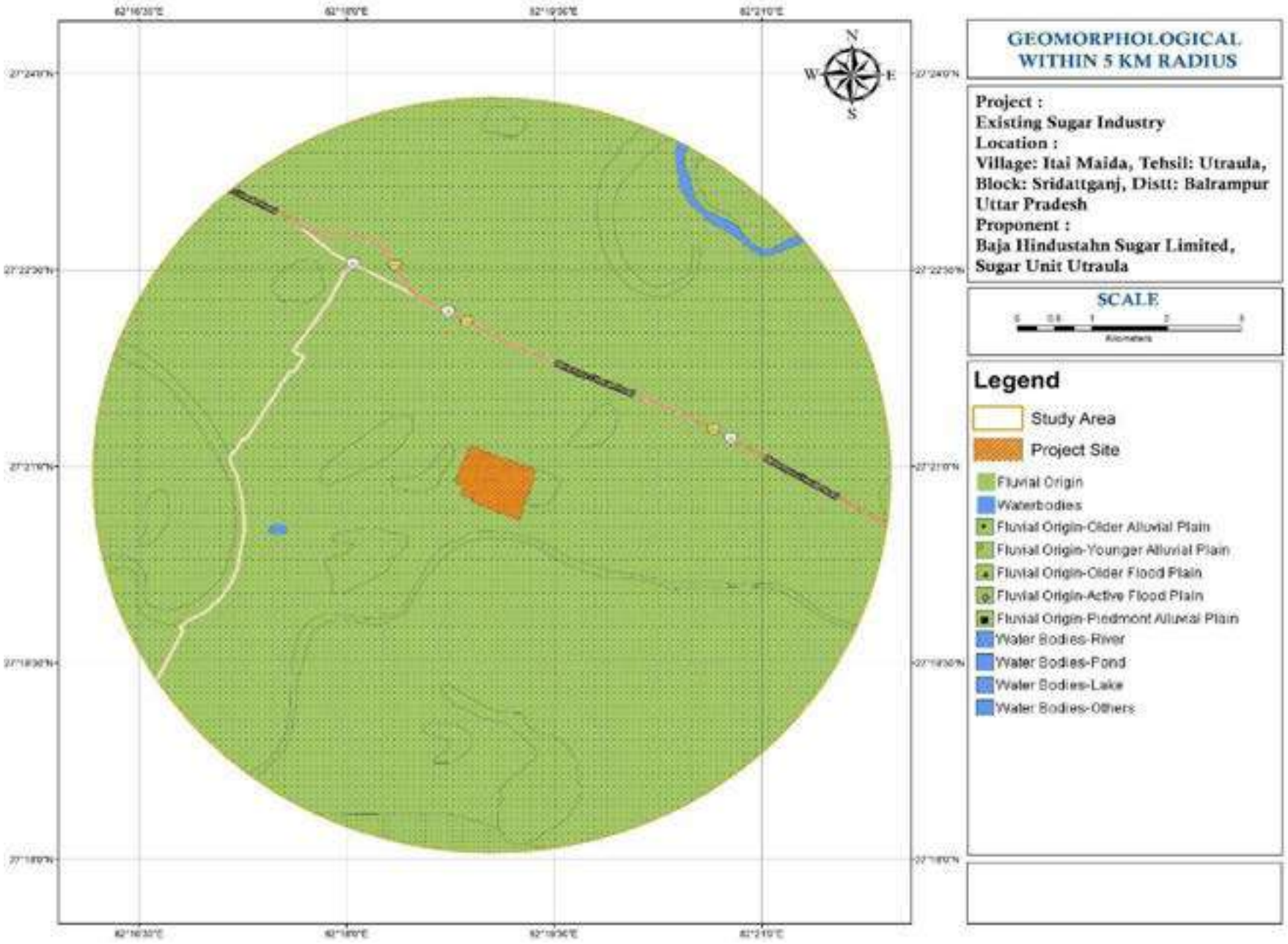


Fig No. 2.3 Geomorphology Map of the study area

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 **Bajaj Hindusthan Sugar Limited, Unit: Sugar** 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 84.16%, fallow land / bare soil with 0.41 %, and human settlement (including both urban and rural) 3.2 %. The land use land cover details of 5 km radius area are given in Table-1.4 below:

Table – 2.2,
Land Use / Land Cover details of study area

S. No	Legends	Area in sqm	Area in Ha.	Area in %
1.	Crop land	66.49	6648.8	84.16
2.	Deciduous	1.08	108.1	1.37
3.	Fallow	0.33	32.6	0.41
4.	Inland wetland	4.14	414.1	5.24
5.	Mining	0.05	4.8	0.06
6.	Plantation	0.97	97.2	1.23
7.	River / Stream / Canals	3.22	322.3	4.08
8.	Rural	1.98	197.9	2.50
9.	Scrub land	0.16	15.6	0.20
10.	Urban	0.55	55.1	0.70
11.	Waterbodies	0.03	2.7	0.03
	TOTAL	**79.0**	**7900.00**	**100**

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

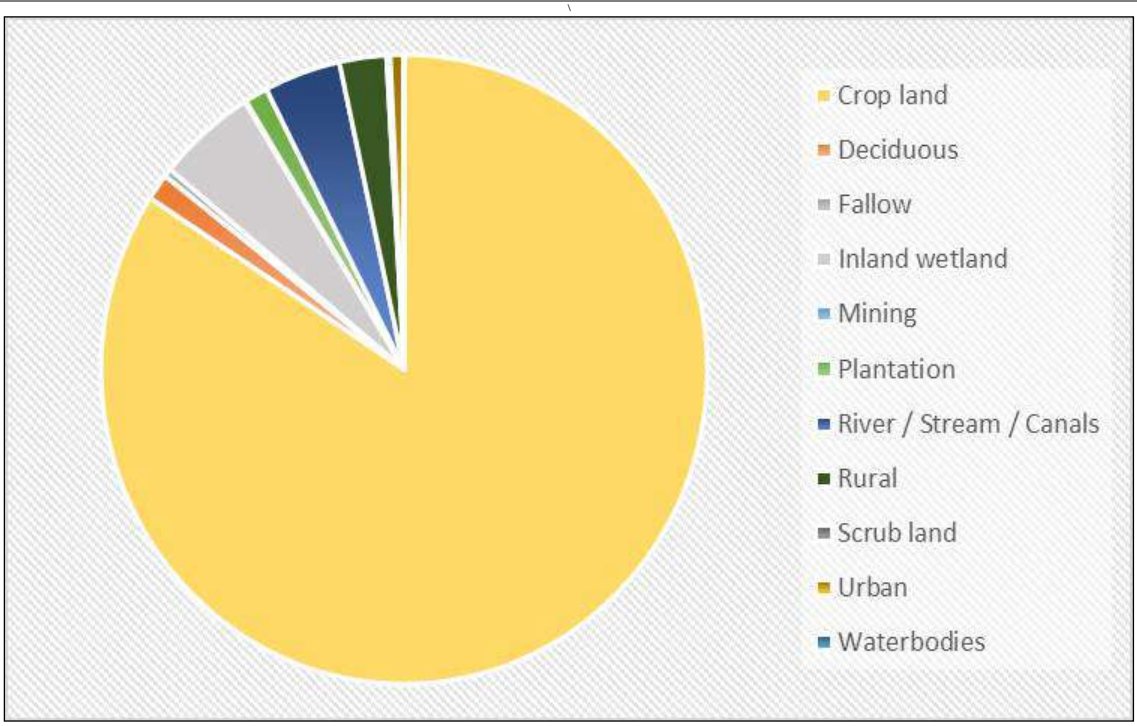


Fig No. 2.4 Land Use / Land Cover details of study area

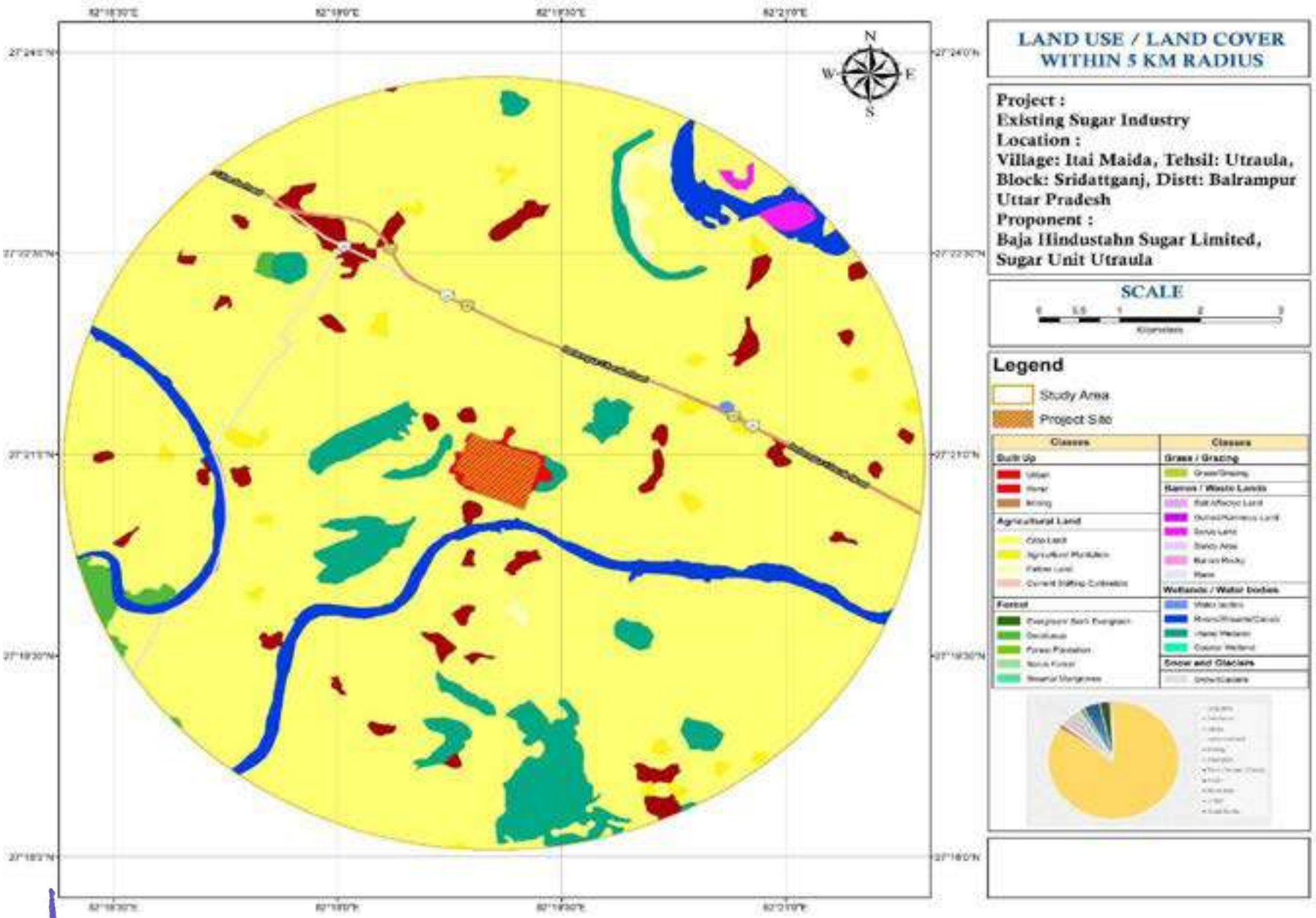


Figure No 2.5: Land Use Map of the study area

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 Sugar unit of M/s Bajaj Hindusthan Sugar Limited, Sugar Unit – Utraula, 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 100 m to 108 m in the whole study area. General Slope in study area is from North West to South East, Lowest elevation is found in South East of study area where elevation ranges from 98 - 100 m amsl. DEM of the study area given in **Figure-2.6.**

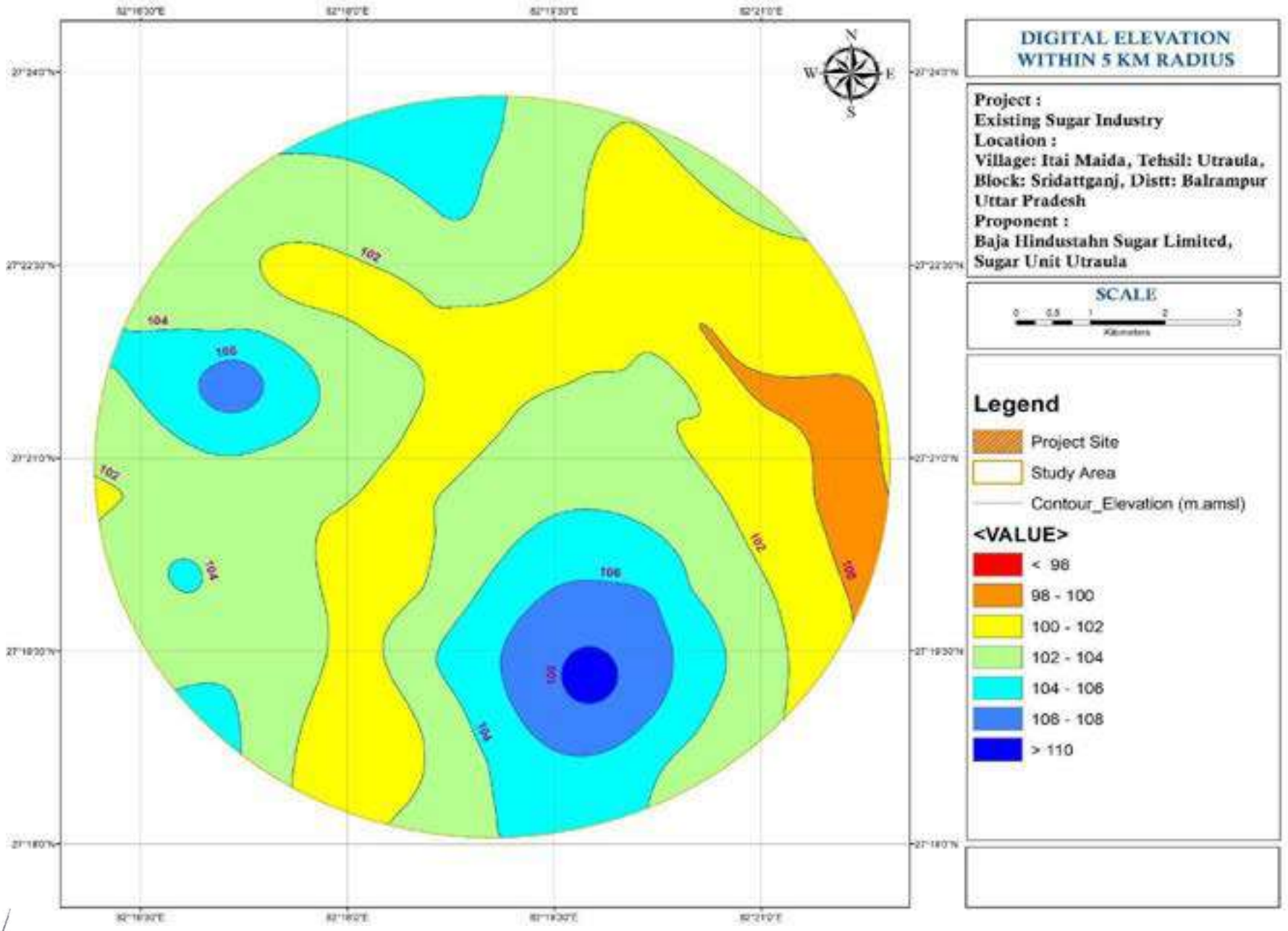


Fig: 2.6 Digital elevation map within Study area

2.6 BRIEF HYDROGEOLOGY OF THE AREA

The ground water occurrence and its distribution in space are highly influenced by the underlying geological formations and hydro-geological characteristic of the surroundings. The hydrogeology of the area broadly describes the disposition of water bearing formations, occurrence of ground water and their yield potential, groundwater regime conditions, depth to water level its seasonal and long-term trends, yield potential of the aquifers etc. Detailed hydro-geological investigation has been carried out in and around the project area for elucidating the hydrogeology and establishing the interrelationships between various hydraulic parameters. Alluvial tract of Balrampur district is under lain by sands of various grades, gravels, silt and clay. The ground water in the area 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 thick unconsolidated sediments have been explored for groundwater availability and utility. The Rapti Alluvial plains in Balrampur district comprise of an aquifer system that forms good repository of ground water that occurs in granular zones constituted of coarse sand and occasional gravels. Thick clays, which are predominant, act as the confining layers and separate the aquifers. The aquifer material is comprised of fine to medium sand and coarse sand with gravel.

2.6.1 AQUIFER DESCRIPTION

Alluvial tract of Balrampur district is under lain by sands of various grades, gravels, silt and clay. The ground water in the area 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 thick unconsolidated sediments have been explored for groundwater availability and utility. The result of exploratory drillings indicates that the aquifers vary great deal in extent, both vertically as well as laterally. The southern part of the district is characterized by thicker aquifers, where sand and gravel predominate over clays. The northern part comprises of thinner granular zones and lenses of sand of varying lateral extent, dominated by thick clay. Broadly, a three (3) tier aquifer system can be inferred in the area down to a depth of 350 mbgl. The sticky and yellowish clay marks the boundary between these aquifers at 120 mbgl and 210mbgl. Groundwater in the top most aquifer occurs under phreatic or water table conditions while in intermediate and deeper aquifer it occur under semi confined to confined condition. Central Ground Water Board, under its exploratory drilling programme has drilled number of boreholes with an objective of mapping of sub-surface sediments and aquifer system. The average yield of tube wells varies from 2000 to 3325 lpm for a reasonable drawdown. In and around plant area the tube wells of depth upto100 m yields from 2000 lpm to 2500 lpm. GW quality is fresh and suitable both for domestic and irrigation purpose.

- **Transmissivity**

  The Transmissivity in the district is up to as high as1631 m^2/day.

- **Storativity:**

  The Storativity of the aquifers has been estimated to be in the range of 1.9 x 10-5 to 1.7 x10-3.

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

Table No. 2.3 BLOCK – SRIDUTTAGANJ
(PREMONSOON 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
		Pre Mn	Pre Mn	Pre Mn	Pre Mn	Pre Mn	Pre Mn	Pre Mn	Pre Mn	Pre Mn	Pre Mn
BALRAMPUR	SRIDUTTAGANJ	3.12	3.65	4.05	2.95	3.05	3.10	3.60	4.46	3.50	2.75

Table No. 2.4 BLOCK – SRIDUTTAGANJ
(POSTMONSOON 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
		Post Mn	Post Mn	Post Mn	Post Mn	Post Mn	Post Mn	Post Mn	Post Mn	Post Mn	Post Mn
BALRAMPUR	SRIDUTTAGANJ	1.02	3.20	2.12	2.15	2.55	2.35	3.05	2.25	1.80	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 2015 to year 2018. Reason of declining trends is majorly due to increase in industrial and domestic draft and decrease in rain water recharge in comparison to draft.

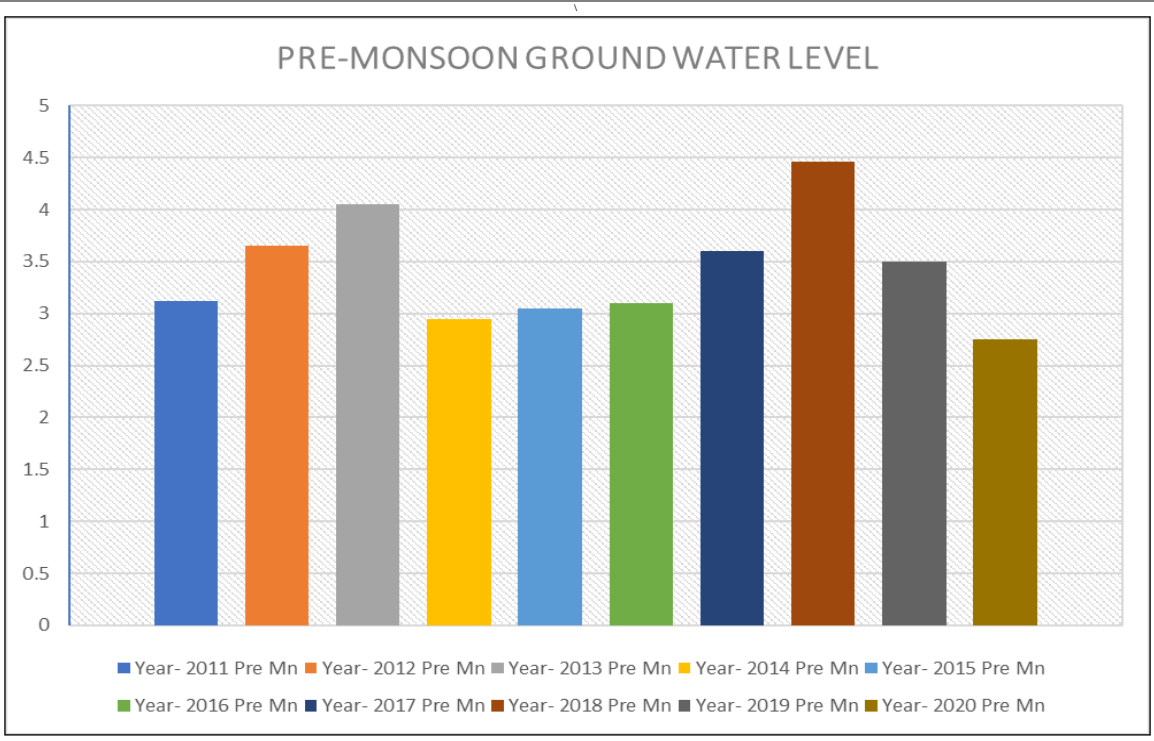


Fig No. 2.7 Hydrographs of Pre-Monsoon Ground Water Level

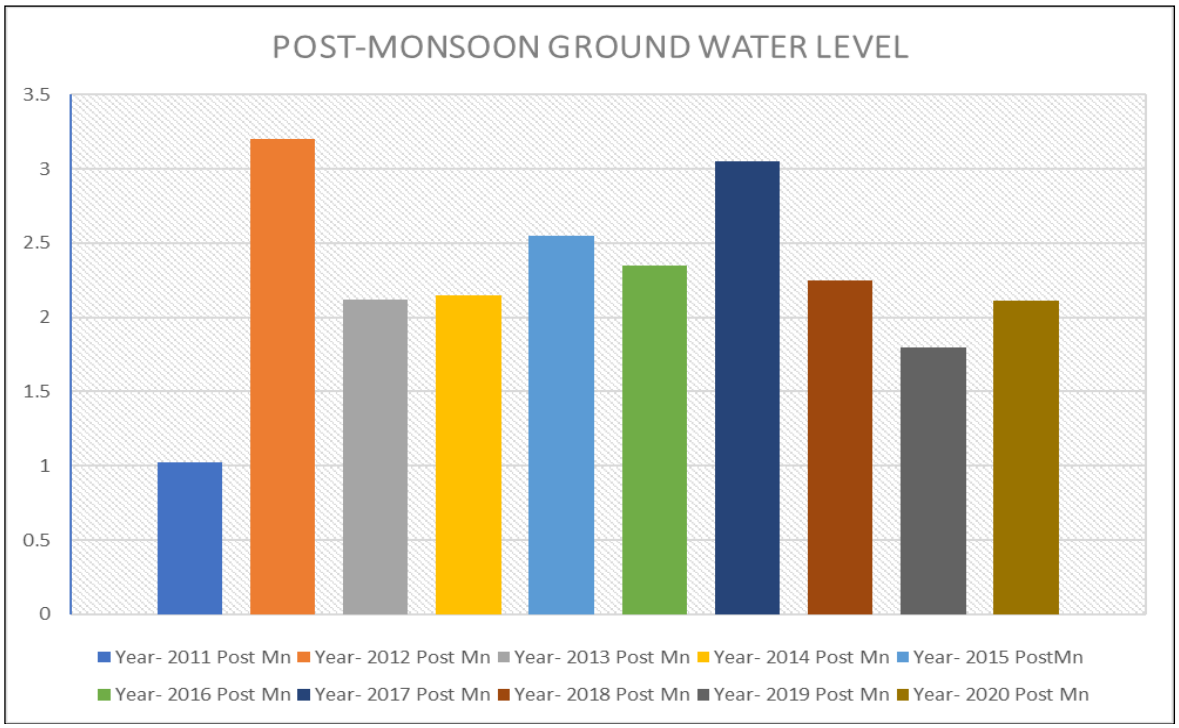


Fig No. 2.8 Hydrographs of Post Monsoon Ground Water Level

Table 2.5

Location of Tube well for Ground water level maps of Pre-Monsoon and Post monsoon

Code	Village	Latitude	Longitude	Pre-Monsoon	Post Monsoon	Elevation (m)	Direction from Project Site
		(In Decimal Degree)		(mbgl)			
TW1	Within project	27.348186°	82.318095°	3.65	2.85	102	-
TW2	Galibpur	27.364357°	82.315366°	3.5	2.9	104	1.34 km, N
TW3	Niranjan Pur	27.338766°	82.318326°	3.45	2.75	105	061 km, S
TW4	Kapauasher pur	27.348966°	82.348378°	3.25	2.15	105	2.57 km, E
TW5	Mahua Birahim	27.348071°	82.289715°	3.85	2.8	102	2.33 km, W
TW6	Chandarpur	27.371801°	82.346222°	3.2	2.25	108	3.40 km, NE
TW7	Sahdaiya	27.377617°	82.301425°	3.75	2.1	103	3.14 km, NW
TW8	Murao Dih	27.326837°	82.281957°	3.8	2.65	102	3.87 km, SW
TW9	Allah Nagar	27.329093°	82.337009°	3.4	2.5	104	2.25 km, SE

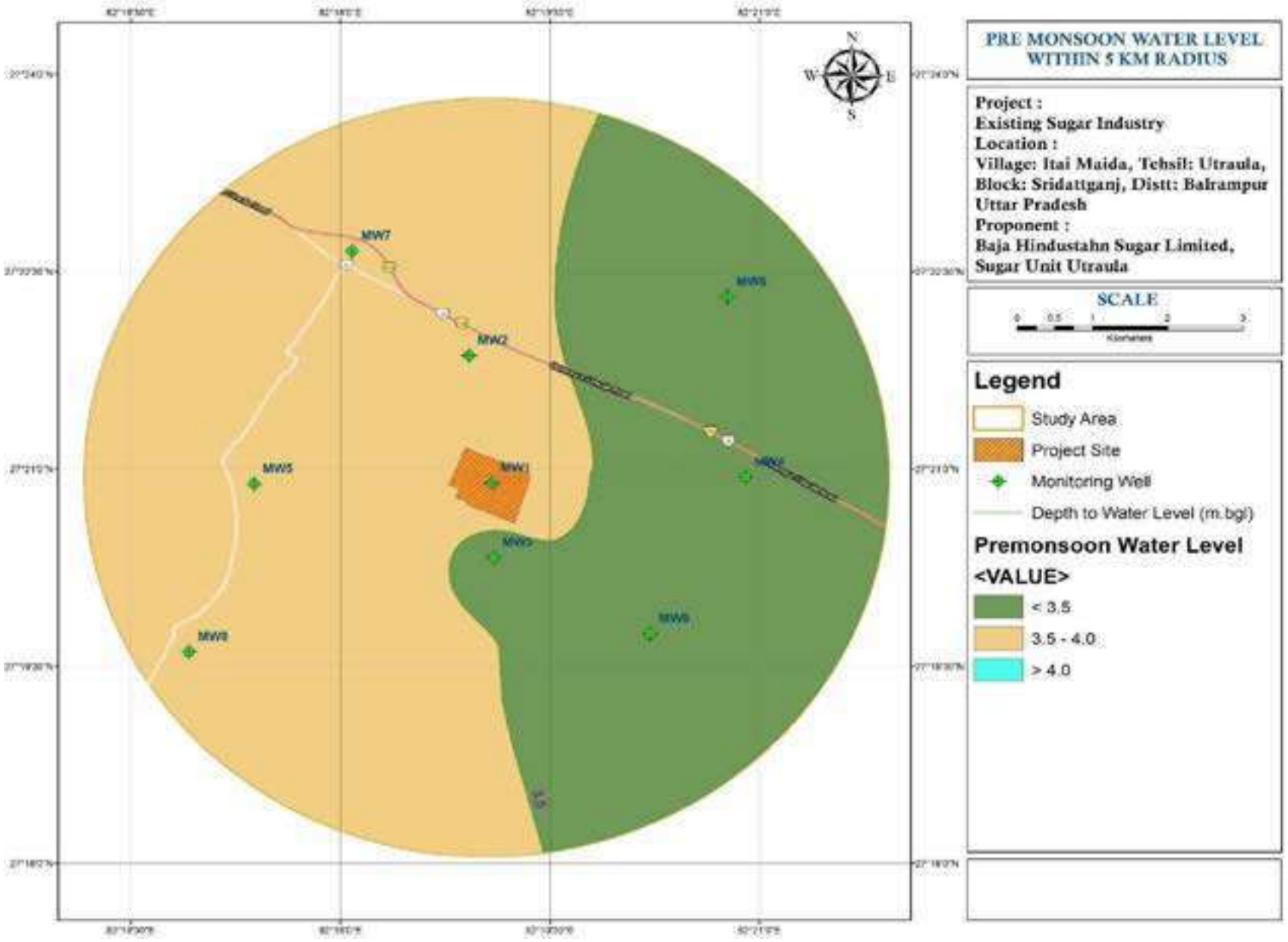


Figure No.: 2.9 Ground water level map Pre-Monsoon

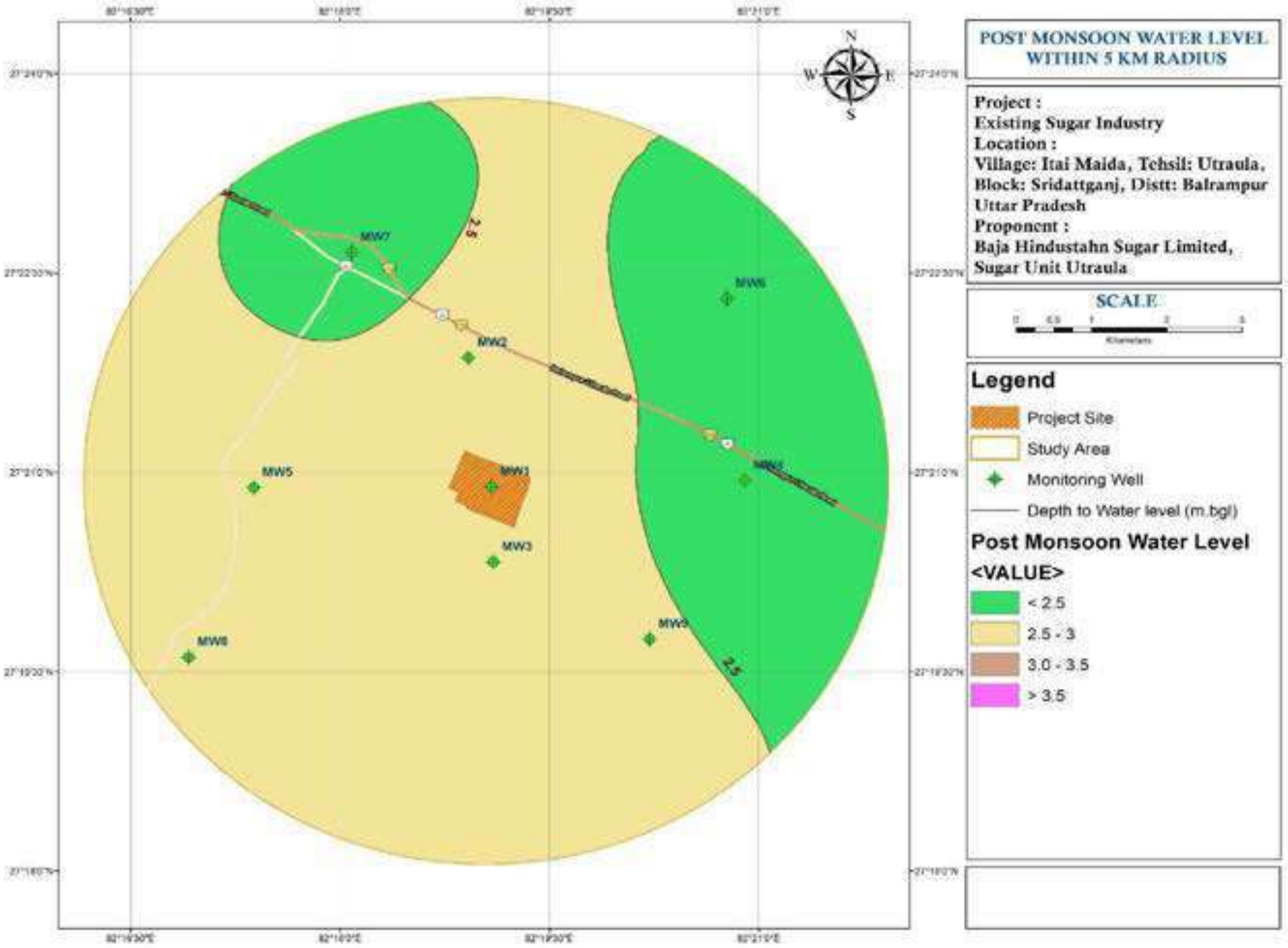


Figure No.: 2.10 Ground water level map Post monsoon

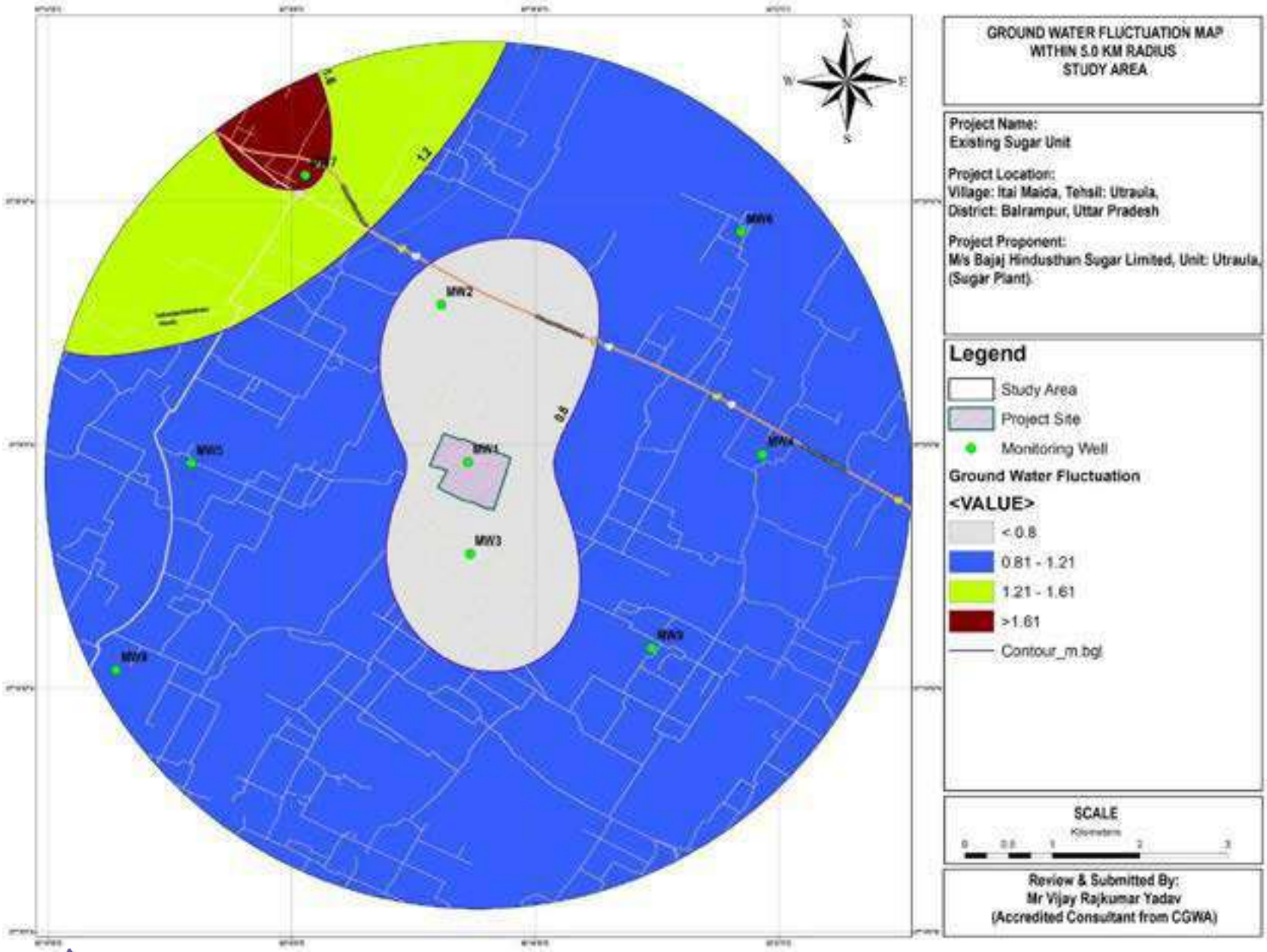


Figure No.: 2.11 Ground Water Fluctuation Map

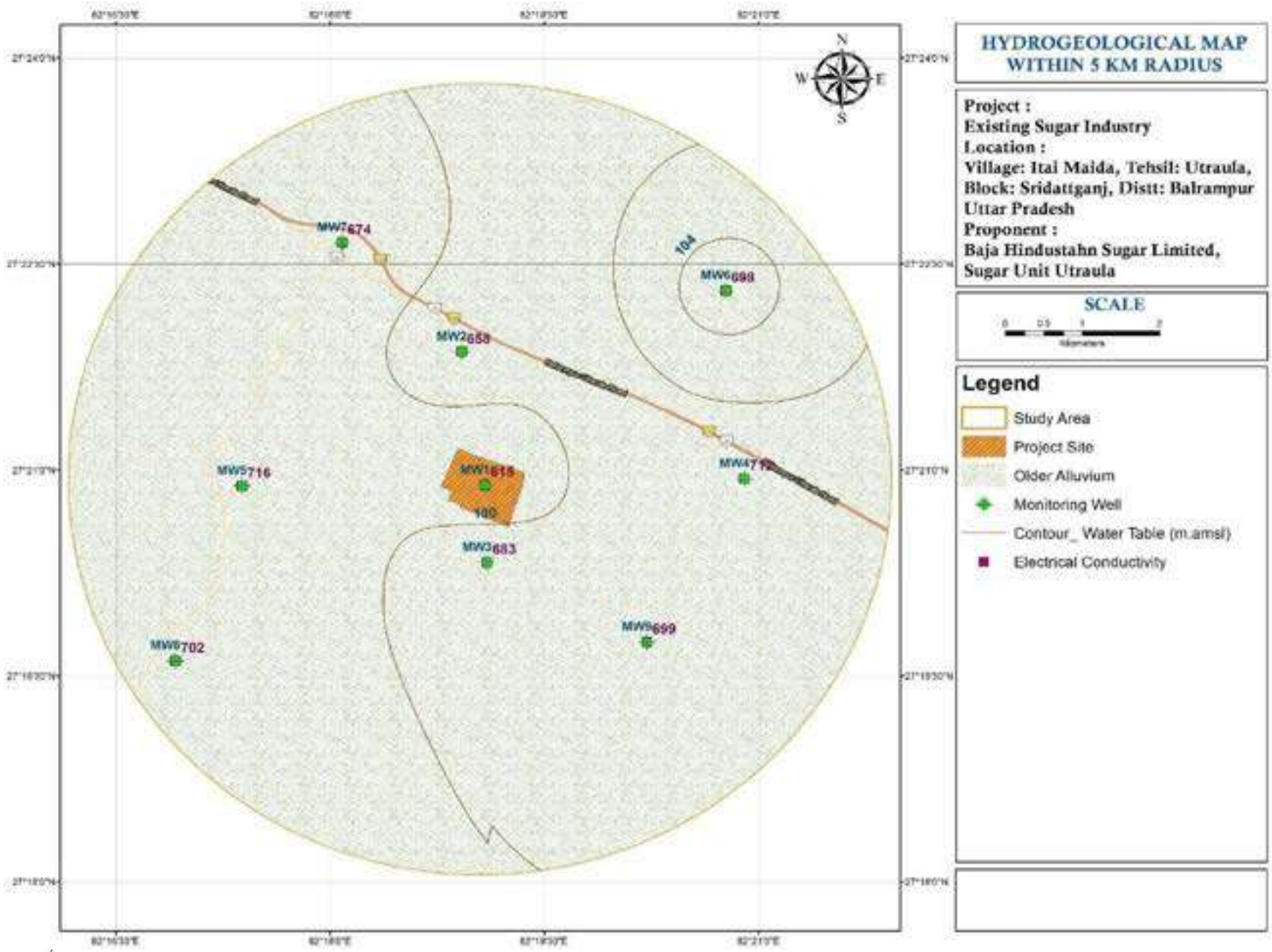


Figure No.: 2.12, Hydrogeological Map within 5 Km Study Area

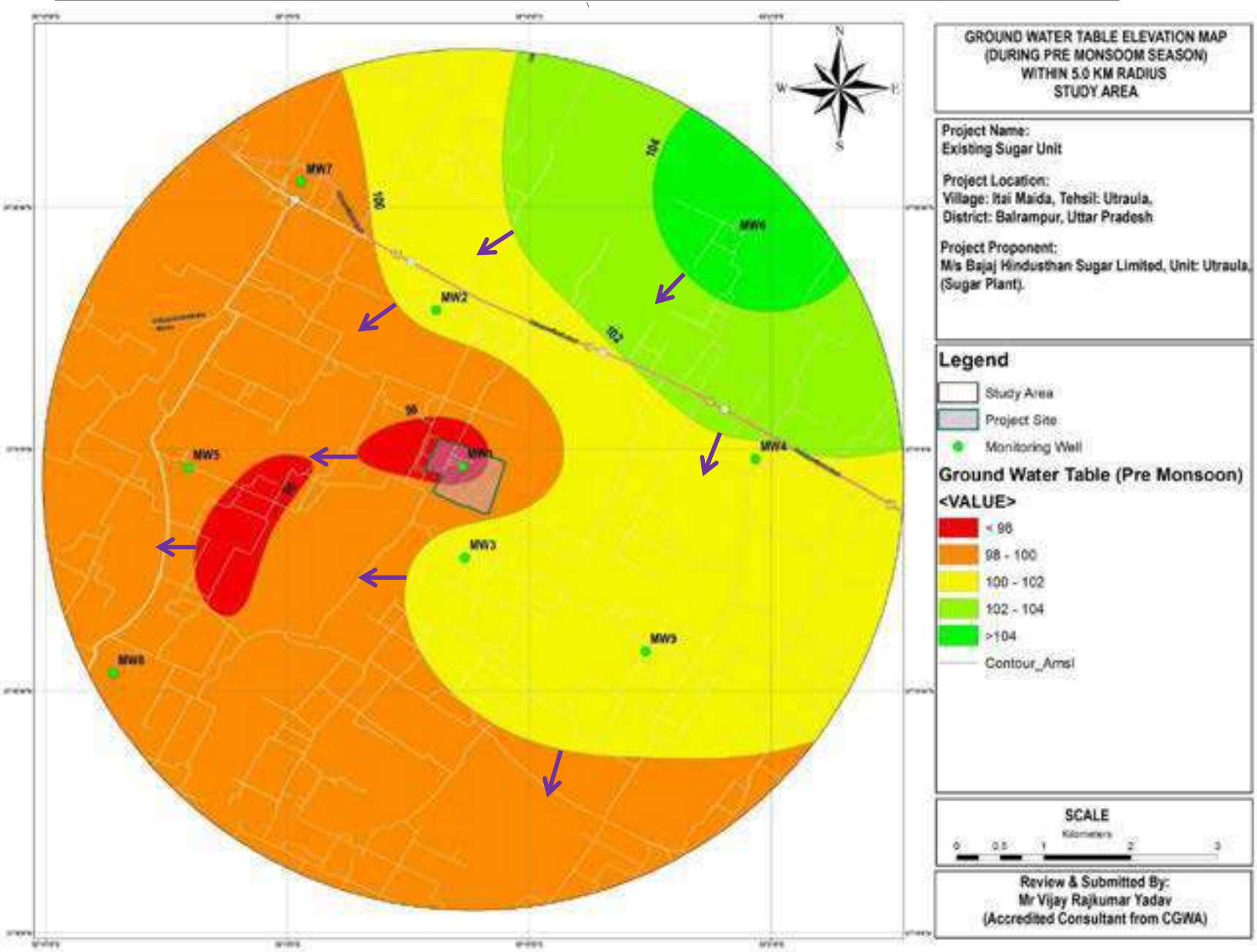


Figure No.: 2.13 (A) Water Table Flow Maps During Pre Monsoon within 5 Km Study Area

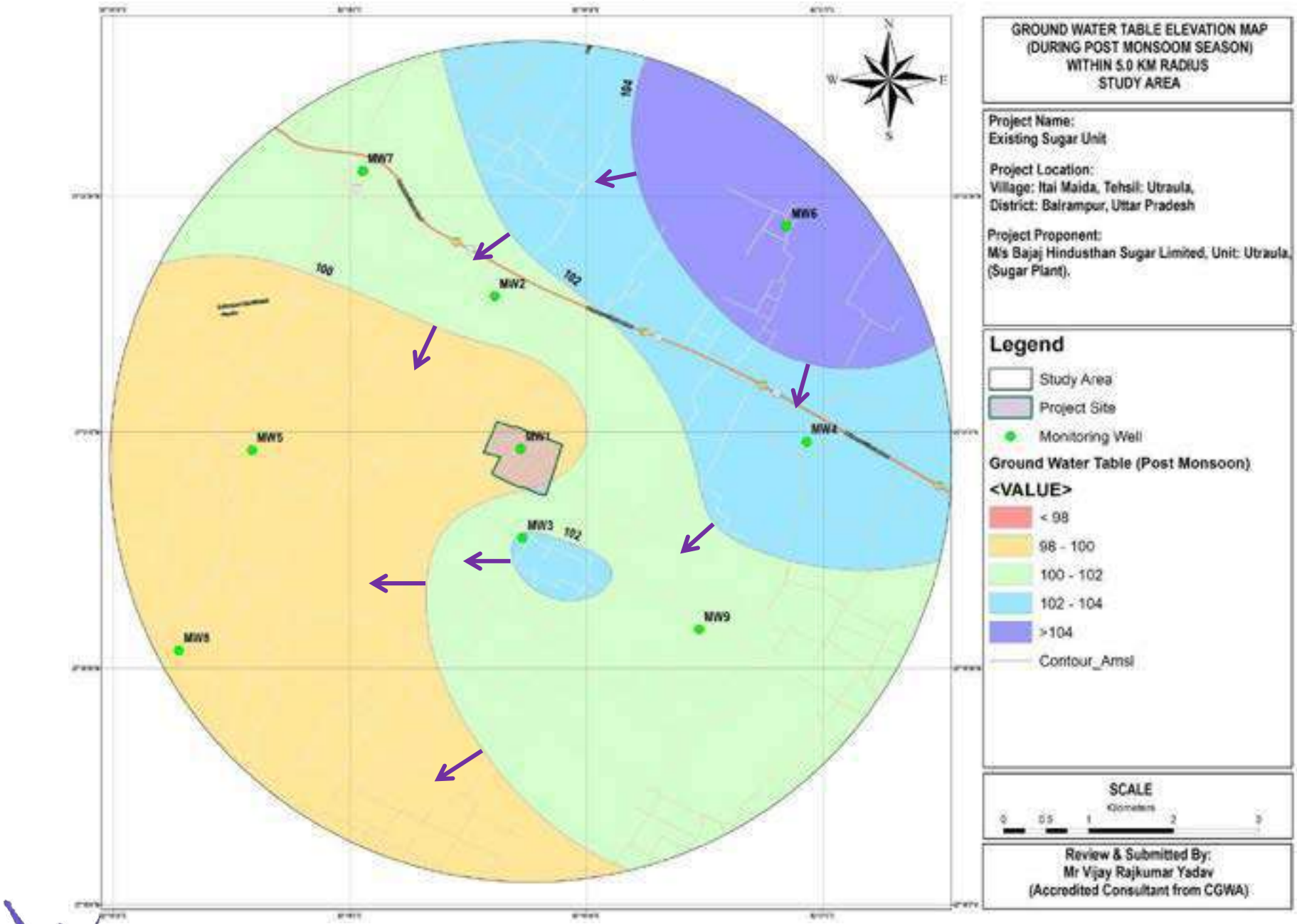


Figure No.: 2.13 (B) Water Table Flow Maps During Post Monsoon within 5 Km Study Area

2.6.3.1 Change in Water Table Elevation (Including Seasonal Fluctuation)

- **During Pre Monsoon:**

During pre-monsoon water table elevation will be 98 m amsl to 104 m amsl in the 5.0 Km radius of the project site and from 98 m amsl to 100 m amsl at the project site.

Ground water flow will be North East to South West direction during pre-monsoon.

- **During Post Monsoon**

During Post monsoon water table elevation will be 98 m amsl to 104 m amsl in the 5.0 Km radius study area and from 98 m amsl to 102 m amsl at the project site.

Ground water flow will be North East to South West direction during Post monsoon.

- **Seasonal Fluctuation in Water Table Elevation**

Seasonal fluctuation in water table is 2 m amsl from pre monsoon season to post monsoon season. There is no change in ground water flow direction due to abstraction of Ground water.

2.6.3.2 Base Flow within the study area

Base flow is a portion of the stream flow that is not runoff; it is **water from the ground, flowing into the channel over a long time and with a certain delay.** Runoff and base flow both increase eastward with precipitation but the increase is greater for runoff. As such, base flow index (BFI, baseflow/streamflow) decreases with increasing precipitation, potentially reflecting the limits of infiltration on recharge/runoff partitioning. Spatial patterns in variables that influence infiltration (land use and soil texture) also vary with precipitation, consistent with long-term influences of climate on landscapes. The watersheds included in our temporal analysis experienced small, mainly insignificant increases in precipitation and temperature and large, significant increases in irrigation. During this time, BFI increased significantly only in semi-arid, agriculture dominated catchments overlaying higher permeability deposits. These findings underscore the importance of watershed characteristics as controls on current spatial patterns in stream flow and BFI and also the sensitivity of stream flow and BFI to climate and land use changes over time.

Base flow study is not applicable for the M/s Bajaj Hindusthan Sugar Limited, Unit: Utraula Sugar Plant at Village: Itai Maida, Tehsil: Utraula, District: Balrampur, Uttar Pradesh because there is not any water cannel within study area. Hence, there is no change in base flow is found within study period

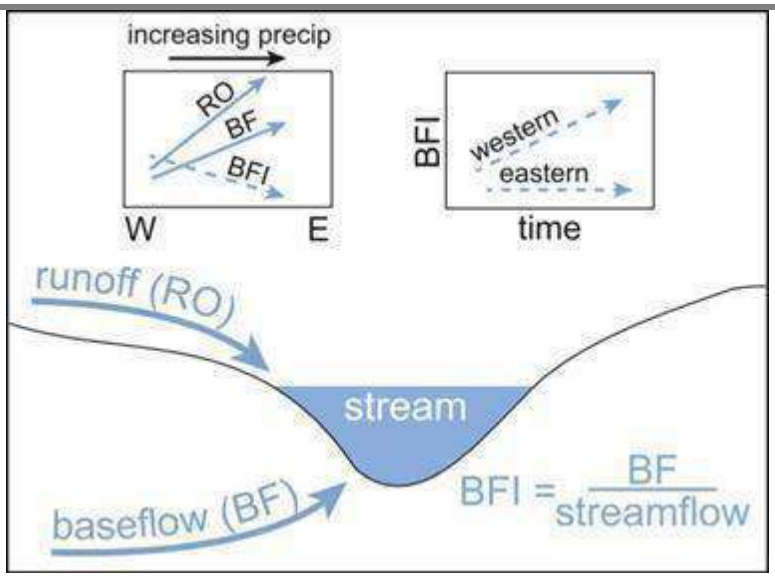


Fig: Showing Base flow

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 **2160 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 **324000 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.

2.7.1 GROUND WATER QUALITY

Table No 2.6: Ground Water Quality

Sr. No.	Test Parameter	Unit	GWQ-1 With Project	GWQ-2 Galibpur	GWQ-3 Niranjanpur	GWQ-4 Kapauasher pur	GWQ-5 Mahua Birahim	GWQ-6 Chandarpur	GWQ-7 Sahadaiya	GWQ8 Murao Dih	GWQ9 Allah Nagar	Indian Standard 10500 : 2012	
												Desirable	Permissible
						Physico-chemical Parameters							
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	-	7.5	7.6	7.5	7.4	7.5	7.4	7.4	7.4	7.5	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	615	658	683	712	716	698	674	702	699	-	-
6	Total Dissolved Solids (TDS)	mg/l	375.4	398.6	404.0	468.8	472.0	436.8	422.8	428.4	426.0	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	64.0	64.0	67.2	62.4	59.2	59.2	60.8	62.4	59.2	75	200
10	Magnesium as Mg	mg/l	34.50	32.0	23.32	33.0	32.0	33.04	25.27	30.13	25.27	30	100
11	Chloride as Cl	mg/l	42.0	32.23	38.0	34.0	42.0	38.0	38.0	36.0	46.24	250	1000
12	Fluoride as F	mg/l	0.39	0.41	0.39	0.43	0.36	0.38	0.38	0.44	0.43	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_2	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	62.4	BDL	BDL	BDL	BDL	BDL	0.001	0.002
16	Sulphate as SO_4	mg/l	24.14	39.76	44.12	42.47	46.20	26.34	42.24	30.12	274	200	400
17	Alkalinity as	mg/l	272.0	BDL	292.0	316.0	296.0	284.0	272.0	292.0	26.28	200	600

	$CaCO_3$			(0.015)									
18	Total Hardness as $CaCO_3$	mg/l	302.0	264.0	264.0	292.0	280.0	276.0	256.0	**280.0**	**274.0**	**200**	**600**
19	Aluminum 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**	**0.5**	**1.5**
22	Iron as Fe	mg/l	0.15	0.11	0.12	0.15	0.11	0.19	0.18	**0.17**	**0.19**	**0.3**	**No Relaxation**
23	Manganese as Mg	mg/l	0.06	0.04	0.03	0.04	0.05	0.04	0.06	**0.03**	**0.06**	**0.1**	**0.3**
24	Zinc as Zn	mg/l	1.08	0.97	1.19	1.02	0.98	1.12	1.23	**1.14**	**1.16**	**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	µg/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**	**0.05**
29	Arsenic as As	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	**BDL**	**BDL**	**0.01**	**0.05**
30	Total Chromium as Cr		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**	



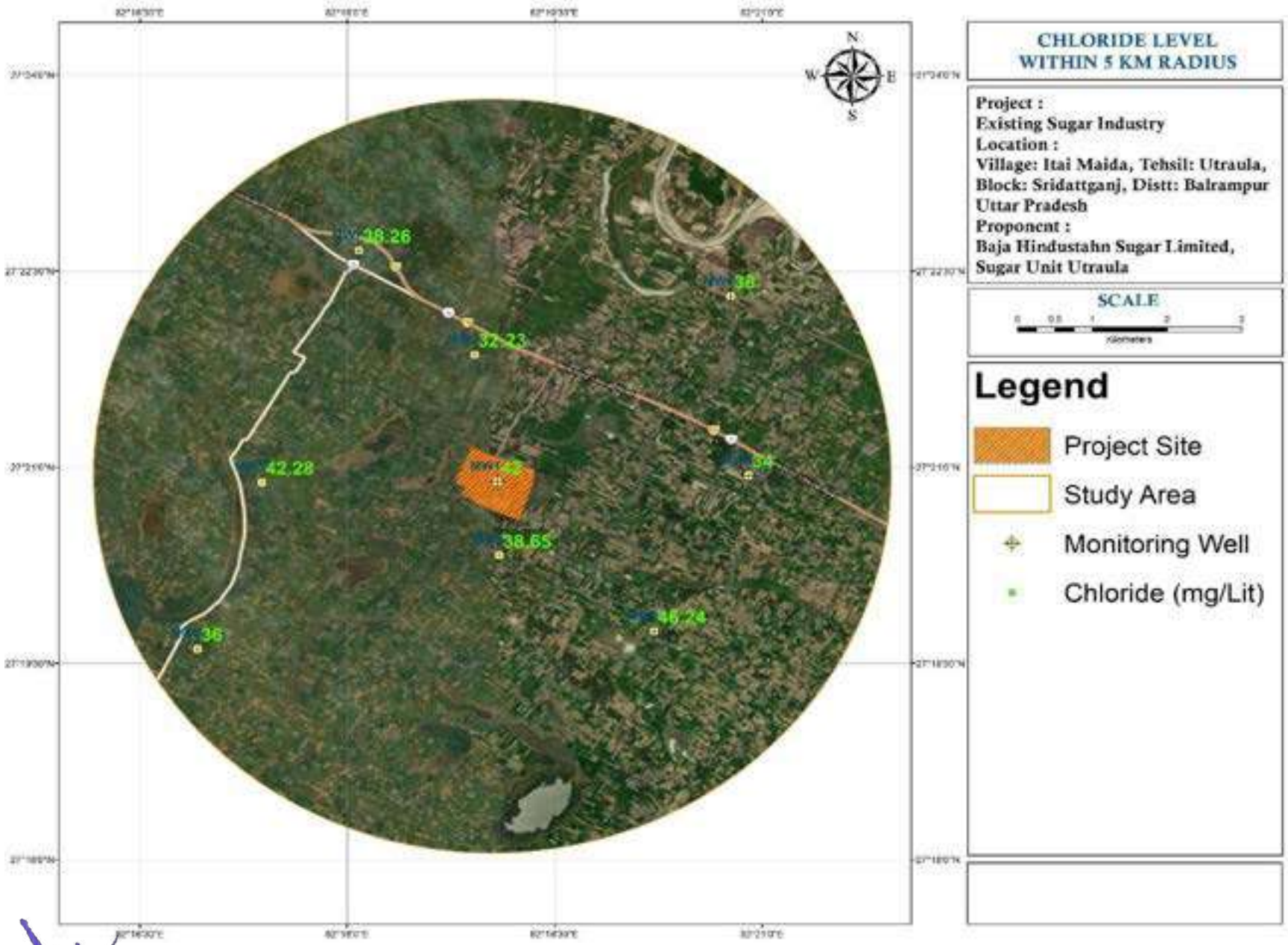


Figure No:2.13 Chloride Level map Within 5 km of Study Area

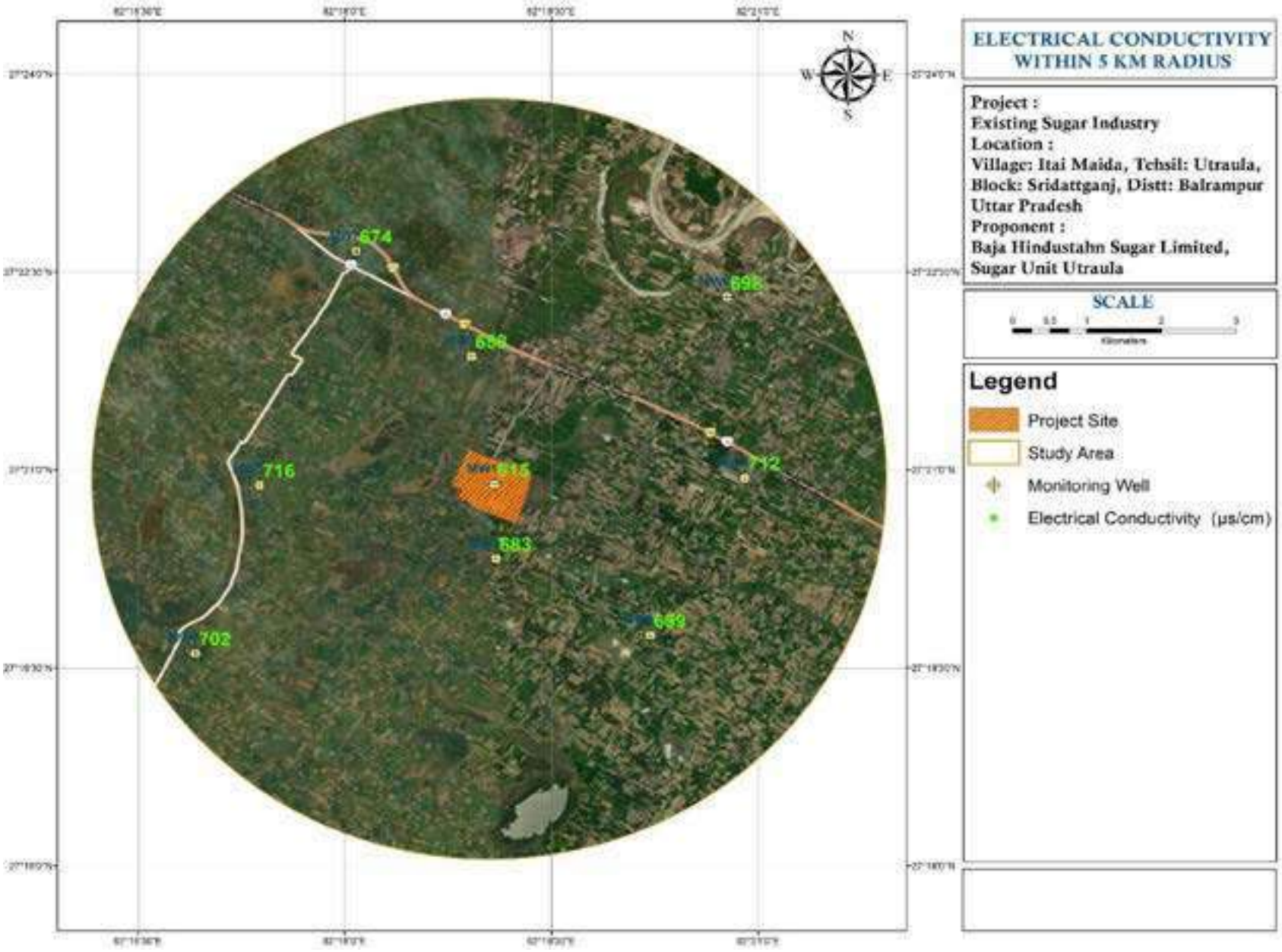


Figure No: 2.14 Electrical Conductivity Level Map Within 5 km of Study Area

2.7.2 WATER QUALITY OF NEARBY WATER BODIES

Table No. 2.7 Surface Water Quality

Sr. No.	Test Parameter	Unit	Rapti River	Suwana Nadi Upstream	Suwana Nadi Downstream	Chatra Tal	Pipra Tal	Sumraha Tal	Harha Tal	Maida Tal	Khamua Tal	Khajua Tal
1	pH	-	7.5	7.5	7.5	7.6	7.6	7.6	7.6	7.3	7.8	7.5
2	Turbidity	NTU	006	002	003	006	006	008	003	003	003	008
3	Electrical Conductivity	µs/cm	538.4	524.3	538.7	672.2	528.0	696.4	772.6	834.6	964.0	672.6
4	Total Hardness as $CaCO_3$	mg/l	204.0	192.0	204.0	196.0	192.0	192.0	224.0	216.0	228.0	180.
5	Alkalininity as $CaCO_3$	mg/l	212.0	208.0	212.0	212.0	208.0	216.0	272.0	224.0	252.0	192.0
6	Calcium as Ca	mg/l	46.4	41.6	41.6	43.2	44.8	51.2	43.2	44.88	46.4	38.4
7	Magnesium as Mg	mg/l	21.38	21.38	24.30	21.38	19.44	15.55	28.18	25.27	27.21	20.41
8	Chloride as Cl	mg/l	26.0	18.0	20.0	24.0	22.0	32.0	28.0	22.02	28.0	18.0
9	Fluoride as F	mg/l	0.35	0.35	0.35	0.42	0.37	0.46	0.73	0.70	0.44	0.43
10	Sulphate as SO_4	mg/l	20.6	14.56	15.05	18.2	18.2	36.2	24.33	23.52	30.6	14.2
11	Nitrate as NO_3	mg/l	9.65	5.58	5.65	8.6	8.28	7.6	15.69	16.82	12.4	5.6
12	Phosphate as P_2O_5	mg/l	4.16	1.22	1.16	2.82	4.32	6.45	2.55	2.36	2.24	2.55
13	Hexavalent Chromium as Cr^{6+}	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14	Total Kjeldahl Nitrogen	mg/l	4.65	4.65	465	5.12	4.65	422.6	7.36	3.46	5.68	5.36
15	Phenolic Compound (as C_6H_5OH)	mg/l	BDL	BDL	BDL	BDL	BDL	56.5	BDL	BDL	BDL	BDL
16	Total Dissolve Solid (TDS)	mg/l	330.4	318.6	322.2	396.2	4.65	4.9	425.2	531.2	548.4	412.2
17	Total Suspended Solid (TSS)	mg/l	88.2	5.36	58.8	66.2	BDL	8.6	81.5	63.4	62.4	51.5
18	Dissolve Oxygen	mg/l	5.4	5.2	5.1	5.0	320.5	32.0	4.1	4.7	4.4	4.8

19	Biochemical Oxygen Demand	mg/l	2.2	2.2	2.4	10.6	72.2	40.2	10.2	12.4	4.2	10.2
20	Chemical Oxygen Demand	mg/l	16.0	8.0	12.0	40.0	5.3	5.1	68.0	48.4	36.0	36.0
21	Sodium as Na	mg/l	36.2	42.0	38.9	42.6	7.4	BDL	48.6	42.8	48.4	48.6
22	Potassium as K	mg/l	5.8	5.2	5.3	5.1	24.0	BDL	6.2	5.8	6.1	5.0
23	Aluminium as Al	mg/l	BDL	BDL	BDL	BDL	38.0	0.28	BDL	BDL	BDL	BDL
24	Boron as B	mg/l	BDL	BDL	BDL	BDL	6.1	BDL	BDL	BDL	BDL	BDL
25	Iron as Fe	mg/l	0.18	0.13	0.14	0.32	BDL	BDL	0.25	0.27	0.24	0.25
26	Manganese as Mn	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.11	BDL	BDL
27	Lead as Pb	mg/l	BDL	BDL	BDL	BDL	0.15	BDL	BDL	BDL	BDL	BDL
28	Nickel as	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29	Cadmium as Cd	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30	Total Chromium as Cr	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
31	Copper as Cu	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
32	Zinc as Zn	mg/l	0.82	1.14	0.98	0.76	1.26	0.66	1.69	1.27	1.40	1.69
33	Arsenic as As	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
34	Mercury as Hg	µg/l	BDL	BDL	BDL	BDL	BDL	BDL	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 7.6
- Total Hardness varies from 256 to 302 mg/l
- Chloride varies from 34 to 46.24 mg/l
- Fluoride varies from 0.36 to 0.44 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 7.5 to 7.8 showing good productivity of water. The Dissolved oxygen content varied from 4.1 to 320 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 (5.36 to 88.2 mg/l) were fair in all water bodies. The values of BOD (2.2 to 72.2 mg/l) and COD (8 to 68 mg/l) were also low indicating very marginal pollution of surface water samples. The values of conductivity ranges from 524.3 to 964.0 µs/cm which is satisfactory due o the presence of ions in the water bodies.

2.7.5 Impact on Water Quality (Ground & Surface Water)

2.7.5.1 Impact on Ground water quality

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. Due to the abstraction of water and rain water recharge from this project will not impact the Ground Water Quality, Hence there will be not impact on Ground Water Quality of the area.

2.7.5.2 Impact on Surface Water Quality

All surface water quality complies with class D,E and suitable for fisheries, irrigation, cooling and industrial use. It cannot be used for drinking and bathing purpose without treatment. Due to the abstraction of water and rain water recharge from this project will not impact the Surface Water Quality, Hence there will be not impact on Surface Water Quality of the area.

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

3.1 DETAIL OF THE TUBE WELLS/BOREWELLS

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

Table No. 3.1 Details of the existing Borewells

Sr. No.	Type of Structure-Date	Depth (m)	Depth to Water Level (mbgl)	Discharge (m^3 /Hr)	Operational Hrs. (Day)	Mode of Lift	Pump Capacity (HP)	Coordinates	Flow meter installed (Yes/No)
1	Borewell 01/06/2010	110	3 - 2	180	5.0	Submersible	50	27.348648 ° N 82.319570 ° E	Yes
2	Borewell 01/06/2010	110	3 - 2	180	4.0	Submersible	50	27.348517 ° N 82.318077 ° E	Yes
3	Borewell 01/06/2010	110	3 - 2	180	3.0	Submersible	50	27.347084 ° N 82.317644 ° E	Yes
Log book is available with each borewells.									

3.2 PIEZOMETER NUMBER AND COORDINATES

Number of Piezometer	Coordinates
Piezometer-1	Lat: 27°20'54.9"N Long: 82°19'09.8"E
Piezometer-2	Lat: 27°20'53.5"N Long: 82°18'47.0"E

3.2.1 PIEZOMETER PHOTOGRAPHS



Figure No: 3.1 Piezometer-1



Figure No: 3.2 Piezometer-2

3.3 WATER REQUIREMENT & ITS UTILIZATION

Existing Industrial fresh water requirement is 2120 KLD. Domestic water requirement is 40 KLD. Hence total fresh water requirement is 2160 KLD, which will be sourced from ground water.

Table No.: 3.2
Breakup of Fresh Water Requirement

S.No	Particulars	Water Requirement (KLD)
1.	**Sugar Operation**	2120
2.	**Domestic Activates**	40
	Total	2160

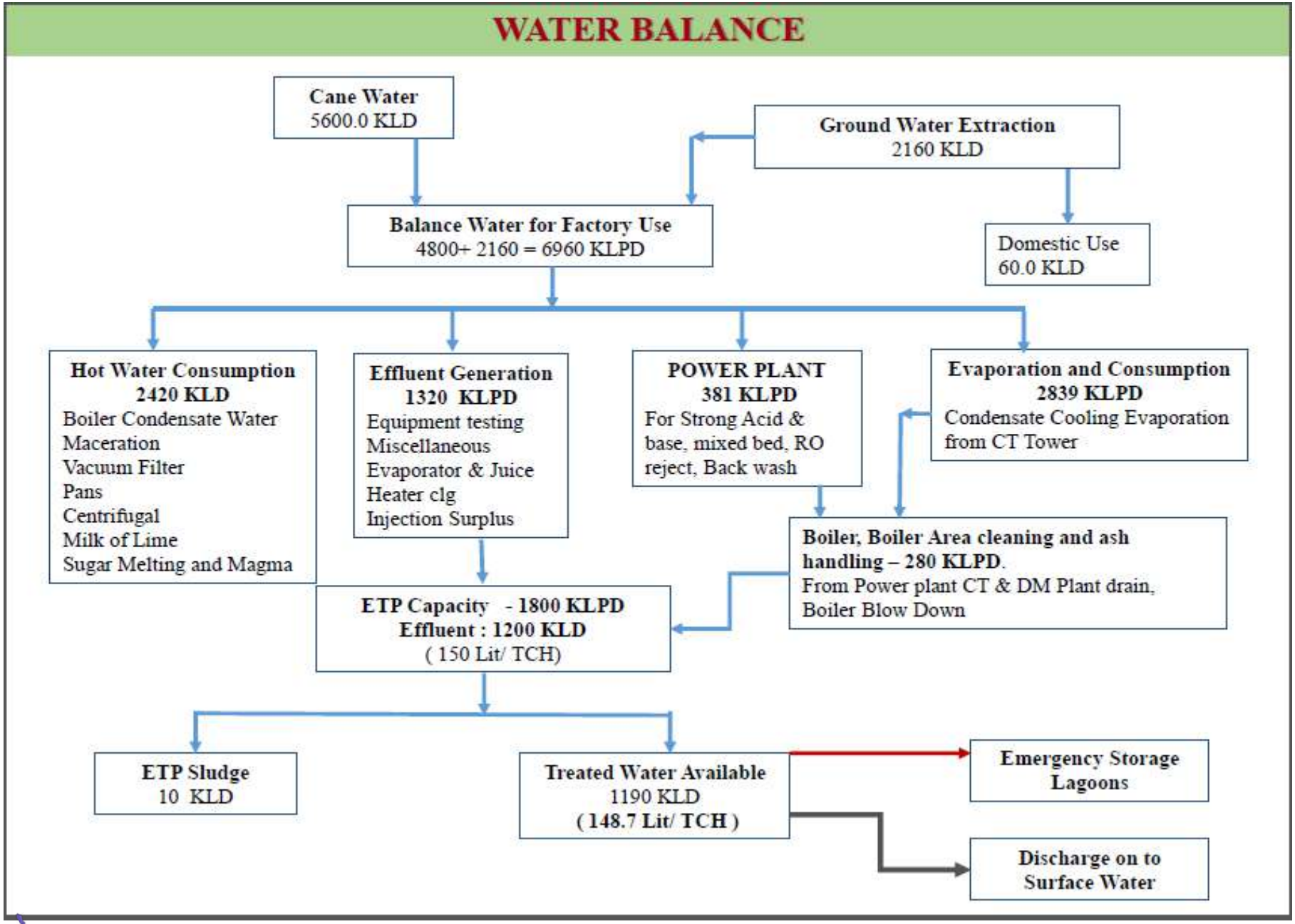


Fig No. 3.1 Flow Chart for Water Requirement

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. Bajaj Hindusthan Sugar Limited, Unit: Utraula Located at Village: Itai Maida, Block: Sriduttaganj, Tehsil: Utraula, District: Balrampur, Uttar Pradesh. Total 33 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	7871
2.	Total Population	53427
3.	Total Male Population	26978
4.	Total Female Population	26449
5.	Population (Age 0-6 years)	9629
6.	Total SC Population	6561
7.	Total Literates	23993

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.	Gulariha	402	2770	1469	1301	505	704	1128
2.	Aadampur	43	244	132	112	42	0	116
3.	Dhorahri	29	210	106	104	41	59	82
4.	Padari Raikwar	147	1045	527	518	188	114	451
5.	Dhowadaber	364	2698	1397	1301	528	383	997
6.	Itai Maida	212	1696	893	803	276	120	835
7.	Mahua Ibrahim	269	1647	808	839	288	151	830
8.	Galibpur	176	1248	665	583	242	244	608
9.	Sahdeia	506	3325	1696	1629	517	46	1927
10.	Chawai Khurd	91	680	352	328	97	90	419
11.	Chawai Bujurg	223	1863	960	903	310	140	622
12.	Chandapur	291	2119	1043	1076	365	84	1080
13.	Mastijot	78	586	248	338	99	84	311
14.	Kayamjot	90	660	319	341	134	206	268
15.	Dari Chaura	162	966	504	462	198	180	555
16.	Jagdeva	183	1264	625	639	287	26	391
17.	Chamaroopur	702	5081	2510	2571	882	212	2545
18.	Ahiraula Nagawa	130	888	432	456	151	75	440
19.	Pipraramchander	417	2662	1186	1476	454	206	1258
20.	Niranjanpur	161	991	471	520	208	45	345
21.	Allah Nager	208	1092	588	504	223	756	358
22.	Padrauna	338	2250	1220	1030	469	171	778
23.	Kewalpur	57	362	189	173	60	16	72

S. No	Name of Village	Household	Total Population	Total Male Population	Total Female Population	Population (Age 0-6 years)	Total SC Population	Total Literates
24.	Deoria	303	1896	989	907	334	398	832
25.	Sekhuiya	235	1461	757	704	306	384	553
26.	Chulahbhari	286	1905	1003	902	352	482	677
27.	Pandari	468	2999	1592	1407	538	658	1159
28.	Pipri Kolhai	723	4785	2295	2490	813	297	2622
29.	Kapauasherpur	356	2639	1324	1315	473	106	1211
30.	Bhogajot	75	484	236	248	91	100	268
31.	Terahwa Chuhchuia	8	46	26	20	9	0	25
32.	Rajgarh	24	127	61	66	21	15	44
33.	Tendui	114	738	355	383	128	9	186
Total		**7871**	**53427**	**26978**	**26449**	**9629**	**6561**	**23993**

- Total Number of households is about 7871.
- Total population of villages within the 5 km study area is 53427 out of which males are 26978 and Females are 26449.
- Sex ratio in the study area is 980.
- Out of the total population, the population of children within the age 0-6 age-group is about 9629 (18.02 %).
- Scheduled caste population is 6561 (12.28 %).
- Out of the total population in the study area is 23993 i.e 44.90 % are literates.

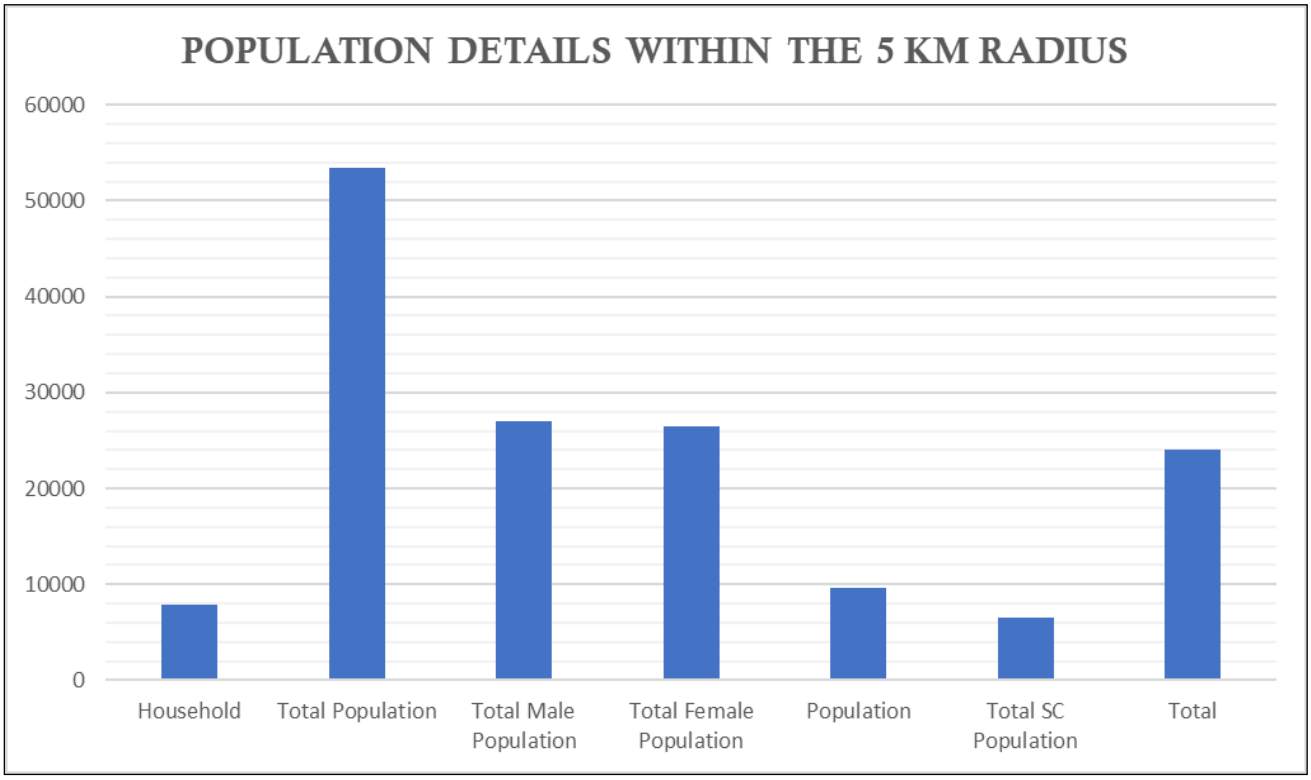


Fig No.: 4.1 - Population Details in the study area

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
SRIDUTTAGANJ	33	45	96	63	43	70	91	47	48	27	112

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
Sriduttaganj	0	0	0	33	25

4.4 INDUSTRY WITHIN THE 5.0 K RADIUS OF THE PROJECT SITE

• M/s Bajaj Hindusthan Sugar Limited, Unit Sugar	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 2160 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.

4.1.6 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 55.63% and Sridattganj block falls under Safe stage.
- The entire Balrampur district is under lain by sands of various grades, gravels, silt and clay. The study of all available lithological logs of the tubewells and lower boring in the area, hand pump and other in the area reveals the configuration of alluvial sediments showing quick alteration from finer to coarser lithology.
- 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 fresh water requirement is 2160 KLD is sourced from three 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 968 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.	Rooftop Area	20224	0.85	0.968	16640.30
	Total	**20224**			**16640.00**

From the above computation, it is evident that a total quantum of 16640 cum/year of rain water can be fruitfully harvested & recharged from plant premises annually by constructing suitable recharge structures against the mandatory requirement of 162000.0 Cum/year. In order to design the recharge structures, hourly runoff of 35 mm/hr has been taken into account and the details are tabulated below.

Hourly Computation of Runoff – (35 mm/hr)

S.No	Land use type	Area (sqm)	Coefficient of runoff	Intensity of Rainfall (m)	Quantity of Rainwater (cub m)
2.	Rooftop Area	20224	0.85	0.035	601.66
	Total	**20224**			**601.66**

Structure Calculation:

STRUCTURE CALCULATION:

Thus, the total rainwater harvesting capacity of roof top area of the industry is about 601.66 Cu.mts per hour.

Assuming retention time of 0.25 hour in the recharge pit, the design volume for the recharge pit is 601.66/4 = 150 m3

Let us provide recharge pit of 3 m × 3 m in size and 3.5 depth.

Volume of one pit = 31.5 m3

Capacity of One Bore well recharge: 30 Cubic meter

Average Recharge Capacity of Pit with two well = 31.5 + 30 + 30 = 91.5

Required no. of pits = 150/ 91.5 = 1.63 (02 appx.)

Proponent shall provide 02 nos. recharge pits each of 3 m × 3 m × 3.5 m in size at peak rainfall intensity of 30 mm.

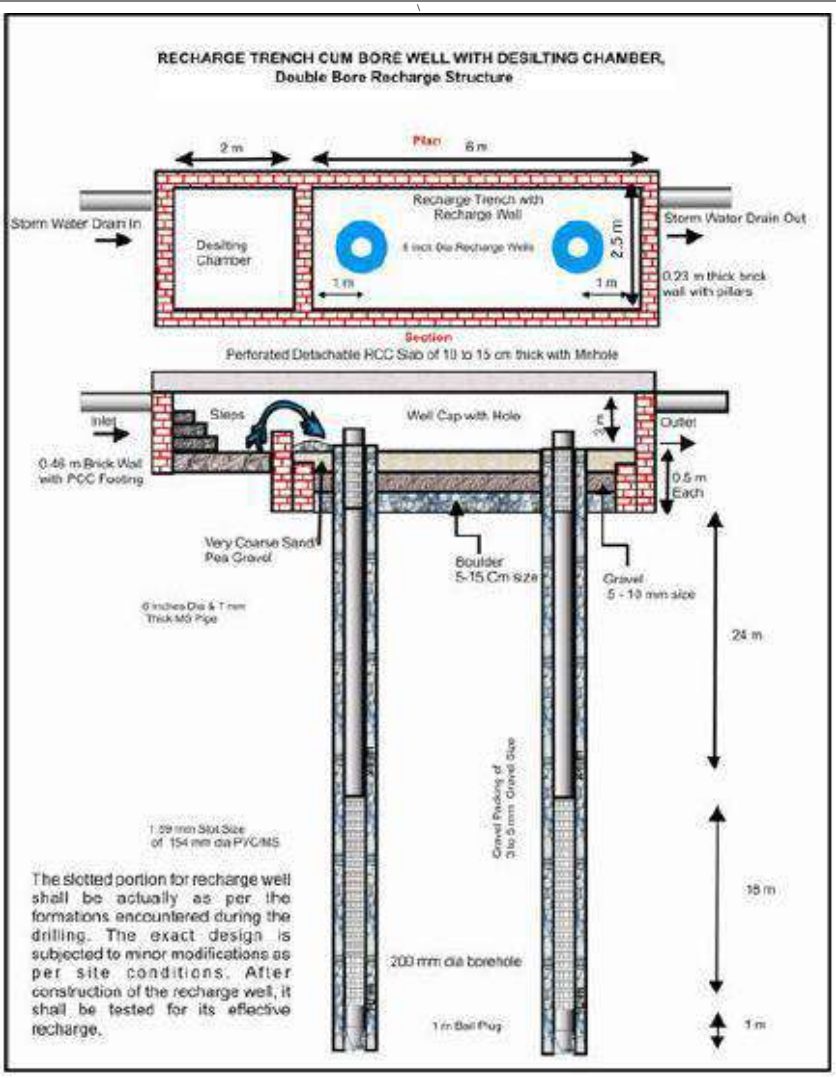


Fig No.: 4.2 Proposed designs of Double Bore Recharge structure

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 16640 cub m per year against the withdrawal of 324000 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 Sriduttaganj 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:

The industry has adopted 1 pond near the industrial complex in order to recharge the rain water. These village ponds are 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 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 areas will result into rise in water levels in the village tube-wells as wells and increase the supply of water to the lands adjacent for irrigation purposes. Thus, recharge schemes in the ponds will benefit the area

Table No 4.5, Recharge calculation in ponds

Type	Village Name	Gata No.	Area (in Sqm)	Depth of Ponds (M)	Total Storage Capacity m^3
Pond I	Puraina Vaajid	554	52990	2.0	105980
Grand Total			**52990**	**2.0**	**105980**

4.6.1.3 Pond Recharge Calculations:

POND I:

Now, total storage capacity of pond from above computation is about 105980 m3.

In approximation, in a year 3 filling will occur

Hence, 105980 X 3 = 317940 m3

Out of 317940m3 we take 60 % filling on safer side.

So, the total will be about 190764 m3 (recharge available for@ 60% of total run off generated in a year.)

4.6.1.4 Through Ponds of Village Puraina Vaajid:

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 has adopted 1 pond located in village: Puraina Vaajid 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 fulfil the mandatory requirements as per guidelines of Ministry.

Total pond area is 5.299-hectare i.e 52990 m2.

Table No 4.6 Recharge calculation in ponds

Sr No	Area (in Hectare)	Area (m2)	Depth in meter after Desilting	Total Storage Capacity	60%	No of Filling	Quantity of water to be recharge	No of Recharge structure (@15M^3/Hr)
1	5.299	52990	2.0	105980	63588	3	190764	10 Nos

From pond total water available recharge will be 190764 m3.

The total amount of recharge including both within premises and outside the premise will be 207404 m3 (within premises + pond outside the premises) in a year and withdrawal will be 324000 m3 per year (2160 M3 x 150 days).

Existing industry is situated in safe block Sriduttaganj of district Balrampur as per Ground water dynamic 2020, hence we will have to recharge 50% of total withdrawal annually.

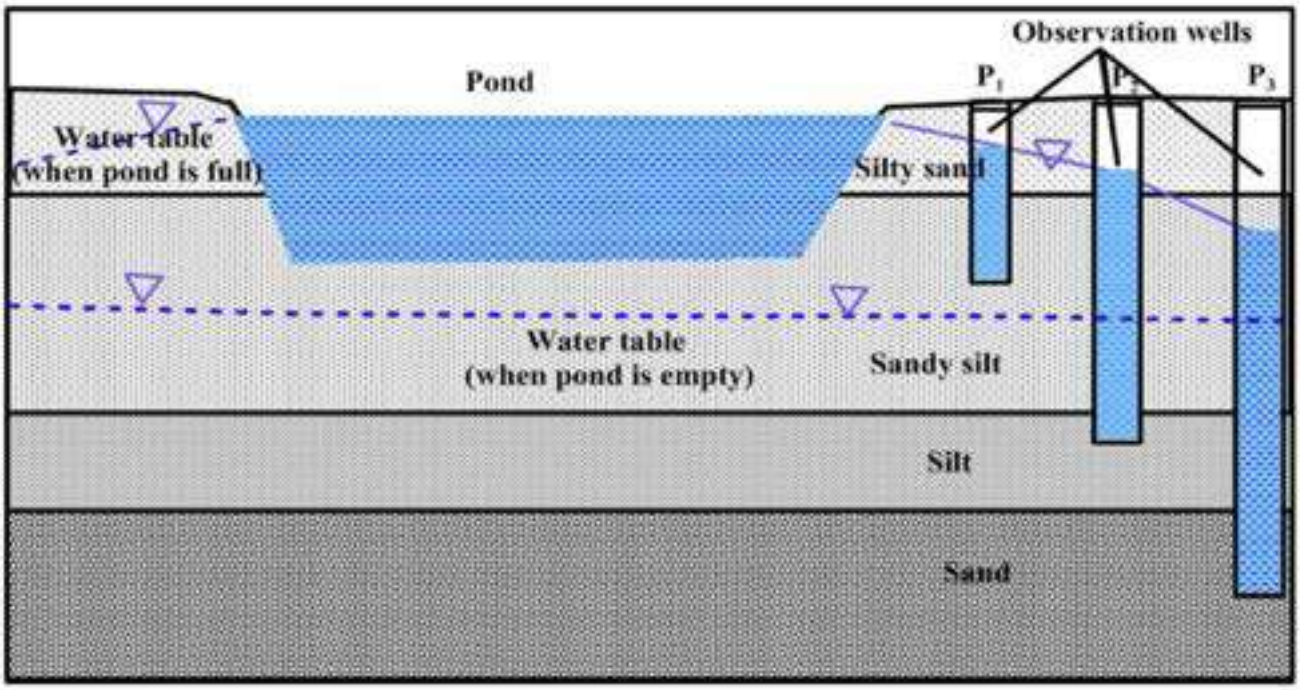
As per CGWA guidelines total amount of rainwater to recharge for the withdrawal of 324000 m3/Annum is 162000 m3/Annum (50% of 324000 m3/annum).

Against requirement of 162000 m3/annum, the company will recharge 207404 m3/annum through 10 no. of recharge structures, which is more than 50 %.

Table No 4.6
Recharge Summary

Total Fresh Water Requirement for Sugar project	2160 KLD/324000 cum/year
Source of water for plant activates	Ground Water
RHW potential /Artificial recharge required	Maximum up to 50 % recharge Criteria (safe Zone) 162000 cum/year
Total artificial rainwater recharge inside the plant	16640 cum/year
Total artificial rainwater recharge outside the plant	190764 cum/year
Total recharge	207404 cum/year

SCHEMATIC DIAGRAM OF POND RECHARGE TO BE CONSTRUCTED IN VILLAGE DEORIA AND BISHUNIPUR



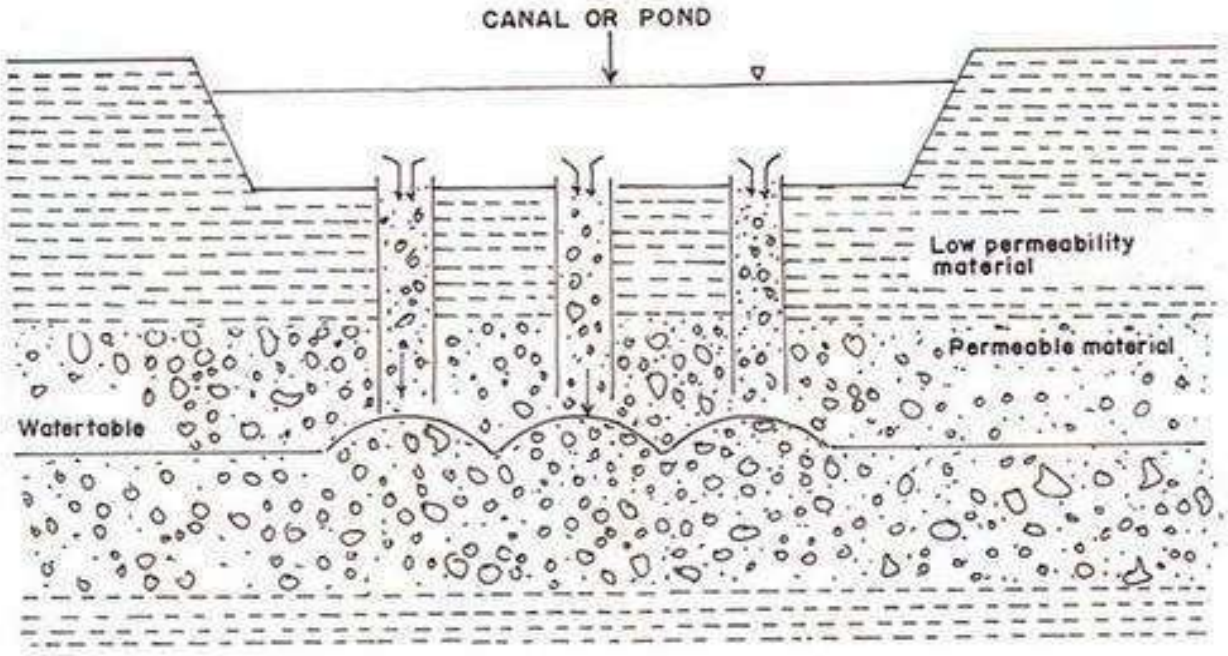


Fig No. 4.3 Cross Section of Pond
Recharge Shaft Cross Section

4.7 DYNAMIC GROUND WATER RESOURCES

With increasing population and development activities in Balrampur district, block: Sriduttaganj 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 91.74 % of this resource can be utilized for irrigation purpose leaving 8.25 % 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 2017 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 Utraula administrative Block: Sridattganj, Tehsil: Utraula, District: Balrampur. As per the reported data, (Report on Dynamic Ground Water Resources of Uttar Pradesh, CGWB, 2020) a summarized Ground Water Potential of Sriduttaganj block, Balrampur district is as follows: Net Annual Ground Water Availability (Ham)	7898.438 ham
Gross Ground Water Draft for All Uses (Ham)	434.982
Stage of G.W. Development (%)	55.631 %
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 55.631 % and it is in safe category. The total replenish able ground water resource in the district is 8776.034 ham, of which the total existing ground water draft by all means is 434.982 Ham. The net utilizable ground water resources for future irrigation development are – 3959.000 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 rain water 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 WASTE WATER TREATMENT

Industry has already installed biological treatment having adequate capacity as per norms. A conventional mode of Activated Sludge Process is incorporated.

Technology and Process Description

- Weighing of sugar cane.
- Crushing of sugar cane.
- Juice clarification (Double Sulphitation).
- Evaporation & boiling.
- Crystallzation**.**
- 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 carrier #1 is 1980 mm wide having 34.5 m length between sprocket centres. The horizontal loading is 25 m and vertical depth at horizontal portion of carrier is 1350mm. Inclination is 11°. Chain in having 150 mm pitch with 40 t breaking load. Driving power is

37.5kW, 1220 rpm dyno drive with gearbox and one stage open gearing. No change has been proposed in cane carrier #1.

The main carrier #2 is 1980 mm wide having 44.5 m length between sprocket centres. The horizontal loading is 21 m and vertical depth at horizontal portion of carrier is 1350 mm. Inclination is 9°. Chain in having 150 mm pitch with strands with 60 t breaking load. Drive power is 75kW, 1440 rpm vfd with gearbox and one stage open gearing.

Modify cane carrier to accommodate increased mill centre distance. Reduce length of cane carrier (approximate by 10 – 12 m) as per layout.

In secondary cane carrier further modification will be done like rake elevator to accommodate mill centre distance of 10 m between mill # 1 & 2. Inclination changed to 39 degree. Tail boot of rake elevator is lowered by 500 mm approximately and relocate existing rake elevator since head end of cane carrier is shifted by 10 – 12 m. inclination of rake elevator will be 44°.

- **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 donnelly chutes to enable maximum extraction of juice from the cane. Imbibition 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**

The juice extracted from the first two mills after screening through rotary drum screen and measured through mass flow meter is passed through vertical high velocity tubular multipass juice heaters heated by vapour from evaporator bodies where the temperature is raised to about 70ºC.

The Juice after primary heating is treated with milk of lime and sulphur dioxide gas in a simultaneous and continuous liming and sulphitation vessel to achieve a pH level of about 7.4.

Automatic juice stabilization provision and auto pH control provisions will be installed for precise and continuous control of clarification process to ensure efficiency. The treated juice will be further heated to 102 ºC, in another set of juice heaters by bled vapors from evaporators

and exhaust steam if required. This is to enable efficient coagulation of precipitates and faster settling.

The heated juice at 102 C° is sent to a continuous settler or sedimentation vessel known as clarified of 10.91 m diameter divided into four equal compartments superimposed one over the other.

Clear juice and thick precipitate known as muddy juice continuously flow out of the top and bottom respectively of all the four compartments. While the clear juice will be taken to the evaporators through clear juice heater, the muddy juice will be taken to the rotary drum vacuum filter. The muddy juice is mixed with fine bagacillo particles obtained by screening from the bagasse elevator to give the required porosity to the muddy juice and the entrapped juice is filtered through screens of the vacuum filter and the collected juice is treated separately. The solids that sticks to the external surface of the filter drum is also washed by hot water spray and drips to minimize the loss of sugar through the cake. The cake sticking to the external surface of the drum will be scrapped and taken through a belt conveyor which will be used for the production of bio-compost manure.

The juice from the vacuum filters will be further processed in a separate filtrate clarified by phosphatation process and the clear juice will be re-circulated to the clarified.

- **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. etc. Considering limitation for exhaust pressure availability at evaporator set, it is proposed to follow the existing Double Effect Vapour Cell + Quadrule Evaporator Configuration (Devc + Quad), to achievable the maximum possible steam economy by utilizing existing equipment and addition of minimum possible new equipment.

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.

- **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 massescuite. 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. Flow diagram of Sugar industry process is enclosed at Fig : 2.6.

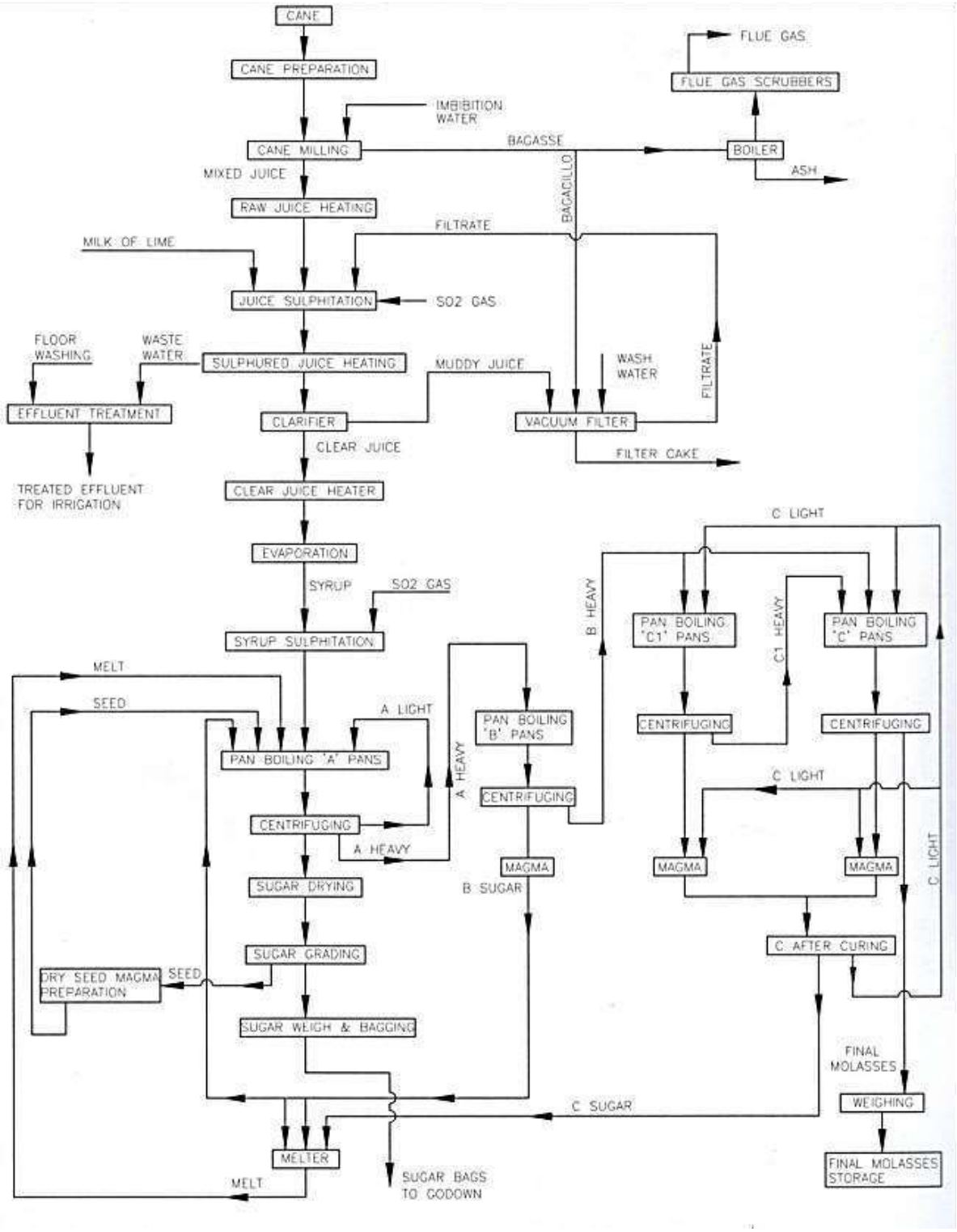


Fig No.: 5.1 Flow Diagram of Sugar Production

5.2 EFFLUENT TREATMENT PLANT PROCESS:

Effluent treatment plant is a unit in which all the liquid effluents of industry are treated. 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	3000 mg/Lit
3	COD	1500 mg/Lit
4	TS	5779 mg/Lit
5	TDS	4924 mg/Lit
6	TSS	856 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:

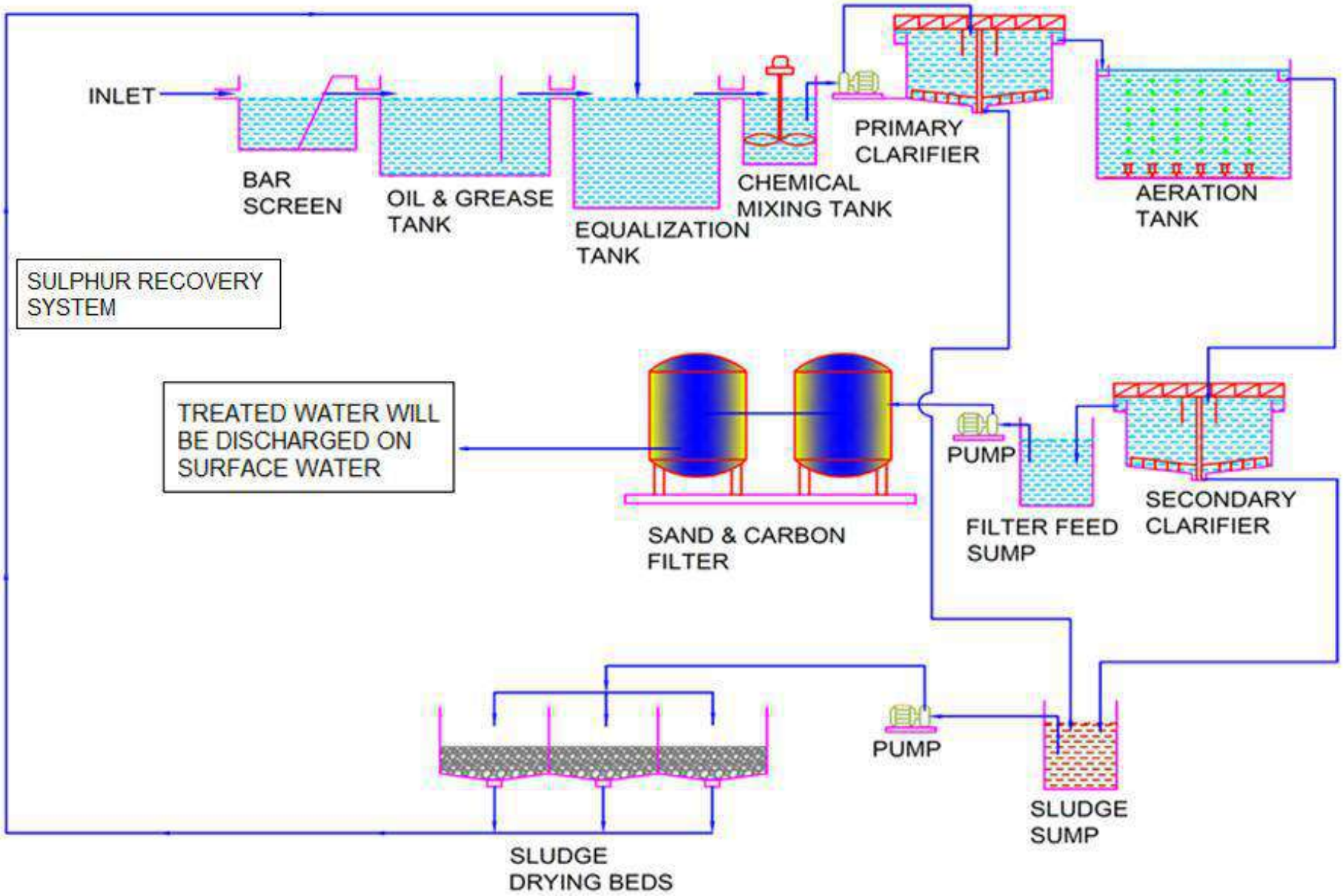


Fig 5.2, Existing effluent treatment Plant

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 **2160 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 more than 5 m bgl, hence ground water recharge proposed against anticipated groundwater draft. The annual draft is 324000 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.

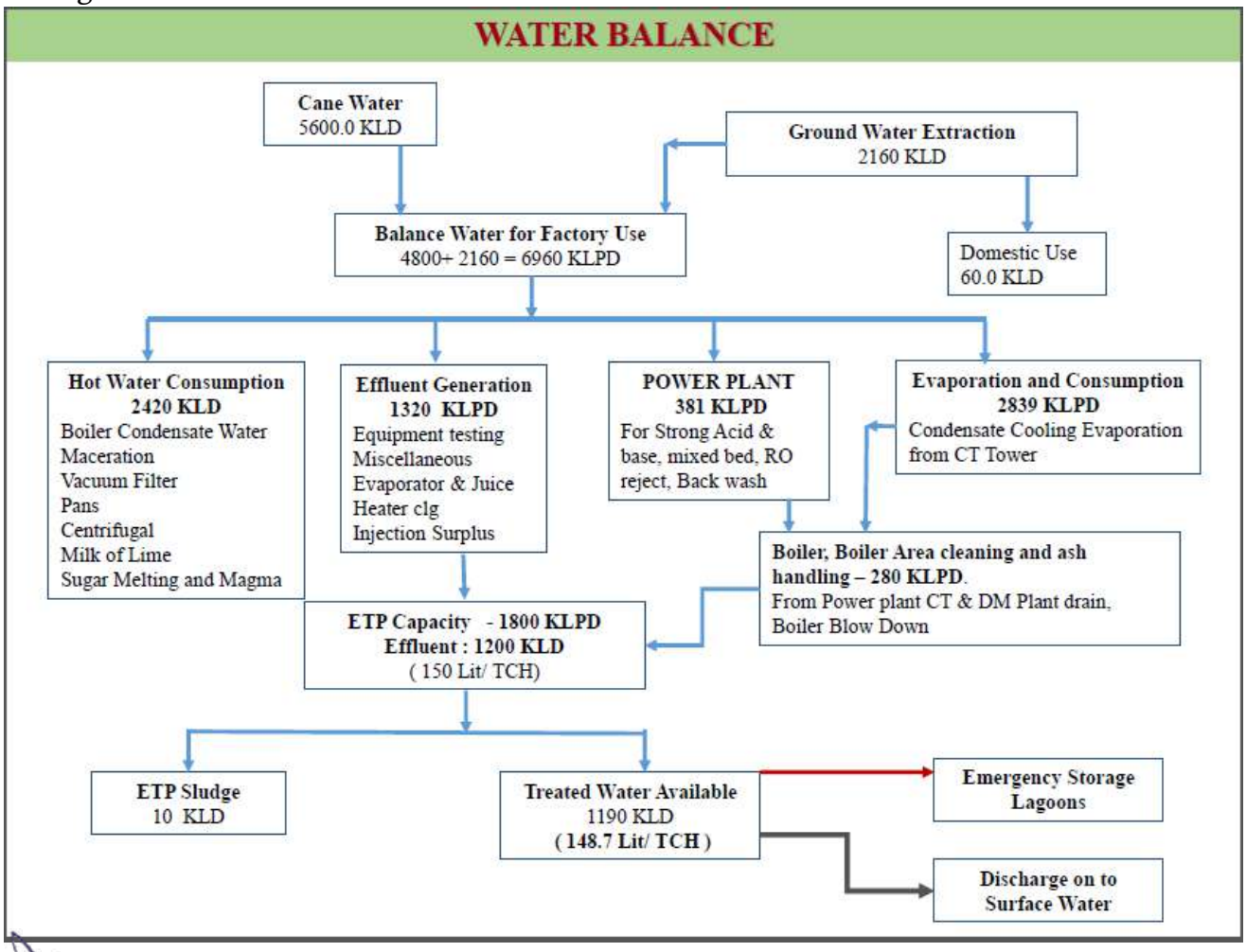


Fig: 5.3 FLOW CHART FOR WATER REQUIREMENT

6.0 CONCLUSION & SUMMARY

The premises of M/S Bajaj Hindusthan Sugar Limited, Unit: Utraula (Sugar Plant) is situated on village: Itai maida, Block: Sriduttaganj, District: Balrampur, Uttar Pradesh well connected with road to major cities. The area falls in Sriduttaganj Block. The total ground water requirement of plant 2160 m^3/day or **324000 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. Settlements, Agriculture land, Industry, and Rocky Water body.
- The district experiences sub-humid climate and three distinct seasons viz. summer, rainy and winter seasons. The climatological data gives an idea of the hydro-meteorological condition in the district. The hottest month is May with average mean temp. of 34.8 ºC followed by June with 34.3ºC. The coldest month is January with average mean temperature of 16.15 ºC followed by December with 16.95ºC. The relative humidity is highest in month of August with normal relative humidity of 81%, followed by July & Sept. with normal value of 75.5%.
- The ground water exploration in the district reveals that clay group of formations dominates over the sand group in the district area. Ground water in the district occurs in the alluvium under water table and semi-confined to confined conditions.
- On the basis of the depth to water level of the district, the pre monsoon depth to water level ranges between 3.5 m bgl to 4.0 m bgl. Pre monsoon depth to water level map is prepared.
- On the basis of the depth to water level of the district, the post monsoon depth to water level ranges between 2.5 m bgl to 3 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 7 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 – 1.5 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 three 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.

CERTIFICATE

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

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Regional Director
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RGNGWT&RI

सदस्य
Member
आरजीएनजीडब्ल्यूटीआरआई
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ETRCPM14/TES-REP/FT/17

TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/EPA/5091/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Ground Water	5	Packing Condition	Sealed
2	Sample Description	Within Project	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No	Test Parameter	Unit	Protocol/Test Method	Result	Range of testing /limit of detection	Indian Standard 10500 : 2012	
						Desirable	Permissible
	Physico-chemical Parameters						
1	Colour	Hazen	IS: 3025 (Part-4): 1983 Reaffirmed: 2017	<5.0	5 - 30	5	15
2	Odour	-	IS: 3025 (Part-5): 1983 Reaffirmed: 2017	Agreeable	Qualitative	Agreeable	Agreeable
3	pH	-	APHA 23rd Ed. 2017-4500 H^+	7.5	1 - 14	6.5-8.5	No Relaxation
4	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	BDL	2 - 40	1	5
5	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 – 2552- A + B	615	1 - 40000	-	-
6	Total Dissolved Solids (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	375.4	10 - 5000	500	2000
7	Ammonia (as total ammonia-N)	mg/l	APHA 23rd Ed. 2017-4500-NH_3 F	BDL	0.5 - 10	0.5	No Relaxation
8	Anionic Detergents (as MBAS)	mg/l	APHA 23rd Ed. 2017-5540 C	BDL	0.05 - 0.5	0.2	1.0
9	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	64.0	2.0 - 600	75	200
10	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg. B	34.50	0.1 - 400	30	100
11	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	42.0	2.0 - 2000	250	1000
12	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.39	0.02 - 5.0	1.0	1.5
13	Free Residual Chlorine	mg/l	IS: 3025 (Part-26): 1986 Reaffirmed: 2019	BDL	0.1 - 5.0	0.2	1.0
14	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1986 Reaffirmed: 2019	BDL	1.0 - 70	45	No Relaxation
15	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-5530 C	BDL	0.001-0.005	0.001	0.002
16	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	24.14	1.0 - 500	200	400
17	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	272.0	2.0 - 1000	200	600
18	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	302.0	5.0 - 800	200	600
19	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 5.0	0.03	0.2
20	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.5	1.0

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Test Report Ref No. ETRC/EPA/5091/2021

21	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 10	0.05	1.5
22	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.15	0.05 - 20	0.3	No Relaxation
23	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.06	0.02 - 5.0	0.1	0.3
24	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	1.08	0.05 - 15	5	15
25	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.003	No Relaxation
26	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 10	0.01	No Relaxation
27	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000	1.0	No Relaxation
28	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 5.0	0.02	No Relaxation
29	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 2.0	0.01	0.05
30	Total Chromium	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 5.0	0.05	No Relaxation
	Microbiological Parameters						
31	E. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	
32	T. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	

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BDL=Below Detection Limit

..... END OF REPORT.....

ETRC warrants that all analytical work is conducted professionally in accordance with all applicable standard laboratory practices and that this data reflects our best attempt to generate accurate results for the sample, mentioned in the report as above.

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Authorized Signatory
(Sandeep Kr Verma)
Lab-Incharge

CHECKED

Authorized Signatory
(Ritu Garg)
QM

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ETRCPM14/TES-REP/FT/17

TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/EPA/5092/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Ground Water	5	Packing Condition	Sealed
2	Sample Description	**Galibpur**	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No	Test Parameter	Unit	Protocol/Test Method	Result	Range of testing /limit of detection	Indian Standard 10500 : 2012	
						Desirable	Permissible
	Physico-chemical Parameters						
1	Colour	Hazen	IS: 3025 (Part-4): 1983 Reaffirmed: 2017	<5.0	5 - 30	5	15
2	Odour	-	IS: 3025 (Part-5): 1983 Reaffirmed: 2017	Agreeable	Qualitative	Agreeable	Agreeable
3	pH	-	APHA 23rd Ed. 2017-4500 H^+	7.6	1 - 14	6.5-8.5	No Relaxation
4	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	BDL	2 - 40	1	5
5	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 – 2552- A + B	658	1 - 40000	-	-
6	Total Dissolved Solids (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	398.6	10 - 5000	500	2000
7	Ammonia (as total ammonia-N)	mg/l	APHA 23rd Ed. 2017-4500-NH_3 F	BDL	0.5 - 10	0.5	No Relaxation
8	Anionic Detergents (as MBAS)	mg/l	APHA 23rd Ed. 2017-5540 C	BDL	0.05 - 0.5	0.2	1.0
9	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	64.0	2.0 - 600	75	200
10	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg, B	32.0	0.1 - 400	30	100
11	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl^- B	32.23	2.0 - 2000	250	1000
12	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.41	0.02 - 5.0	1.0	1.5
13	Free Residual Chlorine	mg/l	IS: 3025 (Part-26): 1986 Reaffirmed: 2019	BDL	0.1 - 5.0	0.2	1.0
14	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1986 Reaffirmed: 2019	BDL	1.0 - 70	45	No Relaxation
15	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-5530 C	BDL	0.001-0.005	0.001	0.002
16	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	39.76	1.0 - 500	200	400
17	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	288.0	2.0 - 1000	200	600
18	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	264.0	5.0 - 800	200	600
19	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 5.0	0.03	0.2
20	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.5	1.0

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Test Report Ref No ETRC/EPA/5092/2021

21	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 10	0.05	1.5
22	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.11	0.05 - 20	0.3	No Relaxation
23	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.04	0.02 - 5.0	0.1	0.3
24	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.97	0.05 - 15	5	15
25	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.003	No Relaxation
26	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 10	0.01	No Relaxation
27	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000	1.0	No Relaxation
28	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 5.0	0.02	No Relaxation
29	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 2.0	0.01	0.05
30	Total Chromium	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 5.0	0.05	No Relaxation
	Microbiological Parameters						
31	E. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	
32	T. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	

4763

BDL=Below Detection Limit

..... END OF REPORT.....

ETRC warrants that all analytical work is conducted professionally in accordance with all applicable standard laboratory practices and that this data reflects our best attempt to generate accurate results for the sample, mentioned in the report as above.

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Authorized Signatory
(Sandeep Kr Verma)
Lab-Incharge

CHECKED

Authorized Signatory
(Ritu Garg)
QM

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ETRCPM14/TES-REP/FT/17

TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/EPA/5093/2021	**Date of Report:** 21.10.2021
Name /Address/Type of Industry	**M/s Bajaj Hindusthan Sugar Limited** **Sugar Unit Utraula** **Village: Itai Maida, Tehsil: Utraula** **Block: Sridattganj** **District: Balrampur (Uttar Pradesh)**

SAMPLE DETAILS

1	Water/ Waste Water	Ground Water	5	Packing Condition	Sealed
2	Sample Description	**Niranjanpur**	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No	Test Parameter	Unit	Protocol/Test Method	Result	Range of testing /limit of detection	Indian Standard 10500 : 2012	
						Desirable	Permissible
	Physico-chemical Parameters						
1	Colour	Hazen	IS: 3025 (Part-4): 1983 Reaffirmed: 2017	<5.0	5 - 30	5	15
2	Odour	-	IS: 3025 (Part-5): 1983 Reaffirmed: 2017	Agreeable	Qualitative	Agreeable	Agreeable
3	pH	-	APHA 23rd Ed. 2017-4500 H^+	7.5	1 - 14	6.5-8.5	No Relaxation
4	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	BDL	2 - 40	1	5
5	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 – 2562- A + B	683	1 - 40000	-	-
6	Total Dissolved Solids (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	404.0	10 - 5000	500	2000
7	Ammonia (as total ammonia-N)	mg/l	APHA 23rd Ed. 2017-4500-NH_3 F	BDL	0.5 - 10	0.5	No Relaxation
8	Anionic Detergents (as MBAS)	mg/l	APHA 23rd Ed. 2017-5540 C	BDL	0.05 - 0.5	0.2	1.0
9	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	67.2	2.0 - 600	75	200
10	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg. B	23.32	0.1 - 400	30	100
11	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl^- B	38.0	2.0 - 2000	250	1000
12	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F^- C	0.39	0.02 - 5.0	1.0	1.5
13	Free Residual Chlorine	mg/l	IS: 3025 (Part-26): 1986 Reaffirmed: 2019	BDL	0.1 - 5.0	0.2	1.0
14	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1986 Reaffirmed: 2019	BDL	1.0 - 70	45	No Relaxation
15	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-5530 C	BDL	0.001-0.005	0.001	0.002
16	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	44.12	1.0 - 500	200	400
17	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	292.0	2.0 - 1000	200	600
18	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	264.0	5.0 - 800	200	600
19	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 5.0	0.03	0.2
20	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.5	1.0

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Test Report Ref No. ETRC/EPA/5093/2021

21	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 10	0.05	1.5
22	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.12	0.05 - 20	0.3	No Relaxation
23	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.03	0.02 - 5.0	0.1	0.3
24	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	1.19	0.05 - 15	5	15
25	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.003	No Relaxation
26	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 10	0.01	No Relaxation
27	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000	1.0	No Relaxation
28	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 5.0	0.02	No Relaxation
29	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 2.0	0.01	0.05
30	Total Chromium	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 5.0	0.05	No Relaxation
			Microbiological Parameters				
31	E. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	
32	T. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	

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BDL=Below Detection Limit

..... END OF REPORT.....

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Authorized Signatory
(Sandeep Kr Verma)
Lab-Incharge

CHECKED

Authorized Signatory
(Ritu Garg)
QM

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ETRCPM14/TES-REP/FT/17

TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/EPA/5094/2021	**Date of Report:** 21.10.2021
Name /Address/Type of Industry	**M/s Bajaj Hindusthan Sugar Limited** **Sugar Unit Utraula** **Village: Itai Maida, Tehsil: Utraula** **Block: Sridattganj** **District: Balrampur (Uttar Pradesh)**

SAMPLE DETAILS

1	Water/ Waste Water	Ground Water	5	Packing Condition	Sealed
2	Sample Description	**Kapauasherpur**	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No	Test Parameter	Unit	Protocol/Test Method	Result	Range of testing /limit of detection	Indian Standard 10500 : 2012	
						Desirable	Permissible
	Physico-chemical Parameters						
1	Colour	Hazen	IS: 3025 (Part-4): 1983 Reaffirmed: 2017	<5.0	5 - 30	5	15
2	Odour	-	IS: 3025 (Part-5): 1983 Reaffirmed: 2017	Agreeable	Qualitative	Agreeable	Agreeable
3	pH	-	APHA 23rd Ed. 2017-4500 H^+	7.4	1 - 14	6.5-8.5	No Relaxation
4	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	BDL	2 - 40	1	5
5	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 – 2552- A + B	712	1 - 40000	-	-
6	Total Dissolved Solids (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	468.8	10 - 5000	500	2000
7	Ammonia (as total ammonia-N)	mg/l	APHA 23rd Ed. 2017-4500-NH_3 F	BDL	0.5 - 10	0.5	No Relaxation
8	Anionic Detergents (as MBAS)	mg/l	APHA 23rd Ed. 2017-5540 C	BDL	0.05 - 0.5	0.2	1.0
9	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	62.4	2.0 - 600	75	200
10	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg. B	33.0	0.1 - 400	30	100
11	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	34.0	2.0 - 2000	250	1000
12	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.43	0.02 - 5.0	1.0	1.5
13	Free Residual Chlorine	mg/l	IS: 3025 (Part-26): 1986 Reaffirmed: 2019	BDL	0.1 - 5.0	0.2	1.0
14	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1986 Reaffirmed: 2019	BDL	1.0 - 70	45	No Relaxation
15	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-5530 C	BDL	0.001-0.005	0.001	0.002
16	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	42.47	1.0 - 500	200	400
17	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	316.0	2.0 - 1000	200	600
18	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	292.0	5.0 - 800	200	600
19	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 5.0	0.03	0.2
20	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.5	1.0

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Test Report Ref No. ETRC/EPA/5094/2021

21	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 10	0.05	1.5
22	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.15	0.05 - 20	0.3	No Relaxation
23	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.04	0.02 - 5.0	0.1	0.3
24	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	1.02	0.05 - 15	5	15
25	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.003	No Relaxation
26	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 10	0.01	No Relaxation
27	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000	1.0	No Relaxation
28	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 5.0	0.02	No Relaxation
29	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 2.0	0.01	0.05
30	Total Chromium	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 5.0	0.05	No Relaxation
	Microbiological Parameters						
31	E. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	
32	T. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	

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BDL=Below Detection Limit

.....END OF REPORT.....

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Authorized Signatory
(Sandeep Kr Verma)
Lab-Incharge

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Authorized Signatory
(Ritu Garg)
QM

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ETRCPM14/TES-REP/FT/17

TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/EPA/5095/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Ground Water	5	Packing Condition	Sealed
2	Sample Description	**Mahua Birahim**	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No	Test Parameter	Unit	Protocol/Test Method	Result	Range of testing /limit of detection	Indian Standard 10500 : 2012	
						Desirable	Permissible
	Physico-chemical Parameters						
1	Colour	Hazen	IS: 3025 (Part-4): 1983 Reaffirmed: 2017	<5.0	5 - 30	5	15
2	Odour	-	IS: 3025 (Part-5): 1983 Reaffirmed: 2017	Agreeable	Qualitative	Agreeable	Agreeable
3	pH	-	APHA 23rd Ed. 2017-4500 H^+	7.5	1 - 14	6.5-8.5	No Relaxation
4	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	BDL	2 - 40	1	5
5	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 – 2552- A + B	716	1 - 40000	-	-
6	Total Dissolved Solids (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	472.0	10 - 5000	500	2000
7	Ammonia (as total ammonia-N)	mg/l	APHA 23rd Ed. 2017-4500-NH_3 F	BDL	0.5 - 10	0.5	No Relaxation
8	Anionic Detergents (as MBAS)	mg/l	APHA 23rd Ed. 2017-5540 C	BDL	0.05 - 0.5	0.2	1.0
9	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	59.2	2.0 - 600	75	200
10	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg, B	32.0	0.1 - 400	30	100
11	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl^- B	42.0	2.0 - 2000	250	1000
12	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F^- C	0.36	0.02 - 5.0	1.0	1.5
13	Free Residual Chlorine	mg/l	IS: 3025 (Part-26): 1986 Reaffirmed: 2019	BDL	0.1 - 5.0	0.2	1.0
14	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1986 Reaffirmed: 2019	BDL	1.0 - 70	45	No Relaxation
15	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-5530 C	BDL	0.001-0.005	0.001	0.002
16	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	46.20	1.0 - 500	200	400
17	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	296.0	2.0 - 1000	200	600
18	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	280.0	5.0 - 800	200	600
19	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 5.0	0.03	0.2
20	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.5	1.0

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Test Report Ref No. ETRC/EPA/5095/2021

21	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 10	0.05	1.5
22	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.11	0.05 - 20	0.3	No Relaxation
23	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.05	0.02 - 5.0	0.1	0.3
24	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.98	0.05 - 15	5	15
25	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.003	No Relaxation
26	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 10	0.01	No Relaxation
27	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000	1.0	No Relaxation
28	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 5.0	0.02	No Relaxation
29	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 2.0	0.01	0.05
30	Total Chromium	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 5.0	0.05	No Relaxation
	Microbiological Parameters						
31	E. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	
32	T. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	

4769

BDL=Below Detection Limit

..... END OF REPORT.....

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Lab-Incharge

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TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/EPA/5096/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Ground Water	5	Packing Condition	Sealed
2	Sample Description	Chandarpur	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No	Test Parameter	Unit	Protocol/Test Method	Result	Range of testing /limit of detection	Indian Standard 10500 : 2012	
						Desirable	Permissible
	Physico-chemical Parameters						
1	Colour	Hazen	IS: 3025 (Part-4): 1983 Reaffirmed: 2017	<5.0	5 - 30	5	15
2	Odour	-	IS: 3025 (Part-5): 1983 Reaffirmed: 2017	Agreeable	Qualitative	Agreeable	Agreeable
3	pH	-	APHA 23rd Ed. 2017-4500 H^+	7.4	1 - 14	6.5-8.5	No Relaxation
4	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	BDL	2 - 40	1	5
5	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 – 2552- A + B	698	1 - 40000	-	-
6	Total Dissolved Solids (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	436.8	10 - 5000	500	2000
7	Ammonia (as total ammonia-N)	mg/l	APHA 23rd Ed. 2017-4500-NH_3 F	BDL	0.5 - 10	0.5	No Relaxation
8	Anionic Detergents (as MBAS)	mg/l	APHA 23rd Ed. 2017-5540 C	BDL	0.05 - 0.5	0.2	1.0
9	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	59.2	2.0 - 600	75	200
10	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg. B	33.04	0.1 - 400	30	100
11	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500 Cl B	38.0	2.0 - 2000	250	1000
12	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.38	0.02 - 5.0	1.0	1.5
13	Free Residual Chlorine	mg/l	IS: 3025 (Part-26): 1986 Reaffirmed: 2019	BDL	0.1 - 5.0	0.2	1.0
14	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1986 Reaffirmed: 2019	BDL	1.0 - 70	45	No Relaxation
15	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-5530 C	BDL	0.001-0.005	0.001	0.002
16	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	26.34	1.0 - 500	200	400
17	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	284.0	2.0 - 1000	200	600
18	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	276.0	5.0 - 600	200	600
19	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 5.0	0.03	0.2
20	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.5	1.0

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Test Report Ref No. ETRC/EPA/5096/2021

21	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 10	0.05	1.5
22	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.19	0.05 - 20	0.3	No Relaxation
23	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.04	0.02 - 5.0	0.1	0.3
24	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	1.12	0.05 - 15	5	15
25	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.003	No Relaxation
26	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 10	0.01	No Relaxation
27	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000	1.0	No Relaxation
28	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 5.0	0.02	No Relaxation
29	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 2.0	0.01	0.05
30	Total Chromium	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 5.0	0.05	No Relaxation
	Microbiological Parameters						
31	E. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	
32	T. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	> 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	

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BDL - Below Detection Limit

.....END OF REPORT.....

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(Sandeep Kr Verma)
Lab-Incharge

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(Ritu Garg)
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TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/EPA/5097/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Ground Water	5	Packing Condition	Sealed
2	Sample Description	Sahdaiya	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No	Test Parameter	Unit	Protocol/Test Method	Result	Range of testing /limit of detection	Indian Standard 10500 : 2012	
						Desirable	Permissible
	Physico-chemical Parameters						
1	Colour	Hazen	IS: 3025 (Part-4): 1983 Reaffirmed: 2017	<5.0	5 - 30	5	15
2	Odour	-	IS: 3025 (Part-5): 1983 Reaffirmed: 2017	Agreeable	Qualitative	Agreeable	Agreeable
3	pH	-	APHA 23rd Ed. 2017-4500 H^+	7.4	1 - 14	6.5-8.5	No Relaxation
4	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	BDL	2 - 40	1	5
5	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 – 2552- A + B	674	1 - 40000	-	-
6	Total Dissolved Solids (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	422.8	10 - 5000	500	2000
7	Ammonia (as total ammonia-N)	mg/l	APHA 23rd Ed. 2017-4500-NH_3 F	BDL	0.5 - 10	0.5	No Relaxation
8	Anionic Detergents (as MBAS)	mg/l	APHA 23rd Ed. 2017-5540 C	BDL	0.05 - 0.5	0.2	1.0
9	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	60.8	2.0 - 600	75	200
10	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg. B	25.27	0.1 - 400	30	100
11	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl^- B	38.0	2.0 - 2000	250	1000
12	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F^- C	0.38	0.02 - 5.0	1.0	1.5
13	Free Residual Chlorine	mg/l	IS: 3025 (Part-26): 1986 Reaffirmed: 2019	BDL	0.1 - 5.0	0.2	1.0
14	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1986 Reaffirmed: 2019	BDL	1.0 - 70	45	No Relaxation
15	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-5530 C	BDL	0.001-0.005	0.001	0.002
16	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	42.24	1.0 - 500	200	400
17	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	272.0	2.0 - 1000	200	600
18	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	256.0	5.0 - 800	200	600
19	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 5.0	0.03	0.2
20	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.5	1.0

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Test Report Ref No. ETRC/EPA/5097/2021

21	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 10	0.05	1.5
22	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.18	0.05 - 20	0.3	No Relaxation
23	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.06	0.02 - 5.0	0.1	0.3
24	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	1.23	0.05 - 15	5	15
25	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.003	No Relaxation
26	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 10	0.01	No Relaxation
27	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000	1.0	No Relaxation
28	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 5.0	0.02	No Relaxation
29	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 2.0	0.01	0.05
30	Total Chromium	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 5.0	0.05	No Relaxation
	Microbiological Parameters						
31	E. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	
32	T. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	

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BDL=Below Detection Limit

.....END OF REPORT.....

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Authorized Signatory
(Sandeep Kr Verma)
Lab-Incharge

Environmental And Technical Research Centre ★ CHECKED

Authorized Signatory
(Ritu Garg)
QM

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ETRCPM14/TES-REP/FT/17

TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/EPA/5098/2021	**Date of Report:** 21.10.2021
Name /Address/Type of Industry	**M/s Bajaj Hindusthan Sugar Limited** **Sugar Unit Utraula** **Village: Itai Maida, Tehsil: Utraula** **Block: Sridattganj** **District: Balrampur (Uttar Pradesh)**

SAMPLE DETAILS

1	Water/ Waste Water	Ground Water	5	Packing Condition	Sealed
2	Sample Description	**Murao Dih**	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No	Test Parameter	Unit	Protocol/Test Method	Result	Range of testing /limit of detection	Indian Standard 10500 : 2012	
						Desirable	Permissible
	Physico-chemical Parameters						
1	Colour	Hazen	IS: 3025 (Part-4): 1983 Reaffirmed: 2017	<5.0	5 - 30	5	15
2	Odour	-	IS: 3025 (Part-5): 1983 Reaffirmed: 2017	Agreeable	Qualitative	Agreeable	Agreeable
3	pH	-	APHA 23rd Ed. 2017-4500 H^+	7.4	1 - 14	6.5-8.5	No Relaxation
4	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	BDL	2 - 40	1	5
5	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 – 2552- A + B	702	1 - 40000	-	-
6	Total Dissolved Solids (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	428.4	10 - 5000	500	2000
7	Ammonia (as total ammonia-N)	mg/l	APHA 23rd Ed. 2017-4500-NH_3 F	BDL	0.5 - 10	0.5	No Relaxation
8	Anionic Detergents (as MBAS)	mg/l	APHA 23rd Ed. 2017-5540 C	BDL	0.05 - 0.5	0.2	1.0
9	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	62.4	2.0 - 600	75	200
10	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg, B	30.13	0.1 - 400	30	100
11	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl^- B	36.0	2.0 - 2000	250	1000
12	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F^- C	0.44	0.02 - 5.0	1.0	1.5
13	Free Residual Chlorine	mg/l	IS: 3025 (Part-26): 1986 Reaffirmed: 2019	BDL	0.1 - 5.0	0.2	1.0
14	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1986 Reaffirmed: 2019	BDL	1.0 - 70	45	No Relaxation
15	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-5530 C	BDL	0.001-0.005	0.001	0.002
16	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	30.12	1.0 - 500	200	400
17	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	292.0	2.0 - 1000	200	600
18	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	280.0	5.0 - 800	200	600
19	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 5.0	0.03	0.2
20	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.5	1.0

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21	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 10	0.05	1.5
22	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.17	0.05 - 20	0.3	No Relaxation
23	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.03	0.02 - 5.0	0.1	0.3
24	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	1.14	0.05 - 15	5	15
25	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.003	No Relaxation
26	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 10	0.01	No Relaxation
27	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000	1.0	No Relaxation
28	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 5.0	0.02	No Relaxation
29	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 2.0	0.01	0.05
30	Total Chromium	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 5.0	0.05	No Relaxation
	Microbiological Parameters						
31	E. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	
32	T. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	

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BDL=Below Detection Limit

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Authorized Signatory
(Sandeep Kr Verma)
Lab-Incharge

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Authorized Signatory
(Ritu Garg)
QM

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TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/EPA/5099/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Ground Water	5	Packing Condition	Sealed
2	Sample Description	**Allah Nagar**	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No	Test Parameter	Unit	Protocol/Test Method	Result	Range of testing /limit of detection	Indian Standard 10500 : 2012	
						Desirable	Permissible
	Physico-chemical Parameters						
1	Colour	Hazen	IS: 3025 (Part-4): 1983 Reaffirmed: 2017	<5.0	5 - 30	5	15
2	Odour	-	IS: 3025 (Part-5): 1983 Reaffirmed: 2017	Agreeable	Qualitative	Agreeable	Agreeable
3	pH	-	APHA 23rd Ed. 2017-4500 H^+	7.5	1 - 14	6.5-8.5	No Relaxation
4	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	BDL	2 - 40	1	5
5	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 – 2652- A + B	699	1 - 40000	-	-
6	Total Dissolved Solids (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	426.0	10 - 5000	500	2000
7	Ammonia (as total ammonia-N)	mg/l	APHA 23rd Ed. 2017-4500-NH_3 F	BDL	0.5 - 10	0.5	No Relaxation
8	Anionic Detergents (as MBAS)	mg/l	APHA 23rd Ed. 2017-5540 C	BDL	0.05 - 0.5	0.2	1.0
9	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	59.2	2.0 - 600	75	200
10	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg. B	25.27	0.1 - 400	30	100
11	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	46.24	2.0 - 2000	250	1000
12	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.43	0.02 - 5.0	1.0	1.5
13	Free Residual Chlorine	mg/l	IS: 3025 (Part-26): 1986 Reaffirmed: 2019	BDL	0.1 - 5.0	0.2	1.0
14	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1986 Reaffirmed: 2019	BDL	1.0 - 70	45	No Relaxation
15	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-5530 C	BDL	0.001-0.005	0.001	0.002
16	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	26.28	1.0 - 500	200	400
17	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	274.0	2.0 - 1000	200	600
18	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	252.0	5.0 - 800	200	600
19	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 5.0	0.03	0.2
20	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.5	1.0

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21	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 10	0.05	1.5
22	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.19	0.05 - 20	0.3	No Relaxation
23	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.06	0.02 - 5.0	0.1	0.3
24	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	1.16	0.05 - 15	5	15
25	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 2.0	0.003	No Relaxation
26	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 10	0.01	No Relaxation
27	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000	1.0	No Relaxation
28	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 5.0	0.02	No Relaxation
29	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 2.0	0.01	0.05
30	Total Chromium	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 5.0	0.05	No Relaxation
	Microbiological Parameters						
31	E. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	
32	T. coli	MPN/ 100 ml	IS: 1622 - 1981 Reaffirmed: 2019	Absent	≥ 2 MPN Present or Absent per 100 ml	Shall not be detected in any 100 ml sample	

4777

BDL=Below Detection Limit

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(Sandeep Kr Verma)
Lab-Incharge

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Authorized Signatory
(Ritu Garg)
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TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/2110/9431/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Surface Water	5	Packing Condition	Sealed
2	Sample Description	Rapti River	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No.	Test Parameter	Unit	Protocol/ Test Method	Result	Range of testing /limit of detection
1.	pH	-	APHA 23rd Ed. 2017-4500 H+	7.5	1 - 14
2.	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	006	2 - 40
3.	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 - 2552- A + B	538.4	1 - 40000
4.	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	204.0	5.0 - 5000
5.	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	212.0	2.0 - 1000
6.	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	46.4	2.0 - 1500
7.	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg.B	21.38	0.1 - 400
8.	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	26.0	2.0 - 2000
9.	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.35	0.02 - 15
10.	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	20.6	1.0 - 800
11.	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1988 Reaffirmed: 2019	9.65	1.0 - 400
12.	Phosphate as P_2O_5	mg/l	APHA 23rd Ed. 2017-4500 P, D	4.16	0.1 - 200
13.	Hexavalent Chromium as Cr^{6+}	mg/l	APHA 23rd Ed. 2017, 3500 Cr.B	BDL	0.1 - 100
14.	Total Kjeldahl Nitrogen	mg/l	APHA 23rd Ed. 2017, 4500 N_{org} B + C	4.65	0.1 - 100
15.	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-3530 C	BDL	0.001 - 0.005
16.	Total Dissolve Solid (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	330.4	10 - 20000
17.	Total Suspended Solid (TSS)	mg/l	APHA 23rd Ed. 2017-2540 D	88.2	5.0 - 5000
18.	Dissolve Oxygen	mg/l	APHA 23rd Ed. 2017-4500 O, C	5.4	1.0 - 12
19.	Biochemical Oxygen Demand	mg/l	IS: 3025 (Part-44): 1993 Reaffirmed: 2019	2.2	1.0 - 90000
20.	Chemical Oxygen Demand	mg/l	APHA 23rd Ed. 2017-5220 B	16.0	2.0 - 135000
21.	Sodium as Na	mg/l	APHA 23rd Ed. 2017, 3500 Na	36.2	1.0 - 3000
22.	Potassium as K	mg/l	APHA 23rd Ed. 2017, 3500 K, B	5.8	1.0 - 200
23.	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 100
24.	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 10
25.	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.18	0.05 - 50

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26.	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 20
27.	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 20
28.	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
29.	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
30.	Total Chromium as Cr	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 50
31.	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 20
32.	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.82	0.05 - 30
33.	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 5.0
34.	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000

BDL=Below Detection Limit

.....END OF REPORT.....

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Lab-Incharge

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Authorized Signatory
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ETRCPM14/TES-REP/FT/17

TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/2110/9432/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Surface Water	5	Packing Condition	Sealed
2	Sample Description	Suwawan Nadi Upstream	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No.	Test Parameter	Unit	Protocol/ Test Method	Result	Range of testing /limit of detection
1.	pH	-	APHA 23rd Ed. 2017-4500 H+	7.5	1 - 14
2.	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	002	2 - 40
3.	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 - 2552- A + B	524.3	1 - 40000
4.	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	192.0	5.0 - 5000
5.	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	208.0	2.0 - 1000
6.	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	41.6	2.0 - 1500
7.	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg B	21.38	0.1 - 400
8.	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	18.0	2.0 - 2000
9.	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.35	0.02 - 15
10.	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{-2}	14.56	1.0 - 800
11.	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1988 Reaffirmed: 2019	5.58	1.0 - 400
12.	Phosphate as P_2O_5	mg/l	APHA 23rd Ed. 2017-4500 P, D	1.22	0.1 - 200
13.	Hexavalent Chromium as Cr^{6+}	mg/l	APHA 23rd Ed. 2017, 3500 Cr,B	BDL	0.1 - 100
14.	Total Kjeldahl Nitrogen	mg/l	APHA 23rd Ed. 2017, 4500 N_{org} B + C	4.65	0.1 - 100
15.	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-3530 C	BDL	0.001 - 0.005
16.	Total Dissolve Solid (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	318.6	10 - 20000
17.	Total Suspended Solid (TSS)	mg/l	APHA 23rd Ed. 2017-2540 D	53.6	5.0 - 5000
18.	Dissolve Oxygen	mg/l	APHA 23rd Ed. 2017-4500 O, C	5.2	1.0 - 12
19.	Biochemical Oxygen Demand	mg/l	IS: 3025 (Part-44): 1993 Reaffirmed: 2019	2.2	1.0 - 90000
20.	Chemical Oxygen Demand	mg/l	APHA 23rd Ed. 2017-5220 B	8.0	2.0 - 135000
21.	Sodium as Na	mg/l	APHA 23rd Ed. 2017, 3500 Na	42.0	1.0 - 3000
22.	Potassium as K	mg/l	APHA 23rd Ed. 2017, 3500 K, B	5.2	1.0 - 200
23.	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 100
24.	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 10
25.	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.13	0.05 - 50

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26.	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 20
27.	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 20
28.	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
29.	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
30.	Total Chromium as Cr	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 50
31.	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 20
32.	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	1.14	0.05 - 30
33.	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 5.0
34.	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000

BDL=Below Detection Limit

..... END OF REPORT .....

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Authorized Signatory
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TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/2110/9433/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Surface Water	5	Packing Condition	Sealed
2	Sample Description	Suwawan Nadi Downstream	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No.	Test Parameter	Unit	Protocol/ Test Method	Result	Range of testing /limit of detection
1.	pH	-	APHA 23rd Ed. 2017-4500 H+	7.5	1 - 14
2.	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	003	2 - 40
3.	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 - 2552 - A + B	538.7	1 - 40000
4.	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	204.0	5.0 - 5000
5.	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	212.0	2.0 - 1000
6.	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	41.6	2.0 - 1500
7.	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg B	24.30	0.1 - 400
8.	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	20.0	2.0 - 2000
9.	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.35	0.02 - 15
10.	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	15.05	1.0 - 800
11.	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1988 Reaffirmed: 2019	5.65	1.0 - 400
12.	Phosphate as P_2O_5	mg/l	APHA 23rd Ed. 2017-4500 P, D	1.16	0.1 - 200
13.	Hexavalent Chromium as Cr^{6+}	mg/l	APHA 23rd Ed. 2017, 3500 Cr,B	BDL	0.1 - 100
14.	Total Kjeldahl Nitrogen	mg/l	APHA 23rd Ed. 2017, 4500 N_{org} B + C	4.65	0.1 - 100
15.	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-3530 C	BDL	0.001 - 0.005
16.	Total Dissolve Solid (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	322.2	10 - 20000
17.	Total Suspended Solid (TSS)	mg/l	APHA 23rd Ed. 2017-2540 D	58.8	5.0 - 5000
18.	Dissolve Oxygen	mg/l	APHA 23rd Ed. 2017-4500 O, C	5.1	1.0 - 12
19.	Biochemical Oxygen Demand	mg/l	IS: 3025 (Part-44): 1993 Reaffirmed: 2019	2.4	1.0 - 90000
20.	Chemical Oxygen Demand	mg/l	APHA 23rd Ed. 2017-5220 B	12.0	2.0 - 135000
21.	Sodium as Na	mg/l	APHA 23rd Ed. 2017, 3500 Na	38.9	1.0 - 3000
22.	Potassium as K	mg/l	APHA 23rd Ed. 2017, 3500 K, B	5.3	1.0 - 200
23.	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 100
24.	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 10
25.	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.14	0.05 - 50

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Test Report Ref No. ETRC/2110/9433/2021

26.	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 20
27.	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 20
28.	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
29.	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
30.	Total Chromium as Cr	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 50
31.	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 20
32.	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.98	0.05 - 30
33.	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 5.0
34.	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000

BDL=Below Detection Limit

..... END OF REPORT.....

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TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/2110/9434/2021	**Date of Report:** 21.10.2021
Name /Address/Type of Industry	**M/s Bajaj Hindusthan Sugar Limited** **Sugar Unit Utraula** **Village: Itai Maida, Tehsil: Utraula** **Block: Sridattganj** **District: Balrampur (Uttar Pradesh)**

SAMPLE DETAILS

1	Water/ Waste Water	Surface Water	5	Packing Condition	Sealed
2	Sample Description	**Chatra Tal**	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No.	Test Parameter	Unit	Protocol/ Test Method	Result	Range of testing /limit of detection
1.	pH	-	APHA 23rd Ed. 2017-4500 H+	**7.6**	1 - 14
2.	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	**006**	2 - 40
3.	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 - 2552- A + B	**672.2**	1 - 40000
4.	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	**196.0**	5.0 - 5000
5.	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	**212.0**	2.0 - 1000
6.	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	**43.2**	2.0 - 1500
7.	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg,B	**21.38**	0.1 - 400
8.	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	**24.0**	2.0 - 2000
9.	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	**0.42**	0.02 - 15
10.	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	**18.2**	1.0 - 800
11.	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1988 Reaffirmed: 2019	**8.6**	1.0 - 400
12.	Phosphate as P_2O_5	mg/l	APHA 23rd Ed. 2017-4500 P, D	**2.82**	0.1 - 200
13.	Hexavalent Chromium as Cr^{6+}	mg/l	APHA 23rd Ed. 2017, 3500 Cr,B	**BDL**	0.1 - 100
14.	Total Kjeldahl Nitrogen	mg/l	APHA 23rd Ed. 2017, 4500 N_{org} B + C	**5.12**	0.1 - 100
15.	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-3530 C	**BDL**	0.001 - 0.005
16.	Total Dissolve Solid (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	**396.2**	10 - 20000
17.	Total Suspended Solid (TSS)	mg/l	APHA 23rd Ed. 2017-2540 D	**66.2**	5.0 - 5000
18.	Dissolve Oxygen	mg/l	APHA 23rd Ed. 2017-4500 O, C	**5.0**	1.0 - 12
19.	Biochemical Oxygen Demand	mg/l	IS: 3025 (Part-44): 1993 Reaffirmed: 2019	**10.6**	1.0 - 90000
20.	Chemical Oxygen Demand	mg/l	APHA 23rd Ed. 2017-5220 B	**40.0**	2.0 - 135000
21.	Sodium as Na	mg/l	APHA 23rd Ed. 2017, 3500 Na	**42.6**	1.0 - 3000
22.	Potassium as K	mg/l	APHA 23rd Ed. 2017, 3500 K, B	**5.1**	1.0 - 200
23.	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.015 - 100
24	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.05 - 10
25	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**0.32**	0.05 - 50

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Test Report Ref No. ETRC/2110/9434/2021

26.	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 20
27.	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 20
28.	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
29.	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
30.	Total Chromium as Cr	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 50
31.	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 20
32.	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.76	0.05 - 30
33.	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 5.0
34.	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000

BDL=Below Detection Limit

.....END OF REPORT.....

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TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/2110/9435/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Surface Water	5	Packing Condition	Sealed
2	Sample Description	Pipra Tal	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No.	Test Parameter	Unit	Protocol/ Test Method	Result	Range of testing /limit of detection
1.	pH	-	APHA 23rd Ed. 2017-4500 H+	7.6	1 - 14
2.	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	006	2 - 40
3.	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 - 2552- A + B	528.0	1 - 40000
4.	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	192.0	5.0 - 5000
5.	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	208.0	2.0 - 1000
6.	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	44.8	2.0 - 1500
7.	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg,B	19.44	0.1 - 400
8.	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	22.0	2.0 - 2000
9.	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.37	0.02 - 15
10.	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	18.2	1.0 - 800
11.	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1988 Reaffirmed: 2019	8.28	1.0 - 400
12.	Phosphate as P_2O_5	mg/l	APHA 23rd Ed. 2017-4500 P, D	4.32	0.1 - 200
13.	Hexavalent Chromium as Cr^{6+}	mg/l	APHA 23rd Ed. 2017, 3500 Cr,B	BDL	0.1 - 100
14.	Total Kjeldahl Nitrogen	mg/l	APHA 23rd Ed. 2017, 4500 N_{org} B + C	4.65	0.1 - 100
15.	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-3530 C	BDL	0.001 - 0.005
16.	Total Dissolve Solid (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	320.5	10 - 20000
17.	Total Suspended Solid (TSS)	mg/l	APHA 23rd Ed. 2017-2540 D	72.2	5.0 - 5000
18.	Dissolve Oxygen	mg/l	APHA 23rd Ed. 2017-4500 O, C	5.3	1.0 - 12
19.	Biochemical Oxygen Demand	mg/l	IS: 3025 (Part-44): 1993 Reaffirmed: 2019	7.4	1.0 - 90000
20.	Chemical Oxygen Demand	mg/l	APHA 23rd Ed. 2017-5220 B	24.0	2.0 - 135000
21.	Sodium as Na	mg/l	APHA 23rd Ed. 2017, 3500 Na	38.0	1.0 - 3000
22.	Potassium as K	mg/l	APHA 23rd Ed. 2017, 3500 K, B	6.1	1.0 - 200
23.	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 100
24	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 10
25	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.15	0.05 - 50

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Test Report Ref No. ETRC/2110/9435/2021

26.	**Manganese as Mn**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.02 - 20
27.	**Lead as Pb**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.01 - 20
28.	**Nickel as Ni**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.05 - 20
29.	**Cadmium as Cd**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.05 - 20
30.	**Total Chromium as Cr**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.03 - 50
31.	**Copper as Cu**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.03 - 20
32.	**Zinc as Zn**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**1.26**	0.05 - 30
33.	**Arsenic as As**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.02 - 5.0
34.	**Mercury as Hg**	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.5 - 1000

BDL=Below Detection Limit

..... END OF REPORT.....

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ETRCPM14/TES-REP/FT/17

TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/2110/9436/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Surface Water	5	Packing Condition	Sealed
2	Sample Description	Sumraha Tal	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No.	Test Parameter	Unit	Protocol/ Test Method	Result	Range of testing /limit of detection
1.	pH	-	APHA 23rd Ed. 2017-4500 H+	7.6	1 - 14
2.	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	008	2 - 40
3.	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 - 2552- A + B	696.4	1 - 40000
4.	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	192.0	5.0 - 5000
5.	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	216.0	2.0 - 1000
6.	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	51.2	2.0 - 1500
7.	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg,B	15.55	0.1 - 400
8.	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	32.0	2.0 - 2000
9.	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.46	0.02 - 15
10.	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	36.2	1.0 - 800
11.	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1988 Reaffirmed: 2019	7.6	1.0 - 400
12.	Phosphate as P_2O_5	mg/l	APHA 23rd Ed. 2017-4500 P, D	6.45	0.1 - 200
13.	Hexavalent Chromium as Cr^{6+}	mg/l	APHA 23rd Ed. 2017, 3500 Cr,B	BDL	0.1 - 100
14.	Total Kjeldahl Nitrogen	mg/l	APHA 23rd Ed. 2017, 4500 N_{org} B + C	6.12	0.1 - 100
15.	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-3530 C	BDL	0.001 - 0.005
16.	Total Dissolve Solid (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	422.6	10 - 20000
17.	Total Suspended Solid (TSS)	mg/l	APHA 23rd Ed. 2017-2540 D	56.5	5.0 - 5000
18.	Dissolve Oxygen	mg/l	APHA 23rd Ed. 2017-4500 O, C	4.9	1.0 - 12
19.	Biochemical Oxygen Demand	mg/l	IS: 3025 (Part-44): 1993 Reaffirmed: 2019	8.6	1.0 - 90000
20.	Chemical Oxygen Demand	mg/l	APHA 23rd Ed. 2017-5220 B	32.0	2.0 - 135000
21.	Sodium as Na	mg/l	APHA 23rd Ed. 2017, 3500 Na	40.2	1.0 - 3000
22.	Potassium as K	mg/l	APHA 23rd Ed. 2017, 3500 K, B	5.1	1.0 - 200
23.	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 100
24	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 10
25	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.28	0.05 - 50

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Test Report Ref No. ETRC/2110/9436/2021

26.	**Manganese as Mn**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.02 - 20
27.	**Lead as Pb**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.01 - 20
28.	**Nickel as Ni**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.05 - 20
29.	**Cadmium as Cd**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.05 - 20
30.	**Total Chromium as Cr**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.03 - 50
31.	**Copper as Cu**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.03 - 20
32.	**Zinc as Zn**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**0.66**	0.05 - 30
33.	**Arsenic as As**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.02 - 5.0
34.	**Mercury as Hg**	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.5 - 1000

BDL=Below Detection Limit

..... END OF REPORT .....

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ETRCPM14/TES-REP/FT/17

TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/2110/9437/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Surface Water	5	Packing Condition	Sealed
2	Sample Description	Harha Tal	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No.	Test Parameter	Unit	Protocol/ Test Method	Result	Range of testing /limit of detection
1.	pH	-	APHA 23rd Ed. 2017-4500 H+	7.6	1 - 14
2.	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	003	2 - 40
3.	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 - 2552- A + B	772.6	1 - 40000
4.	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	224.0	5.0 - 5000
5.	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	272.0	2.0 - 1000
6.	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	43.2	2.0 - 1500
7.	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg,B	28.18	0.1 - 400
8.	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	28.0	2.0 - 2000
9.	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.73	0.02 - 15
10.	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	24.33	1.0 - 800
11.	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1988 Reaffirmed: 2019	15.69	1.0 - 400
12.	Phosphate as P_2O_5	mg/l	APHA 23rd Ed. 2017-4500 P, D	2.55	0.1 - 200
13.	Hexavalent Chromium as Cr^{6+}	mg/l	APHA 23rd Ed. 2017, 3500 Cr,B	BDL	0.1 - 100
14.	Total Kjeldahl Nitrogen	mg/l	APHA 23rd Ed. 2017, 4500 N_{org} B + C	7.36	0.1 - 100
15.	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-3530 C	BDL	0.001 - 0.005
16.	Total Dissolve Solid (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	425.2	10 - 20000
17.	Total Suspended Solid (TSS)	mg/l	APHA 23rd Ed. 2017-2540 D	81.5	5.0 - 5000
18.	Dissolve Oxygen	mg/l	APHA 23rd Ed. 2017-4500 O, C	4.1	1.0 - 12
19.	Biochemical Oxygen Demand	mg/l	IS: 3025 (Part-44): 1993 Reaffirmed: 2019	10.2	1.0 - 90000
20.	Chemical Oxygen Demand	mg/l	APHA 23rd Ed. 2017-5220 B	68.0	2.0 - 135000
21.	Sodium as Na	mg/l	APHA 23rd Ed. 2017, 3500 Na	48.6	1.0 - 3000
22.	Potassium as K	mg/l	APHA 23rd Ed. 2017, 3500 K, B	6.2	1.0 - 200
23.	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 100
24	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 10
25	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.25	0.05 - 50

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Test Report Ref No. ETRC/2110/9437/2021

26.	**Manganese as Mn**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.02 - 20
27.	**Lead as Pb**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.01 - 20
28.	**Nickel as Ni**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.05 - 20
29.	**Cadmium as Cd**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.05 - 20
30.	**Total Chromium as Cr**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.03 - 50
31.	**Copper as Cu**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.03 - 20
32.	**Zinc as Zn**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**1.69**	0.05 - 30
33.	**Arsenic as As**	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.02 - 5.0
34.	**Mercury as Hg**	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.5 - 1000

BDL=Below Detection Limit

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ETRCPM14/TES-REP/FT/17

TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/2110/9438/2021	**Date of Report:** 21.10.2021
Name /Address/Type of Industry	**M/s Bajaj Hindusthan Sugar Limited** **Sugar Unit Utraula** **Village: Itai Maida, Tehsil: Utraula** **Block: Sridattganj** **District: Balrampur (Uttar Pradesh)**

SAMPLE DETAILS

1	Water/ Waste Water	Surface Water	5	Packing Condition	Sealed
2	Sample Description	**Maida Tal**	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No.	Test Parameter	Unit	Protocol/ Test Method	Result	Range of testing /limit of detection
1.	pH	-	APHA 23rd Ed. 2017-4500 H+	7.3	1 - 14
2.	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	003	2 - 40
3.	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 - 2552- A + B	834.6	1 - 40000
4.	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	216.0	5.0 - 5000
5.	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	224.0	2.0 - 1000
6.	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	44.88	2.0 - 1500
7.	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg.B	25.27	0.1 - 400
8.	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	22.02	2.0 - 2000
9.	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.70	0.02 - 15
10.	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	23.52	1.0 - 800
11.	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1988 Reaffirmed: 2019	16.82	1.0 - 400
12.	Phosphate as P_2O_5	mg/l	APHA 23rd Ed. 2017-4500 P, D	2.36	0.1 - 200
13.	Hexavalent Chromium as Cr^{6+}	mg/l	APHA 23rd Ed. 2017, 3500 Cr,B	BDL	0.1 - 100
14.	Total Kjeldahl Nitrogen	mg/l	APHA 23rd Ed. 2017, 4500 N_{org} B + C	3.46	0.1 - 100
15.	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-3530 C	BDL	0.001 - 0.005
16.	Total Dissolve Solid (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	531.2	10 - 20000
17.	Total Suspended Solid (TSS)	mg/l	APHA 23rd Ed. 2017-2540 D	63.4	5.0 - 5000
18.	Dissolve Oxygen	mg/l	APHA 23rd Ed. 2017-4500 O, C	4.7	1.0 - 12
19.	Biochemical Oxygen Demand	mg/l	IS: 3025 (Part-44): 1993 Reaffirmed: 2019	12.4	1.0 - 90000
20.	Chemical Oxygen Demand	mg/l	APHA 23rd Ed. 2017-5220 B	48.4	2.0 - 135000
21.	Sodium as Na	mg/l	APHA 23rd Ed. 2017, 3500 Na	42.8	1.0 - 3000
22.	Potassium as K	mg/l	APHA 23rd Ed. 2017, 3500 K, B	5.8	1.0 - 200
23.	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 100
24	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 10
25	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.27	0.05 - 50

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Test Report Ref No. ETRC/2110/9438/2021

26.	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.11	0.02 - 20
27.	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 20
28.	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
29.	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
30.	Total Chromium as Cr	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 50
31.	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 20
32.	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	1.27	0.05 - 30
33.	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 5.0
34	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000

BDL=Below Detection Limit

..... END OF REPORT.....

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TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/2110/9439/2021	Date of Report: 21.10.2021
Name /Address/Type of Industry	M/s Bajaj Hindusthan Sugar Limited Sugar Unit Utraula Village: Itai Maida, Tehsil: Utraula Block: Sridattganj District: Balrampur (Uttar Pradesh)

SAMPLE DETAILS

1	Water/ Waste Water	Surface Water	5	Packing Condition	Sealed
2	Sample Description	Khamua Tal	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No.	Test Parameter	Unit	Protocol/ Test Method	Result	Range of testing /limit of detection
1.	pH	-	APHA 23rd Ed. 2017-4500 H+	7.8	1 - 14
2.	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	003	2 - 40
3.	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 - 2552- A + B	964.8	1 - 40000
4.	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	228.0	5.0 - 5000
5.	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	252.0	2.0 - 1000
6.	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	46.4	2.0 - 1500
7.	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg.B	27.21	0.1 - 400
8.	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	28.0	2.0 - 2000
9.	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	0.44	0.02 - 15
10.	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	30.6	1.0 - 800
11.	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1988 Reaffirmed: 2019	12.4	1.0 - 400
12.	Phosphate as P_2O_5	mg/l	APHA 23rd Ed. 2017-4500 P. D	2.24	0.1 - 200
13.	Hexavalent Chromium as Cr^{6+}	mg/l	APHA 23rd Ed. 2017, 3500 Cr.B	BDL	0.1 - 100
14.	Total Kjeldahl Nitrogen	mg/l	APHA 23rd Ed. 2017, 4500 N_{org} B + C	5.68	0.1 - 100
15.	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-3530 C	BDL	0.001 - 0.005
16.	Total Dissolve Solid (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	548.4	10 - 20000
17.	Total Suspended Solid (TSS)	mg/l	APHA 23rd Ed. 2017-2540 D	62.4	5.0 - 5000
18.	Dissolve Oxygen	mg/l	APHA 23rd Ed. 2017-4500 O, C	4.4	1.0 - 12
19.	Biochemical Oxygen Demand	mg/l	IS: 3025 (Part-44): 1993 Reaffirmed: 2019	4.2	1.0 - 90000
20.	Chemical Oxygen Demand	mg/l	APHA 23rd Ed. 2017-5220 B	36.0	2.0 - 135000
21.	Sodium as Na	mg/l	APHA 23rd Ed. 2017, 3500 Na	48.4	1.0 - 3000
22.	Potassium as K	mg/l	APHA 23rd Ed. 2017, 3500 K, B	6.1	1.0 - 200
23.	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.015 - 100
24	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 10
25	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	0.24	0.05 - 50

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Regd. Address: 4/57, Vipul Khand, Gomti Nagar, Lucknow - 226010 (U.P.) Mob: 09897674227

ENVIRONMENTAL AND TECHNICAL RESEARCH CENTRE

Office & Laboratory: 2/261, Vishwas Khand, Gomti Nagar, Lucknow- 226 010 (U.P.)
Email : ETRCLTH@YAHOO.IN, Web: www.etrcindia.com
ISO 9001:2015, ISO 14001 : 2015, OHSAS 18001 : 2007
An Approved Laboratory from Ministry of Environment, Forest and Climate change, Govt. of India under EPA 1986

Test Report Ref No. ETRC/2110/9439/2021

26.	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 20
27.	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 20
28.	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
29.	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
30.	Total Chromium as Cr	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 50
31.	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 20
32.	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	1.40	0.05 - 30
33.	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 5.0
34.	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000

BDL=Below Detection Limit

..... END OF REPORT.....

- ETRC warrants that all analytical work is conducted professionally in accordance with all applicable standard laboratory practices and that this data reflects our best attempt to generate accurate results for the sample, mentioned in the report as above.
- The result relate only to the items tested.
- ETRC does not assume any liability for any claims or damages related to the quality of parameter analyzed in the results and/or the performance of the equipment constituting to the results.
- All disputes subject to Lucknow jurisdiction.
- This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law and should not be used in any advertising media without our special permission in writing.
- Complain register is available in our laboratory.

4795

Authorized Signatory
(Sandeep Kr Verma)
Lab-Incharge

Environmental and Technical Research Centre CHECKED

Authorized Signatory
(Ritu Garg)
QM

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ETRCPM14/TES-REP/FT/17

TEST REPORT
WATER ANALYSIS

Test Report Ref No. ETRC/2110/9440/2021	**Date of Report:** 21.10.2021
Name /Address/Type of Industry	**M/s Bajaj Hindusthan Sugar Limited** **Sugar Unit Utraula** **Village: Itai Maida, Tehsil: Utraula** **Block: Sridattganj** **District: Balrampur (Uttar Pradesh)**

SAMPLE DETAILS

1	Water/ Waste Water	Surface Water	5	Packing Condition	Sealed
2	Sample Description	**Khajua Tal**	6	Sample Collected By	Industry Self
3	Sample received date	15.10.2021	7	Analysis Start Date	15.10.2021
4	Sample Quantity	5.0 liters	8	Analysis End Date	20.10.2021

TEST RESULT

Sr. No.	Test Parameter	Unit	Protocol/ Test Method	Result	Range of testing /limit of detection
1.	pH	-	APHA 23rd Ed. 2017-4500 H+	**7.5**	1 - 14
2.	Turbidity	NTU	APHA 23rd Ed. 2017-2130 B	**008**	2 - 40
3.	Electrical Conductivity	µs/cm	APHA 23rd Ed. 2017 - 2552- A + B	**672.6**	1 - 40000
4.	Total Hardness as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2340 C	**180.0**	5.0 - 5000
5.	Alkalinity as $CaCO_3$	mg/l	APHA 23rd Ed. 2017-2320 B	**192.0**	2.0 - 1000
6.	Calcium as Ca	mg/l	IS: 3025 (Part-40): 1991 Reaffirmed: 2019	**38.4**	2.0 - 1500
7.	Magnesium as Mg	mg/l	APHA 23rd Ed. 2017-3500 Mg,B	**20.41**	0.1 - 400
8.	Chloride as Cl	mg/l	APHA 23rd Ed. 2017-4500-Cl B	**18.0**	2.0 - 2000
9.	Fluoride as F	mg/l	APHA 23rd Ed. 2017-4500 F C	**0.43**	0.02 - 15
10.	Sulphate as SO_4	mg/l	APHA 23rd Ed. 2017-4500- SO_4^{2-}	**14.2**	1.0 - 800
11.	Nitrate as NO_3	mg/l	IS: 3025 (Part-34): 1988 Reaffirmed: 2019	**5.6**	1.0 - 400
12.	Phosphate as P_2O_5	mg/l	APHA 23rd Ed. 2017-4500 P, D	**2.55**	0.1 - 200
13.	Hexavalent Chromium as Cr^{6+}	mg/l	APHA 23rd Ed. 2017, 3500 Cr,B	**BDL**	0.1 - 100
14.	Total Kjeldahl Nitrogen	mg/l	APHA 23rd Ed. 2017, 4500 N_{org} B + C	**5.36**	0.1 - 100
15.	Phenolic Compound (as C_6H_5OH)	mg/l	APHA 23rd Ed. 2017-3530 C	**BDL**	0.001 - 0.005
16.	Total Dissolve Solid (TDS)	mg/l	IS: 3025 (Part-16): 1984 Reaffirmed: 2017	**412.2**	10 - 20000
17.	Total Suspended Solid (TSS)	mg/l	APHA 23rd Ed. 2017-2540 D	**51.5**	5.0 - 5000
18.	Dissolve Oxygen	mg/l	APHA 23rd Ed. 2017-4500 O, C	**4.8**	1.0 - 12
19.	Biochemical Oxygen Demand	mg/l	IS: 3025 (Part-44): 1993 Reaffirmed: 2019	**10.2**	1.0 - 90000
20.	Chemical Oxygen Demand	mg/l	APHA 23rd Ed. 2017-5220 B	**36.0**	2.0 - 135000
21.	Sodium as Na	mg/l	APHA 23rd Ed. 2017, 3500 Na	**48.6**	1.0 - 3000
22.	Potassium as K	mg/l	APHA 23rd Ed. 2017, 3500 K, B	**5.0**	1.0 - 200
23.	Aluminium as Al	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.015 - 100
24	Boron as B	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**BDL**	0.05 - 10
25	Iron as Fe	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	**0.25**	0.05 - 50

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Test Report Ref No. ETRC/2110/9440/2021

26.	Manganese as Mn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 20
27.	Lead as Pb	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.01 - 20
28.	Nickel as Ni	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
29.	Cadmium as Cd	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.05 - 20
30.	Total Chromium as Cr	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 50
31.	Copper as Cu	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.03 - 20
32.	Zinc as Zn	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	1.69	0.05 - 30
33.	Arsenic as As	mg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.02 - 5.0
34.	Mercury as Hg	µg/l	APHA 23rd Ed. 2017-3120 B (ICP-OES)	BDL	0.5 - 1000

BDL=Below Detection Limit

..... END OF REPORT.....

- ETRC warrants that all analytical work is conducted professionally in accordance with all applicable standard laboratory practices and that this data reflects our best attempt to generate accurate results for the sample, mentioned in the report as above.
- The result relate only to the items tested.
- ETRC does not assume any liability for any claims or damages related to the quality of parameter analyzed in the results and/or the performance of the equipment constituting to the results.
- All disputes subject to Lucknow jurisdiction.
- This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law and should not be used in any advertising media without our special permission in writing.
- Complain register is available in our laboratory.

4797

Authorized Signatory
(Sandeep Kr Verma)
Lab-Incharge

Authorized Signatory
(Ritu Garg)
QM

Regd. Address: 4/57, Vipul Khand, Gomti Nagar, Lucknow - 226010 (U.P.) Mob: 09897674227

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

196544/UPPCB/Basti(UPPCBRO)/CTO/both/BALRAMPUR/2023 **Date: 28/12/2023**

To,

M/s

BAJAJ HINDUSTHAN SUGAR LIMITED UTRAULA

Villege itaimaida, post shriduttganj, tehsil utraula, distt.- Balrampur,BALRAMPUR,271607

Application Id- 23514745

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 UTRAULA** located at **Villege itaimaida, post shriduttganj, tehsil utraula, distt.- Balrampur,BALRAMPUR,271607.** 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 UTRAULA **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	Sugar Cane Crushing	12000	Metric Tonnes/Day
2	Power Co-generation	33	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	**2400 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	03 Boilers having Capacity 90 TPH each	Baggasse (40 TPH each)	1	Particulate Matter	As per E(P)A Rules, 1986
2	1500 KVA DG Set	Diesel Oil	2	Sulphur Dioxide	As per E(P)A Rules, 1986
3	1500 KVA DG Set	Diesel Oil	3	Sulphur Dioxide	As per E(P)A Rules, 1986
4	500 KVA DG Set	Diesel Oil	4	Sulphur Dioxide	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	3	Sulphur Dioxide	As per E(P)A Rules, 1986
3	2	Sulphur Dioxide	As per E(P)A Rules, 1986

4	4	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 Sugar cane crushing (12000 TCD) using raw material as sugar cane & sulfur etc. and Power Cogeneration of 33 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. The order passed by Hon'ble National Green Tribunal, New Delhi in OA No 912 and 913 of 2022 in the matter of Manav Sewa Sansthan and Ors versus UoI shall prevail on this CTO.

16. 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 12:20:42 +05'30'

Chief Environmental Officer, Circle-6

Copy to:

Regional Officer, U.P. Pollution Control Board, Basti for information and necessary action.

Chief Environmental Officer, Circle-6

RAM KARAN

Digitally signed by RAM KARAN
Date: 2024.01.17 12:20:57 +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 (E)

[See rules 15(2)]

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

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: REG024839

VALID FROM 06/09/2021 TO 05/09/2026

Registration No.: 202108000332			
Name of the Owner	NISHANT SRIVASTAVA		
Address of the Applicant	Vill. Itai maida post-shriduttganj,tehsil utarula, distt.- Balrampur UP	**Application Form Serial No.**	BLMP0821RIN0018
Date of Submission	11/08/2021	**Specimen Signature**	
Company Name	Bajaj Energy Ltd	**Company Address**	Village-Itai Maida,Post-Sriduttaganj,Utraula,Balra
Location Particulars			
District	Balrampur	**Block**	Sridattganj
Plot No./Khasra No.	228M	**Municipality/Corporation**	No
Ward No./Holding No.			NA
Particular of the Existing Well and Pumping Device			
Date of Construction/Sinking of the Well	01/10/2011		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	121.95
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 (m3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		01/11/2011	
Approx. Strainer Length (For Tube Well)	0.00	**Diameter (For Dug Well)**	0.00
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	18.00
Maximum Allowable Annual Extraction of Ground Water (m^3/year):			972000.00
Reason for renewal of N.O.C. **एन.ओ.सी. के नवीनीकरण का कारण**	CGWA NOC valid till 28.08.2021		
Against Case	No	**Recharge Required:**	0.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at SI. (2) for extraction of ground water at a rate not exceeding that as shown at SI. (3j), for Running Hours per day as shown at SI. (3k), and for maximum allowable annual extraction of ground water as shown at SI. (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 0.00 cubic meter, as specified under the application form within the given time period..

Conditions

- (1) Holder of this NOC is hereby directed to fill from 1(A) for registering his/her well within 90 days as mentioned in application form shall only started after registration of his/her NOC.
- (2) In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- (3) 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.
- (4) 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
- (5) 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.
- (6) In case of any change of ownership of the existing well, fresh registration has to be obtained.
- (7) No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at SI. (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.

- (8) In case, any of the particulars I 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.
- (9) 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.
- (10) 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.
- (11) 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	Monitiring 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.
- • 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.
- (11) Any other condition(s) that may be imposed by the concerned Authority.
- (12) In case, any of the particulars I 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 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)/ PHD Chamber of Commerce & Industries 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 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 50 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.

Date :**05/12/2022**

Place:**Balrampur**

This certificate is electronically generated and does not require digital signature

Ground Water Department

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

Form 8 (E)

[See rules 15(2)]

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

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: REG029714

VALID FROM 06/09/2021 TO 05/09/2026

Registration No.: 202108000181

Name of the Owner	NISHANT SRIVASTAVA		
Address of the Applicant	Vill. Itai maida post-shriduttganj,tehsil utarula, distt.- Balrampur UP	**Application Form Serial No.**	BLMP0821RIN0017
Date of Submission	05/08/2021	**Specimen Signature**	
Company Name	Bajaj Energy Limited	**Company Address**	Village - Itaimaida ,PO - Sriduttganj , Utraula Di
Location Particulars			
District	Balrampur	**Block**	Sridattganj
Plot No./Khasra No.	NA	**Municipality/Corporation**	No
Ward No./Holding No.			NA
Particular of the Existing Well and Pumping Device			
Date of Construction/Sinking of the Well	01/10/2010		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	121.95
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 (m3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		01/11/2010	
Approx. Strainer Length (For Tube Well)	0.00	**Diameter (For Dug Well)**	0.00
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 (m^3/year):			756000.00
Reason for renewal of N.O.C. **एन.ओ.सी. के नवीनीकरण का कारण**	cgwa noc valid upto 28082021		
Against Case	No	**Recharge Required:**	0.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at SI. (2) for extraction of ground water at a rate not exceeding that as shown at SI. (3j), for Running Hours per day as shown at SI. (3k), and for maximum allowable annual extraction of ground water as shown at SI. (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 0.00 cubic meter, as specified under the application form within the given time period..

Conditions

- (1) Holder of this NOC is hereby directed to fill from 1(A) for registering his/her well within 90 days as mentioned in application form shall only started after registration of his/her NOC.
- (2) In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- (3) 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.
- (4) 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
- (5) 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.
- (6) In case of any change of ownership of the existing well, fresh registration has to be obtained.
- (7) No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at SI. (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.

- (8) In case, any of the particulars I 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.
- (9) 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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- • 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	Monitiring 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.
- • 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.
- (11) Any other condition(s) that may be imposed by the concerned Authority.
- (12) In case, any of the particulars I 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 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)/ PHD Chamber of Commerce & Industries 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 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 50 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.

Date :**05/12/2022**

Place:**Balrampur**

This certificate is electronically generated and does not require digital signature

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Ground Water Department

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

Annexure(13.3)

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: NOC029570

VALID FROM 18/10/2021 TO 17/10/2026

Name of the Applicant	NISHANT SRIVASTAVA		
Address of the Applicant:	Vill. Itai maida post-shriduttganj,tehsil utarula, distt.- Balrampur UP		
Company Name:	BAJAJ ENERGY LIMITED	**Company Address**	vill:Itaimaida,utraula,balrampur UP
Serial No. of Application Form	BLMP0821NIN0011	**Date of Submission**	12/08/2021
Specimen Signature of the User:			

Location particulars:

District	Balrampur	**Block**	Sridattganj
J.L. No		**Plot No.**	228M
Municipality/Corporation	No	**Ward No.**	na
Holding No.			na
Rate of Withdrawal (m^3/hr.)	180.00	**Date of Energization (In Case of Electric Pump)**	15/04/2020

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:	30.00	**Operational Device**	Electric Motor
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	**Recharge Required:**	0.00

- This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at SI. (2) for extraction of ground water at a rate not exceeding that as shown at SI. (3j), for Running Hours per day as shown at SI. (3k), and for maximum allowable annual extraction of ground water as shown at SI. (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 0.00 cubic meter, as specified under the application form within the given time period..

GENERAL CONDITIONS

- Holder of this NOC is hereby directed to fill from 1(A) for registering his/her well within 90 days as mentioned in application form shall only started after registration of his/her NOC.
- 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 SI. (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 I 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.
- 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	Monitiring 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 I 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)/ PHD Chamber of Commerce & Industries 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 shall be mandatory for industries drawing/ proposing to draw more than 10 m^3 /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 50 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 m^3 /day. The water from STP shall be utilized for toilet flushing, car washing, gardening etc

Date :**28/12/2022**

Place:**Balrampur**

This certificate is electronically generated and does not require digital signature



उत्तर प्रदेश UTTAR PRADESH CA 022079

अनापत्ति प्रमाण पत्र

मैं शकील खां ग्राम प्रधान इटईमेदा विकास खण्ड श्रीदत्तगंज जनपद बलरामपुर उ0प्र0 तस्दीक करता हूँ कि पंचायत की सहमति से लिये गये निर्णय के अनुसार हमारे ग्राम में खाता संख्या 322 खसरा /गाटा नं0 403, 547च में स्थित तालाब जिसका क्षेत्रफल 26.426 हे0है को मे0बजाज इनर्जी लिमिटेड इटईमेदा जनपद बलरामपुर उ0प्र0 को रेन वाटर हर्वेस्टिंग रिचार्ज के लिये अधिग्रहित करता हूँ तो इस ग्राम की पंचायत को कोई आपत्ति नही है।

मैं यह भी तस्दीक करता हूँ कि यह तालाब किसी अन्य व्यक्ति या अन्य कम्पनी को अधिग्रहित नही किया गया एवं न ही भविष्य में किया जायेगा।

ग्राम पंचायत महुआ इटईमेदा विकास खण्ड श्रीदत्तगंज जनपद बलरामपुर
प्रधान



उत्तर प्रदेश UTTAR PRADESH

CA 022080

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ग्राम प्रधान

ग्राम इटईमैदा

विकासखण्ड श्रीदत्तगंज

जनपद बलरामपुर ।

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दिनांक:-

उद्धरण खतौनी

उद्धरण क्रमांक : 17381420200236

ग्राम क्रमांक : 173814 ग्राम का नाम / परगना : इटई मैदा(उतरौला) तहसील : उतरौला जनपद : बलरामपुर फसली वर्ष : 1422-1427 भाग : 1

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			102	0.0450			
			128	0.0110			
			150ख	2.5330			
			160	0.0200			
			246	0.0080			
			264	0.0320			
			267	0.0610			
			268	0.0160			

312	0.0120
325च	0.0570
341	0.0530
356	0.0850
363	0.2950
369	0.1050
375	0.0930
378	0.0770
391	0.0690
403	2.5820
419	0.0970
445	0.0280
452ग	0.2710
499ख	0.2830
506	0.0360
520ख	0.0080
540	0.0400
547च	23.8440
570	0.0450
595	0.0690
614	0.1540
645	0.1170
662ख	0.0400
709ख	0.9470
743ख	0.7570
744	0.0120
385/756	0.1010
78	0.0240
498मि	0.0810
499कमि	0.3640
547कमि	0.1610

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
(Utraula Plant)
Village- Itai Maida, Post- Shriduttganj
Tehsil Utraula, Distt. - Balrampur, U.P



BY

PHD Chamber of Commerce and Industry
PHD House, 4/2 Siri Institutional Area
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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, Utraula Unit, Balrampur in line with CGWA Notification dated 24/09/2020.

We are grateful to Dr. Amitosh Verma (Vice President- EHS), Mr. Varun Jhamb (Energy Manager-Utraula), 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)

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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, Utraula 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

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, Utraula 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 28/07/2023 to 29/07/2023.

<table>
<tr><td colspan="2">Project Title:</td><td colspan="2">PHDCCI Report Number:</td></tr>
<tr><td colspan="2">Water Audit at M/s Bajaj Energy Limited, Utraula Unit
Village- Itai Maida, Post- Shriduttganj, Tehsil Utraula, Distt. - Balrampur, U.P.</td><td colspan="2">2023-24/PHDCCI/S/W/008</td></tr>
<tr><td colspan="4">Client:</td></tr>
<tr><td colspan="4">M/s Bajaj Energy Limited</td></tr>
<tr><td colspan="4">Contact Person:</td></tr>
<tr><td colspan="4">Dr. Amitosh Verma (Vice President- EHS)</td></tr>
<tr><td colspan="2">Date of Audit:</td><td colspan="2">Source of Water:</td></tr>
<tr><td colspan="2">28/07/2023 to 29/07/2023</td><td colspan="2">Groundwater</td></tr>
<tr><td colspan="2">Date of this Report:</td><td colspan="2">Date of Approval:</td></tr>
<tr><td colspan="2">08/11/2023</td><td colspan="2">12/01/2024</td></tr>
<tr><td>Work Carried out by:
(Team Composition)</td><td>Mohit Kumar
Pushpendra Yadav
Rahul Sharma
Akhilesh Yadav</td><td>Team Leader
Team Member
Team Member
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="3">  </td></tr>
<tr><td colspan="2">Dr. Ranjeet Mehta
(Executive Director, PHDCCI)</td><td>Date: 12/01/2024</td></tr>
</table>

M/s Bajaj Energy Limited (BEL), Utraula 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 vide Registration No.- 202108000332, 202108000181 and it is valid up to 05/09/2026. Borewell 1,2&3 are having rated capacity of 30 HP with discharge capacity of 180m3/hr. As per GWD, Govt. of U.P, the running hrs. of each pump shall not be exceeded by 18hrs/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 (97200m3/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 7020m3/day (21,06,000 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 764127m3/year (2547m3/day), 722575m3/year (2409m3/day) & 810877m3/year (2703m3/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 4518m3/day. Out of total, Fresh water through borewells are about 3937m3/day (87%) and ETP Treated Water is about 582m3/day (13%). **Thus, Plant is under compliance of abstracting ground water less than 7020m3/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 4m3 (0.1%), CT Makeup is around 3897m3 (86.3%), Boiler Makeup is around 21m3 (0.5%), WTP- RO Reject, Backwash & Regeneration is around 13.7m3 (0.3%). The treated water consuming areas are Firefighting of around 26m3 (0.6%), Ash quenching is around 87m3 (1.9%), Horticulture/Gardening is about 47m3 (1.0%), Coal Yard is around 145m3 (3.2%), Road dust suppression/sprinkling is around 64m3 (1.4%) & Balanced ETP treated water is stored in Reservoir or supplied to farmers for irrigation is about 212m3 (4.7%).

As per GWD, U.P NOC, M/s Bajaj Energy Limited (BEL), Utraula 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), Utraula 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), Utraula 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), Utraula 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 2Nos. of RWH structures within plant premises each having installed capacity of 37m3 & 20.4m3 respectively to recharge the generated runoff to ground. Team also noticed, 1 RWH structure is being connected with Rooftop near condenser 1/Chiller while others are connected with Storm water line. 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), Utraula Unit, has been granted Consent to Operate (CTO) issued by Uttar Pradesh Pollution Control Board vide Ref No.- **140717/UPPCB/Basti(UPPCBRO)/CTO/water/BALRAMPUR/2021** 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 582m3/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), Utraula 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	332522.5	307608.5	375022
2	Borewell 2	m3/year	431604.5	400150.5	286748
3	Borewell 3	m3/year	0	14816	149107
4	**Total Ground Water Abstraction, A**	**m3/year**	**764127**	**722575**	**810877**
5	**Domestic**	m3/year	**489**	**940**	**1151**
6	**Industrial**	m3/year	**763638**	**721635**	**809726**
7	ETP Treated Water, B	m3/year	62336	56452	78619
8	No. of Working days, C	Nos./year	300	300	300
9	**Ground water abstraction per day, D= (A/C)**	**m3/day**	**2547**	**2409**	**2703**
10	**ETP treated water per day, E= (B/C)**	**m3/day**	**208**	**188**	**262**

Sr. No.	Description	UOM	FY 2020-21	FY 2021-22	FY 2022-23
11	Production (Generation), F	MU/year	261.34	242.17	282.76
12	**Specific Water Consumption (SWC) of Power Generation, G= [A/(F X 1000)]**	**m3/MWh**	**2.92**	**2.98**	**2.87**

SWC per unit generation w.r.t Total Fresh water intake in FY 2022-23 has been improved from FY 2021-22 because of water conservation because of water conservation initiatives taken by the plant

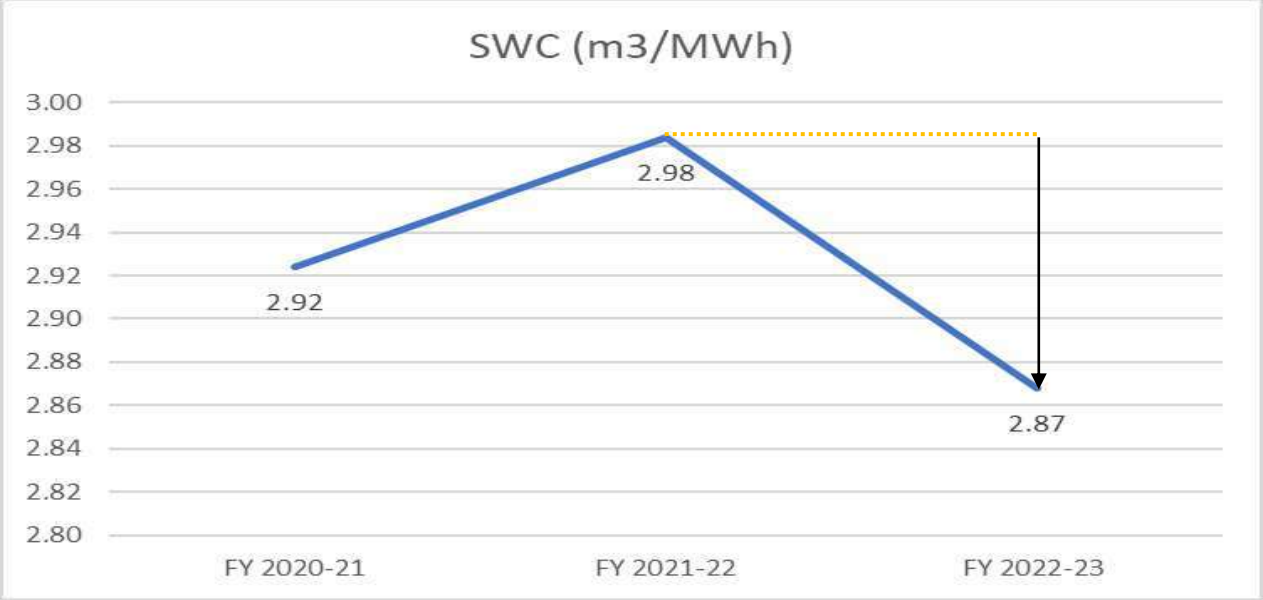


Figure: Specific water consumption per Unit of Power Generation (m3/MWh)

Following are the initiatives already adopted by Plant Management to reduce the fresh Water/Treated Water.

*Reuse of ETP treated water in Dust Suppression, Firefighting, Ash Silo areas etc.

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 2Nos. of RWH structures within plant premises each having installed capacity of 37m3 & 20.4m3 respectively to recharge the generated runoff to ground. Team also noticed, 1 RWH structure is being connected with Rooftop & stormwater line near condenser 2 while 2nd are connected with Storm water line. Team noticed; Rooftop, Road/paved area, Open land & green belt runoff available from the plant is about 3859 m3/year, 36680 m3/year & 17592 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.	5	1930
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 37m3/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 11m3/day treated water used in backwash of filters & around 7m3/day treated water utilized 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.	19	5700
RO Reject water supplied to Storage tank/ETP Storage Lagoon directly for reuse	During Audit, team noticed RO Reject water of about 8m3/day and Backwash/Regeneration of filters are around 5m3 has been discharged to drain line for treatment in ETP. This results in load on ETP treatment.	It is recommended that RO reject water blended with Fresh water can be used in domestic use for flushing & Wash basin Taps. Secondly, RO Reject water can be stored directly to ETP lagoon further it can be utilized after treatment.	8	2400
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.		

Description	Key Observations	Recommendations	Water savings (m3)/ day	Annual water savings (m3)/ year
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.		
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 system.		
	Total Water consumed within Plant (Ground water + ETP Treated Water)		4518 m3/day	
	Total Ground water abstracted for industrial use		**3937 m3/day**	
	As per GWD NOC of 3 Nos. of Borewell, Cumulative Ground water per day withdrawal limit for industrial purpose		**7020 m3/day**	
	% utilization of Ground water w.r.t per day total withdrawal limit		**56% {44% below of withdrawal limit)**	
	Total Fresh water savings potential		32.3 m3/day	
	Thus, Total Fresh water savings in Plant by implementation of measures		0.8%	

Remarks: It is estimated that by implementing suggested schemes, M/s Bajaj Energy Limited (BEL), Utraula Unit can reduce its freshwater water consumption by about 32.3m3/day (0.8%).



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, Utraula 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), Utraula 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, Utraula 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, Utraula 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, Utraula Unit.

1.3 Brief Description about the plant:

M/s Bajaj Energy Limited, Utraula Unit has installed 90 MW (2 X 45MW) Power Plant with Water Cooled condenser for Power Plant. BEL has commissioned Unit #1 in year 3rd April 2012 & Unit #2 in year 24th March 2012.

Utraula 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 Utraula Unit is shown below;

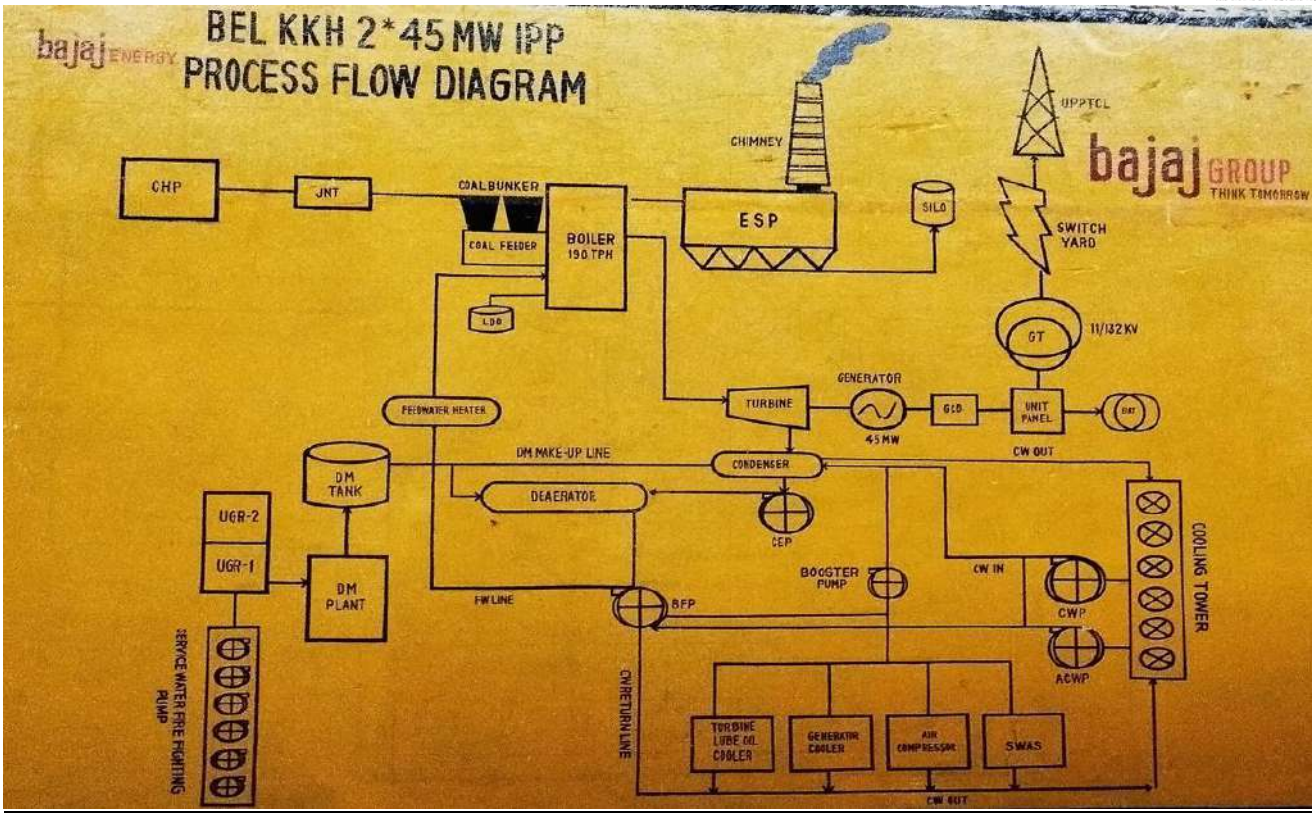




Figure 1: Process Flow chart & Location of Plant



CHAPTER 2

Scope of Work

2. SCOPE OF WORK

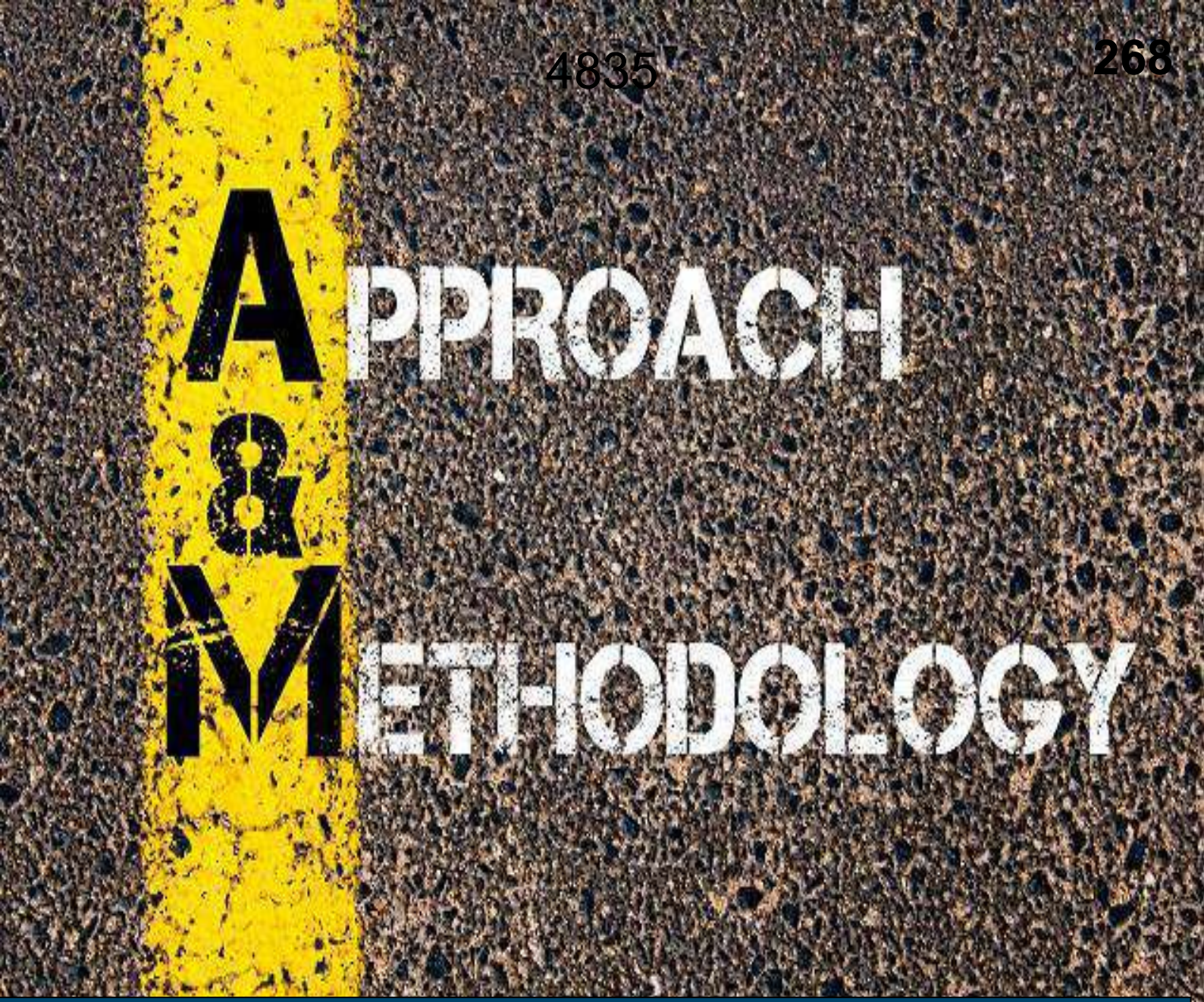
The main objective of the study was to identify the water uses & water saving opportunities and to demonstrate water conservation at BEL, Utraula Unit. Scope of work of the study includes the following:

- 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, Utraula 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, Utraula Unit. PHDCCI team visited plant on 28/07/2023 to 29/07/2023 for the field measurement and conducting the audit. The broad methodology adopted for the Water Audit at BEL, Utraula 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, Utraula Unit is furnished below.

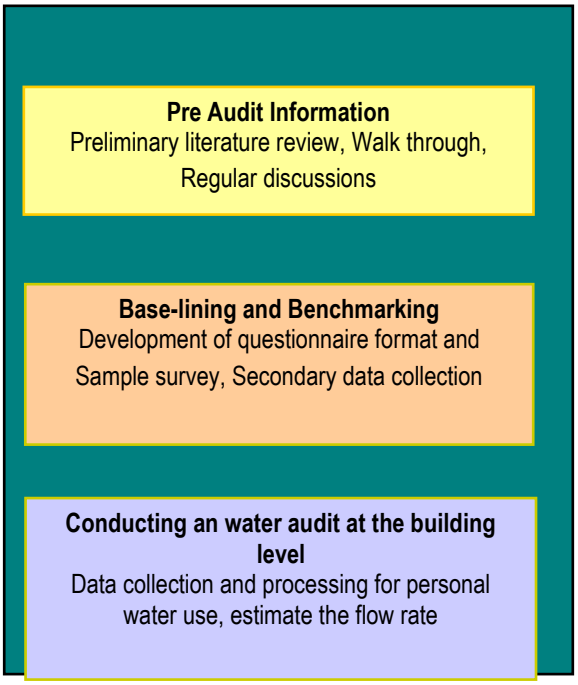
3.1 Pre Audit Information

- 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, Utraula 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, Utraula 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), Utraula 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 vide Registration No.- 202108000332, 202108000181 and it is valid up to 05/09/2026. Borewell 1,2&3 are having rated capacity of 30 HP with discharge capacity of 180m3/hr. As per GWD, Govt. of U.P, the running hrs. of each pump shall not be exceeded by 18hrs/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 (97200m3/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 7020m3/day (21,06,000 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:

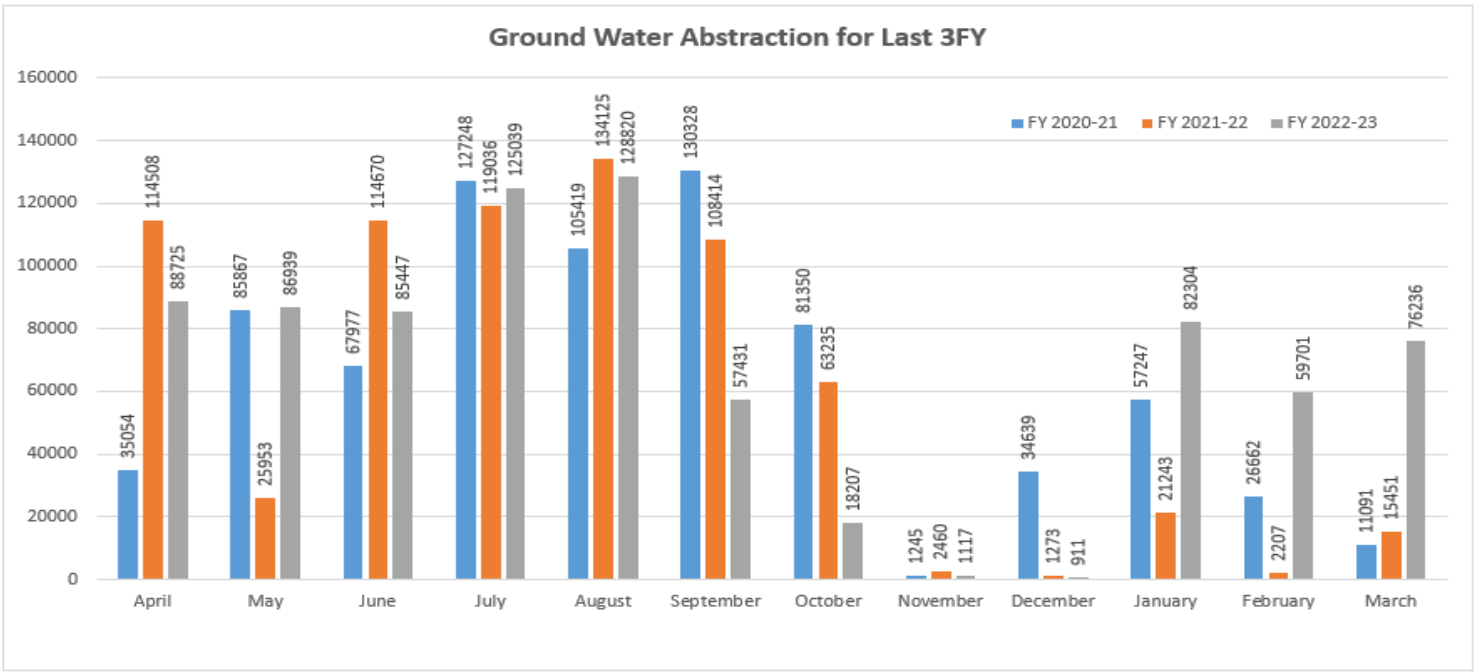
Table 1: Fresh Water Withdrawal Pattern for Last 3 FY

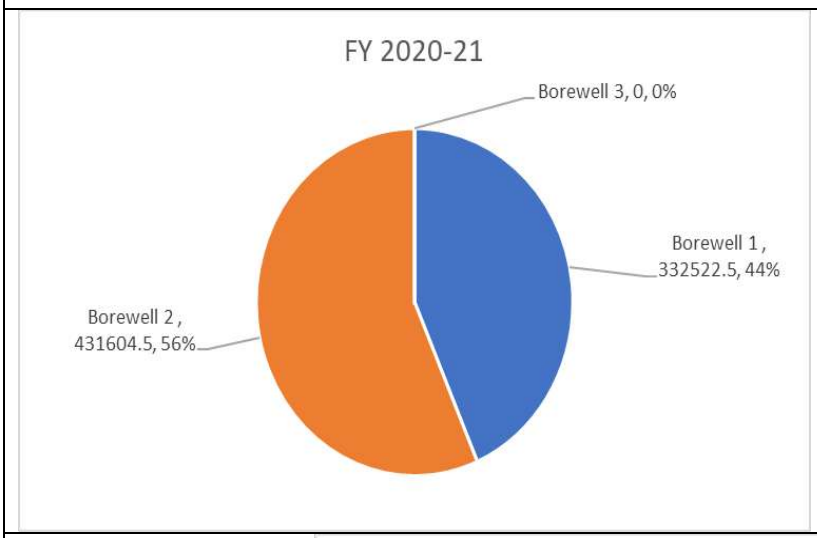
	FY 2020-21					
Year	Borewell- 1 (m3/month)	Borewell- 2 (m3/month)	Borewell- 3 (m3/month)	Total Fresh Water Intake to Plant (m3/month)	Domestic (m3/month)	Industrial (m3/month)
April	14229	20825	0	35054	0	35054
May	36030	49837	0	85867	0	85867
June	33848	34129	0	67977	0	67977
July	52821	74427	0	127248	0	127248
August	41317	64102	0	105419	0	105419
September	55463	74865	0	130328	0	130328
October	40547	40803	0	81350	120	81230
November	562	683	0	1245	30	1215
December	17033.5	17605.5	0	34639	37	34602
January	20669	36578	0	57247	64	57183
February	13628	13034	0	26662	83	26579
March	6375	4716	0	11091	155	10936
Total	332522.5	431604.5	0	764127	489	763638

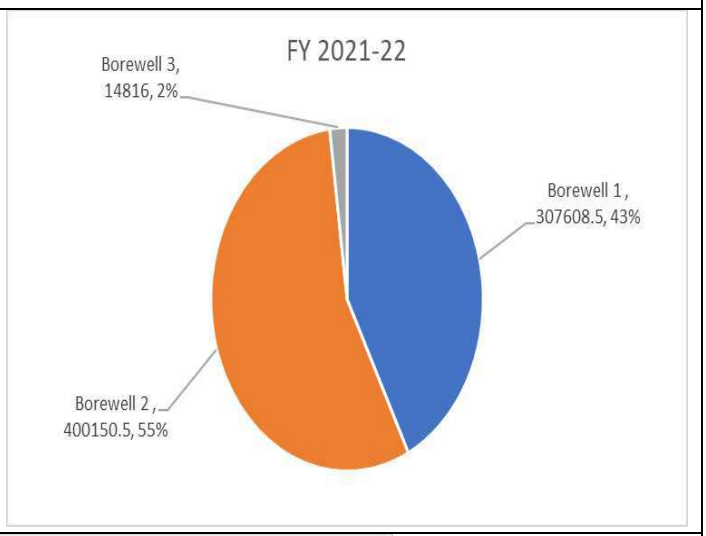
	FY 2021-22					
Year	Borewell- 1 (m3/month)	Borewell- 2 (m3/month)	Borewell- 3 (m3/month)	Total Fresh Water Intake to Plant (m3/month)	Domestic (m3/month)	Industrial (m3/month)
April	49425	65084	0	114508	60	114448
May	8858	17095	0	25953	107	25846
June	50900	63771	0	114670	32	114638
July	52953	66083	0	119036	65	118971
August	56138	77988	0	134125	44	134081
September	44492	63922	0	108414	36	108378
October	30208	33027	0	63235	68	63167
November	17	1038	1405	2460	106	2354
December	7	270	996	1273	56	1217
January	8820	6844	5579	21243	134	21109
February	158	309	1740	2207	122	2085
March	5634	4721	5096	15451	110	15341
Total	307608.5	400150.5	14816	722575	940	721635

	FY 2022-23					
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	44515	30259	13951	88725	52	88673
May	39734	32746	14459	86939	114	86825
June	36966	32669	15812	85447	120	85327
July	59891	41240	23908	125039	125	124914
August	58038	46041	24741	128820	150	128670
September	23017	21960	12454	57431	132	57299
October	8987	5729	3491	18207	40	18167
November	10	11	1096	1117	53	1064
December	34	10	867	911	51	860
January	40519	28188	13597	82304	101	82203
February	27727	20984	10990	59701	98	59603
March	35584	26911	13741	76236	115	76121
Total	375022	286748	149107	810877	1151	809726

Note: Information sourced from plant data







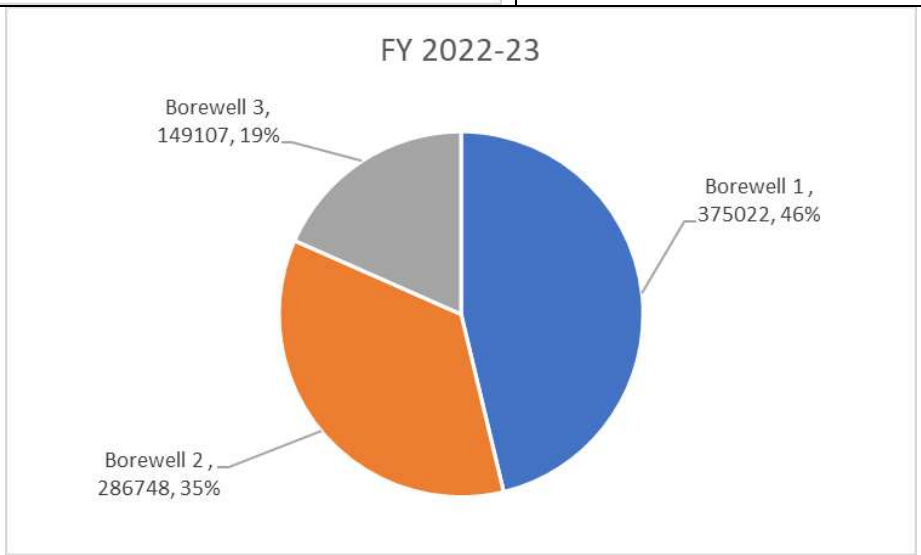


Figure 2: Graphical representation of abstracted ground water for last 3 FY

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 764127m3/year (2547m3/day), 722575m3/year (2409m3/day) & 810877m3/year (2703m3/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 for Last 3 Year

Year	FY 2020-21	FY 2021-22	FY 2022-23
April	10.44	39.451	30.4
May	28.006	8.189	29.2
June	22.798	39.82	29.2
July	44.397	40.31	43.5
August	36.347	48.651	44.3
September	46.327	36.943	18.8
October	28.235	20.937	6.1
November	0	0	0.0
December	12.358	0	0.0
January	21.81	7.533	32.1
February	9.606	0	22.1
March	1.011	0.336	27.0
Total	261.335	242.17	282.76

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/MU) for Last 3 FY

Sr. No.	Description	UOM	FY 2020-21	FY 2021-22	FY 2022-23
1	Borewell 1	m3/year	332522.5	307608.5	375022
2	Borewell 2	m3/year	431604.5	400150.5	286748
3	Borewell 3	m3/year	0	14816	149107
4	**Total Ground Water Abstraction, A**	**m3/year**	**764127**	**722575**	**810877**
5	**Domestic**	m3/year	**489**	**940**	**1151**
6	**Industrial**	m3/year	**763638**	**721635**	**809726**
7	ETP Treated Water, B	m3/year	62336	56452	78619
8	No. of Working days, C	Nos./year	300	300	300
9	**Ground water abstraction per day, D= (A/C)**	**m3/day**	**2547**	**2409**	**2703**
10	**ETP treated water per day, E= (B/C)**	**m3/day**	**208**	**188**	**262**
11	Production (Generation), F	MU/year	261.34	242.17	282.76
12	**Specific Water Consumption (SWC) of Power Generation, G= [A/(F X 1000)]**	**m3/MWh**	**2.92**	**2.98**	**2.87**

**It is noticed from above table that SWC per unit generation w.r.t Total Fresh water intake in FY 2022-23 has been improved from FY 2021-22.*

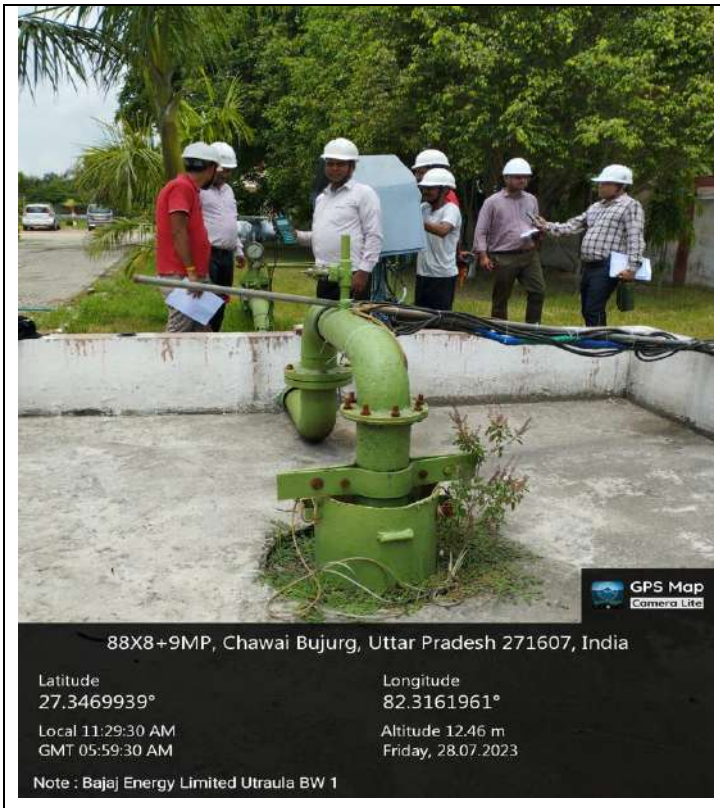
**It is also noticed that Out of total abstracted water in FY 2022-23, domestic utilization is around 0.1% and Industrial utilization is around 99.9%.*

4.2 WATER SOURCES

The main source of process and domestic water usage at Bajaj Energy Limited, Utraula 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

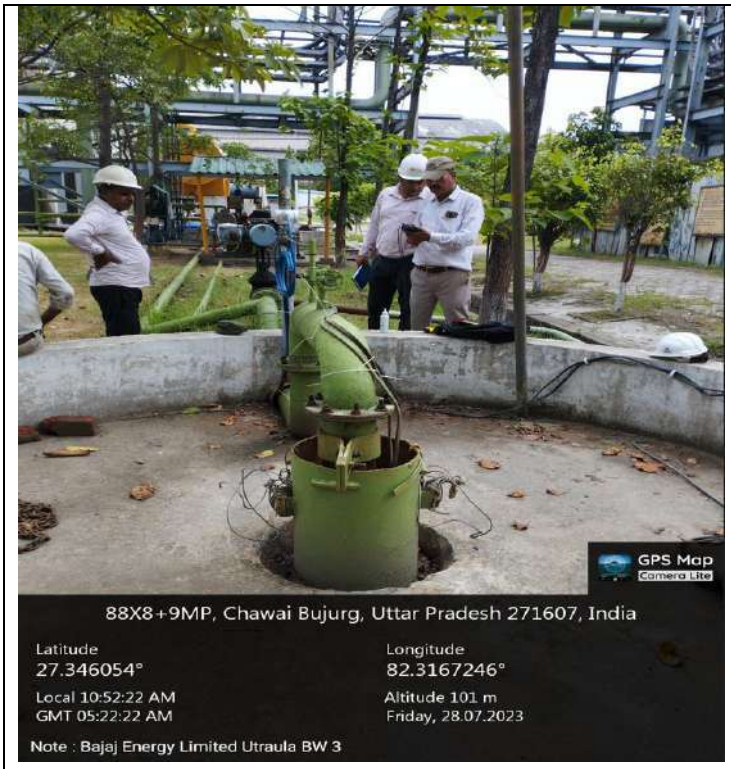
Sr. No.	Type of Structure	Borewell 1	Borewell 2	Borewell 3
1	Location of Structure	Near Time Office	Near ETP Gate	Near DM Plant
2	Depth (meter)/ Diameter (millimeter)	121.95	121.95	121
3	Metered (Yes/No)	Yes	Yes	Yes
4	Meter No	S5L307430	S5L307431	S5L307428
5	Metered Condition (Analog/Digital)	Digital	Digital	Digital
6	TDS (mg/l)	430	427	370
7	Rated Capacity (m3/hr)	180	180	180
8	Rated Pump Power (HP)	30	30	30
9	Rated Running Hrs (Hrs./day)	18	14	7



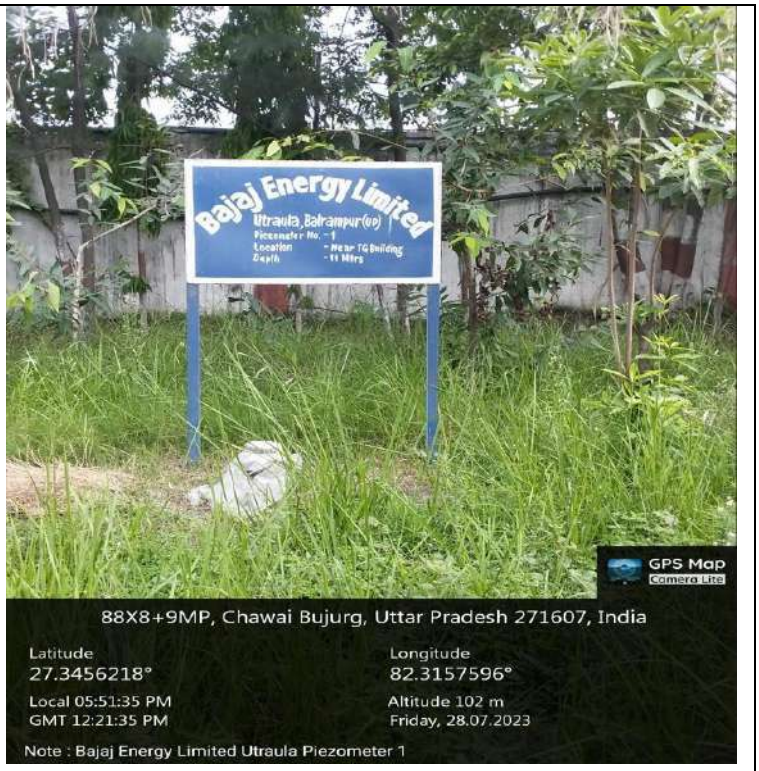
Borewell-1 (Near Time Office)



Borewell-2 (Near ETP Gate)



Borewell-3 (Near DM Plant)



Piezometer 1 (Project office (Near TG Building)



Measured Condition



Cooling Tower

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, Utraula, 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 domestic purpose & Boiler makeup. 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, Utraula Unit provided below:

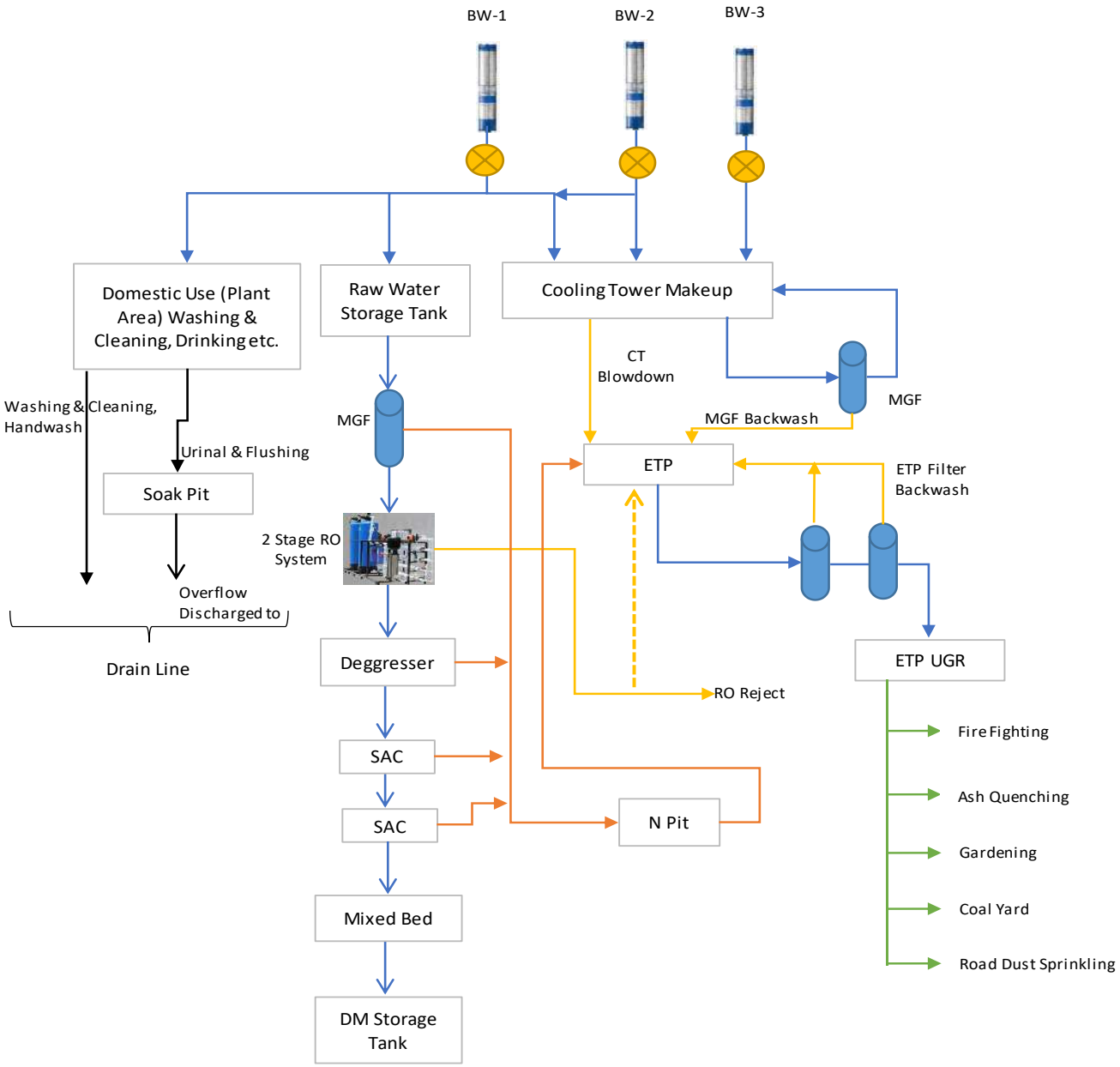


Figure 3: Water Distribution Network of Bajaj Energy Limited, Utraula Unit

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 4518m3/day. Out of total, Fresh water through borewells are about 3937m3/day (87%) and ETP Treated Water is about 582m3/day (13%). **Thus, Plant is under compliance of abstracting ground water less than 7020m3/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.

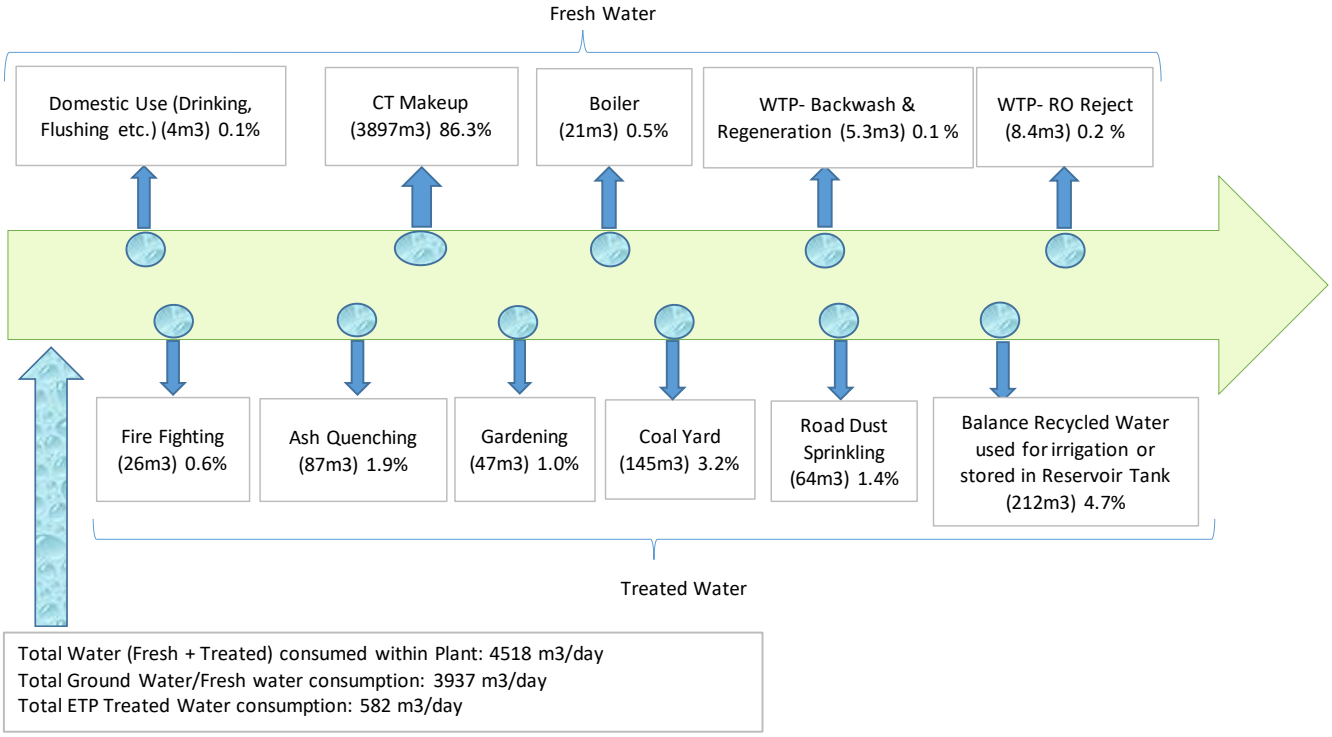


Figure 4: Water Balance Diagram

It is evident from the above water balance diagram is that the Fresh water consuming areas are Domestic Use (TG building, DM Plant, Security area & CHP area) of about 4m3 (0.1%), CT Makeup is around 3897m3 (86.3%), Boiler Makeup is around 21m3 (0.5%), WTP- RO Reject, Backwash & Regeneration is around 13.7m3 (0.3%). The treated water consuming areas are Firefighting of around 26m3 (0.6%), Ash quenching is around 87m3 (1.9%), Horticulture/Gardening is about 47m3 (1.0%), Coal Yard is around 145m3 (3.2%), Road dust suppression/sprinkling is around 64m3 (1.4%) & Balanced ETP treated water is stored in Reservoir or supplied to farmers for irrigation is about 212m3 (4.7%).

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	Working	Submersible Pump	Yes	DWFM	169	2070
2	Borewell 2	Working	Submersible Pump	Yes	DWFM	132	1219
3	Borewell 3	Working	Submersible Pump	Yes	DWFM	194	648
	Total						3937

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	2070	46%
2	Borewell 2	Fresh Water	1219	27%
3	Borewell 3	Fresh Water	648	14%
4	ETP Treated Water	Recycled Water	582	13%
5	Total Water Consumed within Plant		4518	100%

From above it is observed that the total ground water withdrawal is about 3937m3/Day which complies with the total daily limit of 7020 m3/Day as per GWD NOC.

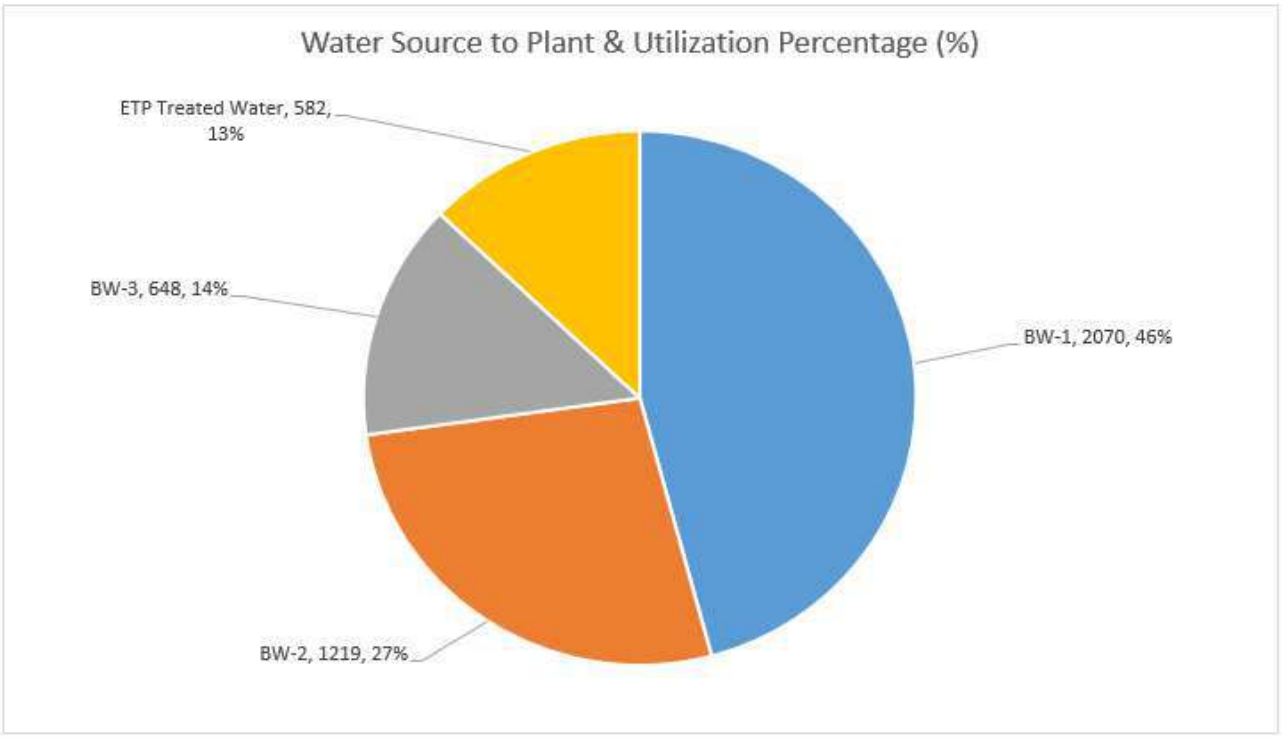


Figure 5: Source of Plant & their utilization percentage

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	4	0.1%
2	Cooling Tower Makeup	Fresh Water	3897	86.3%
3	Boiler	Fresh Water	21	0.5%
4	WTP- Backwash & Regeneration	Fresh Water	5.3	0.1%
5	WTP- RO Reject	Fresh Water	8.4	0.2%
6	Fire Fighting	Recycled Water	26	0.6%
7	Ash Quenching	Recycled Water	87	1.9%
8	Horticulture/Gardening	Recycled Water	47	1.0%
9	Coal Yard	Recycled Water	145	3.2%
10	Road Dust Sprinkling	Recycled Water	64	1.4%
11	Balance Recycled Water used for irrigation or stored in Reservoir Tank	Recycled Water	212	4.7%
	Total		4518	100.0%

As evident from the area wise water consumption table, the major water consumption in Plant is shown below in Pie chart.

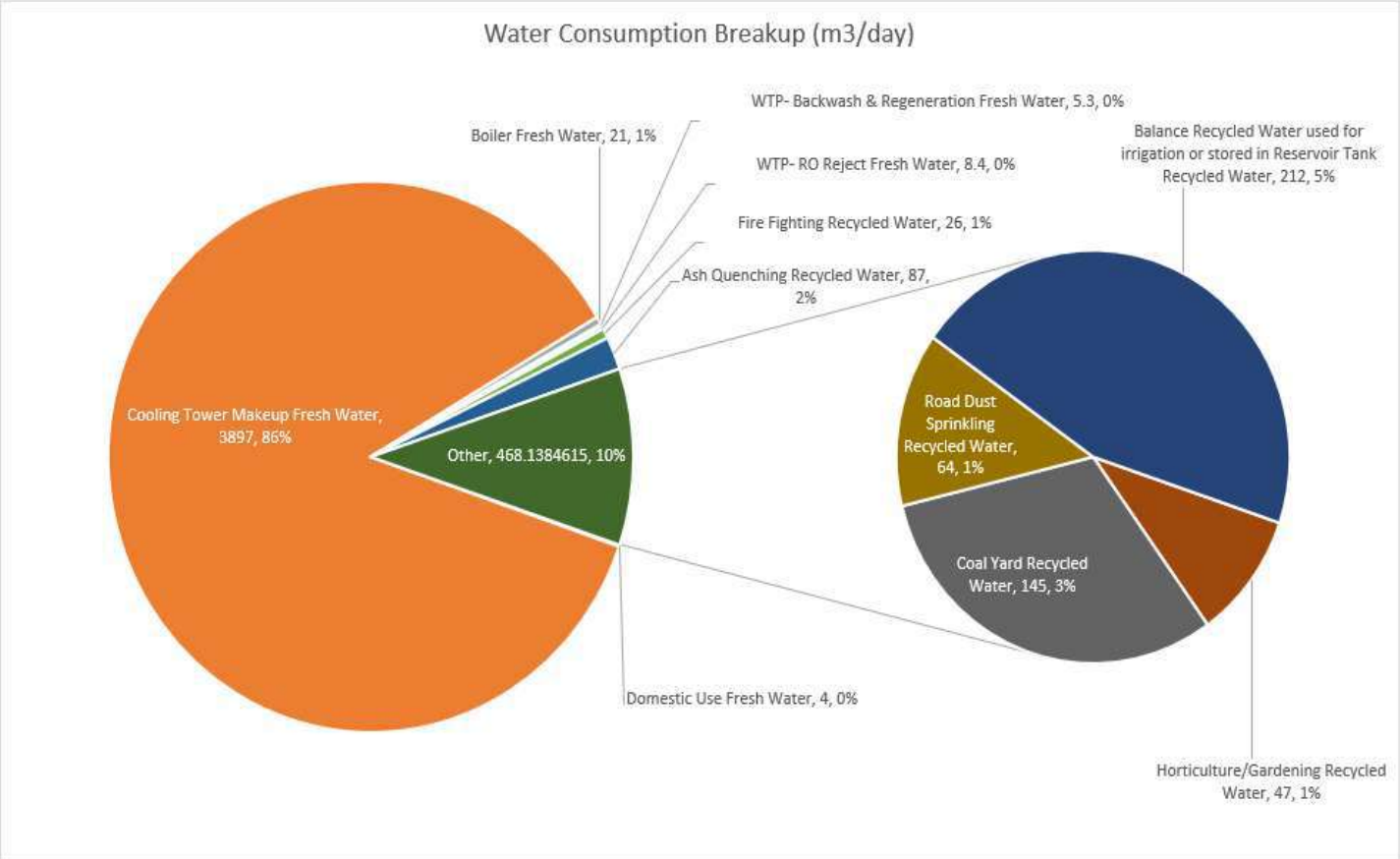


Figure 6: Source of Plant & their utilization percentage

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. 1.9/m3, Rs. 1.8/m3 and Rs. 1.8/m3 respectively. The detail of raw water per m3 cost is provided in below table.

Table 8: Per KL 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	764127	722575	810877
2	Man Power Cost	Rs.	3,82,375	3,26,402	3,36,176
3	Maintenance Cost	Rs.	20,000	21,000	22,000
4	Energy Cost (Rs.)	Rs.	3,57,304	3,31,661	3,68,238
5	Ground Water Pumping Cost, A	Rs./m3	1.0	0.9	0.9
6	Ground Water Abstraction Cost, B	Rs./m3	0.9	0.9	0.9

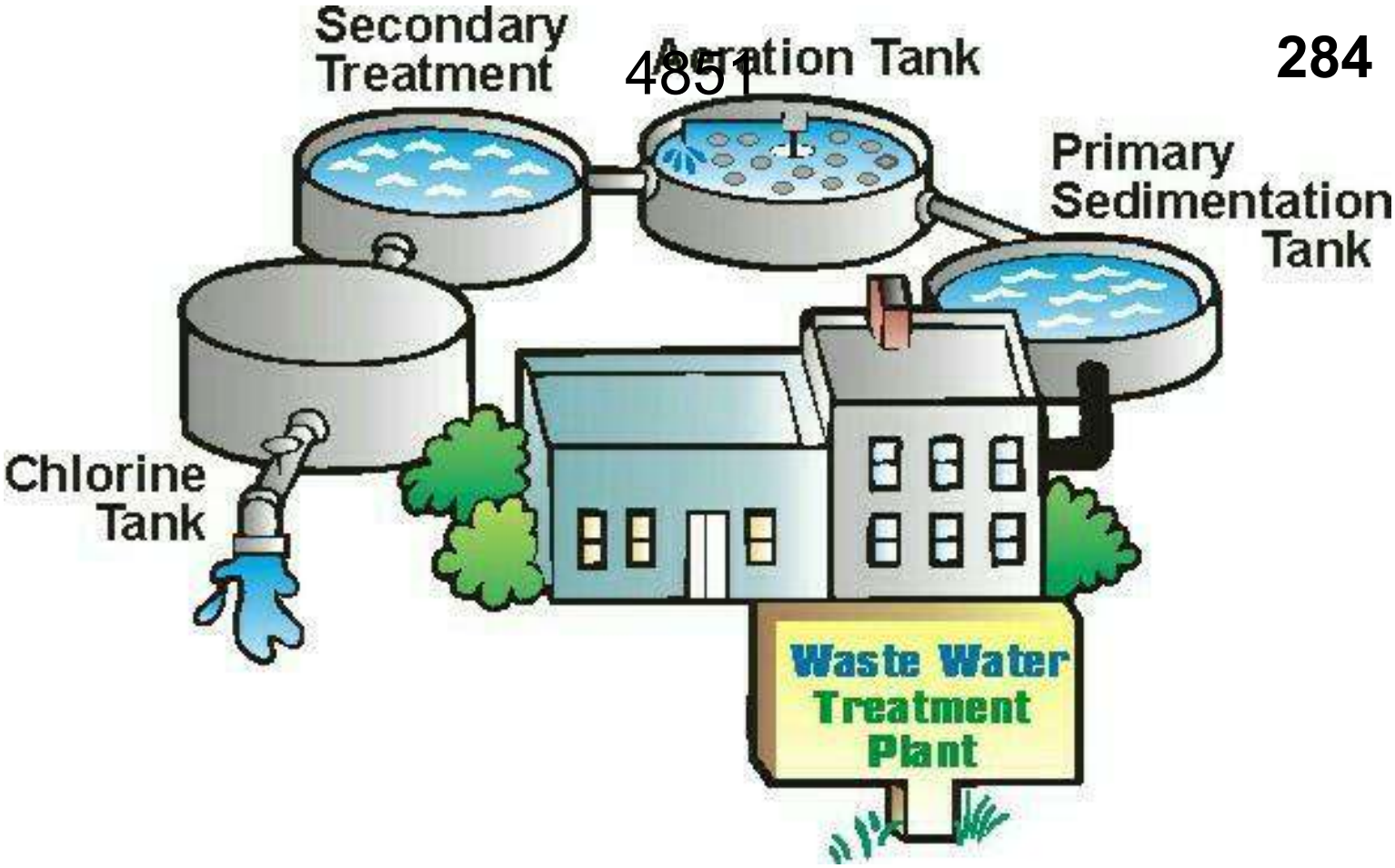
Thus, Total Ground water cost including Abstraction & Pumping Cost is calculated to be about Rs. 1.8/m3 for FY 2022-23.

4.7 CALIBRATION CERTIFICATES

The Bajaj Energy Limited (BEL), Utraula 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. The audit team has found that all water meters are in working conditions and verify the meter reading of water meters with portable ultrasonic meter readings during measurement. Further, the BEL, Utraula 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 calibration details of all water meters are provided in below table and the copy of calibration certificate 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)	Make & Model	Meter Sr. No/ Id. No.	Calibration Certificate No	Date of Calibration	Due Date of Calibration
1	Borewell No. 1	Yokogawa	S5L307430	220926A/NN-101	26.09.22	25.09.23
2	Borewell No. 2	Yokogawa	S5L307431	220926A/NN-102	27.09.22	26.09.23
3	Borewell No. 3	Yokogawa	S5L307428	220926A/NN-103	28.09.22	27.09.23
4	MGF Inlet	Yokogawa	S5L307502	NA	NA	NA
5	RO Permeate	Rosemount	6031892	NA	NA	NA
6	RO Reject-1	Rosemount	6031922	NA	NA	NA
7	RO Reject-2	Rosemount	6203357	NA	NA	NA
8	ETP I/L	MANAS Micro System PVT	S5L307427	NA	NA	NA
9	ETP O/L (Manual)	Aquamet	19013588	NA	NA	NA
10	CT Blowdown	Yokogawa	AXFA14G	NA	NA	NA



CHAPTER 5

Water Treatment Practices

5 WATER TREATMENT PRACTICES

The main source of Process & domestic water usage at M/s Bajaj Energy Limited (BEL), Utraula 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 & to farmers for irrigation.

5.1 RAW/FRESH WATER TREATMENT:

M/s BEL Utraula 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.

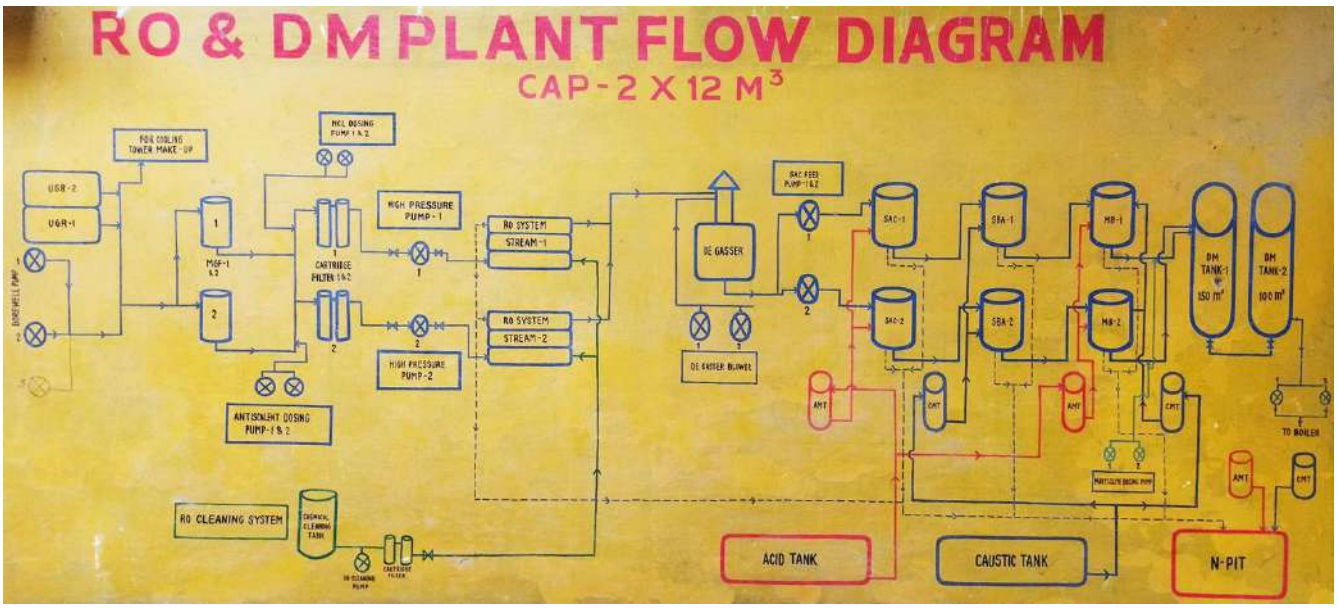


Figure 7: Water Treatment Plant process flow chart

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)	RO Reject Water (m3/month)	Total Backwash & Regeneration Water (m3/month)
April	889	472	169	248
May	2193	1190	408	595
June	2140	1233	416	491
July	2137	1156	472	509
August	2032	1367	483	182
September	1537	1032	367	138

	FY 2020-21			
Year	Total Raw Water Intake for Treatment (m3/month)	Total DM Water for Process (m3/month)	RO Reject Water (m3/month)	Total Backwash & Regeneration Water (m3/month)
October	711	472	168	71
November	407	247	95	65
December	1161	844	286	31
January	982	662	240	80
February	348	127	83	138
March	1188	812	293	83
Total	15725	9614	3480	2631

	FY 2021-22			
Year	Total Raw Water Intake for Treatment (m3/month)	Total DM Water for Process (m3/month)	RO Reject Water (m3/month)	Total Backwash & Regeneration Water (m3/month)
April	1010	647	241	122
May	552	372	131	49
June	1633	1131	397	105
July	2060	1387	497	176
August	1708	1156	414	138
September	1767	1201	432	134
October	1718	1142	421	155
November	296	166	71	59
December	193	104	47	42
January	1109	726	289	94
February	322	172	76	74
March	1009	613	248	148
Total	13377	8817	3264	1296

	FY 2022-23			
Year	Total Raw Water Intake for Treatment (m3/month)	Total DM Water for Process (m3/month)	RO Reject Water (m3/month)	Total Backwash & Regeneration Water (m3/month)
April	1205	824	302	79
May	1402	930	349	123
June	1586	1060	400	126
July	1842	1226	476	140
August	1554	1014	388	152
September	1864	1275	468	121
October	381	179	91	111
November	742	497	195	50
December	584	404	145	35
January	1397	940	350	107
February	1238	863	309	66
March	1179	735	298	146
Total	14974	9947	3771	1256

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. 48.1/m3, Rs. 48.2/m3 and Rs. 46.3/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	15725	13377	14974
2	Man Power Cost	Rs.	3,82,375	3,26,402	3,36,176
3	Maintenance Cost	Rs.	34,000	32,000	33,000
4	Chemical Cost	Rs.	65,822	54,334	64,357
5	Energy Cost (Rs.)	Rs.	2,73,478	2,32,643	2,60,417
6	Water Treatment Plant (DM Plant) Cost	Rs./m3	48.1	48.2	46.3

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, Utraula 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, Utraula 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;

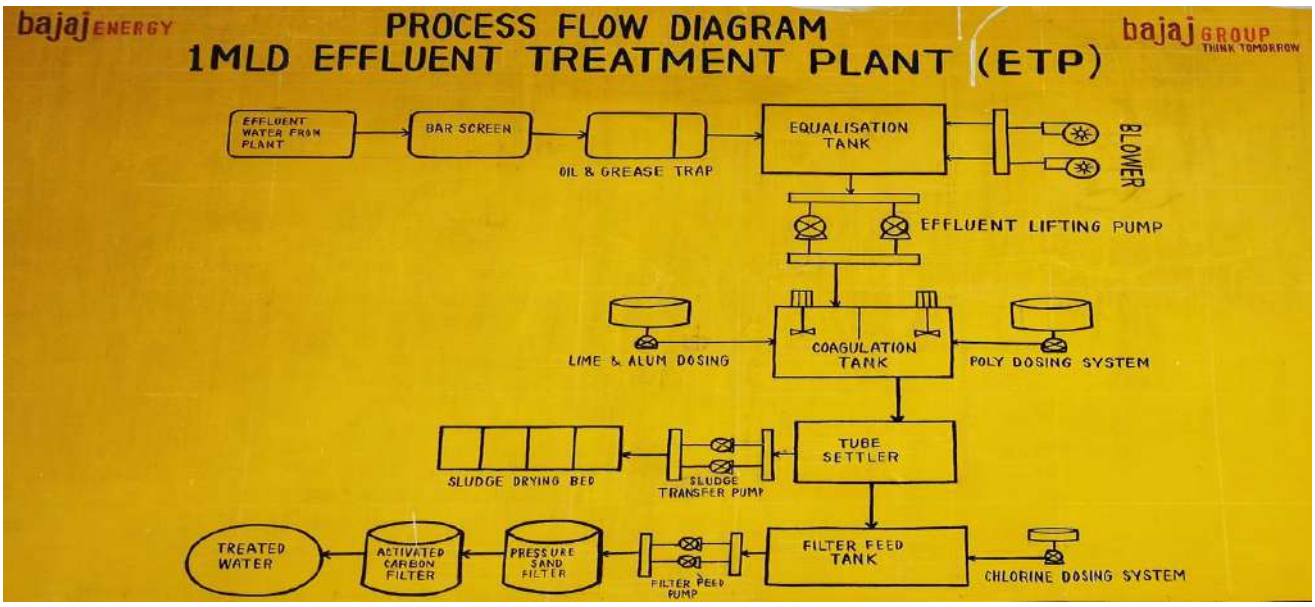


Figure 8: Effluent Treatment Process

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)	Reutilized STP Treated Water (m3)
April	2478	1668	11340	617	617
May	8563	6133	13770	643	643
June	5027	5027	13770	650	650
July	10424	9213	14981	650	650
August	8384	8384	14981	676	676
September	8264	8264	14981	644	644
October	7126	7126	14981	590	590
November	0	1040	13941	416	416
December	2126	2109	13958	671	671
January	6086	4779	15265	688	688
February	3457	5382	13340	624	624
March	401	13340	401	678	678
Total	62336	72465	155709	7547	7547

	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)	Reutilized STP Treated Water (m3)
April	8296	5759	3938	668	668
May	3116	1398	5656	674	674
June	8081	657	13080	655	655
July	9858	9161	13777	686	686
August	10524	9424	14877	666	666
September	8951	10283	13545	659	659
October	4313	4640	13218	680	680
November	0	107	13111	647	647
December	56	1192	11975	897	897
January	1094	1043	12026	868	868
February	97	7325	4798	792	792
March	2066	4825	5539	732	732
Total	56452	55814	125540	8624	8624

	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)	Reutilized STP Treated Water (m3)
April	4168	6063	3644	741	741
May	8956	7313	5287	649	649
June	8709	5993	8003	623	623
July	12892	8928	11967	639	639
August	15869	12546	15290	764	764
September	6711	7807	14194	731	731
October	1922	892	15224	215	215
November	0	2935	12289	589	589
December	0	563	11726	684	684
January	6138	7319	10545	826	826
February	4880	4412	10993	746	746
March	8374	4044	15323	809	809
Total	78619	68815	134485	8016	8016

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 62336 m3/year, 56452 m3/year & 78619 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. 8.9/m3, Rs. 10.0/m3 and Rs. 7.9/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. 45.8/m3, Rs. 41.4/m3 and Rs. 45.1/m3 respectively. The details of raw water per KL 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	KL	62336	56452	78619
4	Man Power Cost	Rs.	4,13,476	4,36,080	4,62,736
5	Maintenance Cost	Rs.	15,000	14,000	15,000
6	Chemical Cost	Rs.	45,893	36,673	35,023
7	Energy Cost	Rs.	81,105	77,527	1,09,677
8	Industrial Effluent Treatment Cost	Rs./KL	8.9	10.0	7.9
B	**Domestic Effluent Treatment Cost (STP)**				
1	**Capacity of STP Plant**	KLD	**100**		
2	Domestic Effluent for Treatment at STP	KL	7547	8624	8016
4	Man Power Cost	Rs.	2,06,738	2,18,040	2,31,368
5	Maintenance Cost	Rs.	4,000	4,100	4,200

Sr. No.	Description	UOM	Effluent Treatment Cost		
			FY 2020-21	FY 2021-22	FY 2022-23
6	Chemical Cost	Rs.	1,823	2,025	1,890
7	Energy Cost	Rs.	1,32,827	1,32,990	1,24,247
8	Domestic Effluent Treatment Cost	Rs./KL	45.8	41.4	45.1

*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, Utraula Unit

As per CGWA NOC, M/s Bajaj Energy Limited (BEL), Utraula 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 2Nos. of RWH structures within plant premises each having installed capacity of 37m3 & 20.4m3 respectively to recharge the generated runoff to ground. Team also noticed, 1 RWH structure is being connected with Rooftop near condenser 1/Chiller while others are connected with Storm water line. 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. In addition, It is also recommended to clean storm water and drain line before pre monsoon season.



Photos of Some RWH Structures & Ponds are shown below;



RWH 1 - RWH connected with Rooftop & Storm water line



RWH 2- RWH connected with CT/Storm water line

Figure 9 Photos of some 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/	4514	0.95	0.9	3859
2	Road/Paved area	59400.2	0.95	0.65	36680
3	Open Land	56004.3	0.95	0.20	10641
4	Green Belt	48783	0.95	0.15	6952
5	Total	168701.5			58131

** Plant has provided the Rooftop area of the building.*
** Rooftop potential is calculated to be about 3859 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), Utraula 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 vide Registration No.- 202108000332, 202108000181 and it is valid up to 05/09/2026. Borewell 1,2&3 are having rated capacity of 30 HP with discharge capacity of 180m3/hr. As per GWD, Govt. of U.P, the running hrs. of each pump shall not be exceeded by 18hrs/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 (97200m3/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 7020m3/day (21,06,000 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 764127m3/year (2547m3/day), 722575m3/year (2409m3/day) & 810877m3/year (2703m3/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), Utraula 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), Utraula 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), Utraula 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), Utraula 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 2Nos. of RWH structures within plant premises each having installed capacity of 37m3 & 20.4m3 respectively to recharge the generated runoff to ground. Team also noticed, 1 RWH structure is being connected with Rooftop near condenser 1/Chiller while others are connected with Storm water line. 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), Utraula Unit, has been granted Consent to Operate (CTO) issued by Uttar Pradesh Pollution Control Board vide Ref No.- **140717/UPPCB/Basti(UPPCBRO)/CTO/water/BALRAMPUR/2021** 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 582m3/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	35054	114508	88725
May	85867	25953	86939
June	67977	114670	85447
July	127248	119036	125039
August	105419	134125	128820
September	130328	108414	57431
October	81350	63235	18207
November	1245	2460	1117
December	34639	1273	911
January	57247	21243	82304
February	26662	2207	59701
March	11091	15451	76236
Total	764127	722575	810877

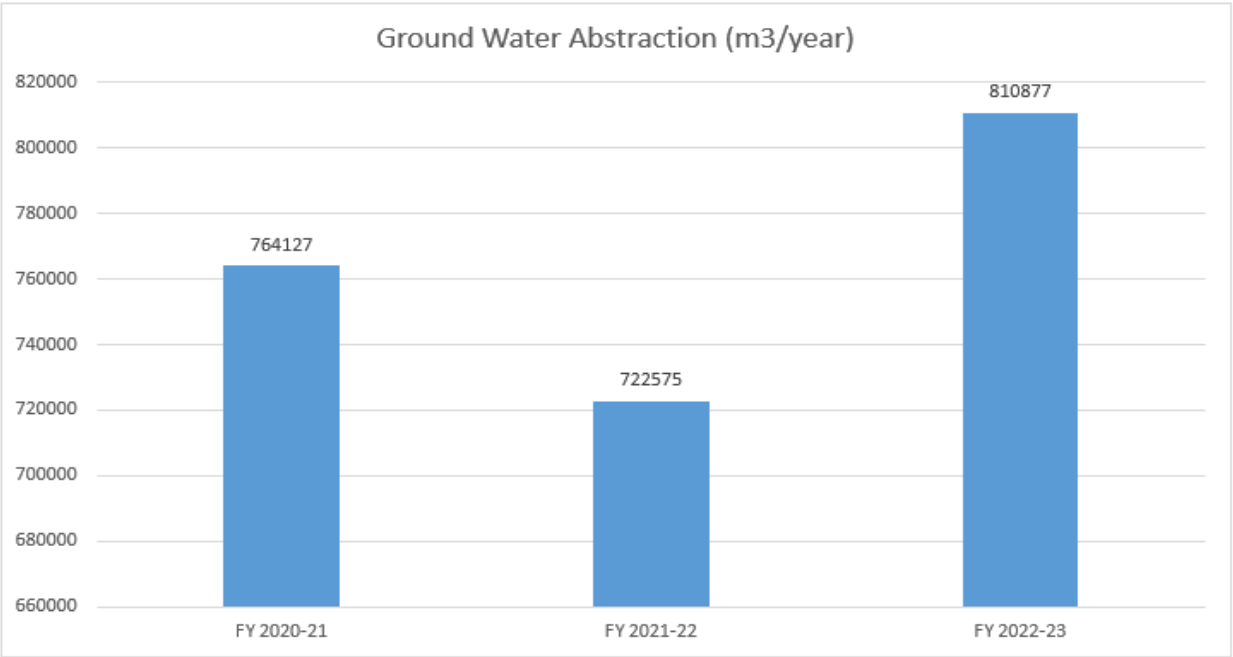
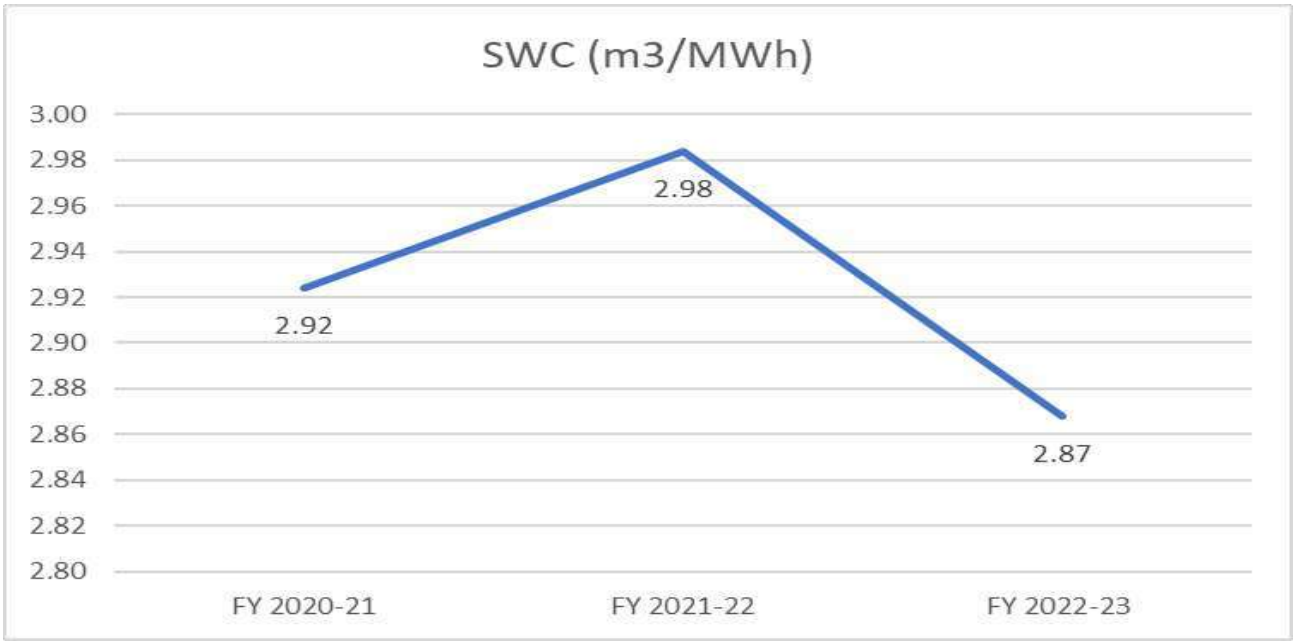


Figure 10: Fresh water consumption in Plant in Last 3 Year

Table 16: Historical Specific water consumption

Sr. No.	Description	UOM	FY 2020-21	FY 2021-22	FY 2022-23
1	Borewell 1	m3/year	332522.5	307608.5	375022
2	Borewell 2	m3/year	431604.5	400150.5	286748
3	Borewell 3	m3/year	0	14816	149107
4	**Total Ground Water Abstraction, A**	**m3/year**	**764127**	**722575**	**810877**
5	**Domestic**	m3/year	**489**	**940**	**1151**
6	**Industrial**	m3/year	**763638**	**721635**	**809726**
7	ETP Treated Water, B	m3/year	62336	56452	78619
8	No. of Working days, C	Nos./year	300	300	300
9	**Ground water abstraction per day, D= (A/C)**	**m3/day**	**2547**	**2409**	**2703**
10	**ETP treated water per day, E= (B/C)**	**m3/day**	**208**	**188**	**262**
11	Production (Generation), F	MU/year	261.34	242.17	282.76
12	**Specific Water Consumption (SWC) of Power Generation, G= [A/(F X 1000)]**	**m3/MWh**	**2.92**	**2.98**	**2.87**

**SWC per unit generation w.r.t Total Fresh water intake in FY 2022-23 has been improved from FY 2021-22 because of water conservation because of water conservation initiatives taken by the plant*





CHAPTER 8

Water Conservation Opportunities

8. WATER CONSERVATION OPPORTUNITIES

M/s. Bajaj Energy Limited (BEL), Utraula 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.

*Reuse of ETP treated water in Dust Suppression, Firefighting, Ash Silo areas etc.

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 17: Inventory details

Building name	No. of employees in building	No. of off-role employees in building	Total no. of washrooms	No. of taps	No. of urinals
TG Building	30	2	1	4	3
HR/Admin	2	6	1	2	2
Boiler	6	22	1	1	3
CHP CCR	5	30	2	NA	NA
CHP weighbridge	2	5	1	1	NA
DM Plant	5	5	NA	NA	2

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

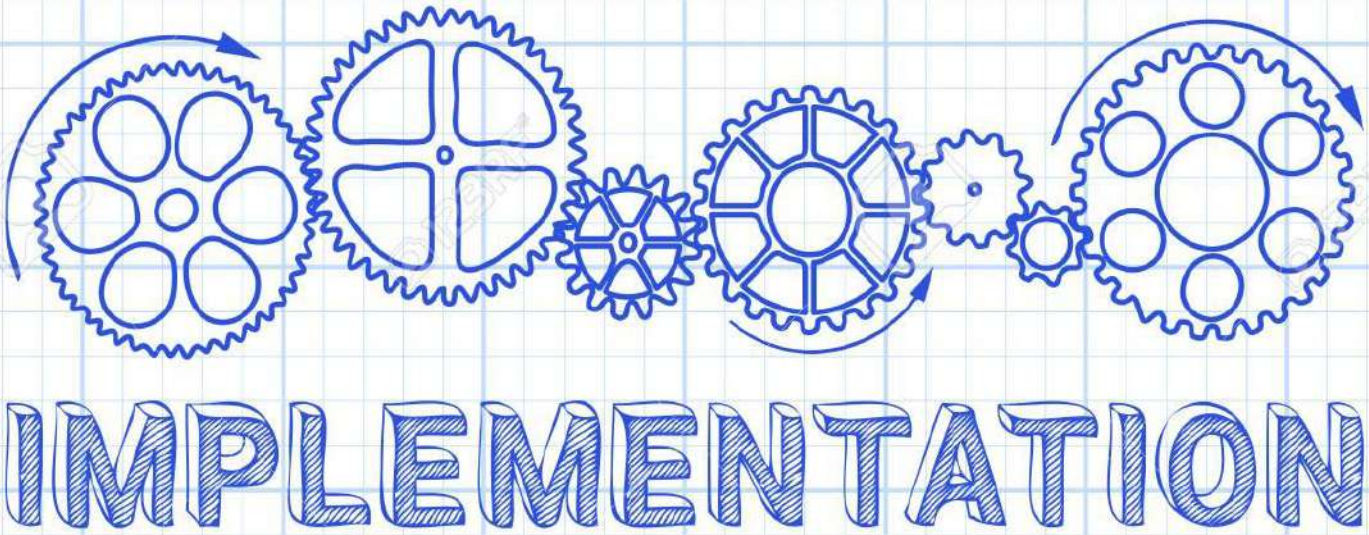
The metering and sub-metering of the Plant's water use is essential to understand the water consumption pattern inside the Plant. The accurate measurements enable management to understand maximum and minimum consumption area in the Plant and improve water efficiency in the Plant. Monitoring the water 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, Utraula. The recommendation/implementation plan are provided below:

9.1 Effective Utilization Of Roof Top RWH Potential

As per CGWA NOC, M/s BEL, Utraula, 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 18: Fresh Water savings by utilization of RWH potential

Sr. No.	Description	UOM	Value
1	Total Plant Area	m2	168702
2	Rooftop area of building/Shed	m2	4514
3	Road/Paved area	m2	59400
4	Open Land & Green Belt area	m2	104787
5	Average rainfall	mm	950
6	Total Quantum of Runoff Available for RWH Potential	m3/year	58131
7	Total Quantum of Rooftop Runoff Available for RWH Potential	m3/year	3859
8	Considering effective Annual Rooftop Runoff Available for RWH utilization @ 50%	m3/year	1930
9	Yearly RWH potential is extrapolated on a daily basis savings in Fresh water intake	m3/day	5

**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 37m3/day treated STP water was noticed. Out of 37m3/day, around 11m3/day treated water used in backwash of filters & around 7m3/day treated water utilized nearby area. Balance around 19m3/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 RO Reject Water Supplied To Storage Tank/ETP Storage Lagoon Directly for Reuse

During Audit, team noticed RO Reject water of about 8m3/day and Backwash/Regeneration of filters are around 5m3 has been discharged to drain line for treatment in ETP. This results in load on ETP treatment.

It is recommended that RO reject water blended with Fresh water can be used in domestic use for flushing & Wash basin Taps. Secondly, RO Reject water can be stored directly to ETP lagoon further it can be utilized after treatment.

9.4 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 Time Office)	Borewell 2 (Near ETP Gate)	Borewell 3 (Near DM Plant)
	Rated Parameters				
1	Flow	m3/hr	180	180	180
2	Power	HP	30	30	30
	Measured Parameters				
3	Volt	V	424.3	424.3	426.1
4	Current	A	29	28	30
5	PF	pf	0.76	0.87	0.81
6	Power	kW	16.2	17.9	17.9
7	Flow	m3/hr	169	132	194

11. ANNEXURES (DATA PROVIDED BY PLANT)

A. NOC for ground water withdrawal to Bajaj Energy Limited, Utraula as per CGWA guidelines

Borewell 1

9/8/21 5:10 PM NOC Application Form

GROUND WATER DEPARTMENT
Minor Irrigation & Rural Water Supply Department
Ministry of Jal Shakti
Government of Uttar Pradesh

Form 8 (E)
[See rules 15(2)]
(RENEWAL OF AUTHORIZATION/ NO-OBJECTION CERTIFICATE FOR SINKING OF NEW WELL FOR INDUSTRIAL/ COMMERCIAL/ INFRASTRUCTURAL OR BULK USER OF GROUND WATER)
VALID UP TO : 05/09/2026

Registration No.: 202108000332

Name of the Owner	NISHANT SRIVASTAVA		
Address of the Applicant	Vill. Itai maida post-shriduttganj,tehsil utarula, distt.-Balrampur UP	Application Form Serial No.	BLMP0821RIN0018
Date of Submission	11/08/2021	Specimen Signature	
Company Name	Bajaj Energy Ltd	Company Address	Village-Itai Maida,Post-Sriduttaganj,Utraula Bala
NOC Issued By: अनापत्ति प्रमाण पत्र (द्वारा निर्गत)			
Central Ground Water Authority केन्द्रीय भूगर्भ जल प्राधिकरण			Yes
Certificate Number प्रमाणपत्र संख्या	214243NRCGWA2020091841	Issue Date निर्गमन तिथि	19/09/2018
Expiry Date अंतिम तिथि	28/08/2021		
Ground Water Department Uttar Pradesh भूगर्भ जल विभाग उत्तर प्रदेश सरकार			No

Location Particulars

District	Balrampur	Block	Sridattganj
Plot No./Khasra No.	228M	Municipality/Corporation	No
Ward No./Holding No.			NA

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	01/10/2011		
Type of Well	Tube Well/Boring	Depth of the Well (In meter)	121.95
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 (m3/hr.)	180.00
Date of Energization (In Case of Electric Pump)		01/11/2011	
Maximum Allowable Rate of Withdrawal (m3/hr.):	180.00	Maximum Allowable Running Hours Per Day:	18.00
Maximum Allowable Annual Extraction of Ground Water:			972000

1/3

Borewell 2

9/9/21 5:24 PM

NOC Application Form

GROUND WATER DEPARTMENT

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

Form 8 (E)

[See rules 15(2)]

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

VALID UP TO : 05/09/2026

Registration No.: 202108000181

Name of the Owner	NISHANT SRIVASTAVA		
Address of the Applicant	Vill. Itai maida post-shriduttganj,tehsil utarula, distt.-Balrampur UP	Application Form Serial No.	BLMP0821RIN0017
Date of Submission	05/08/2021	Specimen Signature	
Company Name	Bajaj Energy Limited	Company Address	Village - Itaimaida ,PO - Sridutlganj , Utraula Th
NOC Issued By: अनापत्ति प्रमाण पत्र (द्वारा निर्गत)			
Central Ground Water Authority केन्द्रीय भूगर्भ जल प्राधिकरण			Yes
Certificate Number प्रमाणपत्र संख्या	CGWA2018324R	Issue Date निर्गमन तिथि	19/09/2018
Expiry Date अंतिम तिथि	28/08/2021		
Ground Water Department Uttar Pradesh भूगर्भ जल विभाग उत्तर प्रदेश सरकार			No

Location Particulars

District	Balrampur	Block	Sridattganj
Plot No./Khasra No.	NA	Municipality/Corporation	No
Ward No./Holding No.			NA

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	01/10/2010		
Type of Well	Tube Well/Boring	Depth of the Well (In meter)	121.95
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 (m3/hr.)	180.00
Date of Energization (In Case of Electric Pump)		01/11/2010	
Maximum Allowable Rate of Withdrawal (m3/hr.):	180.00	Maximum Allowable Running Hours Per Day:	14.00
Maximum Allowable Annual Extraction of Ground Water:			756000

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. Consent to Operate (CTO)

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.com, Website: www.uppcb.com

CONSENT ORDER

Ref No. -
140147/UPPCB/Basti(UPPCBRO)/CTO/water/BA
LRAMPUR/2021

Dated : 03/12/2021

To,

Shri Dr A V Singh
M/s BAJAJ ENERGY LIMITED
Bajaj Energy Limited, Vill.- Itai maida, post- shri duttganj, tehsil-utarula,distt.-Balrampur
U.P,BALRAMPUR,271607
BALRAMPUR

Sub : Consent under Section 25/26 of The Water (Prevention and control of Pollution) Act, 1974 (as amended) for discharge of effluent to M/s. BAJAJ ENERGY LIMITED

Reference Application No :13866102 **Dated :03/12/2021**

1. For disposal of effluent into water body or drain or land under The Water (Prevention and control of Pollution) Act,1974 as amended (here in after referred as the act) M/s. BAJAJ ENERGY LIMITED is hereby authorized by the board for discharge of their industrial effluent generated through ETP for irrigation/river through drain and disposal of domestic effluent through septic tant/soak pit subject to general and special conditions mentioned in the annexure ,in refrence to their foresaid application .
2. This consent is valid for the period from 01/01/2022 to 31/12/2023 .
3. In spite of the conditions and provisions mentioned in this consent order UP Pollution Control Board reserves its right and powers to reconsider/amend any or all conditions under section 27(2) of the Water (Prevention and Control of Pollution) Act, 1974 as amended .

This consent is being issued with the permission of competent authority .

For and on behalf of U.P. Pollution Control Board

Chief Environmental Officer, Circle-6

PRADEEP SHARMA Digitally signed by PRADEEP SHARMA Date: 2021.12.15 12:16:10 +05'30'

Enclosed : As above
(condition of consent):

Copy to Regional Officer, U.P. Pollution Control Board, Basti for information and necessary action.

Chief Environmental Officer, Circle-6

PRADEEP SHARMA Digitally signed by PRADEEP SHARMA Date: 2021.12.15 12:17:06 +05'30'

U.P. POLLUTION CONTROL BOARD, LUCKNOW

Annexure to Consent issued to M/s.BAJAJ ENERGY LIMITED vide

Consent Order No. 13866102/ Water Dated : 03/12/2021

CONDITIONS OF CONSENT

1. This consent is valid only for the approved production capacity of 45 x 2 (90) Megawatt Thermal Power.
2. The quantity of maximum daily effluent discharge should not be more than the following :

Effluent Discharge Details

S.No	Kind of Effulant	Maximum daily discharge,KL/day	Treatment facility and discharge point
1	Domestic	20 KLD	STP
2	Industrial	980 KLD	ETP

3. Arrangement should be made for collection of water used in process and domestic effluent separately in closed water supply system. The treated domestic and industrial effluent if discharged outside the premises, if meets at the end of final discharge point, arrangement should be made for measurement of effluent and for collecting its sample. Except the effluent informed in the application for consent no other effluent should enter in the said arrangements for collection of effluent. It should also be ensured that domestic effluent should not be discharged in storm water drain .

4(a) The domestic effluent should be treated in treatment plant so that the should be in conformity with the following norms dated treated effluent .

Domestic Effulant

S.No	Parameter	Standard
1	Quantity of Discharge	10 KLD
2	Total Suspended Solids	As prescribed by Hon'ble NGT order dated 30.04.2019 in O.A. No. 1069/2018
3	BOD	As prescribed by Hon'ble NGT order dated 30.04.2019 in O.A. No. 1069/2018
4	COD	As prescribed by Hon'ble NGT order dated 30.04.2019 in O.A. No. 1069/2018
5	Oil & Grease	As prescribed by Hon'ble NGT order dated 30.04.2019 in O.A. No. 1069/2018

4(b). The industrial effluent should be treated in treatment plant so that the treated effluent should be in conformity with the following norms. .

Industrial Effulant

S.No	Parameter	Standard
1	BOD	As per E (P) A Rules, 1986
2	COD	As per E (P) A Rules, 1986
3	Total Suspended Solids	As per E (P) A Rules, 1986
4	Oil & Grease	As per E (P) A Rules, 1986
5	Quantity of Discharge	980 KLD

5. Effluent generated in all the processes, bleed water, cooling effluent and the effluent generated from washing of floor and equipments etc should be treated before its disposal with treated industrial effluent so that it should be according to the norms prescribed under The Environment (Protection) Act,1986 or otherwise mandatory .

6. The other pollutant for which norms have not been prescribed, the same should not be more than the norms prescribed for the water used in manufacturing process of the industry .
7. The method for collecting industrial and domestic effluent and its analysis should be as per legal Indian standards and its subsequent amendments/standards prescribed under The Environment (Protection) Act, 1986.
8. The treated domestic and industrial effluent be mixed (as per the provisions of Condition No. 2) and disposed of on one disposal point. This common effluent disposal point should have arrangement for flow meter/V Notch for measuring effluent and its log book be maintained .
9. The Unit will file the renewal application at least 2 months prior to the expiry of this Order.

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. 1116405/220/2018/02 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. 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.

16. The industry must be follow the rules mentioned in Hazardous Waste and Other Waste Management and Transboundary Movement Rules, 2016.

17. 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.

18. The industry shall install separate storm water drain in premises.

19. The industry shall comply with the provision of MSW Management Rules, 2016.

20. The industry shall comply the provision of E(P)A 1986.

19. 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.

C. Calibration Certificate

ADVANCE
CALIBRATION SERVICES
(ISO : 17025 NABL ACCREDITED LAB.)
C - 23, SETOR-10, NOIDA - 201301 (U.P.)
Mob : +91-9891121066, 7982584097 • E-mail : advance.cal@gmail.com

Calibration Certificate

CERTIFICATE NO.	: 220926A/NN-101	Page	: 1 of 1
CALIBRATED ON. CALIBRATION DUE.	: 26 / 09 / 2022 : 25 / 09 / 2023	C.P. No.	: ACS/CP/25
SRF No. & DATE	: 220926A/NN Dt. 26.09.2022	Phy. Inspection	: O.K.
ULR No. & ISSUE DATE	: CC342722000006067P Dt. 05.10.2022	Cal. At	: Site / Lab

CALIBRATED FOR : M/s Bajaj Energy Limited
Village Itai Maida, Utraula, P.O Sridutgarj, Balrampur, 271607

ITEM CALIBRATED : Magnetic Flow Meter

Make	: Yokogawa / AXFA14G	Range	: 0-180 m³/Hr
Type	: Electro Magnetic	S .No	: S5L307508 110
Accuracy	: ± 0.35 %	Comb No	: S5L307430
Location	: Borewell-1 Near Time Office	Zero Error	: Nil

ENVIRONMENT CONDITION: Temp. (31.2°C) R.H. (48%)

STANDARD INSTRUMENTS USED :

INSTT. NAME	ID No. / S. No.	TRACEABILITY	CERTIFICATE No	DUE DATE
Digital Calibrator	ACS/UC/01 / 300551	Anshaankan	AIPL/2021/0784	11/11/2022
Timer /Stop Watch	ACS/TM/01/1108J08-038	ATCS	ATCS22000000578	08/09/2023
Digital Pr. Gauge	ACS/DPG/03/ 028006	ACS Noida	220601A/NN-101	31/05/2023
Weight Set	ACS/SWTS/001	ACS Noida	220416A/NN-101	14/04/2023

RESULTS :

mA	Flow Rate (m³/hr)	UUC Reading (m³)	STANDARD READING (m³) (1)	(2)	(3)	Mean (m³)	ERROR (m³)
4	0	0	0	0	0	0	
8	45	3750	3747	3747	3746	3746.66	3.34
12	90	7500	7492	7495	7495	7494.00	6.00
16	135	11250	11238	11240	11237	11238.33	11.67
20	180	15000	14964	14985	14985	14984.66	15.34

REMARKS : The Expanded uncertainty of measurement at 95% confidence level is± at coverage Factor k=2

Under Calibration

Borewell 1

ADVANCE
CALIBRATION SERVICES
(ISO : 17025 NABL ACCREDITED LAB.)
C - 23, SETOR-10, NOIDA - 201301 (U.P.)
Mob : +91-9891121066, 7982584097 • E-mail : advance.cal@gmail.com

Calibration Certificate

CERTIFICATE NO.	: 220926A/NN-102	Page	1 of 1
CALIBRATED ON. CALIBRATION DUE.	: 27 / 09 / 2022 : 26 / 09 / 2023	C.P. No	ACS/CP/25
SRF No. & DATE	: 220926A/NN Dt. 26.09.2022	Phy. Inspection	O.K.
ULR No. & ISSUE DATE	: CC342722000006068P Dt. 05.10.2022	Cal. At	Site / Lab

CALIBRATED FOR : M/s Bajaj Energy Limited
Village Itai Maida, Utraula, P.O Sridutgarj, Balrampur, 271607

ITEM CALIBRATED : Magnetic Flow Meter

Make	: Yokogawa /AXFA14G	Range	: 0-180 m³/Hr
Type	: Counter	S .No	: S5L307509 111
Accuracy	: ± 0.35 %	Comb No	: S5L307431
Location	: Borewell-2 Near ETP Gate	Zero Error	: Nil

ENVIRONMENT CONDITION: Temp. (31.8°C) R.H. (49%)

STANDARD INSTRUMENTS USED :

INSTT. NAME	ID No. / S. No.	TRACEABILITY	CERTIFICATE No	DUE DATE
Digital Calibrator	ACS/UC/01 / 300551	Anshaankan	AIPL/2021/0784	11/11/2022
Timer /Stop Watch	ACS/TM/01/1108J08-038	ATCS	ATCS22000000578	08/09/202
Digital Pr. Gauge	ACS/DPG/03/ 028006	ACS Noida	220601A/NN-101	31/05/202
Weight Set	ACS/SWTS/001	ACS Noida	220416A/NN-101	14/04/202

RESULTS :

mA	Flow Rate (m³/hr)	UUC Reading (m³)	STANDARD READING (m³) (1)	(2)	(3)	Mean (m³)	ERROR (m³)
4	0	0	0	0	0	0	
8	45	3750	3742	3744	3747	3744.33	5.67
12	90	7500	7490	7495	7492	7492.33	7.67
16	135	11250	11238	11237	11241	11238.66	11.34
20	180	15000	14981	14983	14985	14983.33	16.67

REMARKS : The Expanded uncertainty of measurement at 95% confidence level is± at coverage Factor k=2.

Under Calibration

Borewell 2

ADVANCE
CALIBRATION SERVICES
(ISO : 17025 NABL ACCREDITED LAB.)

C - 23, SETOR-10, NOIDA - 201301 (U.P.)
Mob. : +91-9891121066, 7982584097 • E-mail : advance.cal@gmail.com

Calibration Certificate

CERTIFICATE NO.	: 220926A/NN-103	Page	: 1 of 1
CALIBRATED ON.	: 28 / 09 / 2022		
CALIBRATION DUE.	: 27 / 09 / 2023	C.P. No.	ACS/CP/25
SRF No. & DATE	: 220926A/NN Dt. 26.09.2022	Phy. Inspection	O.K
ULR No. & ISSUE DATE	: CC342722000006069P Dt. 05.10.2022	Cal. At	: Site / Lab

CALIBRATED FOR : M/s Bajaj Energy Limited
Village Itai Maida, Utraula, P.O Sriduttganj, Balrampur, 271607

ITEM CALIBRATED : Magnetic Flow Meter

Make	: Yokogawa /AXFA14G	Range	: 0-180 m^3/Hr
Type	: Counter	S .No	: S5L30703 110
Accuracy	: ± 0.35 %	Comb No	: S5L307428
Location	: Borewell-3 Near DM Plant	Zero Error	: Nil

ENVIRONMENT CONDITION: Temp. (31.8°C) R.H. (49%)

STANDARD INSTRUMENTS USED :

INSTT. NAME	ID No. / S. No.	TRACEABILITY	CERTIFICATE No.	DUE DATE
Digital Calibrator	ACS/UC/01 / 300561	Anshaankan	AIPL/2021/0784	11/11/2022
Timer /Stop Watch	ACS/TM/01/1108J08-038	ATCS	ATCS22000000578	08/09/202
Digital Pr. Gauge	ACS/DPG/03/ 028006	ACS Noida	220601A/NN-101	31/05/202
Weight Set	ACS/SWTS/001	ACS Noida	220416A/NN-101	14/04/2023

RESULTS :

mA	Flow Rate (m^3/hr)	UUC Reading (m^3)	STANDARD READING (m^3) (1)	(2)	(3)	Mean (m^3)	ERROR (m^3)
4	0	0	0	0	0	0	
8	45	3750	3742	3745	3745	3744.00	6.00
12	90	7500	7484	7488	7495	7489.00	11.00
16	135	11250	11242	11237	11235	11239.00	12.00
20	180	15000	14988	14983	14977	14982.66	17.34

REMARKS : The Expanded uncertainty of measurement at 95% confidence level is± at coverage Factor *k*=2

Under Calibration

Standard instruments whose values are traceable to National [illegible]

This certificate is valid for the item calibrated and under the stated condition only. [illegible] without obtained prior written permission [illegible] Any alteration, forgery or misuse of this certificate is liable to legal action. [illegible] Testing and Reference Laboratories [illegible]

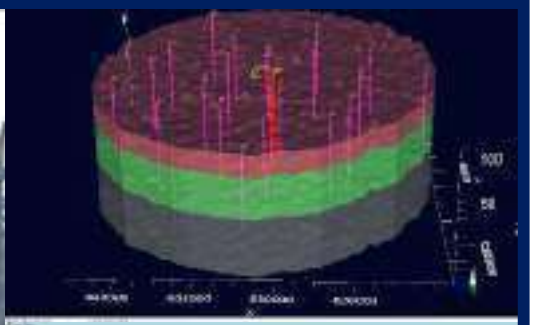
D. Piezometer Data

Sr. No.	Description	Piezometer 1	Piezometer 2
1	Location of piezometer	Project office (Near TG Building)	CHP WB
2	Depth (meter)/ Diameter (millimeter)	11 m Depth	11 m Depth
3	Distance from the existing borewell (meter)	> 150 M	> 300 M

		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	4.1	6.19	2.96	3.6	6.28	3.57
2	May	4.59	3.71	2.79	4.39	3.05	3.61
3	June	1.56	1.88	3.49	1.53	1.28	3.98
4	July	1.57	2.71	4.04	1.44	2.34	3.39
5	August	1.57	-0.19	2.27	1.44	0.35	1.92
6	September	1.23	0.48	1.15	1.3	1.94	1.43
7	October	1.64	0.73	0.17	1.7	1.37	0.83
8	November	2.44	1.65	0.34	2.35	1.25	0.77
9	December	2.96	2.28	0.20	2.88	1.62	0.47
10	January	3.09	2.78	2.32	3.24	2.69	1.84
11	February	5.12	2.87	3.42	5.18	3.33	2.78
12	March	5.11	2.88	3.84	5.23	3.51	4.24
	Average	2.92	2.33	2.25	2.86	2.42	2.40

Impact Assessment Report with Groundwater Modeling as per CGWA Guidelines for BAJAJ ENERGY LIMITED, UTRAULA UNIT, Village – Itai maida, Block - Sridattganj, Tehsil - Utraula, District - Balrampur, Uttar Pradesh State, India







APPLICANT

BAJAJ ENERGY LIMITED

Application No.	
Report Prepared Jointly 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)	**Sridattganj – Safe (62.89%)**
Ground water requirement	**6,984 cu.m/day**
Modeling Required (Yes/No)	**Yes**

BAJAJ ENERGY LIMITED
Utraula Unit, Utraula,
District. Balrampur
Uttar Pradesh – 271 607.

V.PUGAZHENDI
A-6 Balaji Arcade,
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, UTRAULA UNIT, Village - Itaimaida, Block - Sridattganj, Tehsil - Utraula, District - Balrampur, 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
A6- Bajaj Arcade, 140 Arcot Road,
Arugambakkam, Chennai-600 032, Tamil Nadu.
Cell: 9443182134 / E-mail: vp.pk66@gmail.com

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, UTRAULA UNIT, Village – Itai maida, Block - Sridattganj, Tehsil - Utraula, District - Balrampur, 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 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 Fluidised 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 Utraula unit is located in Sridattganj 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 Utraula Plant is located in Village - Itaimaida, Block – Sridattganj, Tehsil – Utraula, District - Balrampur, State- Uttar Pradesh. Power Plant has **51.0 acres** of land within existing premises**.**

The Plant is located about 15 kms from District headquarter Balrampur which is located in the Northwest of the Plant. The area is accessible in all seasons. The nearest railway station is in Balrampur 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 **31 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° 18’00” and 27°23’30” and East Longitude of 82°16’00” and 82°22’05”.

The study area of 5 Km from Plant boundary covers in **G44E7** (1 Survey of India Topo sheets).

The Plant site falls in **G44E7.** The total aerial extent of the study area covering 5 Km radius from the Plant site boundary is **78.66 Sq.km.** The details of Plant area are given in **Table-1.**

Table 1: The details of Plant area

Feature	Details
Site Location	Village - Itaimaida, Block – Sridattganj, Tehsil – Utraula, District - Balrampur, State- Uttar Pradesh.
Latitude	27° 18'00" to 27°23'30"
Longitude	82°16'00" to 82°22'05
Area of the Plant	**51 Acres 206390 Sq.m**
Topography	Site is located in Fallow land. Crop is predominant in 5 km radius area
SOI Toposheet	**G44E7**
Above Mean Sea level	5 Km Buffer Zone elevation: **Highest point 119 m amsl and Lowest point 95 m amsl** **Plant Site elevation: Maximum and Minimum elevation 103 m amsl and 100 m amsl respectively**
Nearest habitation	Itai Maida in the South West (0.30 Km)
Nearest Water body	No Major water body / Dam / Reservoir nearby the Plant site
Nearest River	Suwawan Nadi flows at a distance of ~ 240 m in south direction. Rapti River flows at a distance of ~ 4.1 Km in North East direction (Perianal River)
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**:

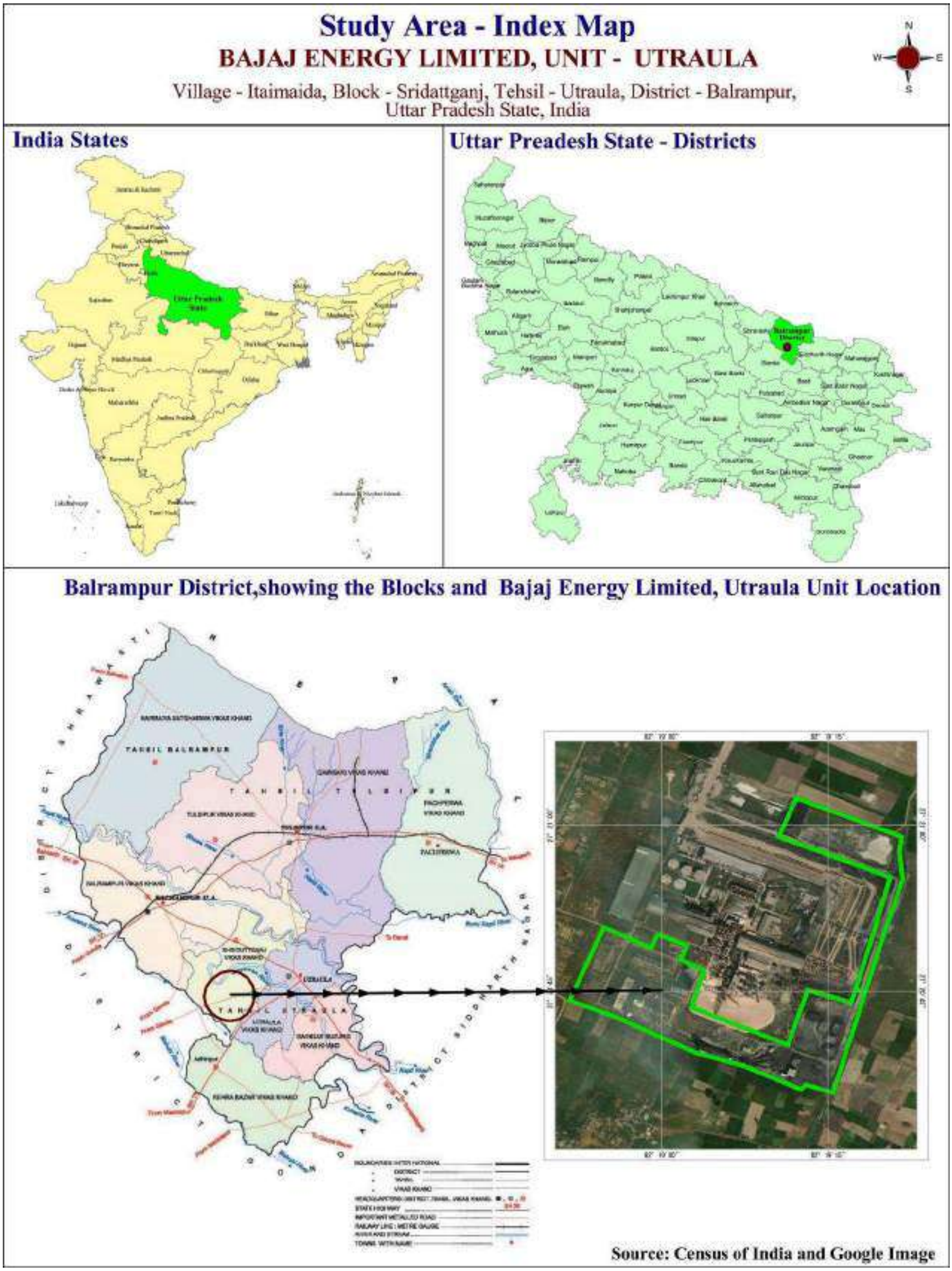
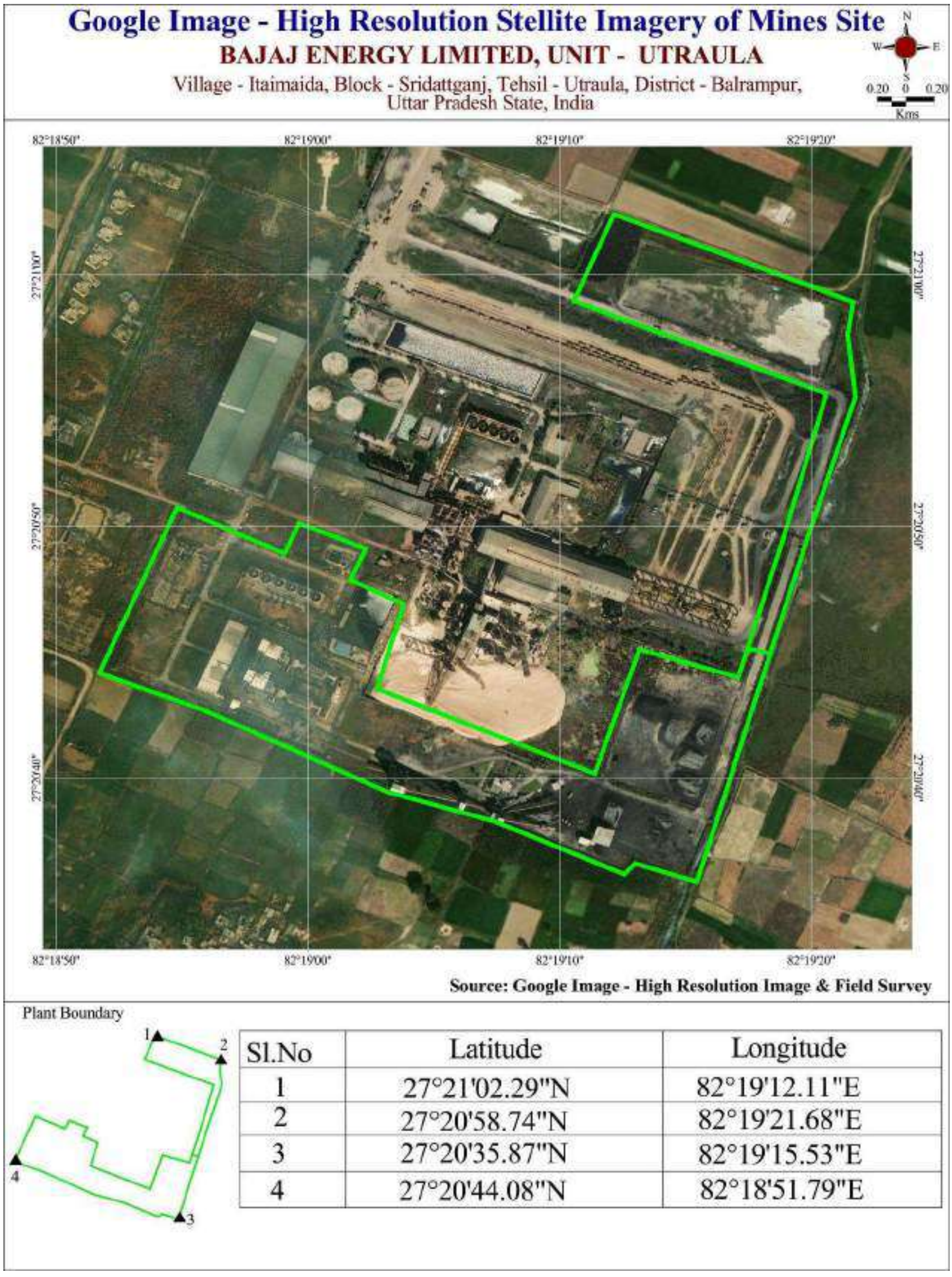


Plate 1: Study area – Index Map



Sl.No	Latitude	Longitude
1	27°21'02.29"N	82°19'12.11"E
2	27°20'58.74"N	82°19'21.68"E
3	27°20'35.87"N	82°19'15.53"E
4	27°20'44.08"N	82°18'51.79"E

Plate 2: High Resolution Satellite Imagery – Plant Site

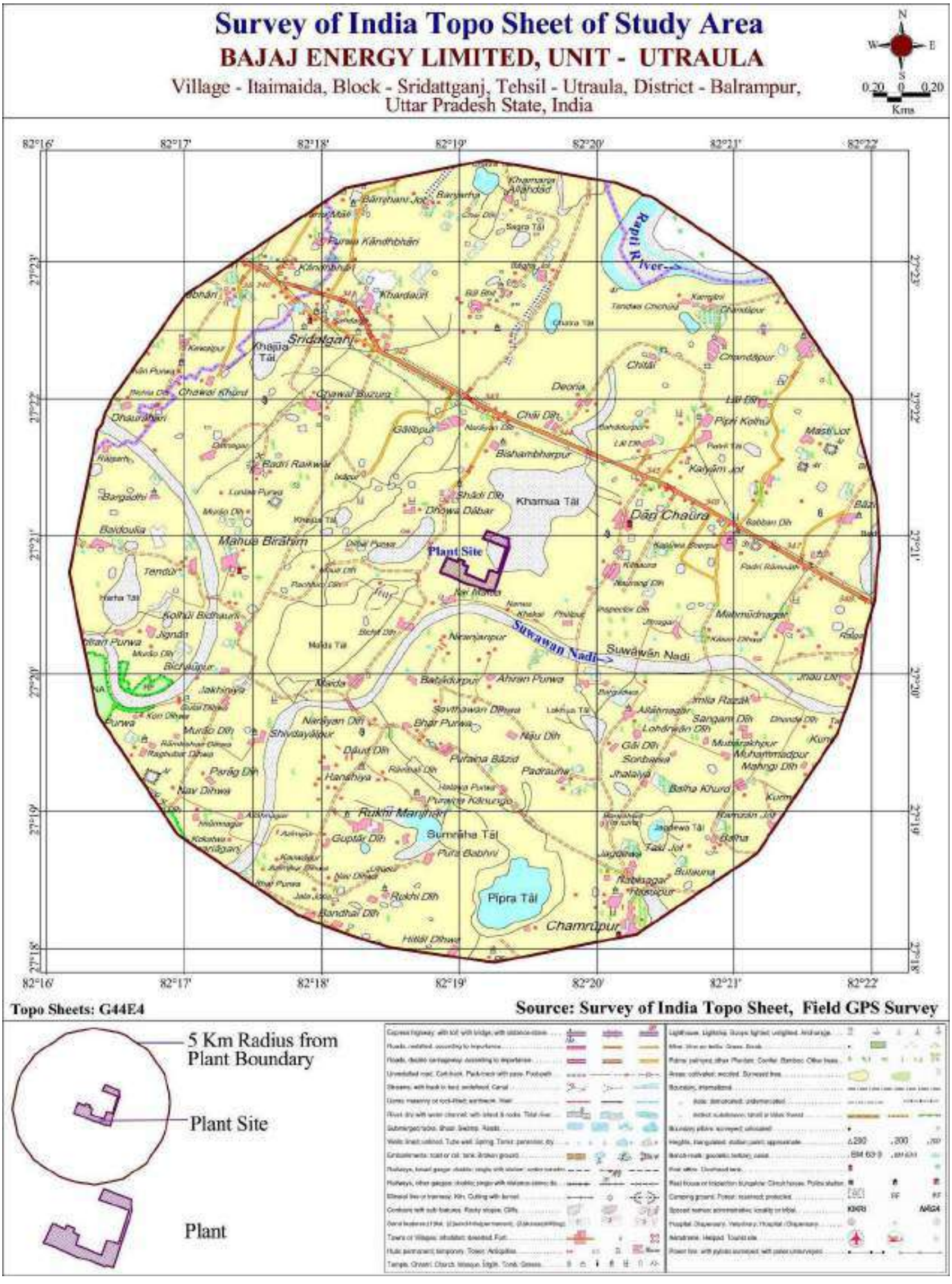


Plate 3: Survey of India Topo map

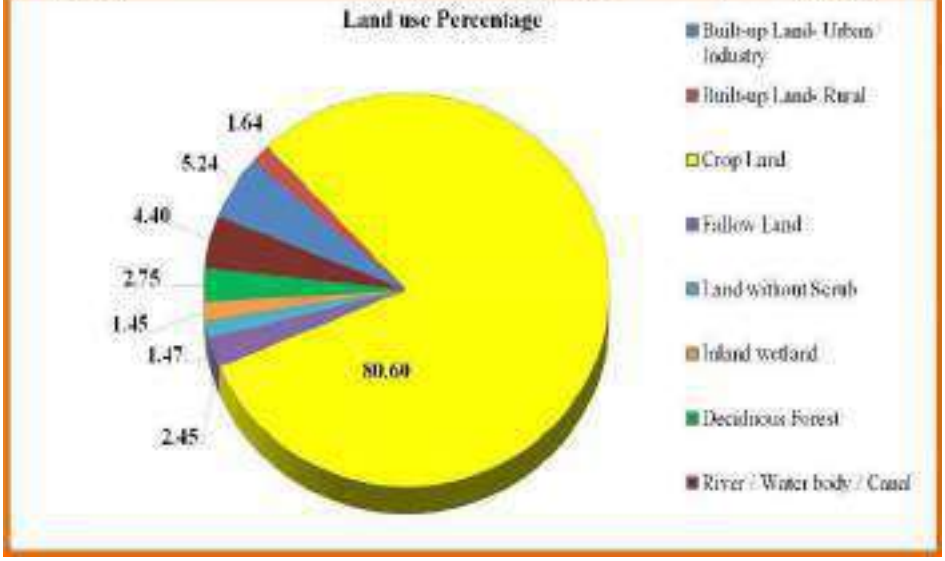
1.1 Land use Land cover of the surrounding area, Percentage of LULC Category

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 80.60 %). The second major land use is built-up land. Majority of the area is irrigated by bore well. River and canal-based irrigation was also noticed in the study area. Rapti River flows at a distance of ~ 4.1 Km in North East direction is a Perianal River. 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- Urban / Industry	5.24	4.12
2	Built-up Land- Rural	1.64	1.29
3	Crop Land	80.60	63.40
4	Fallow Land	2.45	1.93
5	Land without Scrub	1.47	1.16
6	Inland wetland	1.45	1.14
7	Deciduous Forest	2.75	2.16
8	River / Water body / Canal	4.40	3.46
	Total	**100.00**	**78.66**



Land use Photographs outside the Plant Boundary- within 5 Km radius



Built-up Land - Industry



Crop Land



In Land Wetland



Fallow Land



Rapti River

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	Roof area (TG+DEA+Switchard+ DMP+ESP+CHP+UGR+Boiler+Unit Panel)	4514.00
2	Plant	103482.17
3	Green Belt Area	48753.00
4	Road / Paved Area	59400.20
5	Unpaved Open area	56004.30
	Total	**272153.67**



Green Belt Area in the Plant Site

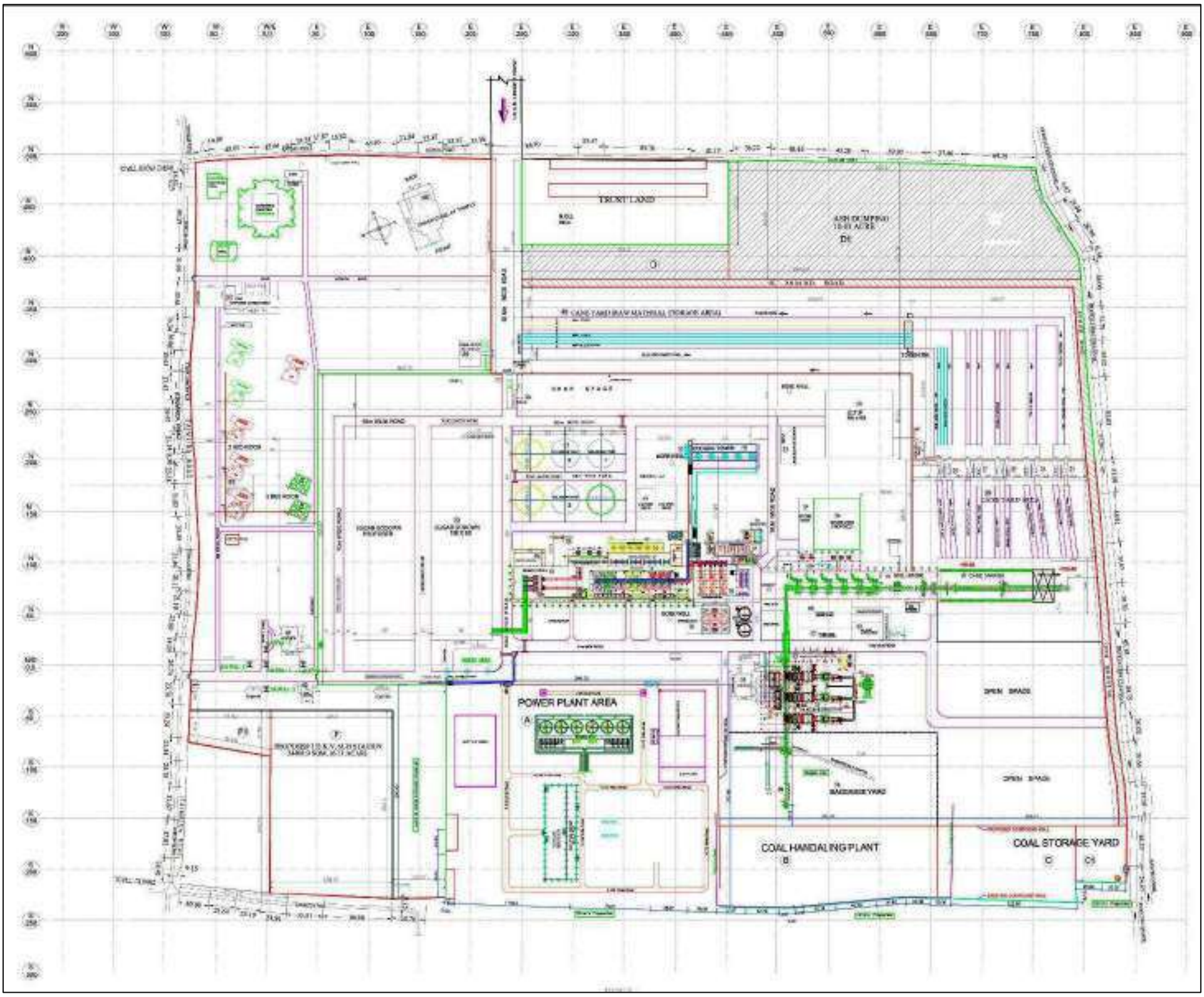


Plate 4: Plant Layout Plan

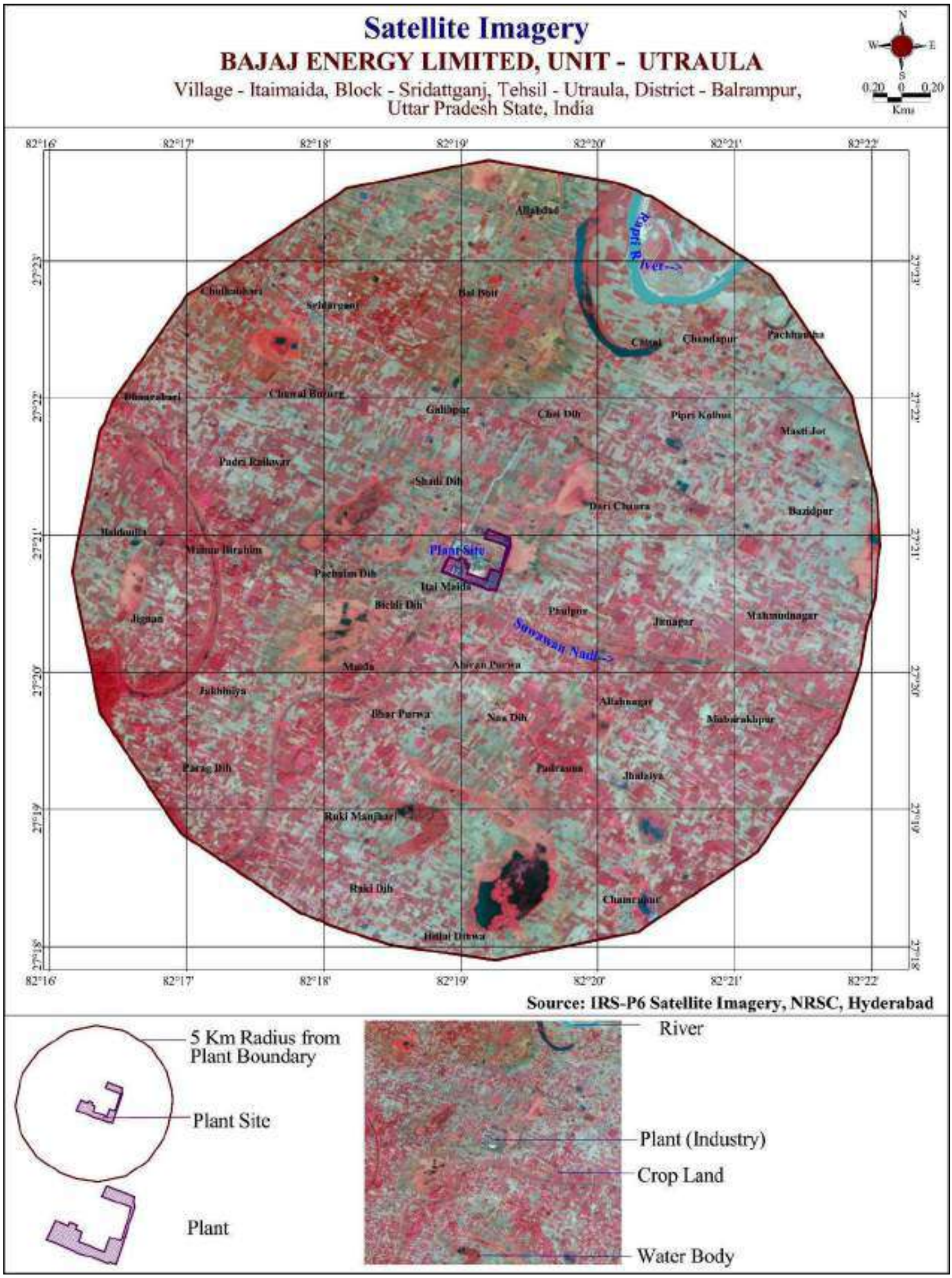


Plate 5: Satellite Imagery

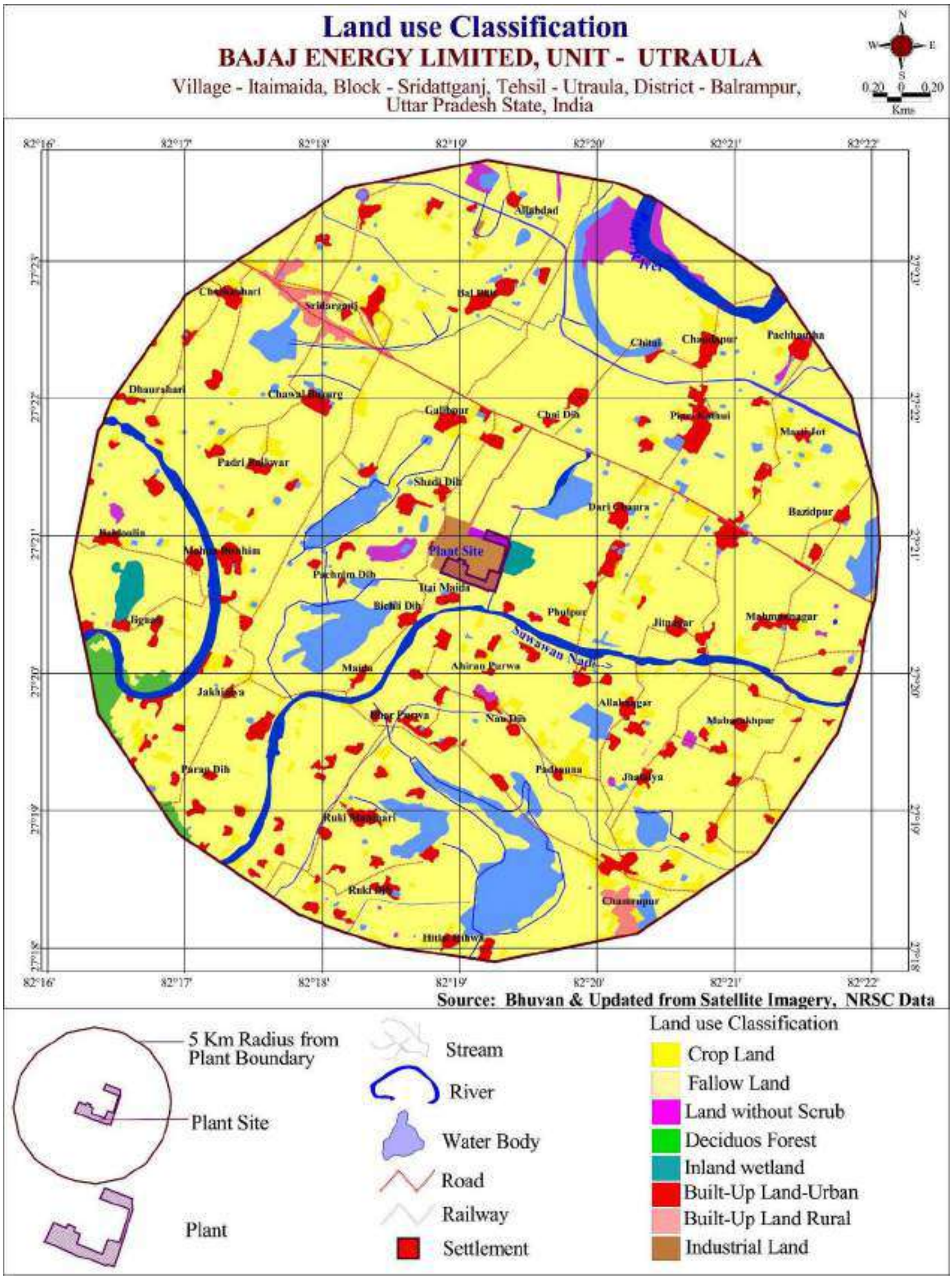


Plate 6: Land use Classification

1.2 Topography and Drainage

The district area, in general, comprises of undulating plains. The district can be almost identifiably divided into two units, the upland plains and lowland plains.

The general slope of the district is from northwest to southeast. The topography is largely influenced or modified by the existing network of rivers and streams.

The northern part of the district comprises of the **uplands** and gently undulating plains. This is the area just south of Nepal Himalayas and Siwaliks.

Further south of the Upland Plains. It comprises of lowland plains and has a comparatively gentler slope. The study area falls in the Lowland plains.

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 **95 m to 119 m amsl**. The maximum elevation is observed in the western part of the study area.

The maximum and minimum elevation of the Plant site is **100 m and 103 m amsl** respectively. The Plant site is sloping towards north.

Topography map of the study area is presented in **Plate-7**

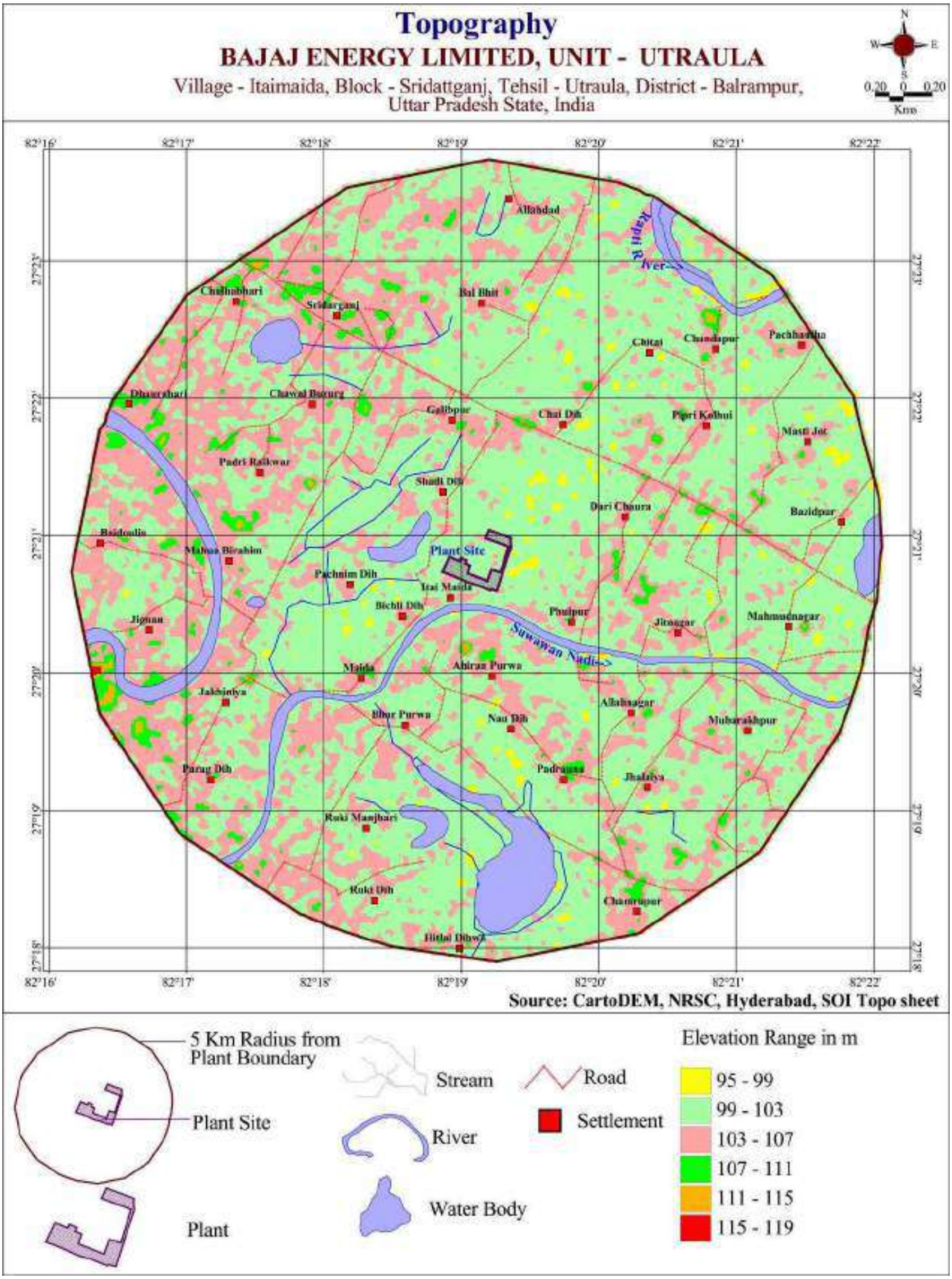


Plate 7: Topography of the Study area

Drainage and Water Bodies

River Rapti is the major river draining Balrampur district and flows from the north- west towards south-east. The river divides the district into two parts. There are large number of ephemeral (Dhobania, Kharjhar, Bhambhar etc.) and few perennial nalas, in the northern part, flow southwards into the Rapti River. South of the Rapti River, there are two other tributaries (Suwawan and Kuwana) which run almost parallel to Rapti before their confluence in the adjacent Basti District.

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	Suwawan Nadi	0.24 Km	South	East
2	Rapti River	4.1 Km	North East	East

The development of stream is very less as the runoff flows as overland flow towards the river / nalla. The Rapti River is perianal. The river system is the main recharge source for the study area.

1) From the plant site the surface water flow towards south and joins with the tributary of Rapti River. Portion of the surface water from the plant flows towards north.

There are no major reservoirs / Dam or irrigation tanks in the 5 Km radius study area. However, number of small 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**

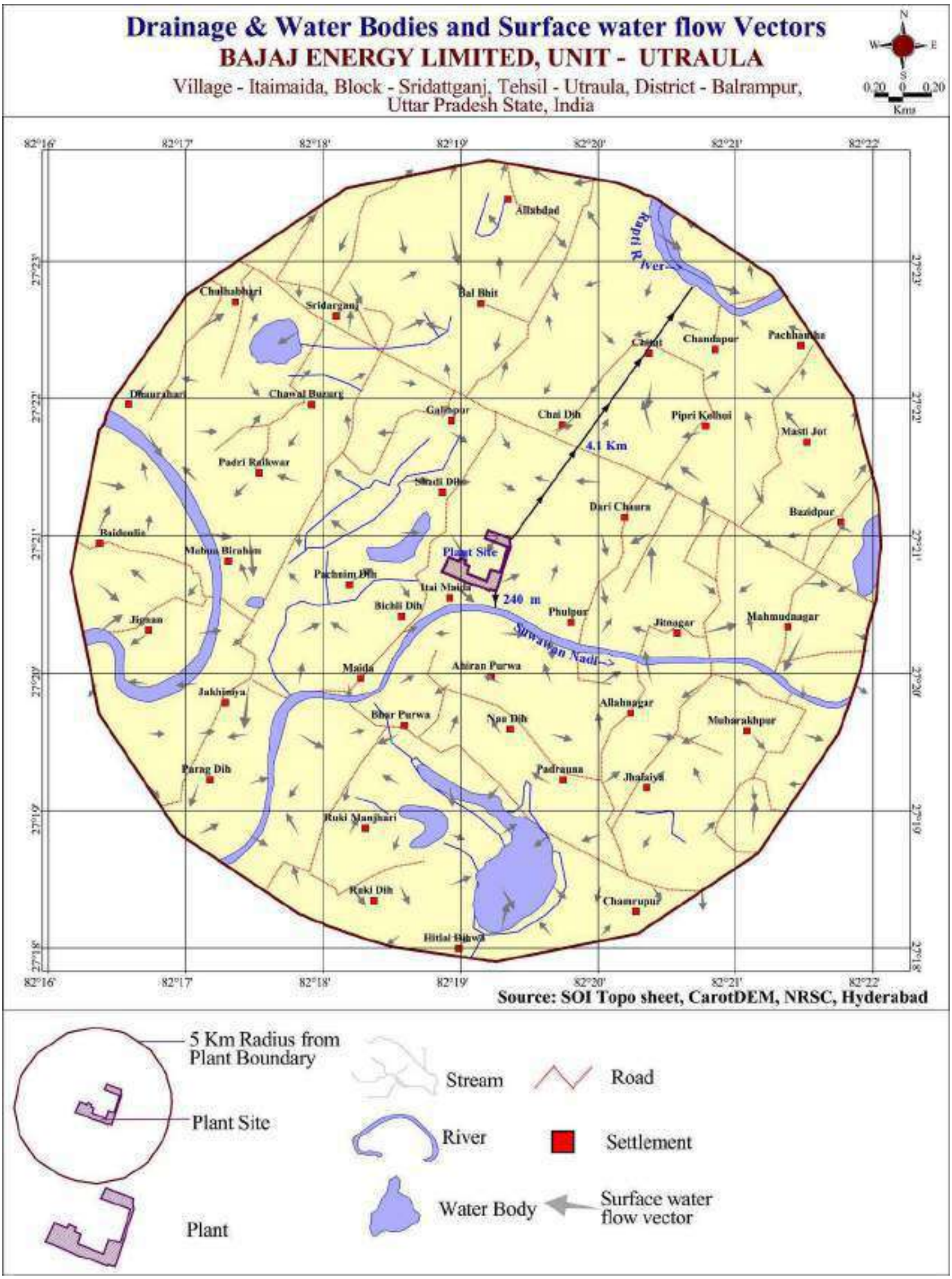
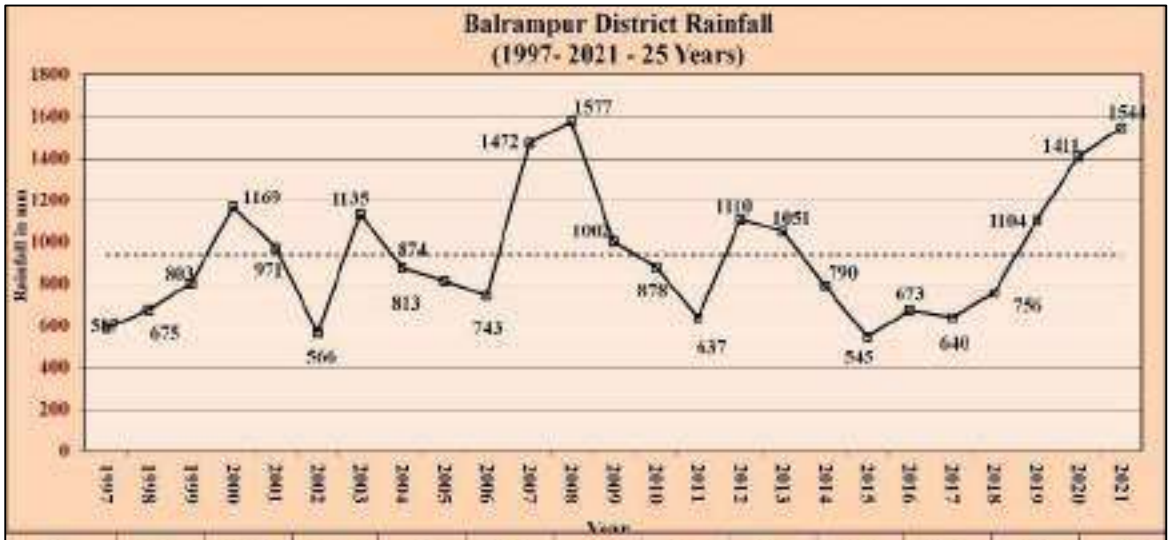


Plate 8: Drainage and Water bodies and surface water flow vectors

Climate and Rainfall

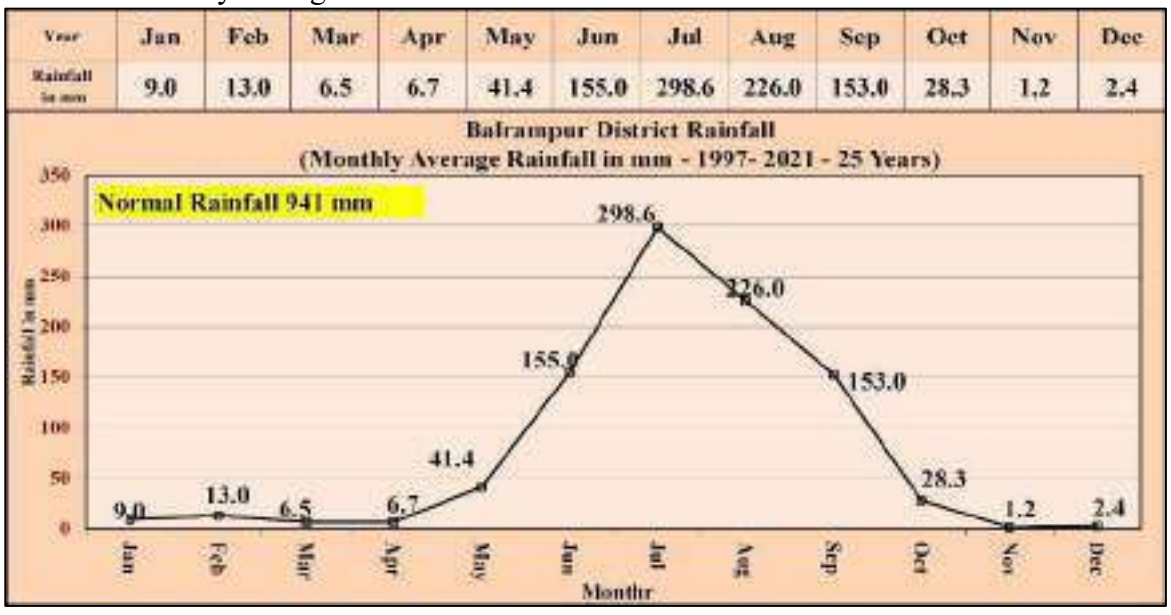
The normal annual rainfall of Balrampur district is **941 mm (25 year Normal)**. District received maximum rainfall during south west monsoon period i.e., June to September. About **88 %** of the annual rainfall received during south west monsoon season. Only **12 %** of the annual rainfall takes place 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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall in mm	9.0	13.0	6.5	6.7	41.4	155.0	298.6	226.0	153.0	28.3	1.2	2.4

Table 6: Monthly average Rainfall



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 Arga Bird Sanctuary** which is about **48.5 Km in the South west from the Plant's boundary.** The Plant site is located away from **500 m**. The Ramsar site map is given in **Plate - 9.**

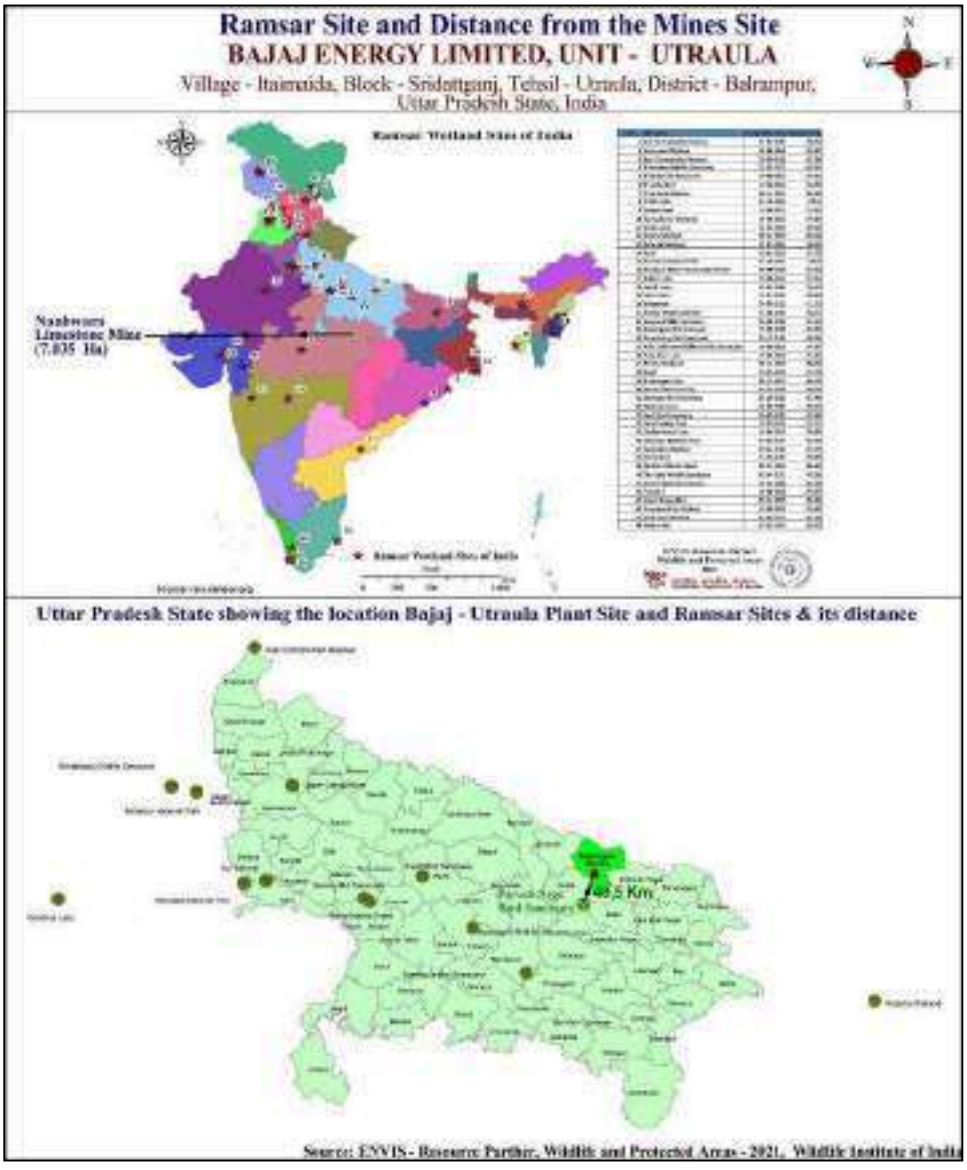


Plate 9: Ramsar sites and distance from the Plant

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 geology of Balrampur District does not expose anything except generally Gangetic alluvium with the exception of the boulder's detritus brought down from the hills in the north. 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 Balrampur 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 **Utraula** 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
Q2nar1	Grey Micaceous Sand, Silt and Clay
Q2nca	Grey Sand, Silt and Clay
Q1oahz	Oxidised Silt-clay with Kankar and Micaceous Sand

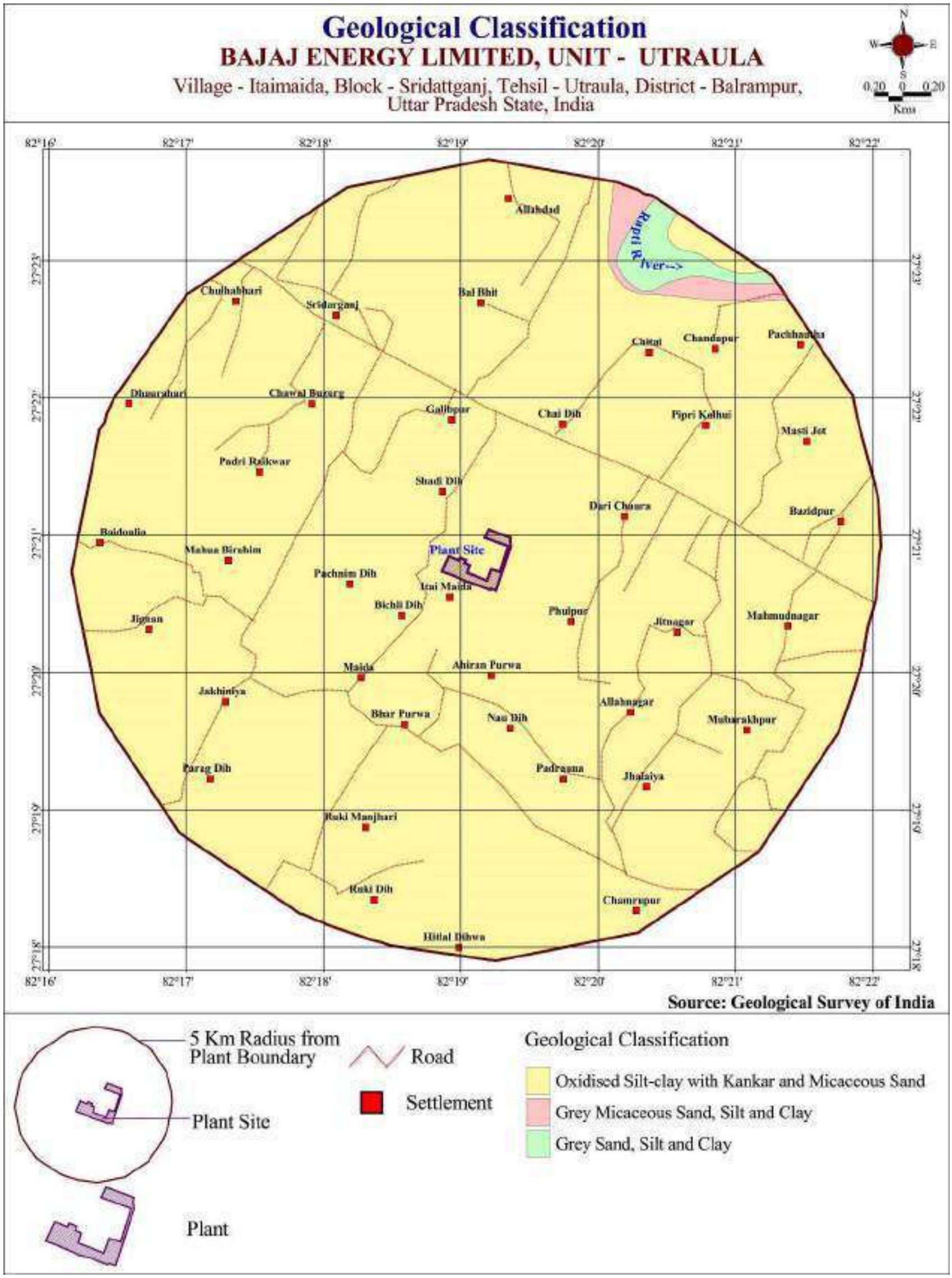
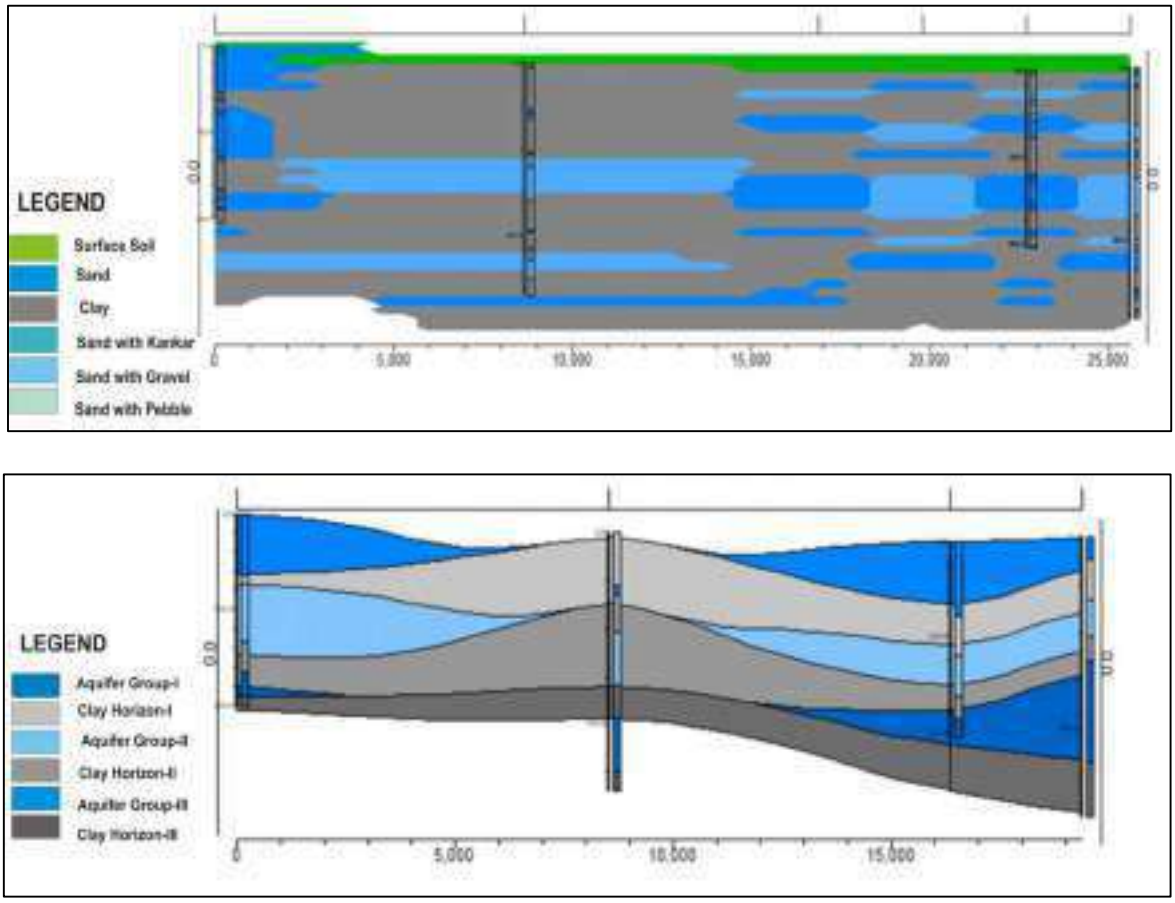


Plate 10: Geological Classification

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

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.

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.

Younger Alluvial Plain: A flat to gently sloping slightly undulating terrain. It is produced by extensive deposition of alluvium usually on and adjacent to flood plain. It consists of various fluvial land forms such as back swamp, oxbow lakes, old meander and meander scars etc.

Geomorphologically, the study area has been divided into following units

1. Active Flood Plain
2. Older Alluvial Plain
3. Older Flood Plain

The occurrence and movement of ground water is controlled by the primary porosity. The Plant is located in older flood plain.

In the north east of the study area the Active flood plain noticed. The occurrence is in the banks of Rapti River. The Geomorphology and structure maps are presented in **Plate 11.**

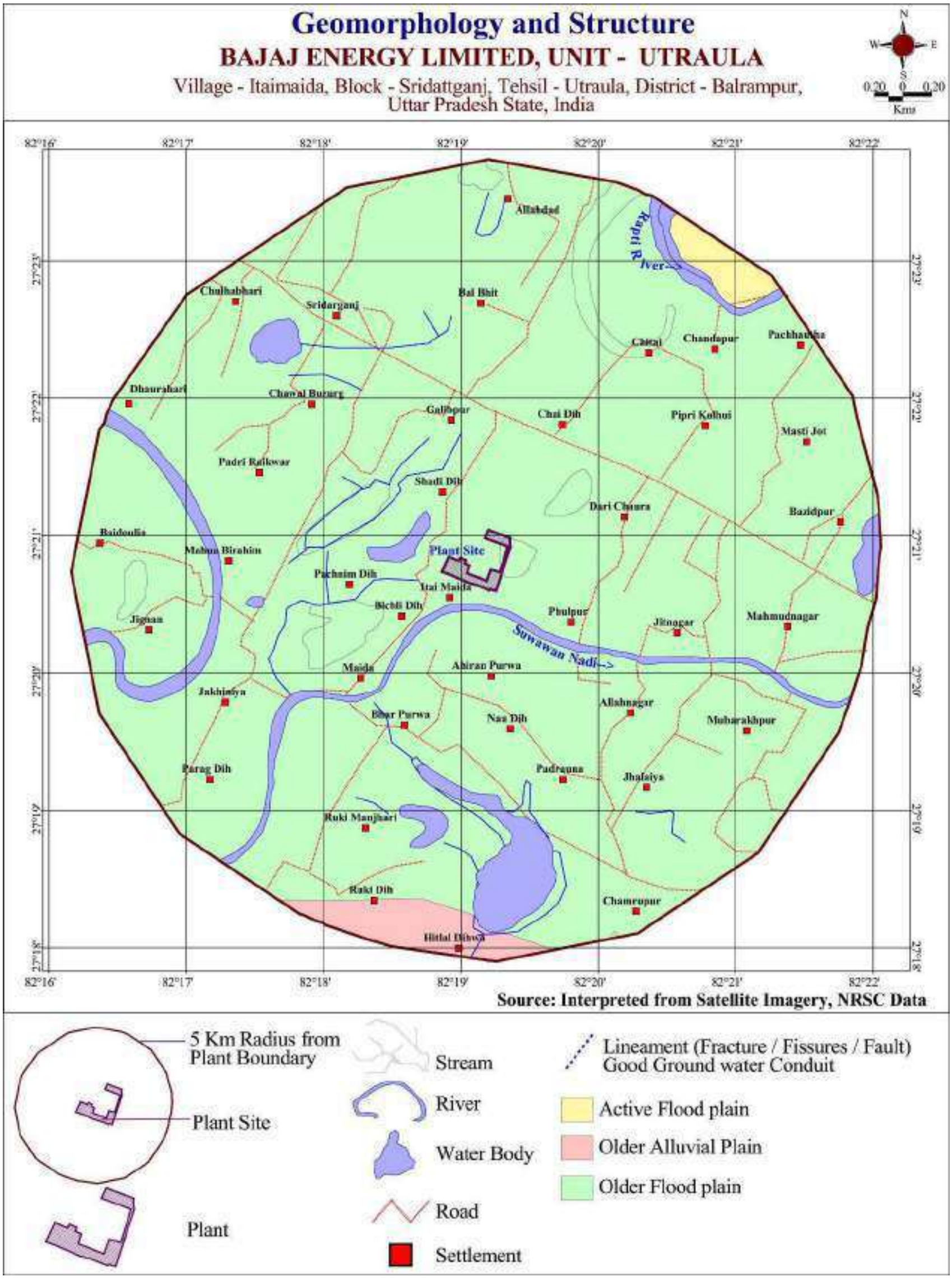


Plate 11: Geomorphology and Structure

2.2 Hydrogeology of the area

Alluvial tract of Balrampur district is underlain by sands of various grades, gravels, silt and clay. The result of exploratory drillings indicates that the aquifers vary great deal in extent, both vertically as well as laterally.

The southern part of the district is characterized by thicker aquifers, where sand and gravel predominate over clays. The northern part comprises of thinner granular zones and lenses of sand of varying lateral extent, dominated by thick clay.

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
Zone with 30- 80 m Deep 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.

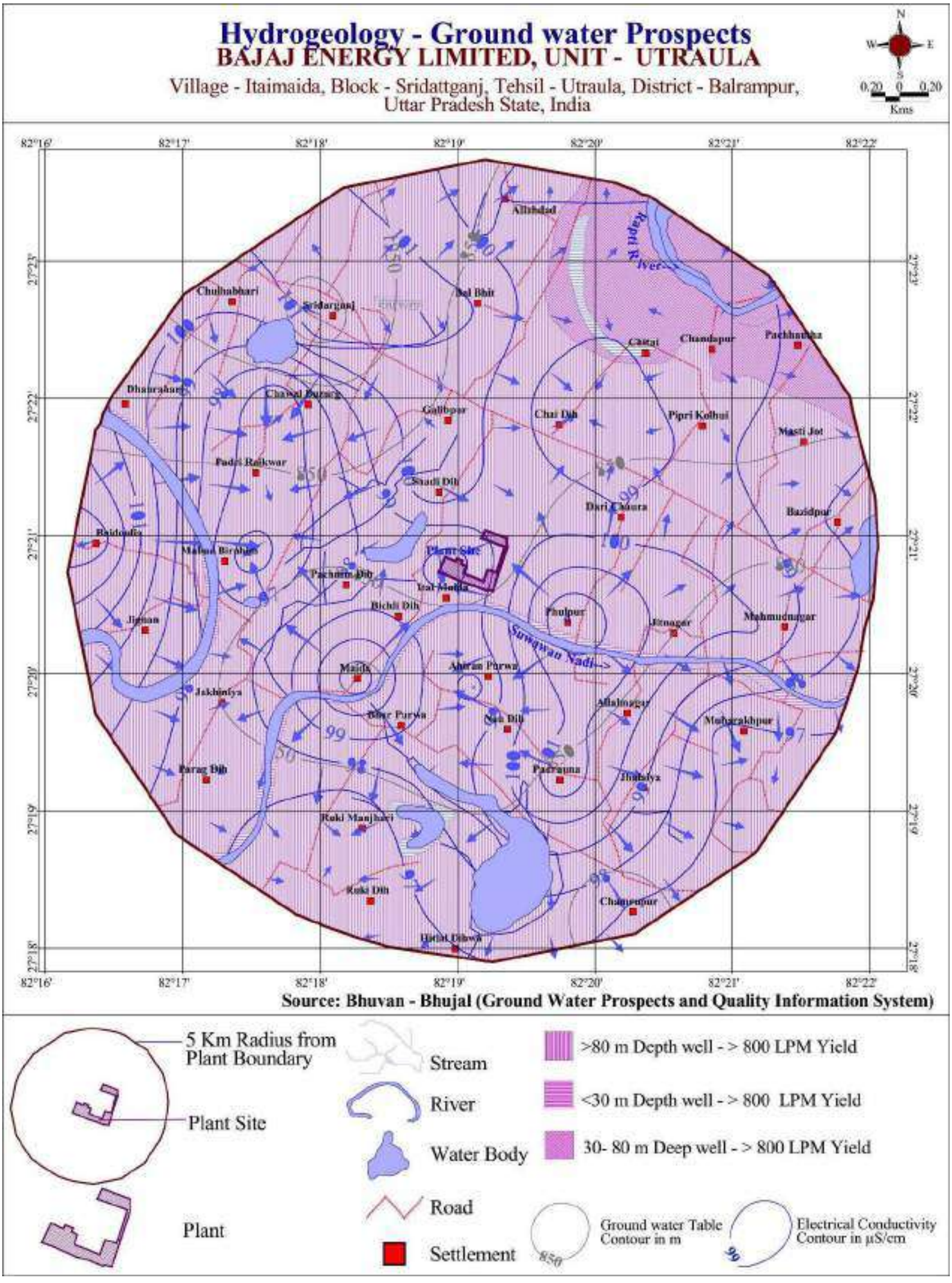


Plate 12: Ground Water Prospects

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 **21 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 (TDS) has also been recorded for the ground water using (Potable EC meter). The snap shot of the mobile app is presented in **Figure – 6.**

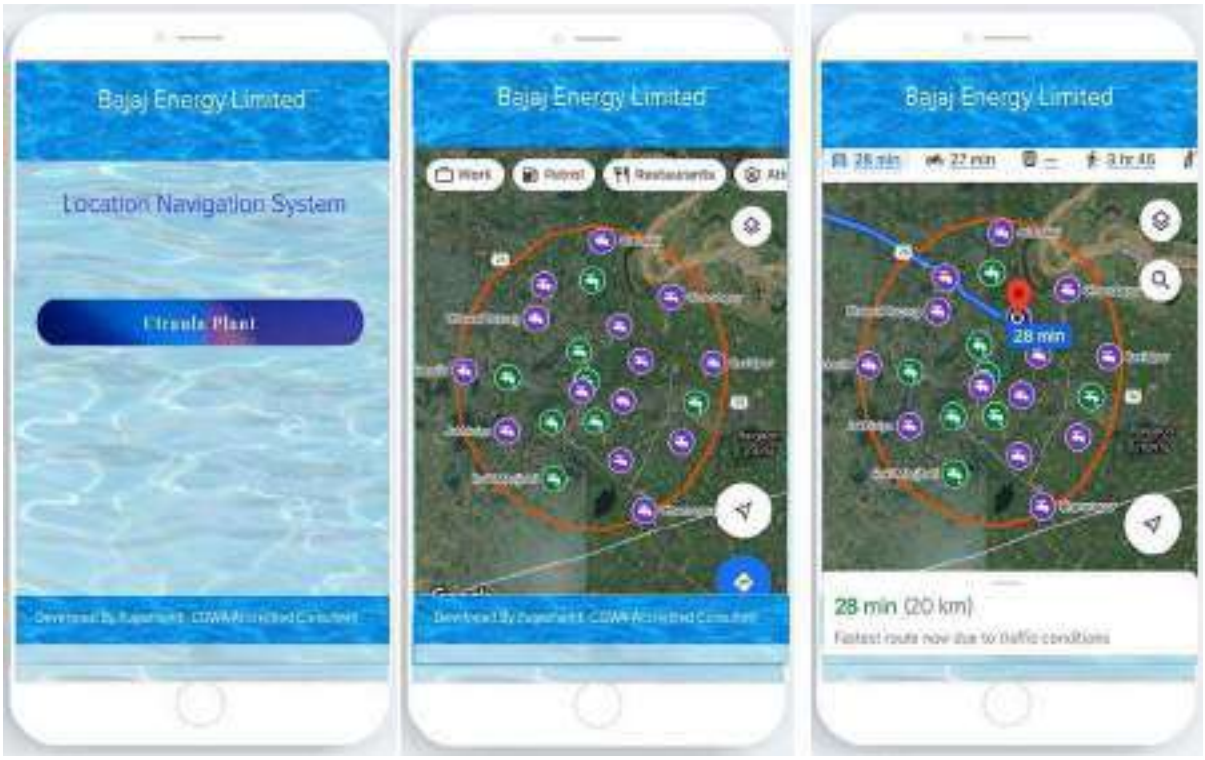


Figure 2: Snap shot of Mobile APP

Since there is no open well in the study area, all the 21 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 **45 m to 121 m** respectively. Yield varies from **187 - 375 m³ /day for 8 hours of Pumping**. Post-monsoon water level varies from **2.4 m to 7.1 m** below ground level. In Pre-monsoon period it varies from **3.4 m to 8.8 m** below ground level. Seasonal fluctuation in water level in these Tube well varies from **0.3 m to 1.7 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 96 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° 20' 48.725" E	82° 18' 58.032" N	121	5.60	4.80	0.80
2	Maida	27° 19' 57.85" E	82° 18' 15.311" N	72	4.20	3.50	0.70
3	Ahiran Purwa	27° 19' 54.008" E	82° 19' 7.072" N	100	4.40	3.65	0.75
4	Padrauna	27° 19' 13.44" E	82° 19' 45.224" N	78	4.30	3.65	0.65
5	Chamrupur	27° 18' 17.896" E	82° 20' 16.159" N	64	7.10	6.70	0.40
6	Rukhi Manjhari	27° 18' 59.393" E	82° 18' 12.312" N	90	8.80	7.10	1.70
7	Mahua Birahim	27° 20' 50.607" E	82° 17' 28.64" N	45	7.60	6.09	1.51
8	Chavai Bujurg	27° 21' 59.771" E	82° 17' 41.417" N	60	6.90	6.09	0.81
9	Shadi Dih	27° 21' 22.352" E	82° 18' 49.849" N	98	5.10	4.10	1.00
10	Baidoulia	27° 20' 57.854" E	82° 16' 23.012" N	102	3.40	2.43	0.97

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	Jhakinia	27° 19' 47.496" E	82° 17' 14.168" N	45	5.60	4.57	1.03
12	Shrirathganj	27° 22' 32.304" E	82° 18' 1.066" N	60	4.20	3.65	0.55
13	Allah Dad	27° 23' 29.551" E	82° 19' 21.148" N	68	4.10	3.65	0.45
14	Bal Bhit	27° 22' 38.377" E	82° 19' 3.047" N	88	3.80	3.04	0.76
15	Chai Dih	27° 21' 55.879" E	82° 19' 47.942" N	106	3.90	3.65	0.25
16	Chandapur	27° 22' 15.582" E	82° 20' 46.799" N	85	7.40	6.09	1.31
17	Darichura	27° 21' 10.858" E	82° 20' 8.65" N	55	4.95	4.57	0.38
18	Phulpur	27° 20' 23.831" E	82° 19' 47.536" N	48	4.90	4.57	0.33
19	Bazidpur	27° 21' 7.074" E	82° 21' 43.168" N	45	4.10	3.65	0.45
20	Mahmoodnagar	27° 20' 19.666" E	82° 21' 9.688" N	82	3.90	3.65	0.25
21	Mubarakhpur	27° 19' 33.094" E	82° 20' 55.959" N	84	6.40	5.48	0.92

The summarized ground water level of the open well and Tube well for the core and buffer zone are given in the **Table 12. 21 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	**3.4**	**2.4**	**0.3**
Maximum in m	**8.8**	**7.1**	**1.7**

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 12-13-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 **8.4-8.8 m** falls in the North of the study area near Ruki Manjhari village.

The shallowest ground water level zone of **2.4-4.4 m** occupies in the North and east of the study area near Bal Bhit, Chai Dih and Malmudnagar villages.

The Plants falls in **4.4-6.4 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 **6.4 – 8.4 m** falls in the north of the study area near Ruki Manjhari village. The shallowest ground water level zone of **2.2-4.4 m** occupies in the half of the study area. The Plant site falls in **2.4-4.4 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 – 2.0 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.

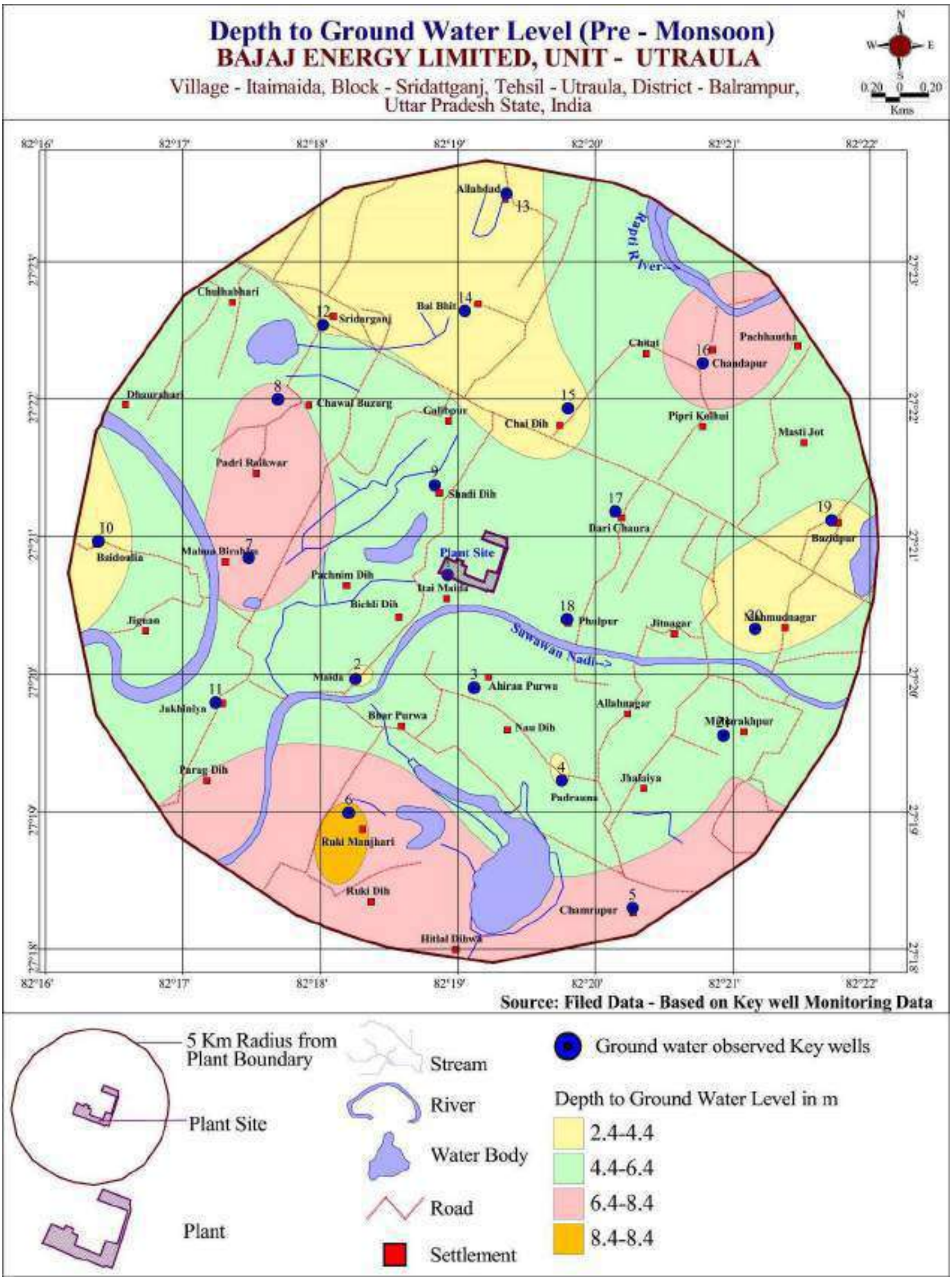


Plate 13: Ground water level zone (Pre-Monsoon)

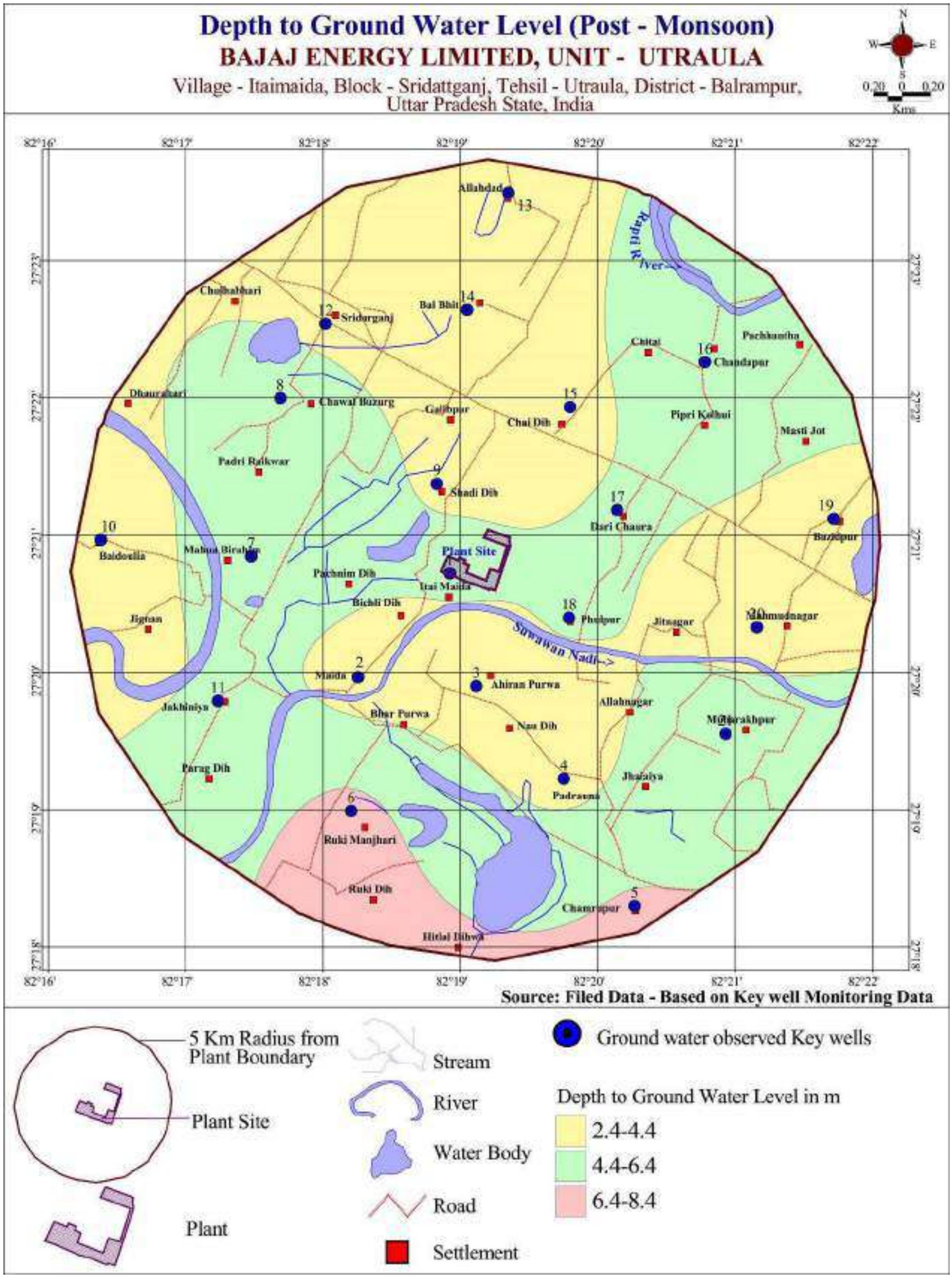


Plate 14: Ground water level zone (Post-Monsoon)

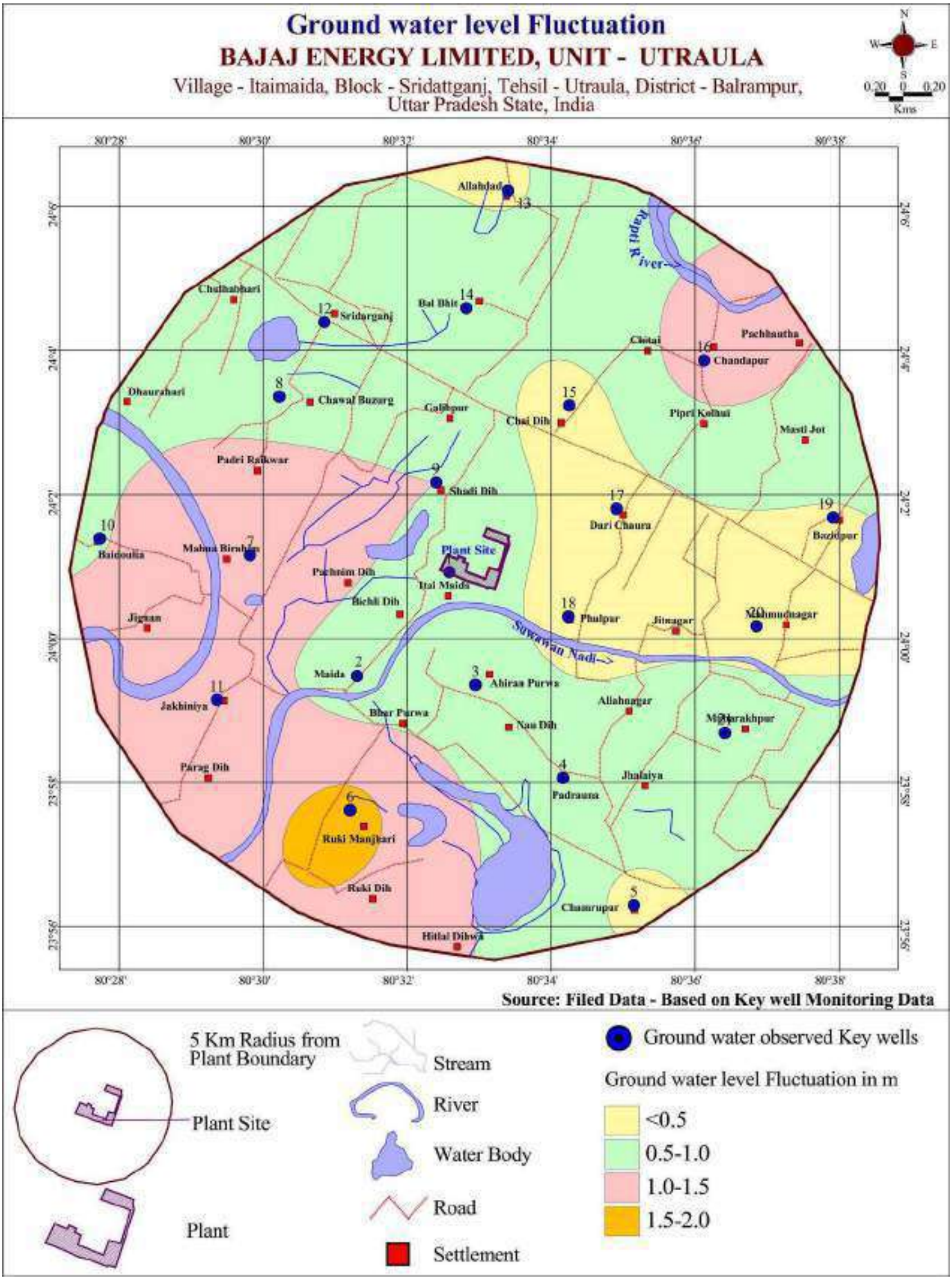


Plate 15: Ground water level fluctuation

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 Trough (Convergent flow of ground water).
2) Ground water mound (Divergent flow of ground water).

Ground water trough is observed in the Plant site where there is convergent flow of ground water. 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) and ground water trough (convergent flow of ground water) noticed in the isolated pockets 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 system.

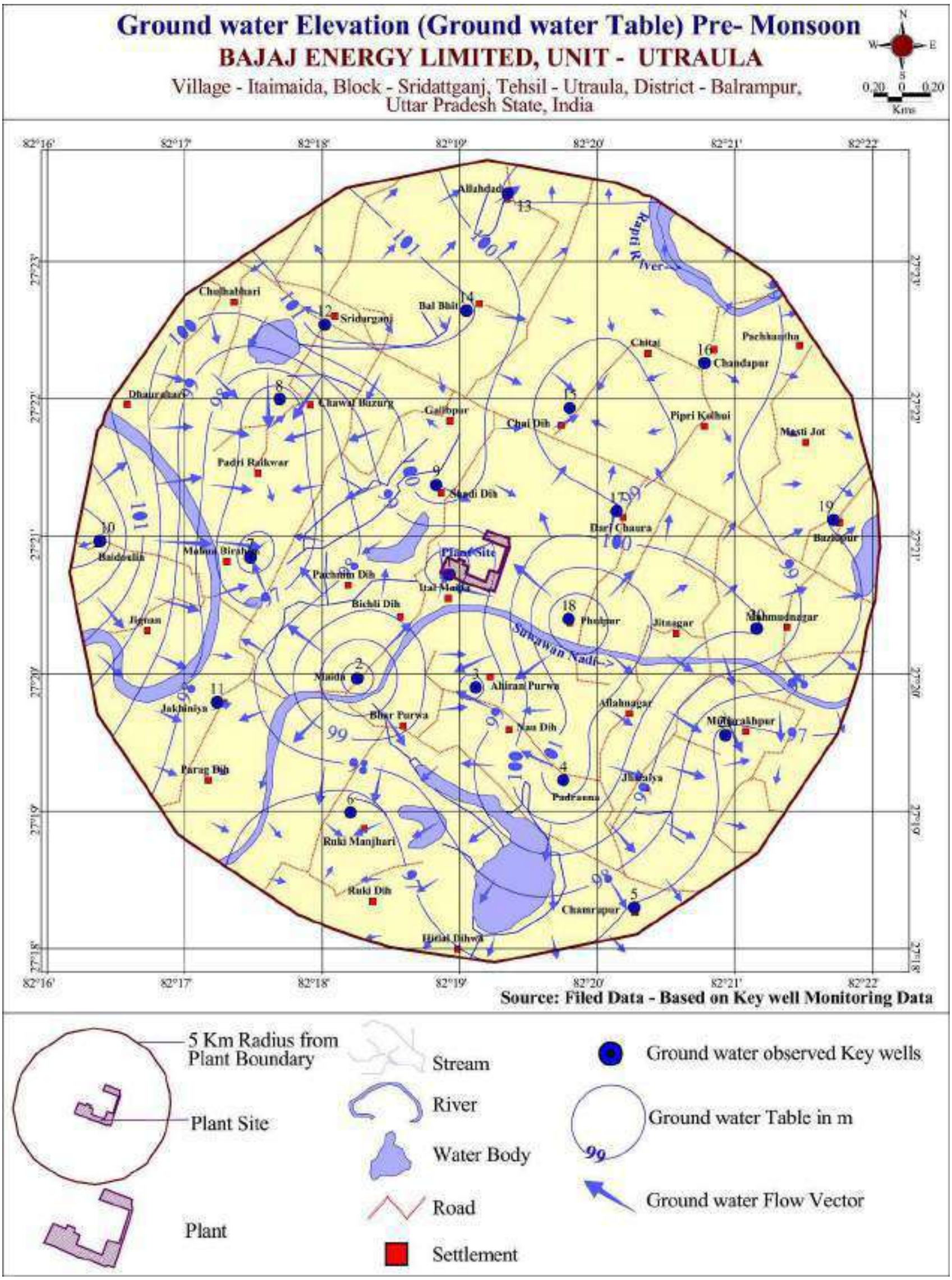


Plate 16: Ground water Table (Pre-Monsoon)

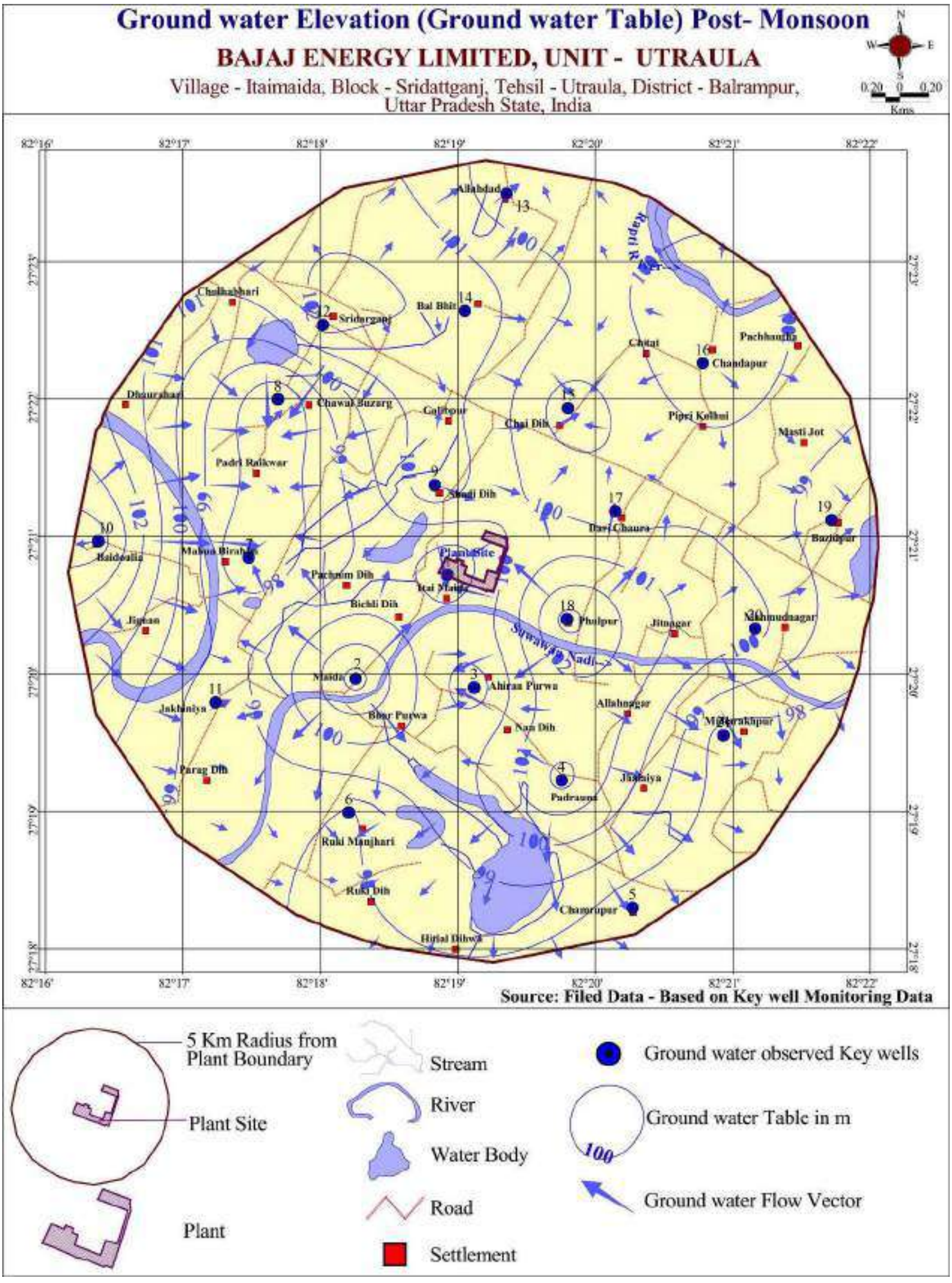


Plate 17: Ground water Table (Post-Monsoon)

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**:

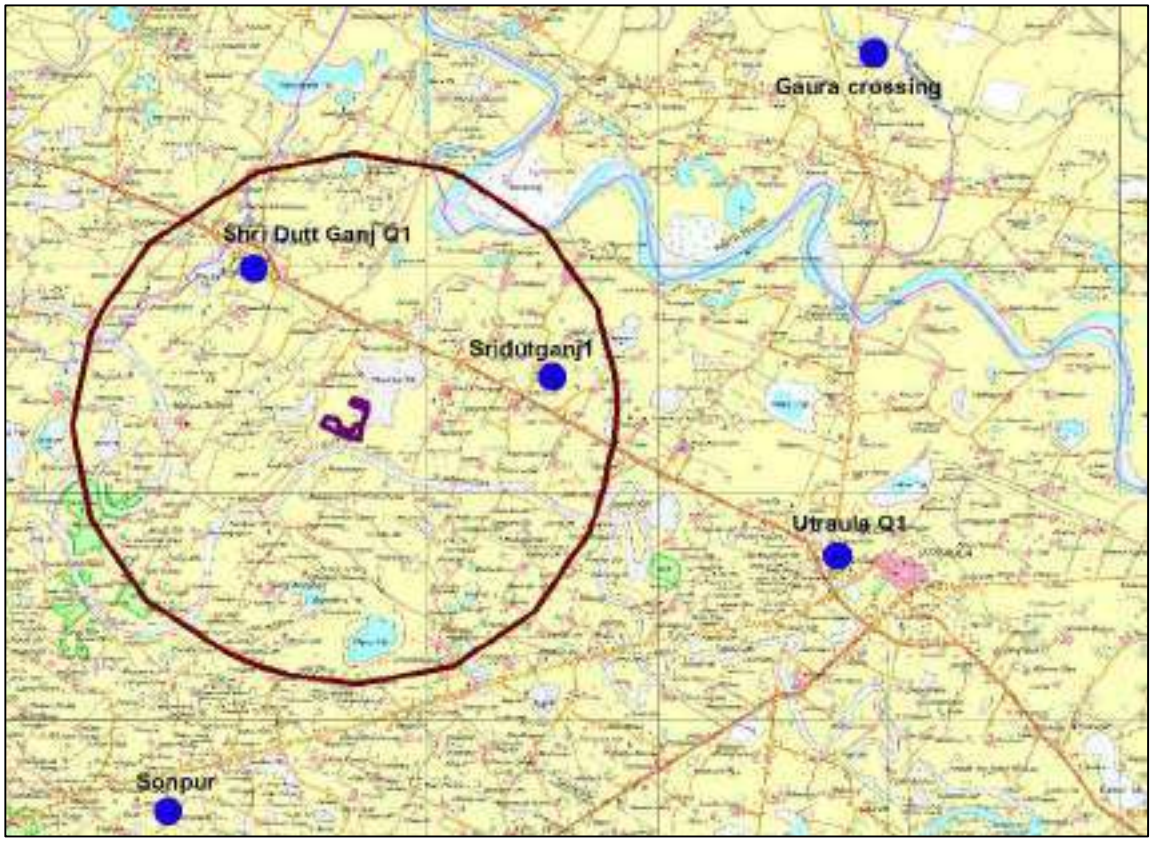


Plate 18: Location of CGWB Observation well

The continuous monitoring data available for location of **Gaura Crossing, Sonpur and Sridatttganj** which are about **13 km radius** in west, north 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 3 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	**Gaura crossing**	CGWB	27° 24' 50" E	82° 24' 50" N
2	**Sonpur**	CGWB	27° 16' 30" E	82° 17' 12" N
3	**Sridattganj-1**	CGWB	27° 21' 16" E	82° 21' 22" 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.**

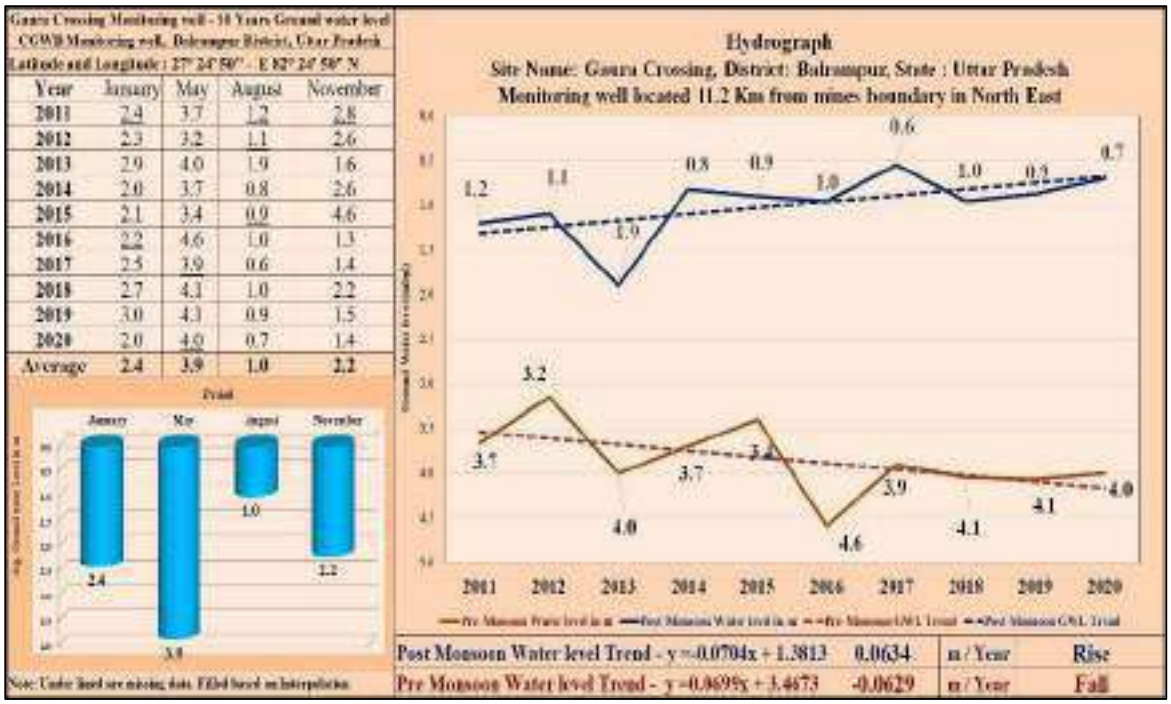


Figure 3: Hydrograph of Gaura crossing CGWB Monitoring well

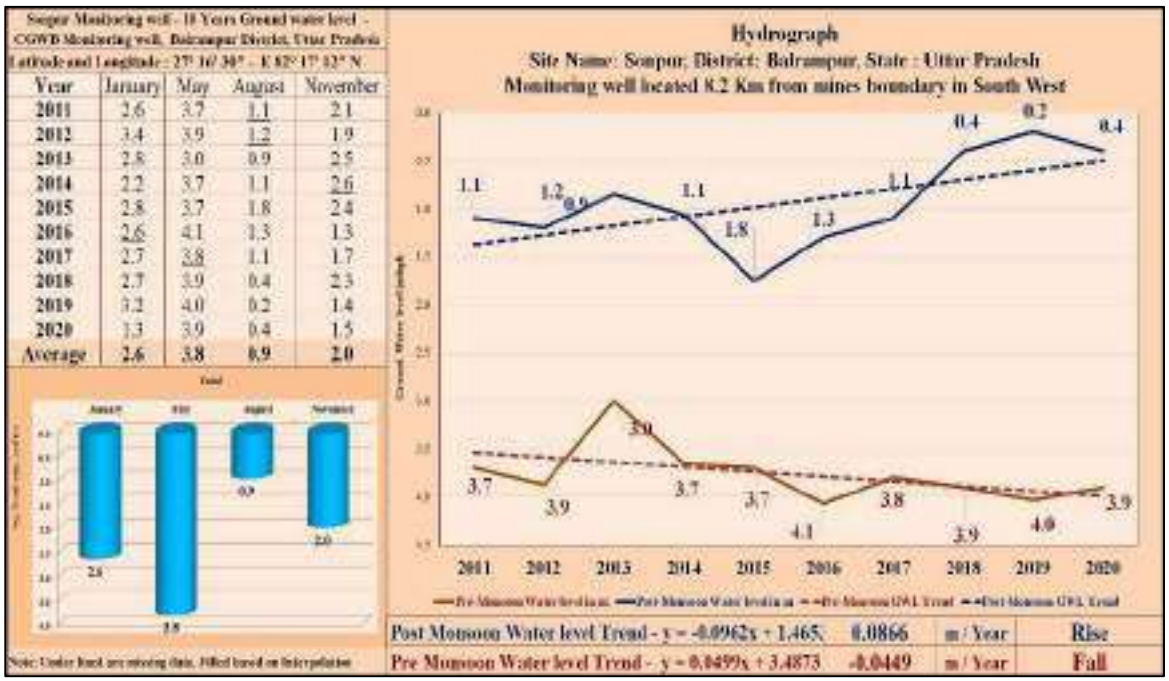


Figure 4: Hydrograph of Sonapur CGWB Monitoring well

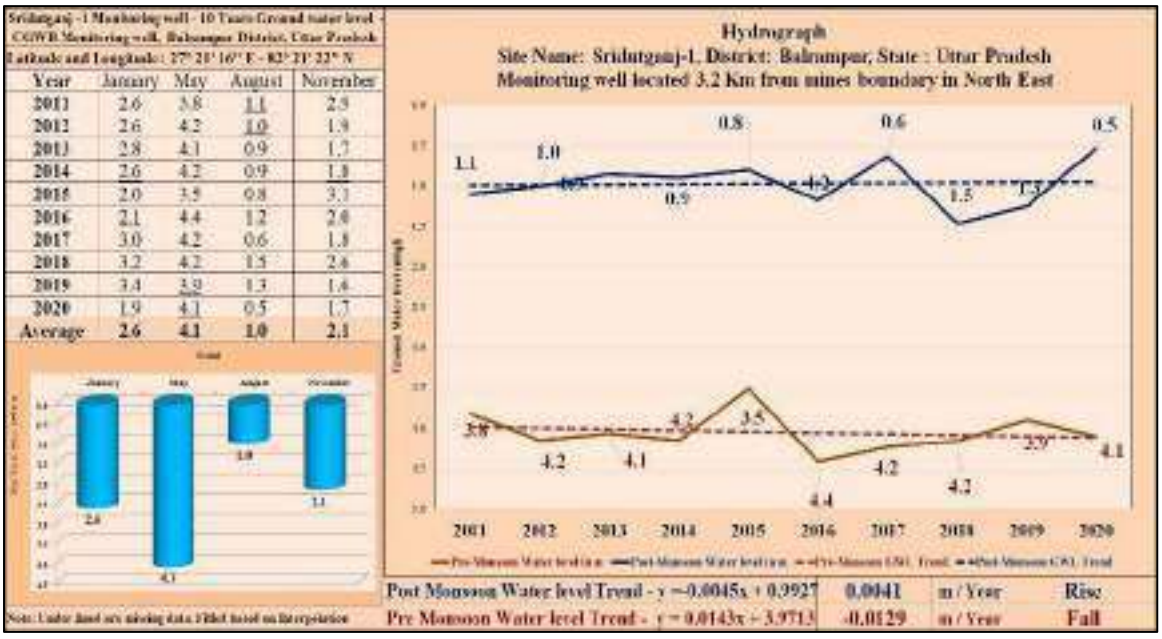


Figure 5: Hydrograph of Sridatganj-1CGWB Monitoring well

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)
Gaura crossing		0.063	-0.063			
Sonpur		0.087	-0.045			
Sridutganj1		0.004	-0.013			
Average		**0.0513**	**-0.0402**			

The long-term ground water level trend for the 3 CGWB wells indicates there is increasing trend in 3 seasons (3 post-monsoon periods). The falling trend observed in 3 seasons (3 pre-monsoon).

The average rise in the post-monsoon period is 0.0513 m/year. (3 Seasons)

The average fall in the pre-monsoon period in -0.0402 m/year (3 Seasons)

The long-term trend in around the study area clearly indicates that the stress in the ground water is merger.

2.2.5 Predicted water level declines for affected aquifers [Ground water modeling]

The Total ground water requirement for the plant is **6,894 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**

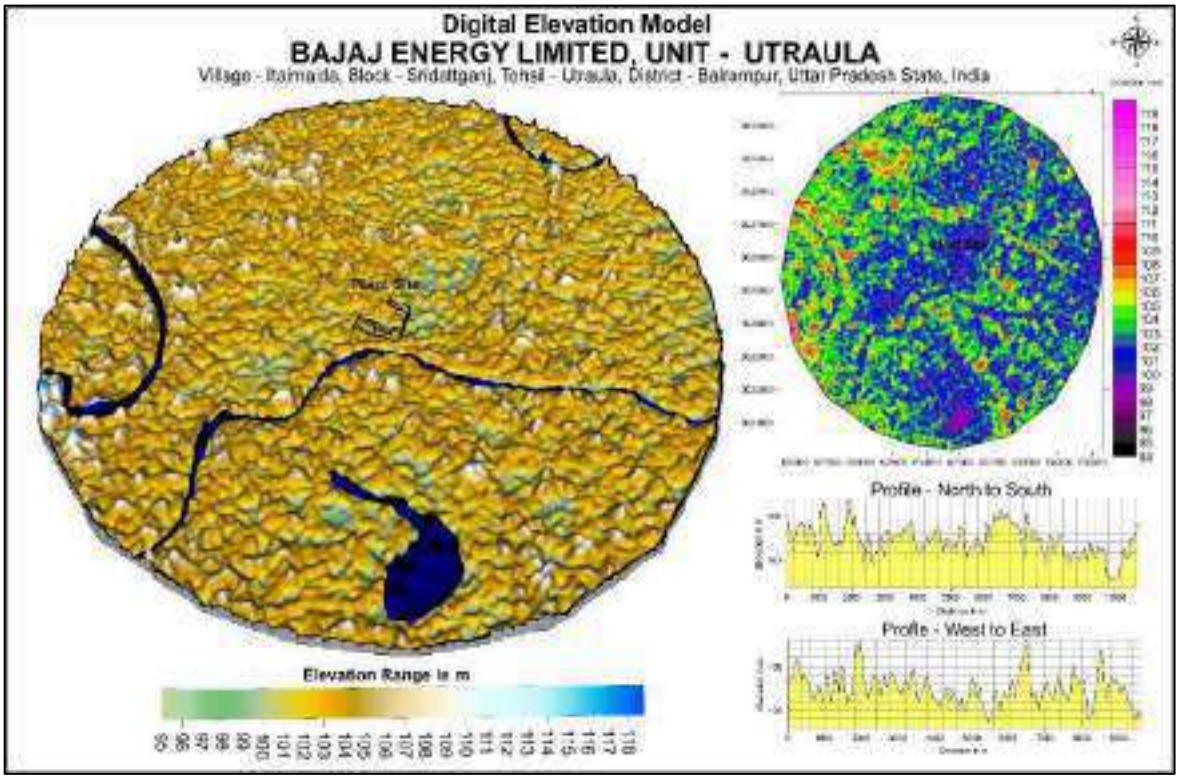


Figure 6: Digital Elevation Model (DEM) of the Model area

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

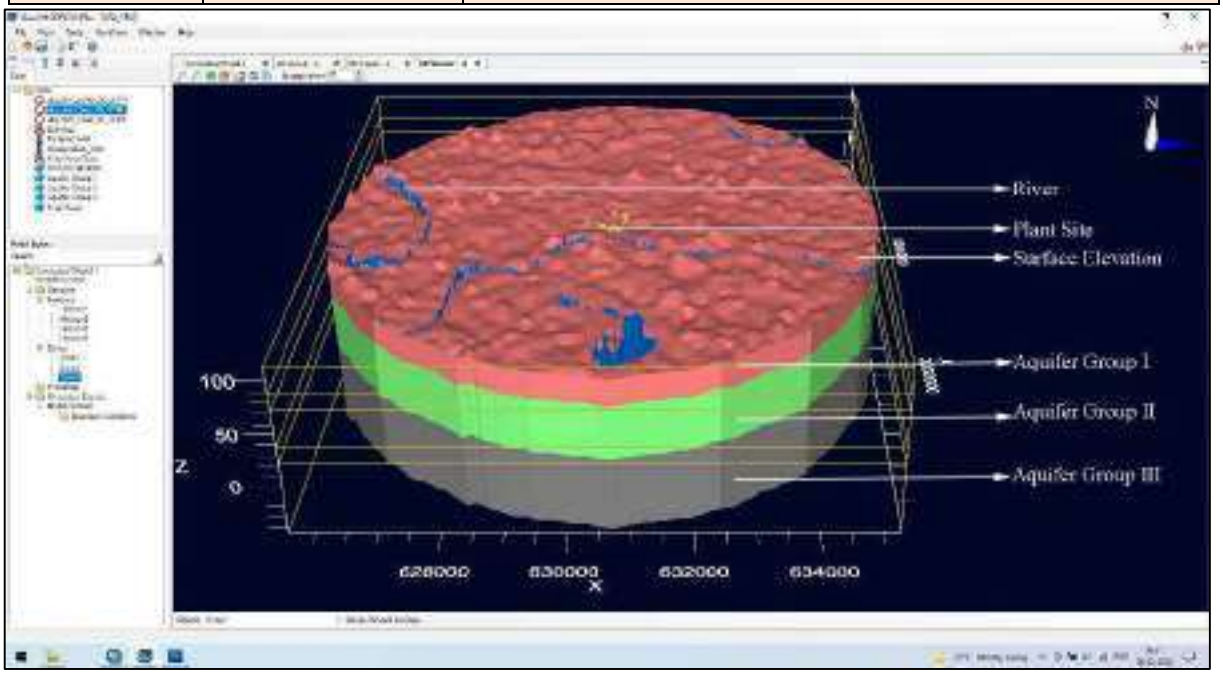


Figure 7: Aquifer geometry of Plants Model area

2.5.2.3 Aquifer Piezometry

To study the aquifer piezometry, 8 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	BAJAJ POWER	630115	3025372	103	97.40
2	MANSHARAM	629025	3023964	106	101.80
3	MAJEED KHAN	630449	3023861	102	97.60
4	RAJKUMAR PRASAD GOV.HP	631511	3022624	107	102.70
5	HASIULLAH KHAN	632379	3020923	106	98.90
6	GOV.HANDPUMP	628962	3022164	106	97.20
7	RAM SAJEEVAN	627726	3025574	103	95.40
8	VERMA JI HOUSE	628055	3027706	105	98.10
9	GOV.HANDPUMP	629947	3026574	106	100.90
10	GOV.HANDPUMP	625920	3025779	108	104.60
11	LODHE HANDPUMP	627348	3023628	104	98.40
12	SHUBHAM MODENWAL	628584	3028713	106	101.80
13	SHRIRAM HANDPUMP	630765	3030498	103	98.90
14	LAUKESH PRASAD	630285	3028918	105	101.20
15	RAM KRIPA	631532	3027623	100	96.10
16	GOV. CHANDARPUR HAND PUMP	633143	3028247	109	101.60
17	BUDHRAM	632116	3026244	104	99.05
18	PARVERALAM KHAN	631551	3024790	108	103.10
19	ATIKUM NISSAH	634714	3026155	101	96.90
20	GOV. HANDPUMP	633810	3024686	104	100.10
21	GOV. HAND PUMP	633448	3023249	103	96.60

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**

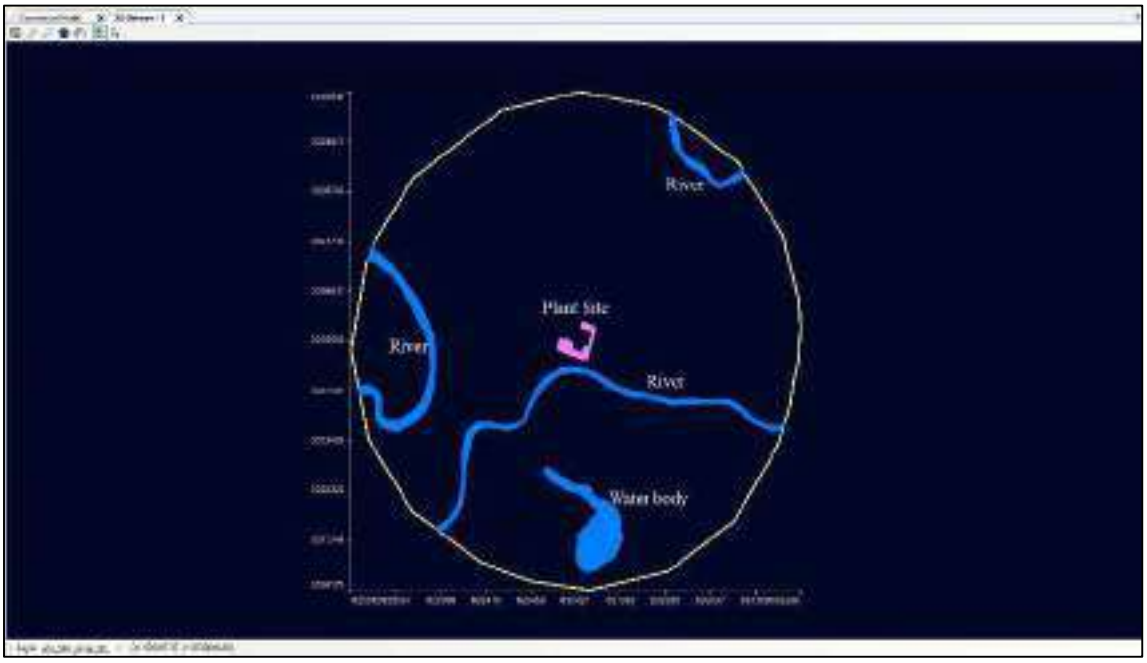


Figure 8: Model showing the Model Boundary, River and Plant site

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**

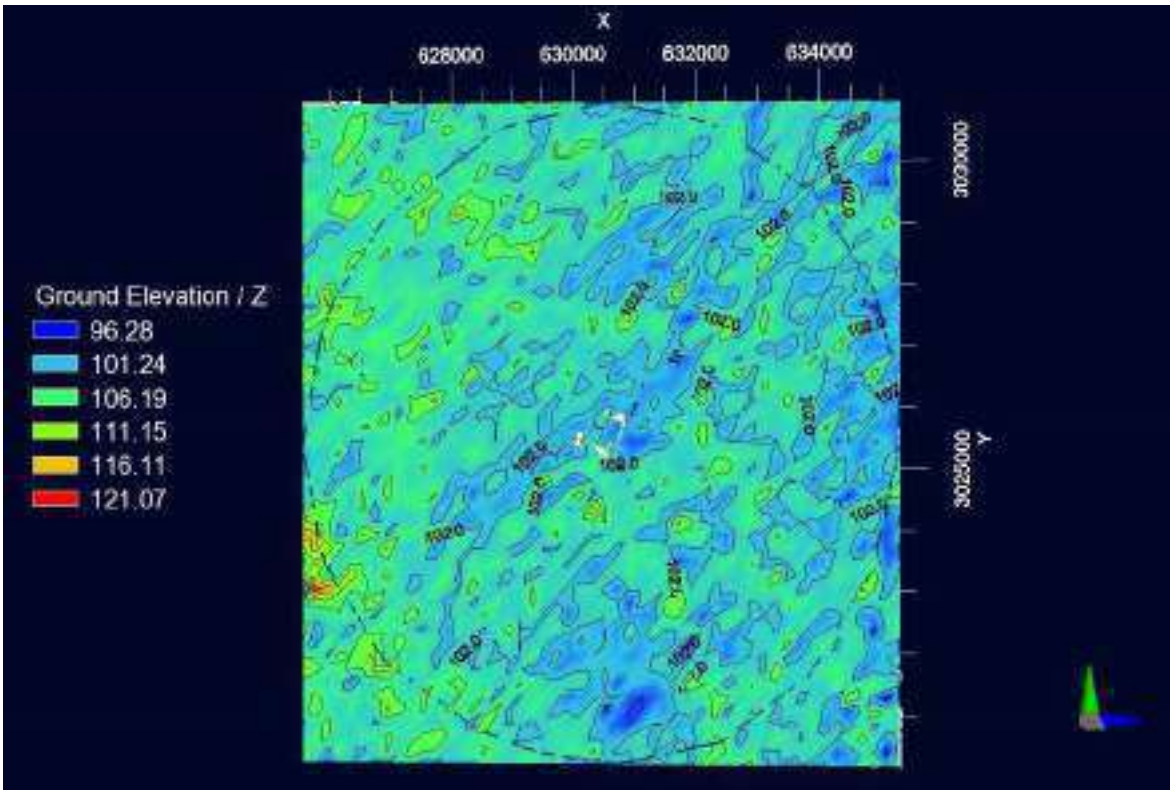


Figure 9: Top Elevation (Ground) of the Model Area

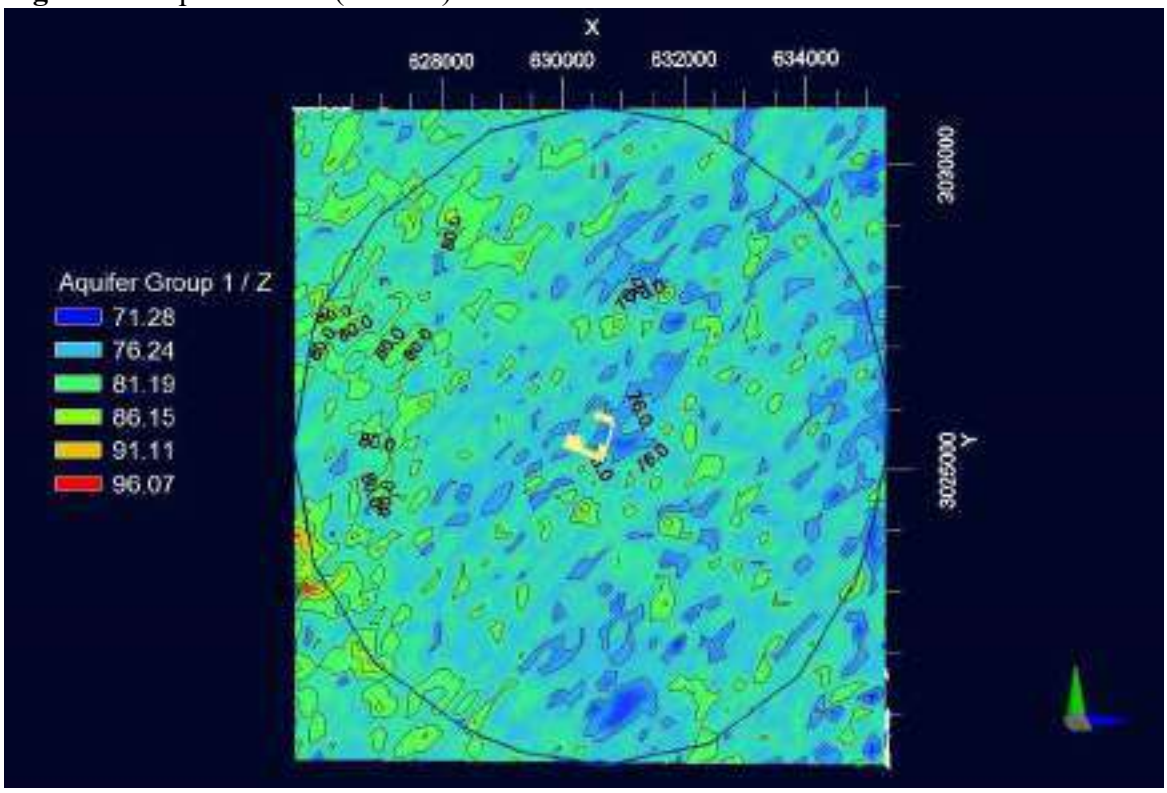


Figure 10: Bottom Elevation (m, amsl) of the Top Layer (Weathered zone)

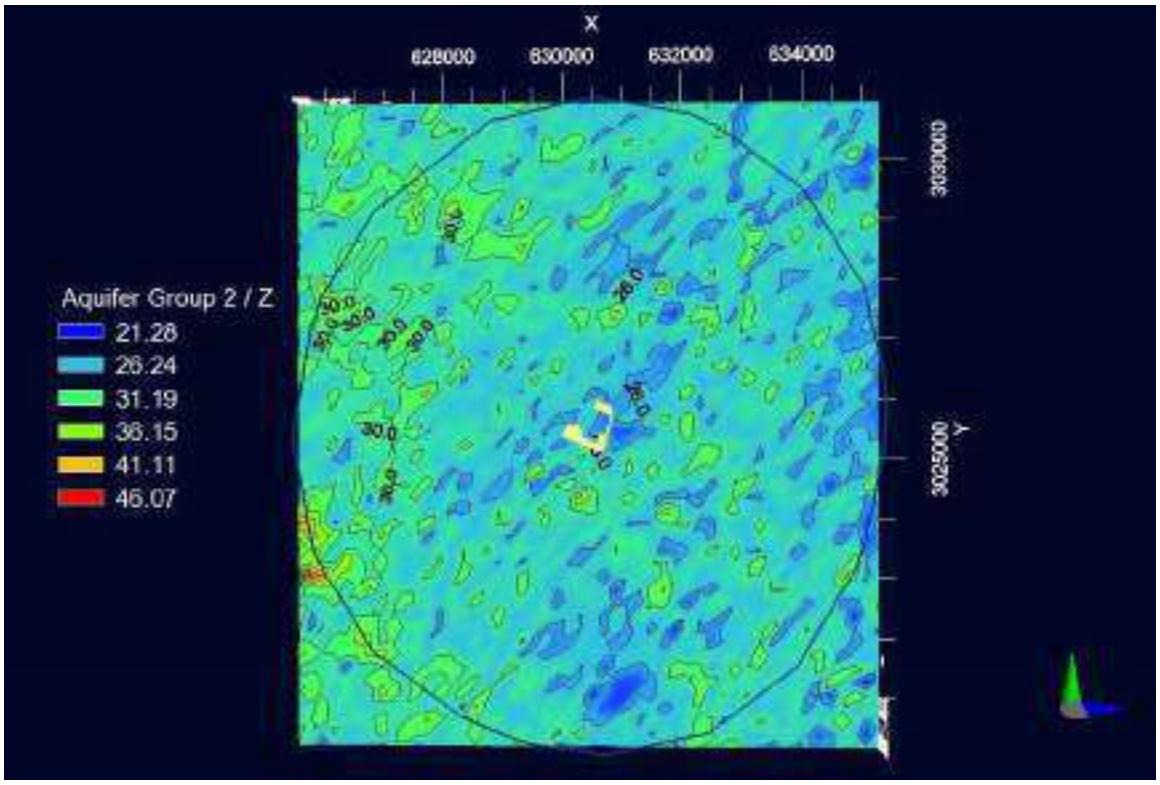


Figure 11: Bottom Elevation (m, amsl) of the Fractured Zone

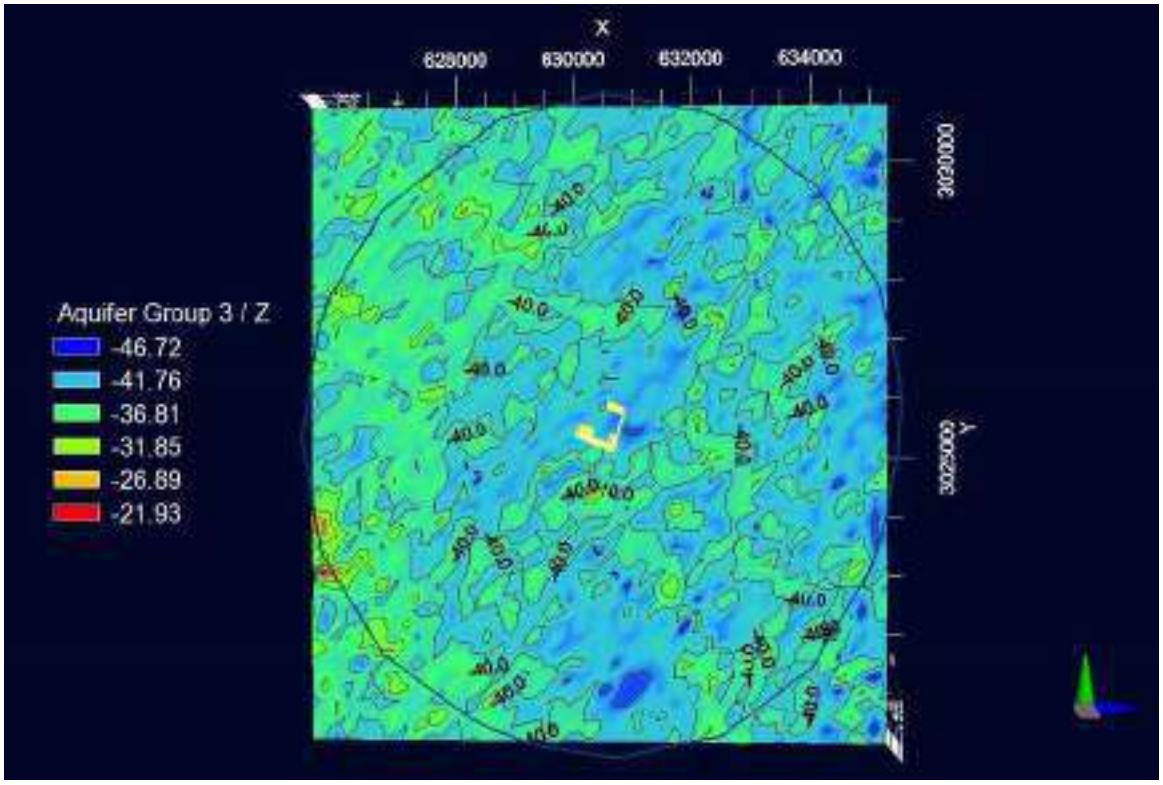


Figure 12: Bottom Elevation (m, amsl) of the Massive Formation

2.5.2.7 Grid Design

The area has been divided into 108 rows and 98columns with a uniform grid size of 100 m X 100 m covering **78.66 Sq.km area.** The total area **78.66 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**

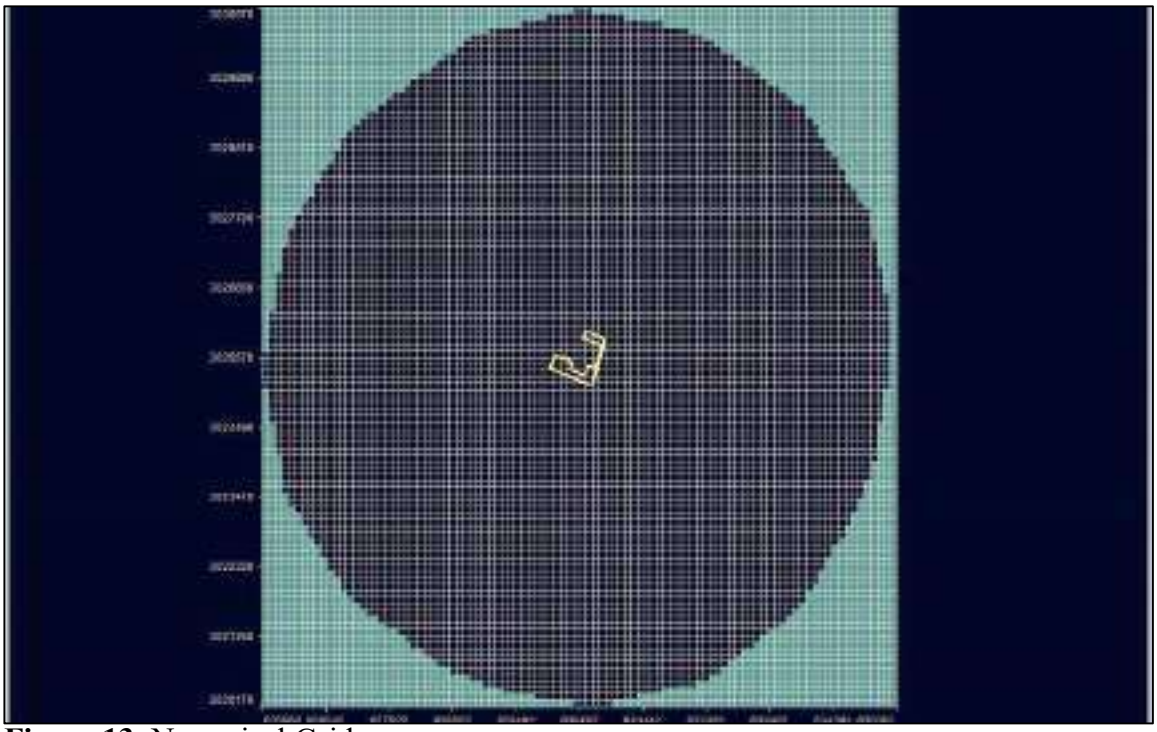


Figure 13: Numerical Grid

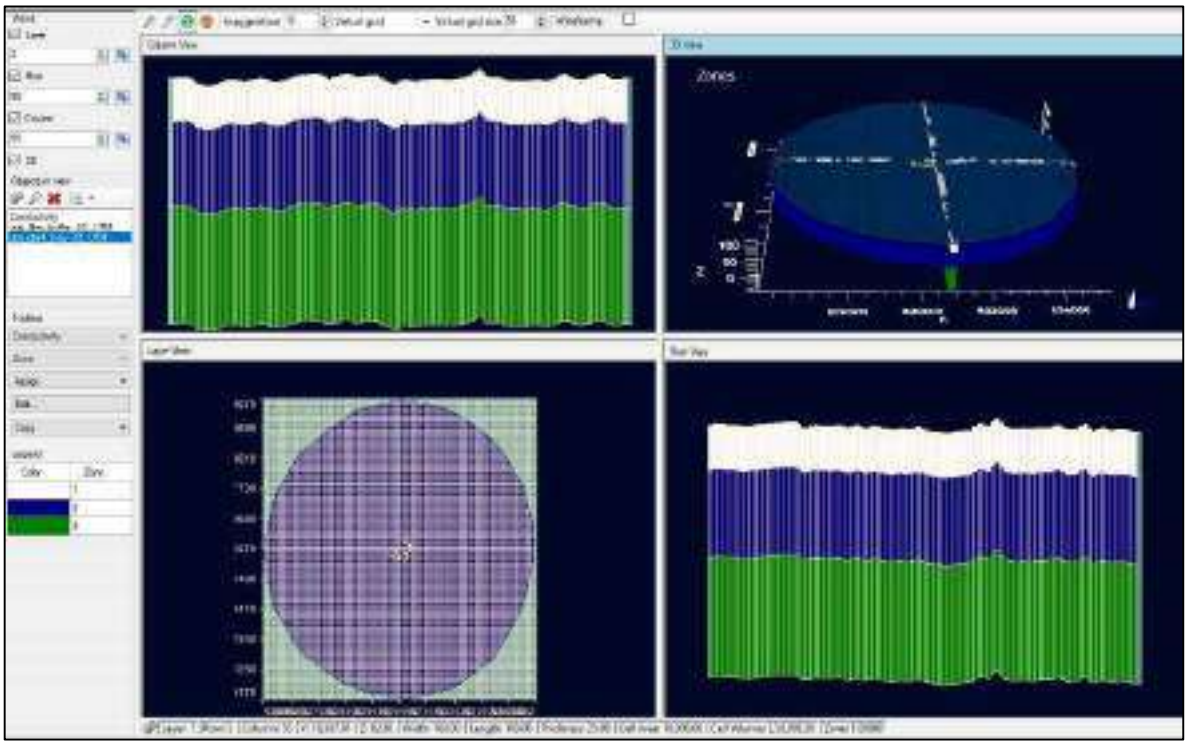


Figure 14: Hydrogeological cross section along row 55 and column 55 (Plant site)

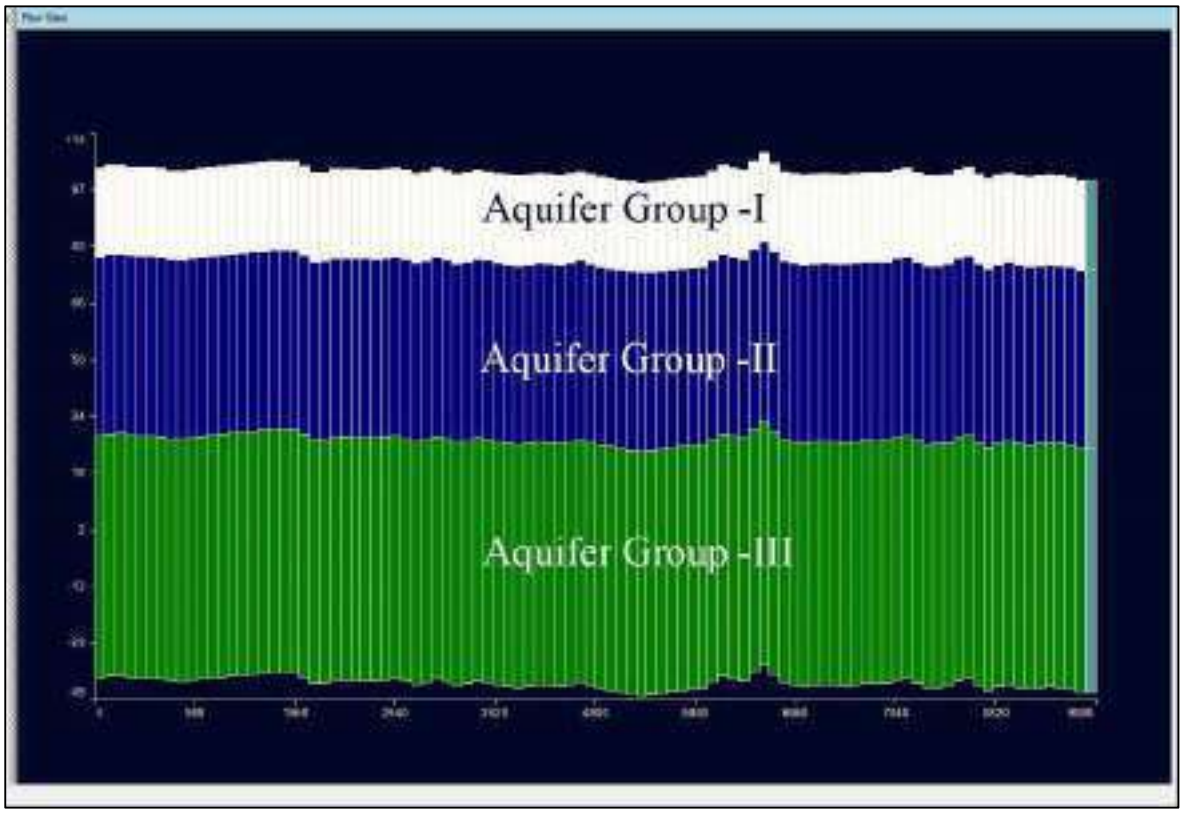


Figure 15: Hydrogeological cross section along row 55 showing 3 layers

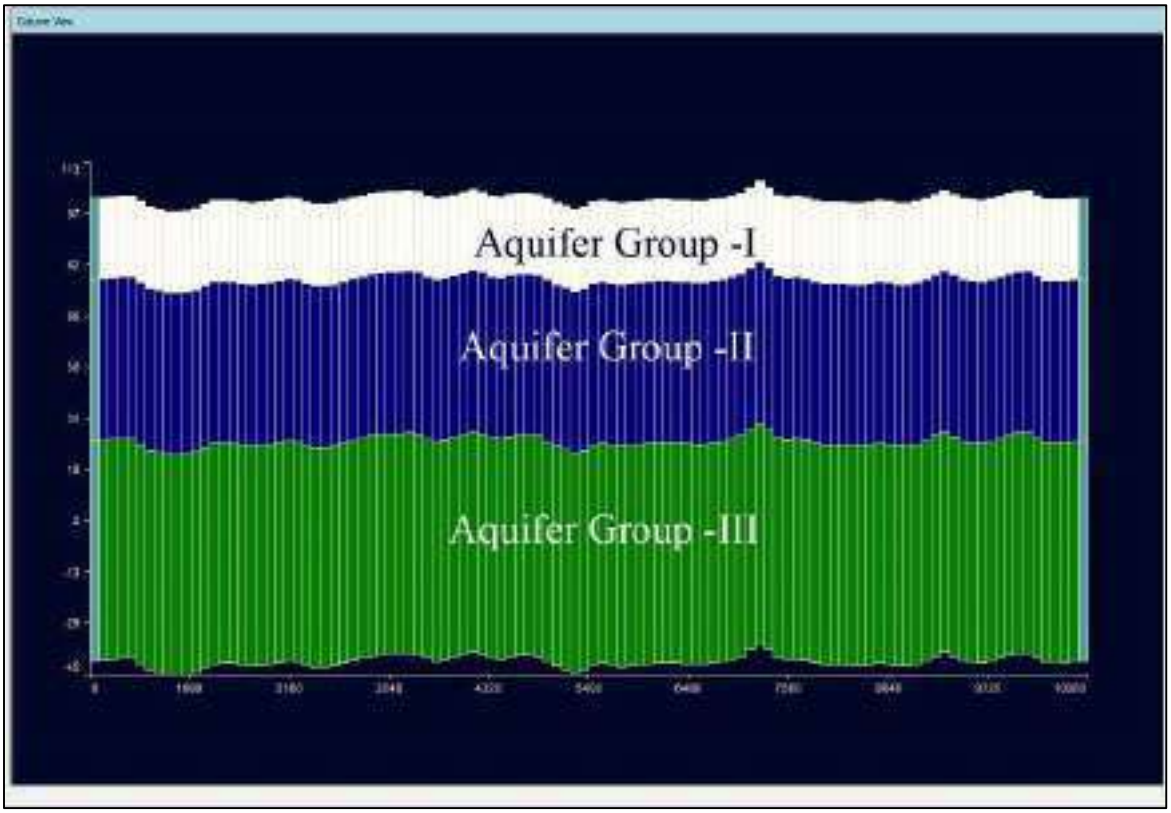


Figure 16: Hydrogeological cross section along column 55 showing 3 layers

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 **21 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**

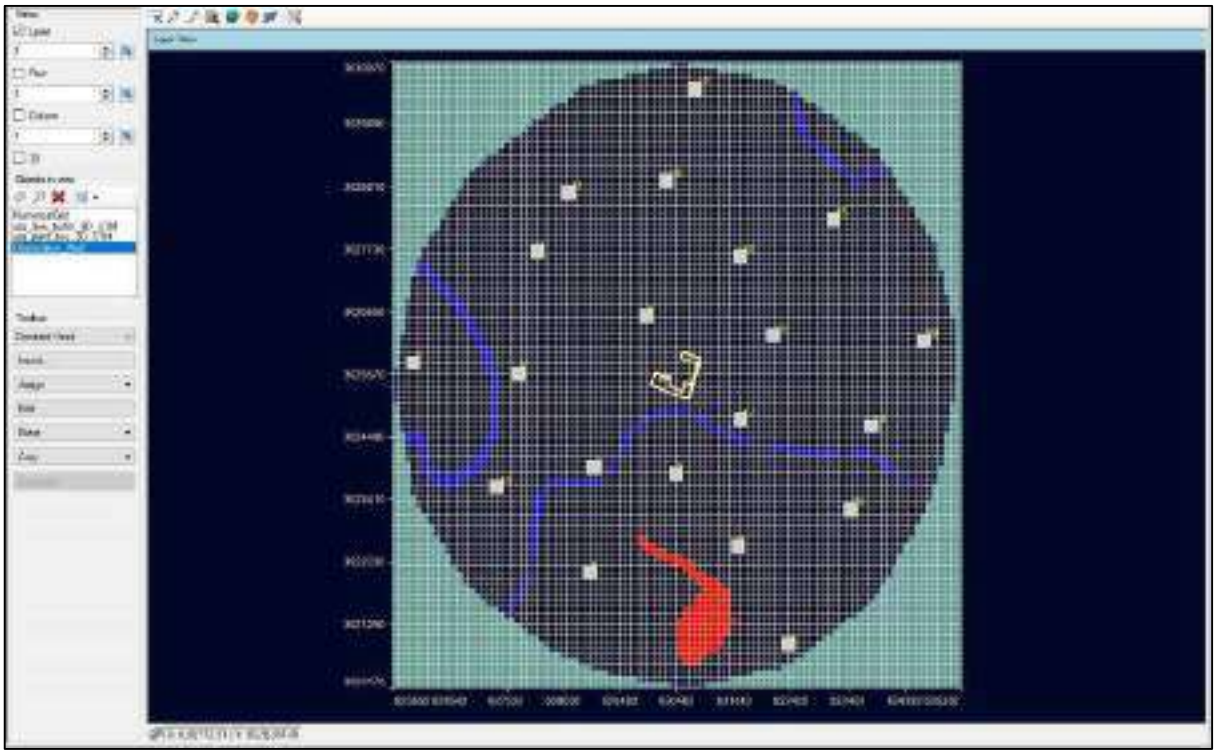


Figure 17: Boundary Conditions

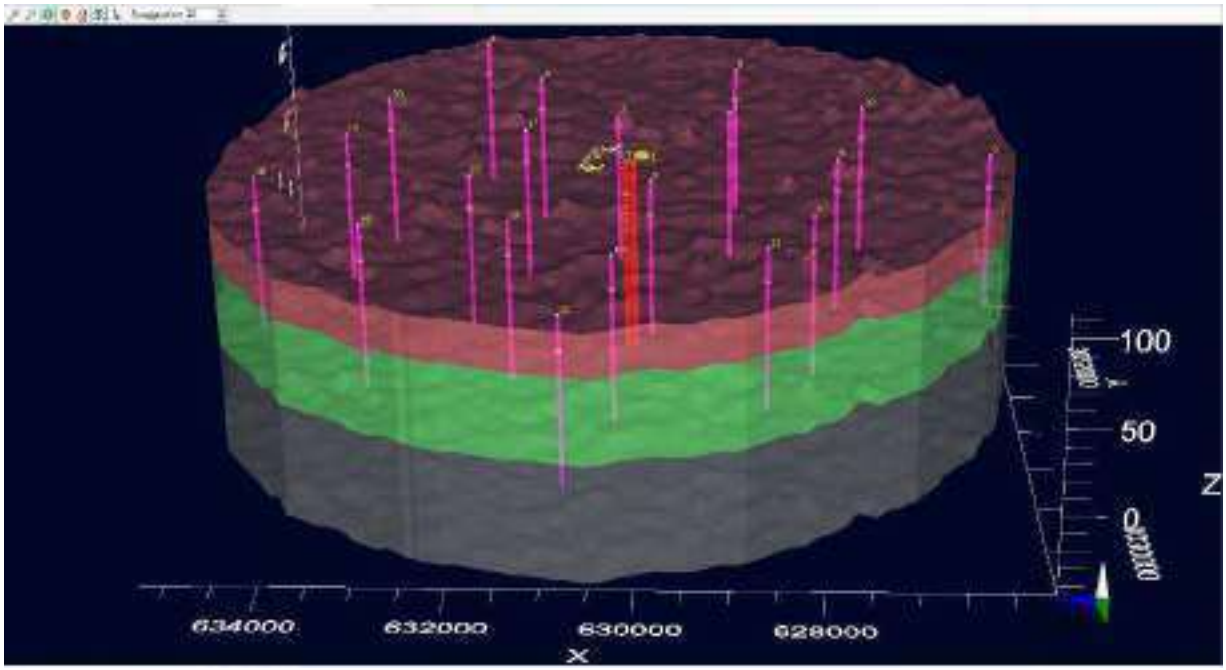


Figure 18: Pumping well (Red are Plant pumping well, violet are irrigation tube wells)

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**

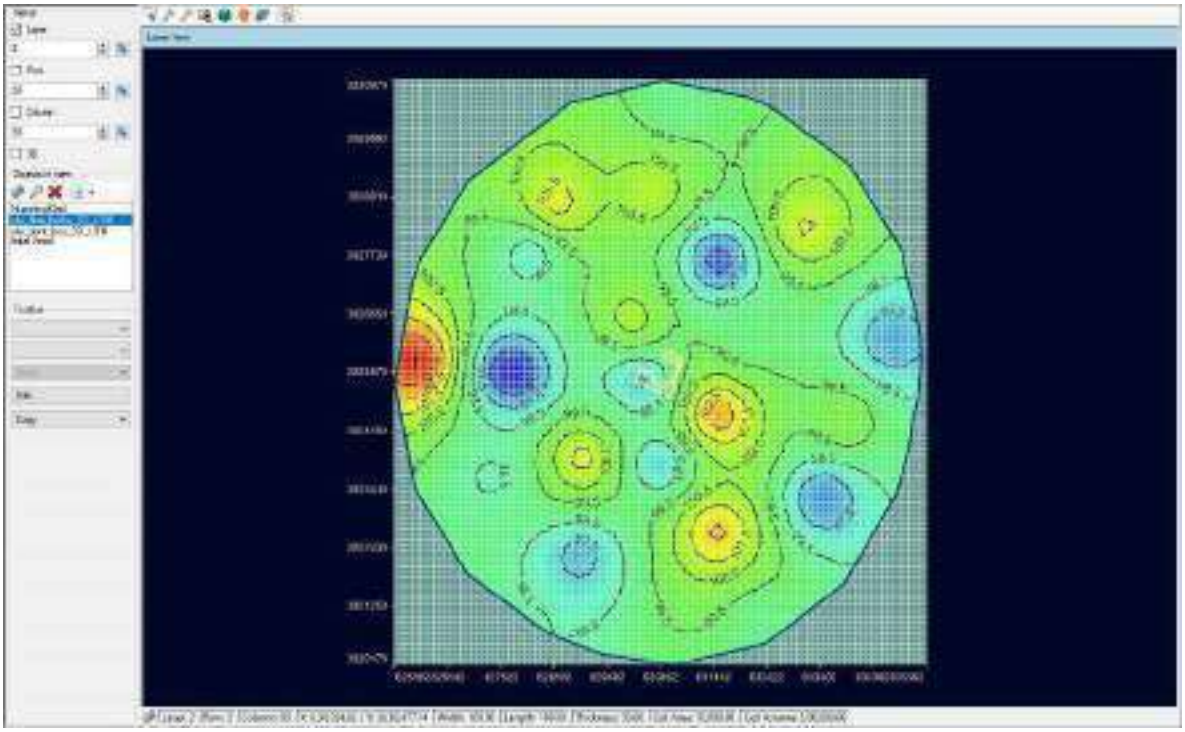


Figure 19: Initial Head

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 0.84 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**

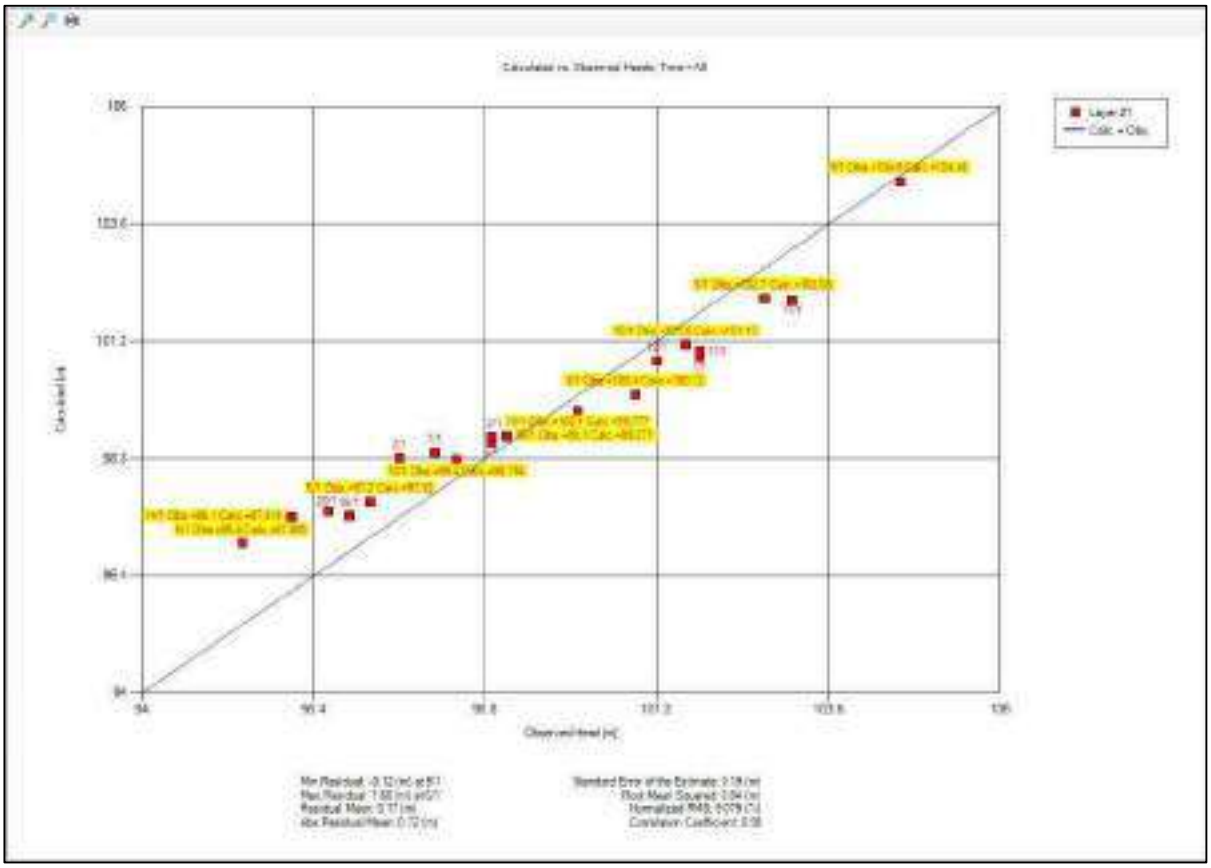


Figure 20: Calculated Vs observed head of the aquifers

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 **4.5 to 5.5 m. (Initial Head 98.5 m and the observed head 94.0 m at the end of 5th year and 93 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.**

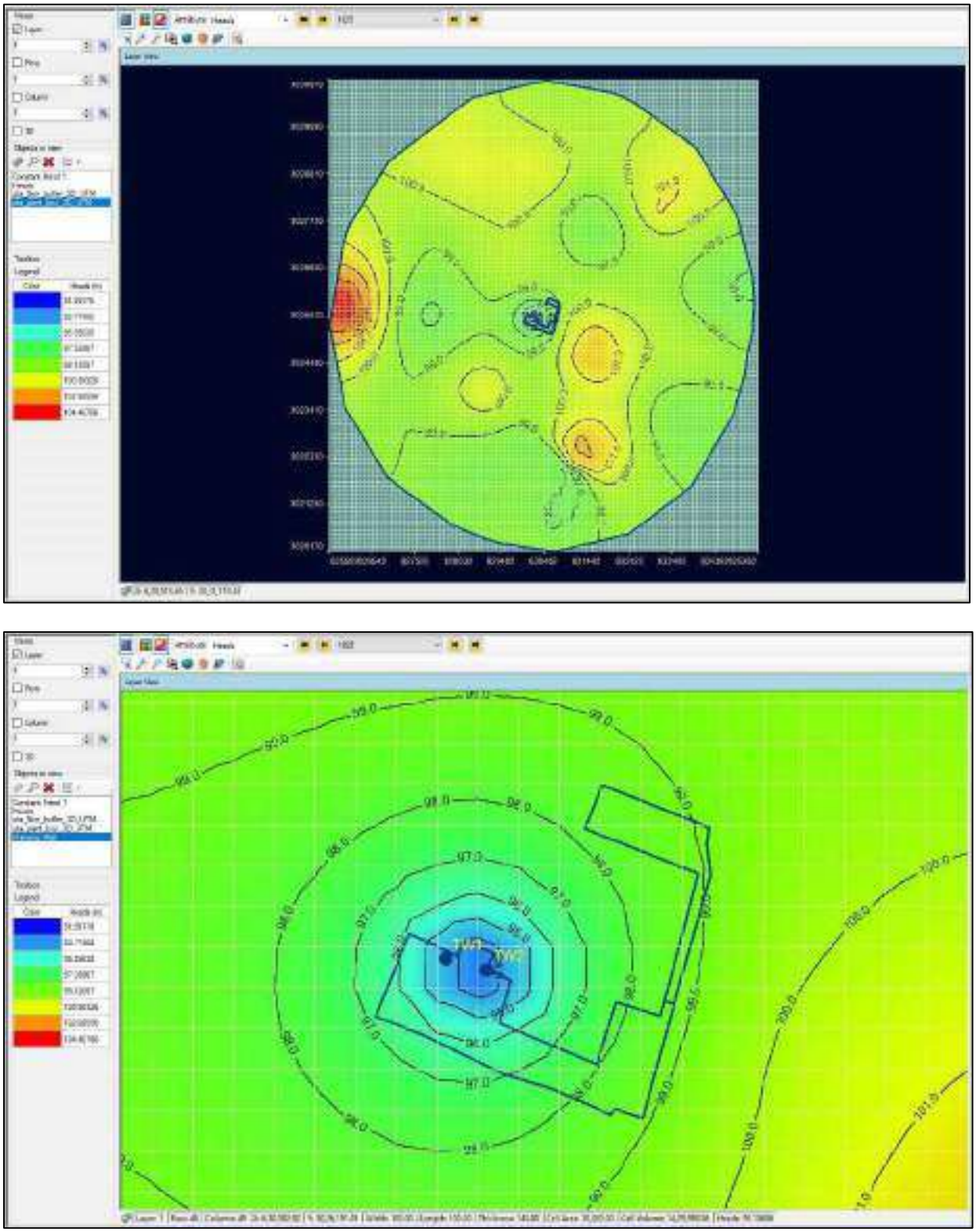
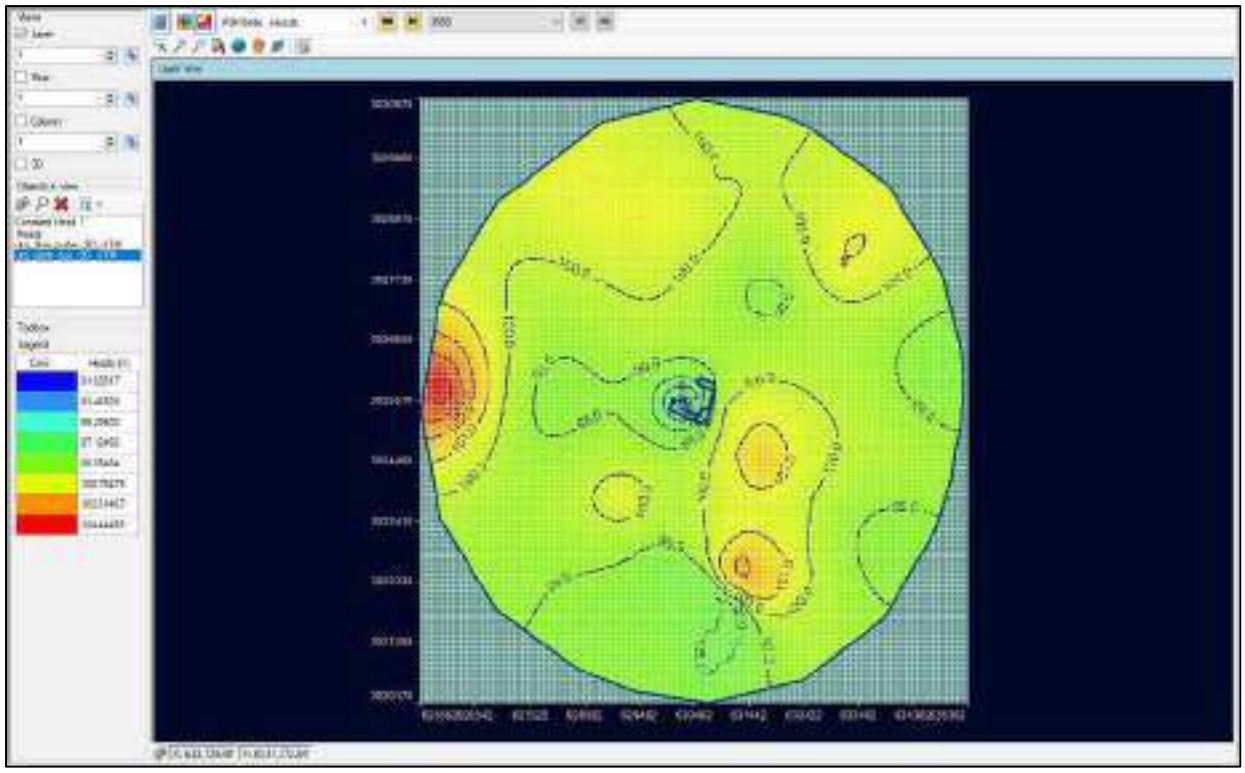


Figure 21: Predicted Head – End of 5th year



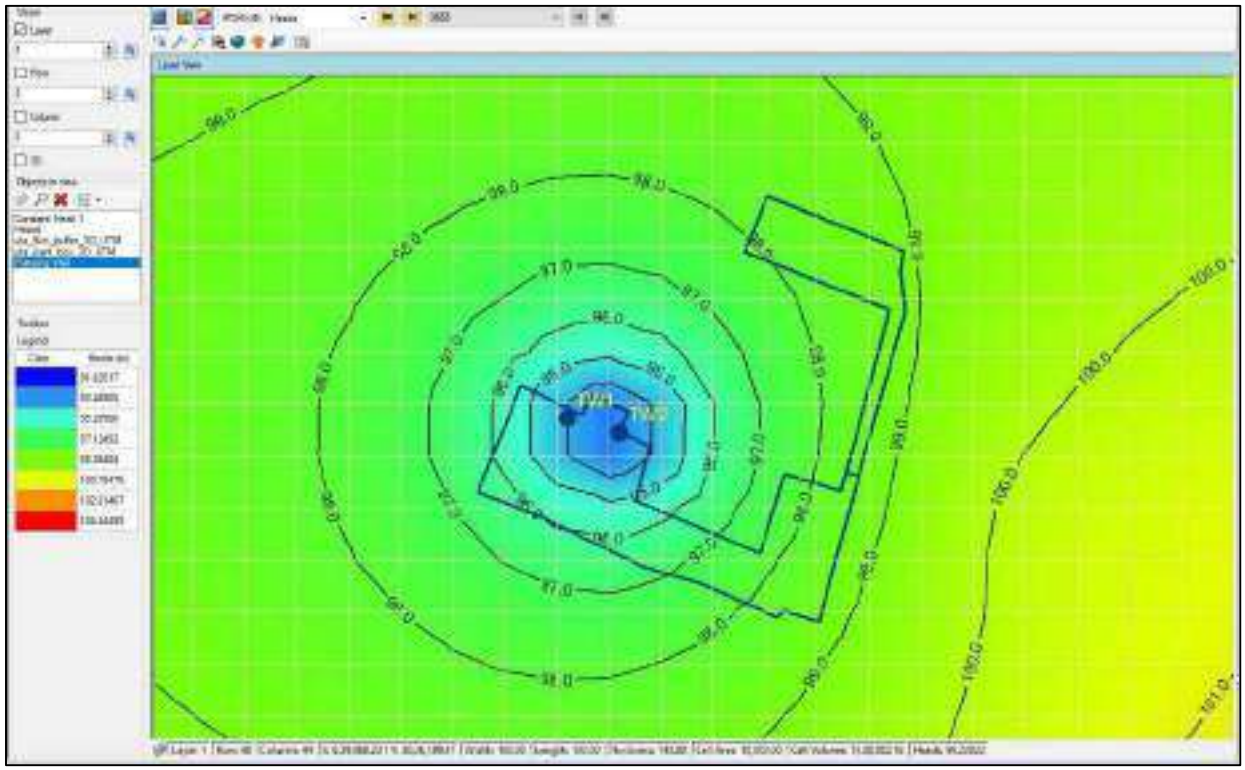


Figure 22: Predicted Head – End of 10th year

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	82362224	114556944
Constant Head		39151408
Wells		7924150
River Leakage	85507	753
Recharge	79185768	
Total	82362224	114556944

Inflow and Outflow from various boundaries in Tenth Year (2031)		
Heads	**Inflow**	**Outflow (Sink)**
	Volume in Cu.m	**Volume in Cu.m**
Storage	121998952	187061888
Constant Head		63360392
Wells		14263470
River Leakage	153323	1001
Recharge	142534384	
Total	**264686659**	**264686751**

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.**

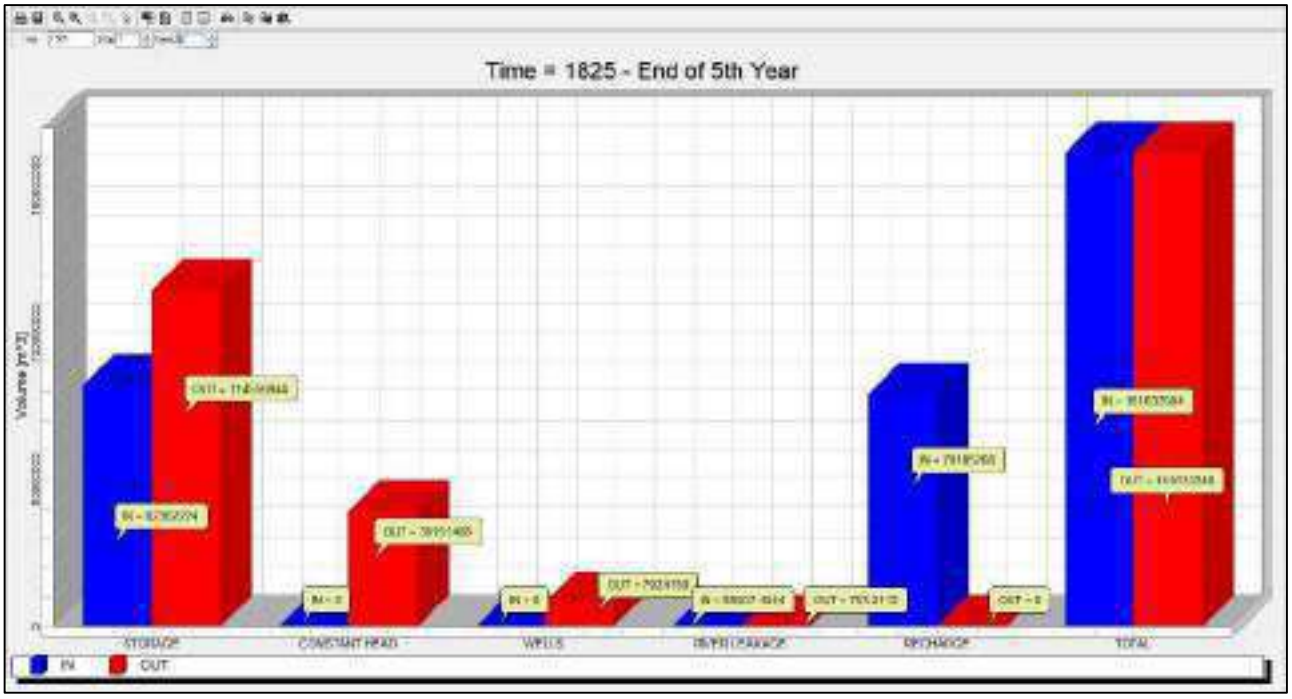


Figure 23: 5th Year Mass balance

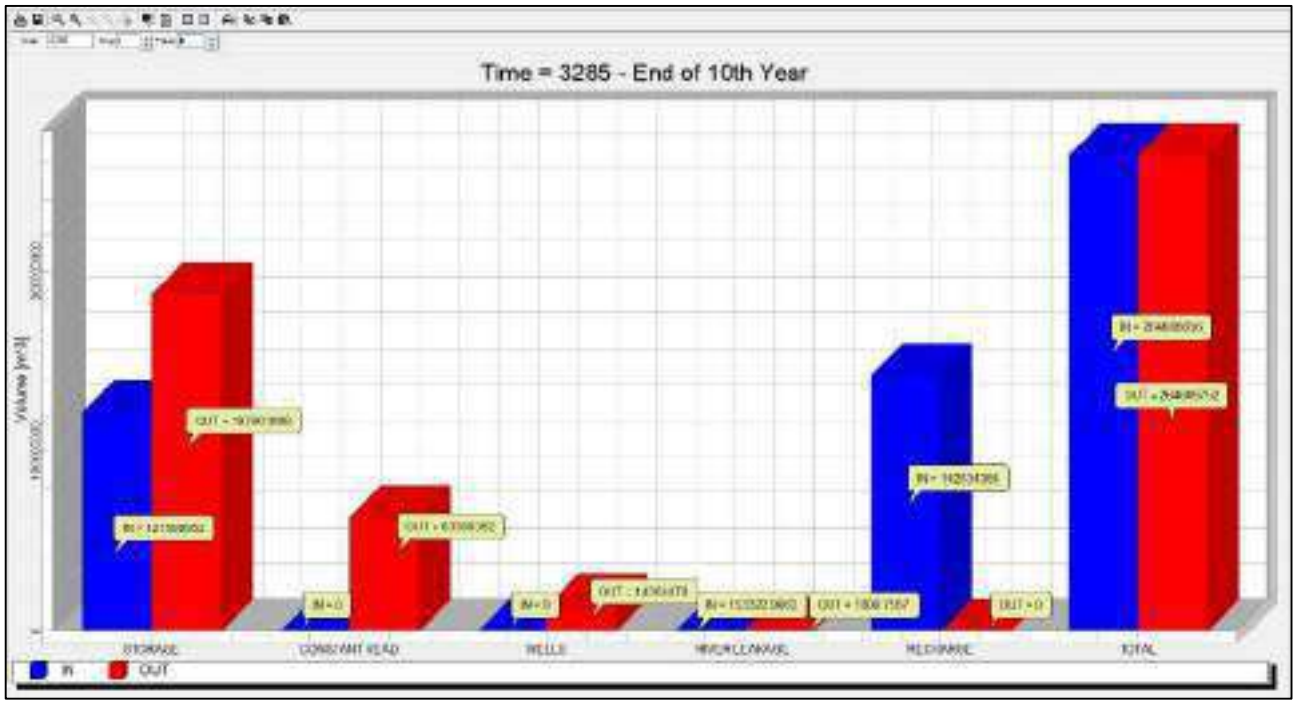


Figure 24: 5th Year Mass balance

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.
- **4.5 to 5.5 m. (Initial Head 98.5 m and the observed head 94.0 m at the end of 5th year and 93 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 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.

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 7 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

S.No	Parameter	Units	Maida Village	Ahiranpurwa Village	Rukhimmjhari Village	Mahua Birahim Village	Shadi-Dih Village	Balbhit Village	Mahmudmagar Village
1	pH	-	7.1	7.38	7.36	7.28	7.49	7.52	7.4
2	Colour	Hazen	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
3	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Conductivity	µs/cm	1376	698	608.0	755	711	757	728
5	Turbidity	NTU	2.60	<0.5	18.90	5.90	8.50	11.50	4.90
6	Total Hardness (as $CaCO_3$)	mg/l	550.00	320.00	272.00	340.00	316.00	348.00	312.00
7	Calcium (as Ca)	mg/l	104.00	51.20	60.80	84.80	73.60	76.80	80.00
8	Sodium (as Na)	mg/l	32.29	3.52	5.87	9.78	9.78	8.81	8.81
9	Potassium (as K)	mg/l	16.14	1.76	2.94	4.89	4.89	2.20	2.20
10	Carbonate (as CO_3)	mg/l	Nill	Nill	Nill	Nill	Nill	Nill	Nill
11	Bicarbonate (as HCO3)	mg/l	561.20	380.64	322.08	390.40	370.88	385.52	370.88
12	Magnesium (as Mg)	mg/l	70.47	46.66	29.16	31.10	32.08	37.91	27.22
13	Chloride (as Cl)	mg/l	107.63	11.74	19.57	19.57	19.57	29.35	29.35
14	Fluoride (as F)	mg/l	0.24	1.29	0.17	0.21	<0.1	0.14	<0.1
15	Alkalinity (as $CaCO_3$)	mg/l	460.00	312.00	264.00	320.00	304.00	316.00	304.00
16	Total Dissolved Solid	mg/l	894.08	453.92	395.21	490.53	462.36	491.76	473.10
17	Nitrate (as NO_3)	mg/l	27.80	7.11	<0.1	0.27	1.70	0.93	0.71
18	Sulphate (as SO_4)	mg/l	45.84	2.83	<1.0	5.02	2.04	3.45	6.75

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° 20' 48.725" E	82° 18' 58.032" N	BW	121	507
2	Maida	27° 19' 57.85" E	82° 18' 15.311" N	BW	72	1334
3	Ahiran Purwa	27° 19' 54.008" E	82° 19' 7.072" N	BW	100	1254
4	Padrauna	27° 19' 13.44" E	82° 19' 45.224" N	BW	78	776
5	Chamrupur	27° 18' 17.896" E	82° 20' 16.159" N	BW	64	925
6	Rukhi Manjhari	27° 18' 59.393" E	82° 18' 12.312" N	BW	90	590
7	Mahua Birahim	27° 20' 50.607" E	82° 17' 28.64" N	BW	45	733
8	Chavai Bujurg	27° 21' 59.771" E	82° 17' 41.417" N	BW	60	1015

No	Village	Latitude	Longitude	Well Type	Depth in m	EC Mmhos /cm
9	Shadi Dih	27° 21' 22.352" E	82° 18' 49.849" N	BW	98	690
10	Baidoulia	27° 20' 57.854" E	82° 16' 23.012" N	BW	102	669
11	Jhakinia	27° 19' 47.496" E	82° 17' 14.168" N	BW	45	843
12	Shrirathganj	27° 22' 32.304" E	82° 18' 1.066" N	BW	60	1851
13	Allah Dad	27° 23' 29.551" E	82° 19' 21.148" N	BW	68	791
14	Bal Bhit	27° 22' 38.377" E	82° 19' 3.047" N	BW	88	734
15	Chai Dih	27° 21' 55.879" E	82° 19' 47.942" N	BW	106	590
16	Chandapur	27° 22' 15.582" E	82° 20' 46.799" N	BW	85	642
17	Darichura	27° 21' 10.858" E	82° 20' 8.65" N	BW	55	1060
18	Phulpur	27° 20' 23.831" E	82° 19' 47.536" N	BW	48	1149
19	Bazidpur	27° 21' 7.074" E	82° 21' 43.168" N	BW	45	940
20	Mahmoodnagar	27° 20' 19.666" E	82° 21' 9.688" N	BW	82	706
21	Mubarakhpur	27° 19' 33.094" E	82° 20' 55.959" N	BW	84	479

The maximum and minimum EC concentration in ground water is **1851 and 479** 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 **450-850 µmhos/cm** EC zone. The Plant is located in 450-850 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 7.1 to 7.52. The pH values of all analyzed samples remain within the standard norm.

Conductivity: Conductivity varies from 479 µS/ cm to 1851 µS/ cm with an average value of **870** 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 **321 to 1240 mg/L** with an average value of **583 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 it ranges from **1.61 to 27.8 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. The fluoride concentrate ion as point map is presented in **Plate - 21**

Photograph showing EC Testing at field



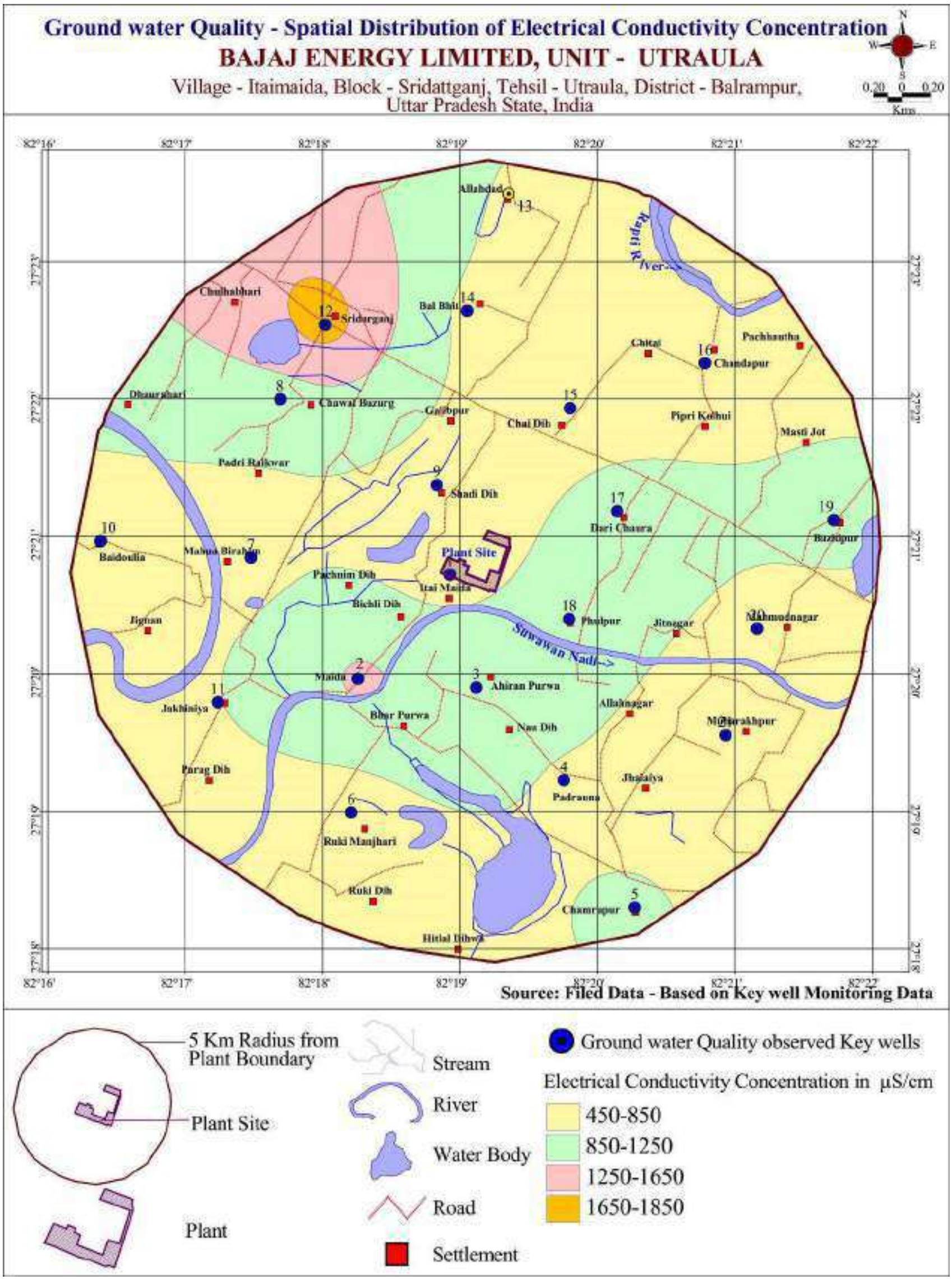


Plate 19: Spatial Distribution of TDS concentration in Ground water

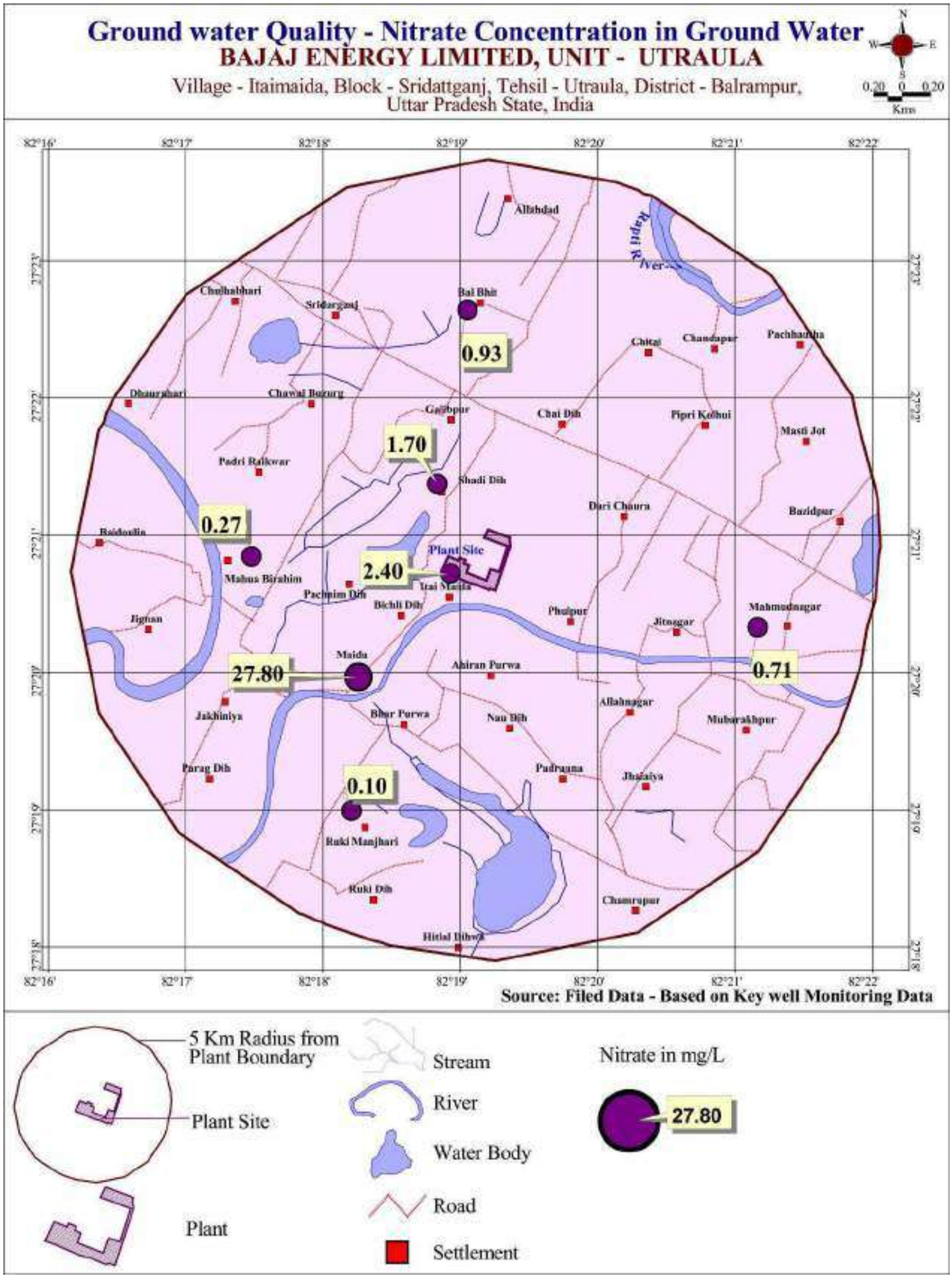


Plate 20: Nitrate concentration in Ground water

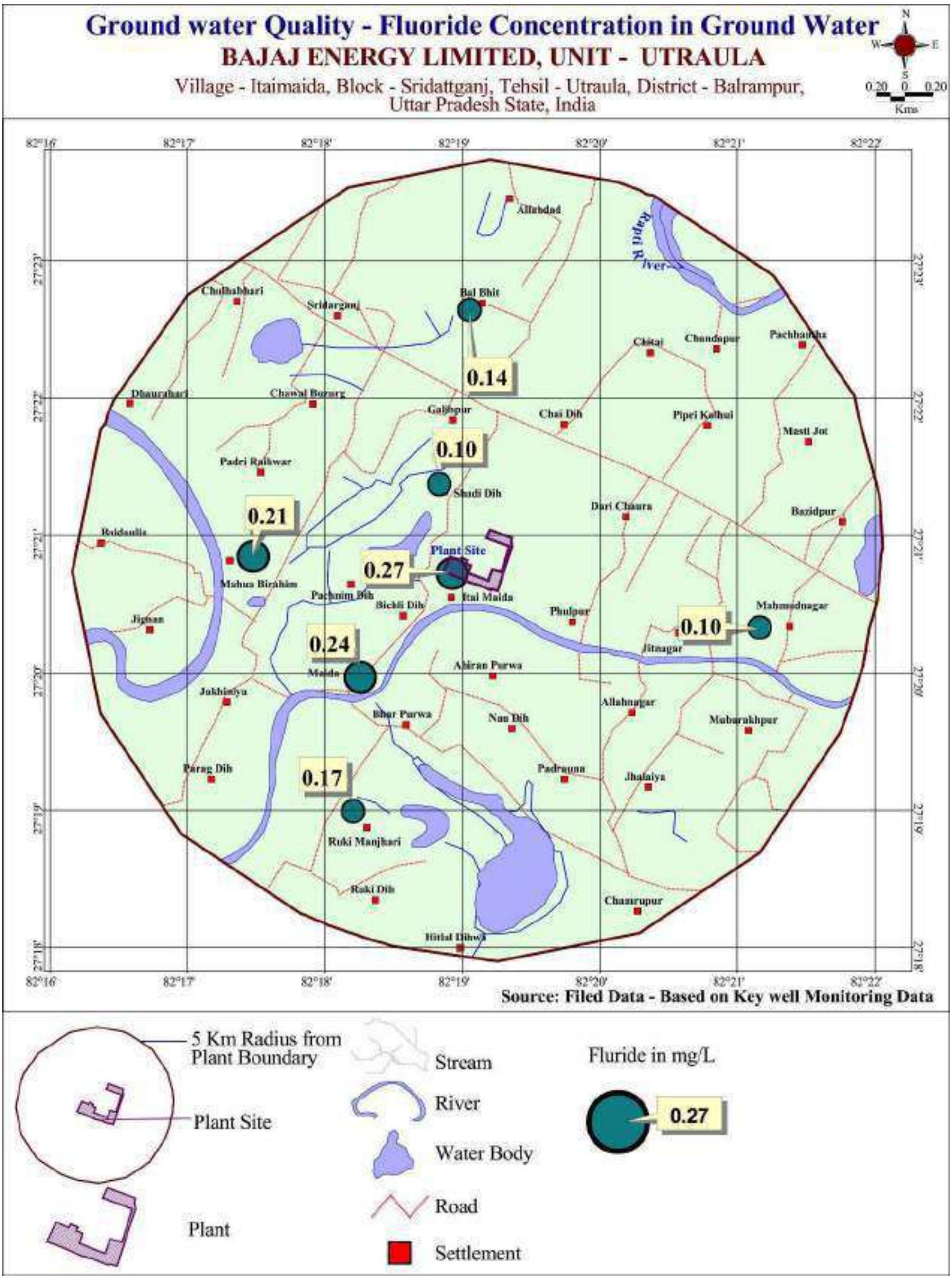


Plate 21: Fluoride concentration in Ground water

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 at Itai Maida Village.

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 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	Itai Maida	Pumping water level in m	6.34
Formation	Gangetic Plain – Sand	Drawdown in m	1.54
Depth in m	121	Residual Drawdown in m	4.83
Water level in m (bgl)	4.8		
Duration of pumping in min	360	Transmissivity m^2/day	4050
Discharge cu.m/hr	2200 lpm 132 cu.m/hr	Storage Coefficient	1.57×10^{-04}

Table 21: Tube well 1 – Drawdown and Recovery data

BAJAJ ENERGY LIMITED, UTRAULA UNIT - Pumping Test

District	Balrampur	Bander	Plant Site		Depth in m	121	Static Water level in m	4.8
Block	Sridattganj	Location	Plant Site		Size of well L*W in m	400 mm	Pumping Rate in LPM	2200
Village	Itai maida	Well Type BW / OW / TW	Tube Well (TW)		Draw down sl	1.54	Date	12.01.2022
Time	10:30	Latitude	27° 29' 48.725" E	Longitude	82° 18' 58.032" 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	4.80			360	0		6.34	1.540
1	6.17	1.37		361	1	361.00	4.94	0.140
2	6.18	1.38		362	2	181.00	4.89	0.090
3	6.19	1.39		363	3	121.00	4.89	0.090
4	6.20	1.40		364	4	91.00	4.88	0.080
5	6.21	1.41		365	5	73.00	4.87	0.070
6	6.21	1.41		366	6	61.00	4.87	0.070
7	6.22	1.42		367	7	52.43	4.86	0.060
8	6.22	1.42		368	8	46.00	4.86	0.060
9	6.23	1.43		369	9	41.00	4.86	0.060
10	6.24	1.44		370	10	37.00	4.86	0.060
12	6.24	1.44		371	11	33.73	4.86	0.060
14	6.25	1.45		372	12	31.00	4.85	0.050
16	6.25	1.45		373	13	28.69	4.85	0.050
18	6.26	1.46		374	14	26.71	4.85	0.050
20	6.26	1.46		375	15	25.00	4.85	0.050
25	6.26	1.46		376	16	23.50	4.84	0.040
30	6.27	1.47		377	17	22.18	4.84	0.040
35	6.27	1.47		378	18	21.00	4.84	0.040
40	6.28	1.48		379	19	19.95	4.84	0.040
45	6.28	1.48		380	20	19.00	4.84	0.040
50	6.29	1.49		385	25	15.40	4.83	0.030
55	6.29	1.49		390	30	13.00	4.83	0.030
60	6.30	1.50						
70	6.30	1.50						
80	6.30	1.50						
90	6.31	1.51						
100	6.31	1.51						
110	6.32	1.52						
120	6.32	1.52						
140	6.32	1.52						
160	6.33	1.53						
180	6.33	1.53						
210	6.33	1.53						
240	6.33	1.53						
270	6.34	1.54						
300	6.34	1.54						
330	6.34	1.54						
360	6.34	1.54						

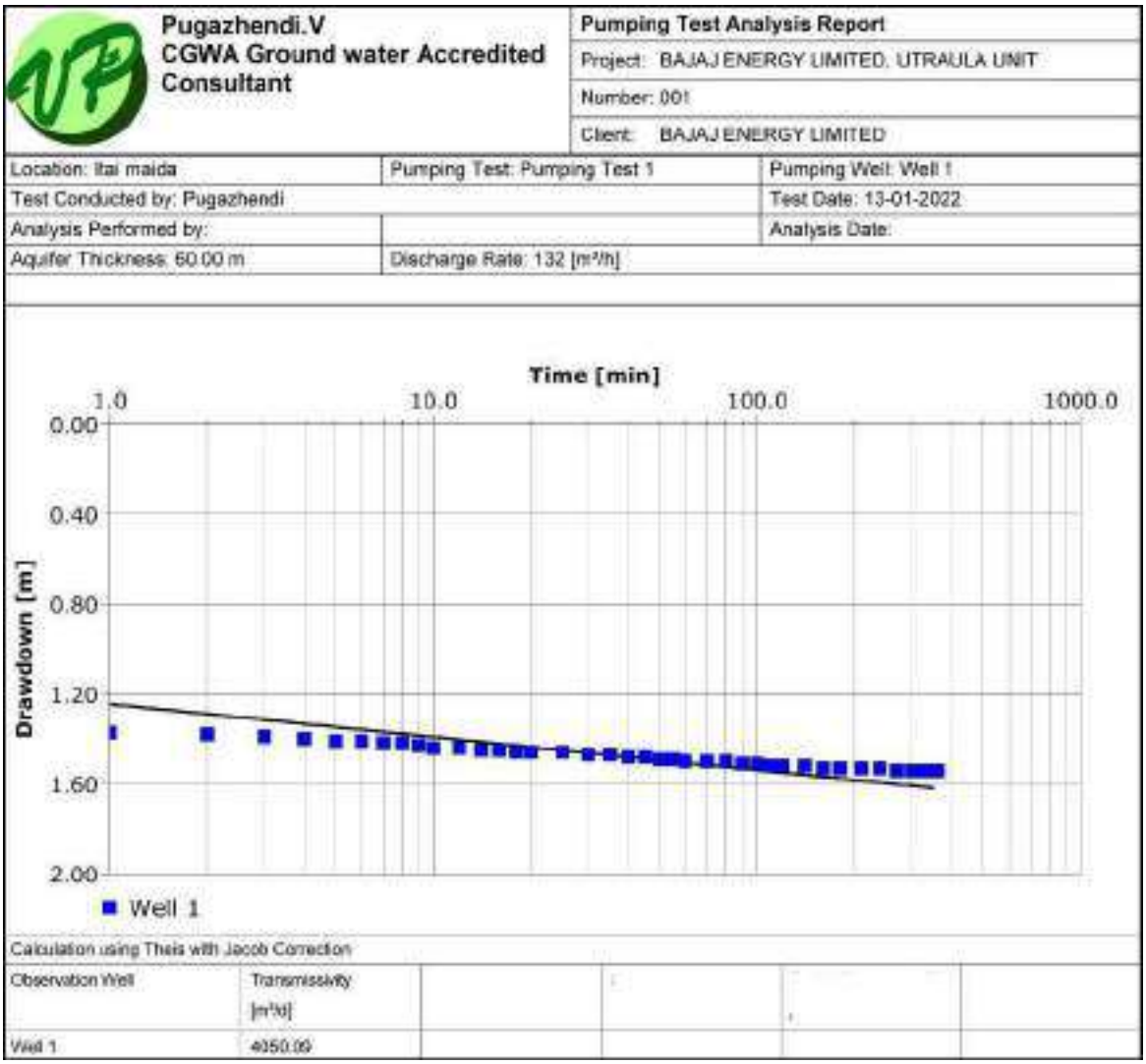


Figure 25: Time vs Drawdown Plot – Tube well

Inference of Pumping Test

Based on the pumping test the following aquifer parameters area derived.

Transmissivity of the study area	**4050**	**m^2/day**
Storativity Average of the study area	**1.57×10^{-04}**	**m/day**
Average Hydraulic Conductivity of the study area	**67.5**	**m/day**

The above values are compared with CGWB exploratory Tube well drilled for Balrampur 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	121
Discharge (Q) in lpm	2200
Time of Pumping in min	320
Drawdown in m	1.54
Assigned / Desired drawdown in m	25
Designed hours of pumping in hour	12
Safe Yield 3178 lpm / 25 m Draw Down 12 Hours of Pumping	
Safe Yield Cum/day = 2288	

The optimum yield of the Tube well is **2288 cu.m/day**. If the pump runs for **12 hours**, with a discharge of **3178 lpm / 12 m Drawdown**, the Tube well can yield **2288 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° 20' 48.725" E 82° 18' 58.032" N	121	400	Alluvium Sand Silt Dominant	30	30	180 cu.m/hour
TW-2	Tube well	27° 20' 47.774" E 82° 19' 1.679" N	121	400	Alluvium Sand Silt Dominant	30	30	180 cu.m/hour
TW-3	Tube well	27° 20' 46.666" E 82° 19' 0.048" N	121	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 26 : 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 3 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 -25**.

Table 24: Location of exiting Piezometers

PZ No.	Location	Coordinate	Depth in m	Diameter in mm
PZ-1	Near Old Office Piezometer Manual	27° 20' 44.358" E 82° 18' 54.194" N	90	152
PZ-2	Near Chimney Road Piezometer Manual	27° 20' 43.188" E 82° 19' 1.675" N	90	152
PZ-3	Near CHP Piezometer Manual	27° 20' 39.977" E 82° 19' 15.643" N	90	152
PZ-4	Near Old office Piezometer Telemetry	27° 20' 43.318" E 82° 18' 55.112" N	90	152
PZ-5	Near CHP Piezometer Manual	27° 20' 39.426" E 82° 19' 6.618" N	90	120



Figure 27 : Location of Existing Piezometers

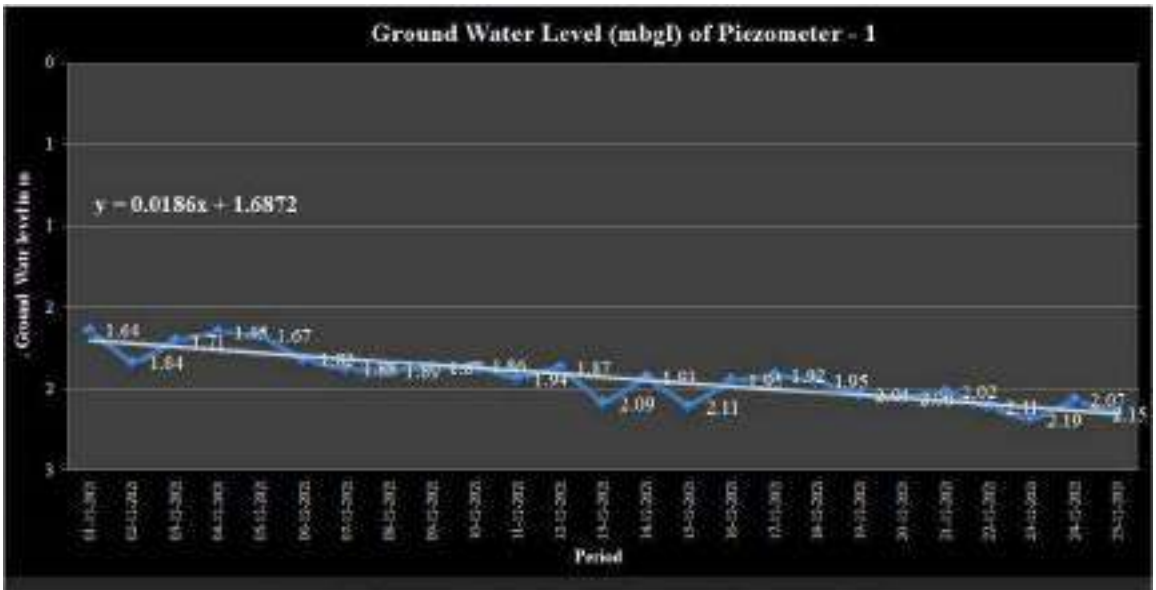

PIEZOMETER
NO-3



The hydrograph has been generated for the Piezometer observed data for the piezometers are presented below.

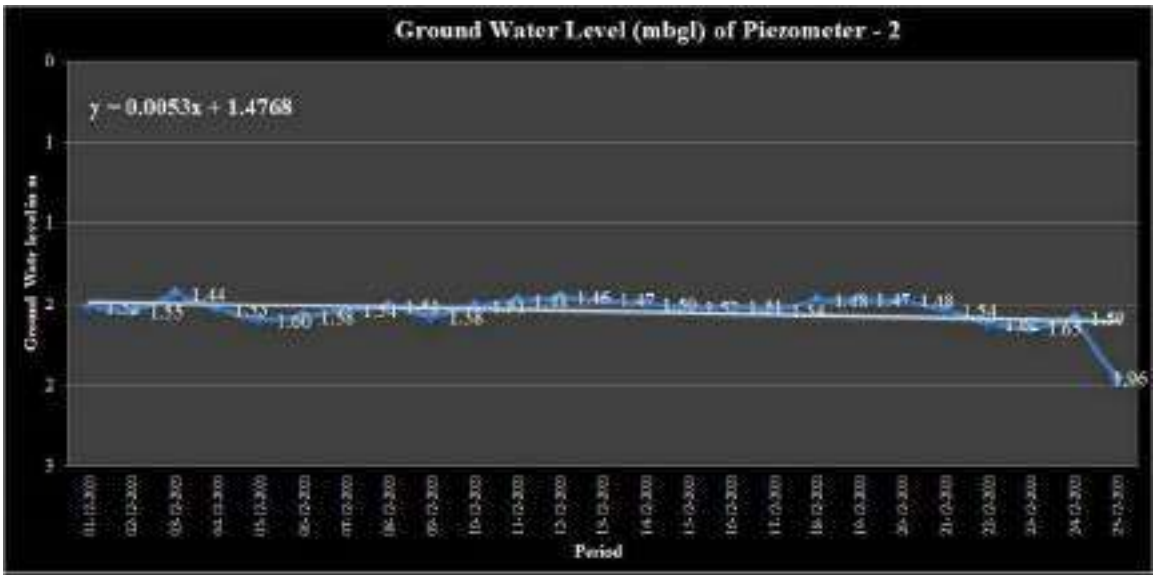
The very merger decline trend **(0.005 & 0.018 m /Year**) of ground water level observed in the past 1 year.

Figure 28: Water Level Trend Analysis for Piezometer -1



Ground Water level Trend Based on the Piezometer Data		
Period	Trend in m / Year	Trend (Rise / Fall)
November-01-12-2021 - November-25-12-2021	-0.018	Fall

Figure 29: Water Level Trend Analysis for Piezometer -2



Ground Water level Trend Based on the Piezometer Data		
Period	Trend in m / Year	Trend (Rise / Fall)
November-01-12-2021 - November-25-12-2021	-0.005	Fall

Table 25: Piezometer data

Period	Piezometer -1	Piezometer -2
01-12-2021	1.64	1.52
02-12-2021	1.84	1.55
03-12-2021	1.71	1.44
04-12-2021	1.65	1.53
05-12-2021	1.67	1.60
06-12-2021	1.82	1.58
07-12-2021	1.88	1.54
08-12-2021	1.89	1.51
09-12-2021	1.87	1.58
10-12-2021	1.86	1.51
11-12-2021	1.94	1.48
12-12-2021	1.87	1.46
13-12-2021	2.09	1.47
14-12-2021	1.93	1.50
15-12-2021	2.11	1.52
16-12-2021	1.95	1.51
17-12-2021	1.92	1.54
18-12-2021	1.95	1.48
19-12-2021	2.04	1.47
20-12-2021	2.06	1.48
21-12-2021	2.02	1.54
22-12-2021	2.11	1.62
23-12-2021	2.19	1.65
24-12-2021	2.07	1.59
25-12-2021	2.15	1.96

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 treated waste water usage for Industrial Use **664 cu.m/day,** green belt development **250 cu.m/day**, firefighting and other requirement **72 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 26: 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 27: 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 28: 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 meter for all the three Tube wells area 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 **1.54 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 **Sridattganj** Block has been categorized as **Safe**, since the stage of ground water development is **62.89%**

The **Sridattganj** block area is **19,147 Hectares**. The total estimated ground water recharge is **7495.75 ha.m**. The natural discharge is in the order of **749.58 ha.m**. The total ground draft is **4242.40 ha.m**. The ground water stage of extraction in **Sridattganj** block **62.89 %** as per the report of CGWB 2020.

The area of 5 Km radius buffer zone is **78.66 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 **1742.87 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 **5,55,585 cu.m/year** is being recharged into the aquifer which is about **27 %** 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**

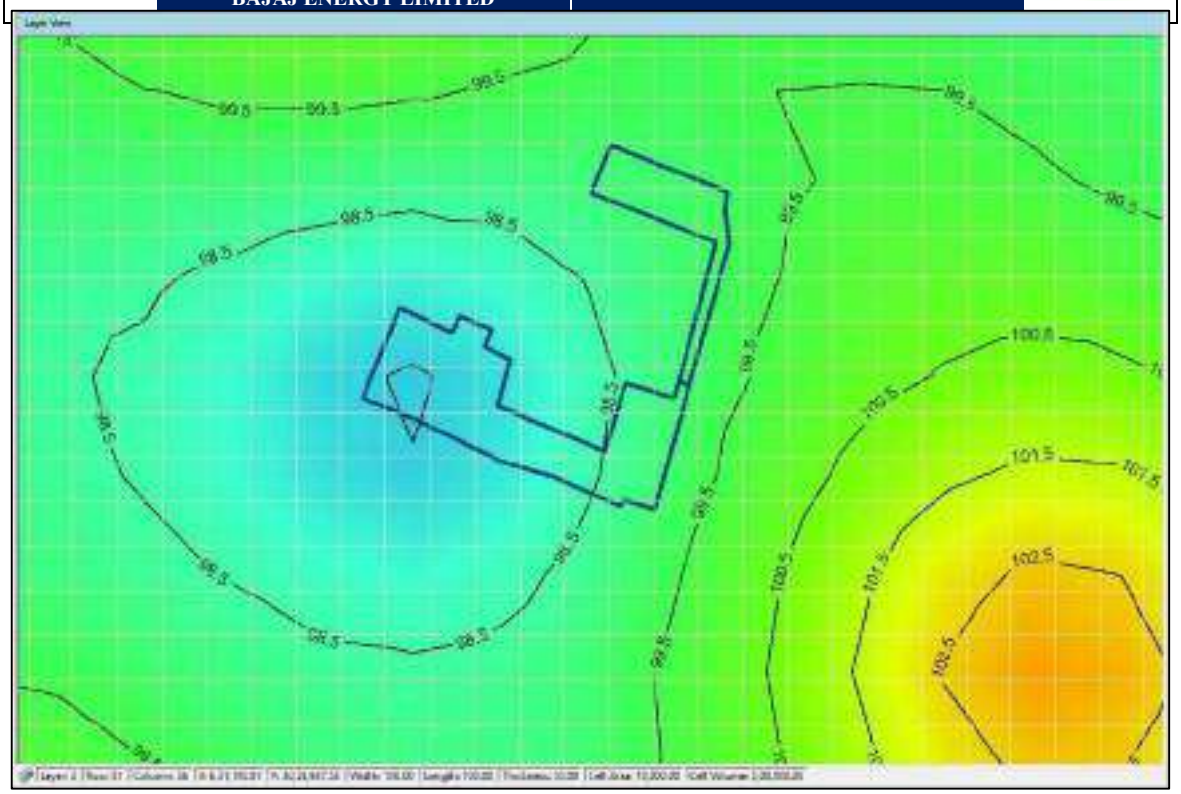


Figure 30: Initial Head in and around the Plant lease area

Prediction Scenario 1 –First year pumping Scenario:

First Year	
Predicted Maximum Down in m	**4.03**

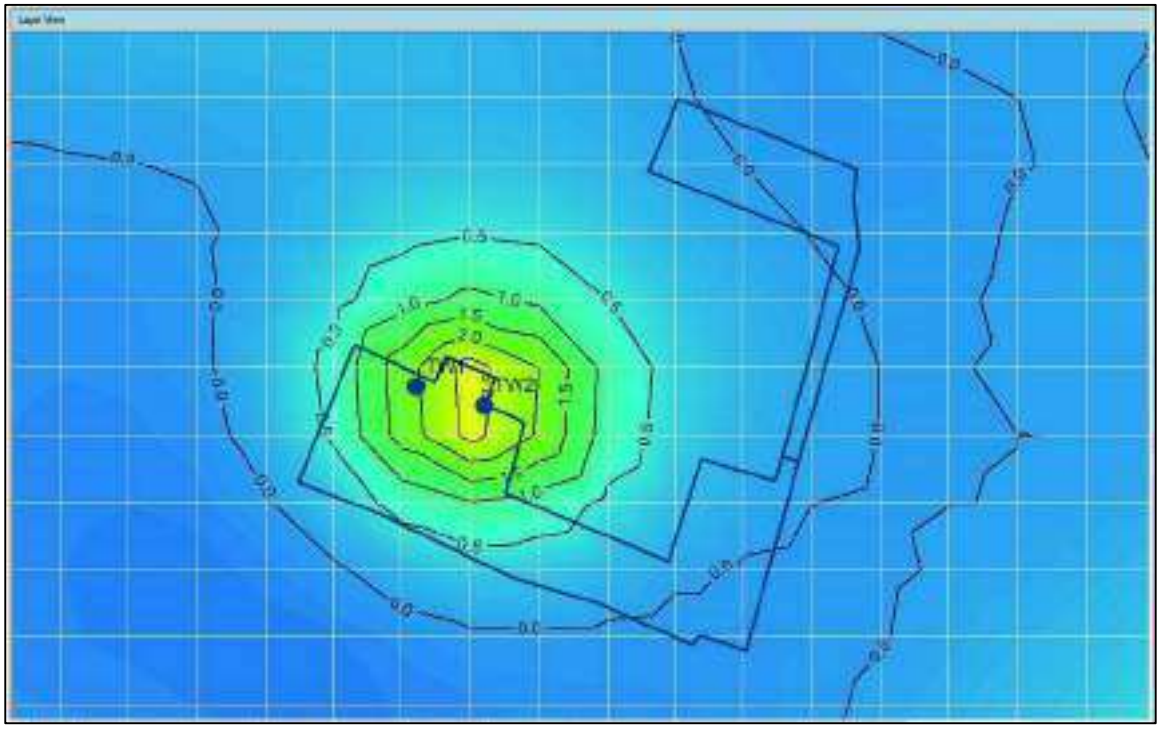


Figure 31: Drawdown in the Plant pit at end of 1st Year

Prediction Scenario 2–Second year pumping Scenario:

Second Year	
Predicted Maximum Down in m	**5.01**

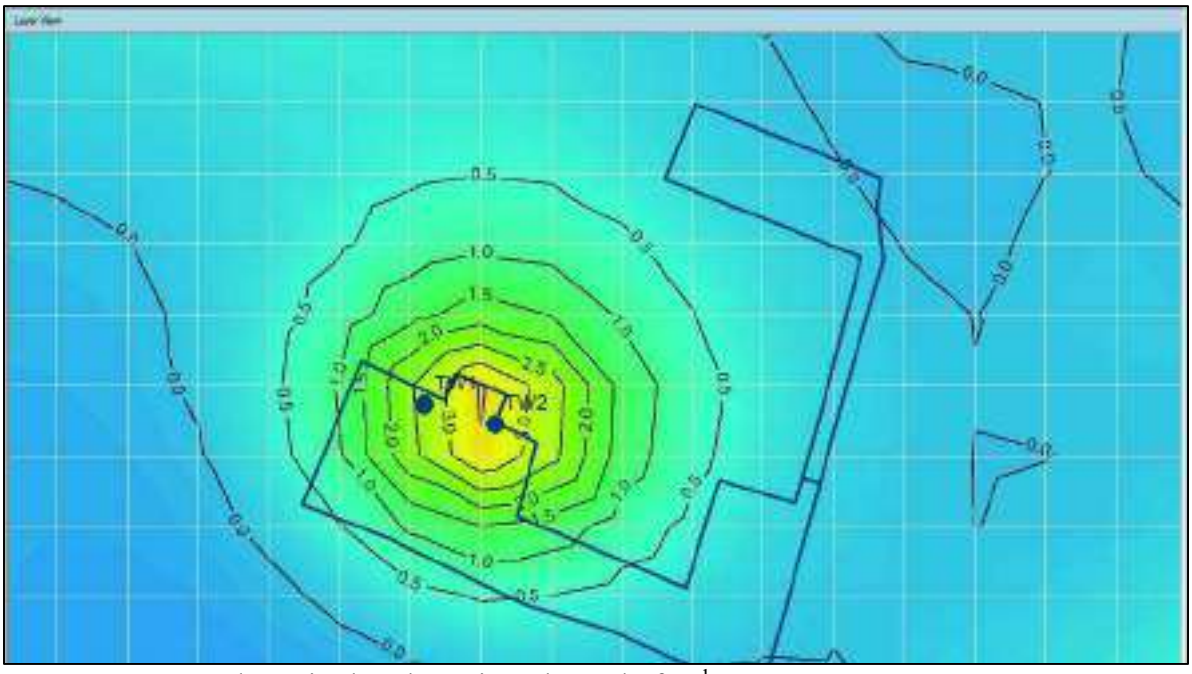


Figure 32: Drawdown in the Plant pit at the end of 2nd Year

Prediction Scenario 3–Third year pumping Scenario:

Third Year	
Predicted Maximum Down in m	**5.42**

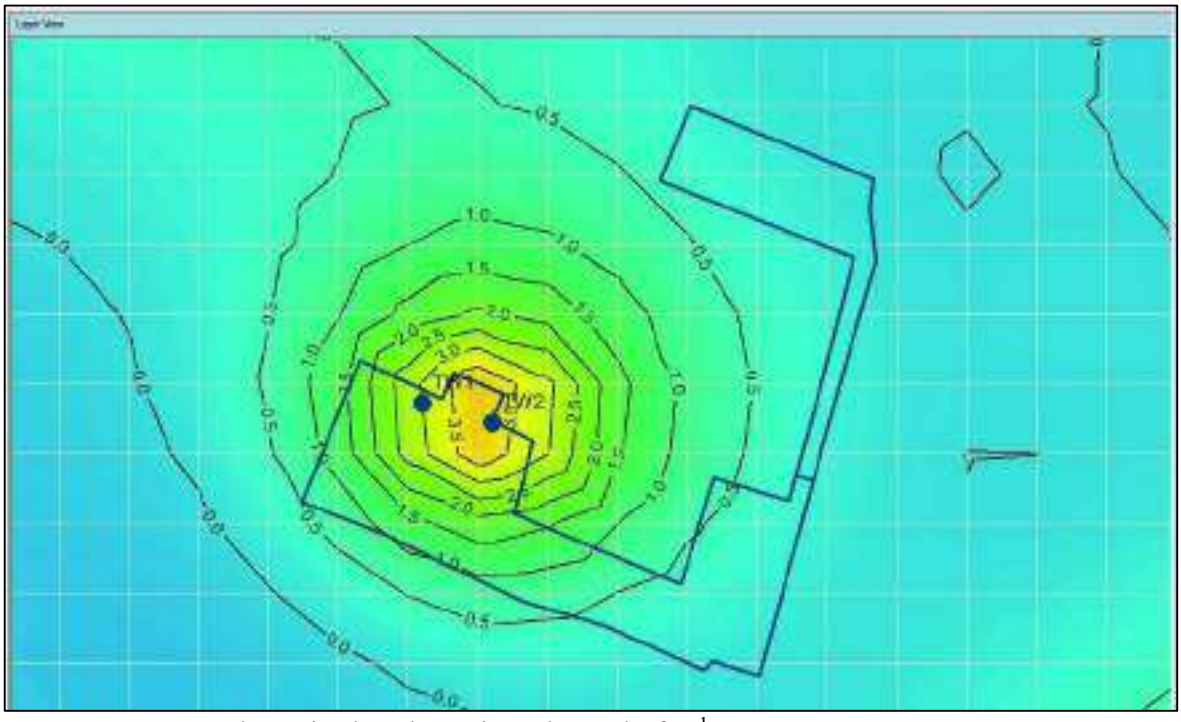


Figure 33: Drawdown in the Plant pit at the end of 3rd Year

Prediction Scenario 4–Fifth year pumping Scenario:

Fourth Year	
Predicted Maximum Down in m	**5.67**

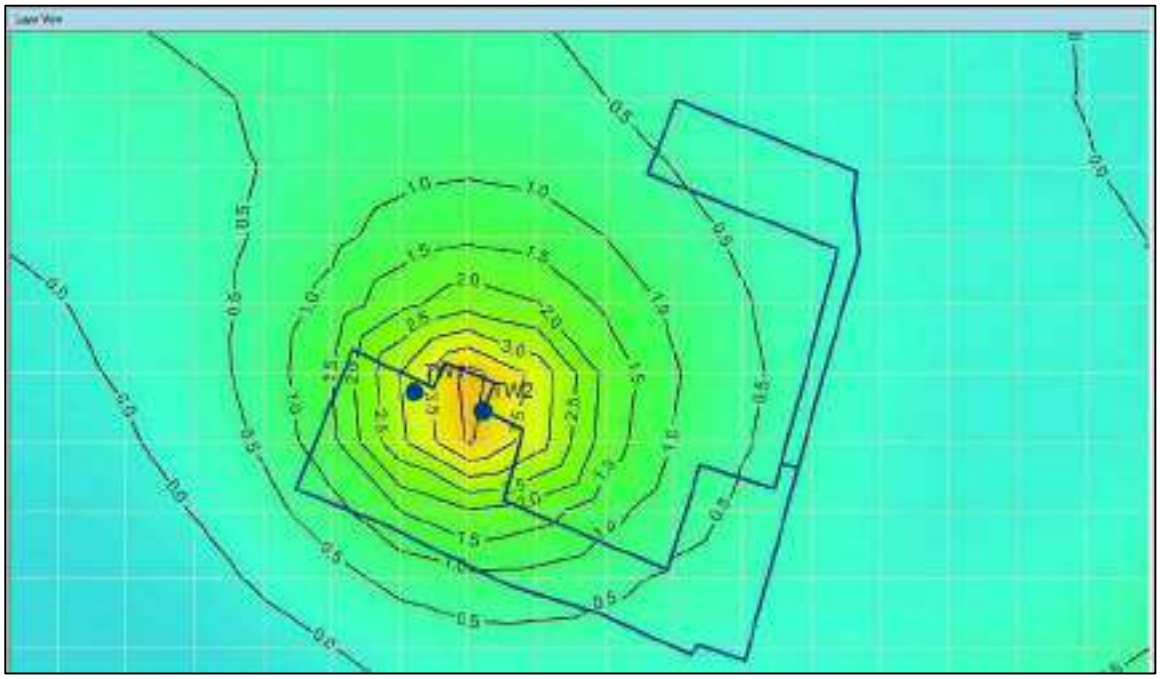


Figure 34: Drawdown in the Plant pit at end of 4th Year

Prediction Scenario 5–Fifth year pumping Scenario:

Fifth Year	
Predicted Maximum Down in m	**5.84**

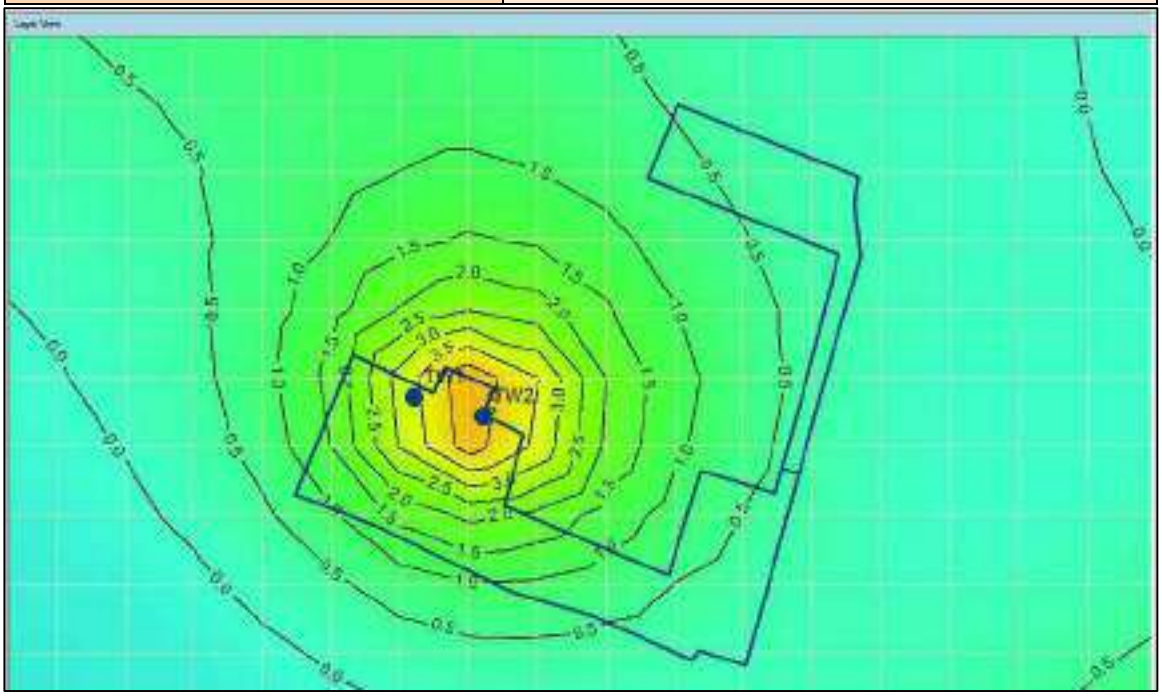


Figure 35: Drawdown in the Plant pit at end of 5th Year

Prediction Scenario 6 – Tenth year pumping Scenario:

Tenth Year	
Predicted Maximum Down in m	**6.19**

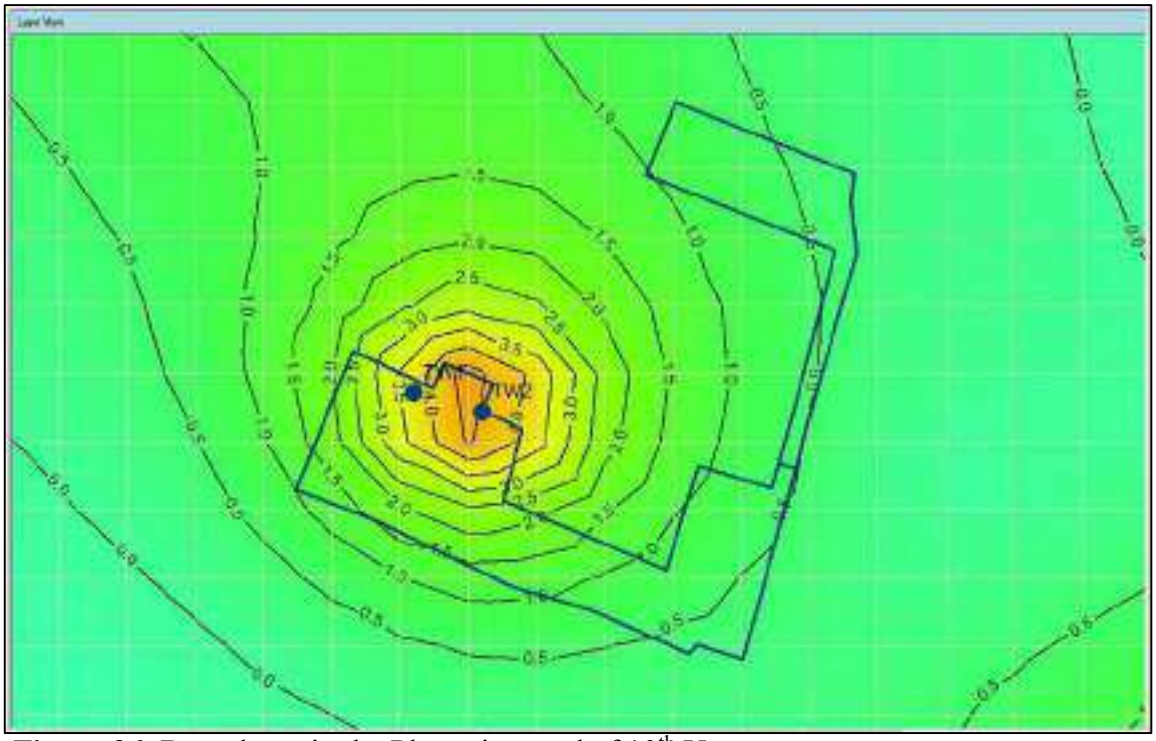


Figure 36: Drawdown in the Plant pit at end of 10th Year

Inference:

- The predicted drawdown in Plant site **5.84 m in the fifth year.**
- The predicted drawdown in Plant pits **6.19 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.

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.

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 Utraula Plant - Itaimaida, Block – Sridattganj, Tehsil – Utraula, District - Balrampur, State- Uttar Pradesh. Power Plant. The Total 31 villages and urban area are coming within the 5 kms radius of the project site and the villages are from Utraula tehsil of Balrampur 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 29: Demographic structure

SNo	Parameter	Study Area
1.	No. of Villages	31
2.	Household	7646
3.	Total Population	51390
4.	Male Population (%)	25989
5.	Female Population (%)	25401
6.	Sex Ratio	102%
7.	No. Govt. Pre-Primary School	Nil
8.	Scheduled Caste %	4840
9.	Scheduled Tribes %	Nil

Demographic Profile of the villages

Total number of households are about 7646

- Total population of villages under the study area is 51390 out of which males are 25989 (50.5%) and females are 25401 (49.95%)
- The average family size is about 5.3 persons per family
- Scheduled caste population is 4840 and Scheduled tribes' population is nil 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 30: Availability of drinking water sources

Village Name	Tap Water-Treated	Hand Pump	Tube Wells/Borehole
Dhamauli	Non-Available	Available	Not-Available
Rajgarh	Non-Available	Available	Not-Available
Badolia	Non-Available	Available	Not-Available
Agaya Khurd	Non-Available	Available	Not-Available
Gulariha	Non-Available	Available	Available
Aadampur	Non-Available	Available	Not-Available

Village Name	Tap Water-Treated	Hand Pump	Tube Wells/Borehole
Jigna	Non-Available	Available	Not-Available
Dhorahri	Non-Available	Available	Not-Available
Dutt Nager	Non-Available	Available	Available
Dhowadaber	Non-Available	Available	Not-Available
Itai Maida	Non-Available	Available	Not-Available
Mahua Ibrahim	Non-Available	Available	Available
Kolhuai Binauni	Non-Available	Available	Not-Available
Gulvaria Mafee	Non-Available	Available	Not-Available
Vaibheet	Non-Available	Available	Not-Available
Sahdeia	Non-Available	Available	Available
Chawai Khurd	Non-Available	Available	Not-Available
Chitahi	Non-Available	Available	Not-Available
Pipri Kolhai	Non-Available	Available	Available
Dari Chaura	Non-Available	Available	Not-Available
Kithoora	Non-Available	Available	Available
Jeetnager	Non-Available	Available	Not-Available
Niranjanpur	Non-Available	Available	Not-Available
Bargadawa	Non-Available	Available	Not-Available
Puraina Vajid	Non-Available	Available	Not-Available
Puraina Kanoongo	Non-Available	Available	Not-Available
Rookhi Majhari	Non-Available	Available	Available
Patiyala Grant	Non-Available	Available	Available
Visarampur	Non-Available	Available	Available
Rampur Baganaha	Non-Available	Available	Not-Available
Tirlokpur	Non-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. There is no 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.
2. 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.
3. 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 31: 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

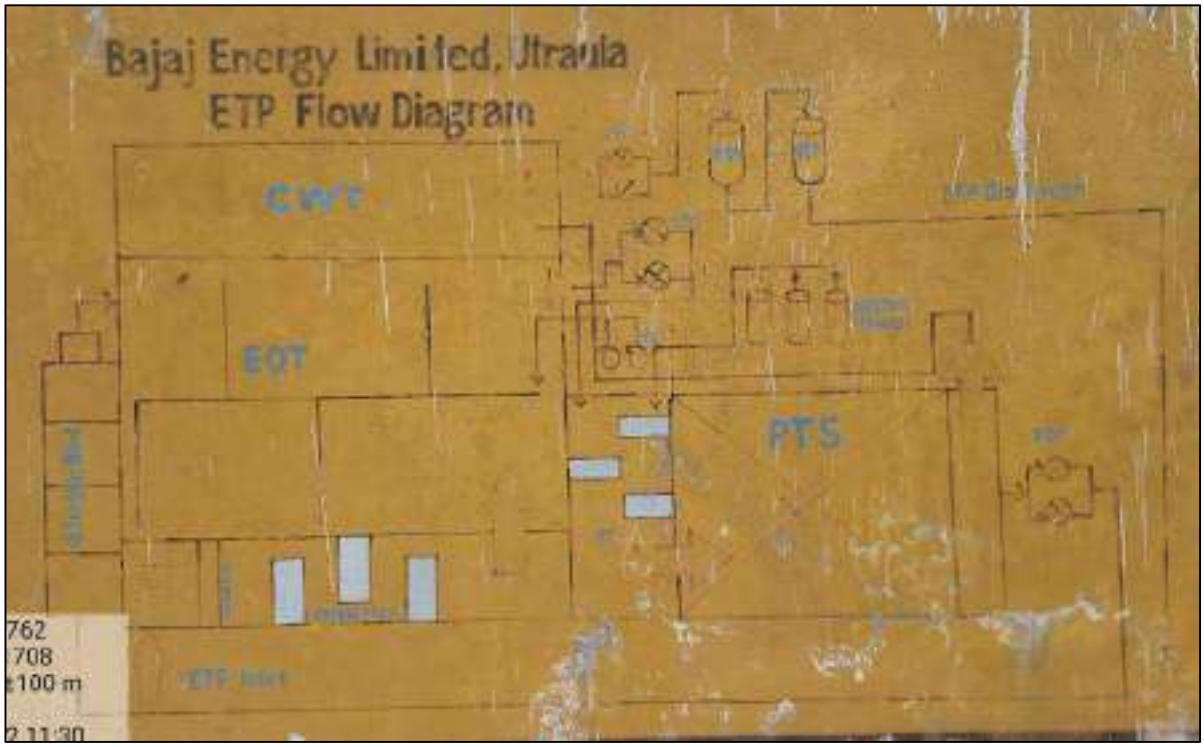


Figure 37: ETP Flow Diagram

Photograph showing the ETP



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	:	874.0 mm, 2004
(ii)	70 % dependable rainfall	:	742.7 mm, 2006
(iii)	90 % dependable rainfall	:	586.9 mm, 1997

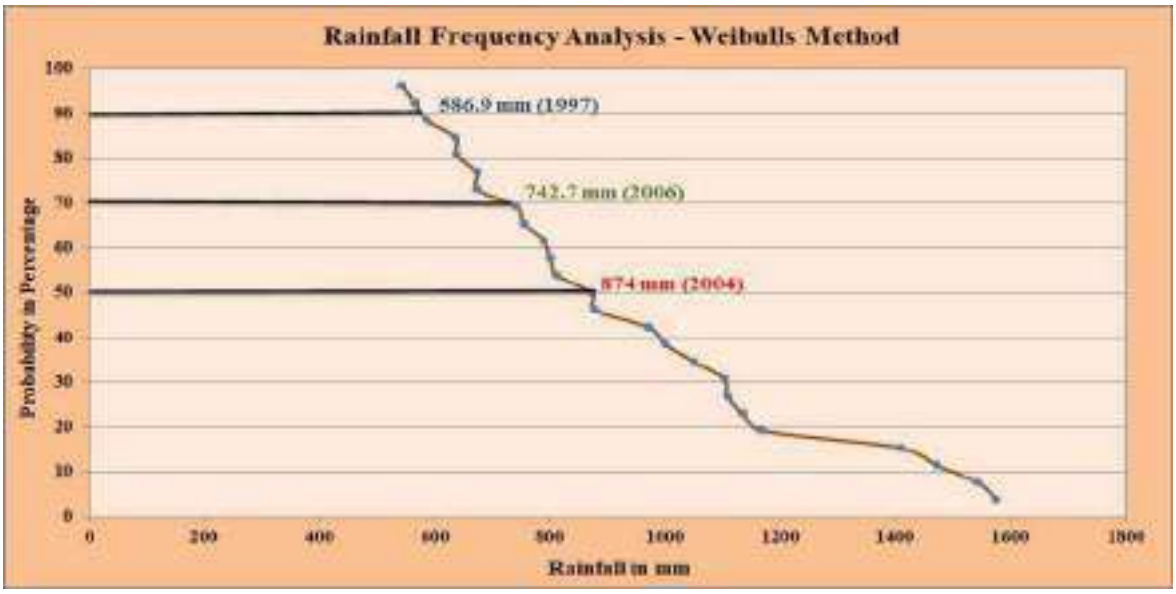


Figure 38: Rainfall Frequency graph

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
0.0	0.0	13.7	3.7	22.9	202.3	185.8	202.6	103.2	6.0	0.2	2.4	742.7

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 32: Area considered for Rain water harvesting

S No	Facility	Area in Sq.m
1	Roof area of the buildings	4514.00
2	Road with Asphalt and Parking area / Storage area including Plant	162882.37
3	Green Belt area	48753.00
	Vacant and open area – Unpaved open area	56004.30
	Total Area	**272153.67**

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 **39,761 Cu.m/Year.**

The predicted Pre–Plant Run-Off is as follows:

Table 33: 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)	272154		0.20	39761
Total Runoff	In Million liters / Year	**39.76**	In cu.m	**39761**
Month	Monthly rainfall (mm)	Number of Rainy days	Pre- Project Runoff in cu.m	
January	11.1	3	196	
February	14.6	3	258	
March	10.0	2	176	
April	24.0	4	422	
May	49.1	5	865	
June	138.9	8	2447	
July	285.1	12	5021	
August	293.9	14	5176	
September	209.9	10	3697	
October	64.9	4	1144	
November	6.3	2	0	
December	3.8	1	0	
Total	**1111.7**	**68**	**19402**	
In ML/YR			**19.40**	
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 34: 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)	4514		0.85		2802	
Road and Paved area m²)	162882		0.65		77340	
Green Belt area (m²)	48753		0.15		5343	
Vacant and Open Land (m²)	56004		0.20		8182	
Total Runoff	In Million liters / Year		**93.67**	In cu.m	**93667**	
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	0.0	0	0	0	0	0
February	0.0	0	0	0	0	0
March	13.7	3	52	1446	100	153
April	3.7	1	0	0	0	0
May	22.9	4	88	2421	167	256
June	202.3	12	776	21420	1480	2266
July	185.8	10	713	19676	1359	2082
August	202.6	14	777	21451	1482	2269
September	103.2	10	396	10926	755	1156
October	6.0	2	0	0	0	0
November	0.2	1	0	0	0	0
December	2.4	1	0	0	0	0
Total	**742.7**	**58**	**2802**	**77340**	**5343**	**8182**
In ML/YR			**2.80**	**77.34**	**5.34**	**8.18**
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– **93,667Cu.m/Year**

The estimated pre- and post-Plant Run-Off is as follows:

Estimated Pre Project-Runoff from the Plant site	**39761**	**Cu.m/Year**
Estimated Post Project Runoff from the Plant site	**93667**	**Cu.m/Year**
Difference in Pre and Post Project Runoff	**53906**	**Cu.m/Year**

Excess Run-Off of 53,906 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
3) Pond with draw well and recharge bore well

Roof top collection:

- The roof water collection is estimated as **952 Cu.m/Year**

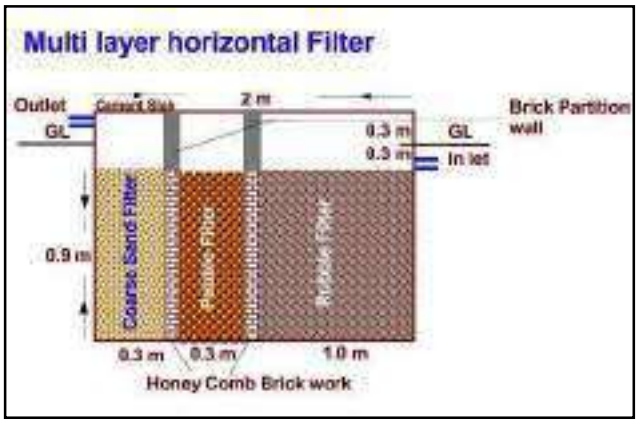
Harvesting measures in Plant Site:

- 10 sumps (Size 1.5 m length X 3 m width X 4.5 m depth) with a total capacity of **205.5 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	**952**
Total Estimated Roof Water Harvesting in CUM/Year						**952**
Total Roof Area in Sq.m	4514		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	0.0	0	0	0		0
February	0.0	0	0	0		0
March	13.7	3	52	52		0
April	3.7	1	0	0		0
May	22.9	4	88	88		0
June	202.3	12	776	203		573
July	185.8	10	713	203		510
August	202.6	14	777	203		574
September	103.2	10	396	203		193
October	6.0	2	0	0		0
November	0.2	1	0	0		0
December	2.4	1	0	0		0
Total	**742.7**	**58**	**2802**	**952**		**1850**
In ML/YR			**2.80**	**0.95**		**1.85**
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) : **1850** CUM/Year
2) Run-Off from Asphalt paved area : **77340** CUM/Year
3) Run-Off from Green belt and Vacant area : **13525** CUM/Year
4) Total Run-Off (1+2+3) : **92715** CUM/Year

Portion of runoff water is being diverted to the recharge shaft with bore well.

Estimated recharge through recharge pits with recharge wells:

2 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 2 recharge pits with recharge bore wells and is **76158 cu.m / year.** The monthly estimated recharge is as follows:

Table 35: 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 Area in sq.m	162882		Runoff co-efficient		0.65	Number Storm water Recharge well	**2**
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	0.0	0	0	0	0.0	0.0	0
February	0.0	0	0	0	0.0	0.0	0
March	13.7	3	1446	0	1446.0	1446.0	0
April	3.7	1	0	0	0.0	0.0	0
May	22.9	4	2421	0	2421.0	2421.0	0
June	202.3	12	21420	573	21993.0	21993.0	0
July	185.8	10	19676	510	20186.0	20186.0	0
August	202.6	14	21451	574	22025.0	22025.0	0
September	103.2	10	10926	193	11119.0	11119.0	0
October	6.0	2	0	0	0.0	0.0	0
November	0.2	1	0	0	0.0	0.0	0
December	2.4	1	0	0	0.0	0.0	0
TOTAL	**742.7**	**58**	**77340**	**1850**	**79190.0**	**79190.0**	**0**
In ML/YR					**79.19**	**79.19**	**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 2 recharge pits with recharge bore will is high (79190 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 increased depth 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. Pond adoption agreement is given in Annexure 6**

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 at Itai Maida	**610.0**	**433.0**	**3.0**	**264130**	**792390**
Total Water spread area in Sq.m				**264130**	**792390**

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**	**316956**	**158478**	**475443**
Total Recharge					**4,75,443**

The abstract of rainwater harvesting is as follows:

Table 36: Rainwater harvesting abstract

Rain water Harvesting – Abstract		
Rain water Harvesting - Ground water recharge		
Estimated Recharge from the rain water collected in the Sump	**952**	**cu.m/Year**
Estimated Ground water recharge through recharge pits with recharge bore wells	**79,190**	**cu.m/Year**
Estimated water harvested through Cleaning of water bodies (Outside the plant)	**4,75,443**	**cu.m/Year**

Estimated Total Ground water recharge Volume	**5,55,585**	**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	**5,55,585**	**cu.m/Year**
CGWA NOC approved quantity	**20,95,850**	**cu.m/Year**
The Estimated percentage Rain water Harvesting Vs NOC approved quantity	**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 39.**

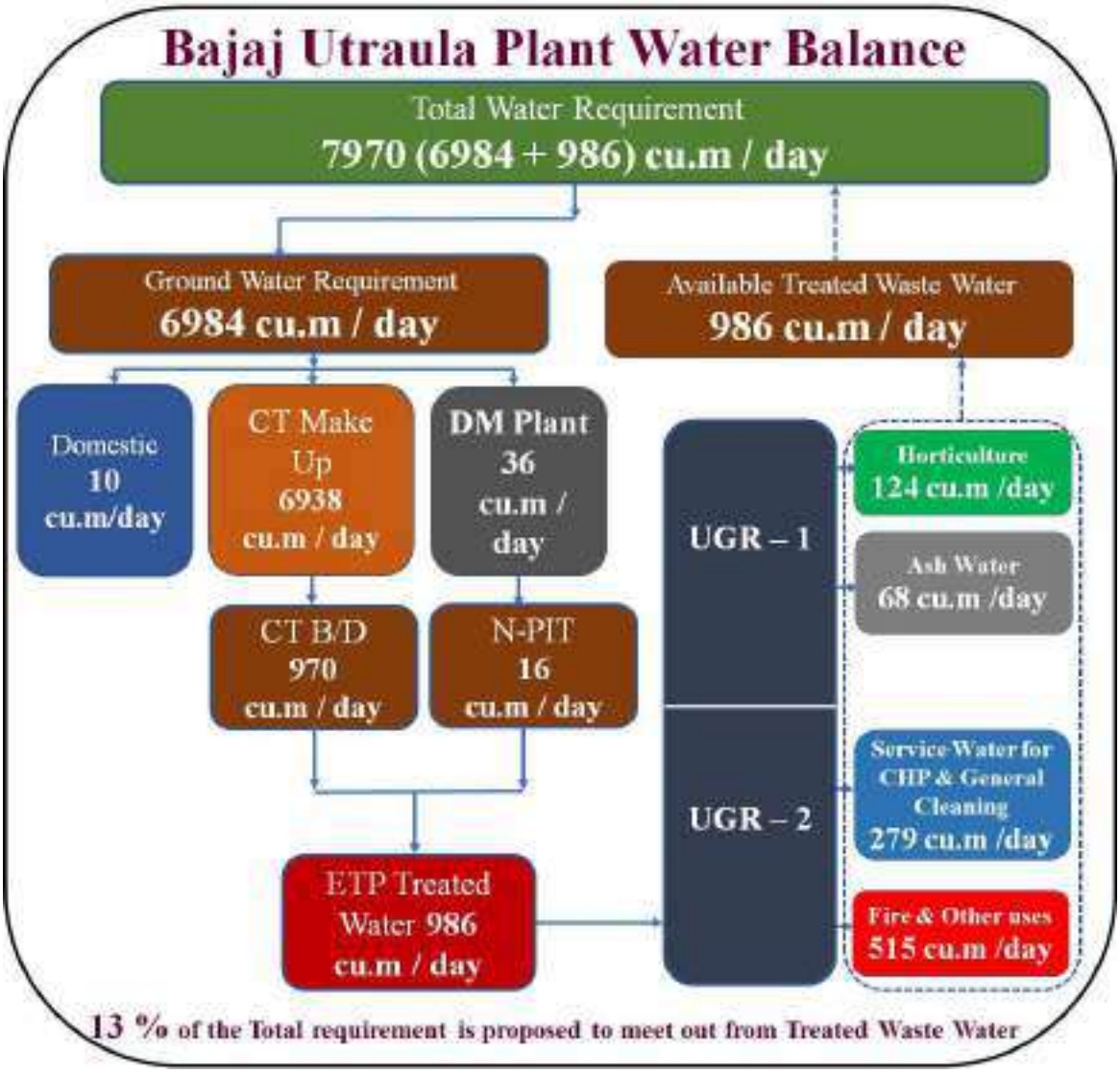


Figure 39: Water Balance Chart

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° 18'00" and 27°23'30" and East Longitude of 82°16'00" and 82°22'05". The Plant site falls in **G44E7.**

The total aerial extent of the study area covering 5 Km radius from the Plant site boundary is **79.66 Sq.km.**

Primarily, 5 Km radius from the Plant site forms part of crop land (about 80.60 %). The second major land use is builtup land.

The second major land use is builtup land. 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 **95 m to 119 m amsl**. The maximum elevation is observed in the western part of the study area

The maximum and minimum elevation of the Plant site is **100 m and 103 m amsl** respectively. The Plant site is sloping towards north**.**

River Rapti is the major river draining Balrampur district and flows from the north- west towards south-east.

The development of stream is very less as the runoff flows as overland flow towards the river / nalla. The Rapti River is perianal. 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 Balrampur district is **941 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 **48.5 Km in the South west from the Plant's boundary**

The study area (5 Km buffer) including the Plant site is underlined by Limestone, Laterite, Shale of compact nature, Sandstone. The availability of ground water in this formation is moderate.

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 has been divided into Active Flood Plain, Older Alluvial Plain, Older Flood Plain

The occurrence and movement of ground water is controlled by the primary porosity. The Plant is located in older flood plain

In the north east of the study area the Active flood plain noticed. The occurrence is in the banks of Rapti River

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.

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 **45 m to 121 m** respectively. Yield varies from **187 - 375 m³ /day for 8 hours of Pumping**. Post-monsoon water level varies from **2.4 m to 7.1 m** below ground level. In Pre-monsoon period it varies from **3.4 m to 8.8 m** below ground level. Seasonal fluctuation in water level in these Tube well varies from **03 m to 1.7 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 **8.4-8.8 m** falls in the North of the study area near Ruki Manjhari village.

The shallowest ground water level zone of **2.4-4.4 m** occupies in the North and east of the study area near Bal Bhit, Chai Dih and Malmudnagar villages. The Plants falls in **4.4-6.4 m** zone.

The post monsoon depth to ground water level depict that relatively deepest of ground water level zone of **6.4 – 8.4 m** falls in the north of the study area near Ruki Manjhari village. The shallowest ground water level zone of **2.2-4.4 m** occupies in the half of the study area. The Plant site falls in **2.4-4.4 m** zone.

The ground water level fluctuation of the study area indicates that the ground water level fluctuation ranges from **<0.5 – 2.0 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 Trough (Convergent flow of ground water).
2) Ground water mound (Divergent flow of ground water).

Ground water trough is observed in the Plant site where there is convergent flow of ground water.

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 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 3 CGWB wells indicates there is increasing trend in 3 seasons (3 post-monsoon periods). The falling trend observed in 3 seasons (3 pre-monsoon).

The average rise in the post-monsoon period is 0.0513 m/year. (3 Seasons)
The average fall in the pre-monsoon period in -0.0402 m/year (3 Seasons)

The long-term trend in around the study area clearly indicates that the stress in the ground water is merger.

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 **4.5 to 5.5 m. (Initial Head 98.5 m and the observed head 94.0 m at the end of 5th year and 93 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.

- **4.5 to 5.5 m. (Initial Head 98.5 m and the observed head 94.0 m at the end of 5th year and 93 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 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 1851 and 479 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 **450-850 µmhos/cm** EC zone. The Plant is located in 450-850 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	**4050**	**m^2/day**
Storativity Average of the study area	**1.57×10^{-04}**	**m/day**
Average Hydraulic Conductivity of the study area	**67.5**	**m/day**

The above values are compared with CGWB exploratory Tube well drilled for Balrampur district and found to be matching.

The optimum yield of the Tube well is **2288 cu.m/day**. If the pump runs for **12 hours**, with a discharge of **3178 lpm / 12 m Drawdown**, the Tube well can yield **2288 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 treated waste water usage for Industrial Use **664 cu.m/day,** green belt development **250 cu.m/day**, firefighting and other requirement **72 cu.m/day**.

As per the Guidelines CGWA, 2 Piezometers have been installed. (One DWLR and 1 DWLR with Telemetry). The project proponent drilled 3 Tube well and installed piezometers.

The hydrograph has been generated for the Piezometer observed data and it reveals that there is very merger decline trend **(0.005 & 0.018 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 meter for all the three Tube wells area 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 **Sridattganj** Block has been categorized as **Safe**, since the stage of ground water development is **62.89%**

- The predicted drawdown in Plant site **5.84 m in the fifth year.**
- The predicted drawdown in Plant pits **6.19 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.

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.

Total number of households are about 7646

• Total population of villages under the study area is 51390 out of which males are 25989 (50.5%) and females are 25401 (49.95%)

• The average family size is about 5.3 persons per family

• Scheduled caste population is 4840 and Scheduled tribes' population is nil 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. There is no 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.

4) Roof top rain water harvesting through sump
5) Recharge trench with bore well
6) Pond with draw well and recharge bore well

The roof water collection is estimated as **952 Cu.m/Year**

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	**952**	**cu.m/Year**
Estimated Ground water recharge through recharge pits with recharge bore wells	**79,190**	**cu.m/Year**
Estimated water harvested through Cleaning of water bodies (Outside the plant)	**4,75,443**	**cu.m/Year**
Estimated Total Ground water recharge Volume	**5,55,585**	**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**

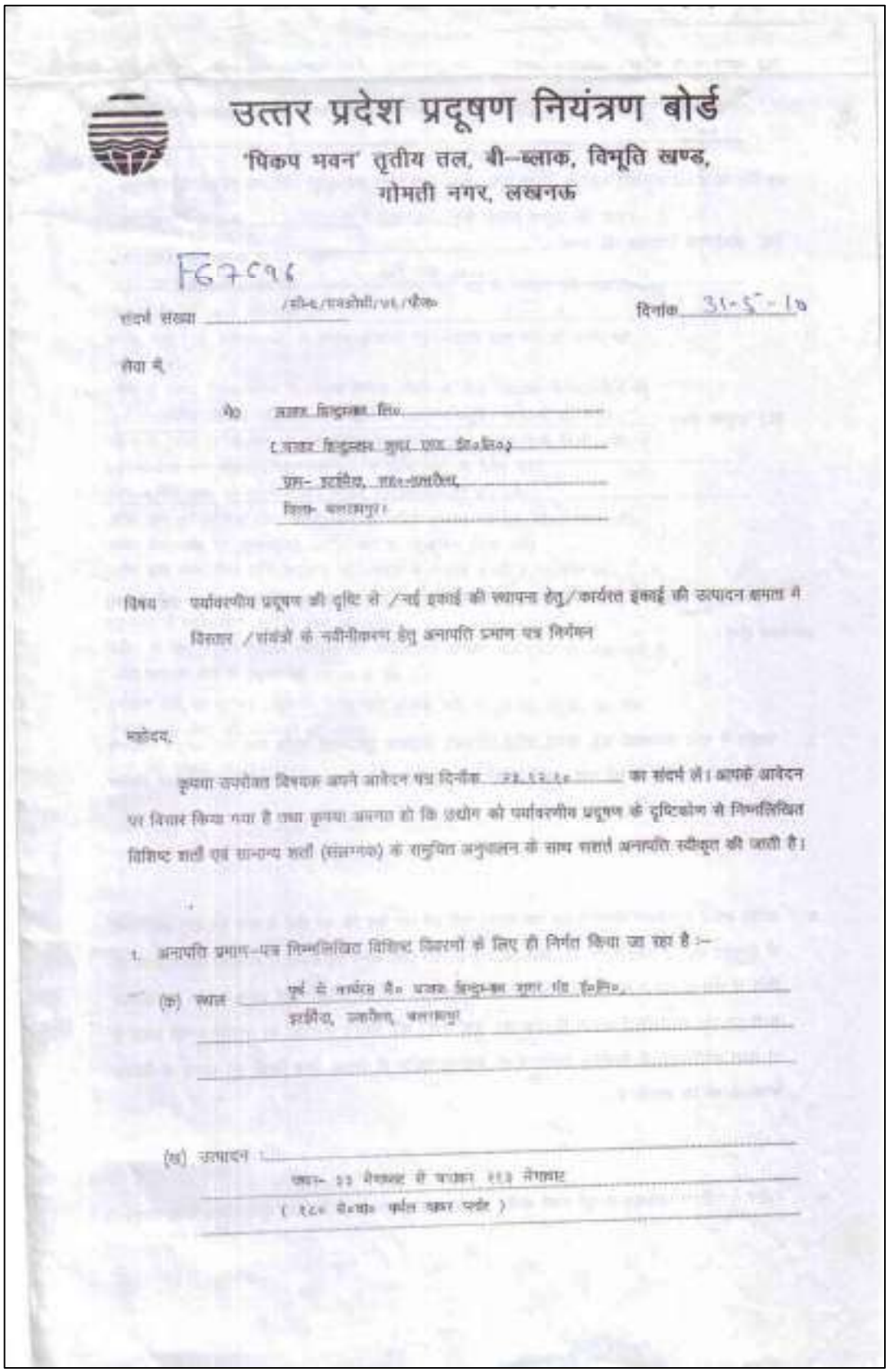
The analysis reveals the following

Estimated Total Ground water recharge Volume	**5,55,585**	**cu.m/Year**
CGWA NOC approved quantity	**20,95,850**	**cu.m/Year**
The Estimated percentage Rain water Harvesting Vs NOC approved quantity	**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

'पिकप भवन' तृतीय तल, बी–ब्लाक, विभूति खण्ड,
गोमती नगर, लखनऊ

F67696

संदर्भ संख्या ...../सी-ए/सवजोमी/वा/पैक० दिनांक 31-5-16

सेवा में,

मै० बजाज हिंदुस्तान लि०

(बजाज हिंदुस्तान शुगर एण्ड डि०लि०)

ग्राम- इटाईया, तह०-उतरौला,

जिला- बलरामपुर।

विषय: पर्यावरणीय प्रदूषण की दृष्टि से /नई इकाई की स्थापना हेतु/कार्यरत इकाई की उत्पादन क्षमता में विस्तार /परिवर्तन के परीक्षीकरण हेतु अनापत्ति प्रमाण पत्र निर्गमन

महोदय,

कृपया उपरोक्त विषयक आपने आवेदन पत्र दिनांक 23.12.15 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 सापेक्ष 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) स्थान: पूर्व से कार्यरत मै० बजाज हिंदुस्तान शुगर एंड डिस्टि०, इटाईया, उतरौला, बलरामपुर

(ख) उत्पादन :

पक्का- 33 मेगावाट से बढ़कर 113 मेगावाट

(82० मे०वा० फर्म पावर प्लांट)

(ग) मुख्य कच्चे माल :

क्षमता- ३२०० मैट्रिक टन/दिन

(घ) औद्योगिक उत्प्रवाह की मात्रा :

३६४८ की मैट्रिक

(ङ) प्रयुक्त ईंधन :

क्षमता- ३२०० 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 के की गयी प्रगति रिपोर्ट इस कार्यालय में प्रत्येक माह की दसवीं तारीख तक नियमित 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 करने 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 अन्तर्गत उद्योग के विरुद्ध 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. घरेलू उत्प्रवाह, जिसकी मात्रा ..... 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 30.6.10 तक अवश्य प्रस्तुत की जाए।

7. पॉवर उत्पादन की क्षमता पूर्ववत रहेगी।

8. उद्योग में दिये गये प्रस्ताव के अनुसार जल एवम् वायु प्रदूषण नियंत्रण की स्थापना क्षमता विस्तार से पूर्व करना अनिवार्य होगा।

9. क्षमता विस्तार के उपरान्त बोर्ड से क्षमता संचालन हेतु सहमति प्राप्त कर ही उद्योग का संचालन करें।

10. उद्योग में क्षमता विस्तारीकरण के पश्चात ईकेसिंग सीवर के दैनिक उत्प्रवाह के शुद्धिकरण हेतु पूर्व में स्थापित उत्प्रवाह शुद्धिकरण के अतिरिक्त आवश्यकतानुसार व्यवस्था की जाये।

11. उद्योग से उत्पन्न फ्लाई ऐश को पुनः उपयोग हेतु सीमेंट उद्योग अथवा अन्य किसी उद्योग से अनुबन्ध प्रस्तुत का खेमना प्रस्ताव तीन माह में बोर्ड को प्रेषित करें।

12. कोल क्रशिंग प्लांट का समुचित वायु प्रदूषण नियंत्रण व्यवस्था की जाये।

13. उद्योग द्वारा पुलिंग तथा अनेकर फ्लाई ऐश से उत्पन्न उत्प्रवाह को पुनः चक्रित किया जाये।

14. उद्योग द्वारा ग्रीन पर नियमानुसार 33% भाग पर वृक्षारोपण किया जाये।

15. उद्योग द्वारा कोल डेस्ट सौम्य व्यवहार की स्थापना के पश्चात ई.आर.ए. कराया जाये।

16. उद्योग द्वारा वन एवम् पर्यावरण मंत्रालय भारत शासन की अधिसूचना दिनांक-14.9.08 के अनुपालन में पर्यावरणीय स्वीकृति प्राप्त की जाये।

17. 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।

18. उपरोक्त शर्तों का पूर्णतया अनुपालन किया जाये अन्यथा की धारा 33.A.B. निरस्त कर बैंक गारंटी जब्त करने की कार्यवाही की जायेगी।

19. अन्य शर्तें 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 एवं सामान्य शर्तों के सम्बन्ध में उद्योग द्वारा इस कार्यालय में दिनांक 30.6.18 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. दिनांक

प्रतिलिपि :

1. महाप्रबन्धक, जिला उद्योग केन्द्र
2. उपकर अधिकारी, उ. प्र. प्रदूषण नियंत्रण बोर्ड, लखनऊ।
3. क्षेत्रीय अधिकारी, उ. प्र. प्रदूषण नियंत्रण बोर्ड – पेचकस
4.

मुख्य पर्यावरण अधिकारी

(सर्किल–)

(4)

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

Valid thru : 30.09.2026

Certificate No. : CGWA/RGI/042

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 & MSME 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

Ultra Lab

TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-17012022-07 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE: UTARAULA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Maida 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)	7.11	-	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)	1376	µs/cm	-	-
5	Turbidity	IS:3025(Part-10)	2.6	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	550	mg/l	200	600
7	Calcium as Ca	IS:3025(Part-40)	101.00	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	32.29	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	16.14	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nil	mg/l	-	-
11	Bicarbonate(as HCO_3)	IS:3025(Part-51)	561.20	mg/l	-	-
12	Magnesium(as Mg)	IS:3025(Part-46)	70.47	mg/l	30	100
13	Chloride as Cl)	IS:3025(Part-32)	107.63	mg/l	250	1000
14	Fluoride as F)	IS:3025(Part-60)	0.73	mg/l	1	1.5
15	Alkalinity as $CaCO_3$)	IS:3025(Part-23)	460	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	894	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	27.80	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	45.84	mg/l	200	400

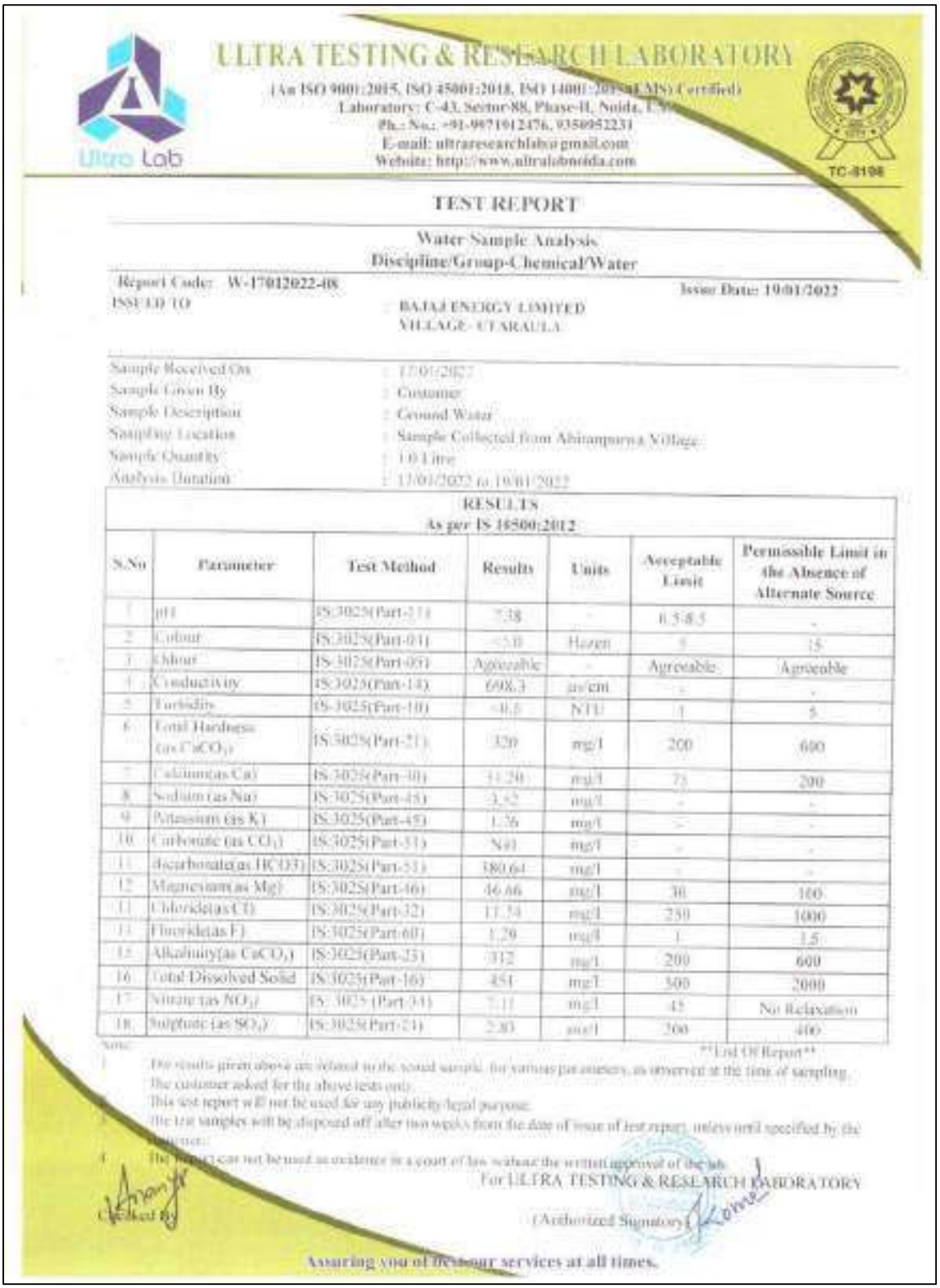
End Of Report

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.
3. This test report will not be used for any publicity/legal purpose.
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.
5. The report can not be used as evidence in a court of law without the written approval of the lab.

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(Authorized Signatory)

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Ph.: Nos.: +91-9871912476, 9350952231
E-mail: ultraresearchlabs@gmail.com
Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-17012022-08 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE- UTARAULA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Ahirampurwa 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)	7.38	-	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)	698.3	µs/cm	-	-
5	Turbidity	IS:3025(Part-10)	<0.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	320	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	71.20	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	3.52	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	1.26	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nil	mg/l	-	-
11	Bicarbonate(as HCO3)	IS:3025(Part-51)	380.64	mg/l	-	-
12	Magnesium(as Mg)	IS:3025(Part-46)	46.66	mg/l	30	100
13	Chloride(as Cl)	IS:3025(Part-32)	11.34	mg/l	250	1000
14	Fluoride(as F)	IS:3025(Part-60)	1.29	mg/l	1	1.5
15	Alkalinity(as $CaCO_3$)	IS:3025(Part-23)	312	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	451	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	7.11	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	2.83	mg/l	200	400

Note: **End Of Report**

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.
3. This test report will not be used for any publicity/legal purpose.
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.
5. 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 the best our services at all times.

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 & MSE Certified)
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Ph.: No.: +91-9971912476, 9350952231
E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com

TC-8108

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-17012022-09 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE- UTARAULA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Rukhaniajhari 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)	7.36	-	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)	608.0	µs/cm	-	-
5	Turbidity	IS:3025(Part-10)	18.9	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	272	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	60.80	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	5.80	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	2.94	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nil	mg/l	-	-
11	Bicarbonate(as HCO_3)	IS:3025(Part-51)	177.08	mg/l	-	-
12	Magnesium(as Mg)	IS:3025(Part-46)	29.16	mg/l	30	100
13	Chloride(as Cl)	IS:3025(Part-32)	19.57	mg/l	250	1000
14	Fluoride(as F)	IS:3025(Part-60)	0.17	mg/l	1	1.5
15	Alkalinity(as $CaCO_3$)	IS:3025(Part-23)	264	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	393	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	<0.1	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	<1.0	mg/l	200	400

Note:

End Of Report

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling.
2. No evidence asked for the above test/study.
3. This test report will not be used for any publicity/legal purpose.
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.
5. 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 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-17012022-10 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE- UTARAULA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Malwa Bandam 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)	7.28	-	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)	754.7	µs/cm	-	-
5	Turbidity	IS:3025(Part-10)	3.9	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	340	mg/l	200	600
7	Calcium as Ca	IS:3025(Part-40)	84.80	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	9.78	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	1.89	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nil	mg/l	-	-
11	Bicarbonate as HCO_3	IS:3025(Part-51)	390.40	mg/l	-	-
12	Magnesium as Mg	IS:3025(Part-46)	31.10	mg/l	30	100
13	Chloride as Cl	IS:3025(Part-32)	19.27	mg/l	250	1000
14	Fluoride (as F)	IS:3025(Part-60)	0.21	mg/l	1	1.5
15	Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	320	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	491	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	0.27	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	5.02	mg/l	200	400

Note:

End Of Report

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.
3. This test report will not be used for any publicity/legal purpose.
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.
5. 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

(Authorized Signatory)

Assuring you of honour services at all times.

ULTRA TESTING & RESEARCH LABORATORY

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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

Ultra Lab

TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group: Chemical/Water

Report Code: W-17012022-11 Issue Date: 19/01/2022

ISSUED TO: BAJAJ ENERGY LIMITED
VILLAGE- UTARAULA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Shahi-Dih 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)	7.49	-	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)	711.3	µs/cm	-	-
5	Turbidity	IS:3025(Part-10)	8.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	316	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	73.60	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	9.78	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	1.80	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nil	mg/l	-	-
11	Bicarbonate(as HCO_3)	IS:3025(Part-51)	170.88	mg/l	-	-
12	Magnesium(as Mg)	IS:3025(Part-46)	32.68	mg/l	30	100
13	Chloride(as Cl)	IS:3025(Part-32)	19.37	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)	304	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	462	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	1.70	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	2.04	mg/l	200	400

Note:

End Of Report

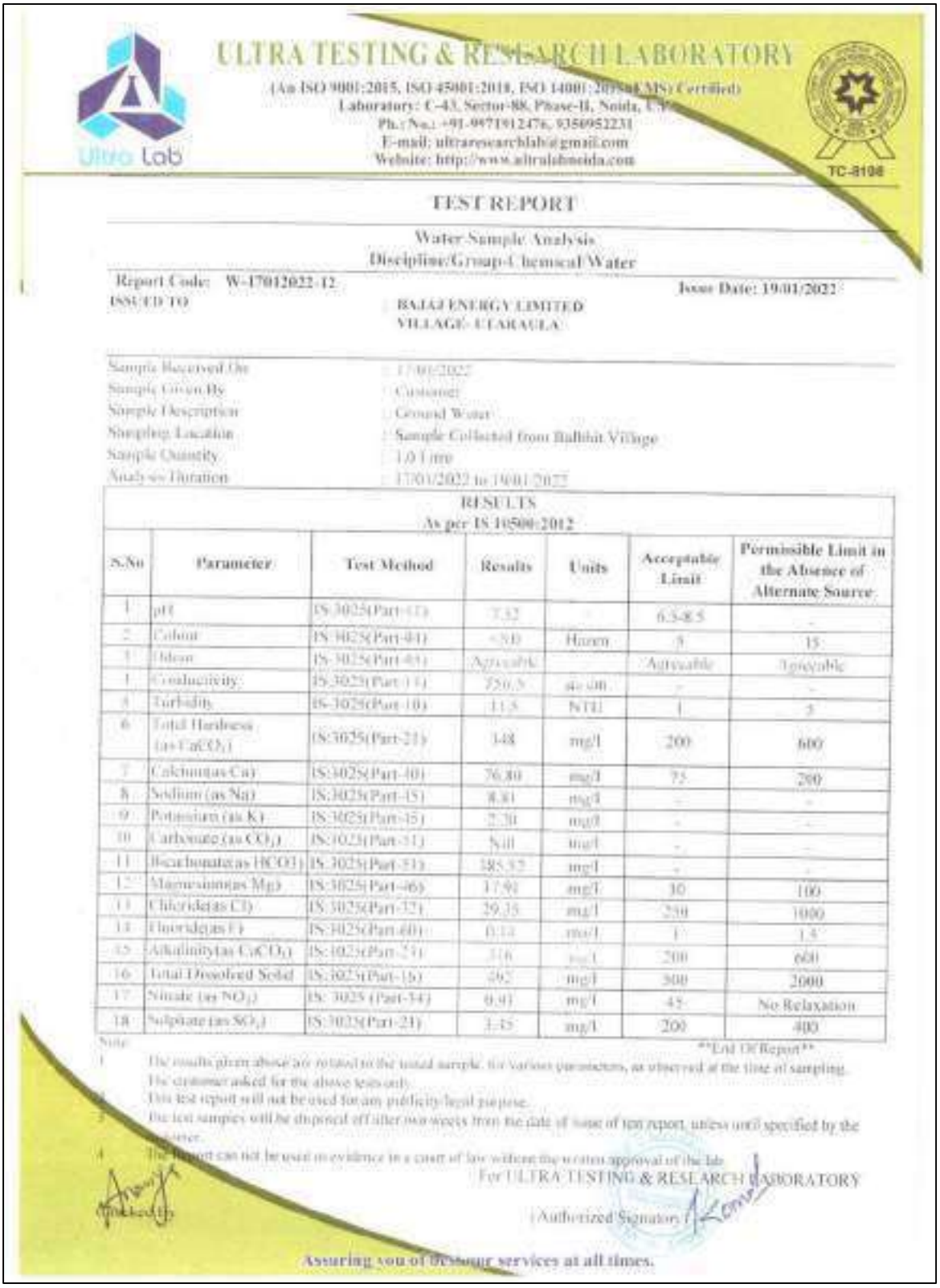
1. The results given above are related to the tested sample for various parameters, as observed at the time of sampling.
2. The customer asked for the above tests only.
3. This test report will not be used for any publicity/ legal purpose.
4. The test samples will be disposed off after seven days from the date of issue of test report, unless until specified by the customer.
5. 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)

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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-8108

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-17012022-12 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE- UTARAULA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Ballhat 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)	7.52	-	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)	720.5	µs/cm	-	-
5	Turbidity	IS:3025(Part-10)	11.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	148	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	76.80	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	8.81	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	2.20	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nil	mg/l	-	-
11	Bicarbonate as (HCO_3)	IS:3025(Part-51)	385.32	mg/l	-	-
12	Magnesium(as Mg)	IS:3025(Part-46)	17.91	mg/l	30	100
13	Chloride(as Cl)	IS:3025(Part-32)	29.35	mg/l	250	1000
14	Fluoride(as F)	IS:3025(Part-60)	0.13	mg/l	1	1.5
15	Alkalinity(as $CaCO_3$)	IS:3025(Part-23)	316	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	462	mg/l	500	2000
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	0.91	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	3.35	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.
3. This test report will not be used for any publicity/legal purpose.
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.
5. This report can not be used in evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

(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 & OHSAS Certified)
Laboratory: C-43, Sector-88, Phase-II, Noida, U.P.
Ph.: No.: +91-9871912476, 9368952231
E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com

TC-6198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-17012022-13 Issue Date: 19/01/2022

ISSUED TO : BAJAJ ENERGY LIMITED
VILLAGE- UTARAULA

Sample Received On : 17/01/2022
Sample Given By : Customer
Sample Description : Ground Water
Sampling Location : Sample Collected from Mahmadnagar Village
Sample Quantity : 1.0 Litre
Analysis Duration : 17/01/2022 to 19/01/2022

RESULTS
As per IS 16500:2012

S.No	Parameter	Test Method	Results	Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
1	pH	IS:3025(Part-11)	7.40	-	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)	727.8	µS/cm	-	-
5	Turbidity	IS:3025(Part-10)	4.8	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	332	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	88.00	mg/l	75	200
8	Sodium (as Na)	IS:3025(Part-45)	8.81	mg/l	-	-
9	Potassium (as K)	IS:3025(Part-45)	2.30	mg/l	-	-
10	Carbonate (as CO_3)	IS:3025(Part-51)	Nil	mg/l	-	-
11	Bicarbonate as (HCO_3)	IS:3025(Part-51)	170.88	mg/l	-	-
12	Magnesium as Mg)	IS:3025(Part-46)	27.22	mg/l	30	100
13	Chloride(as Cl)	IS:3025(Part-32)	29.35	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)	304	mg/l	200	600
16	Total Dissolved Solid	IS:3025(Part-16)	473	mg/l	500	2000
17	Nitrate (as NO_3)	IS:3025(Part-34)	0.21	mg/l	45	No Relaxation
18	Sulphate (as SO_4)	IS:3025(Part-24)	6.73	mg/l	200	400

End Of Report

Note:
1. The results given above are related to the tested sample, for each of the parameters, as obtained at the time of sampling.
2. For customer asked for the above tests only.
3. This test report will not be used for any public or legal purpose.
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.
5. This report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

(Authorized Signatory)

Assuring you of best our services at all times.

Annexure 4 Surface Water, STP, ETP Quality results

NOIDA TESTING LABORATORIES

(A Government Approved Testing Laboratory)

(An ISO :9001 : 2015 & ISO 45001 : 2018 Certified Laboratory)

MoEF & CC (Ministry of Environment, Forest & Climate Change), UPPCB & HSPCB Recognized Laboratory

☎ +91-9313611642, 8510081921, 7503031145, 8527870572, 7503031146, 9999794369

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,
Vill- Itaimaida Utraula Distt- Balrampur (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 Khamahuwa 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	6.68	-
2.	Total Suspended Solid	IS:3025(Part-17):1984	23.0	mg/l
3.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	56.0	mg/l
4.	Biological Oxygen Demand (as O_2)	IS:3025(Part-44):1993	8.4	mg/l
5.	Oil & grease	IS:3025(Part-39):1984	<1.0	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

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

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-231021-05	27/10/2021

Issued To M/S. Bajaj Energy Limited.
Vill- Itaimaida Utraula Distt- Balrampur (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On : 22/10/2021
Sample Drawn By : Mr. Umashankar Sharma (NTL)
Sample Description : ETP Outlet
Sample Quantity/Packing detail : 1 lit/Plastic Cane
Analysis Duration : 23/10/2021 To 27/10/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units	Limit as per CPCB norms
1.	pH	IS:3025(Part-11):1983	7.18	-	5.0-9.0
2.	Total Suspended Solid	IS:3025(Part-17):1984	12.5	mg/l	100
3.	Chemical Oxygen Demand(as O_2)	APHA 5220 B:2005	47.0	mg/l	250
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44):1993	8.2	mg/l	30
5.	Oil & grease	IS:3025(Part-39):1984	<1.0	mg/l	10

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 presented 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

Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
Branch Office : IP-2, Haridwar, Uttrakhand
Branch Office : Gayatri Nagar, Katgodam, Haldwani, Uttrakhand
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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-231021-02	27/10/2021

Issued **M/S. Bajaj Energy Limited.**
Vill- Itaimaida Utraula Distt- Balrampur (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On : 22/10/2021
Sample Drawn By : Mr. Umashankar Sharma (NTL)
Sample Description : STP Inlet
Sample Quantity/Packing detail : 1 lit/Plastic Cane
Analysis Duration : 23/10/2021 To 27/10/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11)	7.06	-
2.	Total Suspended Solid	IS:3025(Part-17)	112.0	mg/l
3.	Chemical Oxygen Demand (COD)	IS:3025(Part-58)	256.0	mg/l
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44)	68.0	mg/l
5.	Oil & Grease	IS: 3025 (P- 39)	1.8	mg/l
6.	Faecal Coliform (MPN/100ML)	IS: 1622:1981	$1.5x10^4$	-

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.
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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

Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
Branch Office : IP-2, Haridwar, Uttrakhand
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MoEF & CC (Ministry of Environment, Forest & Climate Change), UPPCB & HSPCB Recognized Laboratory

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Waste Water	WW-231021-03	27/10/2021

Issued M/S. Bajaj Energy Limited.
Vill- Itaimaida Utraula Distt- Balrampur (U.P) India

SAMPLING & ANALYSIS DATA

Sample Received On : 22/10/2021
Sample Drawn By : Mr. Umashankar Sharma (NTL)
Sample Description : STP Outlet
Sample Quantity/Packing detail : 1 lit/Plastic Cane
Analysis Duration : 23/10/2021 To 27/10/2021

TEST RESULTS

S.No	Parameter	Test Method	Results	Units	Limit as per CPCB norms
1.	pH	IS:3025(Part-11)	7.23	-	5.5-9.0
2.	Total Suspended Solid	IS:3025(Part-17)	10.5	mg/l	100 max
3.	Chemical Oxygen Demand (COD)	IS:3025(Part-58)	42.0	mg/l	No limit Specified
4.	Biological Oxygen Demand(as O_2)	IS:3025(Part-44)	6.7	mg/l	30max
5.	Oil & Grease	IS:3025(Part-39)	<1.0	mg/	No limit Specified
6.	Faecal Coliform (MPN/100ML)	IS: 1622:1981	130	-	<1000 MPN/100ML

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 otherwise informed by the customer.

CHECKED BY

AUTHORIZED SIGNATORY

Laboratory : GT-20, Sector-117, Noida Gautam Budh Nagar - 201301
Branch Office : IP-2, Haridwar, Uttrakhand
Branch Office : Gayatri Nagar, Kalgodam, 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 संस्थानो से पानी की अन–उपलब्धता

बजाज इनर्जी लिमिटेड ग्राम– इटईमैदा, विकास खण्ड– श्रीदत्तगंज, जिला– बलरामपुर उ0प्र0 में स्थित है ।

प्रमाणित किया जाता है कि इस क्षेत्र मे नगर पालिका या किसी भी सरकारी विभाग से पानी की आपूर्ति प्रदाय नहीं है ।

Annexure 6 Village Pond adoption agreement



भारतीय गैर न्यायिक

पचास रुपये रु.50

FIFTY RUPEES 20 FEB 2020 Rs.50

INDIA

INDIA NON JUDICIAL

उत्तर प्रदेश UTTAR PRADESH CA 022079

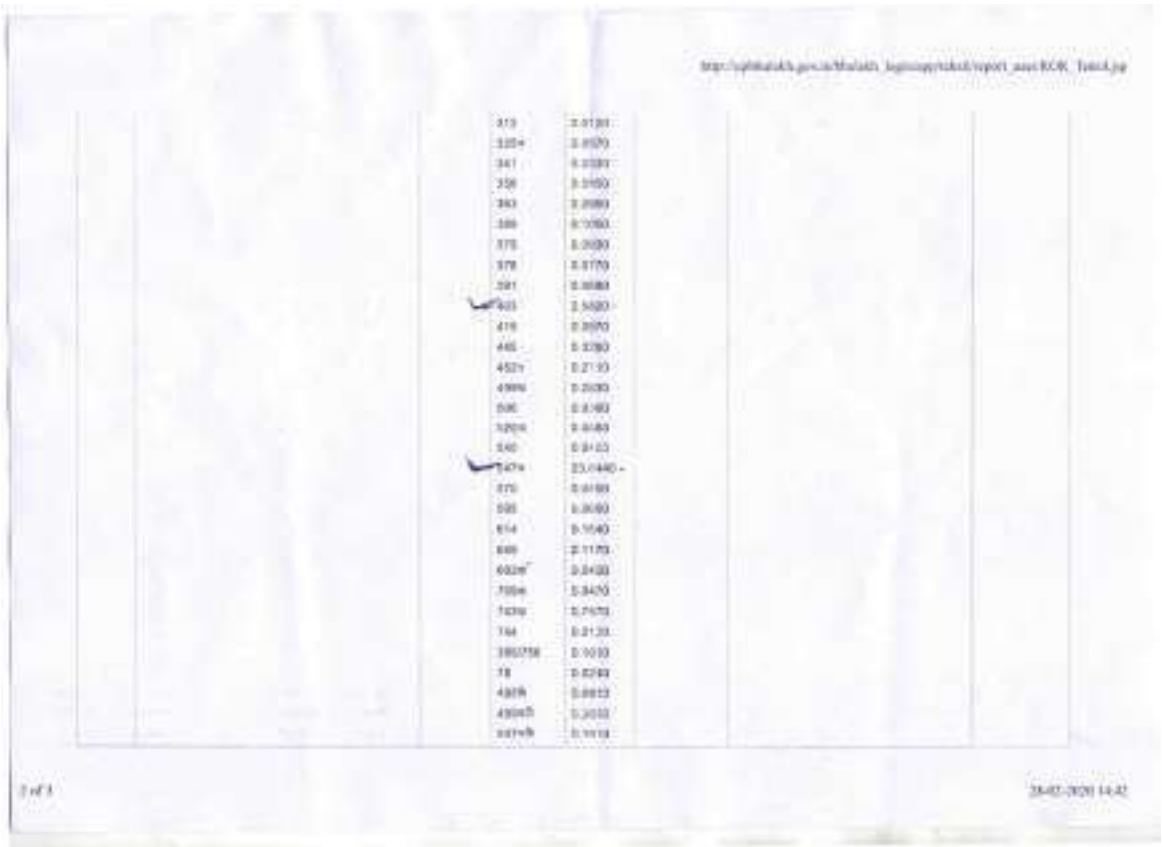
ग्रामपंचायत प्रमाण पत्र

मैं राकीन ग्राम प्रधान इटईमैदा विकास खण्ड श्रीदत्तगंज जनपद बलरामपुर उ0प्र0 तस्दीक करता हूँ कि पंचायत की सहमति से लिये गये निर्णय के अनुसार हमारे ग्राम में खाता संख्या 322 खसरा /गाटा नं0 403, 5474 में स्थित तालाब जिसका क्षेत्रफल 26.426 हेक्टे को मेसर्स बजाज इनर्जी लिमिटेड इटईमैदा जनपद बलरामपुर उ0प्र0 को रेन वाटर हर्वेस्टिंग रिचार्ज के लिये अधिग्रहित करता हूँ तो इस ग्राम की पंचायत को कोई आपत्ति नहीं है।

मैं यह भी तस्दीक करता हूँ कि यह तालाब किसी अन्य व्यक्ति या अन्य कम्पनी को अधिग्रहित नहीं किया गया एवं न ही भविष्य में किया जायेगा।


भारतीय गैर न्यायिक
पचास रुपये
रु.50
FIFTY RUPEES
Rs.50
INDIA
INDIA NON JUDICIAL
उत्तर प्रदेश UTTAR PRADESH
CA 022080
ग्राम प्रधान
ग्राम इटहैमैदा
विकासखण्ड श्रीदत्तगंज
जनपद बलरामपुर ।
उ0प्र0
दिनांक:-







BAJAJ ENERGY LIMITED,
UTRAULA UNIT,

Village – Itai maida,
Block - Sridattganj,
Tehsil - Utraula,
District - Balrampur,
Uttar Pradesh State,
India

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

194897/UPPCB/Basti(UPPCBRO)/CTO/both/BALRAMPUR/2023 **Date: 02/01/2024**

To,

M/s

BAJAJ ENERGY LIMITED

Bajaj Energy Limited, Vill.- Itai maida, post- shri duttganj, tehsil-utarula,distt.-Balrampur UP,BALRAMPUR,271607

Application Id-23192194

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 **Bajaj Energy Limited, Vill.- Itai maida, post- shri duttganj, tehsil-utarula,distt.-Balrampur UP,BALRAMPUR,271607**. 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
Industrial	**980 KLD**	**ETP**	
Domestic	**20 KLD**	**STP**	

(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 TPH each	Coal	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.

38. 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

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Chief Environmental Officer, Circle-6

Copy to:

Regional Officer, U.P. Pollution Control Board, Basti for information and necessary action.

RAM KARAN

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Chief Environmental Officer, Circle-6

मिशन LiFE - पर्यावरण के लिए जीवन शैली

(Lifestyle For Environment)

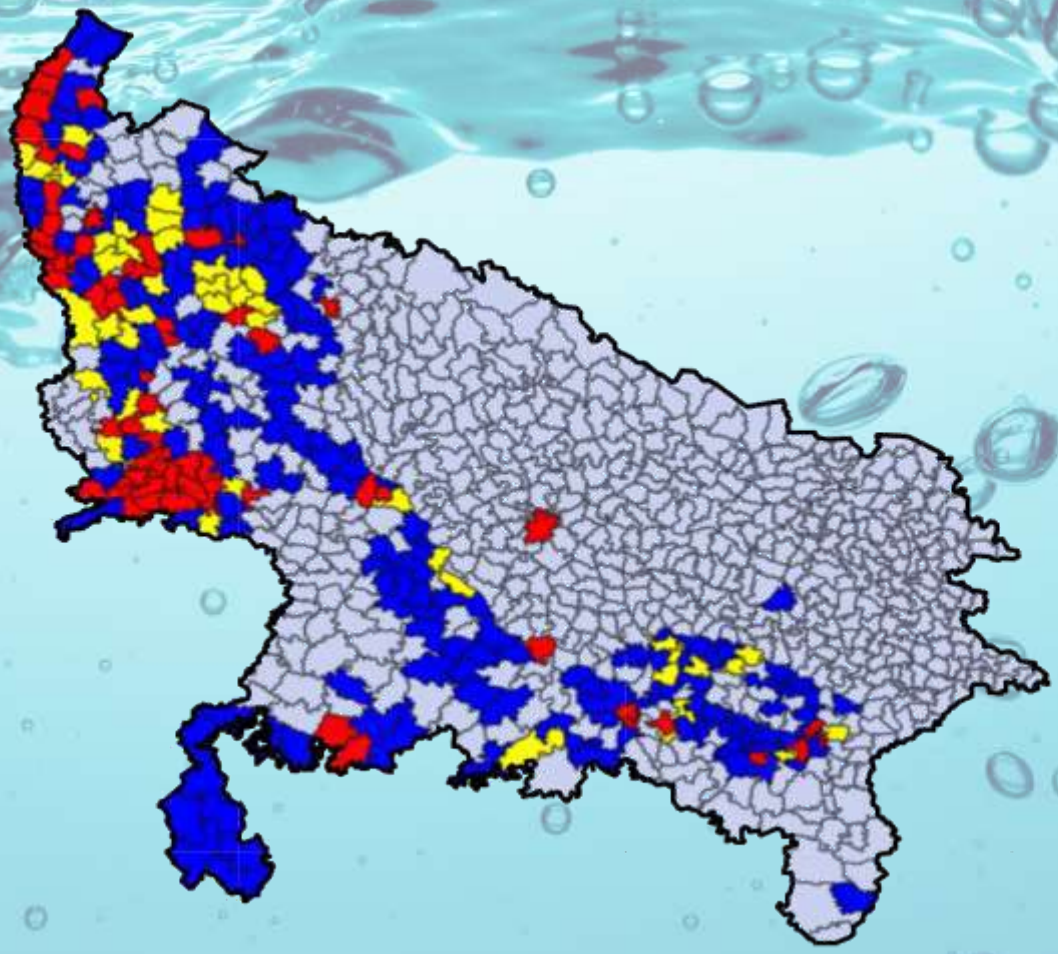
जनसहभागिता का सन्देश

- 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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उत्तर प्रदेश का गतिशील भूजल संसाधन, 2023



लखनऊ

जनवरी, 2024

उत्तर प्रदेश का गतिशील भूजल संसाधन, 2023

(मार्च, 2023 तक)

केन्द्रीय भूमि जल बोर्ड
उत्तरी क्षेत्र, लखनऊ
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
जल शक्ति मंत्रालय
भारत सरकार

भूगर्भ जल विभाग
उत्तर प्रदेश सरकार

लखनऊ
जनवरी, 2024



अनुराग श्रीवास्तव
आई. ए. एस.
प्रमुख सचिव

नमामि गंगे तथा ग्रामीण जलापूर्ति विभाग
उत्तर प्रदेश शासन ।
कक्ष सं. - 6/7, सचिव भवन, लखनऊ - 226001
कार्यालय: 0522-2238102
Email: psmigoup2016@gmail.com

संदेश

जल की उपलब्धता, विशेषकर भूजल विकास, मानवीय गतिविधियों के लिए महत्वपूर्ण रहा है। उत्तर प्रदेश राज्य जो भूजल के एक विशाल जलाशय अर्थात इंडो-गंगेटिक बेसिन में स्थित है, लेकिन कृषि, उद्योगों और घरेलू जीवन में अत्यधिक उपयोग के कारण भू-जल स्तर और इसकी गुणवत्ता में गिरावट हुई है। अतीत में, जल संरक्षण, कुशल उपयोग, जल के पुन: उपयोग और पुनर्चक्रण व भूजल पुनर्भरण के लिए पर्याप्त प्रयास नहीं किए गए। अतः इस दुर्लभ संसाधन के प्रबंधन के लिए समर्पित योजनायें अति आवश्यक है ।

राज्य के भविष्य के विकास की योजनाएं तैयार करने के लिए अदृश्य भूजल स्रोत की उपलब्धता का उचित आकलन महत्वपूर्ण है। भूजल का आकलन एक जटिल कार्य है, जिसमें उथले जलभृतों में वार्षिक रिचार्ज, प्राकृतिक संसाधन के प्रवाह और बहिर्वाह से जुड़े विभिन्न मापदंडों की गणना और अनुमान शामिल है। वर्तमान में भूजल संसाधन आकलन समिति 2015 द्वारा अनुशंसित पद्धति का पालन किया जा रहा है। केन्द्रीय भूमि जल बोर्ड, जल संसाधन, नदी विकास एवं गंगा संरक्षण विभाग, जल शक्ति मंत्रालय एवं भूगर्भ जल विभाग, उत्तर प्रदेश के सहयोग द्वारा उत्तर प्रदेश का भूजल आंकलन विकासखण्ड स्तर पर मार्च 2023 तक उपलब्ध आंकड़ो के आधार पर किया गया हैं।

मुझे उम्मीद है कि यह प्रतिवेदन "उत्तर प्रदेश के गतिशील भूजल संसाधन, 2023" उपयोगकर्ताओं, योजनाकारों और अन्य हितधारकों को भूजल संसाधनों के नवीनतम आंकलन के अनुसार अपनी योजनाओं को तैयार करने और अंतिम रूप देने में मदद करेगी।

Digitally Signed by अनुराग श्रीवास्तव
Date: 08-01-2024 12:41:00

(अनुराग श्रीवास्तव)
आई.ए.एस.

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टी. एस. अनीता श्याम
सदस्य (दक्षिण)
T. S. Anitha Shyam
Member (South)

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
केंद्रीय भूमि जल बोर्ड
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development and Ganga Rejuvenation
Central Ground Water Board

आज़ादी का अमृत महोत्सव

संदेश

भूजल एक बहुत ही महत्वपूर्ण प्राकृतिक संसाधन है और अर्थव्यवस्था में इसकी महत्वपूर्ण भूमिका है। यह कृषि, औद्योगिक और घरेलू उपयोगकर्ताओं के लिए पानी का मुख्य स्रोत है। जैसा कि हम जानते हैं कि 85% से अधिक सिंचाई प्रत्यक्ष या अप्रत्यक्ष रूप से भूजल पर निर्भर करती है। इस प्रकार यह अर्थव्यवस्था के विकास के साथ-साथ खाद्य सुरक्षा में बहुत महत्वपूर्ण भूमिका निभाता है। भूजल का उपयोग करने के बारे में विचार करने के लिए सबसे महत्वपूर्ण बिंदु इस महत्वपूर्ण संसाधन के अत्यधिक दोहन और प्रदूषण से बचने के लिए निकासी और पुनर्भरण के बीच सही संतुलन ढूँढना है। जल नीति निर्माताओं, उपयोगकर्ताओं, शोधकर्ताओं और नागरिकों को इस अदृश्य जल संसाधन के स्थायी प्रबंधन पर ध्यान देना चाहिए और इसके प्रदूषित या समाप्त होने से पहले इसके विवेकपूर्ण, कुशल और न्यायसंगत उपयोग को सुनिश्चित करना चाहिए।

केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ एवं भूगर्भ जल विभाग, उत्तर प्रदेश सरकार द्वारा भूजल की कमी वाले क्षेत्रों की पहचान करने के उद्देश्य से उत्तर प्रदेश के गतिशील भूजल संसाधनों का आकलन किया गया है। भूजल की कमी वाले क्षेत्रों की पहचान के बाद, भू-जल प्रबंधन गतिविधियों की योजना क्षेत्र स्तर पर बनाई जा सकती है।

मुझे उम्मीद है कि यह रिपोर्ट इस सीमित और महत्वपूर्ण संसाधन के सतत उपयोग और प्रबंधन में भूजल के सभी हितधारकों के लिए फायदेमंद होगी।

टी एस अनीता

(टी एस अनीता श्याम)
सदस्य (दक्षिण)
केन्द्रीय भूमि जल बोर्ड



डॉ० बलकार सिंह
आई. ए. एस.
निदेशक

भूगर्भ जल विभाग, उत्तर प्रदेश
भूजल भवन (रा०भू०सू०प्र०के०),
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वेबसाइट: www.upgwd.gov.in

प्रस्तावना

भूजल एक बहुमूल्य प्राकृतिक संसाधन है, जिसने भारत की अर्थव्यवस्था, पर्यावरण और जीवन स्तर के विकास में महत्वपूर्ण भूमिका निभाई है। घरेलू और औद्योगिक उपयोग के लिए जल आपूर्ति का प्राथमिक स्रोत होने के अलावा, यह उत्तर प्रदेश में सिंचाई के पानी का सबसे बड़ा और सबसे अधिक उत्पादक स्रोत है। स्थायी भूजल प्रबंधन और विनियमों के लिए, भूजल संसाधनों का समय-समय पर मूल्यांकन आवश्यक है। वर्तमान में उत्तर प्रदेश के भूजल संसाधन का मूल्यांकन एक ऑनलाइन पोर्टल INGRES (इंडिया ग्राउंडवाटर रिसोर्स एस्टीमेशन सिस्टम) के माध्यम से किया जाता है, जो भूजल आकलन पद्धति 2015 के अनुसार होता है, जो शुद्ध वार्षिक भूजल पुनर्भरण और विभिन्न उपयोगों के लिए निष्कर्षण में योगदान देने वाले सभी प्रासंगिक मापदंडों का ध्यान रखता है। इस प्रकार उत्पन्न डेटाबेस भूजल प्रबंधन और योजना में महत्वपूर्ण भूमिका निभाता है। मार्च, 2023 तक उत्तर प्रदेश के गतिशील भूजल संसाधन की रिपोर्ट केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ और भूगर्भ जल विभाग, उत्तर प्रदेश द्वारा संयुक्त रूप से स्थायी राज्य स्तर समिति (एसएलसी) की देखरेख में 836 मूल्यांकन इकाइयों (826 विकासखण्ड और 10 शहरी क्षेत्रों) और केंद्रीय स्तर के विशेषज्ञ समूह (सीएलईजी) के समग्र मार्गदर्शन में तैयार की गई है।

मैं, श्री अनुराग श्रीवास्तव, आईएएस, प्रमुख सचिव, नमामि गंगे तथा ग्रामीण जलापूर्ति विभाग, उ.प्र. शासन और भूजल संसाधन आकलन की राज्य स्तरीय समिति के अध्यक्ष और समिति के सदस्यों को उत्तर प्रदेश के "गतिशील भूजल संसाधन मार्च 2023" रिपोर्ट के अनुमोदन के लिए धन्यवाद व्यक्त करता हूँ। मैं, श्री स्वतंत्र देव सिंह, माननीय मंत्री, जल शक्ति मंत्रालय, उत्तर प्रदेश को उनके निरंतर समर्थन के लिए आभार व्यक्त करना चाहता हूं। मैं राज्य स्तर पर कार्य के समन्वय के लिए श्री रविकांत सिंह, सीनियर हाइड्रोजियोलाजिस्ट, भूगर्भ जल विभाग के प्रयासों की सराहना भी करता हूँ। मैं, श्री संजय गोपाल भरतरिया, क्षेत्रीय निदेशक, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ और श्री एबादुर रहमान, वैज्ञानिक-सी, केन्द्रीय भूमि जल बोर्ड, लखनऊ, जिन्होंने राज्य भूगर्भ जल विभाग के अधिकारियों को आंकड़ों के प्रयोग और मिलान में मार्गदर्शन करने के लिए ईमानदार और समर्पित प्रयास किए तथा मूल्यांकन के संकलन के लिए भी आभार व्यक्त करता हूँ। मैं भूगर्भ जल विभाग, उत्तर प्रदेश और केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र के सभी अधिकारियों को धन्यवाद देता हूँ, जो इस व्यापक अभ्यास से जुड़े थे।

03-01-24

(डॉ० बलकार सिंह)
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निदेशक

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क्षेत्रीय निदेशक



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प्रस्तावना

भूजल सिंचाई, पीने के पानी और औद्योगिक आवश्यकताओं को पूरा करने के लिए एक बहुमूल्य संसाधन है। लगातार जनसंख्या एवं उद्योगो की वृद्धि तथा असिंचित भूमि को सिंचाई के तहत लाकर खाद्यान्न उत्पादन बढ़ाने के लिए सरकार के प्रयासों के तहत जलभृतों पर दबाव पैदा किया है। इससे भूजल स्तर एवं गुणवत्ता में गिरावट, कुओं के सूखने और विभिन्न उपयोगों के लिए आपूर्ति कम होने लगी है। इसकी दीर्घकालिक स्थिरता सुनिश्चित करने के लिए इसे विवेकपूर्ण तरीके से प्रबंधित करने की आवश्यकता है। इसके प्रबंधन के लिए भूजल संसाधनों की उपलब्धता और उपयोग की स्थिति की उचित समझ आवश्यक है। इस संदर्भ में भूजल संसाधनों का समय-समय पर मूल्यांकन आवश्यक है।

उत्तर प्रदेश का गतिशील भूजल संसाधन -2023 रिपोर्ट में विकासखण्ड और नगरीय मूल्यांकन इकाइयों के गतिशील भूजल आकलन के संकलन हेतु केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ, भूगर्भ जल विभाग, उत्तर प्रदेश सरकार द्वारा राज्य एवं केंद्रीय स्तरीय समिति के समग्र मार्गदर्शन में संयुक्त रूप से किया गया है। गतिशील भूजल संसाधनों के आकलन हेतु भूजल पुनर्भरण और निष्कर्षण में योगदान देने वाले सभी प्रासंगिक मापदंडों को भूजल आकलन पद्धति, 2015 (जीईसी-2015) के अनुसार किया गया है। यह आकलन "इंडिया ग्राउंड वाटर रिसोर्स एस्टीमेशन सिस्टम (IN-GRES)" के माध्यम से GIS प्लेटफॉर्म में किया गया है। इस प्रकार तैयार किए गए डेटाबेस, भूजल से जुड़ी योजनाओं और वैज्ञानिक प्रबंधन में महत्वपूर्ण भूमिका प्रदान करेगी।

मैं, उत्तर प्रदेश राज्य के गतिशील भूजल संसाधन-2023 के अनुमोदन के लिए श्री अनुराग श्रीवास्तव, आई.ए.एस. प्रमुख सचिव, नमामि गंगे और ग्रामीण जलापूर्ति विभाग एवं राज्य स्तरीय समिति के सारे सदस्यों के प्रति अपनी कृतज्ञता व्यक्त करता हूं। मैं, श्री वीके उपाध्याय, निदेशक (सेवानिवृत्त), भूगर्भ जल विभाग, उत्तर प्रदेश सरकार एवं डा. बलकार सिंह, आई.ए.एस. एवं निदेशक भूगर्भ जल विभाग, उत्तर प्रदेश सरकार को मूल्यांकन पूरा करने की दिशा में उनके समर्पित प्रयासों के लिए भी धन्यवाद देता हूं। मैं केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ के वैज्ञानिक श्री एबादुर रहमान, वैज्ञानिक-सी, श्री करम सिंह, वैज्ञानिक-सी, डॉ.फखरे आलम, वैज्ञानिक-बी एवं सुश्री अदिति सिंह, सहायक भूजल वैज्ञानी व भूगर्भ जल विभाग की पूरी टीम के अथक प्रयासों की सराहना करता हूं।

संजय

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क्षेत्रीय निदेशक

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(केन्द्रीय भूमि जल बोर्ड)

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उत्तर प्रदेश का गतिशील भूजल संसाधन, 2023

(मार्च, 2023 तक)

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उत्तर प्रदेश का गतिशील भूजल संसाधन

(मार्च, 2023 तक)

एक नजर में

उत्तर प्रदेश (2023)		(बीसीएम में)
भूजल पुनर्भरण	वर्षा से पुनर्भरण	36.50
	अन्य स्रोतों से पुनर्भरण	35.33
	कुल वार्षिक भूजल पुनर्भरण	71.83
कुल नैचुरल डिस्चार्ज		6.26
वार्षिक निकालने योग्य भूजल संसाधन		65.57
वर्तमान वार्षिक भूजल निकासी	सिंचाई	40.92
	घरेलू	5.04
	उद्योग	0.44
	कुल	46.40
2025 तक घरेलू उपयोग के लिए वार्षिक भूजल आवंटन		5.42
भविष्य में उपयोग हेतु शुद्ध भूजल उपलब्धता		20.04
औसत भूजल दोहन स्तर (%)		70.76%

वर्गीकरण (2023)	उत्तर प्रदेश
कुल मूल्यांकन इकाइयों की संख्या	836
सुरक्षित	559
अर्ध- गंभीर	172
गंभीर	43
अति-दोहित	62

कार्यकारी सारांश

उत्तर प्रदेश राज्य ऊपरी और मध्य गंगा के मैदान में स्थित है इसके उत्तर दिशा में हिमालय, दक्षिण दिशा में बुंदेलखंड के पठारी क्षेत्र यमुना नदी की पश्चिमी सीमा तक सीमित है। उत्तर प्रदेश राज्य उत्तर दिशा में उत्तराखंड और नेपाल, दक्षिण दिशा में मध्य प्रदेश और राजस्थान, पूर्व दिशा में बिहार व झारखंड और पश्चिम दिशा में हरियाणा और दिल्ली से घिरा हुआ है। उत्तर प्रदेश राज्य उत्तरी अक्षांश 23°52'12" और 30°24'30" और पूर्वी देशांतर 77°05'38" और 84°38'30" के बीच 2,41,710 वर्ग किमी के क्षेत्र में स्थित है। प्रशासनिक रूप से राज्य को 18 मंडलों, 75 जिलों, 340 तहसीलों और 826 विकासखण्डों में विभाजित किया गया है। राज्य को चार आर्थिक क्षेत्रों अर्थात पश्चिमी क्षेत्र, पूर्वी क्षेत्र, मध्य क्षेत्र और बुंदेलखंड क्षेत्र में भी बांटा गया है। पश्चिमी क्षेत्र में 30 जिले और पूर्वी क्षेत्र में 28 जिले शामिल हैं। दस जिले मध्य क्षेत्र का गठन करते हैं जबकि बुंदेलखंड क्षेत्र में केवल 7 जिले हैं। राज्य की कुल जनसंख्या (जनगणना रिपोर्ट, 2011) 199.58 मिलियन है, जिसमें पुरुषों की संख्या 104.60 मिलियन और महिलाओं की संख्या 94.99 मिलियन है। शहरी आबादी 39.9 मिलियन और ग्रामीण 159.7 मिलियन है। 2001-2011 से दशकीय वृद्धि 20.8% थी। सबसे अधिक जनसंख्या घनत्व कानपुर शहर में है, जिसके बाद लखनऊ और गाजियाबाद का स्थान आता है। औसत जनसंख्या घनत्व 828 प्रति वर्ग किलोमीटर है। उत्तर प्रदेश राज्य के लोगों का मुख्य स्रोत कृषि है। लगभग 67% आबादी ग्रामीण है और ग्रामीण परिवारों की आय का 20% से अधिक हिस्सा कृषि आय के साथ अपनी आजीविका के लिए कृषि उत्पादन पर निर्भर है।

राज्य में उप-आर्द्र और ट्रोपिकल जलवायु तीन अलग-अलग मौसमों अर्थात् गर्मी, मानसून और सर्दी का अनुभव करता है। दक्षिण पश्चिमी मानसून के राज्य में आने से बरसात का मौसम जून के अंत में शुरू होता है। आर्द्रता धीरे-धीरे बढ़ती है और 80% से ऊपर पहुंच जाती है। अगस्त माह में बरसात अधिक होती है। लगभग 85% वार्षिक वर्षा मानसून अवधि (जून से सितंबर) के दौरान होती है। राज्य की सामान्य वर्षा 888 मिमी तथा वर्ष 2022 की औसत वार्षिक वर्षा 801 मिमी है।

राज्य का अधिकतम हिस्सा क्वार्टर्नरी काल में गंगा और इंडस नदियों द्वारा लाए गए फ्लुवियल सेडिमेंट्स जोकि दक्षिण में पठार क्षेत्र और उत्तर में हिमालय के बीच गहरे फोर डीप बेसिन में डेपोसीट्स हुआ है। राज्य के दक्षिणी भाग में अलग भूगर्भीय स्थितियां हैं जोकि एक पतली जलोढ़ आवरण के नीचे प्रीकैम्ब्रियन

टाइम की कठोर चट्टानें हैं। राज्य को दो हाइड्रोजियोलॉजिकल संरचनाओं में विभाजित किया गया है, जिन्हें uconsolidated सॉफ्ट रॉक और consolidated हार्ड रॉक के रूप में दिखाया गया है।

जीईसी 1997 पद्धति के द्वारा पिछले दो दशकों से देश में भूजल आकलन किया जा रहा है। भूजल आकलन समिति ने वर्ष 2015 में अपनी कार्यप्रणाली में संशोधन किया। राज्य सरकार की एजेंसियों और केन्द्रीय भूमि जल बोर्ड के अध्ययन के आधार पर समिति ने भूजल संसाधन आकलन की गणना के लिए संशोधित पद्धति का सुझाव दिया, इस संशोधित पद्धति को GEC-2015 के नाम से जाना जाता है। केन्द्रीय भूमि जल बोर्ड और भूगर्भ जल विभाग, उ.प्र. सरकार ने संयुक्त रूप से 836 मूल्यांकन इकाइयों (826 ब्लॉक और 10 शहरी क्षेत्र) में आधार वर्ष 2022-23 मानकर मार्च 2023 तक उत्तर प्रदेश के गतिशील भूजल संसाधनों का अनुमान राष्ट्रीय जल नीति 2012 और GEC-15 अनुशंसा के अनुसार अनुमानित किया है।

राज्य में वर्षा से कुल रिचार्ज 36.50 बीसीएम का है, जिसमें लखीमपुर जिले का सर्वाधिक रिचार्ज 142854 हैम और महोबा जिले का न्यूनतम रिचार्ज 9564 हैम है। राज्य में अन्य स्रोतों से कुल रिचार्ज 35.33 बीसीएम है जिसमें बाराबंकी जिले का सर्वाधिक रिचार्ज में 130928 हैम है जहाँ अधिकतम नहर सिंचाई सुविधा उपलब्ध है एवं संभल जिले में सबसे कम 8839 हैम रिचार्ज दर्ज किया गया है, जहां भूजल के साथ-साथ सिंचाई के लिए सतही जल का उपयोग बहुत कम है। जबकि राज्य में सभी स्रोतों से कुल वार्षिक रिचार्ज 71.83 बीसीएम है, जिसमें लखीमपुर खीरी जिले में सर्वाधिक 230481 हैम एवं महोबा जिले में न्यूनतम 30755 हैम रिचार्ज है।

राज्य में कुल अनअकाउंटेड प्राकृतिक डिस्चार्ज 6.26 बीसीएम है, जिसमें सीतापुर जिले में सबसे अधिक 20452 हैम और महोबा में सबसे कम 2797 हैम डिस्चार्ज है। राज्य में वार्षिक निकालने योग्य भूजल संसाधन 65.57 बीसीएम है जिसमें लखीमपुर खीरी जिले में सबसे अधिक शुद्ध भूजल उपलब्धता 210030 हैम और महोबा में सबसे कम 27957 हैम है।

राज्य में सभी उपयोगों के लिए भू-जल की कुल निकासी 46.40 बीसीएम आंकी गई है। सभी उपयोगों के लिए अधिकतम भूजल निकासी बुलंदशहर जिले में 138629 हैम और उत्तर प्रदेश के दक्षिणी भाग के महोबा जिले में सभी उपयोगों के लिए भूजल की न्यूनतम निकासी 25566 हैम है। विभिन्न उपयोगों के लिए भूजल निकासी की तुलना से पता चलता है कि सिंचाई के लिए निष्कर्षण कुल भूजल निष्कर्षण का लगभग 88.2% है, जबकि घरेलू उपयोग में 10.86% और औद्योगिक आपूर्ति हेतु 1% है।

IN-GRES (इंडिया ग्राउंडवाटर रिसोर्स एस्टीमेशन सिस्टम) के ऑनलाइन पोर्टल पर आंकड़ों को अपलोड करने और GEC 2015 पद्धति के आधार पर गणना के बाद, 559 मूल्यांकन इकाइयां सुरक्षित श्रेणी, 172 मूल्यांकन इकाइयां सेमी-क्रिटिकल श्रेणी, 43 मूल्यांकन इकाइयां क्रिटिकल श्रेणी में और प्रदेश की 62 मूल्यांकन इकाई को अतिदोहित की श्रेणी में रखा गया है। उत्तर प्रदेश में, अत्यअधिक भूजल निष्कर्षण मुख्य रूप से पश्चिमी उत्तर प्रदेश, बुंदेलखंड क्षेत्र और राज्य के दक्षिण पूर्वी भाग में केंद्रित है । राज्य का औसत भूजल निष्कर्षण चरण 70.76% है ।

5051

उत्तर प्रदेश के गतिशील भूजल संसाधन

मार्च, 2023 तक

केंद्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ – 226021, भारत

1.0 परिचय

1.1 पृष्ठभूमि

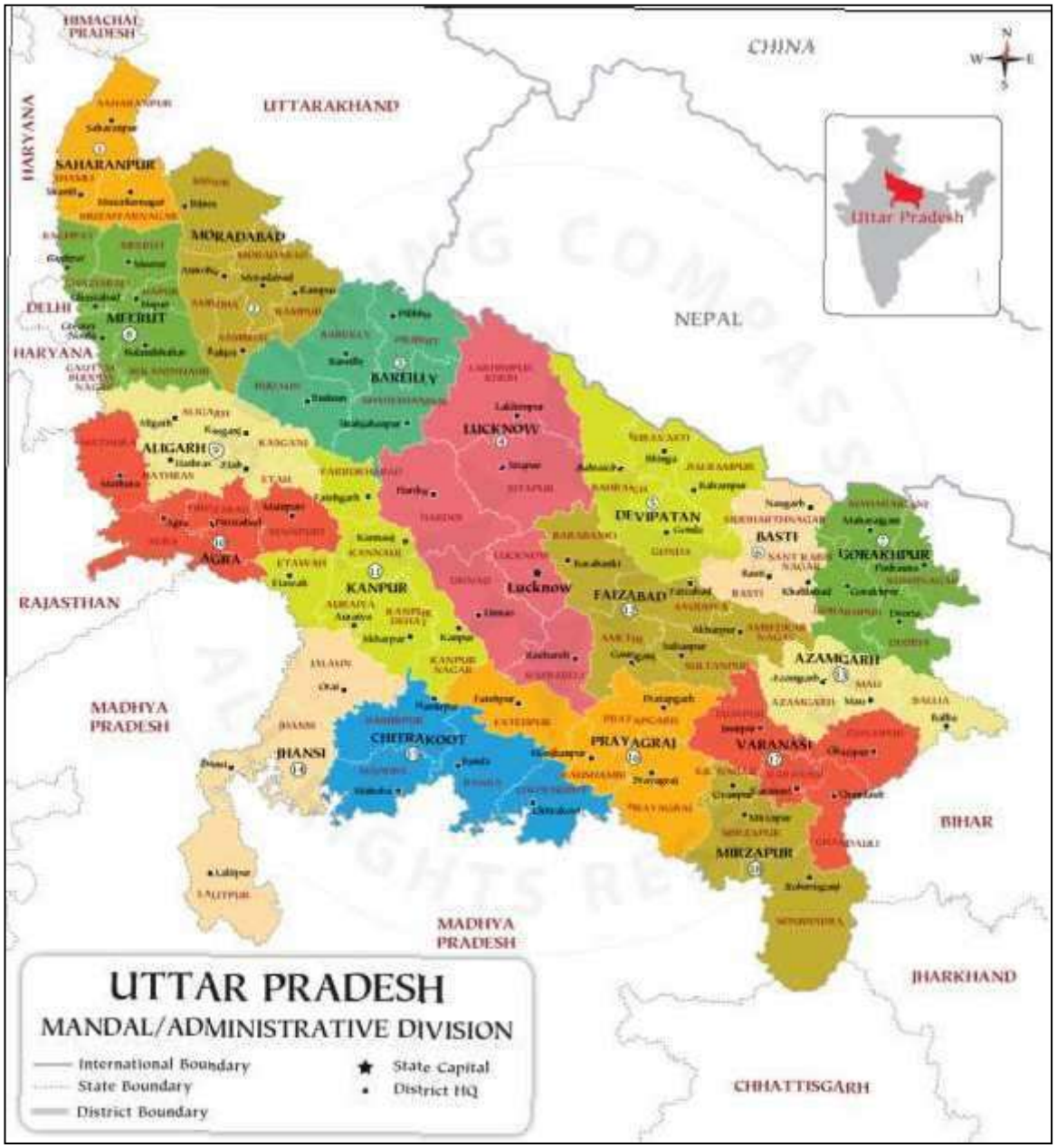
उत्तर प्रदेश राज्य ऊपरी और मध्य गंगा के मैदान में स्थित है और उत्तर दिशा में हिमालय, दक्षिण दिशा में बुंदेलखंड के पठारी क्षेत्र, यमुना नदी की पश्चिमी सीमा तक सीमित है। उत्तर प्रदेश राज्य उत्तर दिशा में उत्तराखंड और नेपाल, दक्षिण दिशा में मध्य प्रदेश और राजस्थान, पूर्व दिशा में बिहार व झारखंड और पश्चिम दिशा में हरियाणा और दिल्ली से घिरा हुआ है । उत्तर प्रदेश राज्य उत्तरी अक्षांश 23°52'12" और 30°24'30" और पूर्वी देशांतर 77°05'38" और 84°38'30" के बीच 2,41,710 वर्ग किमी के क्षेत्र में स्थित है। प्रशासनिक रूप से राज्य को 18 मण्डल, 75 जिलों, 340 तहसीलों और 826 विकासखण्डों में विभाजित किया गया है। राज्य को चार आर्थिक क्षेत्रों अर्थात पश्चिमी क्षेत्र, पूर्वी क्षेत्र, मध्य क्षेत्र और बुंदेलखंड क्षेत्र में भी बांटा गया है। पश्चिमी क्षेत्र में 30 जिले और पूर्वी क्षेत्र में 28 जिले शामिल हैं। दस जिले मध्य क्षेत्र का गठन करते हैं जबकि बुंदेलखंड क्षेत्र में केवल 7 जिले हैं।

राज्य की कुल जनसंख्या (जनगणना रिपोर्ट, 2011) 199.58 मिलियन है, जिसमें पुरुषों की संख्या 104.60 मिलियन और महिलाओं की संख्या 94.99 मिलियन है । शहरी आबादी 39.9 मिलियन और ग्रामीण 159.7 मिलियन है। 2001-2011 से दशकीय वृद्धि 20.8% थी । सबसे अधिक जनसंख्या घनत्व वाला शहर कानपुर है जिसके बाद लखनऊ और गाजियाबाद का स्थान आता है, और न्यूनतम घनत्व ललितपुर जिले में है। राज्य का औसत जनसंख्या घनत्व 828 व्यक्ति प्रति वर्ग किलोमीटर है।

उत्तर प्रदेश राज्य के लोगों का मुख्य स्रोत कृषि है। लगभग 67% आबादी ग्रामीण है और ग्रामीण परिवारों की आय का 20% से अधिक हिस्सा अपनी आजीविका के लिए कृषि उत्पादन पर निर्भर है। बढ़ती आबादी की वजह से जीवन यापन हेतु पानी की आवश्यकता स्वाभाविक रूप से कई गुना बढ़ गई है। सिंचाई प्रयोजनों के लिए पानी आवश्यक है, किन्तु इसके अंधाधुंध उपयोग से न केवल पानी की कमी हो सकती है, बल्कि फसल की पैदावार और मिट्टी की गिरावट भी हो सकती है। विशेष रूप से कृषि आधारित समाज क्षेत्र

में भूजल संसाधन क्षेत्र के संतुलित आर्थिक विकास के लिए बिल्डिंग ब्लॉक्स में से एक है। राज्य में सिंचाई के लिए भूजल पर निर्भरता और शहरी क्षेत्रों में पानी की बढ़ती जरूरतों को बनाए रखने के लिए भूजल संसाधनों के विवेकपूर्ण और नियोजित उपयोग की आवश्यकता है। उत्तर प्रदेश में खाद्यान्न, उत्पादन देश की आत्मनिर्भरता के अनुरूप है, इस पर्याप्तता के लिए प्रमुख योगदान सिंचाई उनमे से एक है। इस उच्च सिंचाई आवश्यकता को पूरा करने के लिए, जल संसाधनों का तेजी से विकास किया जा रहा है। भूजल राज्य की सिंचाई जरूरतों का लगभग 77% योगदान देता है। भूजल के अंधाधुंध दोहन के परिणामस्वरूप एक तरफ जहां भूजल भंडारण में कमी आई है और कुछ क्षेत्रों में जल स्तर नीचे चला गया है। दूसरी उथले जल तालिका वाले क्षेत्रों में जल जमाव और मृदा लवणता की गंभीर समस्याएँ हैं, जिसने योजनाकारों को सतही और जमीनी दोनों जल संसाधनों के संयुक्त उपयोग के लिए मजबूर किया है।

भूजल संसाधनों की बेहतर योजना और प्रबंधन के लिए केन्द्रीय भूमि जल बोर्ड (के.भू.ज.बो.) और भूगर्भ जल विभाग, उत्तर प्रदेश सरकार ने संयुक्त रूप से भारत सरकार द्वारा गठित भूजल आंकलन समिति द्वारा अनुशंसित जीईसी-2015 पद्धति और राज्य स्तरीय समिति की मार्गदर्शन मे उत्तर प्रदेश के 836 मूल्यांकन इकाइयों (826 ब्लॉक और 10 शहरी क्षेत्र) के गतिशील भूजल संसाधनों को अनुमानित किया है। वर्तमान रिपोर्ट वर्ष 2022-23 (मार्च-2023 तक) के लिए उत्तर प्रदेश राज्य के गतिशील भूजल संसाधनों की मात्रा को निर्धारित करती है।



चित्र 1: उत्तर प्रदेश का प्रशासनिक मण्डल

1.2 भूजल संसाधन आकलन के लिए राज्य स्तरीय तकनीकी समिति का गठन

देश का भूजल संसाधन आंकलन पहली बार वर्ष 1979 में किया गया था। भारत सरकार के कृषि पुनर्वित्त और विकास निगम (ARDC) द्वारा भूजल दोहन समिति के रूप में जानी जाने वाली एक समिति का गठन किया गया था। उपरोक्त समिति द्वारा अनुशंसित पद्धति और मानदंडों के आधार पर भूजल संसाधनों का आकलन किया गया था। इसके बाद, कार्यप्रणाली को परिष्कृत करने की आवश्यकता महसूस की गई और केन्द्रीय भूमि जल बोर्ड के अध्यक्ष की अध्यक्षता में **"भूजल आकलन समिति (जीईसी)"** अस्तित्व में आई। विभिन्न क्षेत्रों और केन्द्रीय भूमि जल बोर्ड की परियोजनाओं के तहत किए गए विस्तृत सर्वेक्षण और

अध्ययन के आधार पर, समिति ने भूजल संसाधनों के आकलन के लिए 1982 (जीईसी-84) में संशोधित पद्धति की सिफारिश की। वर्ष 1996 में भारत सरकार ने फिर से **"भूजल आकलन समिति" (GEC)** का गठन किया, जिसमें हाइड्रोजियोलॉजिकल अध्ययन और भूजल विकास में लगे विभिन्न संगठनों के सदस्यों को शामिल किया गया। इस समिति ने केंद्रीय और राज्य एजेंसियों, अनुसंधान संगठनों, विश्वविद्यालयों आदि द्वारा एकत्र किए गए आंकड़ों की समीक्षा करने के बाद वर्ष 1997 में भूजल संसाधन आकलन के तरीकों की अनुशंसा की। पिछले दो दशक से जीईसी-1997 के रूप में लोकप्रिय रूप से देश में भूजल मूल्यांकन का आधार रहा है। गतिशील भूजल संसाधन-2013 तक आकलन के लिए यह पद्धति प्रचलन में थी।

उत्तर प्रदेश की सभी 803 आकलन इकाइयों के गतिशील भूजल संसाधनों का आकलन 2004 में केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ और उत्तर प्रदेश भूगर्भ जल विभाग द्वारा जीईसी-97 पद्धति के आधार पर किया गया था। वर्ष 2008/09, 2010/11 और 2012/13 के 820 ब्लॉकों पर राज्य स्तरीय तकनीकी समिति द्वारा अनुमोदन और अनुसंधान एवं विकास सलाहकार समिति, नई दिल्ली पर स्थायी समिति की सिफारिशों के बाद मार्च 2004, 2009, 2011 और 2013 तक अंतिम रिपोर्ट जारी की गई। जीईसी 1997 द्वारा अनुशंसित पद्धति की समीक्षा के बाद भूजल आकलन समिति ने पुनः वर्ष 2015 में अपनी कार्यप्रणाली में संशोधन किया। समिति ने भूजल संसाधन आकलन की गणना के लिए संशोधित पद्धति का सुझाव दिया, जिसे राज्य सरकार की एजेंसियों और केन्द्रीय भूमि जल बोर्ड के अध्ययन के आधार पर परिष्कृत किया गया था। इस संशोधित पद्धति को जीईसी-2015 के नाम से जाना जाता है।

पूरे देश में भूजल संसाधनों (31 मार्च 2023 तक) के पुनर्मूल्यांकन के समग्र पर्यवेक्षण के लिए एक केन्द्रीय स्तर पर विशेषज्ञ समूह (सीएलईजी) का गठन किया गया है। साथ ही उत्तर प्रदेश का गतिशील भूजल संसाधन आकलन-2023 के लिए प्रमुख सचिव, नमामि गंगे एवं ग्रामीण जल आपूर्ति, उ0प्र0 सरकार की अध्यक्षता में एक राज्य स्तरीय समिति का गठन उत्तर प्रदेश शासन द्वारा किया गया है। उत्तर प्रदेश शासन के पत्र संख्या 103/76-3-2023-04 आर /2009 दिनांक- 05 .06 .2023 के तहत समग्र मूल्यांकन और प्रगति की निगरानी के लिए जारी (अनुलग्नक-1) किया गया।

1.3 भूजल संसाधन आकलन समिति की कार्यवाही

भूगर्भ जल संसाधन आकलन की राज्य स्तरीय समिति की प्रथम बैठक दिनांक 06.04.2022 केन्द्रीयए भूमि जल बोर्ड और भूजल विभाग, उत्तर प्रदेश के साथ आयोजित की गई और कार्य योजना पर चर्चा की गयी।

31.03.2023 तक के भूजल संसाधनों के अनुमान की स्थिति पर चर्चा करने के लिए दिनांक 08.08.2023 को केन्द्रीय भूमि जल बोर्ड और उत्तर प्रदेश भूगर्भ जल विभाग के बीच बैठक आयोजित की गईं। उत्तर प्रदेश भूगर्भ जल विभाग के सम्मेलन कक्ष में निदेशक, उत्तर प्रदेश भूगर्भ जल विभाग और क्षेत्रीय निदेशक, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ की उपस्तिथी में भूजल संसाधन अनुमान-2023 के अभ्यास को पूरा करने में आने वाली चुनौतियों के बारे में चर्चा हुई।

राज्य स्तरीय समिति की दूसरी बैठक दिनांक 13 .09 .2023 को ऑनलाइन माध्यम से प्रमुख सचिव, नमामि गंगे तथा ग्रामीण जलापूर्ति अनुभाग, उत्तर प्रदेश सरकार की अध्यक्षता से बुलाई गई, जिसमें राज्य स्तरीय समिति के अन्य सदस्यों, भूगर्भ जल विभाग एवं केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र के अधिकारी ने भाग लिया। गतिशील भूजल संसाधन-2023 समय सीमा के अनुपालन, GEC-2015 कार्य पद्धति (Methodology), INGRES के अनुमोदन hierarchy (India-Groundwater Resource Estimation System), GWRA-2023 के इनपुट पैरामीटर्स, भूजल संसाधन आंकलन-**2023** के आंकड़ों, पिछले वर्ष के आंकलन से तुलना एवं भूजल गुणवत्ता आंकड़ों समिति के समछ प्रेज़न्टैशन के माध्यम से प्रस्तुत किया गया।

विस्तृत चर्चा और विचार-विमर्श के बाद "मार्च 2023 तक उत्तर प्रदेश के गतिशील भूजल संसाधन" को राज्य स्तरीय समिति द्वारा 13.09.2023 को अनुमोदित किया गया और केन्द्रीय स्तर के विशेषज्ञ समूह (सीएलईजी) नई दिल्ली को अग्रेषित किया गया।

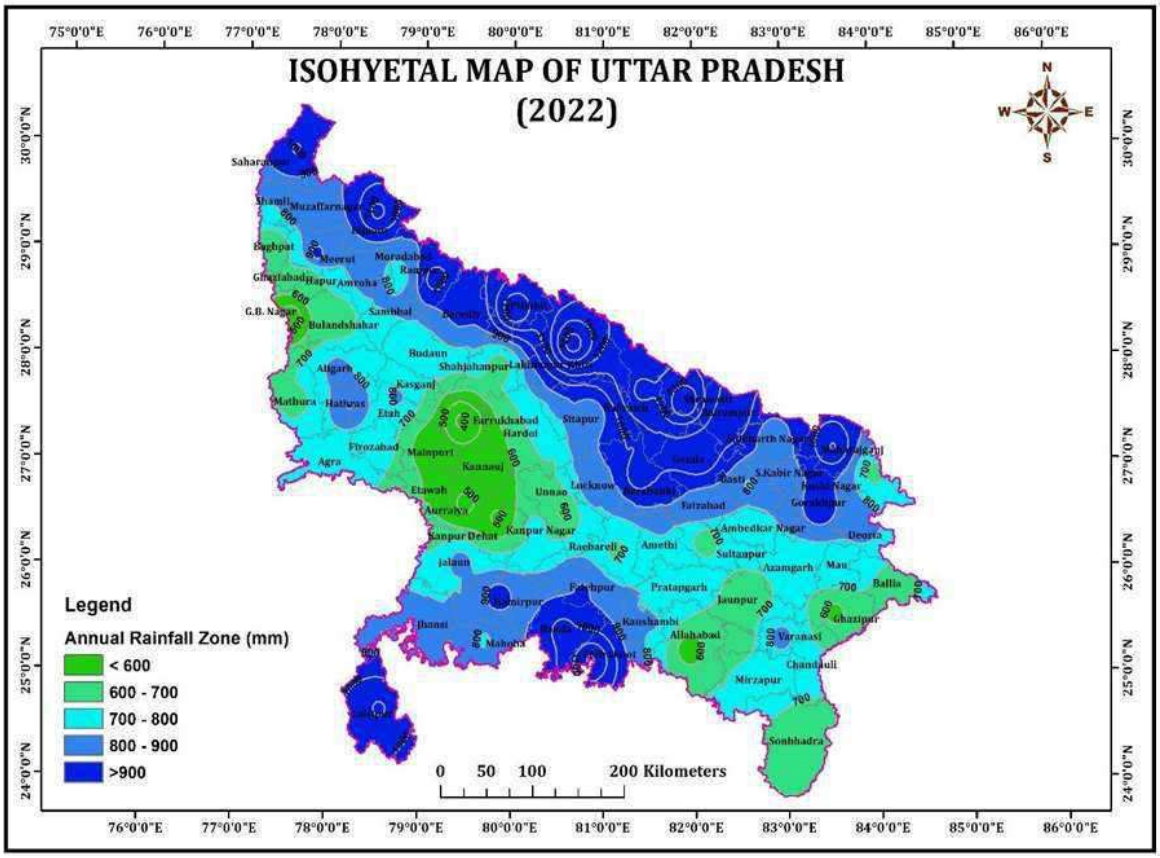
2.0 हाइड्रोजियोलॉजी

2.1 जल मौसम विज्ञान

उत्तर प्रदेश राज्य तीन अलग-अलग मौसमों गर्मी, मानसून और सर्दी के साथ उप-आर्द्र और उष्णकटिबंधीय जलवायु का अनुभव करता है। ग्रीष्म ऋतु काफी गर्म और शुष्क होती हैं, दैनिक तापमान 38 डिग्री सेल्सियस से 43 के बीच होता है। सबसे कम तापमान जनवरी के दौरान देखा जाता है, जब रात का तापमान राज्य में 2 डिग्री सेल्सियस और 6 डिग्री सेल्सियस के बीच होता है। गर्मियों की शुरुआत के साथ, तापमान मई के दौरान अधिकतम होता है जब पारा राज्य के मध्य और पूर्वी भागों में 45 डिग्री सेल्सियस तक पहुंच जाता है। धीरे-धीरे बरसात के मौसम की शुरुआत के साथ तापमान गिर जाता है जो सर्दियों (अक्टूबर, नवंबर) से पहले की अवधि के दौरान फिर से मामूली वृद्धि की प्रवृत्ति दिखाता है। गर्मी के मौसम में हवा की गति 8-10 किमी/घंटा और सर्दियों और बरसात के मौसम में 4-6 किमी/घंटा के बीच होती है.

जून के अंत में दक्षिण पश्चिमी मानसून के राज्य में आने से बरसात का मौसम शुरू होता है। आर्द्रता धीरे-धीरे बढ़ती है और 80% से ऊपर पहुंच जाती है। अगस्त में वर्षा अपने चरम पर होती है। लगभग 85% वार्षिक वर्षा मानसून अवधि (जून से सितंबर) के दौरान होती है। सितंबर के अंत या अक्टूबर की शुरुआत में मानसून राज्य से पीछे हटना शुरू कर देता है। फिर एक और संक्रमणकालीन अवधि शुरू होती है, जिसके बाद नवंबर के अंत से फरवरी तक सर्दी होती है, जनवरी की अवधि का सबसे ठंडा महीना होता है। एक और संक्रमणकालीन अवधि सर्दियों और गर्मियों के बीच होती है। मानसून वर्षा भूजल के प्राकृतिक पुनर्भरण का एकमात्र स्रोत है और वर्षा पैटर्न का जलभृत में भूजल स्तर पर महत्वपूर्ण प्रभाव पड़ता है। 1971-2022 की अवधि के लिए आईएमडी स्टेशनों के वर्षा के आंकड़ों का विश्लेषण किया गया है। वर्ष 2022 -23 के वार्षिक वर्षा के आँकड़ों को नीचे प्रस्तुत किया गया है। महाराजगंज और औरैया जिले में क्रमशः अधिकतम **1**368 से लेकर न्यूनतम 369 मिमी तक राज्य में वर्षा परिवर्तनशील है। राज्य की सामान्य वर्षा 888 मिमी तथा वर्ष 2022-23 की औसत वार्षिक वर्षा 801 मिमी है। मानसून की वार्षिक और सामान्य वर्षा के आंकड़े नीचे दिए गए हैं। सामान्य मानसून वर्षा के ±19% के भीतर मानसून वर्षा को सामान्य माना जाता है। सामान्य मानसून

वर्षा के 19% से अधिक मानसून वर्षा को अधिक माना जाता है और मानसून वर्षा -19% से कम और सामान्य मानसून वर्षा के -59% से अधिक को कमी माना जाता है और यदि मानसून वर्षा सामान्य मानसून वर्षा के 59% से कम है, इसे अल्प माना जाता है।



चित्र 2: वर्ष 2022 के लिए उत्तर प्रदेश का आइसोहाइटल (Isohytal) मानचित्र

तालिका 1: वर्ष 2022-23 का वास्तविक वर्षा डेटा

जिला	मानसून वर्षा (मिमी)		नॉन-मानसून वर्षा (मिमी)		कुल वर्षा (मिमी)		विचलन (%)
	सामान्य	वास्तविक (2022-23)	सामान्य	वास्तविक (2022-23)	सामान्य	वास्तविक (2022-23)	
आगरा	545	596.92	69.7	189.02	614.7	785.94	27.86%
अलीगढ़	581.2	548.7	86.3	288	667.5	836.7	25.35%
अंबेडकरनगर	870.6	586.39	105	162.55	975.6	748.94	-23.23%
औरैया	556.2	367.74	68.7	110.62	624.9	478.36	-23.45%
अयोध्या	849.4	569.11	103.3	279.77	952.7	848.88	-10.90%

जिला	मानसून वर्षा (मिमी)		नॉन-मानसून वर्षा (मिमी)		कुल वर्षा (मिमी)		विचलन (%)
	सामान्य	वास्तविक (2022-23)	सामान्य	वास्तविक (2022-23)	सामान्य	वास्तविक (2022-23)	
आजमगढ़	808.7	564.97	91.5	157.94	900.3	722.91	-19.70%
बागपत	575.5	394.7	99.3	168.98	674.8	563.68	-16.47%
बहराइच	1012.4	712.49	146.4	453.17	1158.9	1165.66	0.58%
बलिया	801.9	535.57	120.1	86.49	922	622.06	-32.53%
बलरामपुर	939.8	752.68	125.6	255.33	1065.4	1008.01	-5.39%
बाँदा	733.5	793.56	79.5	195.72	813	989.28	21.68%
बाराबांकी	867.5	653.86	110.9	390.76	978.4	1044.62	6.77%
बरेली	774.4	482.28	103.5	462.57	877.9	944.85	7.63%
बस्ती	989.5	576.35	121.3	181.75	1110.8	758.1	-31.75%
बिजनौर	909.9	715.58	143.6	341.78	1053.5	1057.36	0.37%
शाहजहांपुर	688.6	407.41	95.9	281.35	784.5	688.76	-12.20%
बुलंदशहर	591.2	364.07	81.9	277.04	673.1	641.11	-4.75%
चंदौली	846	617.9	103.1	126.87	949.1	744.77	-21.53%
चित्रकूट	774.5	965.2	86.4	237.83	860.9	1203.03	39.74%
देवरिया	889.1	686.67	130.2	134.94	1019.4	821.61	-19.40%
एटा	582.5	559.1	75.8	240.77	658.2	799.87	21.52%
इटावा	522.8	462.48	64.7	145.8	587.5	608.28	3.54%
फर्रुखाबाद	668	240.03	85.5	128.65	753.5	368.68	-51.07%
फतेहपुर	669.3	671.95	77.6	188.25	746.9	860.2	15.17%
फिरोजाबाद	582.8	545.83	74.1	215.13	656.9	760.96	15.84%
गौतम बुद्ध नगर	470.8	241.25	66.4	175.4	537.2	416.65	-22.44%
गाज़ियाबाद	633.9	352.24	95.9	205.79	729.8	558.03	-23.54%
गाजीपुर	762.3	515.09	91.5	77.74	853.8	592.83	-30.57%
गोंडा	928.8	721.7	118.3	313.5	1047.1	1035.2	-1.14%
गोरखपुर	962.6	769.56	129.1	187.45	1091.8	957.01	-12.35%
हमीरपुर	660.6	713.85	75.3	182.73	735.9	896.58	21.83%
हरदोई	719.1	469.64	97.2	210.73	816.4	680.37	-16.66%
जालौन	613.4	604.99	73.8	207.95	687.2	812.94	18.30%
जौनपुर	809.1	537.55	92.6	149	901.7	686.55	-23.86%
झांसी	692.7	701.55	72.2	93.3	765	794.85	3.90%

जिला	मानसून वर्षा (मिमी)		नॉन-मानसून वर्षा (मिमी)		कुल वर्षा (मिमी)		विचलन (%)
	सामान्य	वास्तविक (2022-23)	सामान्य	वास्तविक (2022-23)	सामान्य	वास्तविक (2022-23)	
ज्योतिबा फुले नगर	781.3	471.82	112.1	319.63	893.4	791.45	-11.41%
कन्नौज	628.8	419.19	85.8	558.13	714.6	977.32	36.76%
कानपुर देहात	593.7	339.67	76.6	160.8	670.4	500.47	-25.35%
कानपुर नगर	624.9	518.67	84.7	212.65	709.6	731.32	3.06%
कासगंज	639.6	460.7	85.2	216.48	724.8	677.18	-6.57%
कौशाम्बी	754.9	644.5	91.6	155.19	846.5	799.69	-5.53%
खीरी	984.2	945.98	145.8	422.06	1130	1368.04	21.07%
कुशीनगर	965.3	472.8	147.8	117.37	1113.1	590.17	-46.98%
ललितपुर	843.3	923.74	66.6	113.01	909.9	1036.75	13.94%
लखनऊ	776	607.86	103.8	270.62	879.8	878.48	-0.15%
महामाया नगर	546.2	630.5	72.8	263.99	619	894.49	44.51%
महाराजगंज	1141.1	744.03	170.5	263.28	1311.6	1007.31	-23.20%
महोबा	733	581.11	76.3	184.76	809.4	765.87	-5.38%
मैनपुरी	586.8	380.77	72.9	171.7	659.7	552.47	-16.25%
मथुरा	490.5	465.13	66.4	230.93	556.9	696.06	24.99%
मऊ	795.4	601.59	101.9	98.3	897.3	699.89	-22.00%
मेरठ	741.1	514.03	115.8	341.79	856.9	855.82	-0.13%
मिर्जापुर	847.6	633.46	95	159.85	942.7	793.31	-15.85%
मुरादाबाद	789.6	413.68	113.6	319.91	903.2	733.59	-18.78%
मुजफ्फरनगर	708.1	524.52	121.2	273.25	829.3	797.77	-3.80%
पीलीभीत	1064.3	912.05	137	370.19	1201.3	1282.24	6.74%
प्रतापगढ़	751.5	553.11	86.3	236.99	837.7	790.1	-5.68%
प्रयागराज	758.8	448.16	84.2	117.81	843.1	565.97	-32.87%
रायबरेली	670.9	458.02	77.4	205.22	748.3	663.24	-11.37%
रामपुर	915.4	624.86	136.2	423.83	1051.6	1048.69	-0.28%
संत रविदास नगर	806.2	723.13	92.4	205.79	898.6	928.92	3.37%
सहारनपुर	933.1	667.94	169.5	175.41	1102.6	843.35	-23.51%
संत कबीर नगर	1107.4	547.09	146.5	176.59	1253.9	723.68	-42.29%
शाहजहांपुर	783.9	423.78	114.3	232.97	898.2	656.75	-26.88%

जिला	मानसून वर्षा (मिमी)		नॉन-मानसून वर्षा (मिमी)		कुल वर्षा (मिमी)		विचलन (%)
	सामान्य	वास्तविक (2022-23)	सामान्य	वास्तविक (2022-23)	सामान्य	वास्तविक (2022-23)	
श्रावस्ती	1037	868.93	147.5	447.77	1184.5	1316.7	11.16%
सिद्धार्थनगर	1021.9	547.11	136.7	221.5	1158.6	768.61	-33.66%
सीतापुर	876.2	547.43	115	272.72	991.3	820.15	-17.27%
सोनभद्र	869.1	559.28	104	96.2	973.1	655.48	-32.64%
सुल्तानपुर	795.8	463.46	91.7	200.09	887.6	663.55	-25.24%
उन्नाव	679.6	404.43	86.1	200.4	765.7	604.83	-21.01%
वाराणसी	829.5	661.62	96.3	231.83	925.8	893.45	-3.49%
औसत	**771.2**	**573.3**	**101.3**	**227.8**	**888**	**801.1**	-9.79%

2.2 भूआकृति एवं जल निकासी

उत्तर प्रदेश राज्य दो प्रमुख भू आकृति इकाइयों नामतः (i) गंगा मैदान (ii) दक्षिणी प्रायद्वीपीय क्षेत्र जिसमें बुंदेलखंड और बिंध्ययी पठार शामिल है। जलोढ़ निक्षेप की मोटाई पर्याप्त है जो कि दक्षिणी भाग में 100 मीटर से अन्य भागों में 700 मीटर से अधिक है तथा राज्य के मध्य और उत्तरी भागों में शिवालिक चट्टान समूह द्वारा आच्छादित है। समस्त राज्य में गंगा नदी और इसकी सहायक नदियों द्वारा जल निकासी होती है। उत्तर काशी में विशाल हिमालय से उद्गमित होकर गंगा अलीगढ़ जिले तक दक्षिणी दिशा की और बहते हुए दक्षिण पश्चिमी दिशा की ओर उन्मुख हो जाती है और अंततः इलाहाबाद से आगे यह पूर्वी दिशा की ओर बहती है। इस राज्य में गंगा नदी 1400 किमी की दूरी को तय करती है। मैदानी क्षेत्रें में इस नदी की औसत ढलान लगभग 20 सेमी/किमी है। गंगा की मुख्य बाई तटीय सहायक नदियाँ रामगंगा, गोमती और घाघरा है जबकि मुख्य दाई तटीय सहायक नदी यमुना है जो इलाहाबाद में गंगा नदी से मिलती है।

2.3 भूजल वैज्ञानिकी संरचना

राज्य के भूजलवैज्ञानिकी संरचना में सरंध्र और विभंग संरचना शामिल है। राज्य का अधिकांश भाग प्राचीन भूवैज्ञानिकी के मैदान मौजूद है कैब्रियन पूर्व पर सिंधु गंगा जल निकासी प्रणाली द्वारा चतुष्कमहाकल्प के दौरान दक्षिण में पठारी क्षेत्र एवं उत्तर में हिमालय की अग्र गहराई में मौजूद नदीय अवसादों के मुलायम चट्टानों द्वारा आच्छादित है। राज्य की दक्षिणी भाग की भूजलवैज्ञानिकी परिस्थिति बिल्कुल अलग है जो कि

पतले जलोढ़ आवरण के तले कैब्रियन संरचनाओं के कठोर चट्टानों द्वारा आच्छादित है । इस प्रकार राज्य को चित्र और तालिका में दर्शाये गये दो भूजलवैज्ञानिकी संरचनाओँ में विभाजित किया जा सकता है।

(i) असंपीडित संरचानाए

राज्य का लगभग 85% क्षेत्र असंपीडित संरचनाओं द्वारा आच्छादित है । इन क्षेत्रों में विशाल हिमालयी पहाड़ियों से निकलने वाली महानदियों द्वारा अवसादों का निक्षेप हुआ है । ये अवसाद पत्थर, बजरी, रेत, गाद, चिकनी मिट्टी और कंकड़ का सम्मिश्रण हैं। ये अवसाद उत्तर में सामान्यतः अपरिष्कृत हैं तथा धीरे-धीरे दक्षिण पूर्वी दिशा की ओर निकासी के अनुप्रवाह में ये सूक्ष्म होते जाते है। जो कि नदीय निक्षेप की एक सामान्य विशिष्टता है। इस संरचना को पुनः चार भूजल वैज्ञानिकी इकाइयों में विभाजित किया गया है, जैसा कि चित्र और तालिका में दर्शाया गया है। इन इकाइयों की मौजूदा भूजल वैज्ञानिकी संरचना पर आगे चर्चा की गई है।

भाभर क्षेत्र : समाचयी कोडलेसमेंट निहित पिंडमांट निक्षेप उपहिमालयी अंचल की तलहटी क्षेत्र के साथ-साथ 10 से 20 किमी की गहराई में संकरे भूभाग को शामिल करती है। यह बेल्ट उत्तर की ओर (10-20मी/कीमी) ढालू है तथा दक्षिण में तराई बेल्ट से मिल जाता है । तथा पश्चिम में सहारनपुर जिले से पूर्व में बिजनौर जिले तक विस्तारित है। पूर्व की ओर यह धीरे-धीरे संकरा होता जाता है । फैन का निर्माण नदी प्रवाह द्वारा उद्गम से नीचे बहाकर लाये गये मलवे के अंबार से हुआ है फैन में विभिन्न आकार की अनियमित सामग्री होती है। इसमें दानेदार सामग्री की मात्रा अधिक होती है। दक्षिण की ओर चिकनी मिट्टी पाई जाती है । ढलान में आकस्मिक घटाव सहित दानेदार अवसाद के स्थान पर मोटी चिकनी मिट्टी की अनियमितता से भबर की दक्षिणी सीमा का आभास हो जाता है, भूजल अपरिरूद्ध स्थिति में विद्यमान तथा इस बेल्ट में जल स्तर गहरा है । जल तालिका में बढ़ोत्तरी से 250 मी. से 300 मीटर एएमएसएल की विविधता है। जलीय प्रवणता लगभग 3मी./किमी है । भबर में 3 मी. से 10 मी. की गहराई में 1700 से 3800 एलसीएल जल प्राप्ति की क्षमता है। परीक्षण किये गये निष्कर्षों के अनुसार जलीय चालकता 31 और 378 मी./दिन है ।

तराई क्षेत्र : यह भाभर के दक्षिण में एक संकीर्ण बेल्ट पर स्थित है और भाभर के साथ इसका संपर्क सुस्पष्ट रूप में नदीय रेखा द्वारा चिह्नित है। इसकी दक्षिणी सीमा स्पष्ट नहीं है और यह क्रमश: और अप्रत्यक्ष रूप से मध्य गंगा मैदान के साथ मिल जाती है। इसकी विशिष्टता नमी, जल जमाव वाले क्षेत्र हैं जो क्रमशः दक्षिण की ओर (2.5 मीटर / किमी) ढलाव है। तराई तलछट मुख्य रूप से सूक्ष्म अवसाद हैं। भूजल परिरुद्ध, अपरिरुद्ध और अर्द्ध-परिरुद्ध परिस्थितियों में उपलब्ध है। उथले जलभृत में जल स्तर की गहराई **2** से **6** एमबीजीएल के मध्य है तथा औसत मौसमी fluctuation 2 मीटर से 4 मीटर के मध्य है। जल तालिका का ढलाव दक्षिण की ओर है। गहरे जलभृत (50 मी गहराई से नीचे) में भूजल परिरुद्ध अवस्था में है। इस बेल्ट में स्वतः प्रवाह की स्थिति सामान्य है। बहाव की स्थिति फैन तलछट की प्रकृति और आकार पर निर्भर करती है। फ्लोइंग जलभृत का पीज़ोमेट्रिक शीर्ष 1 और 5.3 एमएजीएल के मध्य है जबकि नॉन-फ्लोइंग परिस्थित्यों में यह 2 से 12 एमबीजीएल के बीच स्थिर रहता है। गहरे जलभृत वाले नलकूप 2 से 8 मीटर drawdown से 1400 - 3400 एलपीएम जल प्राप्त किया जा सकता है। नॉन-फ्लोइंग वाले कुओं के मामले में 4 मीटर से 9 मीटर drawdown से 600 और 2400 एलपीएम के मध्य जल की प्राप्ति होती है। पारगम्यता **20** से **120** मीटर / दिन के बीच है।

मध्य गंगा मैदान: राज्य के लगभग दो तिहाई हिस्से द्वारा आच्छादित विशाल जलोढ़ क्षेत्र तराई के दक्षिण में स्थित है और इसे दो उप इकाइयों - नवीन जलोढ़ और प्राचीन जलोढ़ के रूप में विभाजित किया जा सकता है। यह विश्व के सबसे समृद्ध भूजल भंडार में से एक है। इसकी विशिष्टता लो रिलीफ़ मैदान तथा असंख्य नदीय विशेषताएँ जैसे कि परित्यक्त चैनल, प्राकृतिक लेवी और मेन्डार स्क्रॉल है। विभिन्न अपरदन और निक्षेपण द्रव्यों की उपस्थिति नदियों की परिवर्तनीय प्रकृति का संकेत देती है। नदी मार्ग में परिवर्तन की प्रक्रिया के दौरान पुराने बाढ़ के मैदानों को व्यापक उच्च भूमि के रूप रह गए थे जो वर्तमान में इंटरफ्लुव के रूप में कार्य करते है। नदियों द्वारा अपने जलोढ़ मैदानों का ह्रास हुआ है और निचली ढलान पर नए घुमाव बेल्ट का निर्माण हुआ है जहां नवीन बाढ़ मैदान तलछट निर्मित हुए हैं। प्राचीन जलोढ़ की एक विशिष्टता अनुकूल जलवायु परिस्थितियों में कैल्शियम कार्बोनेट की लीचिंग के कारण अपने भीतर कंकर का निर्माण करना है। कंकर कभी-कभी पानी की नीचे की गति को रोकते हुए पैन का निर्माण करता है। जलोढ़ तलछट की मोटाई परिवर्तनशील है और आम तौर पर अर्ध-समेकित ऊपरी सिवालिक संरचनाओं में इसकी गहराई **500** मीटर होती है। पृथक क्षेत्रों में तुलनात्मक रूप से उथले बेसमेंट विद्यमान है जिन्हें "बेसमेंट हाइज" के रूप में जाना जाता है। यह अपरिरुद्ध क्षेत्र अंतरग्रहीय सरंध्रता के साथ झरझरा और पारगम्य है और इसमें भूजल की

संभाव्यता अच्छी होती है। राज्य में संरचनाओं के उप-सतही सह-संबंध के कारण **750** एमबीजीएल की गहराई तक विभिन्न जलभृत की उपस्थिती पाई गई है। ये जलभृत सामान्य रूप से मध्य गंगा मैदान में विद्यमान हैं तथा इन जलभृतों को निम्नलिखित रूप लिथोलॉजिकल विशिष्टताओं के साथ साथ वेधन किए गए बोरहोल के विद्युत लॉग की व्याख्या के आधार पर वर्गीकृत किया गया है।

1. प्रथम जलभृत	0.0 –	~150.00 एमबीजीएल
2. द्वितीय जलभृत	~100.00 –	~210.00 एमबीजीएल
3. तृतीय जलभृत	~225.00 –	~360.00 एमबीजीएल
4. चतुर्थ गहरा जलभृत	~360.00 –	~600.00 एमबीजीएल

50 एमबीजीएल तक के पहले जलभृत का ऊपरी हिस्सा हैंड पंप और खोदे गए कुओं के माध्यम से पेय जल का मुख्य स्रोत है और ये अपरिरुद्ध है। समग्र रूप में प्रथम जलभृत जो अपरिरुद्ध से अर्ध परिरुद्ध परिस्थितियों में विद्यमान है, सबसे अधिक क्षमतावान जलभृत समूह है, जो राज्य में भूजल का मुख्य स्रोत है, जिसका निजी और साथ ही सरकारी नलकूपों द्वारा पेयजल और सिंचाई आवश्यकताओं को पूरा करने के लिए बड़े पैमाने पर दोहन किया जाता है। गहरे जलभृत की प्रकृति परिरुद्ध है तथा इसका अत्यंत सीमित सीमा तक दोहन किया जा रहा है। उथले और अधोभौम जलभृत पर भारी दबाव है। गंगा का मैदान क्वाटरनरी समय के दौरान जमा किए गए जलोढ़ तलछट के बड़े अंबार द्वारा आच्छादित है। जिसमें विभिन्न प्रकार के रेट, चिकनी मिट्टी और गाद शामिल हैं। उत्तर पश्चिमी और मध्य भागों में, सिवालिक संरचनाएं क्वार्टर्नरी तलछट को दर्शाती हैं, जबकि दक्षिणी हिस्से में क्वार्टर्नरी तलछट विभिन्न गहराईयों पर कैम्ब्रियनपूर्व संरचनाओं द्वारा आच्छादित है। अन्वेषन कार्यों से यह पता चलता है कि कानपुर - जौनपुर के बीच कैम्ब्रियन-पूर्व बेड रॉक ~ 300 मीटर और ~ 600 मी के मध्य की गहराई में अवस्थित है।

सीमांत जलोढ़ मैदान: उत्तर में गंगा के मैदान और दक्षिण में पठारी क्षेत्र के बीच का संक्रमण क्षेत्र सीमांत जलोढ़ मैदान का निर्माण करता है। इस क्षेत्र की विशिष्टता उत्तर-पूर्वी ढलान वाले मैदान, परित्यक्त चैनल, घुमावदार चिन्ह और खाई हैं। इस बेल्ट में मौजूद नदीय तलछट आंशिक रूप से यमुना नदी की नदीय गतिविधि और आंशिक रूप से गंगा नदी द्वारा जमा की गई है। कैंब्रियन पूर्व बेसमेंट पर आच्छादित जलोढ़ सामग्री की औसत मोटाई 30 मीटर से 200 मीटर के मध्य है। लिथोलोजी दृष्टि से सीमांत जलोढ़ में चिकनी मिट्टी, गाद तथा विभिन्न मोटाई और विस्तार के रेत शामिल है। जबकि मथुरा-आगरा क्षेत्र में रेतीले क्षेत्र हैं और कुछ सौ मीटर में विद्यमान हैं, जालौन में इनका व्यापक विस्तार है। जालौन क्षेत्र का उपसतही डेटा 30 से

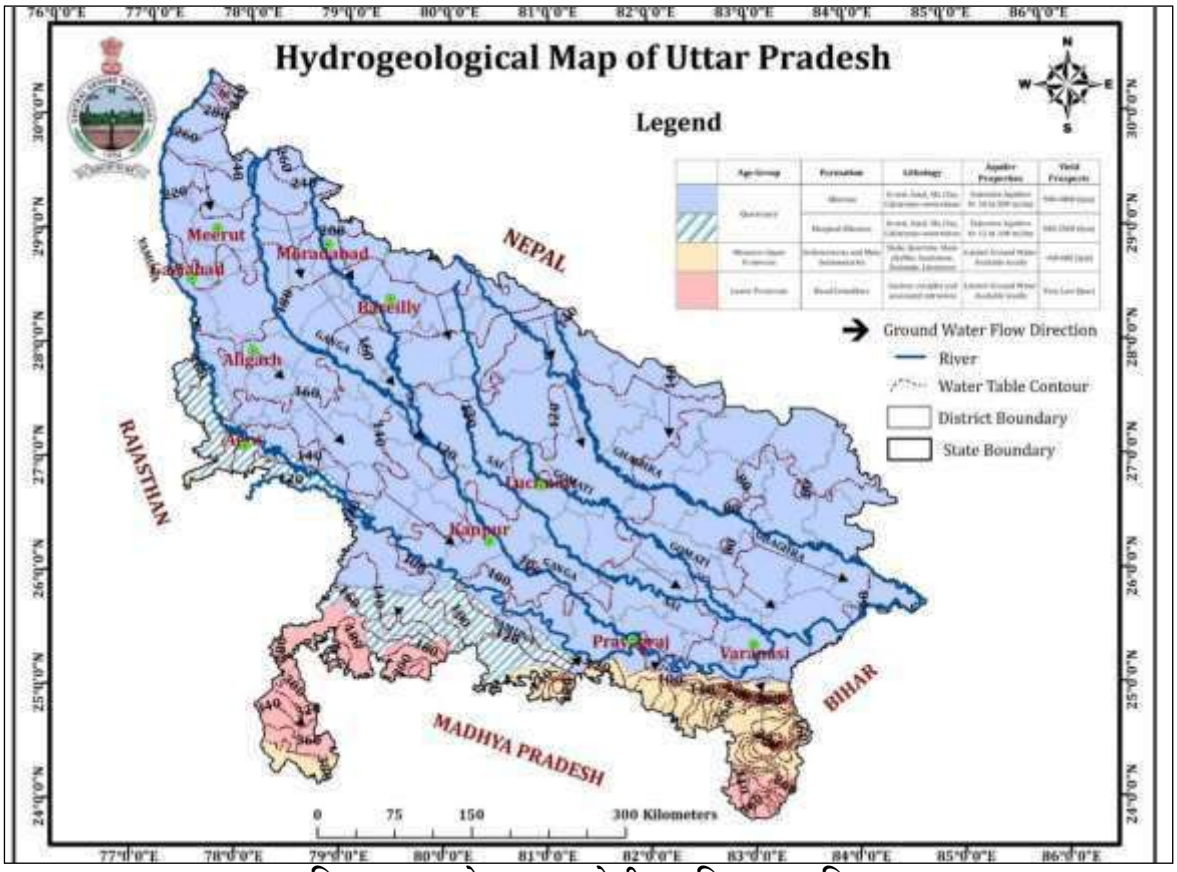
100 मीटर की गहराई के मध्य 10 से 50 मीटर मोटी रेतीले क्षितिज को दर्शाता है। तलछट में विभिन्न ग्रेड के रेत और चिकनी मिट्टी का मिश्रण है। भूजल मुख्य रूप से अपरिरुद्ध अवस्था में विद्यमान है, लेकिन कभी-कभी अर्ध-परिरुद्ध और परिरुद्ध परिस्थिति में भी पाया जाता है। जल तालिका सामान्य रूप से दक्षिणी भाग में उथली है और धीरे-धीरे यमुना नदी के करीब गहरी हो जाती है। गहरे जलभृत परिरुद्ध अवस्था में हैं। आगरा - मथुरा क्षेत्र में जलभृत (25-40 मी मोटाई) से 8 से 12 मी की गहराई मे 720 से 1200 एलपीएम जल की प्राप्ति हुई है। जबकि जालौन, हमीरपुर, बांदा क्षेत्र में समान मोटाई वाले जलभृत से 3 से 5 मीटर की गहराई में बेहतर निस्सरण (3000-3600 एलपीएम) की प्राप्ति हुई है। इस क्षेत्र में 20 और 100 मीटर / दिन के मध्य जलीय चालकता में बड़ी भिन्नता है। आगरा-मथुरा क्षेत्र में भूजल की गुणवत्ता मे गहराई के साथ साथ गिरावट आती है।

केंद्रीय भूमि जल बोर्ड द्वारा इसके भूजल अन्वेषण कार्यक्रम के अंतर्गत गंगा जलोढ़ीय मैदान में कई समन्वेषी बोरहोल का निर्माण किया गया है। गंगा नदी के आस-पास अवस्थित इनमें से कुछ कूपों को संदर्भ कूप के रूप में ग्रहण किया गया है। जैसा की चित्र-2 से स्पष्ट है कुछ समन्वेषी कूपों को छोड़कर अधिकांश समन्वेषी सक्रिय बाढ़ मैदानी क्षेत्र के अंतर्गत नहीं आते हैं तथा ये बाढ़ मैदानी जलभृतों के सीमित भूजल वैज्ञानिक सूचनाओं को प्रदर्शित करते है। हालांकि निर्मित समन्वेषी कूप बहु-जलभृत प्रणाली का प्रतिनिधित्व करते है। इनके वेधन की गहराई 150 मी. से 650 एमबीजीएल के मध्य है। ट्यूबवेलों के निर्माण के लिए बनाए गए ग्रेनुलर क्षेत्र सभी तीन जलभृत समूहों का प्रतिनिधित्व करते हैं। अतः ये जल वैज्ञानिक मापदंड विभिन्न जलभृत समूहों के संचयी प्रभाव को प्रदर्शित करते है। प्रतिनिधित्व करने वाले बोरहोल के उपसतही लिथोलॉजिकल लॉग से गंगा नदी के साथ-साथ 100 मी. की गहराई वाले विभिन्न लिथोलॉजिकल असेम्बली का पता चलता है। गाद के साथ उपरी मृदा की मोटाई तथा 15 मी. से 40 मी. तक के मध्य की रेत 100 मी. तक के ग्रेनुलर क्षेत्र का निर्माण करती है।

ii. सपीडित संरचना: बुंदेलखंड मासिफ तथा कैमूर रेंज के क्षेत्र जैसे पठार दक्षिणी प्रायद्वीपीय क्षेत्र का निर्माण करते है। इस क्षेत्र की विशिष्टता मैसा, बहेज, इन्सेलवर्ग आदि विविध भू-संरचना द्वारा आच्छादित नग्न चट्टानी क्षेत्र है। अवशिष्ट मिट्टी विभिन्न मोटाई के लैटेराइट्स के पृथक भाग एवं उसका विस्तार उपस्थित है। बुंदेलखंड ग्रेनाइट काम्पलैक्स (बीजीएल) समूह के क्रिस्टलीय चट्टान झाँसी, जालौन, हमीरपुर, ललितपुर महोबा तथा बांदा तक आच्छादित है। भूजल जलतालिका परिस्थितियां दित्तीयक सरंध्रता (ज्वांइट,

विखंडित, वीक प्लेन) के साथ चट्टानों के विभंग रेसिडियम में भी पाये जाते हैं। विभंग रेसिडियम ग्रेनुलर या बलुआ मिट्टी हो सकता है। यह मूल चट्टान के बनावट और रचना पर निर्भर है। विभंग क्षेत्र का उध्वार्धर और पाश्र्व विस्तार के स्थान के अनुसार बदलता रहता है। जल स्तर की गहराई 4 से 8 मी. के औसत मान के साथ 2 से 16 एमबीजीएल के मध्य रहता है। इसका मौसमी विचलन उच्च विचलन के अपवादस्वरूप मान के साथ 2 से 4 मी. तक है. इस क्षेत्र में 5 से 20 मी. की जलभृत सामग्री के कई नलकूपों का निर्माण किया गया है जिनसे 60 ली. प्रति मिनट से अधिक 600 ली. प्रति मिनट तक स्वच्छ भूजल प्राप्त होता है। घाटी के भागों में विभिन्न मोटाई और विस्तार के विभंग रेसिडियम के अनियमित और पृथक भाग सामान्य रूप से पाए जाते हैं। यह अनिवार्य रूप से विभिन्न ग्रेड के रेत और मृदा के मिश्रित सामग्री से निर्मित है। ऐसे पदार्थ क्षेत्र में उच्च कोटि के भूजल भंडार का निर्माण करते हैं। भूजल अपरिष्कृत रूप में तथा ऐसे जलभृत के 5 से 20 मी. के उथले नलकूप 120—300 एलपीएम जल की उत्पादकता में सक्षम होते हैं। विंध्यन बलुआ पत्थर / शेल प्रायद्वीपीय क्षेत्र के उल्लेखनीय भागों में आच्छादित हैं। इलाहाबाद, मिर्जापुर तथा चित्रकूट क्षेत्र के शंकरगढ़ बलुआपत्थर के अतिरिक्त अन्य बलुआ पत्थर सामान्यतः भूजल सुगठित बलुआ पत्थर के विभंग और जोड़ में जल तालिका परिस्थितियों में पाया जाता है। भूजल तालिका की गहराई स्थलाकृति पर निर्भर है तथा यह 2 से 25 एमबीजीएल के मध्य पायी जाती है। विध्यांचल क्षेत्र (मिर्जापुर जिला) जहाँ बहाव स्थितियाँ उपस्थित है, उच्च परिरूद्ध परिस्थितियाँ मौजूद हैं में नलकूप से निष्कर्षण 120 से 300 ली. प्रति मी. के मध्य निम्न स्तर पर पाया जाता है।

शेल-बलुआ पत्थर का संयुक्त क्षेत्र 60 से 80 मी. की गहराई पर अवस्थित है तथा इसकी उत्पादकता 1000 से 1200 ली. प्रति मी. है। यहाँ 2.5 एमबीजीएल का पीजोमीट्रिक शीर्ष पाया गया है। इलाहाबाद में शंकरगढ़ बलुआ पत्थर 300 से 600 ली. प्रतिमी. स्वच्छ जल का उत्पादन करने में सक्षम है। मिर्जापुर के केंद्रीय भाग, बांदा के दक्षिणी भाग तथा ललितपुर जिला में पाया जाने वाला विंध्यान चूना पत्थर मामूली रूप से अच्छे भूजल भंडारण का निर्माण करता है।

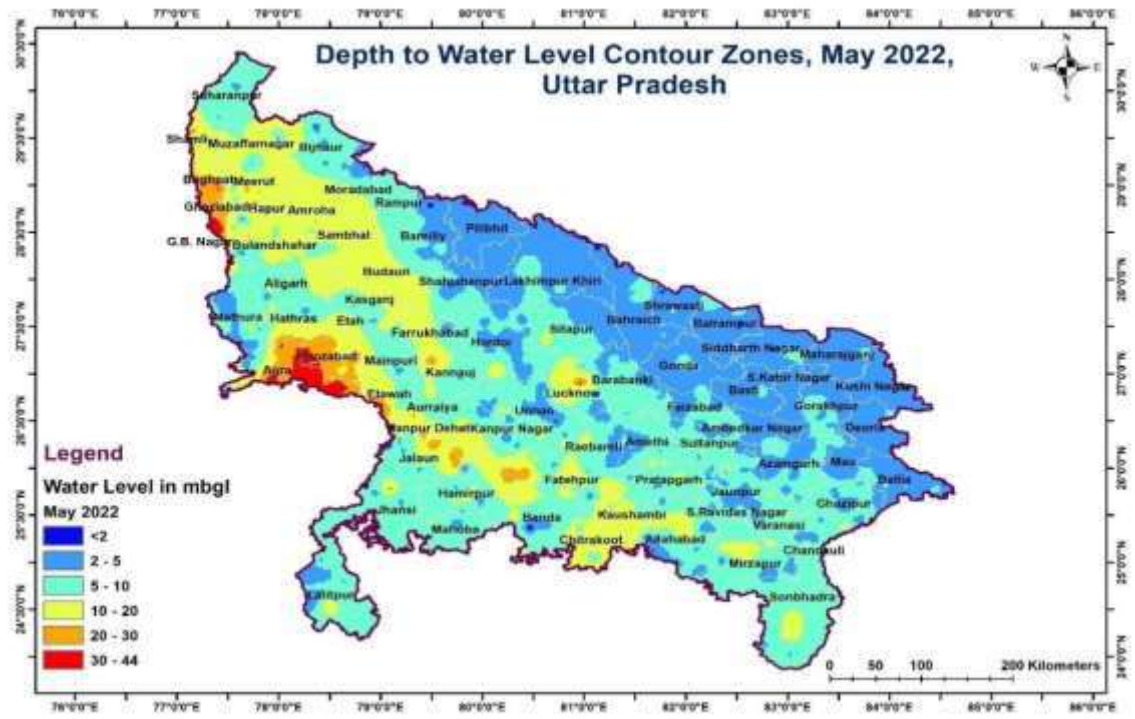


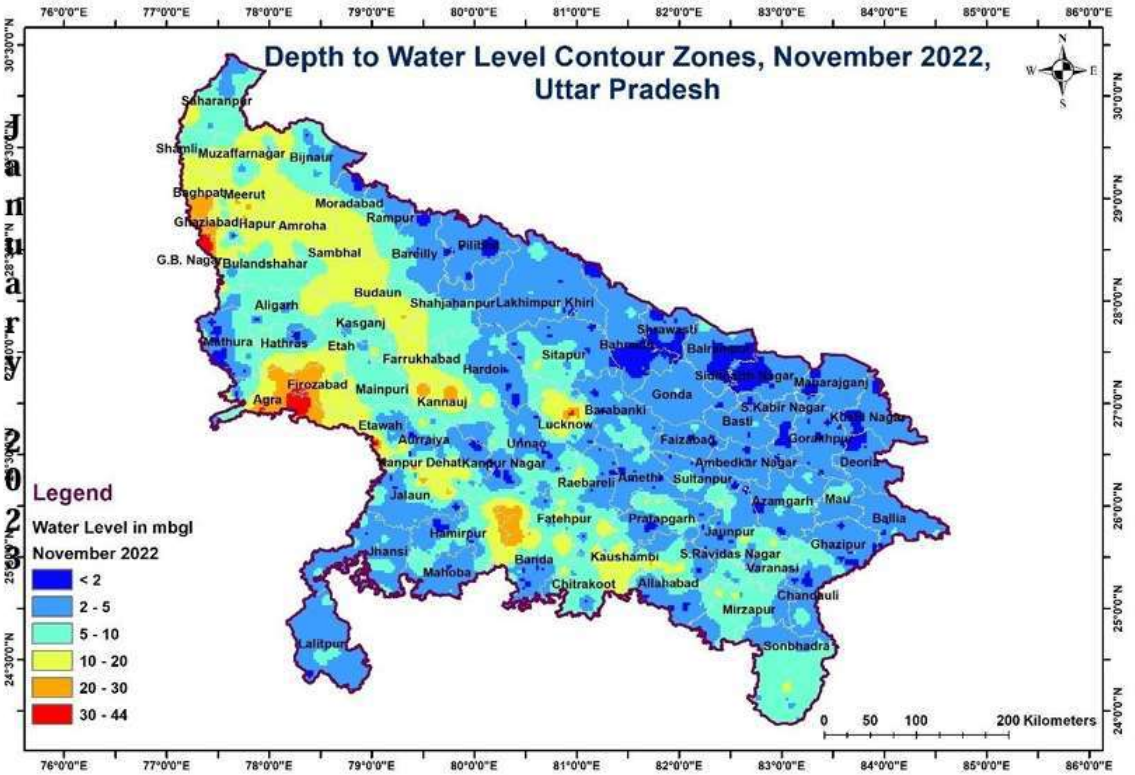
चित्र 3: उत्तर प्रदेश का हाइड्रोजीअलाजिकल मानचित्र

2.4 उत्तर प्रदेश में भूजल स्तर का परिदृश्य

2.4.1 जल स्तर की गहराई

भूजल स्तर का तात्पर्य भूमिगत सतह से है जिसके नीचे की फॉर्मेशन पोरस पूरी तरह से पानी से भरित हों और इसके ऊपरी सतह को जल तालिका कहते हैं। सीमित जलभृतों में बने कुओं के मामले में, जल स्तर बिंदु पर दबाव या पिज़ोमेट्रिक हेड का प्रतिनिधित्व करता है। जल तालिका का विन्यास स्थलाकृति, भूविज्ञान, जलवायु जल उपज और वातन और गीले क्षेत्रों में चट्टानों के जल वहन पर निर्भर करता है जो भूजल पुनर्भरण को नियंत्रित करता है। भंडारण के पुनर्भरण का मुख्य स्रोत वर्षा है, जो उत्तर प्रदेश में स्थान और समय के साथ परिवर्तनशील है। राज्य में भूजल दोहन स्रोत जो भिन्न भी है और तेजी से बढ़ भी रहा है। सिंचाई के मुख्य स्रोत के रूप में भूजल वाले क्षेत्र हमेशा भारी दबाव में रहते हैं। पुनर्भरण और रिसाव के बीच असंतुलन भूजल स्तर में बदलाव के रूप में प्रकट होता है। इस प्रकार, भूजल अध्ययन के लिए जल स्तर एक बहुत ही महत्वपूर्ण पैरामीटर है। मार्च 2016 और मार्च 2022 के दौरान निगरानी किए गए भूजल अवलोकन कुओं के भूजल स्तर के आंकड़ों का संकलन और विश्लेषण किया गया है।





चित्र 4: 2022 में प्री-मॉनसून व पोस्ट-मॉनसून में उत्तर प्रदेश के भूजल स्तर की स्थिति

3.0 भूजल संसाधन आकलन कार्यप्रणाली, 2015

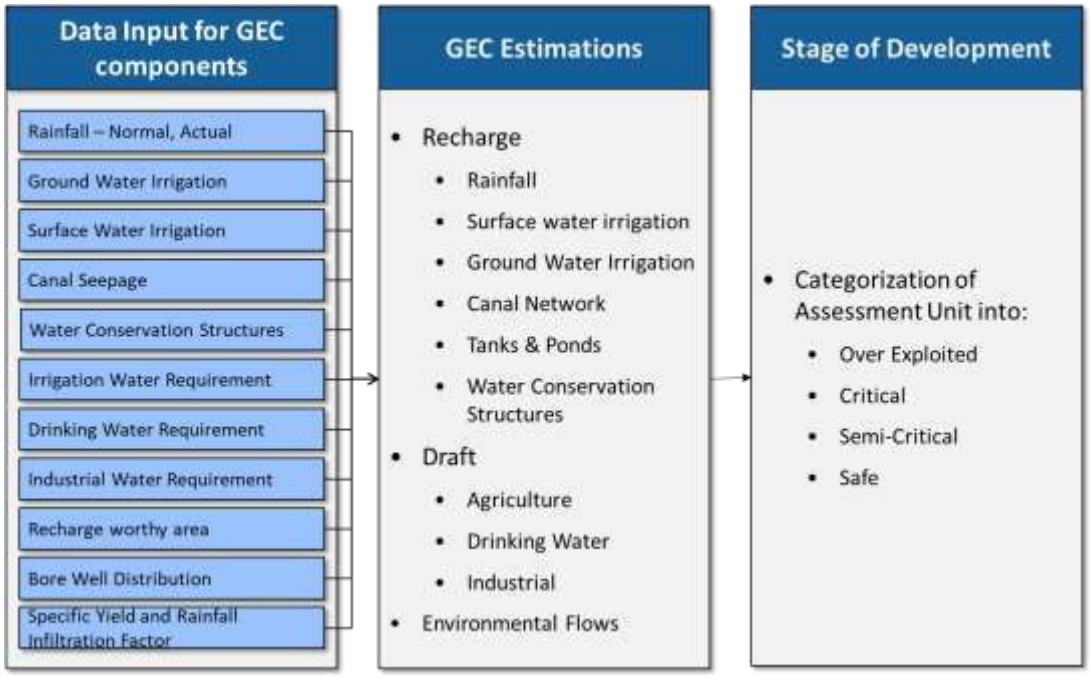
राज्य के पहले भूजल संसाधनों का आकलन भूजल आकलन समिति 1984 (जीईसी 84) की अनुशंसा के आधार पर किया गया था । जीईसी 84 पद्धतियों को बाद में उन्नत डेटाबेस और हाइड्रोजियोलॉजी के क्षेत्र में प्रायोगिक अध्ययन के नए निष्कर्षों के आलोक में संशोधित किया गया था। भूजल आकलन समिति-1997 पिछले दो दशकों से देश में भूजल आकलन का आधार रही है। राष्ट्रीय जल नीति (2012) भी वैज्ञानिक आधार पर भूजल क्षमता के आवधिक मूल्यांकन को प्रतिपादित करती है। इसलिए जल संसाधन मंत्रालय, भारत सरकार ने एक संशोधित पद्धति की सिफारिश करने के लिए भूजल क्षेत्र के विशेषज्ञों की एक समिति का गठन किया। सिफारिश की गई संशोधित कार्यप्रणाली में भूजल आकलन समिति-1997 की सिफारिशों की तुलना में कई बदलाव शामिल किए गए हैं। संशोधित कार्यप्रणाली जीईसी 2015 जलभृत वार भूजल संसाधन मूल्यांकन की अनुशंसा करती है, जिसमें पार्श्व के साथ-साथ ऊर्ध्वाधर सीमा और विभिन्न जलवाही स्तर का निर्धारण पूर्व-अपेक्षित है।

IN-GRES (भारत- भूजल संसाधन आकलन प्रणाली)

GEC-2015 पद्धति का उपयोग गतिशील भूजल संसाधनों के आकलन का स्वचालन करना है। भूजल भारत के शहरी और ग्रामीण क्षेत्रों में कृषि और पेयजल सुरक्षा की रीढ़ है। हालांकि, यह महसूस करना महत्वपूर्ण है कि भूजल एक ऐसा संसाधन नहीं है जिसका भेदभावपूर्ण तरीके से उपयोग किया जा सके। भारत में 1.3 बिलियन से अधिक लोगों का घर होने के नाते, बढ़ती जनसंख्या, शहरीकरण और गैर-समान निकासी ने भूजल संसाधनों की कमी को तेज कर दिया है। यह गिरते भूजल स्तर की प्रवृत्ति और जलभृतों का संदूषण में परिलक्षित होता है। भारत में वर्तमान में अत्यधिक दोहन और भूजल संदूषण के कारण भारत में सभी जिलों का लगभग 60 प्रतिशत हिस्सा गंभीर भूजल संकट की चपेट में है और जनसंख्या की पेयजल सुरक्षा के लिए जोखिम पैदा कर रहा है। पानी के अत्यधिक दोहन और जैविक/रासायनिक संदूषण के अलावा, अतिरिक्त भूजल और जल जमाव भी कई क्षेत्रों में एक गंभीर समस्या है, जो समाज के बड़े वर्गों की आजीविका सुरक्षा को प्रभावित करती है । भूजल आकलन समिति (जीईसी) 2015 मूल्यांकन इकाइयों (बड़े पैमाने पर प्रशासनिक इकाइयों जैसे ब्लॉक / तालुका / मंडल / फ़िरका, और कुछ मामलों में हाइड्रोलॉजिकल इकाइयां जैसे वाटरशेड / जलभृत) को किसी क्षेत्र के लिए सुरक्षित, सेमी-क्रिटिकल, क्रिटिकल और अति-दोहित

श्रेणियां में वर्गीकृत करने के लिए दिशानिर्देश देती है। यह वर्गीकरण किसी वर्ष विशेष में हुए भूजल पुनर्भरण, ड्राफ्ट, फ्लक्स की मात्राओं पर आधारित है.

जीईसी सिस्टम एक्सेल के माध्यम से विभिन्न भूजल घटकों (रिचार्ज, ड्राफ्ट, फ्लक्स, आदि) का डेटा इनपुट लेता है, मूल्यांकन इकाई को उपयुक्त श्रेणियों में वर्गीकृत करता है, प्रत्येक घटकों के लिए दृश्यता डैशबोर्ड विकसित करता है। सिस्टम उपयोगकर्ता को एमआईएस और जीआईएस व्यू दोनों में डेटा देखने की अनुमति देता है। उपयोगकर्ता केन्द्रीय भूमि जल बोर्ड आदि जैसे प्रारूपों में भी रिपोर्ट डाउनलोड कर सकते हैं।



चित्र 5: भूजल संसाधन अनुमान का अवलोकन-जीईसी 2015

प्रयुक्त पद्धति

यह प्रणाली 3 प्रकार के जलभृत के लिए भूजल संसाधन आकलन हेतु जीईसी 2015 की पद्धति पर आधारित है: अपरिबद्ध जलभृत, अर्ध-सीमित जलभृत और परिरुद्ध जलभृत। अपरिरुद्ध जलभृत के लिए संसाधनों का अनुमान जल संतुलन के सिद्धांत पर आधारित है:

अन्तर्वाह- उत्प्रवाह= भंडारण में परिवर्तन (एक जलभृत का)

इस समीकरण को और विस्तृत किया जा सकता है:

$$\Delta S= R_{RF}+R_{STR}+R_{C}+R_{SWI}+R_{GWI}+R_{TP}+R_{WCS}\pm VF \pm LF - GE - T - E - B$$

ΔS –भंडारण में परिवर्तन

R_{RF} - वर्षा पुनर्भरण

R_{STR} - स्ट्रीम चैनलों से रिचार्ज

R_C - नहरों से पुनर्भरण

R_{SWI} - सतही जल सिंचाई से पुनर्भरण

R_{GWI} - भूजल सिंचाई से पुनर्भरण

R_{TP} - टैंकों और तालाबों से पुनर्भरण

R_{WCS} - जल संरक्षण संरचनाओं से पुनर्भरण

VF - वर्टिकल इंटर एक्विफर फ्लो

LF - एक्वीफर सिस्टम के साथ पार्श्व प्रवाह (थ्रूफ्लो)

GE - भूजल निष्कर्षण

T- वाष्पोत्सर्जन

E - वाष्पीकरण

B- बेस फ्लो

जीईसी सिस्टम को 3 मॉड्यूल में बांटा गया है - इनपुट, संगणना और आउटपुट।

1. इनपुट मॉड्यूल- इनपुट मॉड्यूल एक आकलन इकाई स्तर पर डेटा एंट्री मॉड्यूल को संदर्भित करता है। डेटा इनपुट 2 विधियों के माध्यम से किया जाता है, अर्थात

अ. एक्सेल आधारित इनपुट- इसमें उपयोगकर्ता को जिला स्तरीय डेटा शीट टेम्पलेट डाउनलोड करने की आवश्यकता होती है, जहां वह आकलन इकाई स्तर पर डेटा भर सकता/सकती है । उपयोगकर्ता को अब अपनी पूरी तरह से भरी हुई एक्सेल शीट को सिस्टम में अपलोड करना होता है।

ब. **फॉर्म आधारित इनपुट -** इसमें यूजर को एक फॉर्म दिखाया जाता है और वह डेटा शीट में डेटा को ऑनलाइन मोड में भर/संपादित कर सकता है । एक बार जब उपयोगकर्ता ऑनलाइन संपादन कर लेता है, तो वह डेटाफाइल जमा कर सकता/सकती है।

2.0 संगणना मॉड्यूल- संगणना मॉड्यूल एक मूल्यांकन इकाई के लिए भूजल गणना को संदर्भित करता है। ये गणना जीईसी-2015 पद्धति पर आधारित हैं और मूल्यांकन इकाई के लिए वार्षिक निकालने योग्य भूजल संसाधन, कुल वर्तमान वार्षिक भूजल निष्कर्षण (उपयोगिता) और रिचार्ज (भूजल निकासी का चरण) के संबंध में भूजल उपयोग के प्रतिशत की गणना के लिए उपयोग की जाती हैं। इन प्रतिशतों के आधार पर एक मूल्यांकन इकाई को सुरक्षित, सेमी-क्रिटिकल, क्रिटिकल और अति-दोहित श्रेणियों में वर्गीकृत किया जाता है

3.0 आउटपुट मॉड्यूल-एक बार वर्गीकृत करने के बाद डेटा को दो दृश्यों में दिखाया जाता है:

आ.एमआईएस डैशबोर्ड- एमआईएस डैशबोर्ड पूरे भारत के लिए मूल्यांकन के परिणाम दिखाता है और सारणीबद्ध रूप में राज्यवार आंकड़ा भी दिखाता है। एमआईएस डैशबोर्ड वर्ष के मानसून और गैर-मानसून अवधि दोनों के लिए गणना किए गए सभी प्रकार के रिचार्ज, निष्कर्षण, प्रवाह और बहिर्वाह दिखाता है और फिर चयनित जियो-ज़ूम स्तर पर निष्कर्षण के समग्र चरण को दर्शाता है।

ब. **जीआईएस डैशबोर्ड** - जी रीजार्ड वेब जियो-सर्वर ड्राफ्ट में डेटा दिखाता है, जो इंटरएक्टिव जी आईएस प्लेटफॉर्म में लागू किया गया है, जो उपयोगकर्ता को जीईसी से संबंधित सभी पहचान को ही अनुमति देता है। जी आईएस व्यू विज्ञान के आधार पर प्रत्येक जिला/मूल्यांकन इकाई पर भारत के रेखांकन और रंग कोड के आंकड़े का प्रतिनिधित्व करता है।

3.3 भूजल पुनर्भरण

असीमित जलभृत के लिए भूजल पुनर्भरण की गणना इस प्रकार की जाती है:

पुनर्भरण = $R_{RF}+R_{STR}+R_C+R_{SWI}+R_{GWI}+R_{TP}+R_{WCS}$

जहाँ पे,

R_{RF}- वर्षा पुनर्भरण

R_{STR} - धारा चैनलों से पुनर्भरण

R_C - नहरों से पुनर्भरण

R_{SWI} - सतही जल सिंचाई से पुनर्भरण

R_{GWI} - भूजल सिंचाई से पुनर्भरण

R_{TP} - टैंकों और तालाबों से पुनर्भरण

R_{WCS} - जल संरक्षण संरचनाओं से पुनर्भरण

3.3.1 वार्षिक वर्षा पुनर्भरण

मानसूनी वर्षा भूजल पुनर्भरण का प्रमुख स्रोत है। वार्षिक पुन:पूर्ति योग्य संसाधनों का लगभग 58% मानसून वर्षा द्वारा योगदान दिया जाता है। इस पुनर्भरण का आकलन भूजल स्तर उतार-चढ़ाव पद्धति (केवल मानसून के मौसम के लिए) और वर्षा समावेश कारक विधि (मानसून और गैर-मानसून दोनों के लिए) का उपयोग करके किया जाता है। उपयोगकर्ता को आकलन इकाई स्तर, वर्षा गेज स्तर डेटा, आईएमडी ग्रिड स्तर आदि पर डेटा दर्ज करने की अनुमति है।

प्रयुक्त डेटा तत्व

अवयव	पैरामीटर	इकाई
वर्षा समावेश कारक तरीका	वर्षा	मिलीमीटर
भूजल स्तर मे Fluctuation	पानी की सतह	मीटर

डेटा संगणना पद्धति

जल स्तर उतार-चढ़ाव पद्धति पर आधारित वर्षा पुनर्भरण अनुमान, वास्तविक क्षेत्र स्थितियों को दर्शाता है क्योंकि यह भूजल स्तर की प्रतिक्रिया पर विचार करता है। हालांकि, यह अनुमान अक्सर अनिश्चितताओं के अधीन होता है। जिन क्षेत्रों में भूजल स्तर में उतार-चढ़ाव पर पर्याप्त डेटा उपलब्ध नहीं है, वर्षा इन्फ़िल्ट्रेसन फैक्टर विधि का उपयोग करके भूजल पुनर्भरण का अनुमान लगाया जाता है। इसलिए, जल स्तर में उतार-चढ़ाव के दृष्टिकोण से प्राप्त वर्षा पुनर्भरण की तुलना वर्षा समावेश कारक विधि का उपयोग करके अनुमानित करने की सिफारिश की जाती है।

भूजल स्तर Fluctuation विधि

भूजल स्तर मे Fluctuation विधि का उपयोग केवल मानसून के मौसम में वर्षा के पुनर्भरण के

आकलन के लिए किया जाता है। यह रिचार्ज गणना के लिए निम्नलिखित कारकों पर विचार करता है:

• भंडारण बदलाव

• मानसून के मौसम में जल स्तर में वृद्धि/गिरावट

• निर्दिष्ट उपज (एक्विफर नॉर्म्स पर आधारित)

RRF (wtfm) = ((मानसून के दौरान कमांड/नॉन-कमांड क्षेत्र में सभी उपयोगों के लिए भूजल भंडारण + सकल भूजल निष्कर्षण में परिवर्तन) - मानसून के मौसम के दौरान "अन्य स्रोतों" से रिचार्ज))1000

जहाँ पे,

भूजल भंडारण में परिवर्तन = मानसून के मौसम में जल स्तर में वृद्धि/गिरावट * क्षेत्र विशिष्ट उपज

"अन्य स्रोतों" से रिचार्ज = नहरों से रिसाव के कारण रिचार्ज + सतही जल सिंचाई से रिचार्ज +भूजल सिंचाई से रिचार्ज + टैंकों और तालाबों से रिचार्ज + जल संरक्षण संरचनाओं से रिचार्ज सामान्य मानसून वर्षा की स्थिति के लिए मानसून के मौसम के दौरान वर्षा पुनर्भरण, R_{RF} (सामान्य, wtfm) की गणना इस प्रकार की जाती है:

R_{RF} (सामान्य, wtfm) = (वर्षा रिचार्ज * मानसून सामान्य वर्षा) / मानसून वास्तविक वर्षा

वर्षा समावेश कारक विधि

वर्षा समावेश कारक विधि का उपयोग मानसून और गैर-मानसून दोनों मौसमों में वर्षा पुनर्भरण मूल्यांकन के लिए किया जाता है। यह रिचार्ज गणना के लिए निम्नलिखित कारकों पर विचार करता है

- क्षेत्र
- RFIF - वर्षा समावेश कारक (एक्विफर नॉर्म्स पर आधारित)
- सामान्य मानसून वर्षा

आरआरएफ (सामान्य, रिफम) = (क्षेत्र * मानसून-वर्षा सीमा के दौरान सामान्य वर्षा) * वर्षा Infiltration कारक)/1000

जहां, वर्षा थ्रेसोल्ड सीमा वार्षिक वर्षा का 10% है

मानसून के लिए विधि चयन

एक बार दोनों विधियों का उपयोग करके वर्षा पुनर्भरण का अनुमान लगाने के बाद, प्रतिशत विचलन (पीडी) की गणना की जाती है। PD दो विधियों अर्थात RRF (wtfm) और RRF (rifm) के बीच का अंतर है, जिसे RRF (रिफ़म) के प्रतिशत के रूप में व्यक्त किया जाता है।

पीडी = (आरआरएफ (सामान्य, डब्ल्यूटीएफएम) - आरआरएफ (सामान्य, आरआईएफएम)) /आरआरएफ (सामान्य, आरआईएफएम) * 100 जहां,

RRF (wtfm) = जल तालिका उतार-चढ़ाव विधि का उपयोग करके सामान्य मानसून के मौसम की वर्षा के लिए वर्षा का पुनर्भरण

आरआरएफ (RIFM) = वर्षा infiltration कारक विधि का उपयोग करके सामान्य मानसून के मौसम की वर्षा के लिए वर्षा का पुनर्भरण

- अगर -20% < पीडी <+20% अंतिम वर्षा पुनर्भरण= Rrf (wtfm)
- यदि पीडी < -20% अंतिम वर्षा पुनर्भरण = RRF (RIFM)*0.8
- यदि PD> +20% अंतिम वर्षा पुनर्भरण =Rrf (rifm)*1.2

3.3.2 अन्य स्रोतों से पुनर्भरण भूजल सिंचाई

भूजल सिंचाई के माध्यम से पुनर्भरण में भूजल जो पहले कृषि सिंचाई उद्देश्यों के लिए निकाला जाता था, अब भूजल पुनर्भरण में योगदान दे रहा है। इस रिचार्ज की गणना धान के साथ-साथ गैर-धान के खेतों के लिए रिटर्न फ्लो फैक्टर के आधार पर की जाती है।

प्रयुक्त डेटा तत्व

अवयव	पैरामीटर	इकाई
ग्राउंड के कारण रिचार्ज जल सिंचाई	फसल पैटर्न	एकड

डेटा संगणना पद्धति

लागू भूजल सिंचाई के कारण पुनर्भरण का अनुमान निम्न सूत्र के आधार पर लगाया जाता है:

RGWI = GDI*RFF

जहाँ पे,

RGWI = लागू भूजल सिंचाई के कारण पुनर्भरण GDI = सिंचाई के लिए सकल भूजल ड्राफ्ट

RFF = रिटर्न फ्लो फैक्टर और इसकी गणना [(धान के तहत सिंचित क्षेत्र * धान के लिए रिटर्न फ्लो फैक्टर) + (गैर-धान के तहत सिंचित क्षेत्र * गैर-धान के लिए रिटर्न फ्लो फैक्टर)] / (धान के तहत सिंचित क्षेत्र + धान के तहत सिंचित क्षेत्र) के रूप में की जाती है गैर धान)

3.3.3 अन्य स्रोतों से पुनर्भरण - सतही जल सिंचाई

सतही जल सिंचाई नहर के पानी से फसलों की सिंचाई के लिए की जाती है। यह पानी भूजल पुनर्भरण में भी योगदान देता है और रिटर्न फ्लो फैक्टर का उपयोग करके गणना की जाती है और दिनों की संख्या खेतों में छोड़ी जाती है।

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
सरफेस के कारण रिचार्ज जल सिंचाई	डिजाइन निर्वहन आउटलेट का	क्यूसेक
	दिनो की संख्या	संख्या
	फसल पैटर्न	एकड़

डेटा संगणना पद्धति

अनुप्रयुक्त सतही जल सिंचाई के कारण पुनर्भरण: प्रयुक्त सतही जल सिंचाई के कारण पुनर्भरण का अनुमान निम्न सूत्र के आधार पर लगाया जाता है:

RSWI = AD * दिन * RFF

जहाँ पे:

RSWI = लागू सतही जल सिंचाई के कारण पुनर्भरण AD = औसत निर्वहन

दिन = खेतों में पानी छोड़े जाने के दिनों की संख्या RFF = रिटर्न फ्लो फैक्टर

यदि डिस्चार्ज डेटा उपलब्ध नहीं है, तो RSWI की गणना करने के लिए सूत्र का उपयोग किया जाता है:

RSWI = [((धान के तहत सिंचाई क्षेत्र * धान के लिए फसल पानी की आवश्यकता) + (गैर-धान के तहत सिंचाई क्षेत्र * गैर-धान के लिए फसल की आवश्यकता)) * RFF

जहाँ **पे,**

RFF = [(धान के तहत सिंचित क्षेत्र * धान के लिए रिटर्न फ्लो फैक्टर) + (गैर-धान के तहत सिंचित क्षेत्र * गैर-धान के लिए रिटर्न फ्लो फैक्टर)] /(धान के तहत सिंचित क्षेत्र + गैर-धान के तहत सिंचित क्षेत्र)

3.3.4 अन्य स्रोतों से पुनर्भरण नहर रिसाव -

सिंचाई, औद्योगिक और घरेलू उद्देश्यों के लिए वितरित किए जाने तक नहरों में पानी जमा रहता है। इस दौरान पानी जमीन के नीचे रिसता है, जिससे भूजल रिचार्जिंग में योगदान होता है। नहरें दो प्रकार की होती हैं- पंक्तिबद्ध और बिना रेखा वाली।

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
नगर से पुनर्भरण रिसाव	लंबाई तक पहुँचें	मीटर
	पूर्ण आपूर्ति की लंबाई	मीटर
	पार्श्व कोण	डिग्री
	आधार चौड़ाई	मीटर
	दिनो की संख्या	संख्या

डेटा संगणना पद्धति

नहरों के कारण पुनर्भरण का अनुमान निम्न सूत्र के आधार पर लगाया जाता है:

आरसी = डब्ल्यूए * एसएफ * दिन

जहाँ पे:

आरसी = नहरों के कारण पुनर्भरणडब्ल्यूए

गीला क्षेत्र (नहर की गीली परिधि एक्स लंबाई के रूप में गणना की जाती है) एसएफ = सीपेज फैक्टर

दिन = नहर चलने के दिनों की संख्या

3.3.5 अन्य स्रोतों से पुनर्भरण - टैंक और तालाब

मानसून के मौसम के दौरान, टैंक और तालाबों में पानी जमा हो जाता है। यह संग्रहीत पानी भूजल पुनर्भरण में योगदान देता है, जो पानी की मात्रा के आधार पर और दिनों की संख्या के आधार पर पुनर्संरचनाओं में संग्रहीत होता है।

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
टैंको से रिचार्ज और तालाब	जल फैलाव क्षेत्र	हेक्टेयर
	दिनो की संख्या	संख्या

डेटा संगणना पद्धति

टैंकों और तालाबों के कारण पुनर्भरण का अनुमान निम्न सूत्र के आधार पर लगाया जाता है:

आरटीपी = एडब्ल्यूएसए * आर * आरएफ

जहाँ पे:

RTP = टैंकों और तालाबों के कारण पुनर्भरण AWSA = औसत जल फैलाव क्षेत्र

N = टैंक/तालाब में कितने दिन पानी उपलब्ध है

आरएफ = रिचार्ज फैक्टर (जीईसी 2015 के अनुसार, अनुशंसित आरएफ = 1.4 मिमी / दिन)

3.3.6 अन्य स्रोतों से पुनर्भरण - जल संरक्षण संरचनाएं

इसी तरह, टैंक और तालाबों की तरह, जल संरक्षण के लिए कृत्रिम संरचनाएं, मानसून के मौसम में पानी का भंडारण करती हैं जो तब भूजल पुनर्भरण में योगदान देती हैं।

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
पानी के कारण रिचार्ज संरक्षण संरचना	सकल भंडारण	हेक्टेयर मीटर

	रिफिल की संख्या	संख्या

डेटा संगणना पद्धति

जल संरक्षण संरचना के कारण पुनर्भरण का अनुमान निम्न सूत्र के आधार पर लगाया जाता है: RWCS = GS *RF

जहाँ पे:

आरडब्ल्यूसीएस = जल संरक्षण संरचनाओं के कारण रिचार्ज जीएस = सकल भंडारण = भंडारण क्षमता * भरावों की संख्या

आरएफ = रिचार्ज फैक्टर (जीईसी 2015 की सिफारिशों के अनुसार, आरएफ = एक वर्ष के दौरान सकल भंडारण का 40% जिसका अर्थ है मानसून के मौसम के दौरान 20% और गैर-मानसून के मौसम के दौरान 20%)

3.3.7 अन्य स्रोतों से रिचार्ज स्ट्रीम चैनल -

किसी क्षेत्र से होकर बहने वाली धाराएँ भी भूजल पुनर्भरण में योगदान करती हैं

डेटा संगणना पद्धति

डार्सी के नियम का उपयोग करके स्ट्रीम चैनलों से रिचार्ज का अनुमान लगाया जाता है।

क्यू = के * [(एच2-एच1)/एल] * ए

जहाँ पे:

K = पारगम्यता गुणांक / हाइड्रोलिक चालकता h1 = नदी का प्रमुख

h2 = भूजल स्तर पर सिर

एल = नदी की लंबाई जो पुनर्भरण में योगदान करती है ए = क्रॉस-सेक्शन का क्षेत्रफल

3.3.8 अन्य स्रोतों से पाइपलाइन रिचार्ज

जल आपूर्ति योजनाओं के कारण, शहरी क्षेत्र में घरेलू और औद्योगिक उद्देश्य के लिए पानी के परिवहन के लिए पाइपलाइनों का उपयोग किया जाता है। इन पाइपलाइनों से रिसाव कुछ क्षेत्रों में बहुत बड़ा है और भूजल पुनर्भरण में योगदान देता है।

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
पाइपलाइन	जलापूर्ति पाइपलाइन के माध्यम से	हेक्टेयर मीटर
	दिनों की संख्या पानी की आपूर्ति की जाती है	संख्या

डेटा संगणना पद्धति

जीईसी 2015 में दिए गए विवरण के आधार पर पाइपलाइनों (पाइपलाइनों) से पुनर्भरण का अनुमान लगाया गया है:

RP पाइपलाइन = 0.5 * (पाइपलाइनों के माध्यम से जल आपूर्ति * प्रतिशत हानि/100) * भारित घुसपैठ कारक * पाइपलाइनों के माध्यम से पानी की आपूर्ति के दिनों की संख्या

3.3.9 अन्य स्रोतों से पुनर्भरण सीवेज/फ्लैशफ्लड -

गंदे नालों से होने वाला सीपेज भी रिचार्ज में योगदान देता है। जल जो आकस्मिक बाढ़ (थोड़ी देर में भरी वर्षा के कारण होता है) के कारण जमा हो जाता है वो भी भूजल पुनर्भरण में योगदान देता है।

डेटा संगणना पद्धति

सीवेज/फ्लैश फ्लड से रिचार्ज (सीवेज/फ्लैश फ्लड) का अनुमान जीईसी 2015 में दिए गए विवरण के आधार पर लगाया जाता है:

फ्लैश फ्लड = WP * SF * लंबाई * दिन

जहाँ:

WP = गीली परिधि SF = सीपेज फैक्टर दिन = दिनों की संख्या

3.4 अंतर्वाह और बहिर्वाह

पर्यावरणीय प्रवाह में वर्टिकल इंटर एक्विफर फ्लो, लेटरल फ्लो के साथ एक्विफर सिस्टम, वाष्पोत्सर्जन, वाष्पीकरण और आधारभूत प्रवाह शामिल हैं।

3.4.1 वर्टिकल इंटर एक्विफरफ्लो

जिन क्षेत्रों में एक से अधिक जलभृत मौजूद हैं, वहां जलभृतों के बीच भूजल के प्रवाहित होने की संभावना है जिसे वर्टिकल इंटर एक्विफर फ्लो के रूप में जाना जाता है। वर्टिकल एक्विफर इंटरफ्लो की गणना डार्सी के नियम का उपयोग करके की जाती है

डेटा संगणना पद्धति

इसकी गणना डार्सी के नियम का उपयोग करके की जाती है:

$Q = HC * [\Delta h/T] * A$

जहाँ पे,
एचसी = हाइड्रोलिक चालकता
Δh = शीर्ष t में औसत परिवर्तन = Aquitard की मोटाई
ए = क्षेत्र का क्षेत्र

3.4.2 जलभृत प्रणाली के साथ पार्श्व प्रवाह (थ्रूफ्लो)

जब तक मूल्यांकन इकाई सीलबंद सीमाओं के साथ एक हाइड्रोलॉजिकल इकाई नहीं है, तब तक सीमाओं के पार भूजल के संचलन की संभावना हमेशा बनी रहती है। मूल्यांकन इकाई जहां भी ब्लॉक होगी, वहां सीमाओं के आर-पार भू-जल प्रवाह होगा। जलभृतों के बीच भूजल के इस प्रवाह को पार्श्व प्रवाह के रूप में जाना जाता है पार्श्व प्रवाह की गणना डार्सी के नियम का उपयोग करके की जाती है।

डेटा संगणना पद्धति

इसकी गणना डार्सी के नियम का उपयोग करके की जाती है:

क्यू = टी * [Δएच/दूरी] * एल

जहाँ पे,

टी = संप्रेषण

Δh = अप कंटूर - डाउन कंटूर

दूरी = जमीन पर दो समोच्च रेखाओं के बीच की दूरी L = खंड की लंबाई

3.4.3 वाष्पोत्सर्जन

यदि जड़ें भूजल तालिका तक पहुँचती हैं तो वाष्पोत्सर्जन सामान्य रूप से भूजल जलाशय से होता है। यदि जल स्तर नीचे गहरा है, तो भूमिगत जल वाष्पोत्सर्जन द्वारा नहीं खोया जा सकता है। लेकिन ऐसी स्थितियों में जहां जड़ें भूजल स्तर के केशिका वृद्धि तक फैलती हैं, इससे वाष्पोत्सर्जन होगा।

डेटा संगणना पद्धति

इसकी गणना इस प्रकार की जाती है:

वाष्पोत्सर्जन = ए * टीआर * दिन * (आरडी + सीआर - जीडब्ल्यूएल) / (आरडी + सीआर) जहां,

ए = क्षेत्र

TR = वाष्पोत्सर्जन दर RD = औसत जड़ गहराई CR = केशिका वृद्धि

GWL = भूजल स्तर

3.4.4 वाष्पीकरण

वाष्पीकरण सामान्य रूप से सतही जल निकायों से होता है। चूंकि भूजल सतह के संपर्क में नहीं आता है, भूजल निकायों से वाष्पीकरण की संभावना कम होती है। लेकिन ऐसी स्थितियों में जहां भूजल स्तर जलभृत सामग्री के केशिका वृद्धि से कम है, इससे वाष्पीकरण होगा।

डेटा संगणना पद्धति

वाष्पीकरण = ए * ईआर * दिन * (सीआर - जीडब्ल्यूएल)/सीआर जहां,

ए = क्षेत्र

ईआर = वाष्पीकरण दर सीआर = केशिका वृद्धि

GWL = भूजल स्तर

3.4.5 वाष्पोत्सर्जन

कभी-कभी वाष्पीकरण और वाष्पोत्सर्जन दर को अलग-अलग प्राप्त करना कठिन होगा। वाष्पोत्सर्जन की एकल दर प्राप्त करना संभव हो सकता है जो वाष्पीकरण और वाष्पोत्सर्जन का संचयी प्रभाव है। इन स्थितियों

में, दो शब्दों का उपयोग करने के बजाय। वाष्पीकरण और वाष्पोत्सर्जन समीकरण में केवल एक ही शब्द का प्रयोग किया गया है अर्थात वाष्पोत्सर्जन।

डेटा संगणना पद्धति

वाष्पोत्सर्जन = A * ETR * Days * (RD + CR - GWL) / (RD + CR)

जहां,

ए = क्षेत्र

ETR = वाष्पोत्सर्जन दर

RD = औसत रूट गहराई सीआर, CR= केशिका वृद्धि

GWL = भूजल स्तर

3.4.6 बेसफ्लो

भले ही जलभृत अविकसित हैं, जल स्तर जमीनी स्तर तक नहीं बढ़ेगा। इसका कारण बेस फ्लो है।

डेटा संगणना पद्धति

बेसफ्लो की गणना स्ट्रीम गेज डिस्चार्ज पर की जाती है:

यदि वर्तनी संख्या 0 है, तो।

बेसफ्लो = स्ट्रीम डिस्चार्ज वरना

बेसफ्लो = स्पेल में प्रारंभ दिन पर डिस्चार्ज + स्पेल में दिन संख्या * डिस्चार्ज की ढलान स्पेल की सीधी रेखा

जहाँ पे,

स्ट्रीम डिस्चार्ज = डेली स्ट्रीम डिस्चार्ज के 5 साल का औसत जानकारी

निर्वहन की ढलान वर्तनी की सीधी रेखा = (अंतिम दिन निर्वहन - राज्य दिवस पर निर्वहन) / (दिनों की संख्या)

3.4.7 पर्यावरणीय प्रवाह

मानसून के मौसम में वर्षा पुनर्भरण की गणना के लिए उपयोग की जाने वाली विधि के आधार पर बेहिसाब प्राकृतिक निर्वहन का अनुमान लगाया गया है। यदि वर्षा पुनर्भरण की गणना वाटर टेबल

फ्लक्चुएशन पद्धति का उपयोग करके की जाती है, तो कुल वार्षिक भूजल पुनर्भरण का 5% अघोषित प्राकृतिक निर्वहन के रूप में लिया जाता है, अन्यथा यह कुल वार्षिक भूजल पुनर्भरण का 10% होता है।

3.5 वार्षिक निकालने योग्य भूजल संसाधन

कुल वार्षिक भूजल पुनर्भरण का उपयोग मानव उपभोग के लिए नहीं किया जा सकता है क्योंकि निकालने योग्य संसाधनों को परिभाषित करने से पहले कुछ पारिस्थितिक प्रतिबद्धताओं को पूरा करना होता है । इसलिए, नदी के पारिस्थितिक प्रवाह तक सीमित भूजल आधार प्रवाह योगदान निर्धारित किया जाना चाहिए जिसे वार्षिक भूजल पुनर्भरण से घटाकर वार्षिक निकालने योग्य भूजल संसाधन (एईजीआर) निर्धारित किया जाएगा|

डेटा संगणना पद्धति

एईजीआर = टीजीडब्ल्यूआर - एनडी

जहाँ पे,

AEGR = वार्षिक निकालने योग्य भूजल संसाधन TGWR = कुल भूजल पुनर्भरण

एनडी = प्राकृतिक निर्वहन

3.6 भूजल निकासी

भूजल ड्राफ्ट या निकासी का आकलन निम्नानुसार किया जा सकता है:

GEALL = GEDOM + GEIRR + GEIND

जहाँ पे,

GEALL = सभी उपयोगों के लिए भूजल निष्कर्षण

GEDOM = घरेलू उपयोग के लिए भूजल निष्कर्षण GEIRR = सिंचाई के उपयोग के लिए भूजल निष्कर्षण GEIND = औद्योगिक उपयोग के लिए भूजल निष्कर्षण

3.6.1 घरेलू उपयोग के लिए निष्कर्षण

भूजल जो घरेलू उपयोग के लिए निकाला जाता है, उसका अनुमान कुएं की जनगणना पद्धति या आवश्यकता पद्धति के आधार पर लगाया जा सकता है

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
भूजल निकासी	खैर जनगणना	संख्या
	दिनो की संख्या	संख्या
	जनसंख्या	संख्या
	तपेदिक़-संबंधी मांग	लीटर प्रति व्यक्ति प्रति दिन

डेटा संगणना पद्धति

घरेलू उपयोग के लिए भूजल निकासी की गणना 2 तरीकों से की जा सकती है:

यूनिट ड्राफ्ट मेथड: यूनिट ड्राफ्ट मेथड का फॉर्मूला है:

GEDOM = यूनिट ड्राफ्ट * वेल

जहाँ पे,

यूनिट ड्राफ्ट = ड्राफ्ट प्रति वेल

कुएँ = घरेलू उपयोग में आने वाले कुओं की संख्या

उपभोग्य उपयोग विधि: उपभोग्य उपयोग विधि के लिए सूत्र है: GEDOM = जनसंख्या * उपभोगात्मक आवश्यकता * Lg

जहाँ पे,

उपभोग्य आवश्यकता = प्रति व्यक्ति दैनिक पानी की आवश्यकता

(एलपीसीडी)

एलजी = घरेलू जल आपूर्ति के लिए भूजल पर आंशिक भार

3.6.2 सिंचाई उपयोग के लिए निष्कर्षण

पानी के मुख्य स्रोतों में से एक भूजल है जिस पर कई किसान सिंचाई के लिए निर्भर हैं। इसका अनुमान कूप गणना पद्धति, फसल जल आवश्यकता पद्धति या बिजली खपत पद्धति के आधार पर लगाया जा सकता है।

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
भूजल निकासी	खैरजनगणना	संख्या
	दिनो की संख्या	**संख्या**
	फसल पैटर्न	एकड़
	बिजली की खपत	किलोवाट घंटे

डेटा संगणना पद्धति

सिंचाई उपयोग के लिए भूजल निकासी की गणना:3 तरीकों से की जा सकती है।

यूनिट ड्राफ्ट मेथड: यूनिट ड्राफ्ट मेथड का फॉर्मूला है:

GEIRR = यूनिट ड्राफ्ट * वेल

जहाँ पे,

यूनिट ड्राफ्ट = यूनिट ड्राफ्ट प्रति वेल

कुएँ = सिंचाई के लिए उपयोग किए जाने वाले कुओं की संख्या

फसल जल आवश्यकता विधि: फसल जल आवश्यकता विधि के लिए सूत्र है: GEIRR = (फसल जल आवश्यकता * फसल क्षेत्र) / 1000

बिजली की खपत विधि: बिजली की खपत की विधि के लिए सूत्र है:

जीईआईआरआर = एक्सट्रैक्शन * पावर यूनिट जहां,

एक्सट्रैक्शन = एक्सट्रैक्शन प्रति यूनिट बिजली की खपत

बिजली इकाइयां = कृषि के लिए खपत बिजली की इकाइयों की संख्या पंप

3.6.3 औद्योगिक उपयोग के लिए निष्कर्षण

अधिकांश उद्योगों, विशेष रूप से विनिर्माण क्षेत्र में वस्तुओं के उत्पादन के लिए काफी मात्रा में पानी की आवश्यकता होती है। पानी के निरंतर प्रवाह के कारण, भूजल एक सतत उत्पादन के लिए उद्योगों के चल रहे कामकाज को गति प्रदान करता है।

प्रयुक्त डाटा इकाई

अवयव	पैरामीटर	इकाई
भूजल निकासी	खैर जनगणना	संख्या
	दिनोकी संख्या	संख्या
	औद्योगिक इकाइयों की संख्या	संख्या

डेटा संगणना पद्धति

औद्योगिक उपयोग के लिए भूजल निकासी की गणना 2 तरीकों से की जा सकती है:

यूनिट ड्राफ्ट मेथड: यूनिट ड्राफ्ट मेथड का फॉर्मूला है:

GEIND = यूनिट ड्राफ्ट * वेल

जहाँ पे,

यूनिट ड्राफ्ट = यूनिट ड्राफ्ट प्रति वेल

कुएँ = औद्योगिक प्रयोजन के लिए उपयोग किए जाने वाले कुओं की संख्या

उपभोग्य उपयोग विधि: उपभोग्य प्रयोग विधि के लिए सूत्र है:

GEIND = औद्योगिक इकाइयों की संख्या * इकाई पानी की खपत * Lgकहाँ,

एलजी = घरेलू जल आपूर्ति के लिए भूजल पर आंशिक भार

3.7 भूजल निकासी का चरण (%)

भूजल के संदर्भ में किसी विशेष क्षेत्र को परिभाषित करने के लिए हम निष्कर्षण के चरण का उपयोग करते हैं। यह कुल निकालने योग्य भूजल संसाधनों से निकाले गए पानी की मात्रा को परिभाषित करता है और प्रतिशत में व्यक्त किया जाता है

डेटा संगणना पद्धति

भूजल निकासी के चरण की गणना निम्नानुसार की जाती है:

निष्कर्षण की अवस्था (%) = (GE)/(AEGR)*100 जहां,

GE = सभी उपयोगों से मौजूदा सकल भूजल निष्कर्षण AEGR = वार्षिक निकालने योग्य भूजल संसाधन

3.8 मूल्यांकन इकाई का वर्गीकरण

निष्कर्षण के चरण के आधार पर हम क्षेत्र को 4 श्रेणियों में सुरक्षित, अर्ध-गंभीर, गंभीर और अति-दोहित में वर्गीकृत करते हैं। इस वर्गीकरण का उद्देश्य भूजल संसाधनों के संबंध में नियोजन कार्यों के लिए अत्यधिक शोषित और गैर-शोषित क्षेत्रों का पता लगाना है।

डेटा संगणना पद्धति

- भूजल निष्कर्षण के चरण के आधार पर, मूल्यांकन इकाइयों को 4 श्रेणियों में बांटा गया है:
- सुरक्षित
- अर्ध गंभीर
- गंभीर
- अति-दोहित

मूल्यांकन इकाइयों के वर्गीकरण के लिए मानदंड होंगे:

निष्कर्षण का चरण (%)	वर्गीकरण
0 to <= 70	सुरक्षित
>70 to <=90	अर्ध गंभीर
>90 to <= 100	गंभीर
>100	अति-दोहित

3.9 उपयोग के लिए भूजल संसाधन का आवंटन

वार्षिक निकालने योग्य भूजल संसाधनों को घरेलू, औद्योगिक और सिंचाई उपयोगों के बीच विभाजित किया जाना है। यह आवश्यकता वर्ष 2025 के लिए अनुमानित जनसंख्या, घरेलू उपयोग के लिए पानी की प्रति व्यक्ति आवश्यकता और शहरी और ग्रामीण जल आपूर्ति के लिए भूजल पर सापेक्ष भार पर आधारित होनी चाहिए।

डेटा संगणना पद्धति

वार्षिक निकालने योग्य भूजल संसाधन निम्नलिखित अनुभवजन्य संबंध का पालन करते हैं:

एलोक = 22 एक्सएनएक्स एलजी (मिमी/वर्ष)

जहाँ पे,

आवंटन = घरेलू पानी की आवश्यकता के लिए आवंटन

N = इकाई में जनसंख्या घनत्व हजारों प्रति वर्ग किमी में।

Lg = घरेलू जल आपूर्ति के लिए भूजल पर आंशिक भार (<1.0) यह माना जाता है कि घरेलू उपयोग के लिए पानी की आवश्यकता 60 lpcd प्रति व्यक्ति है।

3.10 शुद्ध वार्षिक भूजल उपलब्धता

भविष्य में उपयोग के लिए उपलब्ध पानी घरेलू उपयोग के लिए आवंटन और सिंचाई और औद्योगिक उपयोग के लिए वर्तमान निष्कर्षण को वार्षिक निकालने योग्य भूजल पुनर्भरण से घटाकर प्राप्त किया जाता है। परिणामी भूजल क्षमता को भविष्य में उपयोग के लिए शुद्ध वार्षिक भूजल उपलब्धता कहा जाता है।

डेटा संगणना पद्धति

शुद्ध वार्षिक भूजल उपलब्धता की गणना इस प्रकार की जाती है:

शुद्ध वार्षिक भूजल उपलब्धता = कुल वार्षिक भूजल पुनर्भरण - बेहिसाब प्राकृतिक निर्वहन

3.11 इन-स्टोरेज असीमित भूजल संसाधन

किसी क्षेत्र के स्थैतिक भूजल संसाधन वे संसाधन हैं, जो जल तालिका उतार-चढ़ाव के गतिशील क्षेत्र के नीचे उपलब्ध रहते हैं। यह हर साल भरता नहीं है और इस पानी को निकालने को भूजल दोहन कहा जाता है।

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
भंडारण संसाधनों में अपुष्ट के जलभृत	क्षेत्र	हेक्टेयर
	डायनेमिक जोन के नीचे	मीटर
	अपुष्ट Aquifer के नीचे	मीटर

डेटा संगणना पद्धति

इन-स्टोरेज भूजल संसाधनों को निम्नानुसार व्यक्त किया जा सकता है:

एसजीडब्ल्यूआर = ए * (जेड2 - जेड1) * एसवाई

जहाँ पे,

SGWR = स्थिर या इन-स्टोरेज भूजल संसाधन A = मूल्यांकन इकाई का क्षेत्रफल

Z2 = अपरिरुद्ध जलभृत का तल Z1 = मानसून पूर्व जल स्तर

एसवाई = स्थिर भूजल संसाधनों के क्षेत्र में विशिष्ट उपज

3.12 इन-स्टोरेज सीमित जलभृत जल संसाधन

सीमित जलभृतों में एक अभेद्य गंदगी/चट्टान की परत होती है जो पानी को ऊपर स्थित जमीन की सतह से जलभृत में रिसने से रोकती है। इसके बजाय, पानी उस जगह से सीमित जलभृतों में रिसता है जहां अभेद्य परत मौजूद नहीं है। सीमित जलभृतों के लिए भूजल संसाधनों का आकलन महत्वपूर्ण महत्व रखता है क्योंकि इन जलभृतों के अत्यधिक दोहन से उथले अपरिमित जलभृतों की तुलना में कहीं अधिक हानिकारक परिणाम हो सकते हैं।

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
भंडारण के संसाधनों में सीमित जलभृत	क्षेत्र	हेक्टेयर
	प्री मानसून पीज़ोमेट्रिक हेड	मीटर
	प्री मानसून पीज़ोमेट्रिक हेड	मीटर
	ऊपर से नीचे सीमित परत	मीटर

डेटा संगणना पद्धति

सीमित जलभृत जल संसाधन को निम्नानुसार व्यक्त किया जा सकता है:

Q Confined = A * S * Δh = A * S * (hPRE - h0)

जहाँ पे,

Q Confined = सीमित जलभृत के भंडारण में भूजल संसाधन A = सीमित जलभृत की क्षेत्रफल सीमा

S= स्टोरेटिविटी

Δh = पीजोमेट्रिक हेड में बदलाव

h0 = शीर्ष सीमित परत का निचला स्तर

hPRE = प्री-मानसून अवधि के दौरान पीजोमेट्रिक हेड

यदि सीमित जलभृत का किसी प्रयोजन के लिए दोहन नहीं किया जा रहा है, तो सीमित जलभृत के गतिशील और स्थिर संसाधनों का अलग से अनुमान लगाने की आवश्यकता नहीं है। इसके बजाय, जलभृत के भंडारण में निम्नलिखित सूत्र का उपयोग करके गणना की जा सकती है।

QConfined = A * S * Δh = A * S * (hPOST - h0)

जहाँ पे,

QConfined = सीमित जलभृत के भंडारण में भूजल संसाधन A = सीमित जलभृत की क्षेत्रफल सीमा

एस = स्टोरेटिविटी

Δh = पीजोमेट्रिक हेड में बदलाव

hPOST = मानसून के बाद की अवधि के दौरान पीजोमेट्रिक हेड h0 = शीर्ष सीमित परत के नीचे

3.13 गतिशील सीमित जलभृत जल संसाधन

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
गतिशील संसाधन के सीमित जलभृत	क्षेत्र	हेक्टेयर
	प्री मानसून पीजोमेट्रिक हेड	मीटर
	प्री मानसून पीजोमेट्रिक हेड	मीटर

डेटा संगणना पद्धति

सीमित जलभृत जल संसाधन को निम्नानुसार व्यक्त किया जा सकता है:

QConfined = A * S * Δh = A * S * (hPOST - hPRE) जहाँ,

QConfined = सीमित जलभृत का गतिशील भूजल संसाधन A = सीमित जलभृत का क्षेत्रफल विस्तार

एस = स्टोरेटिविटी

Δh = पीजोमेट्रिक हेड में बदलाव

hPOST = मानसून के बाद की अवधि के दौरान पीज़ोमेट्रिक हेड hPRE = प्री-मानसून अवधि के दौरान पीज़ोमेट्रिक हेड

3.14 इन-स्टोरेज अर्ध-सीमित जलभृत जल संसाधन

एक जलभृत जो कम पारगम्यता वाली मिट्टी की परतों द्वारा आंशिक रूप से सीमित है जिसके माध्यम से पुनर्भरण और निर्वहन अभी भी हो सकता है। जब तक और जब तक, यह अच्छी तरह से अध्ययन नहीं किया जाता है कि इसके पुनर्भरण की गणना या तो असंबद्ध जलभृत या अंतर्निहित/अर्ध-सीमित जलभृत में नहीं की जाती है, इसका अलग से मूल्यांकन नहीं किया जाना चाहिए।

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
भंडारण के संसाधनों में अर्ध-सीमित जलभृत	क्षेत्र	हेक्टेयर
	प्री मानसून पीजोमेट्रिक हेड	मीटर
	प्री मानसून पीजोमेट्रिक हेड	मीटर
	क्षेत्र	हेक्टेयर

डेटा संगणना पद्धति

अर्ध-सीमित जलभृत जल संसाधन को उसी सूत्र का उपयोग करके अभिव्यक्त किया जा सकता है जैसा कि सीमित जलभृत जल संसाधन में है:

QSemi - सीमित = A * S * Δh = A * S * (ht - h0)

जहाँ पे,

क्यूसेमी - सीमित = भंडारण में अर्ध-सीमित एक्विफर का भूजल संसाधन

A = अर्ध-सीमित जलभृत का क्षेत्रफल S = संग्रहणता

Δh = पीजोमेट्रिक हेड में बदलाव

h0 = किसी विशेष समय पर शीर्ष सीमित परत hPRE = पीज़ोमेट्रिक हेड का निचला स्तर

3.15 गतिशील अर्ध-सीमित जलभृत जल संसाधन

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
डायनेमिक रिसोर्सेस अर्ध-सीमित एक्वीफर	क्षेत्र	हेक्टेयर
	प्री मानसून पीजोमेट्रिक हेड	मीटर
	प्री मानसून पीजोमेट्रिक हेड	मीटर

डेटा संगणना पद्धति

अर्ध-सीमित जलभृत जल संसाधन को इस प्रकार व्यक्त किया जा सकता है: Q Semi - सीमित = A * S *

Δh = A * S * (hPOST - hPRE)

जहाँ पे,

QSemi - सीमित = अर्ध के गतिशील भूजल संसाधन - सीमित

एक्विफायर

A = अर्ध-सीमित जलभृत का क्षेत्रफल S = संग्रहणता

Δh = पीजोमेट्रिक हेड में बदलाव

hPOST = मानसून के बाद की अवधि के दौरान पीजोमेट्रिक हेड hPRE = प्री-मानसून अवधि के दौरान पीजोमेट्रिक हेड

3.16 गुणवत्ता टैगिंग

भूजल की गुणवत्ता का आकलन उतना ही महत्वपूर्ण है जितना कि मात्रा का आंकलन। गुणवत्ता की चिंता के प्रमुख स्रोत लवणता, फ्लोराइड और आर्सेनिक हैं। यह क्षेत्र के आधार पर भी भिन्न हो सकता है। यदि विशेष पैरामीटर मैप करने योग्य इकाइयों में एक क्षेत्र को प्रभावित कर रहा है तो पैरामीटर को मूल्यांकन सबयूनिट में टैग किया जाना चाहिए। लवणता, फ्लोराइड और आर्सेनिक के अलावा अगर कोई और पैरामीटर है तो वह भी इसमें कैद हो जाता है।

3.17 अतिरिक्त संभावित संसाधन

3.17.1 स्प्रिंग डिस्चार्ज

स्प्रिंग डिस्चार्ज पहाड़ी क्षेत्रों में भूजल का एक अतिरिक्त स्रोत है जो उन स्थानों पर निकलता है जहां भूजल स्तर सतह स्थलाकृति को काटता है।

डेटा संगणना पद्धति

झरनों के कारण संभावित भूजल संसाधन को निम्नानुसार व्यक्त किया जा सकता है: संभावित संसाधन (स्प्रिंग्स) = Q * दिनों की संख्या जहां,

क्यू = स्प्रिंग डिस्चार्ज

दिनों की संख्या = दिनों की संख्या वसंत उपज

3.17.2 जल भराव क्षेत्र और उथला जल स्तर

ऐसे क्षेत्र में जहां भूजल स्तर जमीनी स्तर से 5 एमबी नीचे या जल भराव वाले क्षेत्रों में है, वहां जमीनी स्तर से 5 मीटर नीचे तक के संसाधन संभावित हैं और क्षेत्र में वार्षिक पुनर्भरण के अतिरिक्त उपयोग किए जाते हैं।

प्रयुक्त डेटा तत्व

अवयव	पैरामीटर	इकाई
जलभराव और उथला जल स्तर	पानी की गहराई जमीन की सतह के नीचे टेबल	मीटर
	उथला का क्षेत्र जल तालिका क्षेत्र	हेक्टेयर
	विशिष्ट उपज	अंश

डेटा संगणना पद्धति

उथले जल तालिका क्षेत्रों में संभावित भूजल संसाधन को निम्नानुसार व्यक्त किया जा सकता है:

संभावित संसाधन (जल भराव/उथला जल तालिका) = (5-डी) * ए * SY जहां,

D = उथले जलवाही स्तर में पूर्व-मानसून अवधि में जमीन की सतह के नीचे जल तालिका की गहराई

A = उथले जल तालिका क्षेत्र का क्षेत्रफल SY = विशिष्ट उपज

3.17.3 बाढ़ प्रवण

बाढ़ के मैदान से भूजल पुनर्भरण की गणना बाढ़ के मैदान के क्षेत्र की सीमा, बाढ़ की अवधारण अवधि और उप-मृदा स्तर के प्रकार और नदी के पानी में गाद के आवेश को ध्यान में रखते हुए की जाती है जो जमा हो जाता है और रिसाव को नियंत्रित करता है।

प्रयुक्त डाटा तत्व

अवयव	पैरामीटर	इकाई
बाढ़ प्रवण	दिनो की संख्या	संख्या
	बाढ़ प्रवण क्षेत्र	हेक्टयर

डेटा संगणना पद्धति

बाढ़ प्रवण क्षेत्रों में संभावित भूजल संसाधन को निम्नानुसार व्यक्त किया जा सकता है: संभावित संसाधन (बाढ़ प्रवण) = 1.4 * एन * ए/1000

जहाँ पे,

N = दिनों की संख्या क्षेत्र A = बाढ़ प्रवण क्षेत्र में पानी को बनाए रखा जाता है

3.18 तटीय क्षेत्र

डेटा संगणना पद्धति

तटीय क्षेत्र संसाधनों को निम्नानुसार व्यक्त किया जा सकता है:

$\Delta S = A * (PostWT - PreWT) * SY$

जहाँ पे,

ΔS = भूजल संग्रहण में परिवर्तन A = तटीय क्षेत्रों का क्षेत्रफल

PreWT = प्री-मानसून के दौरान वाटर टेबल = GL का RL - mbgl में प्री-मानसून सीजन के दौरान जल स्तर

पोस्ट डब्ल्यूटी = मानसून के बाद जल स्तर = जीएल का आरएल - एमबीजीएल में मानसून के बाद के मौसम के दौरान जल स्तर

एसवाई = विशिष्ट उपज

इन-स्टोरेज तटीय क्षेत्र संसाधनों को निम्नानुसार व्यक्त किया जा सकता है:

इन-स्टोरेज रिसोर्सेज = ए * (प्रीडब्ल्यूटी - एक्विफर के नीचे) * एसवाई जहां,

ए = तटीय क्षेत्रों का क्षेत्र

PreWT = प्री-मानसून के दौरान वाटर टेबल = GL का RL - mbgl में प्री-मानसून सीजन के दौरान जल स्तर

जलभृत के तल को 40* तक सीमित किया जाना है (औसत समुद्र तल से पूर्व मानसून जल तालिका)

3.19 पानी की कमी वाले क्षेत्र

डेटा संगणना पद्धति

जल अवक्षय क्षेत्र संसाधनों को निम्नानुसार व्यक्त किया जा सकता है:

$\Delta S = A * (\text{प्री} - \text{पोस्ट}) * SY$

जहाँ पे,

ΔS = भूजल संग्रहण में परिवर्तन A = जल अवक्षय क्षेत्रों का क्षेत्र

प्री = प्री-मानसून भूजल स्तर पोस्ट = पोस्ट-मानसून भूजल स्तर SY = विशिष्ट उपज

3.20 GW का उपयोग करके सत्यापन

भूजल मूल्यांकन निष्कर्षण के चरण पर आधारित है जिसमें अंतर्निहित अनिश्चितताएं हैं । भूजल निकासी का अनुमान बिजली की खपत, कुओं की जनगणना और भूजल से सिंचित क्षेत्र जैसे कारकों का उपयोग करके अप्रत्यक्ष मूल्यांकन पर आधारित है। इस प्रकार, भूजल स्तर की दीर्घकालिक प्रवृत्ति के साथ 'भूजल निकासी के चरण' को मान्य करना बहुत महत्वपूर्ण है। मॉनसून से पहले और मॉनसून के बाद की अवधि के लिए कम से कम 10 साल की लंबी अवधि के जल स्तर के रुझान की जरूरत होती है । यह डेटा

वर्षों से भूजल के रुझान को प्राप्त करने में मदद करेगा। सत्यापन के लिए निम्न तालिका का उपयोग किया जाता है:

निष्कर्षण का चरण	भूजल स्तर का रुझान देखा गया	टिप्पणियां
<= 70%	प्री मानसून और पूर्व मानसून मे जल स्तर ट्रेंड मे गिरावट	स्वीकार्य नहीं और पुनर्मूल्यांकन की जरूरत
>100%	प्री-मानसून और पूर्व मानसून दोनों में कोई खास गिरावट नहीं/ ऊपर आया	स्वीकार्य नहीं और पुनर्मूल्यांकन की जरूरत है

4.0 वर्तमान मूल्यांकन की प्रक्रिया और मान्यताएँ

4.1 प्रत्येक डेटा तत्व के लिए डेटा स्रोत और गणना में डेटा का उपयोग कैसे किया गया (यदि कोई हो तो डेटाबेस में बाधा)

वर्तमान मूल्यांकन पहली बार INGRES पोर्टल के माध्यम से ऑनलाइन आयोजित किया गया था। भूजल पुनर्भरण के प्राथमिक घटकों में से एक होने के कारण वर्षा के आंकड़े भारतीय मौसम विज्ञान विभाग लखनऊ और आईएमडी वेबसाइट से एकत्र किए जाते हैं। 1951 से 2000 तक के पचास वर्षों के आंकड़ों को सामान्य वर्षा और 2016-2020 के औसत वार्षिक आंकड़ों के लिए सभी रेन गेज स्टेशनों के लिए उपलब्ध माना जाता है। जिले को संगणना उद्देश्यों के लिए ध्यान में रखा जाता है। जल स्तर में उतार-चढ़ाव की गणना और प्रवृत्ति विश्लेषण के लिए सीजीडब्ल्यूबी निगरानी कुओं (1050 संख्या) का घनत्व पर्याप्त नहीं था; इसलिए मूल्यांकन के लिए भूगर्भ जल विभाग के प्रतिनिधि स्थायी अवलोकन कुओं (MW-10,000 संख्या) के डेटा का उपयोग किया जाता है। घरेलू जलापूर्ति हेतु भूजल ड्राफ्ट की गणना आधार वर्ष हेतु ब्लॉकवार/नगरीय जनसंख्या के आधार पर की गयी है। जनगणना वर्ष 2011 के लिए राष्ट्रीय जनगणना और 2001 और 2011 के बीच दशकीय वृद्धि दर से जनसंख्या एकत्र की जाती है। बोर / नलकूपों और कुओं के लिए सिंचाई डेटा लघु सिंचाई विभाग सरकार की जनगणना से एकत्र किया जाता है। के ऊपर। जल संसाधन विभाग (सिंचाई) से सतही जल सिंचाई, नहर, तालाब, तालाब आदि से संबंधित आंकड़े भी एकत्र किए जाते हैं जबकि परकोलेशन टैंक, स्टॉप डैम और चेक डैम जैसी संरक्षण संरचनाओं का डेटा जिला विकास कार्यालयों से लिया जाता है। जीईसी 15 द्वारा प्रस्तावित मूल पद्धति में लागू किए गए परिवर्तन, यदि कोई हों, तो औचित्य के साथ प्रदान किए जाते हैं ।

राज्य के विभागों द्वारा प्रदान किए गए सभी डेटा को कम्प्यूटरीकृत किया गया है और भूजल संसाधनों का आकलन भूजल आकलन समिति (जीईसी-2015) द्वारा पुनर्भरण, निष्कर्षण, प्राकृतिक निर्वहन, निष्कर्षण के चरण के आकलन के लिए अनुशंसित पद्धति के आधार पर किया गया है। आदि।

4.2 गणना में प्रयुक्त विभिन्न मानदंड

4.2.1: वर्षा पुनर्भरण में प्रयुक्त मानदंड

मानसून और गैर-मानसून वर्षा से भूजल पुनर्भरण की अलग-अलग गणना की गई है । मानसून वर्षा से पुनर्भरण की गणना के लिए दोनों विधियों अर्थात जल स्तर में उतार-चढ़ाव विधि और वर्षा इन्फ़िल्ट्रेसन फैक्टर विधि

(10% की कटौती सीमा मूल्य) का उपयोग किया गया है। इन दोनों पद्धतियों से प्राप्त आंकड़ों की तुलना के लिए प्रतिशत विचलन की गणना की जाती है और इस पद्धति में अनुशंसित पुनर्भरण के आंकड़ों को स्वीकार किया गया है। गैर-मानसून वर्षा पुनर्भरण की गणना के लिए वर्षा इन्फ़िल्ट्रेसन फैक्टर विधि को तब अपनाया जाता है जब सामान्य गैर-मानसून वर्षा का सामान्य वार्षिक वर्षा से अनुपात 10% से अधिक होता है जैसा कि कार्यप्रणाली में सुझाया गया है। उत्तर प्रदेश के लिए विशेष रूप से पश्चिमी भाग में, रिचार्ज का यह घटक शून्य है क्योंकि कथित अनुपात 10% से कम है। जीईसी 2015 के अनुसार उपसमिति द्वारा अनुशंसित वर्षा के लिए रिचार्ज की गणना के लिए संरचनाओं के विशिष्ट उपज और वर्षा इन्फ़िल्ट्रेसन फैक्टर का उपयोग किया जाता है।

तालिका: 2 वर्षा रिशाव हेतु अनुशंसित मानदंड

वर्षा रिशाव हेतु अनुशंसित मानदंड							
Sl. No	प्रधान जलभृत	प्रमुख जलभृत		आयु	अनुशंसित(%)	न्यूनतम (%)	ज्यादा से ज्यादा (%)
		कोड	नाम				
1	जलोढ़क	AL01	नई जलोढ़ (मिट्टी/गाद/बालू/कैल्शियस	कुअटेरनारी	22	20	24
2	जलोढ़क	AL02	कंकड़ / बजरी / बजड़ा /	कुअटेरनारी	22	20	24
3	जलोढ़क	AL03	पुराना जलोढ़ (गाद/बालू/बजरी)	कुअटेरनारी	22	20	24
4	जलोढ़क	AL04	वातज जलोढ़ (गाद/	कुअटेरनारी	22	20	24
5	जलोढ़क	AL05	तटीय जलोढ़ (रेत/गाद/मिट्टी) - पूर्व	कुअटेरनारी	16	14	18
5	जलोढ़क	AL05	तटीय जलोढ़ (रेत/गाद/मिट्टी) - पश्चिम	कुअटेरनारी	10	8	12
6	जलोढ़क	AL06	घाटी भरती है	कुअटेरनारी	22	20	24
7	जलोढ़क	AL07	ग्लेशियल डिपॉजिट	कुअटेरनारी	22	20	24
8	लेटराइट	LT01	लैटेराइट/फेरुजिनस concretions	कुअटेरनारी	7	6	8
9	बाजालत	BS01	बेसिक रॉक्स (बेसाल्ट) वेसिकुलर या संयुक्त	मेसोज़ोइक से सेनोज़ोइक	13	12	14
9	बाजालत	BS01	मूल चट्टानें (बेसाल्ट) – अपक्षयित	मेसोज़ोइक से सेनोज़ोइक	7	6	8
10	बाजालत	BS01	बेसिक रॉक्स (बेसाल्ट) - बड़े पैमाने पर	मेसोज़ोइक से सेनोज़ोइक	2	1	3
11	बाजालत	BS02	अल्ट्रा बेसिक - वेसिकुलर या संयुक्त	मेसोज़ोइक से सेनोज़ोइक	13	12	14
11	बाजालत	BS02	अल्ट्रा बेसिक – वेयथेरेड, वेसिकुलर और जॉइंटेड	मेसोज़ोइक से सेनोज़ोइक	7	6	8
12	बाजालत	BS02	अल्ट्रा बेसिक – मैसिव, पूर्ली जॉइंटेड	मेसोज़ोइक से सेनोज़ोइक	2	1	3

वर्षा रिशाव हेतु अनुशंसित मानदंड							
Sl. No	प्रधान जलभृत	प्रमुख जलभृत		आयु	अनुशंसित(%)	न्यूनतम (%)	ज्यादा से ज्यादा (%)
		कोड	नाम				
13	बलुआ पत्थर	ST01	बलुआ पत्थर / समूह	अपर पेलियोजोइक	12	10	14
14	बलुआ पत्थर	ST02	शेल के साथ बलुआ पत्थर	अपर पैलियोज़ोइक	12	10	14
15	बलुआ पत्थर	ST03	शेल/कोल बेड के साथ बलुआ पत्थर	अपर पैलियोज़ोइक	12	10	14
16	बलुआ पत्थर	ST04	मिट्टी के साथ बलुआ पत्थर	अपर पैलियोज़ोइक	12	10	14
17	बलुआ पत्थर	ST05	बलुआ पत्थर / समूह	प्रोटेरोज़ोइक से सेनोज़ोइक	6	5	7
18	बलुआ पत्थर	ST06	शेल के साथ बलुआ पत्थर	प्रोटेरोज़ोइक से सेनोज़ोइक	6	5	7
19	एक प्रकार की शीस्ट	SH01	शैल विथ लाइम्स्टोन	अपर पैलियोज़ोइक	4	3	5
20	एक प्रकार की शीस्ट	SH02	बलुआ पत्थर के साथ शैल	अपर पैलियोज़ोइक	4	3	5
21	एक प्रकार की शीस्ट	SH03	शेल, चूना पत्थर और बलुआ पत्थर	अपर पैलियोज़ोइक	4	3	5
22	एक प्रकार की शीस्ट	SH04	एक प्रकार की शीस्ट	अपर पैलियोज़ोइक	4	3	5
23	एक प्रकार की शीस्ट	SH05	बलुआ पत्थर के साथ शेल/शैल	प्रोटेरोज़ोइक से सेनोज़ोइक	4	3	5
24	एक प्रकार की शीस्ट	SH06	चूना पत्थर के साथ शैल	प्रोटेरोज़ोइक से सेनोज़ोइक	4	3	5
25	चूना पत्थर	LS01	मिलिओलिटिक चूना पत्थर	चारों भागों का	6	5	7
27	चूना पत्थर	LS02	चूना पत्थर / डोलोमाइट	अपर पैलियोज़ोइक	6	5	7
28	चूना पत्थर	LS03	करस्टिफाइड चूना पत्थर / डोलोमाइट	अपर पैलियोज़ोइक से सेनोज़ोइक	10	5	15
29	चूना पत्थर	LS03	चूना पत्थर/डोलोमाइट	प्रोटेरोज़ोइक	6	5	7
30	चूना पत्थर	LS03	कार्स्टिफाइड लाइमस्टोन/डोलोमाइट	प्रोटेरोज़ोइक	10	5	15
31	चूना पत्थर	LS04	शेल के साथ चूना पत्थर	प्रोटेरोज़ोइक	6	5	7
32	चूना पत्थर	LS04	शेल के साथ कार्स्टिफाइड चूना पत्थर	प्रोटेरोज़ोइक	10	5	15
33	चूना पत्थर	LS05	संगमरमर	एज़ोइक से प्रोटेरोज़ोइक	6	5	7
34	चूना पत्थर	LS05	कर्स्टिफाइड मार्बल	एज़ोइक से प्रोटेरोज़ोइक	10	5	15
35	ग्रेनाइट	GR01	अम्लीय चट्टानें (ग्रेनाइट, साइनाइट, रिओलाइट अपक्षयित, संयुक्त	मेसोज़ोइक से सेनोज़ोइक	7	5	9
36	ग्रेनाइट	GR01	अम्लीय चट्टानें (ग्रेनाइट, साइनाइट, रिओलाइट आदि) - बड़े पैमाने पर	मेसोज़ोइक से सेनोज़ोइक	2	1	3
37	ग्रेनाइट	GR02	एसिडिक चट्टानें (पेगमेटाइट, ग्रेनाइट, साइनाइट,रायोलाइट अपक्षयित, संयुक्त	प्रोटेरोज़ोइक से सेनोज़ोइक	11	10	12

वर्षा रिशाव हेतु अनुशंसित मानदंड							
Sl. No	प्रधान जलभृत	प्रमुख जलभृत		आयु	अनुशंसित(%)	न्यूनतम (%)	ज्यादा से ज्यादा (%)
		कोड	नाम				
38	ग्रेनाइट	GR02	एसिडिक चट्टानें (पेगमेटाइट,ग्रेनाइट,साइनाइट, रिओलाइट आदि) - बड़े पैमाने पर, खराब रूप से खंडित	प्रोटेरोज़ोइक से सेनोज़ोइक	2	1	3
39	एक प्रकार की शीस्ट	SC01	शिस्ट - अपक्षयित, संयुक्त	एज़ोइक से प्रोटेरोज़ोइक	7	5	9
40	एक प्रकार की शीस्ट	SC01	शिस्ट - भारी, पूरी तरह से खंडित	एज़ोइक से प्रोटेरोज़ोइक	2	1	3
41	एक प्रकार की शीस्ट	SC02	फिलाइत	एज़ोइक से प्रोटेरोज़ोइक	4	3	5
42	एक प्रकार की शीस्ट	SC03	स्लेट	एज़ोइक से प्रोटेरोज़ोइक	4	3	5
43	क्वार्टजाइट	QZ01	क्वार्टजाइट - अपक्षयित, संयुक्त	प्रोटेरोज़ोइक से सेनोज़ोइक	6	5	7
44	क्वार्टजाइट	QZ01	क्वार्टजाइट - भारी, खराब	प्रोटेरोज़ोइक से सेनोज़ोइक	2	1	3
45	क्वार्टजाइट	QZ02	क्वार्टजाइट - अपक्षयित, संयुक्त	एज़ोइक से प्रोटेरोज़ोइक	6	5	7
46	क्वार्टजाइट	QZ02	क्वार्टजाइट- बड़े पैमाने पर, खराब रूप से खंडित	एज़ोइक से प्रोटेरोज़ोइक	2	1	3
47	चर्नोकाइट	CK01	चार्नोकाइट वेदरेड, जॉइंटेड	आज़ोइक	5	4	6
48	चर्नोकाइट	CK01	चर्नोकाइट - विशाल, खराब	आज़ोइक	2	1	3
49	खोंडालाइट	KH01	खोंडालाइट्स, ग्रैन्यूलाइट्स अपक्षयित, संयुक्त	आज़ोइक	7	5	9
50	खोंडालाइट	KH01	खोंडालाइट्स, ग्रैनुलाइट्स एमसिव, पूअरली फ्रैक्चर्ड	आज़ोइक	2	1	3
51	बैंडेड गनीस कॉम्प्लेक्स	BG01	बैंडेड गनीसिक कॉम्प्लेक्स अपक्षयित, जॉइंटेड	आज़ोइक	7	5	9
52	बैंडेड गनीस कॉम्प्लेक्स	BG01	बैंडेड ग्निसिक कॉम्प्लेक्स मैसिव, पूअरली फ्रैक्चर्ड	आज़ोइक	2	1	3
53	शैल	GN01	अधोसंख्यित मेटासेडिमेंटरी/अविभेदित मेटामॉर्फिक - अपक्षयित,	आज़ोइक से प्रोटेरोज़ोइक	7	5	9
54	शैल	GN01	अधोसंख्यित मेटासेडमेंटरीज़ / अविभाजित मेटामॉर्फिक - बड़े पैमाने पर, पूरी तरह से फ्रैक्चर	Azoic to Proterozoic एज़ोइक से प्रोटेरोज़ोइक	2	1	3
55	शैल	GN02	नीस - अपक्षयित, जॉइंटेड	एज़ोइक से प्रोटेरोज़ोइक	11	10	12
56	शैल	GN02	नीस-बड़े पैमाने पर, पूरी तरह से खंडित	एज़ोइक से प्रोटेरोज़ोइक	2	1	3
57	शैल	GN03	मिग्मैटिक नीस- अपक्षयित, जॉइंटेड	आज़ोइक	7	5	9
58	शैल	GN03	मिग्मैटिक नीस – मैसिव	आज़ोइक	2	1	3

वर्षा रिशाव हेतु अनुशंसित मानदंड							
Sl. No	प्रधान जलभृत	प्रमुख जलभृत		आयु	अनुशंसित(%)	न्यूनतम (%)	ज्यादा से ज्यादा (%)
		कोड	नाम				
59	इन्ट्रूसिव	IN01	मूल चट्टानें (डोलेराइट, एनोरोथोसाइट आदि) - अपक्षयित, संयुक्त	प्रोटेरोज़ोइक से सेनोज़ोइक	7	6	8
60	इन्ट्रूसिव	IN01	बेसिक रॉक्स (डोलराइट, एनोरोथोसाइट आदि) - बड़े पैमाने पर, खराब रूप से फ्रैक्चर	प्रोटेरोज़ोइक से सेनोज़ोइक	2	1	3
61	इन्ट्रूसिव	IN02	उल्रता बेसिक्स (एपिडियोराइट, ग्रैनोफायर आदि) - अपक्षयित, संयुक्त	प्रोटेरोज़ोइक से सेनोज़ोइक	7	6	8
62	इन्ट्रूसिव	IN02	Ulrta बेसिक्स (एपिडियोराइट, ग्रैनोफायर आदि) - बड़े पैमाने पर, पूरी तरह से फ्रैक्चर	प्रोटेरोज़ोइक से सेनोज़ोइक	2	1	3

4.2.2: अन्य स्रोतों से रिचार्ज में प्रयुक्त मानदंड

कार्यप्रणाली की सिफारिशों के अनुसार, अन्य स्रोतों से पुनर्भरण की गणना मानसून और गैर-मानसून अवधि के लिए अलग-अलग की गई है । सिंचाई, नहर रिसाव, टैंकों और तालाबों से पुनर्भरण और जल संरक्षण संरचनाओं से वापसी प्रवाह की गणना के कारकों को जीईसी '15 द्वारा अनुशंसित के रूप में लिया गया है । उत्तर प्रदेश में नहरें आमतौर पर गैर-मानसून अवधि के दौरान चलती हैं, क्योंकि क्षेत्र का बड़ा हिस्सा गैर-धान फसलों के अंतर्गत आता है, विशेष रूप से यूपी के पश्चिमी भाग में।

4.2.3 घरेलू और औद्योगिक जल आपूर्ति के लिए भूजल निकासी में प्रयुक्त मानदंड

घरेलू एवं औद्योगिक जलापूर्ति हेतु भूजल ड्राफ्ट की गणना आधार वर्ष हेतु ब्लॉकवार जनसंख्या के आधार पर की गयी है। जनसंख्या के आंकड़े वर्ष 2011 के लिए उपलब्ध थे और 2001-2011 के बीच दशकीय वृद्धि दर को देखते हुए इसे मार्च-2017 और 2025 के लिए अनुमानित किया गया था। प्रति व्यक्ति औसत खपत 60 लीटर प्रतिदिन मानी गई है। सतही जल से जलापूर्ति प्राप्त करने वाली जनसंख्या को भूजल ड्राफ्ट की गणना में शामिल नहीं किया गया है। मानसून और गैर-मानसून अवधि के दौरान निष्कर्षण की अलग-अलग गणना की गई है, जिसमें 4 महीने को मानसून अवधि और 8 महीने को गैर-मानसून अवधि के रूप में लिया गया है।

तालिका: 3 स्पिसिफिक यील्ड हेतु अनुशंसित मानदंड

विशिष्ट उपज के लिए अनुशंसित मानदंड							
अनु क्रमांक	प्रधान जलभृत	प्रमुख जलभृत		आयु	अनुशंसित (%)	न्यूनतम (%)	ज्यादा से ज्यादा (%)
		कोड	नाम				
1	जलोढ़क	AL01	नई जलोढ़ (मिट्टी/गाद/रेत/चूनायुक्त संघनन)	कुअटेरनारी	10	8	12
2	जलोढ़क	AL02	कंकड़ / बजरी / बजड़ा / कंडी	कुअटेरनारी	16	12	20
3	जलोढ़क	AL03	पुराना जलोढ़(गाद/बालू/बजरी/लिथोमर्जिक मिट्टी)	कुअटेरनारी	6	4	8
4	जलोढ़क	AL04	वातज जलोढ़ (गाद/बालू)	कुअटेरनारी	16	12	20
5	जलोढ़क	AL05	तटीय जलोढ़(रेत/गाद/मिट्टी)	कुअटेरनारी	10	8	12
6	जलोढ़क	AL06	घाटी भरती है	कुअटेरनारी	16	12	20
7	जलोढ़क	AL07	ग्लेशियल डिपॉजिट	कुअटेरनारी	16	12	20
8	लेटराइट	LT01	लैटेराइट / फेरुजिनस कॉन्क्रीशन	कुअटेरनारी	2.5	2	3
9	बाजलत	BS01	मूल चट्टानें (बेसाल्ट) अपक्षययुक्त, वेसिकुलर या संयुक्त	मेसोज़ोइक से सेनोज़ोइक	2	1	3
10	बाजलत	BS01	बेसिक रॉक्स (बेसाल्ट) - मैसिव पुअर्ली जॉइंट	मेसोज़ोइक से सेनोज़ोइक	0.35	0.2	0.5
11	बाजलत	BS02	अल्ट्रा बेसिक - वेदरेड, वेसिकुलर या जॉइंट	मेसोज़ोइक से सेनोज़ोइक	2	1	3
12	बाजलत	BS02	अल्ट्रा बेसिक - मैसिव पुअरली जॉइंट	मेसोज़ोइक से सेनोज़ोइक	0.35	0.2	0.5
13	बलुआ पत्थर	ST01	बलुआ पत्थर / कांग्लोम दर	अपर पैलियोज़ोइक से सेनोज़ोइक	3	1	5
14	बलुआ पत्थर	ST02	शेल के साथ बलुआ पत्थर	अपर पैलियोज़ोइक से सेनोज़ोइक	3	1	5
15	बलुआ पत्थर	ST03	शेल/कोल बेड के साथ बलुआ पत्थर	अपर पैलियोज़ोइक से सेनोज़ोइक	3	1	5
16	बलुआ पत्थर	ST04	मिट्टी के साथ बलुआ पत्थर	अपर पैलियोज़ोइक से सेनोज़ोइक	3	1	5
17	बलुआ पत्थर	ST05	बलुआ पत्थर / कांग्लोम दर	अपर पैलियोज़ोइक से सेनोज़ोइक	3	1	5
18	बलुआ पत्थर	ST06	शेल के साथ बलुआ पत्थर	अपर पैलियोज़ोइक से सेनोज़ोइक	3	1	5
19	एक प्रकार की शीस्ट	SH01	चूना पत्थर के साथ शैल	अपर पैलियोज़ोइक से सेनोज़ोइक	1.5	1	2
20	एक प्रकार की शीस्ट	SH02	बलुआ पत्थर के साथ शैल	अपर पैलियोज़ोइक से सेनोज़ोइक	1.5	1	2

विशिष्ट उपज के लिए अनुशंसित मानदंड							
अनु क्रमांक	प्रधान जलभृत	प्रमुख जलभृत		आयु	अनुशंसित (%)	न्यूनतम (%)	ज्यादा से ज्यादा (%)
		कोड	नाम				
21	एक प्रकार की शीस्ट	SH03	शेल, चूना पत्थर और बलुआ पत्थर	अपर पैलियोज़ोइक से सेनोज़ोइक	1.5	1	2
22	एक प्रकार की शीस्ट	SH04	एक प्रकार की शीस्ट	अपर पैलियोज़ोइक से सेनोज़ोइक	1.5	1	2
23	एक प्रकार की शीस्ट	SH05	बलुआ पत्थर के साथ शेल/शैल	अपर पैलियोज़ोइक से सेनोज़ोइक	1.5	1	2
24	एक प्रकार की शीस्ट	SH06	चूना पत्थर के साथ शैल	चारों भागों का	1.5	1	2
25	चूना पत्थर	LS01	मिलिओलिटिक चूना पत्थर	चारों भागों का	2	1	3
26	चूना पत्थर	LS01	कार्स्टिफाइड मिलिओलिटिक लाइमस्टोन	चारों भागों का	10	5	15
27	चूना पत्थर	LS02	चूना पत्थर / डोलोमाइट	अपर पैलियोज़ोइक से सेनोज़ोइक	2	1	3
28	चूना पत्थर	LS02	कार्स्टिफाइड लाइमस्टोन / डोलोमाइट	अपर पैलियोज़ोइक से सेनोज़ोइक	10	5	15
29	चूना पत्थर	LS03	चूना पत्थर/डोलोमाइट	प्रोटेरोज़ोइक	2	1	3
30	चूना पत्थर	LS03	कार्स्टिफाइड लाइमस्टोन/डोलोमाइट	प्रोटेरोज़ोइक	10	5	15
31	चूना पत्थर	LS04	शेल के साथ चूना पत्थर	प्रोटेरोज़ोइक	2	1	3
32	चूना पत्थर	LS04	शेल के साथ कार्स्टिफाइड चूना पत्थर	प्रोटेरोज़ोइक	10	5	15
33	चूना पत्थर	LS05	संगमरमर	एज़ोइक से प्रोटेरोज़ोइक	2	1	3
34	चूना पत्थर	LS05	कर्स्टिफाइड मार्बल	एज़ोइक से प्रोटेरोज़ोइक	10	5	15
35	ग्रेनाइट	GR01	अम्लीय चट्टानें (ग्रेनाइट,साइनाइट, रिओलाइट आदि) अपक्षय, संयुक्त	मेसोज़ोइक से सेनोज़ोइक	1.5	1	2
36	ग्रेनाइट	GR01	अम्लीय चट्टानें (ग्रेनाइट, साइनाइट, रिओलाइट आदि) - विशाल या बुरी तरह से टूटा हुआ	मेसोज़ोइक से सेनोज़ोइक	0.35	0.2	0.5
37	ग्रेनाइट	GR02	अम्लीय चट्टानें अपक्षयित, संयुक्त	प्रोटेरोज़ोइक से सेनोज़ोइक	3	2	4
38	ग्रेनाइट	GR02	अम्लीय चट्टानें भारी, खराब रूप से खंडित	प्रोटेरोज़ोइक से सेनोज़ोइक	0.35	0.2	0.5
39	एक प्रकार की शीस्ट	SC01	शिस्ट - अपक्षयित, संयुक्त	एज़ोइक से प्रोटेरोज़ोइक	1.5	1	2
40	एक प्रकार की शीस्ट	SC01	शिस्ट - भारी, खराब खंडित	एज़ोइक से प्रोटेरोज़ोइक	0.35	0.2	0.5
41	एक प्रकार की शीस्ट	SC02	फिलाइट	एज़ोइक से प्रोटेरोज़ोइक	1.5	1	2

विशिष्ट उपज के लिए अनुशंसित मानदंड							
अनु क्रमांक	प्रधान जलभृत	प्रमुख जलभृत		आयु	अनुशंसित (%)	न्यूनतम (%)	ज्यादा से ज्यादा (%)
		कोड	नाम				
42	एक प्रकार की शीस्ट	SC03	स्लेट	एज़ोइक से प्रोटेरोज़ोइक	1.5	1	2
43	क्वार्टजाइट	QZ01	क्वार्टजाइट - अपक्षयित, जॉइंटेड	प्रोटेरोज़ोइक से सेनोज़ोइक	1.5	1	2
44	क्वार्टजाइट	QZ01	क्वार्टजाइट - बड़े पैमाने पर, खराब रूप से खंडित	प्रोटेरोज़ोइक से सेनोज़ोइक	0.3	0.2	0.4
45	क्वार्टजाइट	QZ02	क्वार्टजाइट, खंडित, जॉइंटेड	एज़ोइक से प्रोटेरोज़ोइक	1.5	1	2
46	क्वार्टजाइट	QZ02	क्वार्टजाइट - बड़े पैमाने पर, खराब रूप से खंडित	एज़ोइक से प्रोटेरोज़ोइक	0.3	0.2	0.4
47	चर्नोकाइट	CK01	चार्नोकाइट - वेदर्ड, ज्वाइण्ट्ली	एज़ोइक	3	2	4
48	चर्नोकाइट	CK01	चर्नोकाइट - विशाल, खराब रूप से खंडित	एज़ोइक	0.3	0.2	0.4
49	खोंडालाइट	KH01	खोंडालाइट्स, ग्रैन्यूलाइट्स - अपक्षयित, संयुक्त	एज़ोइक	1.5	1	2
50	खोंडालाइट	KH01	खोंडालाइट, ग्रैन्यूलाइट्स - बड़े पैमाने पर, खराब फ्रैक्चर	एज़ोइक	0.3	0.2	0.4
51	बैंडेड ग्निसिक कॉम्प्लेक्स	BG01	बैंडेड गनीसिक कॉम्प्लेक्स - वेदर्ड, ज्वाइंटेड	एज़ोइक	1.5	1	2
52	बैंडेड ग्निसिक कॉम्प्लेक्स	BG01	बैंडेड ग्निसिक कॉम्प्लेक्स - बड़े पैमाने पर, खराब रूप से फ्रैक्चर	एज़ोइक	0.3	0.2	0.4
53	नाइस	GN01	अपरिष्कृत मेटासेडिमेंट्रीज़/अविभेदित मेटामॉर्फिक - अपक्षयित, संयुक्त	एज़ोइक से प्रोटेरोज़ोइक	1.5	1	2
54	नाइस	GN01	अपरिष्कृत मेटासेडिमेंट्रीज़ / अविभाजित मेटामॉर्फिक - विशाल, बुरी तरह से टूटा हुआ	एज़ोइक से प्रोटेरोज़ोइक	0.3	0.2	0.4
55	नाइस	GN02	जिनिस - वेदरेड, जॉइंटेड	एज़ोइक से प्रोटेरोज़ोइक	3	2	4
56	नाइस	GN02	गनीस - भारी, खराब खंडित	एज़ोइक से प्रोटेरोज़ोइक	0.3	0.2	0.4
57	नाइस	GN03	मिग्मैटिक नीस- अपक्षयित, जॉइंटेड	एज़ोइक	1.5	1	2
58	नाइस	GN03	मिग्मैटिक नीस - विशाल, बुरी तरह से टूटा हुआ	एज़ोइक	0.3	0.2	0.4
59	इण्ट्रूसिव	IN01	मूल चट्टानें (डोलेराइट, एनोरोथोसाइट आदि) - अपक्षयित, जॉइंटेड	प्रोटेरोज़ोइक से सेनोज़ोइक	2	1	3
60	इण्ट्रूसिव	IN01	बेसिक रॉक्स (डोलराइट, एनोरोथोसाइट आदि) - बड़े पैमाने पर, खराब रूप से फ्रैक्चर	प्रोटेरोज़ोइक से सेनोज़ोइक	0.35	0.2	0.5

विशिष्ट उपज के लिए अनुशंसित मानदंड							
अनु क्रमांक	प्रधान जलभृत	प्रमुख जलभृत		आयु	अनुशंसित (%)	न्यूनतम (%)	ज्यादा से ज्यादा (%)
		कोड	नाम				
61	इण्टूसिव	IN02	अल्ट्राबेसिक्स (एपिडियोराइट, ग्रैनोफायर आदि) - अपक्षयित, जॉइंटेड	प्रोटेरोज़ोइक से सेनोज़ोइक	2	1	3
62	इण्टूसिव	IN02	अल्ट्राबेसिक्स (एपिडियोराइट, ग्रैनोफायर आदि) - विशाल, बुरी तरह से टूटा हुआ	प्रोटेरोज़ोइक से सेनोज़ोइक	0.35	0.2	0.5

जल संरक्षण संरचना के लिए अनुशंसित मानदंड
सकल भंडारण का 40% मानसून के दौरान 20% और गैर-मानसून के दौरान 20%

टैंकों और तालाबों के लिए अनुशंसित मानदंड
चूंकि टैंकों और तालाबों से पुनर्भरण की गणना के लिए क्षेत्र अध्ययन पर डेटा बहुत सीमित है, इसलिए यह अनुशंसा की जाती है कि भविष्य के आकलन में भी जीईसी 1997 में अपनाए गए मानदंडों का पालन किया जाए। इसलिए टैंकों और तालाबों से सीपेज के लिए जीईसी-2015 द्वारा अनुशंसित मानदंड 1.4 मिमी दिन / है।

4.2.4 सिंचाई उपयोग के लिए भूजल निष्कर्षण में प्रयुक्त मानदंड

सिंचाई के लिए ब्लॉकवार भूगर्भ जल निकासी की गणना भूगर्भ जल संरचनाओं की संख्या और विभिन्न प्रकार की संरचनाओं की इकाई ड्राफ्ट के आधार पर की गई है। वर्ष 2015, 2016 और 2017 के लिए लघु सिंचाई-2014 की जनगणना से भूजल संरचनाओं की संख्या का डेटा प्राप्त किया गया था। सिंचाई के लिए प्रत्येक मूल्यांकन इकाई में विभिन्न भूजल निकासी संरचनाओं का यूनिट ड्राफ्ट क्षेत्र में कुएं के निर्वहन, पम्पिंग घंटे, चलने के घंटों की संख्या, मानसून और गैर-मानसून मौसम के दौरान दिनों को ध्यान में रखते हुए निर्धारित किया गया था ।यूनिट ड्राफ्ट को फसल की पानी की आवश्यकता और सिंचित क्षेत्र के डेल्टा कारक के साथ भी मान्य किया गया है । निजी उथले नलकूप (**P.S.**), निजी गहरे नलकूप (**P.T.W.**) राज्य नलकूप (**S.T.W**) मुख्य अमूर्त संरचनाएं हैं, जिनका उपयोग राज्य में सिंचाई के लिए किया जाता है ।

तालिका:4 सिंचाई से पुनर्भरण के लिए अनुशंसित मानक

सिंचाई से रिचार्ज के लिए अनुशंसित मानदंड				
डीटीडबल्यू(एमबीजीएल)	भूजल		ऊपरी तह का पानी	
	धान	गैर धान	धान	गैर धान
<=10	45	25	50	30
11	43.3	23.7	48.3	28.7
12	41.7	22.3	46.7	27.3
13	40	21	45	26
14	38.3	19.7	43.3	24.7
15	36.7	18.3	41.7	23.3
16	35	17	40	22
17	33.3	15.7	38.3	20.7
18	31.7	14.3	36.7	19.3
19	30	13	35	18
20	28.3	11.7	33.3	16.7
21	26.7	10.3	31.7	15.3
22	25	9	30	14
23	23.3	7.7	28.3	12.7
24	21.7	6.3	26.7	11.3
>=25	20	5	25	10

तालिका: 5 नहरों के कारण पुनर्भरण के लिए अनुशंसित मानदंड

गठन	नहर रिसाव कारक हैम/दिन/मिलियन वर्ग मीटर गीला क्षेत्र		
	अनुशंसित	न्यूनतम	अधिकतम
बालू के साथ कुछ मिट्टी की मात्रा के साथ सामान्य मिट्टी में बिना लाइन वाली नहरें	17.5	15	20
रेतीली मिट्टी में कुछ सिल्ट की मात्रा वाली बिना लाइन वाली नहरें	27.5	25	30
बालू के साथ कुछ मिट्टी की मात्रा के साथ सामान्य मिट्टी में पंक्तिबद्ध नहरें	3.5	3	4
रेतीली मिट्टी में कुछ गाद की मात्रा वाली नहरें	5.5	5	6
हार्ड रॉक क्षेत्र में सभी नहरें	3.5	3	4

5.0 उत्तर प्रदेश में भूजल संसाधनों की गणना

5.1. गतिशील भूजल संसाधन मूल्यांकन की मुख्य विशेषताएं और मूल्यांकन का वर्ष

भूजल आकलन समिति (जीईसी 2015) द्वारा अनुशंसित पद्धति के आधार पर भूजल संसाधनों का आकलन किया गया है। भूजल संसाधनों के आकलन के लिए आधार वर्ष 2022-23 है और 31.03.2023 तक वर्षा, भूजल संरचनाओं, नहरों, तालाबों आदि के आंकड़े एकत्र किए जाते हैं। जल स्तर के आंकड़ों का उपयोग 2018 से 2022 तक किया जाता है।

मूल्यांकन इकाई

प्रशासनिक ब्लॉक को मूल्यांकन इकाई माना गया है। गैर-कमांड क्षेत्र की कमी के कारण यूनिट को कमांड क्षेत्र माना जाता है। राज्य के सभी 836 मूल्यांकन इकाइयों (826 ब्लॉक और दस लाख से अधिक आबादी वाले 10 शहरी क्षेत्र) के लिए भूजल संसाधनों की गणना की गई है

5.2. वर्षा की गणना के लिए अपनाई गई उप-इकाई-वार विधि

विभिन्न मापदंडों की गणना के लिए निम्नलिखित उप-इकाइयों को ध्यान में रखा जाता है

(ए) पहाड़ी क्षेत्र

भूजल पुनर्भरण गणना के लिए 20% से अधिक ढलान वाले क्षेत्र को बाहर रखा गया है।

(बी) खराब भूजल गुणवत्ता क्षेत्र

भूजल संसाधनों की गणना के लिए राज्य में खराब गुणवत्ता का कोई स्पष्ट सीमांकित क्षेत्र नहीं है। इसके अलावा भूजल संरचना के सांख्यिकीय आंकड़े भी उपलब्ध नहीं हैं। इसलिए संसाधन आकलन के लिए इस इकाई पर विचार नहीं किया गया है।

(सी) कमांड क्षेत्र और गैर-कमांड क्षेत्र

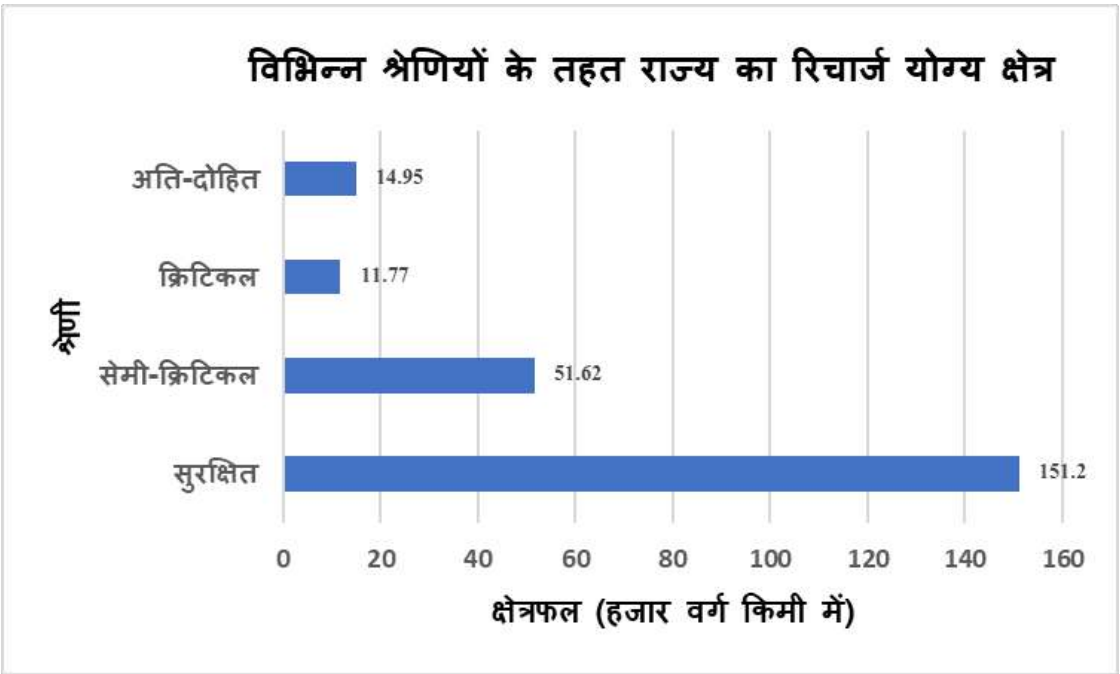
पद्धति में, यह अनुशंसा की जाती है कि कमांड और गैर-कमांड क्षेत्र के लिए गतिशील भूजल संसाधन आकलन किया जाना चाहिए। चूंकि गैर-कमांड क्षेत्र के आँकड़े उपलब्ध नहीं है इसलिए संपूर्ण मूल्यांकन इकाई को कमांड क्षेत्र माना जाता है। ब्लॉक-वार/शहरी क्षेत्र, कुल भौगोलिक क्षेत्र, पहाड़ी क्षेत्र, कमांड क्षेत्र, गैर-कमांड क्षेत्र और भू-पुनर्भरण के योग्य क्षेत्र अनुलग्नक में दिए गए हैं जबकि जिला-वार भौगोलिक क्षेत्र, पहाड़ी क्षेत्र, कमांड क्षेत्र और ग्राउंड रिचार्ज योग्य क्षेत्र तालिका में दिखाया गया है।

तालिका:6 विभिन्न श्रेणियों के तहत उत्तर प्रदेश का जिलावार रिचार्ज योग्य क्षेत्र

क्रम सं	जिला	मूल्यांकित इकाइयों का कुल पुनर्भरण योग्य क्षेत्र (वर्ग कि.मी. में)	सुरक्षित		सेमी-क्रिटिकल		क्रिटिकल		अति-दोहित	
			मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (वर्ग किमी में)	%	मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (इंसक्यू किमी)	%	मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (वर्ग किमी में)	%	मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (वर्ग किमी में)	%
1	ललितपुर	3819.42	-	-	3819.42	100	-	-	-	-
2	आगरा	3947.17	-	-	1427.26	36.16	279.46	7.08	2240.45	56.76
3	अलीगढ़	3808.43	1471.8	38.65	1932.29	50.74	246.37	6.47	157.97	4.15
4	अम्बेडकर नगर	2458.98	2158.67	87.79	300.31	12.21	-	-	-	-
5	अमेठी	2329.92	2228.16	95.63	101.76	4.37	-	-	-	-
6	अमरोहा	2149.03	-	-	1078.66	50.19	720.65	33.53	349.72	16.27
7	औरैया	2094.27	2094.27	100	-	-	-	-	-	-
8	अयोध्या	2522.01	2522.01	100	-	-	-	-	-	-
9	आजमगढ़	4171.19	4171.19	100	-	-	-	-	-	-
10	बागपत	1351.39	-	-	692.82	51.27	-	-	658.57	48.73
11	बहराइच	4387.25	4387.25	100	-	-	-	-	-	-
12	बलिया	2927	2927	100	-	-	-	-	-	-
13	बलरामपुर	3348.57	3348.57	100	-	-	-	-	-	-
14	बाँदा	4404.6	2159.49	49.03	2245.11	50.97	-	-	-	-
15	बाराबंकी	3891.32	3891.32	100	-	-	-	-	-	-
16	बरेली	4120	3244.34	78.75	742.83	18.03	-	-	132.83	3.22
17	बस्ती	2938.07	2938.07	100	-	-	-	-	-	-
18	बिजनौर	4589.03	2809.11	61.21	1398.84	30.48	381.08	8.3	-	-
19	बदायूं	4237.88	1372.45	32.39	1854.39	43.76	489.02	11.54	522.02	12.32
20	बुलंदशहर	3609.47	152.46	4.22	1258.17	34.86	1002.49	27.77	1196.35	33.14
21	चंदौली	1884.69	1884.69	100	-	-	-	-	-	-
22	चित्रकूट	3006.65	1041.84	34.65	1410.8	46.92	554.01	18.43	-	-
23	देवरिया	2538	2538	100	-	-	-	-	-	-
24	एटा	2427.57	869.07	35.8	1558.5	64.2	-	-	-	-
25	इटावा	2403.01	2403.01	100	-	-	-	-	-	-

क्रम सं	जिला	मूल्यांकित इकाइयों का कुल पुनर्भरण योग्य क्षेत्र (वर्ग कि.मी. में)	सुरक्षित		सेमी-क्रिटिकल		क्रिटिकल		अति-दोहित	
			मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (वर्ग किमी में)	%	मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (इंसक्यू किमी)	%	मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (वर्ग किमी में)	%	मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (वर्ग किमी में)	%
26	फर्रुखाबाद	2206.23	1063.82	48.22	1142.41	51.78	-	-	-	-
27	फतेहपुर	4252.55	2270.83	53.4	1637.54	38.51	-	-	344.18	8.09
28	फिरोजाबाद	2419.53	-	-	891.92	36.86	202.61	8.37	1325	54.76
29	गौतमबुद्ध नगर	1442.73	-	-	473.82	32.84	636.66	44.13	332.25	23.03
30	गाज़ियाबाद	1169.14	-	-	228.16	19.52	-	-	940.98	80.48
31	गाजीपुर	3300.52	3082.02	93.38	218.5	6.62	-	-	-	-
32	गोंडा	3996.09	3996.09	100	-	-	-	-	-	-
33	गोरखपुर	3210.87	3210.87	100	-	-	-	-	-	-
34	हमीरपुर	3815.4	2718.29	71.25	1097.11	28.75	-	-	-	-
35	हापुड़	1144.81	-	-	238.01	20.79	560.55	48.96	346.25	30.25
36	हरदोई	5948.43	5948.43	100	-	-	-	-	-	-
37	हाथरस	1837.99	327.4	17.81	556.14	30.26	272.77	14.84	681.68	37.09
38	जालौन	4565.83	4565.83	100	-	-	-	-	-	-
39	जौनपुर	3990.94	2522.77	63.21	1072.14	26.86	396.03	9.92	-	-
40	झांसी	4619.37	2644.95	57.26	1974.42	42.74	-	-	-	-
41	कन्नौज	2143.46	996.35	46.48	468.08	21.84	305.17	14.24	373.86	17.44
42	कानपुर देहात	3237.37	943.68	29.15	2293.69	70.85	-	-	-	-
43	कानपुर नगर	3094.83	695.86	22.48	1905.53	61.57	493.44	15.94	-	-
44	कासगंज	1993.88	1342.45	67.33	651.43	32.67	-	-	-	-
45	कौशाम्बी	1780.01	484.65	27.23	1015.97	57.08	-	-	279.39	15.7
46	कुशीनगर	2873.78	2873.78	100	-	-	-	-	-	-
47	लखीमपुर खीरी	6555.05	6555.05	100	-	-	-	-	-	-
48	लखनऊ	2452.86	2142.76	87.36	-	-	-	-	310.1	12.64
49	महोबा	2293.41	-	-	1417.74	61.82	-	-	875.67	38.18
50	महाराजगंज	2477.6	2477.6	100	-	-	-	-	-	-
51	मैनपुरी	2760.72	1944.47	70.43	605.9	21.95	-	-	210.35	7.62

क्रम सं	जिला	मूल्यांकित इकाइयों का कुल पुनर्भरण योग्य क्षेत्र (वर्ग कि.मी. में)	सुरक्षित		सेमी-क्रिटिकल		क्रिटिकल		अति-दोहित	
			मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (वर्ग किमी में)	%	मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (इंसक्यू किमी)	%	मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (वर्ग किमी में)	%	मूल्यांकित इकाइयों का पुनर्भरण योग्य क्षेत्र (वर्ग किमी में)	%
52	मथुरा	3360.78	2345.15	69.78	-	-	674.24	20.06	341.39	10.16
53	मऊ	1716.24	1716.24	100	-	-	-	-	-	-
54	मेरठ	2810.49	726.68	25.86	1457.45	51.86	381.47	13.57	244.89	8.71
55	मिर्जापुर	2954.37	2137.01	72.33	603.47	20.43	117.19	3.97	96.7	3.27
56	मुरादाबाद	2249.44	317.95	14.13	1585.16	70.47	269.08	11.96	77.25	3.43
57	मुजफ्फरनगर	2756.66	1469.32	53.3	468.39	16.99	580.22	21.05	238.73	8.66
58	पीलीभीत	3369.59	3369.59	100	-	-	-	-	-	-
59	प्रतापगढ़	3717.43	976.01	26.25	1782.15	47.94	959.27	25.8	-	-
60	प्रयागराज	4996.3	3144.72	62.94	1365.85	27.34	313.9	6.28	171.83	3.44
61	रायबरेली	3924.58	3924.58	100	-	-	-	-	-	-
62	रामपुर	2297.9	522.51	22.74	1775.39	77.26	-	-	-	-
63	सहारनपुर	3689.41	260.96	7.07	2067.9	56.05	-	-	1360.55	36.88
64	संभल	2415.2	304.73	12.62	868.27	35.95	1242.2	51.43	-	-
65	संत कबीर नगर	1646.99	1646.99	100	-	-	-	-	-	-
66	संत रविदास नगर	983.05	-	-	983.05	100	-	-	-	-
67	शाहजहांपुर	4581.31	4581.31	100	-	-	-	-	-	-
68	शामली	1361.26	-	-	234.4	17.22	503.29	36.97	623.57	45.81
69	श्रावस्ती	1857.82	1857.82	100	-	-	-	-	-	-
70	सिद्धार्थ नागर	2895.03	2895.03	100	-	-	-	-	-	-
71	सीतापुर	5746.95	5746.95	100	-	-	-	-	-	-
72	सोनभद्र	2414.59	2231.52	92.42	183.07	7.58	-	-	-	-
73	सुल्तानपुर	2653.81	2653.81	100	-	-	-	-	-	-
74	उन्नाव	4602.34	4602.34	100	-	-	-	-	-	-
75	वाराणसी	1605.32	353.7	22.03	536.03	33.39	195.99	12.21	519.6	32.37
	कुल	229555.18	151205	65.87	51620	22.49	11777	5.13	14952	6.51



चित्र 6: विभिन्न श्रेणियों के तहत राज्य का रिचार्ज योग्य क्षेत्र

5.3 उत्तर प्रदेश के गतिशील भूजल संसाधन

अध्याय-4 में वर्णित पद्धति एवं मानकों के अनुसार उत्तर प्रदेश के गतिशील भू-जल संसाधनों की गणना की गई है। मूल्यांकन इकाई वार (ब्लॉक/शहरी) विवरण अनुलग्नक IV व V में प्रदान किया गया है। संगणना की मुख्य विशेषताएं नीचे दी गई हैं।

5.3.1. वर्षा से पुनर्भरण

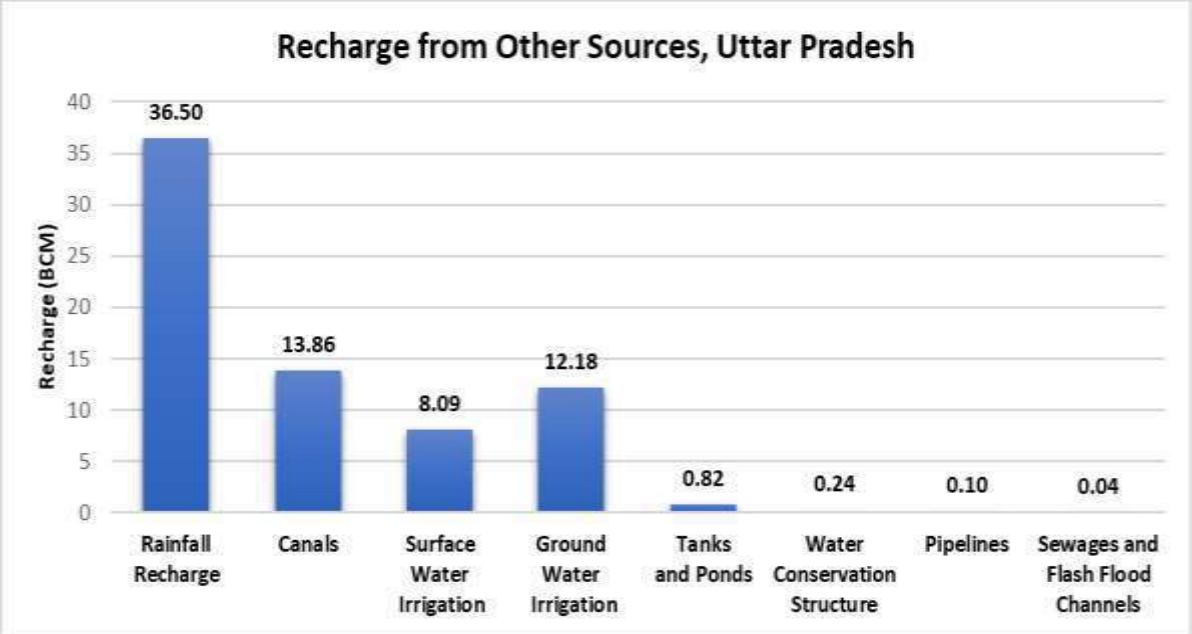
वर्षा से पुनर्भरण मुख्य रूप से जिले के भौगोलिक क्षेत्र, सामान्य मानसून वर्षा और क्षेत्र की लिथोलॉजी पर निर्भर करती है। वर्षा से पुनर्भरण की गणना मानसून और गैर-मानसून अवधि के लिए अलग-अलग की गई है। मानसून के मौसम के दौरान वर्षा से पुनर्भरण की गणना मुख्य रूप से वाटर लेवल fluctuation विधि का उपयोग करके की गई है, जबकि गैर-मानसून अवधि के दौरान वर्षा से पुनर्भरण की गणना वर्षा infiltration विधि का उपयोग करके की गई है। मूल्यांकन इकाई वार मानसून वर्षा पुनर्भरण और गैर-मानसून वर्षा पुनर्भरण का विवरण अनुलग्नक IV में दिया गया है। वर्षा से जिलावार पुनर्भरण संबंधित जिलों के मूल्यांकन वार आंकड़ों को जोड़कर तालिका-1 में दिया गया है। राज्य में वर्षा से कुल रिचार्ज 3650463 हेक्टेयर मीटर का है जिसमें लखीमपुर जिले का सर्वाधिक रिचार्ज 142854 हेक्टेयर मीटर और महोबा जिले का न्यूनतम रिचार्ज 9564.34 हेक्टेयर मीटर का है।

5.3.2. अन्य स्रोतों से रिचार्ज

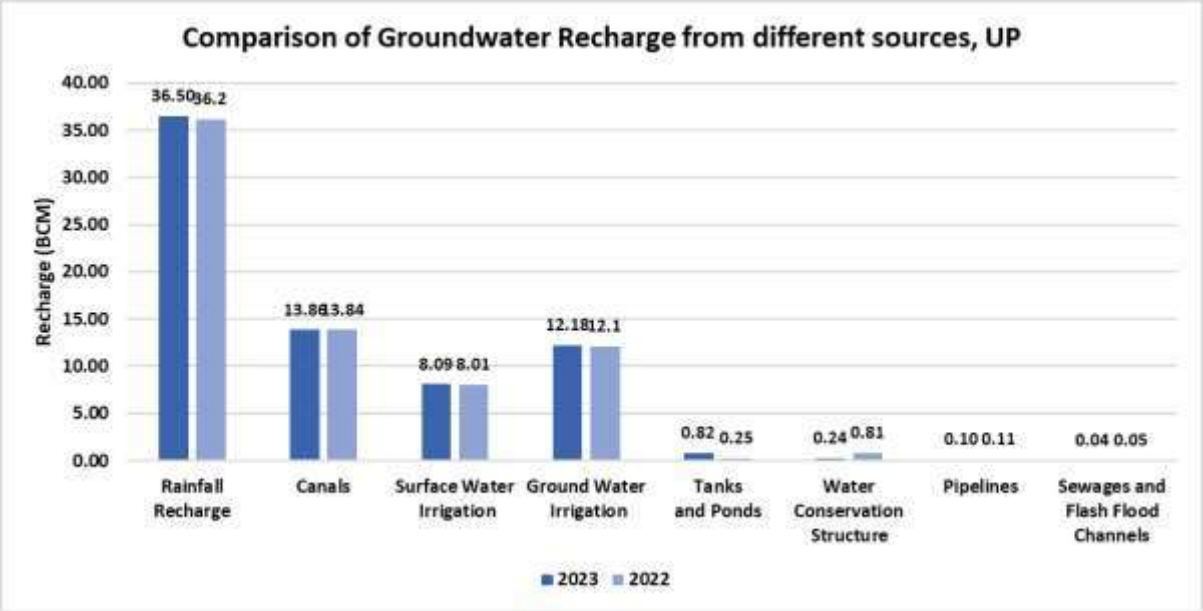
भूजल के कुल पुनर्भरण के कई घटक हैं, जिनमें वर्षा प्रमुख है। अन्य घटकों में नहरों से रिसाव, सतही जल सिंचाई से वापसी प्रवाह, भूजल सिंचाई से वापसी प्रवाह, टैंकों और तालाबों से रिसाव शामिल हैं। अन्य स्रोतों से मूल्यांकन इकाइयों का पुनर्भरण अनुलग्नक -IV में दिया गया है। अन्य स्रोतों से कुल भूजल पुनर्भरण 35.3 बीसीएम अनुमानित है।

5.3.3. सभी स्रोतों से रिचार्ज

वर्षा पुनर्भरण और अन्य स्रोतों से पुनर्भरण सहित कुल पुनःपूर्ति योग्य भूजल संसाधनों की गणना मूल्यांकन इकाई के आधार पर और संबंधित जिलों के मूल्यांकन इकाई के आंकड़ों को जोड़कर की गई है जो क्रमशः अनुलग्नक और तालिका में प्रस्तुत किया गया है।



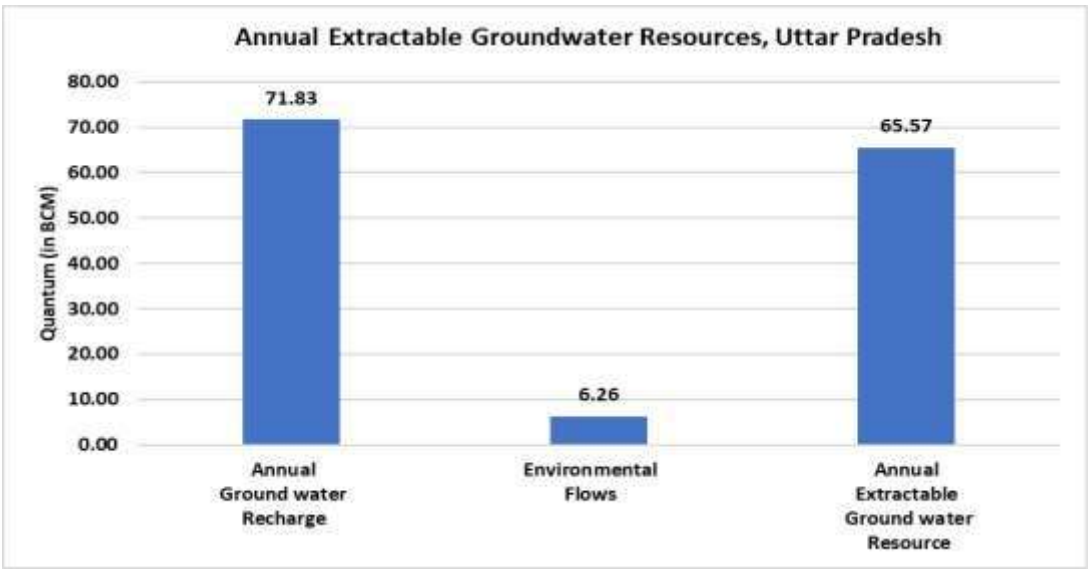
चित्र 7: विभिन्न स्रोतों से भूजल पुनर्भरण, उत्तर प्रदेश

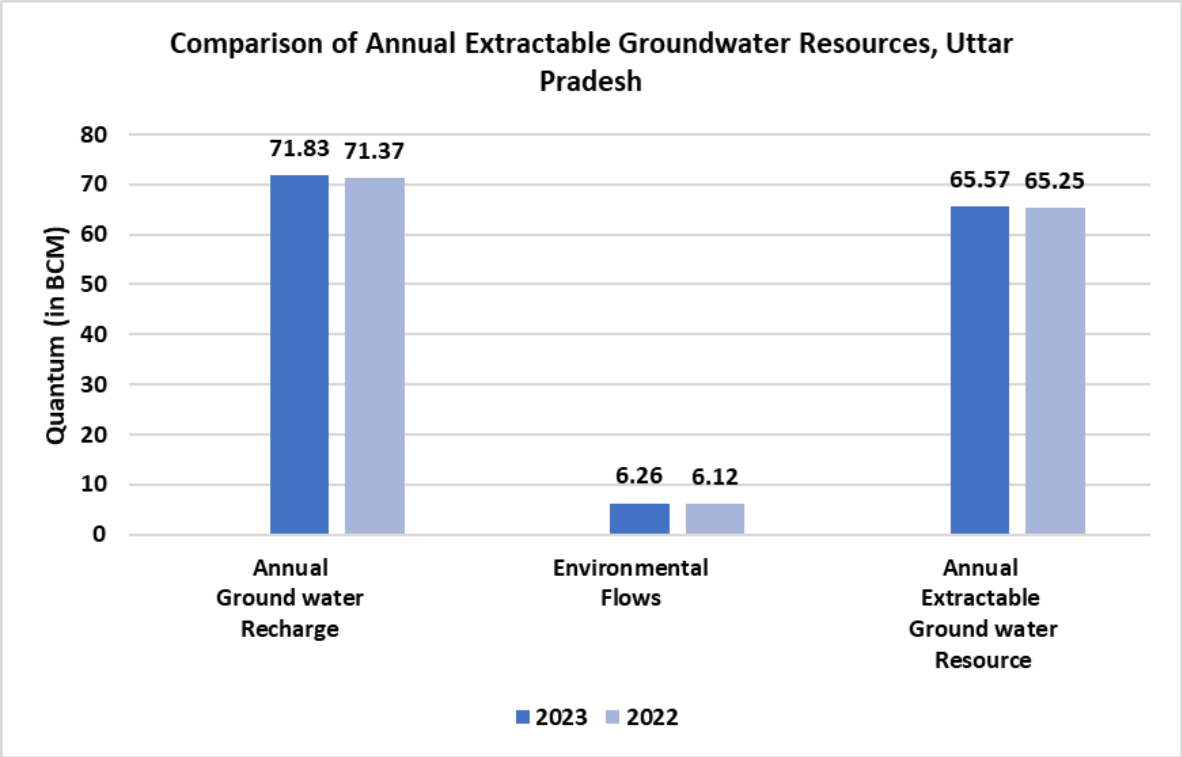


चित्र 8: GWRE-2022 और GWRE-2023 में विभिन्न स्रोतों से GW रिचार्ज की तुलना

5.3.4. अनअकाउंटेड प्राकृतिक निर्वहन और वार्षिक निकालने योग्य भूजल संसाधन

क्षेत्र का कुल वार्षिक भूजल पुनर्भरण मानसून और गैर-मानसून पुनर्भरण का योग है। वार्षिक भूजल पुनर्भरण से प्राकृतिक निर्वहन हेतु 5% से 10% तक आवंटन किया गया है। चूंकि मानसून के मौसम में वर्षा पुनर्भरण की गणना के लिए डब्ल्यूएलएफ ((WLF) और आरआईएफ (RIF) पद्धति का उपयोग किया जाता है, उपलब्ध शेष भूजल विभिन्न उपयोगों और भविष्य के विकास की क्षमता के लिए मौजूदा शुद्ध भूजल उपलब्धता के लिए शेष है। मूल्यांकन इकाई वार बेहिसाब प्राकृतिक डिस्चार्ज और शुद्ध भूजल उपलब्धता अनुबंध में दी गई है जबकि जिलेवार बेहिसाब प्राकृतिक डिस्चार्ज और शुद्ध भूजल उपलब्धता तालिका में दी गई है।

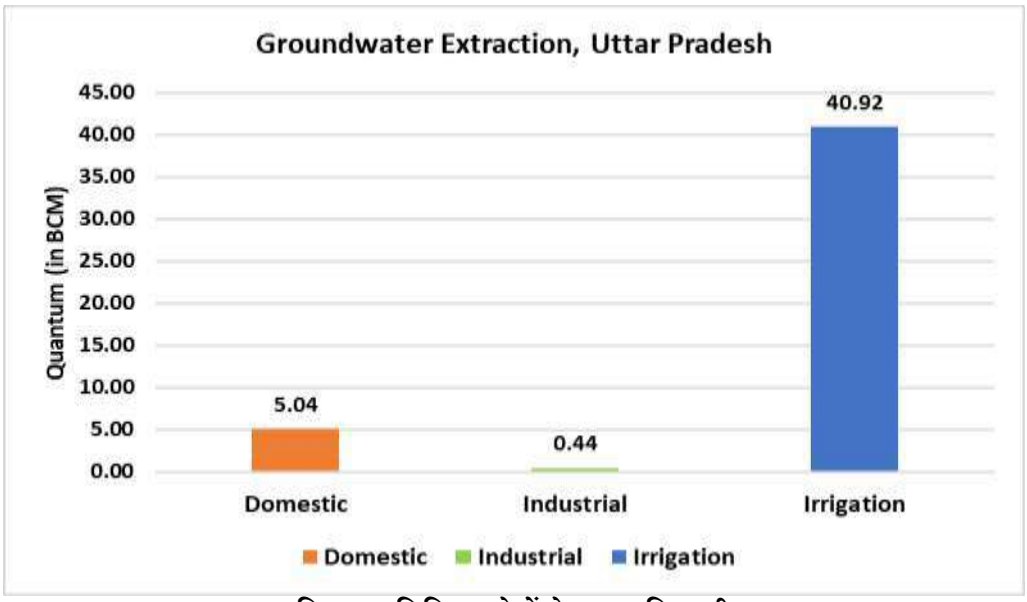




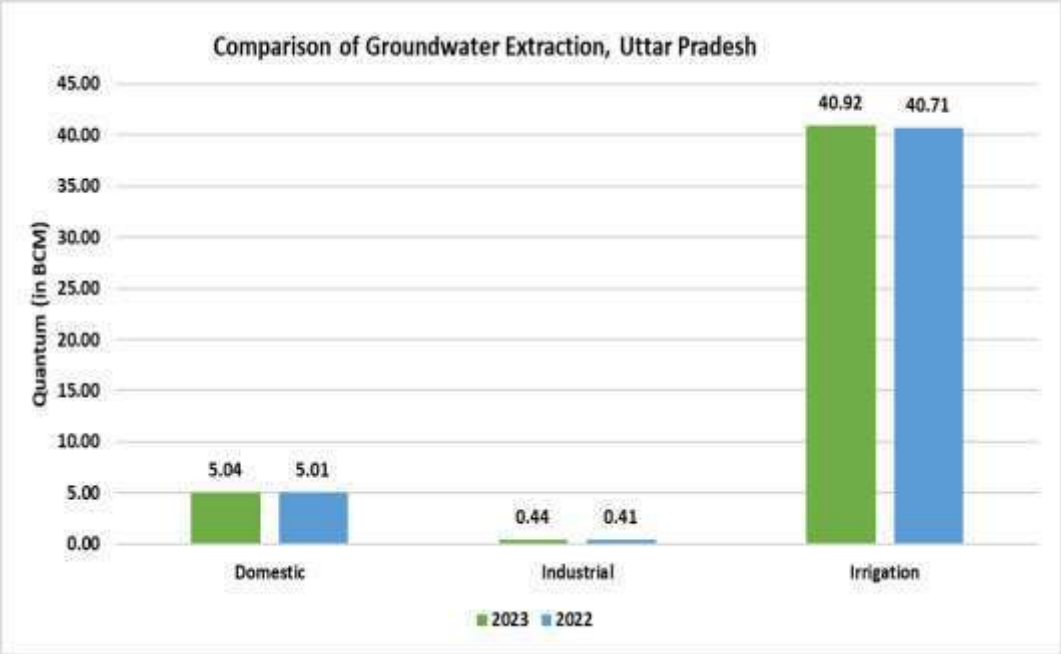
चित्र 9: वार्षिक निकालने योग्य भूजल संसाधन और GWRE-2022 के साथ तुलना

5.3.5. विभिन्न उपयोगों के लिए भूजल निष्कर्षण

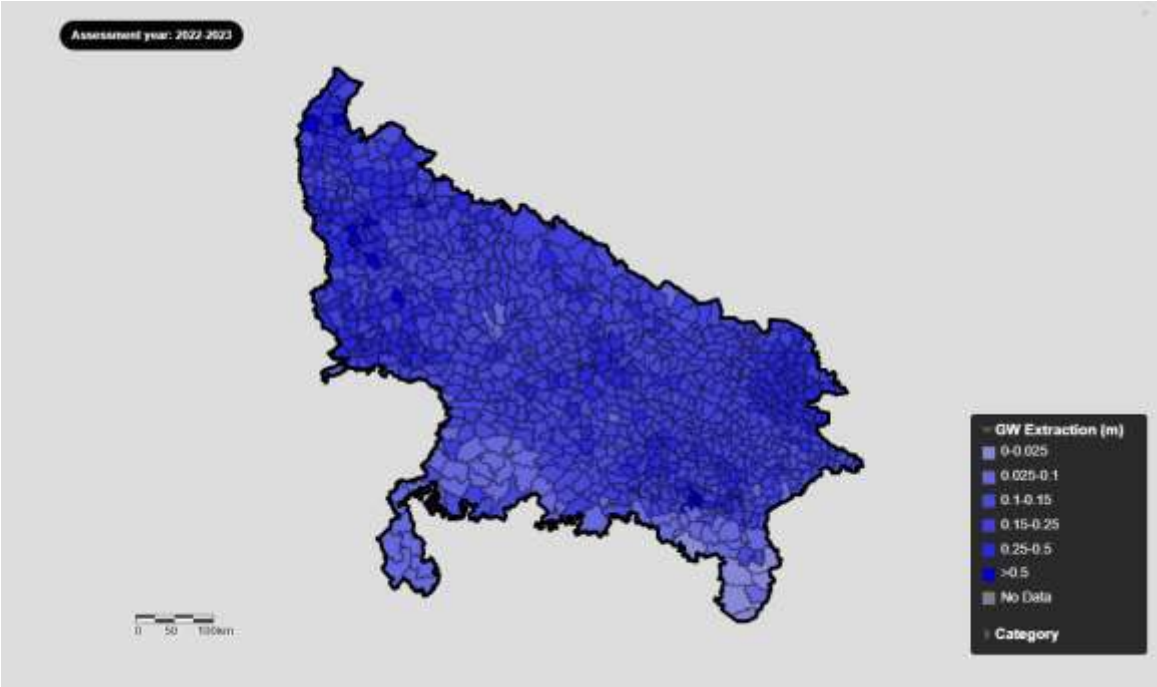
विभिन्न उपयोगों के लिए भूजल निकासी की गणना की गई है और मूल्यांकन इकाई वार भूजल का विवरण अनुबंध में दिया गया है। जिलेवार भूजल निकासी के आंकड़े भी संकलित किए गए हैं और तालिका में दिए गए हैं।



चित्र 10: विभिन्न स्रोतों से भूजल निकासी



चित्र 11: 2022 और 2023 के बीच भूजल निकासी की तुलना



चित्र 12: भूजल निष्कर्षण (मीटर) (INGRES)

तालिका: 7 विभिन्न श्रेणियों के अंतर्गत उत्तर प्रदेश के जिलेवार कुल वार्षिक निष्कर्षणीय संसाधन

उत्तर प्रदेश										
क्रसं	जिला	मूल्यांकन इकाइयों का कुल वार्षिक निकालने योग्य संसाधन (एमसीएम में)	सुरक्षित		सेमी-क्रिटिकल		क्रिटिकल		अति-दोहित	
			वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%
1	ललितपुर	367.67	-	-	367.67	100	-	-	-	-
2	आगरा	809.54	-	-	299.43	36.99	48.8	6.03	461.31	56.98
3	अलीगढ़	902.25	391.5	43.39	435.77	48.3	56.92	6.31	18.06	2
4	अंबेडकर नगर	717.95	636.91	88.71	81.04	11.29	-	-	-	-
5	अमेठी	798.21	763.91	95.7	34.3	4.3	-	-	-	-
6	अमरोहा	733.66	-	-	393.32	53.61	233.85	31.87	106.49	14.51
7	औरैया	597.85	597.85	100	-	-	-	-	-	-
8	अयोध्या	844.3	844.3	100	-	-	-	-	-	-
9	आजमगढ़	1230.33	1230.33	100	-	-	-	-	-	-
10	बागपत	335.51	-	-	191.87	57.19	-	-	143.63	42.81
11	बहराइच	1342.57	1342.57	100	-	-	-	-	-	-
12	बलिया	835.12	835.12	100	-	-	-	-	-	-
13	बलरामपुर	841.12	841.12	100	-	-	-	-	-	-
14	बाँदा	664.36	367.5	55.32	296.86	44.68	-	-	-	-
15	बाराबंकी	1827.65	1827.65	100	-	-	-	-	-	-
16	बरेली	1136.15	915.16	80.55	200.96	17.69	-	-	20.03	1.76
17	बस्ती	754.4	754.4	100	-	-	-	-	-	-
18	बिजनौर	1334.41	756.92	56.72	463.85	34.76	113.64	8.52	-	-
19	बदायूँ	765.99	240.29	31.37	338.45	44.18	94.63	12.35	92.62	12.09
20	बुलंदशहर	1450.63	92.95	6.41	560.49	38.64	343.11	23.65	454.07	31.3
21	चंदौली	506.75	506.75	100	-	-	-	-	-	-

उत्तर प्रदेश										
क्रसं	जिला	मूल्यांकन इकाइयों का कुल वार्षिक निकालने योग्य संसाधन (एमसीएम में)	सुरक्षित		सेमी-क्रिटिकल		क्रिटिकल		अति-दोहित	
			वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%
22	चित्रकूट	402.3	93.95	23.35	201.53	50.1	106.81	26.8	-	-
23	देवरिया	1336.15	1336.15	100	-	-	-	-	-	-
24	एटा	755.18	273.99	36.28	481.19	63.72	-	7.59	-	-
25	इटावा	646.1	646.1	100	-	-	-	-	-	-
26	फर्रुखाबाद	401.83	195.71	48.71	206.11	51.29	-	-	-	-
27	फतेहपुर	1039.93	562.84	54.12	361.73	34.78	-	-	115.37	11.09
28	फिरोजाबाद	725.45	-	-	348.7	48.07	57.75	7.97	319	43.97
29	जीबी नगर	471.78	-	-	100.06	21.21	254.58	54.4	117.15	24.83
30	गाज़ियाबाद	375.08	-	-	119.27	31.8	-	-	255.81	68.2
31	गाजीपुर	949.32	884.13	93.13	65.19	6.87	-	-	-	-
32	गोंडा	1108.72	1108.72	100	-	-	-	-	-	-
33	गोरखपुर	1553.92	1553.92	100	-	-	-	-	-	-
34	हमीरपुर	407.54	285.26	70	122.28	30	-	-	-	-
35	हापुड़	459.56	-	-	83.75	18.22	212.46	43.5	163.35	35.54
36	हरदोई	1583.12	1583.12	100	-	-	-	-	-	-
37	हाथरस	652.61	158.73	24.32	241.6	37.02	76.49	34.6	175.78	26.94
38	जालौन	941.87	941.87	100	-	-	-	-	-	-
39	जौनपुर	1178.23	755.01	64.08	313.9	26.64	109.32	7.95	-	-
40	झांसी	646.58	405.19	62.67	241.38	37.33	-	-	-	-
41	कन्नौज	548.46	330.66	60.29	102.75	18.73	43.71	8.77	71.35	13.01
42	कानपुर देहात	732.12	184.47	25.2	547.65	74.8	-	-	-	-
43	कानपुर नगर	797.91	211.35	26.49	452.58	56.72	133.98	16.6	-	-

उत्तर प्रदेश										
क्रसं	जिला	मूल्यांकन इकाइयों का कुल वार्षिक निकालने योग्य संसाधन (एमसीएम में)	सुरक्षित		सेमी-क्रिटिकल		क्रिटिकल		अति-दोहित	
			वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%
44	कासगंज	690.42	445.6	64.54	244.81	35.46	-	-	-	-
45	कौशाम्बी	447.42	132.95	29.72	249.39	55.74	-	-	65.07	14.54
46	कुशी नगर	1550.94	1550.94	100	-	-	-	-	-	-
47	लखीमपुर खीरी	2100.3	2100.3	100	-	-	-	-	-	-
48	लखनऊ	734.9	659.43	89.73	-	-	-	-	75.46	10.27
49	महोबा	279.58	-	-	171.45	61.33	-	-	108.13	38.67
50	महाराजगंज	1022.54	1022.54	100	-	-	-	-	-	-
51	मैनपुरी	839.33	614.65	73.23	180.39	21.49	-	-	44.29	5.28
52	मथुरा	1267.6	901.84	71.15	-	-	227.67	17.96	138.08	10.89
53	मऊ	466.3	466.3	100	-	-	-	-	-	-
54	मेरठ	754.03	244.68	32.45	409.18	54.27	82.65	10.96	17.52	2.32
55	मिर्जापुर	557.8	401.46	71.97	111.43	19.98	30.75	5.51	14.16	2.54
56	मुरादाबाद	603	98.12	16.27	436.56	72.4	51.76	8.58	16.56	2.75
57	मुजफ्फरनगर	1042.01	644.97	61.9	137.33	13.18	166.64	15.99	93.08	8.93
58	पीलीभीत	1036.95	1036.95	100	-	-	-	-	-	-
59	प्रतापगढ़	1264.22	381.07	30.14	575.84	45.55	307.31	24.31	-	-
60	प्रयागराज	1284.22	766.97	59.72	413.42	32.19	80.48	6.27	23.34	1.82
61	राय बरेली	1118.25	1118.25	100	-	-	-	-	-	-
62	रामपुर	703.36	231.56	32.92	471.8	67.08	-	-	-	-
63	सहारनपुर	1312.72	115.29	8.78	701.72	53.46	-	-	495.71	37.76
64	संभल	432.67	58.9	13.61	157.55	36.41	216.22	49.97	-	-
65	संत कबीर नगर	490.8	490.8	100	-	-	-	-	-	-

उत्तर प्रदेश										
क्रसं	जिला	मूल्यांकन इकाइयों का कुल वार्षिक निकालने योग्य संसाधन (एमसीएम में)	सुरक्षित		सेमी-क्रिटिकल		क्रिटिकल		अति-दोहित	
			वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%	वार्षिक निकालने योग्य संसाधन (एमसीएम में)	%
66	संत रविदास नगर	776.69	-	-	776.69	100	-	-	-	-
67	शाहजहांपुर	1240.15	1240.15	100	-	-	-	-	-	-
68	शामली	430.35	-	-	76.8	17.85	177.18	41.17	176.38	40.98
69	श्रावस्ती	515.19	515.19	100	-	-	-	-	-	-
70	सिद्धार्थ नागर	868.77	868.77	100	-	-	-	-	-	-
71	सीतापुर	1821.94	1821.94	100	-	-	-	-	-	-
72	सोनभद्र	518.51	479.64	92.5	38.87	7.5	-	-	-	-
73	सुल्तानपुर	848.4	848.4	100	-	-	-	-	-	-
74	उन्नाव	1562.56	1562.56	100	-	-	-	-	-	-
75	वाराणसी	479.67	124.37	25.93	170.12	35.47	49.67	10.36	135.51	28.25
	कुल	65571.79	45401.02	69.24	12977.06	19.79	3276.41	5	3917.31	5.97

तालिका: 8 विभिन्न उपयोगों के लिए जिलेवार भूजल निकासी और भूजल निकासी के चरण

उत्तर प्रदेश															
क्रमसं	जिला	भूजल पुनर्भरण					कुल प्राकृतिक निर्वहन	वार्षिक निकालने योग्य भूजल संसाधन	वर्तमान वार्षिक भूजल निकासी				2025 तक घरेलू उपयोग के लिए वार्षिक भूजल आवंटन	भविष्य में उपयोग के लिए शुद्ध भूजल उपलब्धता	भूजल निकासी की स्थिति (%)
		मानसून ऋतु		गैर-मानसून ऋतु		कुल वार्षिक भूजल पुनर्भरण			सिंचाई	औद्योगिक	घरेलू	कुल			
		वर्षा से पुनर्भरण	अन्य स्रोतों से पुनर्भरण	वर्षा से पुनर्भरण	अन्य स्रोतों से पुनर्भरण										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	आगरा	37965.83	15903.1	547.66	34875.73	89292.32	8337.83	80954.49	83152.89	164.01	10897.89	94214.78	11662.91	4955.08	116.38
2	अलीगढ़	47244.28	16203.69	1597.97	33398.48	98444.42	8219.29	90225.13	60372.56	512.92	11667.78	72553.24	12629.69	19961.74	80.41
3	अम्बेडकर नगर	51881.73	11826.45	387.87	15293.99	79390.04	7595.04	71795	38897.45	17.7	6304.17	45219.33	6670.83	26209.01	62.98
4	अमेठी	38921.89	20870.39	891.9	26732.36	87416.54	7595.25	79821.29	46499.69	133.04	4942.25	51575	5243.71	27944.83	64.61
5	अमरोहा	58557.15	6256.17	2150.33	13712.52	80676.17	7309.67	73366.5	61661.15	836.58	4812.36	67310.1	5188.02	9285.09	91.75
6	औरैया	27295.04	12563.11	286.67	26283.36	66428.18	6642.82	59785.36	30632.69	8.14	2912.67	33553.51	3041.69	26102.83	56.12
7	अयोध्या	48690.72	15531.38	447.72	29141.53	93811.35	9381.15	84430.2	45657.59	52.58	7117.68	52827.85	7822.51	30897.51	62.57
8	आजमगढ़	72902.71	24631.24	136.21	36650.35	134320.51	11287.49	123033.02	61649.02	7.1	13572.22	75228.33	14836.82	46540.09	61.14
9	बागपत	16395.8	7820.99	945.23	12116.4	37278.42	3727.84	33550.58	30024.02	43.23	2517.99	32585.21	2597.17	3880.84	97.12
10	बहराइच	81662.27	21912.34	2945.77	37261.64	143782.02	9524.66	134257.36	70723.9	131.4	9692.09	80547.41	10470.83	52931.19	59.99
11	बलिया	50141.86	15037.45	1799.62	23585.65	90564.58	7052.25	83512.33	45071.15	9.02	8125.49	53205.63	8772.29	29659.88	63.71
12	बलरामपुर	58790.79	11405.14	1398.21	19472.38	91066.52	6954.6	84111.92	43674.41	284.68	6157.91	50117.01	6750.02	33402.8	59.58
13	बाँदा	49322.1	8712.25	519.8	14079.69	72633.84	6197.71	66436.13	39960.02	0	3962.62	43922.63	4256.96	22219.16	66.11
14	बाराबंकी	69830.08	45243.9	1121.58	85684.29	201879.85	19115.12	182764.73	106367.98	40.06	8968.36	115376.4	9670.51	66686.18	63.13
15	बरेली	70400.18	20081.26	1401.51	31485.65	123368.6	9753.42	113615.18	67591.02	446.44	13333.52	81371.01	14209.9	33754.48	71.62
16	बस्ती	66457.64	4196.25	662.66	11343.53	82660.08	7219.82	75440.26	42819.04	209.08	6484.2	49512.33	6902.14	25509.99	65.63
17	बिजनौर	90559.63	18437.04	3865.7	32456.01	145318.38	11877.85	133440.53	87196.22	790.19	7897.14	95883.56	8345.53	37108.59	71.85
18	शाहजहांपुर	65960.27	6303.44	1631.21	10379.23	84274.15	7675.58	76598.57	55094.37	59.24	8506.12	63659.74	9105.51	14193.96	83.11
19	बुलंदशहर	45581.95	43937.2	1160.71	68903.29	159583.15	14520.38	145062.77	131950.57	0	6678.17	138628.73	6972.13	14719.37	95.56
20	चंदौली	30753.45	16033.36	285.55	9124.28	56196.64	5521.14	50675.5	23197.45	0	4632.21	27829.66	4896.29	22581.76	54.92
21	चित्रकूट	30711.78	5551.8	305.36	7690.59	44259.53	4029.85	40229.68	30537.93	0	2579.95	33117.87	2834.09	6857.67	82.32

उत्तर प्रदेश																
क्रमसं	जिला	भूजल पुनर्भरण					कुल प्राकृतिक निर्वहन	वार्षिक निकालने योग्य भूजल संसाधन	वर्तमान वार्षिक भूजल निकासी				2025 तक घरेलू उपयोग के लिए वार्षिक भूजल आवंटन	भविष्य में उपयोग के लिए शुद्ध भूजल उपलब्धता	भूजल निकासी की स्थिति (%)
		मानसून ऋतु		गैर-मानसून ऋतु		कुल वार्षिक भूजल पुनर्भरण			सिंचाई	औद्योगिक	घरेलू	कुल			
		वर्षा से पुनर्भरण	अन्य स्रोतों से पुनर्भरण	वर्षा से पुनर्भरण	अन्य स्रोतों से पुनर्भरण										
22	देवरिया	49519.33	43812.39	1534.42	50540.84	145406.98	11791.72	133615.26	76152.64	0	7127.65	83280.31	7468.53	49994.07	62.33
23	एटा	27021.27	16466.83	530.17	38333.6	82351.87	6833.9	75517.97	50452.98	25.77	4606.85	55085.61	4840.12	20199.11	72.94
24	इटावा	27469.38	15078.32	313.59	28277.08	71138.37	6528.27	64610.1	29222.45	160.77	3235.19	32618.39	3431.04	31795.86	50.48
25	फर्रुखाबाद	28940.09	3812.64	492.27	11402.25	44647.25	4464.73	40182.52	25807.91	0	3974.18	29782.09	4244.47	10130.14	74.12
26	फतेहपुर	60547.59	21943.4	276.01	32781.18	115548.18	11554.83	103993.35	67962.88	2.02	7339.35	75304.26	7940.09	30474.16	72.41
27	फिरोजाबाद	31384.29	16069.75	449.69	32702.03	80605.76	8060.59	72545.17	69234.6	0.01	6714.68	75949.29	7151.21	9145.73	104.69
28	गौतम बुद्ध नगर	15885.55	14188.32	401.64	21944.93	52420.44	5242.05	47178.39	47888.36	0	1552.14	49440.49	1602.73	2539.6	104.79
29	गाज़ियाबाद	14514.13	10362.64	539.38	16259.15	41675.3	4167.54	37507.76	36881.78	2246.1	7063.48	46191.34	7937.73	1685.94	123.15
30	गाजीपुर	57888.25	17539.52	445.32	28777.51	104650.6	9718.46	94932.14	49221.36	54.3	6905.93	56181.55	7362.55	38293.99	59.18
31	गोंडा	77715.12	15965.74	1186.83	24866.58	119734.27	8862.72	110871.55	56400.31	488.51	9753.15	66641.95	10644.32	43338.44	60.11
32	गोरखपुर	69982.06	66123.77	2046.4	31616.39	169768.62	14376.46	155392.16	87020.02	2111.94	9412.26	98544.26	9998.11	56262.05	63.42
33	हमीरपुर	32528.81	5863.36	84.22	6805.73	45282.12	4528.23	40753.89	25205.23	343.47	2193.8	27742.5	2268.15	12937.05	68.07
34	हापुड़	17763.39	12782.22	647.33	19294.51	50487.45	4531.13	45956.32	45031.95	0	3.39	45035.34	3.56	1638.42	98
35	हरदोई	92431.54	29991.19	2042.14	50035.05	174499.92	16188.22	158311.7	89451.45	76.41	8614	98141.86	9183.18	59600.66	61.99
36	हाथरस	18853.27	19243.38	442.05	32302.38	70841.08	5580.58	65260.5	57057.7	28.64	4146.14	61232.5	4390.96	8780.51	93.83
37	जालौन	65650.98	12105.01	513.29	26382.84	104652.12	10465.23	94186.89	47635.33	7.3	4316.04	51958.68	4509.25	42035.01	55.17
38	जौनपुर	71785.81	20334.77	214.94	37197.96	129533.48	11710.07	117823.41	70450.69	0	13572.02	84022.71	14572.66	32800.07	71.31
39	झांसी	29482.6	17751.38	0	23923.22	71157.2	6499.53	64657.67	40441.47	40.15	3189.47	43671.07	3439.34	20736.74	67.54
40	कन्नौज	26050.71	10464.77	675.64	23749.33	60940.45	6094.06	54846.39	36787.93	15.79	4396.49	41200.25	4685.36	18773.43	75.12
41	कानपुर देहात	41564.56	12556.86	684.58	25768.47	80574.47	7362.04	73212.43	49810.86	402.82	4049.65	54263.34	4202.93	18795.8	74.12
42	कानपुर नगर	42677.77	13990.1	918.52	29910.55	87496.94	7705.5	79791.44	53988.75	385.67	7992.27	62366.66	8284.77	17132.27	78.16
43	कासगंज	28888.68	13193.69	557.66	32700.42	75340.45	6298.9	69041.55	42702.47	3.65	4000.13	46706.23	4325.08	22010.37	67.65
44	कौशाम्बी	29840.98	7611.03	271.18	11989.62	49712.81	4971.3	44741.51	32025	0	4540.43	36565.42	4995.9	9145.56	81.73
45	कुशीनगर	46718.28	69136.54	2263.39	54208.55	172326.76	17232.7	155094.06	69450.17	1237.54	8689.64	79377.32	9454.67	74951.72	51.18

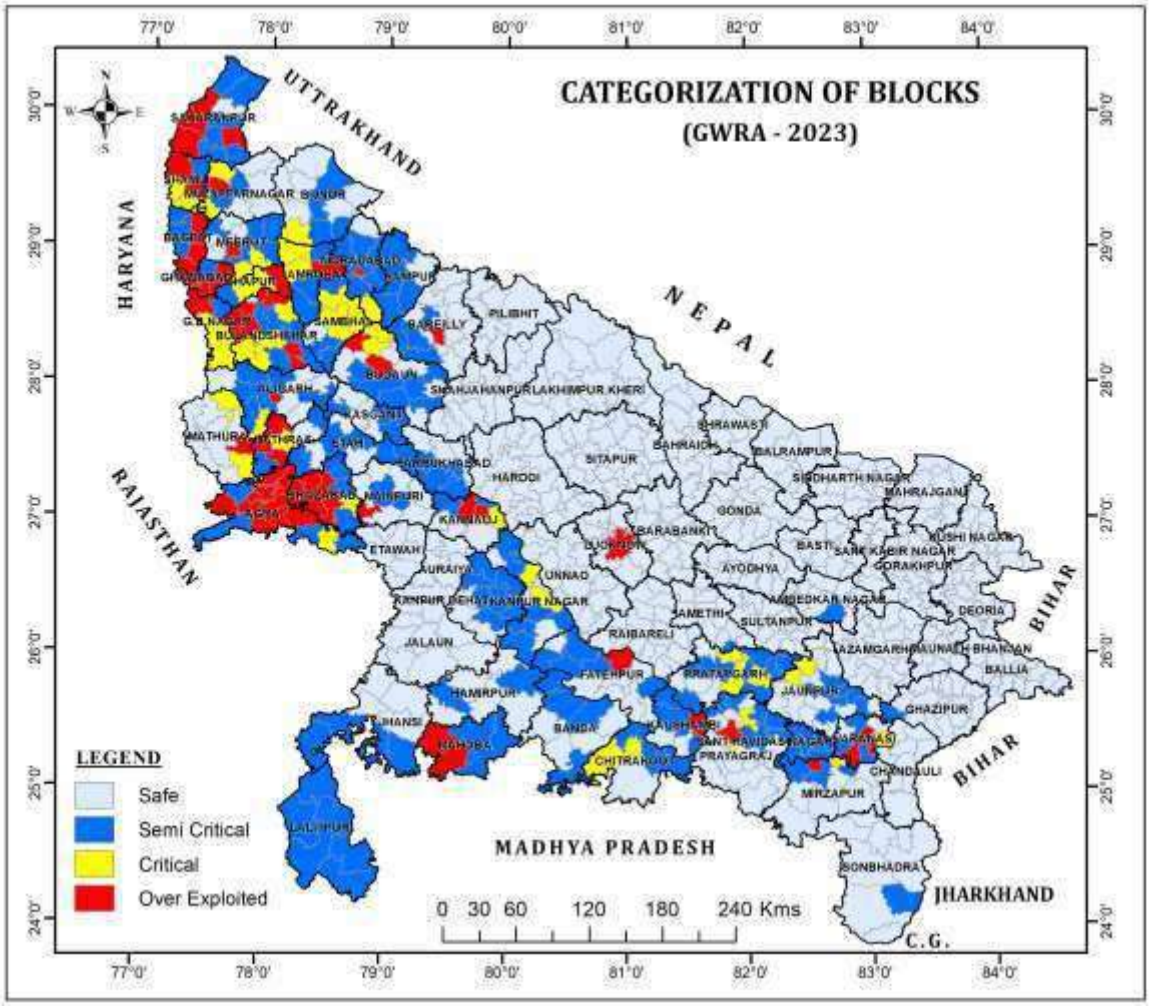
उत्तर प्रदेश																
क्रमसं	जिला	भूजल पुनर्भरण					कुल प्राकृतिक निर्वहन	वार्षिक निकालने योग्य भूजल संसाधन	वर्तमान वार्षिक भूजल निकासी				2025 तक घरेलू उपयोग के लिए वार्षिक भूजल आवंटन	भविष्य में उपयोग के लिए शुद्ध भूजल उपलब्धता	भूजल निकासी की स्थिति (%)
		मानसून ऋतु		गैर-मानसून ऋतु		कुल वार्षिक भूजल पुनर्भरण			सिंचाई	औद्योगिक	घरेलू	कुल			
		वर्षा से पुनर्भरण	अन्य स्रोतों से पुनर्भरण	वर्षा से पुनर्भरण	अन्य स्रोतों से पुनर्भरण										
46	लखीमपुर खीरी	138123.91	33591.43	4730.12	54036.17	230481.63	20451.81	210029.82	115315.84	225.55	12140.68	127682.08	13690.09	80798.32	60.79
47	ललितपुर	16090.56	6145.48	0	18616.47	40852.51	4085.27	36767.24	27664.81	0	3456.04	31120.85	3775.9	5326.53	84.64
48	लखनऊ	37675.7	15965.98	829.93	24735.76	79207.37	5717.83	73489.54	29879.96	6110.33	12469.87	48460.16	13872.83	24854.34	65.94
49	महाराजगंज	66689.03	19836.15	1967.16	22902.63	111394.97	9141.22	102253.75	56831.29	7.7	7102.51	63941.51	7698.58	37716.19	62.53
50	महोबा	9564.34	9202.15	0	11988.24	30754.73	2797.19	27957.54	24406.7	2.01	1157.36	25566.08	1212.54	3346.56	91.45
51	मैनपुरी	35335.92	20074.09	420.64	36080.26	91910.91	7977.98	83932.93	55422.01	1.06	4972.56	60395.61	5240.74	24930.57	71.96
52	मथुरा	34937.7	34116.1	792.68	68325.58	138172.06	11412.38	126759.68	83916.46	114.23	6498.49	90529.17	6972	37103.44	71.42
53	मऊ	30993.97	8763.34	458.75	10907.44	51123.5	4493.58	46629.92	23744.21	7.36	6379.68	30131.23	7033.82	15844.54	64.62
54	मेरठ	42153.18	15451.34	1783.44	23568.23	82956.19	7552.92	75403.27	47442.24	1304.2	9515.72	58262.16	9910.16	19195.23	77.27
55	मिर्जापुर	25556.47	16119.19	57.63	19459.4	61192.69	5412.94	55779.75	28124.47	40.71	6810.43	34975.63	7319.87	20331.2	62.7
56	मुरादाबाद	36268.75	12052.42	1106.96	16636.63	66064.76	5764.43	60300.33	42545.4	223.21	10682.86	53451.47	11804.71	10027.51	88.64
57	मुजफ्फरनगर	43675.33	23665.46	3128.13	40398.18	110867.1	6666.32	104200.78	72329.04	341.38	6808.28	79478.72	7363.97	25321.28	76.27
58	पीलीभीत	66500.48	15717.95	1250.07	28423.45	111891.95	8197.07	103694.88	61600	164.68	5411.95	67176.62	5768.94	36161.28	64.78
59	प्रतापगढ़	60943.12	31519.43	203.23	45789.96	138455.74	12033.55	126422.19	91157.06	32.85	8210.97	99400.89	8699.65	26560.49	78.63
60	प्रयागराज	73165.81	28765.65	0	39394.2	141325.66	12904.13	128421.53	75451.95	1606.26	17040.33	94098.54	18139.56	35328.78	73.27
61	रायबरेली	54907.22	26131.73	225.36	41164.23	122428.54	10603.1	111825.44	58540.32	12.01	7101.83	65654.17	7673.42	45599.66	58.71
62	रामपुर	42713.42	12399.03	1571.16	20126.69	76810.3	6474.1	70336.2	47015.01	299.45	5193.12	52507.57	5579.04	17442.69	74.65
63	संत कबीरनगर	42340.85	4018.87	764.46	7062.22	54186.4	5105.99	49080.41	26542.47	172.97	4322.7	31038.17	4631.67	17733.27	63.24
64	संत रविदासनगर	16773.95	22080.41	184.7	46997	86036.06	8366.84	77669.22	58416.61	80.3	3478.76	61975.68	3648.85	15523.46	79.79
65	सहारनपुर	75855.33	21834.81	5463.56	37251.19	140404.89	9132.79	131272.1	123985.56	817.66	7281.19	132084.43	7702.09	15869.83	100.62
66	शाहजहांपुर	86711.32	17662.93	2690.75	25362.56	132427.56	8412.6	124014.96	69274.2	1639.25	8526.36	79439.81	9322.62	43778.9	64.06
67	संभल	38075.84	3366.8	929.64	5471.97	47844.25	4577.13	43267.12	31535.6	494.47	5732.43	37762.49	6263.01	5052.96	87.28
68	शामली	21882.42	9051.43	1544.69	13746.32	46224.86	3189.53	43035.33	41103.54	394.47	3033.93	44531.93	3066.96	1000.2	103.48
69	श्रावस्ती	43057.31	4603.41	1187.29	7103.28	55951.29	4432.06	51519.23	26203.57	0	3237.06	29440.62	3632.46	21683.2	57.14

उत्तर प्रदेश																
क्रसं	जिला	भूजल पुनर्भरण					कुल प्राकृतिक निर्वहन	वार्षिक निकालने योग्य भूजल संसाधन	वर्तमान वार्षिक भूजल निकासी				2025 तक घरेलू उपयोग के लिए वार्षिक भूजल आवंटन	भविष्य में उपयोग के लिए शुद्ध भूजल उपलब्धता	भूजल निकासी की स्थिति (%)
		मानसून ऋतु		गैर-मानसून ऋतु		कुल वार्षिक भूजल पुनर्भरण			सिंचाई	औद्योगिक	घरेलू	कुल			
		वर्षा से पुनर्भरण	अन्य स्रोतों से पुनर्भरण	वर्षा से पुनर्भरण	अन्य स्रोतों से पुनर्भरण										
70	सिद्धार्थनगर	68612.81	10439.92	1324.31	15706.7	96083.74	9207.18	86876.56	47636.17	0.34	7366.84	55003.3	8079.37	31160.72	63.31
71	सीतापुर	95088.42	39901.44	2012.06	63277.31	200279.23	18085.06	182194.17	80780.35	17352.1	11259.84	109392.3	12255.85	71805.87	60.04
72	सोनभद्र	15380.48	30026.53	129.25	11829.78	57366.04	5514.93	51851.11	21249.33	830.19	4315.1	26394.62	4730.88	25040.7	50.9
73	सुल्तानपुर	47274.06	18704.21	174.63	26405.26	92558.16	7718.02	84840.14	46135.58	5.81	6177.35	52318.77	6567.92	32130.79	61.67
74	उन्नाव	62175.05	45294.97	966.14	62790.02	171226.18	14969.77	156256.41	87098.17	74.37	8623.82	95796.34	9372.65	59711.23	61.31
75	वाराणसी	28751.27	9512.63	123.08	14607.17	52994.15	5027.04	47967.11	31394.08	114.06	10599.38	42107.54	10946.31	8968.05	87.78
	कुल (हैम)	**3572405.61**	**1400860.8**	**78039.72**	**2131605.42**	**7182911.6**	**625732.28**	**6557179.32**	**4091757.41**	**43845.24**	**504058.56**	**4639661.21**	**541792.72**	**2003946.54**	**70.76**
	कुल (बीसीएम)	**35.72**	**14.01**	**0.78**	**21.32**	**71.83**	**6.26**	**65.57**	**40.92**	**0.44**	**5.04**	**46.4**	**5.42**	**20.04**	**70.76**

6.0 भू-जल का निष्कर्षण तथा आकलन का वर्गीकरण

6.1. भूजल निकासी का चरण और मूल्यांकन का वर्गीकरण

विभिन्न वर्गीकृत ब्लॉकों का वितरण चित्र-12 में दिखाया गया है, जिसमें 559 मूल्यांकन इकाइयां सुरक्षित, 172 मूल्यांकन इकाइयां सेमी क्रिटिकल श्रेणी में, 43 मूल्यांकन इकाइयां (42 ब्लॉक और 1 शहरी क्षेत्र) गंभीर श्रेणी में और 62 मूल्यांकन इकाई (53 ब्लॉक और 9 शहरी क्षेत्र)) को अति-दोहित के रूप में वर्गीकृत किया गया है। सेमी-क्रिटिकल, क्रिटिकल और अतिदोहित क्षेत्रों की सूची तालिका-10 में दी गई है। लगभग सभी अतिदोहित ब्लॉक उत्तर प्रदेश के पश्चिमी छेत्र में हैं, जहां पिछले दशकों के दौरान भूजल का स्तर कई गुना बढ़ा है। राज्य का औसत भूजल निकासी स्तर 70.76% है ।



चित्र 13: भूजल निकासी के लिए मूल्यांकन इकाई (ब्लॉक और शहरी क्षेत्र) का वर्गीकरण - मार्च 2023 तक

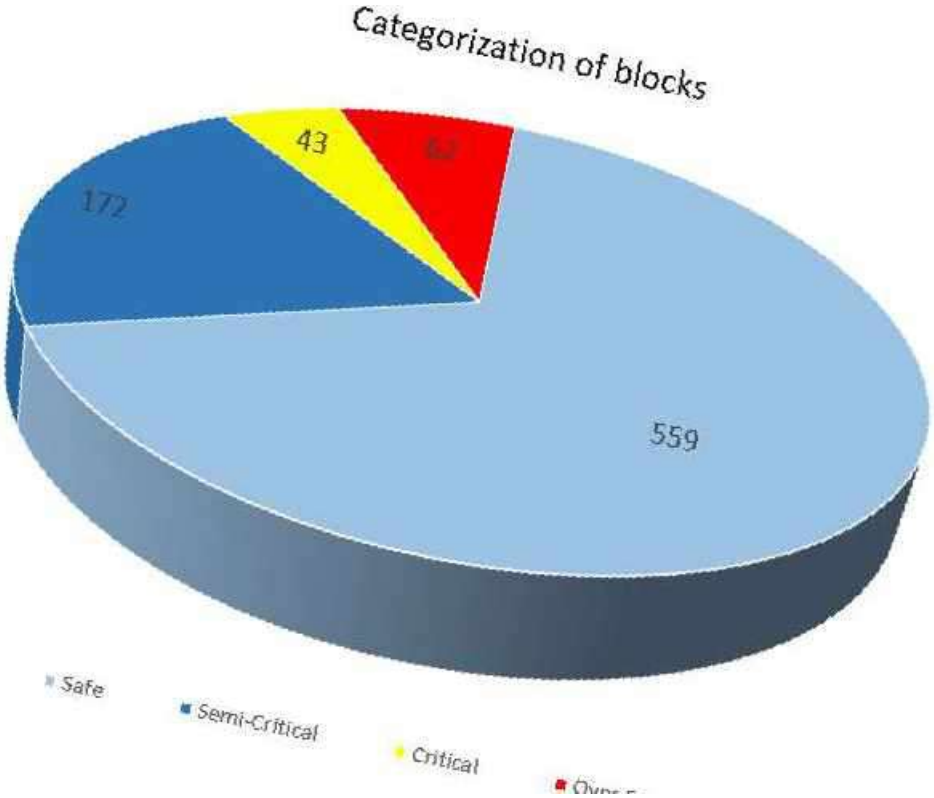
राज्य में वर्षा से कुल रिचार्ज 36.50 बीसीएम का है, जिसमें लखीमपुर जिले का सर्वाधिक रिचार्ज 142854 हैम और महोबा जिले का न्यूनतम रिचार्ज 9564 हैम है। राज्य में अन्य स्रोतों से कुल रिचार्ज 35.33 बीसीएम है जिसमें बाराबंकी जिले का सर्वाधिक रिचार्ज में 130928 हैम है जहाँ अधिकतम नहर सिंचाई सुविधा उपलब्ध है एवं संभल जिले में सबसे कम 8839 हैम रिचार्ज दर्ज किया गया है, जहां भूजल के साथ-साथ सिंचाई के लिए सतही जल का उपयोग बहुत कम है। जबकि राज्य में सभी स्रोतों से कुल वार्षिक रिचार्ज 71.83 बीसीएम है, जिसमें लखीमपुर खीरी जिले में सर्वाधिक 230481 हैम एवं महोबा जिले में न्यूनतम 30755 हैम रिचार्ज है।

राज्य में कुल अनअकाउंटेड प्राकृतिक डिस्चार्ज 6.26 बीसीएम है, जिसमें सीतापुर जिले में सबसे अधिक 20452 हैम और महोबा में सबसे कम 2797 हैम डिस्चार्ज है। राज्य में वार्षिक निकालने योग्य भूजल संसाधन 65.57 बीसीएम है जिसमें लखीमपुर खीरी जिले में सबसे अधिक शुद्ध भूजल उपलब्धता 210030 हैम और महोबा में सबसे कम 27957 हैम है।

राज्य में सभी उपयोगों के लिए भू-जल की कुल निकासी 46.40 बीसीएम आंकी गई है। सभी उपयोगों के लिए अधिकतम भूजल निकासी बुलंदशहर जिले में 138629 हैम और उत्तर प्रदेश के दक्षिणी भाग के महोबा जिले में सभी उपयोगों के लिए भूजल की न्यूनतम निकासी 25566 हैम है। विभिन्न उपयोगों के लिए भूजल निकासी की तुलना से पता चलता है कि सिंचाई के लिए निष्कर्षण कुल भूजल निष्कर्षण का लगभग 88.2% है, जबकि घरेलू उपयोग में 10.86% और औद्योगिक आपूर्ति हेतु 0.94% है।

IN-GRES (इंडिया ग्राउंडवाटर रिसोर्स एस्टीमेशन सिस्टम) के ऑनलाइन पोर्टल पर आंकड़ों को अपलोड करने और GEC 2015 पद्धति के आधार पर गणना के बाद, 559 मूल्यांकन इकाइयां सुरक्षित श्रेणी, 172 मूल्यांकन इकाइयां सेमी-क्रिटिकल श्रेणी, 43 मूल्यांकन इकाइयां क्रिटिकल श्रेणी में और प्रदेश की 62 मूल्यांकन इकाई को अतिदोहित की श्रेणी में रखा गया है। उत्तर प्रदेश में, अत्यअधिक भूजल निष्कर्षण मुख्य रूप से पश्चिमी उत्तर प्रदेश, बुंदेलखंड क्षेत्र और राज्य के दक्षिण पूर्वी भाग में केंद्रित है। राज्य का औसत भूजल निष्कर्षण चरण 70.76% है।

559

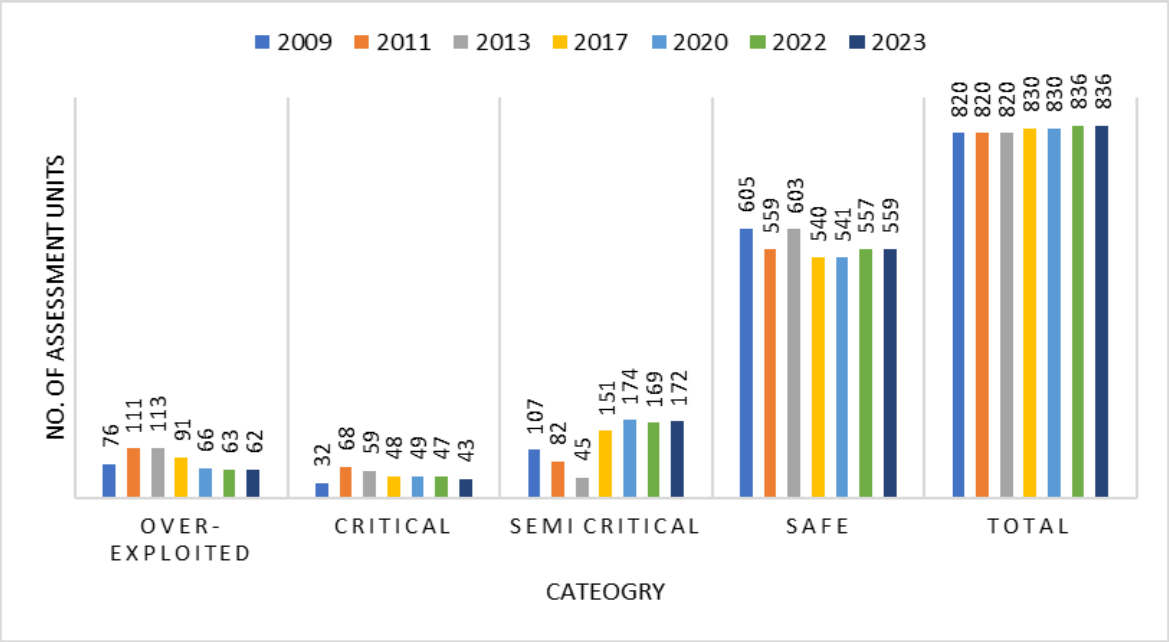


चित्र 14: मूल्यांकन इकाइयों का वर्गीकरण

श्रेणी	संख्या	प्रतिशत
सुरक्षित	559	66.87
अर्द्ध -गंभीर	172	20.57
गंभीर	43	5.14
अति-दोहित	62	7.42
कुल मूल्यांकन इकाई	**836**	**100**

तालिका 9: भूजल निष्कर्षण की स्थिति (% में)

श्रेणी	भूजल निष्कर्षण की स्थिति (% में)						
	न्यूनतम	नाम	अधिकतम	नाम	मध्य	मिडियन	Std. Dev
इकाई वार मूल्यांकन (शहर को छोड़कर)	24.34	हलिया (मिर्ज़ापुर)	216.66	जलालाबाद (कन्नौज)	70.32	65.79	20.46
जिलावार	50.48	इटावा	123.15	गाज़ियाबाद	70.76	68.07	15.66
शहरी इकाइयां	96.97	कानपुर शहर	313.83	मुरादाबाद शहर	195.04	214.56	70.72



चित्र 15: GWRE-2009, 2011, 2013, 2017, 2020, 2022 और 2022 में मूल्यांकन इकाइयों की तुलना

तालिका 10: मूल्यांकन इकाइयों का वर्गीकरण

ओ सी एस मूल्यांकन इकाइयों का वर्गीकरण, उत्तर प्रदेश-2023							
क्रम सं	**जिला**	**क्रम सं**	**सेमी-क्रिटिकल असेसमेंट यूनिट का नाम**	**क्रम सं**	**क्रिटिकल असेसमेंट यूनिट का नाम**	**क्रम सं**	**अति-दोहित असेसमेंट यूनिट का नाम**
1	**आगरा**	1	पिनाहट	1	बाह	1	आगरा शहर
		2	अछनेरा			2	एतमादपुर
		3	खेरागढ़			3	फतेहाबाद
		4	जगनेर			4	बिचपुरी
		5	जैतपुर कलां			5	खंडौली
						6	सैयना
						7	फतेहपुर सीकरी
						8	बरौली अहीर
						9	अकोला
						10	शमसाबाद
2	**अलीगढ़**	1	गोंडा	1	इग्लास	1	अलीगढ़ शहर
		2	खैर				
		3	लोढ़ा				
		4	चंदौस				
		5	गंगीरी				
		6	जावा सिकंदरपुर				
3	**अंबेडकर नगर**	1	जलालपुर				
4	**अमेठी**	1	संग्रामपुर				
5	**अमरोहा**	1	गंगेश्वरी	1	धनौरा	1	जोया
		2	अमरोहा	2	गजरौला		
		3	हसनपुर				
6	**बागपत**	1	बागपत			1	पिलाना
		2	बड़ौत			2	बिनौली

ओ सी एस मूल्यांकन इकाइयों का वर्गीकरण, उत्तर प्रदेश-2023							
क्रम सं	**जिला**	**क्रम सं**	**सेमी-क्रिटिकल असेसमेंट यूनिट का नाम**	**क्रम सं**	**क्रिटिकल असेसमेंट यूनिट का नाम**	**क्रम सं**	**अति-दोहित असेसमेंट यूनिट का नाम**
		3	छपरौली			3	खेकड़ा
7	**बाँदा**	1	बबेरू				
		2	तिंदवारी				
		3	नरैनी				
		4	जसपुरा				
8	**बरेली**	1	आलमपुर जाफराबाद			1	बरेली शहर
		2	रामनगर				
		3	मझगवा				
		4	फतेहगंज				
9	**बिजनौर**	1	सेओहर (बुधनपुर)	1	जलीलपुर		
		2	कोतवाली				
		3	नेहटौर (आकू)				
		4	नूरपुर				
10	**शाहजहांपुर**	1	सहस्वान	1	आसफपुर	1	अम्बियापुर
		2	क्वाडर चौक	2	बिसौली	2	इस्लामनगर
		3	जगत				
		4	मियाओं				
		5	समरेर				
		6	उझानी				
11	**बुलंदशहर**	1	पहासु	1	अरनिया खुर्द	1	सिकंदराबाद
		2	देबाई	2	खुर्जा	2	बुलंदशहर
		3	अनूप शहर	3	शिकारपुर	3	सियाना
		4	जहांगीराबाद	4	उंचगांव	4	गुलाओथी

ओ सी एस मूल्यांकन इकाइयों का वर्गीकरण, उत्तर प्रदेश-2023							
क्रम सं	जिला	क्रम सं	सेमी-क्रिटिकल असेसमेंट यूनिट का नाम	क्रम सं	क्रिटिकल असेसमेंट यूनिट का नाम	क्रम सं	अति-दोहित असेसमेंट यूनिट का नाम
		5	लखोथी			5	भवन बहादुर नगर
						6	दानपुर
12	**चित्रकूट**	1	रामनगर	1	कार्वी		
		2	पहाड़ी				
		3	मऊ				
13	**एटा**	1	निधौली कलां				
		2	अलीगंज				
		3	जलेसर				
		4	जैथर				
		5	शीतलपुर				
14	**फर्रुखाबाद**	1	मोहम्मदाबाद				
		2	बरहपुर				
		3	नवाबगंज				
		4	कमालगंज				
15	**फतेहपुर**	1	तेलयानी			1	भिटौरा
		2	खजुहा				
		3	मलावान				
		4	ऐराया				
		5	अमौली				
16	**फिरोजाबाद**	1	मदनपुर	1	आरोन	1	फिरोजाबाद
		2	एका			2	शिकोहाबाद
		3	जसराना			3	खैरागढ़ (हथवंत)
						4	नरखी
						5	टुंडला

ओ सी एस मूल्यांकन इकाइयों का वर्गीकरण, उत्तर प्रदेश-2023							
क्रम सं	जिला	क्रम सं	सेमी-क्रिटिकल असेसमेंट यूनिट का नाम	क्रम सं	क्रिटिकल असेसमेंट यूनिट का नाम	क्रम सं	अति-दोहित असेसमेंट यूनिट का नाम
17	**गौतम बुद्ध नगर**	1	दादरी	1	जेवर	1	बिसरख
18	**गाज़ियाबाद**	1	मुरादनगर			1	गाजियाबाद शहर
						2	भोजपुर
						3	रजापुर
						4	लोनी
19	**गाजीपुर**	1	सईदपुर				
20	**हमीरपुर**	1	सुमेरपुर				
		2	गोहंद				
21	**हापुड़**	1	ढोलाना	1	सिंभोली	1	गढ़
				2	हापुड़		
22	**हाथरस**	1	सिकंदर राव	1	हाथरस	1	सहपऊ
		2	सादाबाद			2	मुरसान
						3	सासनी
23	**जौनपुर**	1	केराकत	1	बदलापुर		
		2	सिरकोनी	2	महाराजगंज		
		3	रामनगर				
		4	मुफ्तीगंज				
		5	करंज कलां				
		6	सिकरारा				
		7	धरमपुर				
24	**झांसी**	1	बारागॉव				

ओ सी एस मूल्यांकन इकाइयों का वर्गीकरण, उत्तर प्रदेश-2023							
क्रम सं	जिला	क्रम सं	सेमी-क्रिटिकल असेसमेंट यूनिट का नाम	क्रम सं	क्रिटिकल असेसमेंट यूनिट का नाम	क्रम सं	अति-दोहित असेसमेंट यूनिट का नाम
		2	बांगड़ा				
		3	बबीना				
		4	मऊरानीपुर				
25	**कन्नौज**	1	गोगरापुर	1	कन्नौज	1	जलालाबाद
		2	छिबरामऊ			2	तालग्राम
26	**कानपुर देहात**	1	अकबरपुर				
		2	मैथा				
		3	झींझक				
		4	सरवन खेड़ा				
		5	मालसा				
		6	डेरापुर				
		7	रसूलाबाद				
27	**कानपुर नगर**	1	पाराारा	1	कानपुर शहर		
		2	सरसोल	2	चौबेपुर		
		3	घाटमपुर				
		4	बिधनु				
		5	बिल्हौर				
		6	शिवराजपुर				
28	**कासगंज**	1	गंजडुंडवारा				
		2	पटियाली				
		3	कासगंज				
29	**कौशाम्बी**	1	मंझनपुर			1	चैल
		2	काड़ा			2	मूरतगंज
		3	सिराथू				

ओ सी एस मूल्यांकन इकाइयों का वर्गीकरण, उत्तर प्रदेश-2023							
क्रम सं	जिला	क्रम सं	सेमी-क्रिटिकल असेसमेंट यूनिट का नाम	क्रम सं	क्रिटिकल असेसमेंट यूनिट का नाम	क्रम सं	अति-दोहित असेसमेंट यूनिट का नाम
		4	नेवादा				
30	**ललितपुर**	1	तालबेहट				
		2	बिरधा				
		3	बार				
		4	जखोरा				
		5	महरोनी				
		6	मंडवारा				
31	**लखनऊ**					1	लखनऊ शहर
32	**महोबा**	1	कबराई			1	पंवारी
		2	चरखारी			2	जैतपुर
33	**मैनपुरी**	1	जागीर			1	बरनाहल
		2	मैनपुरी				
34	**मथुरा**			1	बलदेव	1	राया
				2	नोहझिल		
35	**मेरठ**	1	राजपुरा	1	मचरा	1	मेरठ शहर
		2	मेरठ	2	खरखोदा		
		3	सरूरपुर				
		4	हस्तिनापुर				
		5	परीछटगढ़				
		6	मवाना कलां				
36	**मिर्जापुर**	1	शहर	1	मझावन	1	कॉन
		2	चनबे				

ओ सी एस मूल्यांकन इकाइयों का वर्गीकरण, उत्तर प्रदेश-2023							
क्रम सं	**जिला**	**क्रम सं**	**सेमी-क्रिटिकल असेसमेंट यूनिट का नाम**	**क्रम सं**	**क्रिटिकल असेसमेंट यूनिट का नाम**	**क्रम सं**	**अति-दोहित असेसमेंट यूनिट का नाम**
		3	शिखर				
37	**मुरादाबाद**	1	दिलारी	1	बिलारी	1	मुरादाबाद शहर
		2	मुरादाबाद				
		3	कुंदरकी (डेंगापुर)				
		4	भगतपुर				
		5	मुंडापांडेय				
		6	छजलेट				
38	**मुजफ्फरनगर**	1	शाहपुर	1	चरथावल	1	भाघरा
		2	मुजफ्फरनगर	2	बुधाना		
39	**प्रतापगढ़**	1	लालगंज	1	शिवगढ़		
		2	गौर	2	सदर		
		3	बाबा बेलखर नाथ	3	मंधाता		
		4	पट्टी	4	संडवा चंडिका		
		5	रामपुर-संग्रामगढ़				
		6	लक्ष्मणपुर				
		7	आसपुर देवसरा				
		8	कुंदा				
		9	मंगरौरा				
40	**प्रयागराज**	1	बहादुरपुर	1	चाका	1	प्रयागराज शहर
		2	होलागढ़	2	साहसन		
		3	सैदाबाद				
		4	मौआइमा				
		5	फूलपुर				
		6	प्रतापपुर				

ओ सी एस मूल्यांकन इकाइयों का वर्गीकरण, उत्तर प्रदेश-2023							
क्रम सं	**जिला**	**क्रम सं**	**सेमी-क्रिटिकल असेसमेंट यूनिट का नाम**	**क्रम सं**	**क्रिटिकल असेसमेंट यूनिट का नाम**	**क्रम सं**	**अति-दोहित असेसमेंट यूनिट का नाम**
		7	श्रृंगवेरपुर धाम				
		8	धनुपुर				
41	**रामपुर**	1	सईद नगर				
		2	चामरौवा				
		3	शाहाबाद				
		4	सौर				
		5	मिलाक				
42	**सहारनपुर**	1	देवबंद			1	नकुर
		2	रामपुर मनिहारान			2	सरसावा
		3	सधौली कदीम			3	गंगोह
		4	बलिया खीरी			4	नागल
		5	नानौटा				
		6	मुजफ्फराबाद				
43	**संभल**	1	गुन्नौर	1	संभल		
		2	जनवाई	2	बहज़ोई		
		3	अस्मोली	3	पवनसा		
				4	बनियाखेड़ा		
44	**संत रविदास नगर**	1	ज्ञानपुर				
		2	डीघ				
		3	सुरियावान				
		4	अभौली				
		5	औराई				
		6	भदोही				

ओ सी एस मूल्यांकन इकाइयों का वर्गीकरण, उत्तर प्रदेश-2023							
क्रम सं	**जिला**	**क्रम सं**	**सेमी-क्रिटिकल असेसमेंट यूनिट का नाम**	**क्रम सं**	**क्रिटिकल असेसमेंट यूनिट का नाम**	**क्रम सं**	**अति-दोहित असेसमेंट यूनिट का नाम**
45	**शामली**	1	थाना भवन	1	कैराना	1	शामली
				1	कांधला	2	उन
46	**सोनभद्र**	1	दूधी				
47	**वाराणसी**	1	सेवापुरी	1	चिराइगांव	1	वाराणसी शहर
		2	पिंडरा			2	हरहुआ
		3	काशी विद्यापीठ			3	अज़ीलीन
सार							
मूल्यांकित इकाइयों की कुल संख्या		**सेमी क्रिटिकल असेसमेंट यूनिट्स की संख्या**		**क्रिटिकल मूल्यांकन इकाइयों की संख्या**		**अति-दोहित मूल्यांकन इकाइयों की संख्या**	
836		**172**		**43**		**62**	

नोट: 10 शहर (10 लाख से अधिक आबादी वाले) भी मूल्यांकन इकाइयों में शामिल हैं

तालिका 11: विभिन्न श्रेणियों के अंतर्गत मूल्यांकन इकाइयों की कुल संख्या

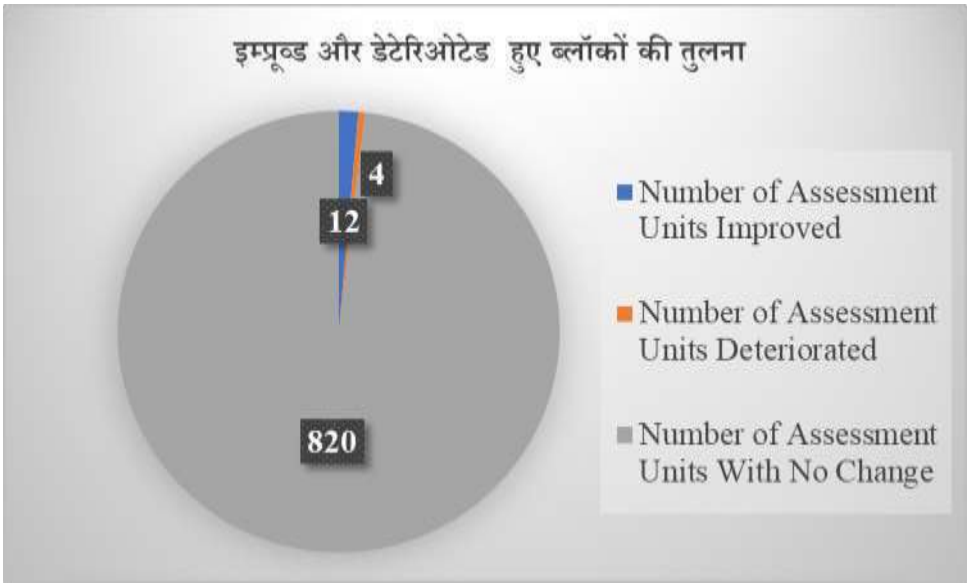
उत्तर प्रदेश के गतिशील भू-जल संसाधन, 2023										
क्रमसं	**जिला**	**मूल्यांकित इकाइयों की कुल संख्या**	**सुरक्षित**		**सेमी क्रिटिकल**		**क्रिटिकल**		**अति-दोहित**	
			सं.	**%**	**सं.**	**%**	**सं.**	**%**	**सं.**	**%**
1	आगरा	16	-	-	5	31.25	1	6.25	10	62.5
2	अलीगढ़	13	5	38.46	6	46.15	1	7.69	1	7.69
3	अंबेडकर नगर	9	8	88.89	1	11.11	-	-	-	-
4	अमेठी	13	12	92.31	1	7.69	-	-	-	-
5	अमरोहा	6	-	-	3	50	2	33.33	1	16.67
6	औरैया	7	7	100	-	-	-	-	-	-
7	अयोध्या	11	11	100	-	-	-	-	-	-
8	आजमगढ़	22	22	100	-	-	-	-	-	-
9	बागपत	6	-	-	3	50	-	-	3	50
10	बहराइच	14	14	100	-	-	-	-	-	-
11	बलिया	17	17	100	-	-	-	-	-	-
12	बलरामपुर	9	9	100	-	-	-	-	-	-

उत्तर प्रदेश के गतिशील भू-जल संसाधन, 2023										
क्रमसं	जिला	मूल्यांकित इकाइयों की कुल संख्या	सुरक्षित		सेमी क्रिटिकल		क्रिटिकल		अति-दोहित	
			सं.	%	सं.	%	सं.	%	सं.	%
13	बाँदा	8	4	50	4	50	-	-	-	-
14	बाराबंकी	15	15	100	-	-	-	-	-	-
15	बरेली	16	11	68.75	4	25	-	-	1	6.25
16	बस्ती	14	14	100	-	-	-	-	-	-
17	बिजनौर	11	6	54.55	4	36.36	1	9.09	-	-
18	बदायूं	15	5	33.33	6	40	2	13.33	2	13.33
19	बुलंदशहर	16	1	6.25	5	31.25	4	25	6	37.5
20	चंदौली	9	9	100	-	-	-	-	-	-
21	चित्रकूट	5	1	20	3	60	1	20	-	-
22	देवरिया	16	16	100	-	-	-	-	-	-
23	एटा	8	3	37.5	5	62.5	-	-	-	-
24	इटावा	8	8	100	-	-	-	-	-	-
25	फर्रुखाबाद	7	3	42.86	4	57.14	-	-	-	-
26	फतेहपुर	13	7	53.85	5	38.46	-	-	1	7.69
27	फिरोजाबाद	9	-	-	3	33.33	1	11.11	5	55.56
28	गौतमबुद्ध नगर	3	-	-	1	33.33	1	33.33	1	33.33
29	गाज़ियाबाद	5	-	-	1	20	-	-	4	80
30	गाजीपुर	16	15	93.75	1	6.25	-	-	-	-
31	गोंडा	16	16	100	-	-	-	-	-	-
32	गोरखपुर	20	20	100	-	-	-	-	-	-
33	हमीरपुर	7	5	71.43	2	28.57	-	-	-	-
34	हापुड़	4	-	-	1	25	2	50	1	25
35	हरदोई	19	19	100	-	-	-	-	-	-
36	हाथरस	7	1	14.29	2	28.57	1	14.29	3	42.86
37	जालौन	9	9	100	-	-	-	-	-	-
38	जौनपुर	21	12	57.14	7	33.33	2	9.52	-	-
39	झांसी	8	4	50	4	50	-	-	-	-
40	कन्नौज	8	3	37.5	2	25	1	12.5	2	25
41	कानपुर देहात	10	3	30	7	70	-	-	-	-
42	कानपुर नगर	11	3	27.27	6	54.55	2	18.18	-	-
43	कासगंज	7	4	57.14	3	42.86	-	-	-	-
44	कौशाम्बी	8	2	25	4	50	-	-	2	25
45	कुशी नगर	14	14	100	-	-	-	-	-	-

उत्तर प्रदेश के गतिशील भू-जल संसाधन, 2023										
क्रमसं	जिला	मूल्यांकित इकाइयों की कुल संख्या	सुरक्षित		सेमी क्रिटिकल		क्रिटिकल		अति-दोहित	
			सं.	%	सं.	%	सं.	%	सं.	%
46	लखीमपुर खीरी	15	15	100	-	-	-	-	-	-
47	ललितपुर	6	-	-	6	100	-	-	-	-
48	लखनऊ	9	8	88.89	-	-	-	-	1	11.11
49	महोबा	4	-	-	2	50	-	-	2	50
50	महाराजगंज	12	12	100	-	-	-	-	-	-
51	मैनपुरी	9	6	66.67	2	22.22	-	-	1	11.11
52	मथुरा	10	7	70	-	-	2	20	1	10
53	मूनाथ भंजन	9	9	100	-	-	-	-	-	-
54	मेरठ	13	4	30.77	6	46.15	2	15.38	1	7.69
55	मिर्जापुर	12	7	58.33	3	25	1	8.33	1	8.33
56	मुरादाबाद	9	1	11.11	6	66.67	1	11.11	1	11.11
57	मुजफ्फरनगर	9	4	44.44	2	22.22	2	22.22	1	11.11
58	पीलीभीत	7	7	100	-	-	-	-	-	-
59	प्रतापगढ़	17	4	23.53	9	52.94	4	23.53	-	-
60	प्रयागराज	24	13	54.17	8	33.33	2	8.33	1	4.17
61	राय बरेली	18	18	100	-	-	-	-	-	-
62	रामपुर	6	1	16.67	5	83.33	-	-	-	-
63	सहारनपुर	11	1	9.09	6	54.55	-	-	4	36.36
64	संभल	8	1	12.5	3	37.5	4	50	-	-
65	संत कबीर नगर	9	9	100	-	-	-	-	-	-
66	संत रविदास नगर	6	-	-	6	100	-	-	-	-
67	शाहजहांपुर	15	15	100	-	-	-	-	-	-
68	शामली	5	-	-	1	20	2	40	2	40
69	श्रावस्ती	5	5	100	-	-	-	-	-	-
70	सिद्धार्थ नागर	14	14	100	-	-	-	-	-	-
71	सीतापुर	19	19	100	-	-	-	-	-	-
72	सोनभद्र	10	9	90	1	10	-	-	-	-
73	सुल्तानपुर	14	14	100	-	-	-	-	-	-
74	उन्नाव	16	16	100	-	-	-	-	-	-
75	वाराणसी	9	2	22.22	3	33.33	1	11.11	3	33.33
	कुल	**836**	**559**	**66.87**	**172**	**20.57**	**43**	**5.14**	**62**	**7.42**

6.2 मूल्यांकन इकाइयों के संसाधन, निष्कर्षण, वर्गीकरण में महत्वपूर्ण परिवर्तन के कारण

ब्लॉक एवं दस लाख से अधिक आबादी वाले नगरीय क्षेत्र स्तर पे भूजल संसाधनों का आंकलन किया गया है। राज्य के कुल वार्षिक भूजल पुनर्भरण का अनुमान 71.83 बीसीएम और वार्षिक निकालने योग्य भूजल संसाधन 65.57 बीसीएम है। वार्षिक भूजल निष्कर्षण 46.4 बीसीएम है और भूजल निष्कर्षण का चरण 70.76% है। 836 (826 ब्लॉक और 10 शहरी क्षेत्र) मूल्यांकन इकाइयों में से, 62 को अति-दोहित, 43 को गंभीर, 172 को अर्द्ध -गंभीर और 559 को सुरक्षित के रूप में वर्गीकृत किया गया है। 2022 की तुलना में, वर्तमान मूल्यांकन वर्ष में अति- दोहित श्रेणी की 63 मूल्यांकन इकाइयां घटकर 62 रह गई हैं, जबकि सेमी क्रिटिकल श्रेणी में 169 मूल्यांकन इकाइयां 2023 में बढ़ कर 172 हो गए हैं। क्रिटिकल श्रेणी की 47 मूल्यांकन इकाइयां घटकर 43 और 557 सुरक्षित मूल्यांकन इकाइयां 2023 में बढ़कर 559 हो गए हैं।



चित्र 16: 2022 से 2023 तक इम्प्रूव्ड और डेटेरिओटेड हुए ब्लॉकों की संख्या

तालिका 12: 2022 से 2023 तक इम्प्रूव्ड और डेटेरिओटेड हुई मूल्यांकन इकाइयों का राज्यवार सारांश

राज्य	उत्तर प्रदेश
इम्प्रूव्ड आकलन इकाइयां	12
डेटेरिओटेड मूल्यांकन इकाइयां	04
कोई बदलाव नहीं	820

तालिका 13: जीडब्ल्यूआरई-2022 की तुलना में जीडब्ल्यूआरई-2023 में सुधार और गिरावट वाली आकलन इकाइयां

क्रमसं	जिला	मूल्यांकन इकाई का नाम	जीडबल्यूआरई-2022		जीडबल्यूआरई-2023		टिप्पणी
			भूजल निकासी की स्थित(%)	वर्गीकरण	भूजल निकासी का चरण (%)	वर्गीकरण	
1	आगरा	जैतपुर कलां	95.38	गंभीर	87.93	अर्द्ध -गंभीर	इम्प्रूव्ड
2	अलीगढ़	गोंडा	69.9	सुरक्षित	72.28	अर्द्ध -गंभीर	डेटेरिओटेड
3	बागपत	बागपत	93.35	गंभीर	88.34	अर्द्ध -गंभीर	इम्प्रूव्ड
4	बदायूं	सालारपुर	70.71	अर्द्ध -गंभीर	68.32	सुरछित	इम्प्रूव्ड
5	बदायूं	समरेर	69.99	सुरछित	72.88	अर्द्ध -गंभीर	डेटेरिओटेड
6	एटा	जलेसर	90.36	गंभीर	88.98	अर्द्ध -गंभीर	इम्प्रूव्ड
7	हमीरपुर	रथ	71.52	अर्द्ध -गंभीर	69	सुरछित	इम्प्रूव्ड
8	हमीरपुर	सरीला	73.89	अर्द्ध -गंभीर	69.15	सुरछित	इम्प्रूव्ड
9	हाथरस	सिकंदर राव	90.35	गंभीर	89.61	अर्द्ध -गंभीर	इम्प्रूव्ड
10	जौनपुर	बकशा	70.81	अर्द्ध -गंभीर	69.22	सुरछित	इम्प्रूव्ड
11	मेरठ	सरूरपुर	68.39	सुरछित	70.55	अर्द्ध -गंभीर	डेटेरिओटेड
12	प्रयागराज	बहरिया	70.78	अर्द्ध -गंभीर	69.84	सुरछित	इम्प्रूव्ड
13	रामपुर	सईद नगर	64.23	सुरछित	79.93	अर्द्ध -गंभीर	डेटेरिओटेड
14	शामली	कंढाला	102.13	अति-दोहित	99.41	गंभीर	इम्प्रूव्ड
15	सोनभद्र	नागावा	72.76	अर्द्ध -गंभीर	67.28	सुरछित	इम्प्रूव्ड
16	वाराणसी	पिंडरा	90.64	गंभीर	78.15	अर्द्ध -गंभीर	इम्प्रूव्ड

7.0 जनपदवार गतिशील रिपोर्ट (GWRE-2023)

1. आगरा

आगरा जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 399700 हेक्टेयर में से 399700 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 16 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 80954.49 हैम है और सभी उपयोगों के लिए भूजल निकासी 94214.78 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 116.38% है। भूजल निकासी की उच्चतम स्थिति शमसाबाद विकासखण्ड में 192.86 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 4955.08 हैम होगा। 5 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक क्रिटिकल में वर्गीकृत किया गया है। जिले के 10 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है। जिले में एक भी ब्लॉक सुरक्षित श्रेणी में नहीं है।

2. अलीगढ़

अलीगढ़ जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 380843 हेक्टेयर में से 380843 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 13 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 90225.13 हैम है और सभी उपयोगों के लिए भूजल निकासी 72553.24 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 80.41 % है। भूजल निकासी की उच्चतम स्थिति अलीगढ़ शहर विकासखण्ड में 249.84% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 19964.74 हैम होगा। 6 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक क्रिटिकल में वर्गीकृत किया गया है। जिले के 1 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है। 5 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

3. अम्बेडकर नगर

अम्बेडकर नगर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 245898 हेक्टेयर में से 245898 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 9 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं

। जिले में निकालने योग्य वार्षिक भूजल संसाधन 71795 हैम है और सभी उपयोगों के लिए भूजल निकासी 45219.33 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 62.98% है। भूजल निकासी की उच्चतम स्थिति जलालपुर विकासखण्ड में 75.77% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 26209.01 हैम होगा। 1 ब्लॉक सेमी क्रिटिकल व 8 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

4. अमेठी

अमेठी जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 232992 हेक्टेयर में से 232992 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 13 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 79821.29 हैम है और सभी उपयोगों के लिए भूजल निकासी 51575 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 64.61% है। भूजल निकासी की उच्चतम स्थिति संग्रामपुर विकासखण्ड में 77.31% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 27944.83 हैम होगा। 1 ब्लॉक सेमी क्रिटिकल व 12 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

5. अमरोहा

अमरोहा जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 214903 हेक्टेयर में से 214903 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 6 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 73366.5 हैम है और सभी उपयोगों के लिए भूजल निकासी 67310.1 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 91.75% है। भूजल निकासी की उच्चतम स्थिति जोया विकासखण्ड में 133.19 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 9285.09 हैम होगा। 3 ब्लॉक सेमी क्रिटिकल, 2 ब्लॉक क्रिटिकल में वर्गीकृत किया गया है। जिले के 1 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है। किसी भी ब्लॉक को सुरक्षित श्रेणी में नहीं रखा गया है।

6. औरैया

औरैया जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 209427 हेक्टेयर में से 209427 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 7 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं।

जिले में निकालने योग्य वार्षिक भूजल संसाधन 59785.36 हैम है और सभी उपयोगों के लिए भूजल निकासी 33553.51 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 56.12% है। भूजल निकासी की उच्चतम स्थिति एरवा कटरा विकासखण्ड में 63.47% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 26102.83 हैम होगा। जिले के सभी 7 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

7. अयोध्या

अयोध्या जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 252201 हेक्टेयर में से 252201 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 11 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 84430.2 हैम है और सभी उपयोगों के लिए भूजल निकासी 52827.51 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 62.57 % है। भूजल निकासी की उच्चतम स्थिति मसोधा विकासखण्ड में 68.29% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 30897.51 हैम होगा। जिले के सभी 11 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

8. आजमगढ़

आजमगढ़ जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 417119 हेक्टेयर में से 417119 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 22 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 123033.02 हैम है और सभी उपयोगों के लिए भूजल निकासी 75228.33 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 61.14% है। भूजल निकासी की उच्चतम स्थिति सथियांव विकासखण्ड में 69.79% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 46540.09 हैम होगा। जिले के सभी 22 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

9. बागपत

बागपत जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 135138.96 हेक्टेयर में से 135138.96 भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 6 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं।

जिले में निकालने योग्य वार्षिक भूजल संसाधन 33550.58 हैम है और सभी उपयोगों के लिए भूजल निकासी 32585.21 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 97.12% है। भूजल निकासी की उच्चतम स्थिति पिलाना विकासखण्ड में 130.59 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 3880.84 हैम होगा। 3 ब्लॉक सेमी क्रिटिकल एवं 3 ब्लॉक को अति-दोहित की श्रेणी में वर्गीकृत किया गया है।

10. बहराइच

बहराइच जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 438725 हेक्टेयर में से 438725 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 14 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 134257.36 हैम है और सभी उपयोगों के लिए भूजल निकासी 80547.41हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 59.99% है। भूजल निकासी की उच्चतम स्थिति तेजवापुर विकासखण्ड में 65.17% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 52931.19 हैम होगा। जिले के सभी 14 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

11. बलिया

बलिया जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 292700 हेक्टेयर में से 292700 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 17 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 83512.33 हैम है और सभी उपयोगों के लिए भूजल निकासी 53205.63हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 63.71% है। भूजल निकासी की उच्चतम स्थिति रसरा विकासखण्ड में 68.78% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 29659.88 हैम होगा। जिले के सभी 17 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

12. बलरामपुर

बलरामपुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 334857 हेक्टेयर में से 334857 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 9 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं।

जिले में निकालने योग्य वार्षिक भूजल संसाधन 84111.92हैम है और सभी उपयोगों के लिए भूजल निकासी 50117.01हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 59.58% है। भूजल निकासी की उच्चतम स्थिति रेहरा बाज़ार विकासखण्ड में 67.33% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 33402.8 हैम होगा। जिले के सभी 9 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

13. बाँदा

बाँदा जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 440460 हेक्टेयर में से 440460 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 8 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 66436.13 हैम है और सभी उपयोगों के लिए भूजल निकासी 43922.63 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 66.11% है। भूजल निकासी की उच्चतम स्थिति तिंदवारी विकासखण्ड में 78.84% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 22219.16 हैम होगा। 4 ब्लॉक सेमी क्रिटिकल एवं 4 ब्लॉक को सुरक्षित की श्रेणी में वर्गीकृत किया गया है।

14. बाराबंकी

बाराबंकी जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 389132 हेक्टेयर में से 389132 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 15 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 182764.73 हैम है और सभी उपयोगों के लिए भूजल निकासी 115376.4 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 63.13% है। भूजल निकासी की उच्चतम स्थिति मसौली विकासखण्ड में 68.79% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 66686.18 हैम होगा। जिले के सभी 15 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

15. बरेली

बरेली जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 412000 हेक्टेयर में से

412000 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 16 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 113615.18 हैम है और सभी उपयोगों के लिए भूजल निकासी 81371.01 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 71.62 % है। भूजल निकासी की उच्चतम स्थिति बरेली शहर विकासखण्ड में 205.90 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 33754.48 हैम होगा। 4 ब्लॉक सेमी क्रिटिकल एवं 1 ब्लॉक को अति-दोहित की श्रेणी में वर्गीकृत किया गया है। 11 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

16. बस्ती

बस्ती जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 293807 हेक्टेयर में से 293807 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 14 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 75440.26 हैम है और सभी उपयोगों के लिए भूजल निकासी 49512.33 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 65.63% है। भूजल निकासी की उच्चतम स्थिति रूदहौली विकासखण्ड में 69.68 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 25509.99 हैम होगा। जिले के सभी 14 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

17. बिजनौर

बिजनौर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 458903 हेक्टेयर में से 458903 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 11 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 133440.53 हैम है और सभी उपयोगों के लिए भूजल निकासी 37108.59 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 71.85% है। भूजल निकासी की उच्चतम स्थिति जलीलपुर विकासखण्ड में 97.28 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 37108.59 हैम होगा। 4 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक क्रिटिकल में वर्गीकृत किया गया है एवं 6 ब्लॉक को सुरक्षित की श्रेणी में वर्गीकृत किया गया है।

18. बदायूँ

बदायूँ जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है । वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 423788 हेक्टेयर में से 423788 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 15 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 76598.57 हैम है और सभी उपयोगों के लिए भूजल निकासी 63659.74 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 83.11% है। भूजल निकासी की उच्चतम स्थिति इस्लामनगर विकासखण्ड में 123.66% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 14193.96 हैम होगा। जिले के 6 ब्लॉक सेमी क्रिटिकल, 2 ब्लॉक क्रिटिकल, 2 ब्लॉक को अति-दोहित एवं 5 ब्लॉक को सुरक्षित की श्रेणी में वर्गीकृत किया गया है।

19. बुलन्दशहर

बुलन्दशहर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 360947 हेक्टेयर में से 360947 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 16 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 145062.77 हैम है और सभी उपयोगों के लिए भूजल निकासी 138628.73 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 95.56% है। भूजल निकासी की उच्चतम स्थिति बुलन्दशहर विकासखण्ड में 144.46% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 14719.37 हैम होगा। 5 ब्लॉक सेमी क्रिटिकल, 4 ब्लॉक क्रिटिकल, 6 ब्लॉक को अति-दोहित एवं 1 ब्लॉक को सुरक्षित की श्रेणी में वर्गीकृत किया गया है।

20. चंदौली

चंदौली जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 188469 हेक्टेयर में से 188469 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 9 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 50675.5 हैम है और सभी उपयोगों के लिए भूजल निकासी 27829.66 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 54.92% है। भूजल निकासी की उच्चतम स्थिति चकिया

विकासखण्ड में 69.08% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 22581.76 हैम होगा। जिले के सभी 9 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

21. चित्रकूट

चित्रकूट जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 300665 हेक्टेयर में से 300665 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 5 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 40229.68 हैम है और सभी उपयोगों के लिए भूजल निकासी 33117.87 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 82.32% है। भूजल निकासी की उच्चतम स्थिति कार्वी विकासखण्ड में 98.62% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 6857.67 हैम होगा। जिले के 3 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक क्रिटिकल एवं 1 ब्लॉक को सुरक्षित की श्रेणी में वर्गीकृत किया गया है।

22. देवरिया

देवरिया जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 253800 हेक्टेयर में से 253800 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 16 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 133615.26 हैम है और सभी उपयोगों के लिए भूजल निकासी 83280.31 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 62.33% है। भूजल निकासी की उच्चतम स्थिति बनकटा विकासखण्ड में 69.27 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 49994.07 हैम होगा। जिले के सभी 16 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

23. एटा

एटा जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 242757 हेक्टेयर में से 242757 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 8 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 75517.97 हैम है और सभी उपयोगों के लिए भूजल निकासी

55085.61 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 72.94 % है। भूजल निकासी की उच्चतम स्थिति जलेसर विकासखण्ड में 88.98% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 20199.11 हैम होगा। 5 ब्लॉक सेमी क्रिटिकल एवं 3 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

24. इटावा

इटावा जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 240301 हेक्टेयर में से 240301 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 8 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 64610.1 हैम है और सभी उपयोगों के लिए भूजल निकासी 32618.39 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 50.48 % है। भूजल निकासी की उच्चतम स्थिति बराहपुरा विकासखण्ड में 65.63% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 31795.86 हैम होगा। जिले के सभी 8 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

25. फर्रुखाबाद

फर्रुखाबाद जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 220623 हेक्टेयर में से 220623 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 7 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 40182.52 हैम है और सभी उपयोगों के लिए भूजल निकासी 29782.09 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 74.12 % है। भूजल निकासी की उच्चतम स्थिति मोहम्मदाबाद विकासखण्ड में 86.09% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 10130.14 हैम होगा। 4 ब्लॉक सेमी क्रिटिकल एवं 3 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

26. फतेहपुर

फतेहपुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 425255 हेक्टेयर में से 425255 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 13 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 103993.35 हैम है और सभी उपयोगों के लिए भूजल निकासी 75304.26 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 72.41% है। भूजल निकासी की उच्चतम स्थिति भिटौरा विकासखण्ड में 120.28% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु उपलब्ध भू-जल 30474.16 हैम होगा। जिले के 5 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक अति-दोहित एवं 7 ब्लॉक को सुरक्षित की श्रेणी में वर्गीकृत किया गया है।

27. फिरोजाबाद

फिरोजाबाद जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 241953 हेक्टेयर में से 241953 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 9 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 72545.17 हैम है और सभी उपयोगों के लिए भूजल निकासी 75949.29 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 104.69 % है। भूजल निकासी की उच्चतम स्थिति फिरोजाबाद विकासखण्ड में 165.07 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 9145.73 हैम होगा। जिले के 3 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक क्रिटिकल एवं 5 ब्लॉक को अति-दोहित श्रेणी में वर्गीकृत किया गया है।

28. गौतम बुद्ध नगर

गौतम बुद्ध नगर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 144273 हेक्टेयर में से 144273 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 3 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 47178.39 हैम है और सभी उपयोगों के लिए भूजल निकासी 49440.49 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 104.79 % है। भूजल निकासी की उच्चतम स्थिति बिसरख विकासखण्ड में 141.41% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में

भविष्य हेतु शेष उपलब्ध भू-जल 2539.6 हैम होगा। जिले के 1 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक क्रिटिकल में एवं 1 ब्लॉक को अति-दोहित श्रेणी में वर्गीकृत किया गया है।

29. गाज़ियाबाद

गाज़ियाबाद जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 116914 हेक्टेयर में से 116914 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 5 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 37507.76 हैम है और सभी उपयोगों के लिए भूजल निकासी 46191.34 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 123.15 % है। भूजल निकासी की उच्चतम स्थिति गाजियाबाद शहर विकासखण्ड में 230.31% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 1685.94 हैम होगा। जिले के 1 ब्लॉक सेमी क्रिटिकल एवं 4 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है।

30. गाजीपुर

गाजीपुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 330052 हेक्टेयर में से 330052 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 16 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 94932.14 हैम है और सभी उपयोगों के लिए भूजल निकासी 56181.55 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 59.18 % है। भूजल निकासी की उच्चतम स्थिति सईदपुर विकासखण्ड में 80.53 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 38293.99 हैम होगा। जिले के 1 ब्लॉक सेमी क्रिटिकल एवं 15 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

31. गोंडा

गोंडा जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 399609 हेक्टेयर में से 399609 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 16 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 110871.55 हैम है और सभी उपयोगों के लिए भूजल निकासी

66641.95 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 60.11% है। भूजल निकासी की उच्चतम स्थिति बभनजोत विकासखण्ड में 65.95% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 43338.44 हैम होगा। जिले के सभी 16 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

32. गोरखपुर

गोरखपुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 321087 हेक्टेयर में से 321087 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 20 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 155392.16 हैम है और सभी उपयोगों के लिए भूजल निकासी 98544.26 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 63.42 % है। भूजल निकासी की उच्चतम स्थिति कैम्पएयरगंज विकासखण्ड में 69.56% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 56262.02 हैम होगा। जिले के सभी 20 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

33. हमीरपुर

हमीरपुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 381540 हेक्टेयर में से 381540 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 7 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 40753.89 हैम है और सभी उपयोगों के लिए भूजल निकासी 27742.5 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 68.07% है। भूजल निकासी की उच्चतम स्थिति गोहन्ड विकासखण्ड में 79.52% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 12937.05 हैम होगा। 3 ब्लॉक सेमी क्रिटिकल एवं 5 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

34. हापुड़

हापुड़ जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 114481 हेक्टेयर में से 114481 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 4 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं।

जिले में निकालने योग्य वार्षिक भूजल संसाधन 45956.32 हैम है और सभी उपयोगों के लिए भूजल निकासी 45035.34 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 98% है। भूजल निकासी की उच्चतम स्थिति गढ़ विकासखण्ड में 104.39 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 1638.42 हैम होगा। जिले के 1 ब्लॉक सेमी क्रिटिकल, 2 ब्लॉक क्रिटिकल एवं 1 ब्लॉक को अति-दोहित की श्रेणी में वर्गीकृत किया गया है।

35. हरदोई

हरदोई जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 594843 हेक्टेयर में से 594843 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 19 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 158311.7 हैम है और सभी उपयोगों के लिए भूजल निकासी 98141.86 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 61.99% है। भूजल निकासी की उच्चतम स्थिति बावन विकासखण्ड में 68.58% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 59600.66 हैम होगा। जिले के सभी 19 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

36. हाथरस

हाथरस जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 183799 हेक्टेयर में से 183799 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 7 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 65260.5 हैम है और सभी उपयोगों के लिए भूजल निकासी 61232.5 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 93.83% है। भूजल निकासी की उच्चतम स्थिति ससनी विकासखण्ड में 134.38% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 8780.51 हैम होगा। 2 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक क्रिटिकल, 3 ब्लॉक को अति-दोहित एवं 1 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

37. जालौन

जालौन जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है । वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 456583 हेक्टेयर में से 456583 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 9 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 94186.89 हैम है और सभी उपयोगों के लिए भूजल निकासी 51958.68 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 55.17 % है। भूजल निकासी की उच्चतम स्थिति कोंच विकासखण्ड में 66.50 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 42035.01 हैम होगा। जिले के सभी 9 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

38. जौनपुर

जौनपुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है । वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 399094 हेक्टेयर में से 399094 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 21 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 117823.41 हैम है और सभी उपयोगों के लिए भूजल निकासी 84022.71 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 71.31% है। भूजल निकासी की उच्चतम स्थिति बदलापूर विकासखण्ड में 96.32 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 32800.07 हैम होगा। जिले के 7 ब्लॉक सेमी क्रिटिकल, 2 ब्लॉक क्रिटिकल एवं 12 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

39. झांसी

झांसी जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है । वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 502400 हेक्टेयर में से 461937 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 40463 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 8 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 64657.67 हैम है और सभी उपयोगों के लिए भूजल निकासी 43671.07 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 67.54 % है। भूजल

निकासी की उच्चतम स्थिति बबीना विकासखण्ड में 87.33 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु उपलब्ध भू-जल 20736.74 हैम होगा। 4 ब्लॉक सेमी क्रिटिकल एवं 4 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

40. कन्नौज

कन्नौज जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 214346 हेक्टेयर में से 214346 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 8 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 54846.39 हैम है और सभी उपयोगों के लिए भूजल निकासी 41200.25 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 75.12 % है। भूजल निकासी की उच्चतम स्थिति जलालाबाद विकासखण्ड में 216.66 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 18773.43 हैम होगा। जिले के 2 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक क्रिटिकल, 2 ब्लॉक अति-दोहित एवं 3 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

41. कानपुर देहात

कानपुर देहात जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 323737 हेक्टेयर में से 323737 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 10 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 73212.43 हैम है और सभी उपयोगों के लिए भूजल निकासी 54263.34 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 74.12% है। भूजल निकासी की उच्चतम स्थिति रसूलाबाद विकासखण्ड में 85.49% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 18795.8 हैम होगा। जिले के 6 ब्लॉक सेमी क्रिटिकल एवं 4 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

42. कानपुर नगर

कानपुर नगर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 309483 हेक्टेयर में से 309483 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 11 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 79791.44 हैम है और सभी उपयोगों के लिए भूजल निकासी 62366.66 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 78.16% है। भूजल निकासी की उच्चतम स्थिति चौबेपुर विकासखण्ड में 97.06 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 17132.27 हैम होगा। जिले के 6 ब्लॉक सेमी क्रिटिकल, 2 ब्लॉक क्रिटिकल एवं 3 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

43. कासगंज

कासगंज जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 199388 हेक्टेयर में से 199388 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 7 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 69041.55 हैम है और सभी उपयोगों के लिए भूजल निकासी 46706.23 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 67.65% है। भूजल निकासी की उच्चतम स्थिति कासगंज विकासखण्ड में 85.96% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 22010.37 हैम होगा। जिले के 3 ब्लॉक सेमी क्रिटिकल एवं 4 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

44. कौशाम्बी

कौशाम्बी जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 178001 हेक्टेयर में से 178001 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 8 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 44741.51 हैम है और सभी उपयोगों के लिए भूजल निकासी 36565.42 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 81.73% है। भूजल निकासी की उच्चतम स्थिति

चैल विकासखण्ड में 147.53% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 9145.56 हैम होगा। जिले के 4 ब्लॉक सेमी क्रिटिकल, 2 ब्लॉक को अति-दोहित एवं 2 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

45. कुशीनगर

कुशीनगर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 287378 हेक्टेयर में से 287378 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 14 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 155094.06 हैम है और सभी उपयोगों के लिए भूजल निकासी 79377.32 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 51.18% है। भूजल निकासी की उच्चतम स्थिति मोतीचाक विकासखण्ड में 61.71% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 74951.72 हैम होगा। जिले के सभी 14 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

46. लखीमपुर खीरी

लखीमपुर खीरी जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 655505 हेक्टेयर में से 655505 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 15 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 210029.82 हैम है और सभी उपयोगों के लिए भूजल निकासी 127682.08 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 60.79% है। भूजल निकासी की उच्चतम स्थिति धौरहरा विकासखण्ड में 65.71% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 80798.32 हैम होगा। जिले के सभी 15 ब्लॉक को सुरक्षित श्रेणी में रखा गया है।

47. ललितपुर

ललितपुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 503923 हेक्टेयर में से 381942 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 121981 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 6 मूल्यांकन इकाइयां हैं जो

कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 36767.24 हैम है और सभी उपयोगों के लिए भूजल निकासी 31120.85 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 84.64% है। भूजल निकासी की उच्चतम स्थिति बिरधा विकासखण्ड में 86% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 5326.53 हैम होगा। जिले के सभी 6 ब्लॉक सेमी क्रिटिकल श्रेणी में वर्गीकृत किया गया है।

48. लखनऊ

लखनऊ जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 245286 हेक्टेयर में से 245286 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 9 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 73489.54 हैम है और सभी उपयोगों के लिए भूजल निकासी 48460.16 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 65.94% है। भूजल निकासी की उच्चतम स्थिति लखनऊ शहर विकासखण्ड में 104.63% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 24854.34 हैम होगा।जिले के 1 ब्लॉक को अति-दोहित एवं 8 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

49. महोबा

महोबा जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 229341 हेक्टेयर में से 229341 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 4 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 27957.54 हैम है और सभी उपयोगों के लिए भूजल निकासी 25566.08 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 91.45% है। भूजल निकासी की उच्चतम स्थिति पनवारी विकासखण्ड में 109.14% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 3346.56 हैम होगा। जिले के 2 ब्लॉक सेमी क्रिटिकल एवं 2 ब्लॉक को अति-दोहित की श्रेणी में वर्गीकृत किया गया है।

50. महाराजगंज

महाराजगंज जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 247760 हेक्टेयर में से 247760 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है। जिले में 12 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 102253.75 हैम है और सभी उपयोगों के लिए भूजल निकासी 63941.51 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 62.53% है। भूजल निकासी की उच्चतम स्थिति निचलौल विकासखण्ड में 67.09 % है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 37716.19 हैम होगा। जिले के सभी 12 ब्लॉक को सुरक्षित की श्रेणी में वर्गीकृत किया गया है

51. मैनपुरी

मैनपुरी जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 276072 हेक्टेयर में से 276072 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में कुल 9 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 83932.93 हैम है और सभी उपयोगों के लिए भूजल निकासी 60395.61 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 71.96% है। भूजल निकासी की उच्चतम स्थिति बरनाहल विकासखण्ड में 136.99% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 24930.57 हैम है। जिले के 6 ब्लॉक को सुरक्षित श्रेणी, 2 ब्लॉक सेमी क्रिटिकल, 0 ब्लॉक क्रिटिकल, 1 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है।

52. मथुरा

मथुरा जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 336078 हेक्टेयर में से 336078 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 10 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकाले जाने योग्य वार्षिक भूजल संसाधन 126759.68 हैम है और सभी उपयोगों के लिए भूजल निकासी 90529.17 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 71.42% है। भूजल निकासी की उच्चतम स्थिति राया विकासखण्ड में 109.56% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन

करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 37103.44 हैम है। जिले के 7 ब्लॉक को सुरक्षित श्रेणी, 0 ब्लॉक सेमी क्रिटिकल, 2 ब्लॉक क्रिटिकल एवं 1 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है।

53. मऊनाथ भंजन

मऊनाथ भंजन जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 171624 हेक्टेयर में से 171624 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 9 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 46629.92 हैम है और सभी उपयोगों के लिए भूजल निकासी 30131.23 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 64.62% है। भूजल निकासी की उच्चतम स्थिति परदाहा विकासखण्ड में 69.95% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 15844.54 हैम होगा। जिले के सभी 9 ब्लाकों को सुरक्षित की श्रेणी में रखा गया है।

54. मेरठ

मेरठ जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022 -23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 281049 हेक्टेयर में से 281049 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 13 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 75403.27 हैम है और सभी उपयोगों के लिए भूजल निकासी 58262.16 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 77.27% है। भूजल निकासी की उच्चतम स्थिति मेरठ शहर विकासखण्ड में 229.75% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 19195.23 हैम होगा। जिले के 4 ब्लॉक को सुरक्षित श्रेणी 6 ब्लॉक सेमी क्रिटिकल, 2 ब्लॉक क्रिटिकल एवं 1 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है।

55. मिर्जापुर

मिर्जापुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022 -23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 452085 हेक्टेयर में से 295437 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 156648 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 12 संख्या में मूल्यांकन

इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 55779.75 हैम है और सभी उपयोगों के लिए भूजल निकासी 34975.63 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 62.70% है। भूजल निकासी की उच्चतम स्थिति कोन विकासखण्ड में 101.96% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 20331.2 हैम होगा। जिले के 7 ब्लॉक को सुरक्षित श्रेणी, 3 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक क्रिटिकल एवं 1 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है।

56. मुरादाबाद

मुरादाबाद जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022 -23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 224944 हेक्टेयर में से 224944 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 9 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 60300.33 हैम है और सभी उपयोगों के लिए भूजल निकासी 53451.47 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 88.64% है। भूजल निकासी की उच्चतम स्थिति मुरादाबाद शहर विकासखण्ड में 313.83% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु सिंचाई के लिए शेष उपलब्ध भू-जल 10027.51 हैम होगा। जिले के 1 ब्लॉक को सुरक्षित श्रेणी, 6 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक क्रिटिकल एवं 1 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है।

57. मुजफ्फरनगर

मुजफ्फरनगर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 275666 हेक्टेयर में से 275666 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 9 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 104200.78 हैम है और सभी उपयोगों के लिए भूजल निकासी 79478.72 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 76.27% है। भूजल निकासी की उच्चतम स्थिति भाघरा विकासखण्ड में 107.86% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 25321.28 हैम होगा। जिले के 4 ब्लॉक को सुरक्षित श्रेणी2 ब्लॉक सेमी क्रिटिकल, 2 ब्लॉक क्रिटिकल एवं 1 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है।

58. पीलीभीत

पीलीभीत जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022 -23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 336959 हेक्टेयर में से 336959 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 7 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 103694.88 हैम है और सभी उपयोगों के लिए भूजल निकासी 67176.62 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 64.78% है। भूजल निकासी की उच्चतम स्थिति ललौरीखेरा विकासखण्ड में 69.29% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 36161.28 हैम होगा। जिले के 7 ब्लॉक को सुरक्षित श्रेणी में वर्गीकृत किया गया है।

59. प्रतापगढ़

प्रतापगढ़ जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022 -23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 371743 हेक्टेयर में से 371743 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 17 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 126422.19 हैम है और सभी उपयोगों के लिए भूजल निकासी 99400.89 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 78.63% है। भूजल निकासी की उच्चतम स्थिति मंधाता विकासखण्ड में 99.72% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य शेष उपलब्ध भू-जल 26560.49 हैम होगा। जिले के 4 ब्लॉक को सुरक्षित श्रेणी 9 ब्लॉक सेमी क्रिटिकल, 4 ब्लॉक क्रिटिकल में वर्गीकृत किया गया है

60. प्रयागराज

प्रयागराज जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 547000 हेक्टेयर में से 499630 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 47370 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 24 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 128421.53 हैम है और सभी उपयोगों के लिए भूजल निकासी 94098.54 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 73.27% है। भूजल निकासी की उच्चतम स्थिति प्रयागराज शहर विकासखण्ड में 181.97% है। वर्ष 2025 तक भावी

घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु सिंचाई के लिए शेष उपलब्ध भू-जल 35328.78 हैम होगा। जिले के 13 ब्लॉक को सुरक्षित की श्रेणी 8 ब्लॉक सेमी क्रिटिकल, 2 ब्लॉक क्रिटिकल एवं 1 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है।

61. रायबरेली

रायबरेली जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 392458 हेक्टेयर में से 392458 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 18 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 111825.44 हैम है और सभी उपयोगों के लिए भूजल निकासी 65654.17 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 58.71% है। भूजल निकासी की उच्चतम स्थिति शिवगढ़ विकासखण्ड में 67.88% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य के लिए शेष उपलब्ध भू-जल 45599.66 हैम होगा। जिले के सभी 18 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है

62. रामपुर

रामपुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 229790 हेक्टेयर में से 229790 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 6 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 70336.2 हैम है और सभी उपयोगों के लिए भूजल निकासी 52507.57 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 74.65% है। भूजल निकासी की उच्चतम स्थिति सौर विकासखण्ड में 87.96% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 17442.69 हैम होगा। जिले के 1 ब्लॉक को सुरक्षित, 5 ब्लॉक सेमी क्रिटिकल में वर्गीकृत किया गया है।

63. सहारनपुर

सहारनपुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 368941 हेक्टेयर में से 368941 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 11 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 131272.1 हैम है और सभी उपयोगों के लिए भूजल निकासी 132084.43 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 100.62% है। भूजल निकासी की उच्चतम स्थिति गंगोह विकासखण्ड में 152.35% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 0 हैम होगा। जिले के 1 ब्लॉक को सुरक्षित श्रेणी, 6 ब्लॉक सेमी क्रिटिकल श्रेणी, और 4 ब्लॉक को अति-दोहित श्रेणी में वर्गीकृत किया गया है।

64. संभल

संभल जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 241520 हेक्टेयर में से 241520 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 8 मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 43267.12 हैम है और सभी उपयोगों के लिए भूजल निकासी 37762.49 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 87.28% है। भूजल निकासी की उच्चतम स्थिति पवनसा विकासखण्ड में 99.24% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 5052.96 हैम होगा। जिले के 1 ब्लॉक को सुरक्षित श्रेणी, 3 ब्लॉक सेमी क्रिटिकल, 4 ब्लॉक क्रिटिकल में वर्गीकृत किया गया है।

65. संत कबीर नगर

संत कबीर नगर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 164699 हेक्टेयर में से 164699 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 9 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 49080.41 हैम है और सभी उपयोगों के लिए भूजल निकासी 31038.17 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 63.24% है। भूजल निकासी की उच्चतम स्थिति बघौली विकासखण्ड में 69.28% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु

आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 17733.27 हैम होगा। जिले के सभी 9 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

66. संत रविदास नगर

संत रविदास नगर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 101500 हेक्टेयर में से 98305 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 3195 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 6 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 77669.22 हैम है और सभी उपयोगों के लिए भूजल निकासी 61975.68 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 79.79% है। भूजल निकासी की उच्चतम स्थिति अभौली विकासखण्ड में 88.31% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 15523.46 हैम होगा। जिले के सभी 6 ब्लॉक को सेमी क्रिटिकल श्रेणी में रखा गया है।

67. शाहजहांपुर

शाहजहांपुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022 -23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 458131 हेक्टेयर में से 458131 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 15 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 124014.96 हैम है और सभी उपयोगों के लिए भूजल निकासी 79439.81 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 64.06% है। भूजल निकासी की उच्चतम स्थिति कलान विकासखण्ड में 69.89% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 43778.9 हैम होगा। जिले के सभी 15 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

68. शामली

शामली जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022 -23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 136126 हेक्टेयर में से 136126 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 5 संख्या में मूल्यांकन इकाइयां हैं

जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 43035.33 हैम है और सभी उपयोगों के लिए भूजल निकासी 44531.93 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 103.48% है। भूजल निकासी की उच्चतम स्थिति शामली विकासखण्ड में 125.72% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 1000.2 हैम होगा। जिले का 1 ब्लॉक सेमी क्रिटिकल, 2 ब्लॉक क्रिटिकल और 2 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है।

69. श्रावस्ती

श्रावस्ती जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2021-22 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 185782 हेक्टेयर में से 185782 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 5 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 51519.23 हैम है और सभी उपयोगों के लिए भूजल निकासी 29440.62 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 57.14% है। भूजल निकासी की उच्चतम स्थिति जमुनाहा विकासखण्ड में 62.72% है। वर्ष 2025 तक भावी घरेलू एवं औद्योगिक आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु सिंचाई के लिए शेष उपलब्ध भू-जल 21683.2 हैम होगा। जिले के सभी 5 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

70. सिद्धार्थनगर

सिद्धार्थनगर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 289503 हेक्टेयर में से 289503 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 14 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 86876.56 हैम है और सभी उपयोगों के लिए भूजल निकासी 55003.3 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 63.31% है। भूजल निकासी की उच्चतम स्थिति इटवा विकासखण्ड में 69.18% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 31160.72 हैम होगा जिले के सभी 14 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

71. सीतापुर

सीतापुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 574695 हेक्टेयर में से 574695 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 19 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 182194.17 हैम है और सभी उपयोगों के लिए भूजल निकासी 109392.3 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 60.04% है। भूजल निकासी की उच्चतम स्थिति खैराबाद विकासखण्ड में 69.53% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 71805.87 हैम होगा। जिले के सभी 19 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

72. सोनभद्र

सोनभद्र जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 680957.52 हेक्टेयर में से 241458.89 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 439498.63 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 10 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 51851.11 हैम है और सभी उपयोगों के लिए भूजल निकासी 26394.62 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 50.90% है। भूजल निकासी की उच्चतम स्थिति दुद्धि विकासखण्ड में 76.68% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 25040.7 हैम होगा। जिले के 8 ब्लॉक को सुरक्षित की श्रेणी और 1 ब्लॉक सेमी क्रिटिकल श्रेणी में वर्गीकृत किया गया है।

73. सुल्तानपुर

सुल्तानपुर जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 265381 हेक्टेयर में से 265381 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 14 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 84840.14 हैम है और सभी उपयोगों के लिए भूजल निकासी 52318.77 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 60.67% है।

भूजल निकासी की उच्चतम स्थिति लंभुआ विकासखण्ड में 68.24% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 32130.79 हैम होगा। जिले के सभी 14 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

74. उन्नाव

उन्नाव जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2021-22 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 460234 हेक्टेयर में से 460234 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 16 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 156256.41 हैम है और सभी उपयोगों के लिए भूजल निकासी 95796.34 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 61.31% है। भूजल निकासी की उच्चतम स्थिति हसनगंज विकासखण्ड में 69.70% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 59693.65 हैम होगा। जिले के सभी 16 ब्लॉक को सुरक्षित की श्रेणी में रखा गया है।

75. वाराणसी

वाराणसी जिला क्वार्टर्नरी युग के जलोढ़ से ढका हुआ है। वर्ष-2022-23 के लिए जिले के गतिशील भू-जल संसाधनों का विकासखण्ड/नगरीय क्षेत्रवार आधार पर आंकलन किया गया है। भौगोलिक क्षेत्र के 160532 हेक्टेयर में से 160532 हेक्टेयर भूजल पुनर्भरण योग्य क्षेत्र है और 0 हेक्टेयर पहाड़ी क्षेत्र है। जिले में 9 संख्या में मूल्यांकन इकाइयां हैं जो कमांड श्रेणी के अंतर्गत आती हैं। जिले में निकालने योग्य वार्षिक भूजल संसाधन 47967.11 हैम है और सभी उपयोगों के लिए भूजल निकासी 42107.54 हैम है, जिससे पूरे जिले के लिए भूजल निकासी की स्थिति 87.78% है। भूजल निकासी की उच्चतम स्थिति वाराणसी शहर विकासखण्ड में 223.23% है। वर्ष 2025 तक भावी घरेलू आपूर्ति हेतु आवंटन करने के पश्चात जिले में भविष्य हेतु शेष उपलब्ध भू-जल 8968.05 हैम होगा। जिले के 2 ब्लॉक को सुरक्षित श्रेणी, 3 ब्लॉक सेमी क्रिटिकल, 1 ब्लॉक क्रिटिकल और 3 ब्लॉक को अति-दोहित में वर्गीकृत किया गया है।

संदर्भ:

भूजल वर्ष पुस्तक, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र लखनऊ, (2016-2017)

राष्ट्रीय जल नीति भारत सरकार (2012)।

भूजल आकलन पद्धति – 1997, जल संसाधन मंत्रालय, नई दिल्ली।

भूजल आकलन समिति (1997);. जल संसाधन मंत्रालय, भारत सरकार, नई दिल्ली

भूजल संसाधन आकलन समिति (जीईसी-2015) की कार्यप्रणाली की रिपोर्ट। जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय भारत सरकार नई दिल्ली अक्टूबर, 2017

जीडब्ल्यूडी यूपी और सीजीडब्ल्यूबी; उत्तर प्रदेश के गतिशील भूजल संसाधन (मार्च, 2004 तक)।

जीडब्ल्यूडी यूपी और सीजीडब्ल्यूबी; उत्तर प्रदेश के गतिशील भूजल संसाधन (मार्च, 2009 तक)।

जीडब्ल्यूडी यूपी और सीजीडब्ल्यूबी; उत्तर प्रदेश के गतिशील भूजल संसाधन (मार्च, 2011 तक)।

जीडब्ल्यूडी यूपी और सीजीडब्ल्यूबी; उत्तर प्रदेश के गतिशील भूजल संसाधन (मार्च, 2013 तक)।

जीडब्ल्यूडी यूपी और सीजीडब्ल्यूबी; उत्तर प्रदेश के गतिशील भूजल संसाधन (मार्च, 2017 तक)।

जीडब्ल्यूडी यूपी और सीजीडब्ल्यूबी; उत्तर प्रदेश के गतिशील भूजल संसाधन (मार्च, 2020 तक)।

जीडब्ल्यूडी यूपी और सीजीडब्ल्यूबी; उत्तर प्रदेश के गतिशील भूजल संसाधन (मार्च, 2022 तक)।

खान सेराज, केंद्रीय भूजल बोर्ड, उत्तरी क्षेत्र लखनऊ, उत्तर प्रदेश का जल विज्ञान, अक्टूबर 2017

www.imd.gov.in

www.updes.nic.in/

DYNAMIC GROUND WATER RESOURCES OF UTTAR PRADESH, 2023

CENTRAL GROUND WATER BOARD

Northern Region, Lucknow

Department of Water Resources, RD & GR

Ministry of Jal Shakti

Government of India

GROUND WATER DEPARTMENT

Government of Uttar Pradesh

Lucknow
January-2024



ANURAG SRIVASTAVA
I.A.S.
Principal Secretary

NAMAMI GANGE & VILLAGE WATER SUPPLY DEPT.
GOVERNMENT OF UTTAR PRADESH
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Message

Availability of water, especially groundwater has been crucial for the development activities. Uttar Pradesh though located on a vast reservoir of ground water i.e. Indo-Gangetic plain, has also started experiencing decline in ground water levels and deterioration in its quality due to excessive use in agriculture, industries and domestic life. In the past, there has not been adequate effort for water conservation, efficient use, reuse and recycling of water and Groundwater recharge. This calls for dedicated plans and schemes are required to manage this scarce resource.

The precise assessment of availability of groundwater, being an invisible source, is critical to plan the future development of the state. The assessment of ground water is a complex task which involves computation and estimation of different parameters associated with the inflow and the outflow of this natural resource in the shallow aquifers that gets annually recharged. The methodology developed is also being refined continuously and currently follows the methodology recommended by the Ground Water Resource Estimation Committee 2015. Ground water assessment of 2023 is completed by Ground Water Department, Government of Uttar Pradesh in association with Central Ground Water Board, Ministry of Water Resources, River Development and Ganga Rejuvenation.

I hope that this report "Dynamic Ground Water Resources of Uttar Pradesh, 2023" will help users, planners and other stakeholders to prepare and finalize their plans as per latest assessment of ground water resources.

Digitally Signed by अनुराग श्रीवास्तव
Date: 08-01-2024 12:42:01

(Anurag Srivastava)
IAS

टी. एस. अनीता श्याम
सदस्य (दक्षिण)
T. S. Anitha Shyam
Member (South)



भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
केंद्रीय भूमि जल बोर्ड
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development and Ganga Rejuvenation
Central Ground Water Board

Message

Ground Water is a very important natural resource and has a significant role in the economy. It is the main source of water for agricultural, industrial and domestic users. As we are aware that more than 85% of irrigation depends directly or indirectly upon ground water,thus it plays a very crucial role in the development of the economy as well as food security. Most important point to consider about using ground water is to find the right balance between withdrawing and recharging to avoid over exploitation and pollution of this vital resource. Water policy makers, users, researchers, and citizens must focus on sustainable management of this invisible water resource and ensure its judicious, efficient and equitable use before it gets polluted or depleted.

Dynamic Ground Water Resources of Uttar Pradesh has been assessed by Central Ground Water Board, Northern Region, Lucknow and Ground Water Department, Government of Uttar Pradesh with the objective to identify ground water stressed areas. After identification of ground water stressed areas, groundwater management activities may be planned at field level.

I am hopeful that this report will be beneficial for all the stakeholders of groundwater in the sustainable use and management of this finite and important resource.

T S Anitha

(T S Anitha Shyam)
Member (South)



Dr. Balkar Singh
IAS
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PREFACE

Ground water, the precious natural resource, has played pivotal role in development of India's economy, environment and standard of living. Besides being the primary source of water supply for domestic and industrial uses, it is the single largest and most productive source of irrigation water in Uttar Pradesh. For sustainable ground water management and regulations, periodic assessment of the ground water resources is essential. Currently, the Ground Water resource of Uttar Pradesh are assessed through an online portal IN-GRES (India Groundwater Resource Estimation System) following the Ground Water Estimation methodology 2015 which takes care of all the relevant parameters contributing to the net annual Ground Water recharge and extractions for various uses. The database thus generated plays a significant role in Ground Water management and planning. The report "Dynamic Ground Water Resources of Uttar Pradesh as on March, 2023 is jointly prepared by Ground Water Department, Uttar Pradesh and Central Ground Water Board, Northern Region in 836 assessment units (826 blocks and 10 urban areas) under the supervision of State Level Committee (SLC) and overall guidance of Central Level Expert Group (CLEG).

I express my sincere thanks to Sri Anurag Srivastava, IAS, Principal Secretary, Namami Gange & Village Water Supply Department, Government of U.P and Chairperson of State Level Committee of Ground Water Resources Estimation and committee members for the approval of the report **"Dynamic Ground Water Resources of Uttar Pradesh as on March, 2023".** I want to express my gratitude to Shri Swatantra Dev Singh, Hon'ble Minister, Jal Shakti, Uttar Pradesh for his constant support. I acknowledge the efforts of Shri Ravikant Singh, Senior Hydrogeologist, Ground Water Department for coordinating the work at state level. I also acknowledge Sri S.G. Bhartariya, Regional Director, Central Ground Water Board, Northern Region, Lucknow and Sri Ebadur Rahman, Scientist-C, Central Ground Water Board, Lucknow who made sincere and dedicated efforts in guiding line department officers in the exercise, reconciliation of data and compilation of assessment and finally bringing out this report. I acknowledge all the officers of Ground Water Department, Uttar Pradesh and Central Ground Water Board, Northern Region who were associated with this extensive exercise.

03-01-24.

(Dr. Balkar Singh)
IAS
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Preface

Ground water is a precious resource to meet irrigation, drinking water and industrial requirements. Increase in population, industries and government's efforts to increase the food grain production by bringing un-irrigated land under irrigation has led to stress on aquifers under unsustainable levels of exploitation. It has lead to decline in ground water levels, deterioration of ground water quality, drying up of wells and diminishing supplies to various uses. It needs to be managed judiciously to ensure its long term sustainability. A proper understanding of the status of availability and utilization of ground water resources is essential for its management. It is in this context that periodic assessment of ground water resources assumes significance.

The report titled 'Dynamic Ground Water Resources of Uttar Pradesh'-2023 is a compilation of block and city-wise dynamic ground water assessment, carried out jointly by Central Ground Water Board, Northern Region, Lucknow and Ground Water Department U.P. under the supervision of State Level Committee, under overall guidance of Central Level Expert Group. The dynamic ground water resources of Uttar Pradesh is assessed following the Groundwater Estimation Methodology, 2015 (GEC–2015), which takes into account all the relevant parameters contributing to ground water recharge and extraction. All computations for the assessment of ground water resources have been automated and done in a GIS environment through a web based application namely "INDIA GROUND WATER RESOURCE ESTIMATION SYSTEM (IN-GRES)". The database thus generated in IN-GRES will have a significant role in planning and scientific management of ground water.

I express my sincere gratitude to Sh. Anurag Srivastava, IAS, Principal Secretary, Namami Gange & Rural Water Supply, Govt. of UP and Members of State Level Committee for approval of the 'Dynamic Ground Water Resources of Uttar Pradesh'-2023. I also acknowledge Sh. V.K. Upadhyay, Director (Retired), Ground Water Department, UP and Dr. Balkar Singh, IAS and Director, Ground Water Department, UP for his dedicated efforts towards fulfillment of the assessment. I wish to place on record my appreciation of the untiring efforts of Sh Ebadur Rahman, Scientist-C, Sh. Karam Singh, Scientist-C, Dr. Fakhre Alam, Scientist-B, CGWB, NR, Lucknow and Ms. Aditi Singh, AHG, CGWB, NR, Lucknow and whole team of UPGWD.

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DYNAMIC GROUNDWATER RESOURCESOF UTTAR PRADESH
(As on March, 2023)

AT A GLANCE

UTTAR PRADESH (2023)		(in BCM)
Ground Water Recharge	Recharge from rainfall	36.50
	Recharge from other sources	35.33
	Total Annual Ground Water Recharge	71.83
Total Natural Discharges		6.26
Annual Extractable Ground Water Resource		65.57
Current Annual Ground Water Extraction	Irrigation	40.92
	Domestic	5.04
	Industry	0.44
	Total	46.40
Annual GW Allocation for Domestic Use as on 2025		5.42
Net Ground Water Availability for future use		20.04
Stage of Ground Water Extraction (%)		70.76%

CATEGORIZATION (2023)	UTTAR PRADESH
Total No. of Assessed Units	836
Safe	559
Semi-Critical	172
Critical	43
Over-Exploited	62

EXECUTIVE SUMMARY

Uttar Pradesh occupies Upper and Middle Ganga Plain and is confined between Himalaya in the north, plateau region of Bundelkhand in the South, the river Yamuna forming western limit. The state is surrounded by states of Uttarakhand& Nepal in the north, Madhya Pradesh & Rajasthan in the south, Bihar & Jharkhand in the cast and Haryana and Delhi in the west. The state lies between North latitude 23°52'12" & 30°24'30" and East longitude 77°05'38" & 84°38'30" covering an area of 2, 41,710 sq km. Administratively the state has been divided into 18 divisions, 75 districts, 340 tehsils and 826 blocks. State is also divided into four economic regions i.e. Western Region, Eastern Region, Central Region and Bundelkhand Region. The Western Region comprises of 30 districts and the Eastern Region 28 districts. Ten districts constitute the Central Region whereas the Bundelkhand Region has only 7 districts. The total population of the state (census report, 2011) is 199.58 million out of which the males are 104.60 million and females are 94.99 million. The urban population is 39.9 million and rural is 159.7 million. The decadal growth from 2001-2011 was 20.8%. The population density is highest in Kanpur City followed by Lucknow and Ghaziabad. The average population density is 828 per square Kilometer. Agriculture is the main stay of the people of Uttar Pradesh State. About 67% of the population is rural and dependent on agricultural production for their livelihood with farm income accounting for more than 20% of the income of rural households.

The State experiences a sub-humid and tropical climate with three distinct seasons namely summer, monsoon & winter. The rainy season commences by late June when south western monsoon sets in over the State. The humidity gradually increases and reaches above 80%. August is the peak rainy season. The bulk of annual rainfall about 85% occurs during monsoon period (June to September). The normal rainfall of the State is 888 mm and the average annual rainfall for the year 2022 is 801 mm.

The larger part of the State is underlain by soft rocks of fluvial sediments laid down in the fore deep between Plateau region in south and Himalayas in north during the Quaternary period by the Indus-Ganga system of drainage over the Precambrian topography existing during geological past. These deposits owe their origin to riverine activity. The southern part of the State has entirely different geological conditions being underlain by hard rock of Precambrian formations under a thin alluvial cover. The State can be divided into two hydrogeological formations shown as Unconsolidated soft rock and Consolidated hard rock.

The GEC 1997 has been the basis of ground water assessment in the country for last two decades. Ground Water Estimation Committee revised its methodology in the year 2015. The

Committee suggested the modified methodology for computation of ground water resource estimation, which was refined on the basis of studies of State Government agencies and CGWB. This revised methodology is known as GEC-2015. The recommendation of National Water policy 2012 and GEC-15 has been used by the Central Ground Water Board (CGWB) and Ground Water Department, Government of U.P. for jointly estimation of Dynamic Ground Water Resources of Uttar Pradesh in 836 assessment units (826 blocks and 10 Urban area) for the base year 2022-23 (As on March-2023).

Total recharge from Rainfall in the state is of the order of 36.50 BCM with Lakhimpur district having the highest recharge of 142854 Ham and Mahoba district has minimum recharge of the order of 9564 Ham. Component of recharge from other sources in Uttar Pradesh is 35.33 BCM with highest in Barabanki district 130928 Ham where maximum canal irrigation facility is available. Lowest value of recharge from other source is recorded in Sambhal 8839 Ham where use of ground water as well surface water for irrigation purpose is very low. Total annual recharge from all sources in the State is of the order of 71.83 BCM with Lakhimpur Khiri district having the highest recharge of 230481 Ham and Mahoba district has minimum recharge of the order of 30755 ham.

Total unaccounted natural discharge in the State is of the order of 6.26 BCM with Sitapur district having the highest discharge of 20452 Ham and Mahoba with lowest of 2797 Ham. The Annual Extractable Ground Water Resources in the state is 65.57 BCM with Lakhimpur Khiri district having the highest Annual Extractable Ground Water Resources 210030 Ham and Mahoba with lowest of 27957 Ham.

Total extraction of ground water for all uses in state is calculated as 46.40 BCM. The maximum ground water withdrawal for all uses is 138629 Ham in Bulandshahar district and minimum extraction of ground water for all uses is 25566 Ham in Mahoba district at eastern part of Uttar Pradesh. Comparison of ground water extraction for various uses reveals that extraction for irrigation accounts for almost 88.2% of total ground water extraction, whereas extraction for domestic 10.86% & industrial supply accounts for meager 1% of the total ground water extraction in the state.

After successful upload of data on the online portal of IN-GRES (India Groundwater Resource Estimation System) and computation based on GEC 2015 methodology, 559 blocks are Safe, 172 blocks are falling in semi-critical category, 43 assessment units in critical category and 62 assessment unit of the state are categorized as over-exploited. In Uttar Pradesh, the ground water

extraction concentrates mainly in the Western Uttar Pradesh, Bundelkhand Region and south eastern part of the of the State. The average stage of ground water extraction of the State is 70.76%.

DYNAMIC GROUND WATER RESOURCES OF UTTAR PRADESH, 2023

(As on March, 2023)

1.0 INTRODUCTION

1.1 Background

Uttar Pradesh occupies upper and middle Ganga Plain and is confined between Himalaya in the north, plateau region of Bundelkhand in the South, the river Yamuna forming western limit. The state is surrounded by states of Uttarakhand& Nepal in the north, Madhya Pradesh & Rajasthan in the south, Bihar & Jharkhand in the east and Haryana and Delhi in the west (Fig.-1). The state lies between North latitude 23°52'12" & 30°24'30" and East longitude 77°05'38" & 84°38'30" covering an area of 2,41,710 sq km. It is well connected by Air, Railway and Road network to all metros in the country. The district and tehsil headquarter are well connected by state highways. Administratively the state has been divided into 18 divisions, 75 districts, 340 tehsils and 826 blocks. The total number of villages is 55,903 (as per census 2011) out of which 52,117 habited. The total number of Gram Panchayat are 1,06,774 (sources Directorate of Economics and Statistics Government of Uttar Pradesh). State is also divided into four economic regions i.e. Western Region, Eastern Region, Central Region and Bundelkhand Region. The Western Region comprises of 30 districts and the Eastern Region 28 districts. Ten districts constitute the Central Region whereas the Bundelkhand Region has only 7 districts.

The total population of the state (census report, 2011) is 199.58 million out of which the males are 104.60 million and females are 94.99 million. The urban population is 39.9 million and rural is 159.7 million. A review of decadal population growth indicates regular increase after year 1921. The population growth is rather alarming. The decadal growth from 2001-2011 was 20.8%. The population density is highest in Kanpur City followed by Lucknow and Ghaziabad. The average population density is 828 per square Kilometer. The minimum density is in Lalitpur.

Agriculture is the mainstay of the people of Uttar Pradesh State. About 67% of the population is rural and dependent on agricultural production for their livelihood with farm income accounting for more than 20% of the income of rural households. To feed the growing population, requirement of food and water naturally has increased manifolds. Water is essential for irrigation purposes, but its indiscriminate use can lead not only to shortages, but also to the deterioration of crop yields and soils. Ground water resource of a region is one of the building blocks for balanced economic development of the area, especially in an agriculture-based society. Dependence on

ground water for irrigation and increasing water requirements in urban areas in State has necessitated judicious and planned uses of ground water resources in order to reach sustainability. Also due to industrialization, urbanization and modern farming practices, freshness of ground water is also at stake. The food production in U.P. is commensurate with the self-sufficiency of the country. 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 77% of the irrigation needs of the State. The indiscriminate development of ground water has resulted in depletion of groundwater storage and lowering of water table in certain areas on one hand. On other side certain areas having shallow water table led to serious problems of water logging and soil salination in many parts of the state which has forced the planners for conjunctive use of both surface and ground resources.

For better planning and management of ground water resources, Central Ground Water Board (CGWB) and Ground Water Department (GWD), Government of U.P. has jointly estimated Dynamic Ground Water Resources of Uttar Pradesh in 836 assessment units (826 blocks and 10 Urban area) as per GEC-2015 methodology recommended by the Ground Water Estimation Committee constituted by Government of India. The Present report quantifies the Dynamic Ground Water Resources of Uttar Pradesh State for the base year 2022-23 (As on March-2023).



Figure 1: Adminstrative Division Of Uttar Pradesh

1.2 Constitution of State Level Technical Committee for Ground Water Resource Estimation

Ground Water Resources Estimation of the country was done for the first time in the year 1979. A committee known as Ground Water Exploitation Committee was constituted by Agriculture Refinance and Development Corporation (ARDC) of Government of India. Based on the methodology and norms recommended by the above committee ground water resources were assessed. Subsequently, necessity was felt to refine the methodologies and the "Ground Water Estimation Committee (GEC)" headed by the Chairman, CGWB came into existence. Based on the detailed Surveys and Studies carried out by the different Regions and under Projects of CGWB, the committee recommended the revised methodology in 1982 (GEC-84) for estimation of ground water resources. In 1996, Government of India again constituted "Ground Water Estimation Committee" (GEC) with the members taken from various organizations engaged in hydrogeological studies and ground water development. This Committee, after reviewing the data collected by central and state agencies, research organisations, universities, etc. recommended the methods for ground water resource estimation in 1997. The popularly known as GEC 1997 has been the basis of

ground water assessment in the country for last two decades. This methodology was in vogue for the assessment till the Dynamic Ground Water Resources -2013.

The Dynamic Ground Water Resources of all the 803 assessments units of Uttar Pradesh were assessed based on GEC-97 methodology by Central Ground Water Board, Northern Region, Lucknow and Ground Department, Uttar Pradesh in 2004. Later, the estimation was done in the year 2008/09, 2010/11& 2012/13 in 820 blocks. After approval by the State Level Technical Committee and the recommendations of the standing Committee on R&D Advisory Committee, New Delhi final reports were released as on March 2004, 2009, 2011 and 2013. After reviewing methodology as recommended by the GEC 1997, both on its merits and limitations, Ground Water Estimation Committee revised its methodology in the year 2015. The Committee suggested the modified methodology for computation of ground water resource estimation, which was refined on the basis of studies of State Government agencies and CGWB. This revised methodology is known as GEC-2015

The recommendation of National Water policy 2012 and the changes in the GEC 15, Dynamic Ground Water Resources of Uttar Pradesh for the base year 2019-20 has been presently estimated in 836 assessment units (826 blocks and 10 Urban area).

A Central Level Expert Group (CLEG) is constituted for over-all supervision of the re assessment of ground water resources (as on 31 March 2023) in the entire country. Also, a Permanent State Level Committee under the Chairmanship of the Principal Secretary, Namami Gange and Rural Water Supply, Government of U.P for Dynamic Ground Water Resource Estimation 2023 has been constituted vide office memorandum of Govt. of Uttar Pradesh issued under letter No.103/76-3-2023-04 R/2009 dated- 05.06.2023 to monitor the overall assessment and progress (Annexure-I).

1.3 Proceedings of the Ground Water Resource Estimation Committee

The 1st meeting of State Level Committee of the Ground Water Resource Estimation was held between Central ground Water Board and Ground Water Department Uttar Pradesh on 06.04.2022 to discuss the working plan of task.

A Meeting were held between CGWB and UPGWD on 08.08.2023 to discuss the status of Estimation of GW Resources as on 31.03.2023 in the conference room of the GWD, UP in the presence of Director UP Ground Water department and Regional Director CGWB, NR Lucknow. There was a discussion regarding the challenges faced in the completion of the exercise of GW Resource Estimation, 2023.

The 2nd meeting of State Level Committee was convened under the chairmanship of Principle secretary Namami Gange and Rural Water Supply Department, Uttar Pradesh on 13.09.2023 through online mode, which was attended by members of the State Level Committee, officers from Ground Water Department and Central Ground Water Board, Northern Region. Timeline of GWRE-2023, Methodology of GEC-2015, Approval hierarchy in INGRES module, outcome of GWRE-2023 and comparison from previous year were presented before the committee. After detailed discussions and deliberations, the "Dynamic Ground Water Resources of Uttar Pradesh as on March 2023" was approved by State Level Committee on 13.09.2023 and forwarded to Central Level Expert Group (CLEG) New Delhi.

2.0 HYDROGEOLOGY

2.1 Hydrometeorology

The State experiences a sub-humid and tropical climate with three distinct seasons: summer, monsoon & winter. The summer is hot and dry with maximum daily temperature ranging between 38°C. to 43°C. The lowest temperature is observed during January when night temperature ranges between 2°C & 6°C over the state. With the start of summer, the temperature starts rising with maximum during May when the mercury may touch 45°C in central and eastern parts of the State. Gradually with the beginning of rainy season the temperature drops which again shows a mild rising trend during the intervening period before winter (October, November). The wind speed varies between 8-10 km/hr during summer season and 4-6 km/hr during winter and rainy seasons.

The rainy season commences by late June when south western monsoon sets in over the State. The humidity gradually increases and reaches above 80%. August is the peak rainy season. The bulk of annual rainfall about 85% occurs during monsoon period (June to September). The monsoon starts retreating from the State in late September or early October. Then commences another transitional period followed by winter from late November till February January is the coldest month of the period. Another transitional period follows between winter and summer. Monsoon rainfall is the sole source of natural recharge to ground water and rainfall pattern has an important impact on groundwater levels in the phreatic aquifer. The rainfall data of IMD Stations for the period 1971-2022 have been analyzed. The annual rainfall data of the year 2022-23 is presented below. The rainfall is variable over the State ranging from maximum 1368 to minimum of 369 mm at Maharaj Ganj and Auraiya district respectively. The normal rainfall of the State is 888 mm and the average annual rainfall for the year 2022-23 is 801 mm. The data of the monsoon rainfall annual and normal is given below. Monsoon rainfall within ±19% of the normal monsoon rainfall is considered normal. Monsoon rainfall above 19% of the normal monsoon rainfall is considered excess and monsoon rainfall less than -19% and more than -59% of the normal monsoon rainfall is considered deficit and if the monsoon rainfall is below 59% of the normal monsoon rainfall, it is considered scanty.

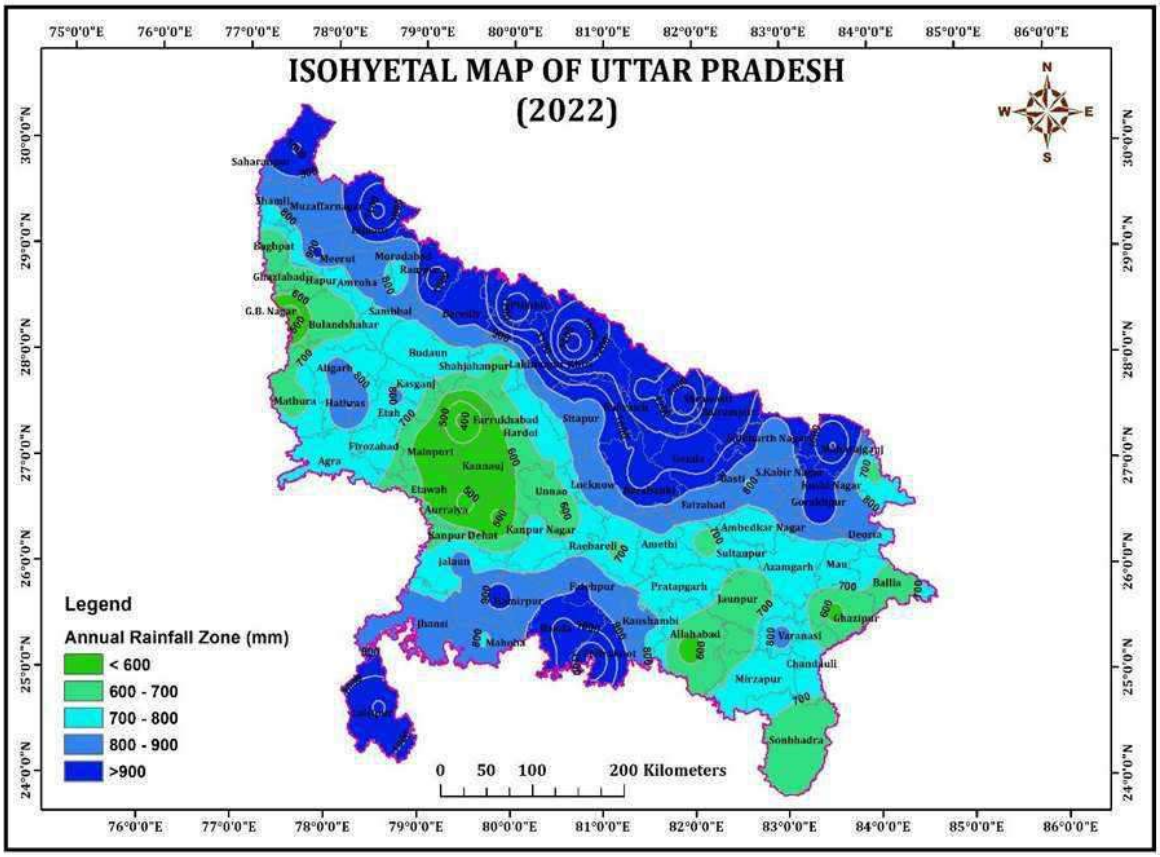


Figure 2: Isohyetal Maps of Uttar Pradesh for the year 2022

Table 1: Actual Rainfall data of the year 2022-23

District	Monsoon Rainfall (mm)		Non-Monsoon Rainfall (mm)		Total Rainfall (mm)		Deviation (%)
	Normal	Actual 2022-23)	Normal	Actual 2022-23)	Normal	Actual 2022-23)	
AGRA	545	596.92	69.7	189.02	614.7	785.94	27.86%
ALIGARH	581.2	548.7	86.3	288	667.5	836.7	25.35%
AMBEDKAR NAGAR	870.6	586.39	105	162.55	975.6	748.94	-23.23%
AURAIYA	556.2	367.74	68.7	110.62	624.9	478.36	-23.45%
AYODHYA	849.4	569.11	103.3	279.77	952.7	848.88	-10.90%
AZAMGARH	808.7	564.97	91.5	157.94	900.3	722.91	-19.70%
BAGHPAT	575.5	394.7	99.3	168.98	674.8	563.68	-16.47%
BAHRAICH	1012.4	712.49	146.4	453.17	1158.9	1165.66	0.58%
BALLIA	801.9	535.57	120.1	86.49	922	622.06	-32.53%

District	Monsoon Rainfall (mm)		Non-Monsoon Rainfall (mm)		Total Rainfall (mm)		Deviation (%)
	Normal	Actual 2022-23)	Normal	Actual 2022-23)	Normal	Actual 2022-23)	
BALRAMPUR	939.8	752.68	125.6	255.33	1065.4	1008.01	-5.39%
BANDA	733.5	793.56	79.5	195.72	813	989.28	21.68%
BARA BANKI	867.5	653.86	110.9	390.76	978.4	1044.62	6.77%
BAREILLY	774.4	482.28	103.5	462.57	877.9	944.85	7.63%
BASTI	989.5	576.35	121.3	181.75	1110.8	758.1	-31.75%
BIJNOR	909.9	715.58	143.6	341.78	1053.5	1057.36	0.37%
BUDAUN	688.6	407.41	95.9	281.35	784.5	688.76	-12.20%
BULANDSHAHR	591.2	364.07	81.9	277.04	673.1	641.11	-4.75%
CHANDAULI	846	617.9	103.1	126.87	949.1	744.77	-21.53%
CHITRAKOOT	774.5	965.2	86.4	237.83	860.9	1203.03	39.74%
DEORIA	889.1	686.67	130.2	134.94	1019.4	821.61	-19.40%
ETAH	582.5	559.1	75.8	240.77	658.2	799.87	21.52%
ETAWAH	522.8	462.48	64.7	145.8	587.5	608.28	3.54%
FARRUKHABAD	668	240.03	85.5	128.65	753.5	368.68	-51.07%
FATEHPUR	669.3	671.95	77.6	188.25	746.9	860.2	15.17%
FIROZABAD	582.8	545.83	74.1	215.13	656.9	760.96	15.84%
G.B.NAGAR	470.8	241.25	66.4	175.4	537.2	416.65	-22.44%
GHAZIABAD	633.9	352.24	95.9	205.79	729.8	558.03	-23.54%
GHAZIPUR	762.3	515.09	91.5	77.74	853.8	592.83	-30.57%
GONDA	928.8	721.7	118.3	313.5	1047.1	1035.2	-1.14%
GORAKHPUR	962.6	769.56	129.1	187.45	1091.8	957.01	-12.35%
HAMIRPUR	660.6	713.85	75.3	182.73	735.9	896.58	21.83%
HARDOI	719.1	469.64	97.2	210.73	816.4	680.37	-16.66%
JALAUN	613.4	604.99	73.8	207.95	687.2	812.94	18.30%
JAUNPUR	809.1	537.55	92.6	149	901.7	686.55	-23.86%
JHANSI	692.7	701.55	72.2	93.3	765	794.85	3.90%

District	Monsoon Rainfall (mm)		Non-Monsoon Rainfall (mm)		Total Rainfall (mm)		Deviation (%)
	Normal	Actual 2022-23)	Normal	Actual 2022-23)	Normal	Actual 2022-23)	
JYOTIBA PHULE NAGAR	781.3	471.82	112.1	319.63	893.4	791.45	-11.41%
KANNAUJ	628.8	419.19	85.8	558.13	714.6	977.32	36.76%
KANPUR DEHAT	593.7	339.67	76.6	160.8	670.4	500.47	-25.35%
KANPUR NAGAR	624.9	518.67	84.7	212.65	709.6	731.32	3.06%
KANSIRAM NAGAR	639.6	460.7	85.2	216.48	724.8	677.18	-6.57%
KAUSHAMBI	754.9	644.5	91.6	155.19	846.5	799.69	-5.53%
KHERI	984.2	945.98	145.8	422.06	1130	1368.04	21.07%
KUSHINAGAR	965.3	472.8	147.8	117.37	1113.1	590.17	-46.98%
LALITPUR	843.3	923.74	66.6	113.01	909.9	1036.75	13.94%
LUCKNOW	776	607.86	103.8	270.62	879.8	878.48	-0.15%
MAHAMAYA NAGAR	546.2	630.5	72.8	263.99	619	894.49	44.51%
MAHARAJGANJ	1141.1	744.03	170.5	263.28	1311.6	1007.31	-23.20%
MAHOBA	733	581.11	76.3	184.76	809.4	765.87	-5.38%
MAINPURI	586.8	380.77	72.9	171.7	659.7	552.47	-16.25%
MATHURA	490.5	465.13	66.4	230.93	556.9	696.06	24.99%
MAU	795.4	601.59	101.9	98.3	897.3	699.89	-22.00%
MEERUT	741.1	514.03	115.8	341.79	856.9	855.82	-0.13%
MIRZAPUR	847.6	633.46	95	159.85	942.7	793.31	-15.85%
MORADABAD	789.6	413.68	113.6	319.91	903.2	733.59	-18.78%
MUZAFFARNAGAR	708.1	524.52	121.2	273.25	829.3	797.77	-3.80%
PILIBHIT	1064.3	912.05	137	370.19	1201.3	1282.24	6.74%
PRATAPGARH	751.5	553.11	86.3	236.99	837.7	790.1	-5.68%
PRAYAGRAJ	758.8	448.16	84.2	117.81	843.1	565.97	-32.87%
RAE BARELI	670.9	458.02	77.4	205.22	748.3	663.24	-11.37%

District	Monsoon Rainfall (mm)		Non-Monsoon Rainfall (mm)		Total Rainfall (mm)		Deviation (%)
	Normal	Actual 2022-23)	Normal	Actual 2022-23)	Normal	Actual 2022-23)	
RAMPUR	915.4	624.86	136.2	423.83	1051.6	1048.69	-0.28%
S. RAVI DAS NAGAR	806.2	723.13	92.4	205.79	898.6	928.92	3.37%
SAHARANPUR	933.1	667.94	169.5	175.41	1102.6	843.35	-23.51%
SANT KABIR NAGAR	1107.4	547.09	146.5	176.59	1253.9	723.68	-42.29%
SHAHJAHANPUR	783.9	423.78	114.3	232.97	898.2	656.75	-26.88%
SHRAWASTI	1037	868.93	147.5	447.77	1184.5	1316.7	11.16%
SIDDHARTH NAGAR	1021.9	547.11	136.7	221.5	1158.6	768.61	-33.66%
SITAPUR	876.2	547.43	115	272.72	991.3	820.15	-17.27%
SONBHADRA	869.1	559.28	104	96.2	973.1	655.48	-32.64%
SULTANPUR	795.8	463.46	91.7	200.09	887.6	663.55	-25.24%
UNNAO	679.6	404.43	86.1	200.4	765.7	604.83	-21.01%
VARANASI	829.5	661.62	96.3	231.83	925.8	893.45	-3.49%
AVERAGE	**771.2**	**573.3**	**101.3**	**227.8**	**888**	**801.1**	-9.79%

2.2 Physiography and Drainage

The State of Uttar Pradesh can broadly be divided into 2 physiographic units, the Central Ganga Plain and the Bundelkhand and Vindhyan Plateau. The Ganga Plain covering 85% of the State is a vast, flat expanse of alluvium having a gentle south easterly regional slope. The highest elevation is around 350 m amsl in the north western parts and lowest 60 mamsl in extreme south eastern part of the state. The land slope is variable, being steep in the north western parts and gradually diminishing south east wards. The slope ranges between less than a meter per kilometer to 5 m/km. This Plain has three sub divisions the Terai in the northwest, the Central Ganga Plain the center and the Marginal alluvial Plain in the south. The southern part of the state south of the Marginal Alluvial Plain is a part of Bundelkhand and Vindhyan plateau. This plateau region slopes northerly and is represented by undulating hilly terrain. The land slope varies from 550-130 m amsl in the western part and 650-100 mamsl in the eastern part with steeper gradients than those in the northern Ganga plain. The State forms a part of Ganga basin. The master drainage of the state is river Ganga and its tributaries. The Ramganga, Ghagra and Gomti are the main left bank tributaries,

while the Yamuna is the main right bank tributary. All these rivers except Gomti originate from Himalayan ranges and are snow fed. Initially the rivers flow southward in the northwestern part of the State, then turn south eastward and finally leave the State in an easterly direction.

2.3 Hydrogeological Units and Aquifer Parameters

The hydrogeological framework of the state consists of both porous and fractured formations. The larger part of the State is underlain by soft rocks of fluvial sediments laid down in the fore deep between Plateau region in south and Himalayas in north during the Quaternary period by the Indus-Ganga system of drainage over the Precambrian topography existing during geological past. These deposits owe their origin to riverine activity. The southern part of the State has entirely different geological conditions being underlain by hard rock of Precambrian formations under a thin alluvial cover. Thus broadly, the State can be divided into two hydrogeological formations

1. Unconsolidated, soft rock.
2. Consolidated, hard rock.

The hydrogeological conditions of the above two formations widely differ and are discussed subsequently in brief.

2.3.1 Unconsolidated Formation:

This unit covers nearly 85% of the State area. The unconsolidated formations comprising the area have been deposited through mighty rivers originating from great Himalayan Mountains. These sediments are an admixture of pebble, gravel, sand, silt, clay and kankar. The sediments are generally coarser in the north and gradually become finer in south east ward along downstream of the drainage which is a typical feature of fluvial deposits.

Bhabar Zone

The piedmont deposits consisting of numerous coalescent fans occupy narrow tract, 10 to 20 Km. in width along the foot hill region south of Sub Himalayan zone. This belt is south sloping (10-20 m./Km.) plain merging with Tarai belt in the south. and extends from Saharanpur in the west to Bijnore in the east. It gradually narrows down eastward. The fans have been formed by accumulation of debris brought down by heavily charged streams on their emergence from the hills. The fans consist of poorly sorted material of all sizes. The percentage of granular material is much higher. The clay occurrence is further south. The presence of thick clay layer over coarser sediment with abrupt reduction of slope marks the southern limit of Bhabar. The ground water occurs under

unconfined state and the level is deep in this belt. Occasionally it goes down as deep as 130 m. bgl. The elevation of water table varies from 250 m. to 300 m.a.m.s.l. The hydraulic gradient is around 3m/Km. TheBhabars are capable of yielding 1700 to 3800 lpm of water at a drawdown of 3 m to 10 m. The hydraulic conductivity as per test result ranges between 31 and 378 m/day.

Tarai Zone

This occupies a narrow belt south of Bhabar and its contact with Bhabar is well marked by a spring line. It's southern boundary is not pronounced and it gradually and imperceptibly merges with Central Ganga plain. It is characterised by moist, water logged area which is gently sloping south-ward (2.5 m/Km). Luxuriant growth of dense forest is characteristic feature. The Tarai deposits are dominantly fine sediments with well sorted material. In Tarai belt the ground water occurs under unconfined, confined and semi-confined conditions. The depth to water level in shallow aquifer ranges between 2 m. and 6 m. below ground with average seasonal fluctuation of 2 m to 4 m. The water table slopes southward. In deeper aquifer (below 50 m. depth) the ground water occurs in confined state. The autoflow conditions are common in this belt. The exploratory results have shown strong confining condition in parts of Saharanpur, Bijnor and Mahrajganj district. The flowing condition is associated with nature and size of fan deposit. The piezometric head of flowing aquifer ranges between 1 & 5.3 m.agl while in non-flowing condition it rest between 2 and 12 m bgl. The tubewells tapping deeper flowing aquifer yield 1400 to 3400 lpm of fresh groundwater for a drawdown of 2 to 8 m. In case of non-flowing wells the yield varies between 600 and 2400 lpm for a drawdown of 4m to 9m. The coefficient of permeability ranges between 20 and 120 m/day.

Central Ganga Plain

The vast alluvial tract covering nearly two third of the state occupies the area south of Terai and can further be divided in two sub units Younger Alluvium and Older Alluvium. This forms one of the richest ground water repositories of the world. It is characterized by plain of low relief and numerous fluvial features such as abandoned channel, natural levee and meander scrolls. The presence of different erosional and depositional fluvial features indicates shifting nature of the rivers. In the process of shifting of the river course, older flood plains were left off as extensive high lands that act as present-day interfluves. The rivers have degraded their own alluvial plains and carved new meander belts at lower elevation, where younger flood plain deposition took place. Thus, this region presents two distinct sub units, the high land or composite flood plain area and low meander flood plains. The physiographic depressions frequented by over bank flow from

adjoining river during high flood period act as back swamp area. The low-lying riparian area occupied by present day meander belts form the meander flood plain. Such meander flood plains are usually underlain by coarser sediments. The Younger Alluvium occurs mostly along the present-day flood plain area. The continuous shifting of the drainage network with time caused reworking of their earlier deposits giving rise to the younger alluvium. The Older alluvium occupying comparatively high area covers major part of the Plain. A typical characteristic of Older alluvium is formation of kankar within itself due to leaching of calcium carbonate under favorable climatic conditions. The kankar occasionally forms pans restricting downward movement of water. The alluvial sediments are variable and generally goes up to 500 m below which occurs, thickness of semi-consolidated Upper Siwalik formations. The Shallower basement occurs in isolated areas which are known as "Basement highs."

This unconsolidated zone is porous and permeable with primary intergranular porosity and has good ground water potential. The sub-surface correlation of formations in the state has shown presence of several aquifers down to a depth of 750 m below the ground. These aquifers mainly encountered in Central Ganga Plain have been grouped on the basis of lithological characters as well as based on interpretation of electrical logs of Boreholes drilled.

The upper part of first aquifer down to 50 mbgl is the main source of drinking water through hand pumps and dug wells and is unconfined in nature. The first aquifer as a whole which is under unconfined to semi-confined conditions is the most potential aquifer group which is the main source of ground water in the State extensively exploited through private as well as Government tube wells to meet the drinking water and irrigation needs. The deeper aquifers are confined in nature and are being exploited to a very limited extent. The shallow and phreatic aquifers are under heavy stress.

Marginal Alluvial Plain

The transition zone between Ganga plain in the north and plateau region in the south forms the Marginal Alluvial Plain region. This zone is characterized by gently north-east sloping plain, comprising abandoned channel, meander scars and ravines. The fluvial sediments present in this belt have been deposited partly by the fluvial action of the river Yamuna and partly by the Ganga river. The average thickness of alluvial material varies from 70m to 200m, overlying Pre Cambrian basement. Lithologically the Marginal Alluvium consist of clay and silt interbeded with sand lenses of variable thickness and extension. While in Mathura - Agra area the sandy horizons are thin and persist over a few hundreds of meter, these have wider extension in Jalaun. The subsurface data for Jalaunarca indicate 10 to 50m., sandy horizon lying between 30 to 100 m. depth. The sediments are

poorly sorted consisting sands of different grade interbeded with clays. The ground water occurs mostly in unconfined state, but occasionally under semi confined to confined state. The water table is. generally shallow in southern part and gradually deepens close to Yamuna river. The deeper aquifers are under confined state. The aquifer material tapped (25-40m. thickness) in Agra - Mathura area have yielded 720 to 1200 lpm for a drawdown of 8 to 12m., while similar thickness of aquifer in Jalaun, Hamirpur, Banda area yield better discharge (3000-3600 lpm) for a drawdown of 3 to 5m. The hydraulic conductivity has large variation in this area ranging between 20 and 100 m/day. The ground water quality deteriorates with depth in Agra - Mathura area.

2.3.2 Consolidated Formation:

The plateau like terrain of Kaimur range and Bundelkhand Massif forms the Southern Peninsular region. The region is characterized by bare rocky terrain punctuated with variety of land forms such as mesas, buttes, inselberg etc. Isolated patches of residual soil and laterites of varying thickness and extension are present. The area is underlain by Bijawar and Vindhyan group of rocks. Depending upon rock types, four sub hydrogeological units are identifiable in this region which is briefly discussed below.

The crystalline rocks of Budelkhand Granite Complex (BGC) group occupy Jhansi, Jalaun, Hamirpur, Lalitpur, Mahoba and Banda districts. The groundwater occurs within the secondary porosity (joints, fractures, weak plains) as well as in the weathered residuum or sandy clay depending upon texture and composition of the rocks under water table conditions. The weathered residuum may be granular parent rock. Hydrogeologically it behaves similar to alluvial formation. The vertical and lateral extension of weathered zone varies from place to place. The depth to water level varies between 2 and 16 mbgl with an average value of 4 to 8 m. The seasonal fluctuation is of the order of 2 to 4 m with exceptional value of high fluctuation large number of tubewells was constructed in this region, tapping Sm to 20m of aquifer material and yielding <60 to 600 lpm of fresh ground water. The water level in these wells lies between 3.5 and 18.5 m. bgl

The Vindhyan sandstone/shale occupies considerable area of Southern Hard Rock region. Generally, the sandstones are compact except for Shankargarh sandstone occurring in Allahabad Mirzapur and Chitrakoot area. The ground water occurs in the joints and fractures of compact sandstone under water table condition. The depth to water table depends on the morphology and varies between 2 and 25 mbgl. The discharge of tubewells has been found low ranging between 120 and 300 lpm strong confining conditions have been found in Vindhyachal area (Mirzapur district) where flowing condition is present. The contact zone of shale sandstone exists at a depth of 60 to 80 m and the yield is 1000 to 1200 lpm. The piezometric head of 2.5 magl. has been observed. The

Shankargarh sandstone in Allahabad are capable of yielding 300 to 600 lpm of fresh ground water. The Vindhyan limestone, exposed in central parts of Mirzapur, southern part of Banda and Lalitpur districts, form moderately good ground water repository. The cavernous limestone of Banda (Chitrakoot area, BiradhKund area) has yielded reasonably good discharge. The limestone area remains to be thoroughly explored.

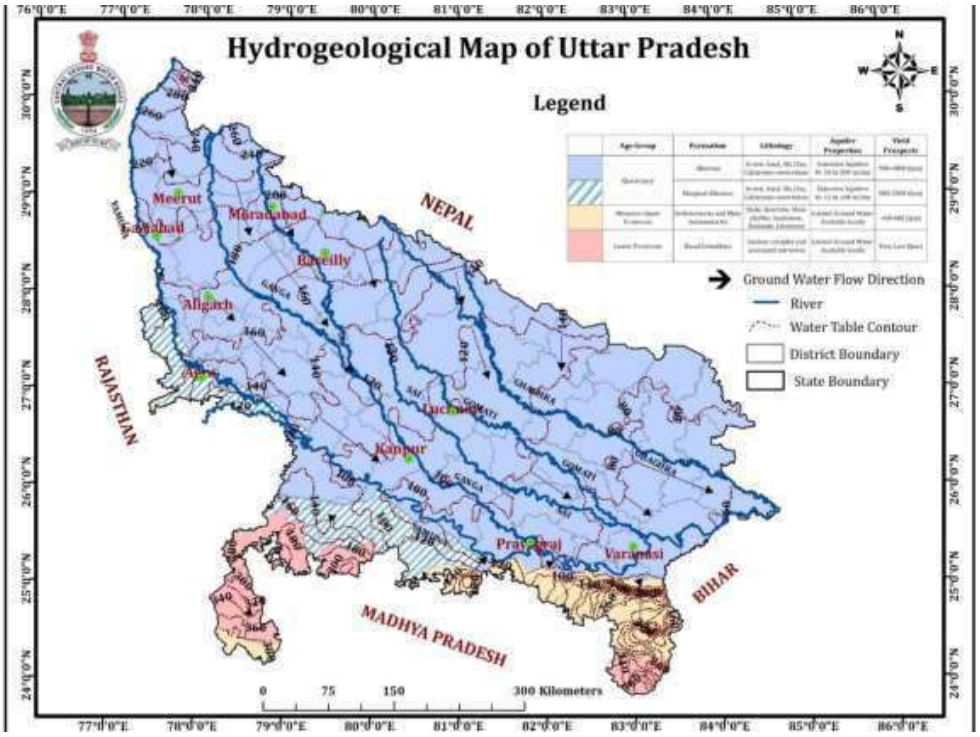


Figure 3: Hydrogeological Map of Uttar Pradesh

2.4 Scenario of Ground Water Levels in Uttar Pradesh

2.4.1 Depth to Water Levels

Ground water level refers to underground surface below which the ground is wholly saturated with water. The upper surface of the zone of saturation is the water table. In case of wells penetrating confined aquifers, the water level represents the pressure or piezometric head at the point. The configuration of the water table depends upon topography, geology, climate water yielding and water bearing of rocks in the zones of aeration and saturation which control ground water recharge. The chief source of recharge to storage is rainfall which is highly variable over space and time. The sources of ground water abstraction structures are also varying and growing exponentially. The regions having ground water as the main source for irrigation always remain under heavy stress. The imbalance between the recharge and discharge expresses itself in terms of

variations in the ground water levels. Thus, the water level is a very important parameter for ground water studies. The groundwater level data of Ground Water Observation wells monitored during May 2022, and November 2022, have been compiled and analyzed.

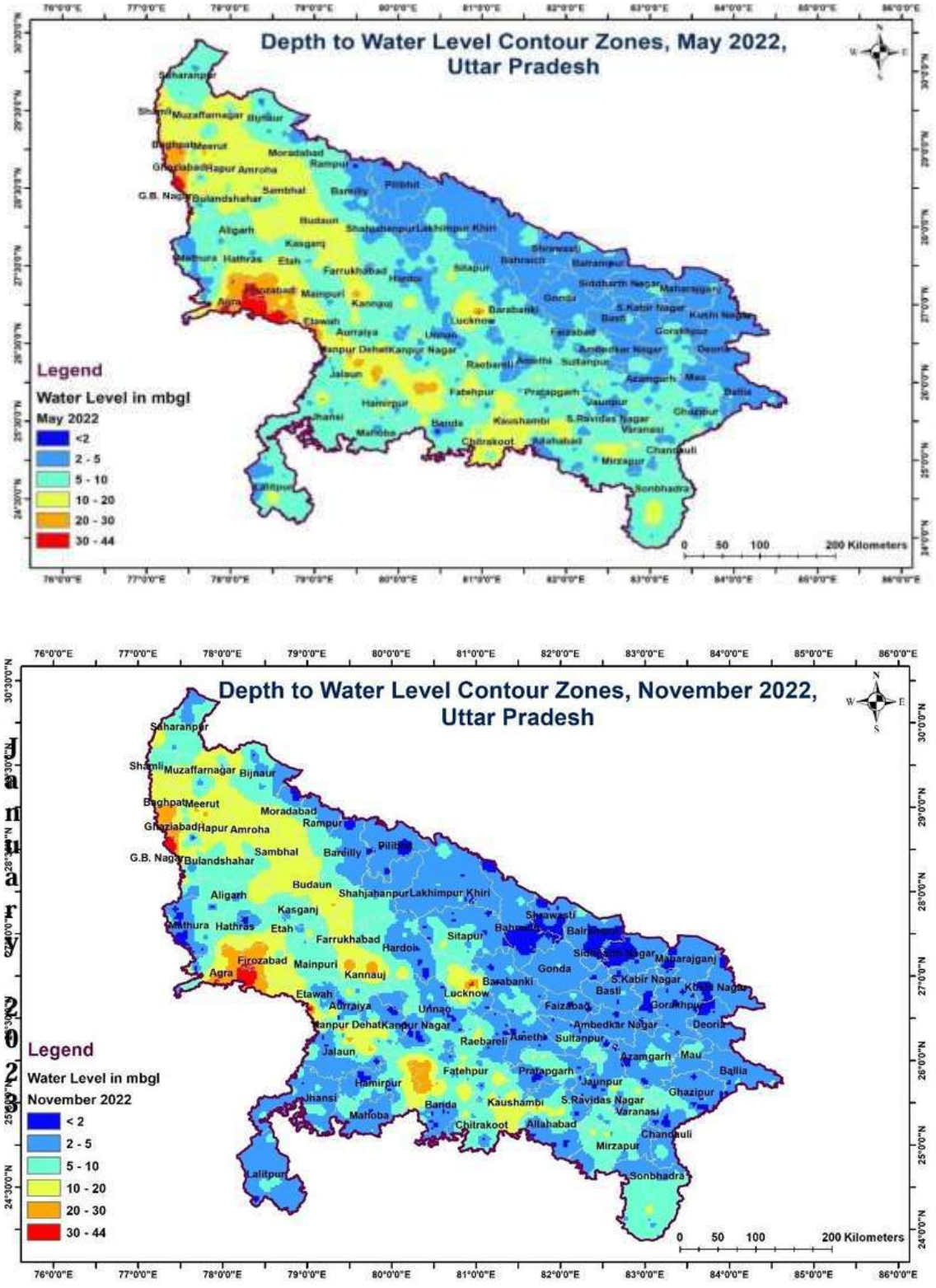


Figure 4: Pre and Post Monsoon Depth to water level maps of Uttar Pradesh of 2022

3.0 GROUND WATER RESOURCES ESTIMATION METHOLOGY, 2015

The earlier ground water resources assessment of the State was done based on the recommendations of Ground Water Estimation Committee 1984 (GEC 84). The GEC 84 methodologies was subsequently modified in the light of enhanced database and new findings of experimental studies in the field of hydrogeology. The Ground Water Estimation Committee- 1997 has been the basis of ground water assessment in the country for last two decades. The National Water Policy (2012) also enunciates periodic assessment of ground water potential on scientific basis. The Ministry of Water Resources, Govt. of India, therefore, constituted a committee consisting of experts in the field ground water to recommend a revised methodology. The revised methodology as recommended has incorporated number of changes compared to the recommendations of Ground Water Estimation Committee-1997. The revised methodology GEC 2015 recommends aquifer wise ground water resource assessment to which demarcation of lateral as well as vertical extent and disposition of different aquifers is pre-requisite.

3.1 IN-GRES (INDIA- Groundwater Resource Estimation System)

Automation of Estimation of Dynamic Ground Water Resources using GEC-2015 methodology.Ground Water is the backbone of India's agriculture and drinking water security in urban and rural areas. However, it is important to realize that groundwater is not a resource that could be utilized in discriminately. India being a home to more than 1.3 billion people, the increasing population, urbanization and non-uniform extraction have accelerated depletion of ground water resources. This is reflected in falling ground water levels trends and contamination of aquifers. A serious groundwater crisis prevails currently in India due to excessive over-extraction and groundwater contamination covering nearly 60 percent of all districts in India and posing a risk to drinking water security of the population. In addition to over-extraction and biological/chemical contamination of water, excess groundwater and water logging is also a serious problem in many regions, impacting livelihood security of large sections of society.

Ground water estimation committee (GEC) 2015 gives guidelines to classify assessment units (largely administrative units such as blocks/talukas/mandals/Farkas, and in some cases hydrological units such as watersheds/aquifers) into SAFE, SEMI-CRITICAL, CRITICAL AND OVER EXPLOITED categories. This classification is based on the amounts of Ground Water Recharge, Draft, Flux happened in a particular year.

GEC system takes Data Input through Excel as well as through Forms, computer various Ground water components (recharge, draft, flux, etc.), classify assessment unit into appropriate categories, develop visibility dashboards for each of the components. System allows user to view the data in both MIS as well as GIS view. User can also download the reports in formats like CGWB, etc.

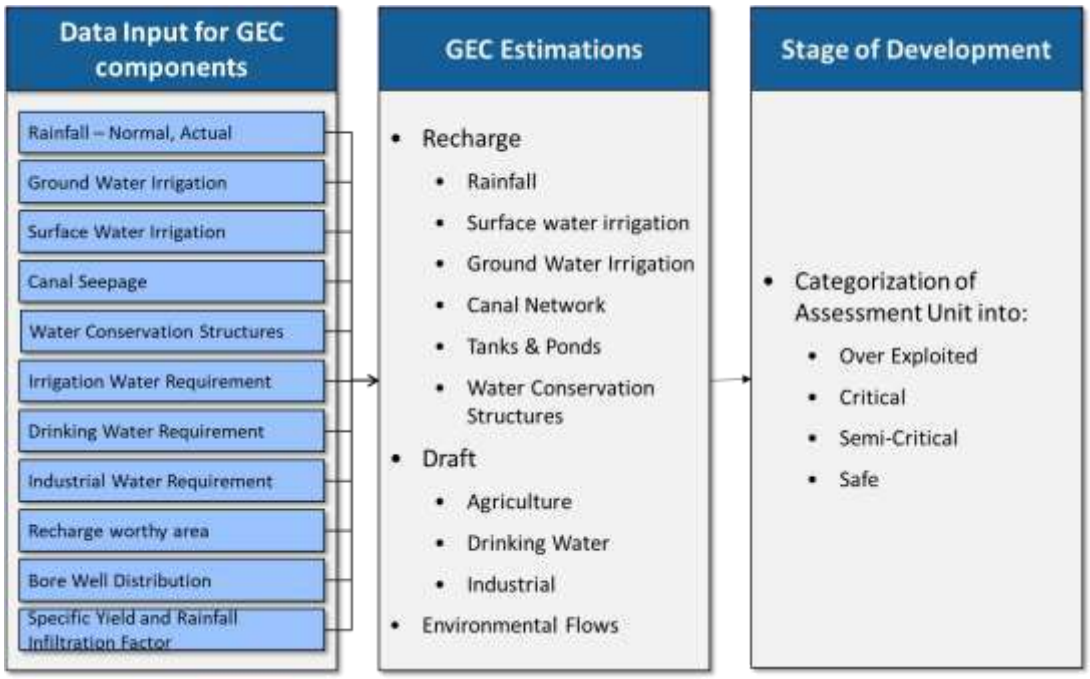


Figure 5: Overview of Ground Water Resource Estimation Platform – GEC 2015

3.2 Methodology Used

The system is based on GEC 2015 methodology for ground water resources estimation for 3 types of Aquifers: Unconfined Aquifer, Semi-Confined Aquifer and Confined Aquifer. The resource estimation for an Unconfined Aquifer is based on the principle of water balance:

Inflow – Outflow = Change in Storage (of an aquifer) This equation can be further elaborated as:

$$\Delta S = R_{RF} + R_{STR} + R_C + R_{SWI} + R_{GWI} + R_{TP} + R_{WCS} \pm VF \pm LF - GE - T - E - B$$

Where,

ΔS – Change is storage

R_{RF} – Rainfall recharge

R_{STR} – Recharge from stream channels

R_C – Recharge from canals

R_{SWI} – Recharge from surface water irrigation R_{GWI} – Recharge from ground water irrigation

R_{TP} – Recharge from tanks & ponds

R_{WCS} – Recharge from water conservation structures

VF – Vertical inter aquifer flow

LF – Lateral flow along the aquifer system (throughflow)

GE – Ground Water Extraction

T –Transpiration

E – Evaporation

B – Base flow

India GEC system is divided into 3 modules – Input, Computation and Output.

1. **Input module**–Input Module refers to the Data Entry module at an Assessment Unit level. Data Input is done via 2 methods i.e.
    a. **Excel based input**– In this, the user needs to download District level data sheet template where he/she can fill the data at an Assessment Unit level. User

now needs to upload their fully filled excel sheet into the system.

b. **Form based input** – In this, the user is shown a form and he/she can fill/edit the data in data sheet in an online mode. Once user is done with editing online, he/she can Submit the datafile.

2. **Computation module** – Computation Module refers to the ground water calculations for an assessment unit. These computations are based on GEC-2015 methodology and are used to calculate Annual Extractable Ground Water Resource, Total Current Annual Ground Water Extraction (utilization) and the percentage of ground water utilization with respect to recharge (stage of Ground Water Extraction) for an assessment unit. Based on these percentages an assessment unit is categorized into SAFE, SEMI-CRITICAL, CRITICAL AND OVER-EXPLOITED categories.

3. **Output module** Once categorized the data is shown in two views:

a. **MIS Dashboard** – MIS dashboard shows the results of the assessment for the entire India, and also State wise in tabular form. The MIS dashboard shows all type of recharges, extractions, inflows and outflows computed for both monsoon and non-monsoon periods of the year and then reflect the overall stage of extraction at the selected Geo – Zoom Level.

b. **GIS Dashboard** – GIS dashboard shows the data in Web Geo-Server format, implemented in interactive GIS platform allowing user to all GEC related information in the map itself. GIS view represents the data on India map and colour codes each District/Assessment unit based on the categorization.

3.3 GROUND WATER RECHARGE

The Ground Water Recharge for an Unconfined Aquifer is calculated as:

$$\text{Recharge} = R_{RF}+R_{STR}+R_{C}+R_{SWI}+R_{GWI}+R_{TP}+R_{WCS}$$

Where,

R_{RF} – Rainfall recharge

R_{STR} – Recharge from stream channels

R_C – Recharge from canals

R_{SWI} – Recharge from surface water irrigation R_{GWI} – Recharge from ground water irrigation

R_{TP} – Recharge from tanks & ponds

R_{WCS} – Recharge from water conservation structures

3.3.1 Annual Rainfall Recharge

Monsoon Rainfall is the major source of ground water recharge. About 58% of the annual replenishable resources are contributed by monsoon rainfall. This recharge is estimated using Ground Water Level Fluctuation method (for Monsoon season only) and Rainfall Infiltration Factor method (for both Monsoon and Non-Monsoon). User is allowed to enter data at Assessment Unit level, Rain Gauge level data, IMD Grid level, etc.

Data Elements Used

Component	Parameter	Unit
Rainfall Infiltration Factor Method	Rainfall	Millimeter
Water Table Fluctuation Method	Water Level	Meter

Data computation methodology

The Rainfall Recharge estimations based on Water Level Fluctuation method, reflects actual field conditions as it considers the response of ground water level. However, this estimation is often subject to uncertainties. In the regions, where adequate data on ground water level fluctuations is not available, ground water recharge is estimated using rainfall infiltration factor method. Therefore, it is recommended to compare the rainfall recharge obtained from water level fluctuation approach with that estimated using rainfall infiltration factor method.

Ground Water Level Fluctuation Method

TheGroundWaterLevelFluctuationmethodistobeusedforassessmentofrainfallrecharge in the monsoon season only. It considers following factors for recharge calculation:

- Change in storage
- Rise/Fall in water level in the monsoon season
- Specified yield (based on Aquifer Norms)

R_{RF} (wtfm) = ((Change in Ground Water Storage + Gross Ground Water Extraction for all uses in Command/Non-Command Area during Monsoon) - Recharge from "Other Sources" during Monsoon Season))1000

Where,

Change in Ground Water Storage = Rise/Fall in water level in the monsoon season * Area * Specific Yield

Recharge from "Other Sources" = Recharge due to seepage from Canals + Recharge from Surface Water Irrigation + Recharge from Ground Water Irrigation + Recharge from Tanks and Ponds + Recharge from Water Conservation Structures

Rainfall recharge during monsoon season for normal monsoon rainfall condition, R_{RF} (Normal, wtfm) is calculated as:

R_{RF} (Normal, wtfm) = (Rainfall Recharge * Monsoon Normal Rainfall) / Monsoon Actual Rainfall

Rainfall Infiltration Factor Method

The Rainfall Infiltration Factor method is used for rainfall recharge assessment in both monsoon and non-monsoon season. It considers following factors for recharge calculation:

- Area
- RFIF - Rainfall Infiltration Factor (based on Aquifer Norms)
- Normal Monsoon Rainfall

RRF (Normal, rifm) = (Area*Normal Rainfall during Monsoon-Rainfall threshold) * Rainfall Infiltration Factor)/1000

Where, Rainfall Threshold = 10% of annual rainfall

Method selection for Monsoon

Once the rainfall recharge is estimated using both the methods, Percent Deviation (PD) is calculated. PD is the difference between the two methods i.e. RRF (wtfm) and RRF (rifm) expressed as a percentage of the R_{RF} (rifm)

PD = (R_{RF} (Normal, wtfm) - R_{RF} (Normal, rifm)) / R_{RF} (Normal, rifm) * 100 Where,

R_{RF} (wtfm) = Rainfall Recharge for normal monsoon season rainfall estimated using Water Table Fluctuation method

R_{RF} (rifm) = Rainfall Recharge for normal monsoon season rainfall estimated using Rainfall Infiltration Factor method

The criteria for adoption are:

- If -20% < PD<+20% Final Rainfall Recharge =Rrf (wtfm)
- If PD <-20% Final Rainfall Recharge = Rrf (rifm)*0.8
- If PD>+20% Final Rainfall Recharge = Rrf (rifm)*1.2

3.3.2 Recharge from Other Sources – Ground Water Irrigation

In recharge through ground water irrigation, the ground water which was earlier extracted for agricultural irrigation purposes is now contributing to the ground water recharge. This recharge is calculated based on the return flow factor for paddy as well as non-paddy fields.

Data Elements Used

Component	Parameter	Unit
Recharge due to Ground Water Irrigation	Cropping Pattern	Acres

3.3.3 Recharge from Other Sources - Surface Water Irrigation

Surface Water Irrigation is done to irrigate crops through the canal water. This water also contributestogroundwaterrechargeandiscalculatedusingReturnFlowFactorandnumber of days the water was discharged to fields.

Data Elements Used

Component	Parameter	Unit
Recharge due to Surface Water Irrigation	Design Discharge of the Outlet	Cusecs
	Number of Days	Number
	Cropping Pattern	Acres

Data computation methodology

Recharge due to Applied Surface Water Irrigation: Recharge due to applied surface water irrigation is estimated based on the following formula:

R_{SWI} = AD * Days * RFF

Where:

R_{SWI} = Recharge due to applied surface water irrigation

AD = Average Discharge

Days = Number of days water is discharged to the Fields

RFF = Return Flow Factor

In case discharge data is not available below formula is used to calculate R_{SWI}:

R_{SWI} = [((Irrigation Area Under Paddy * Crop Water Requirement for Paddy) + (Irrigation Area under Non-Paddy * Crop Requirement for Non-Paddy)) *RFF

Where,

RFF = [(Irrigated Area under Paddy * Return Flow Factor for Paddy) + (Irrigated Area under Non-Paddy * Return Flow Factor for Non-Paddy)] /(Irrigated Area under Paddy + Irrigated Area under Non-Paddy)

3.3.4 Recharge from Other Sources – Canal Seepage

Canals store water till the time it is disbursed for irrigation, industrial and domestic purposes. During this time the water seeps down the ground, contributing to the ground water recharging. Canals are of two types – Lined and Unlined.

Data Elements Used

Component	Parameter	Unit
Recharge from Canal Seepages	Reach Length	Meters
	Full Supply Length	Meters
	Side Angle	Degrees
	Base Width	Meters
	Number of Days	Number

Data computation methodology

Recharge due to canals is estimated based on the following formula:

$$R_C = WA * SF * Days$$

Where:

R_C = Recharge Due to Canals

WA = Wetted Area (calculated as Wetted Perimeter X Length of CanalReach)

SF = Seepage Factor

Days = Number of Canal Running Days

3.3.5 Recharge from Other Sources - Tanks and Ponds

During monsoon season, water get stored in Tanks and Ponds. This stored water contributes to the ground water recharge based on the amount of water stored and number of days water is stored in the restructures.

Data Elements Used

Component	Parameter	Unit
Recharge from Tanks and Ponds	Water Spread Area	Hectares
	Number of Days	Numbers

Data computation methodology

Recharge due to Tanks & Ponds is estimated based on the following formula:

$$R_{TP} = AWSA * R * RF$$

Where:

R_{TP} = Recharge due to Tanks & Ponds

AWSA= Average Water Spread Area

N = Number of days Water is available in the Tank/Pond

RF = Recharge Factor (As per GEC 2015, recommended RF = 1.4 mm / day)

3.3.6 Recharge from Other Sources - Water Conservation Structures

Similarly, like Tanks and Ponds, Artificial Structures for Water Conservation, stores water in monsoon season which then contributes to ground water recharge.

Data Elements Used

Component	Parameter	Unit
Recharge due to Water Conservation Structure	Gross Storage	Hectare Meters
	Number of Refills	Number

Data computation methodology

Recharge due to Water Conservation Structures is estimated based on the following formula:

$$R_{WCS} = GS * RF$$

Where:

R_{WCS} = Recharge due to Water Conservation Structures GS = Gross Storage = Storage Capacity * No. of Fillings

RF = Recharge Factor (As per GEC 2015 recommendations, RF = 40% of Gross Storage during a year which means 20% during monsoon season and 20% during non-monsoon Season)

3.3.7 Recharge from Other Sources – Stream Channels

Streams following through an area also contribute to the Ground Water recharge.

Data computation methodology

Recharge from Stream Channels is estimated using Darcy's Law.

Q = K * [(h2-h1)/L] * A

Where:

K = Coefficient of Permeability / Hydraulic Conductivity

h1 = Head of the river

h2 = Head at the Ground Water level

L = Length of the river which contribute to recharge

A = Area of cross-section

3.3.8 Recharge from Other Sources - Pipelines

Because of the water supply schemes, Pipelines are used for transporting water for domestic and industrial purpose in Urban area. Leakages from the pipelines are huge in some areas and contribute to ground water recharge.

Data Elements Used

Component	Parameter	Unit
Pipelines	Water supply through pipeline	Hectare Meters
	Number of days water is supplied	Number

Data computation methodology

Recharge from pipelines (pipelines) is estimated based on the description given in GEC 2015:

RPipelines = 0.5 * (Water Supply through pipelines * Percentage losses/100) * Weighted Infiltration factor * Number of Days water is supplied through pipelines

3.3.9 Recharge from Other Sources - Sewage/Flashfloods

Seepages from the sewerages also contribute to recharge. Water which gets logged due to flash floods (happening due to heavy rainfall in a short period of time) also contribute to ground water recharge.

Data computation methodology

Recharge from Sewage/Flash Floods ($R_{Sewage/Flash\ Floods}$) is estimated based on the description given in GEC2015:

$R_{Sewage/Flash\ Floods}$= WP * SF * Length * Days Where:

WP = Wetted Perimeter SF = Seepage Factor Days = Number of Days

3.4 Inflows and Outflows

Environmental Flows consists of Vertical inter Aquifer Flow, Lateral Flow along the aquifer system, Transpiration, Evaporation and Baseflow.

3.4.1 Vertical Inter Aquifer Flow

In areas where more than one aquifer is present, there is a possibility that either of ground water flow between the aquifers which is known as Vertical Inter Aquifer Flow. Vertical aquifer interflow is calculated using Darcy'slaw

Data computation methodology

This is calculated using Darcy's Law:

$Q = HC * [\Delta h/T] * A$

Where,

HC = Hydraulic Conductivity

Δh = Average Change in Head

T = Thickness of Aquitard

A = Area of the zone

3.4.2 Lateral flow along the aquifer system (throughflow)

In Unless and until the assessment unit is a hydrological unit with sealed boundaries, there is always a possibility of ground water movement across the boundaries. Wherever the assessment unit are blocks, there will be a ground water flow across the boundaries. This flow of ground water between the aquifers is known as Lateral Flow Lateral Flow is calculated using Darcy's law.

Data computation methodology

This is calculated using Darcy's Law:

$Q = T * [\Delta h/Distance] * L$

Where,

T = Transmissivity

Δh = Up Contour - Down Contour

Distance = Distance between two contours on ground

L = Length of the section

3.4.3 Transpiration

Transpiration normally takes place from the ground water reservoir if the roots reach the ground water table. If the water table is deep below, ground water cannot be lost through transpiration. But in situations where the roots extend up to the capillary rise of ground water levels, it will lead to transpiration.

Data computation methodology

This is calculated as:

Transpiration = A * TR * Days * (RD + CR - GWL) / (RD + CR)

Where,

A = Area

TR = Transpiration Rate

RD = Average Root Depth

CR = Capillary Rise

GWL = Ground Water Level

3.4.4 Evaporation

Evaporation normally takes place from surface water bodies. As the ground water is not exposed to surface, there is a less possibility for evaporation from ground water bodies. But in situations where the ground water levels are less than the capillary rise of the aquifer material, it will lead to evaporation.

Data computation methodology

Evaporation = A * ER * Days * (CR - GWL)/CR

Where,

A = Area

ER = Evaporation Rate

CR = Capillary Rise

GWL = Ground Water Level

3.4.5 Evapotranspiration

Sometimes it will be difficult to get evaporation and transpiration rates separately. It may be possible to get a single rate of evapotranspiration which is the cumulative effect of evaporation and transpiration. In these situations, instead of using two terms viz. evaporation and transpiration in the equation only one term is used i.e. Evapotranspiration.

Data computation methodology

Evapotranspiration = A * ETR * Days * (RD + CR - GWL) / (RD + CR) Where,

A = Area

ETR = Evapotranspiration Rate

RD = Average Root Depth

CR = Capillary Rise

GWL = Ground Water Level

3.4.6 Baseflow

Even though the aquifers are underdeveloped, the water levels will not rise to ground level. The reason for this is base flow.

Data computation methodology

Baseflow is calculated at Stream Gauge discharge: If Spell Number is 0, then.

Baseflow = Stream Discharge Else,

Baseflow = Discharge at Start day in the spell + Day Number in the Spell * Slope of Discharge Straight line of the Spell

Where,

Stream Discharge = Average of 5 years of Daily Stream Discharge data

Slope of Discharge Straight line of the Spell = (Discharge at End Day – Discharge at Start Day) / (Number of Days)

3.4.7 Environmental Flows

The Unaccounted Natural Discharges are estimated based on the method used for calculating rainfall recharge in monsoon season. If the rainfall recharge is computed using water table fluctuation method,5% of the Total Annual Ground Water Recharge is taken as unaccounted Natural discharges else it is 10%of the Total Annual Ground Water Recharge.

3.4.8 Annual Extractable Ground Water Resource

The Total Annual Ground Water Recharge cannot be utilized for human consumption as there are some ecological commitments to be fulfilled before the extractable resources is

defined. Therefore, ground water base flow contribution limited to the ecological flow of the river should be determined which will be deducted from Annual Ground Water Recharge to determine Annual Extractable Ground Water Resources (AEGR).

Data computation methodology

AEGR = TGWR - ND

Where,

AEGR = Annual Extractable Ground Water Resources TGWR = Total Ground Water Recharge

ND = Natural Discharges

3.5 Ground Water Extraction

Ground water draft or extraction can be assessed as follows:

$$GE_{ALL} = GE_{DOM} + GE_{IRR} + GE_{IND}$$

Where,

GE_{ALL} = Ground water extraction for all uses

GE_{DOM} = Ground water extraction for domestic uses

GE_{IRR} = Ground water extraction for irrigation uses

GE_{IND} = Ground water extraction for industrial uses

3.5.1 Extraction for Domestic Use

Ground water which is extracted for domestic use can be estimated based on well census method or requirement method.

Data Elements Used

Component	Parameter	Unit
Ground Water Extraction	Well Census	Number
	Number of days	Number
	Population	Number
	Consumptive Requirement	Litres per capita per day

Data computation methodology

Ground Water Extraction for Domestic Use can be calculated in 2 ways:

Unit Draft Method: Formula for Unit Draft Method is:

GE_{DOM} = Unit Draft * Wells

Where,

Unit Draft = Draft per well

Wells = Number of Wells used for domestic purpose

Consumptive Use Method: Formula for Consumptive Use Method is:

GE_{DOM} = Population * Consumptive Requirement * Lg

Where,

Consumptive Requirement = Per Capita Daily Water Requirement(lpcd)

Lg = Fractional Load on Ground Water for Domestic Water Supply

3.5.2 Extraction for Irrigation Use

One of the main sources of water is ground water on which many farmers depends for irrigation. This can be estimated based on Well Census Method, Crop Water Requirement Method or Power Consumption Method.

Data Elements Used

Component	Parameter	Unit
Ground Water Extraction	Well Census	Number
	Number of days	Number
	Cropping Pattern	Acres
	Power Consumed	Kilo Watt Hours

Data computation methodology

Ground Water Extraction for Irrigation Use can be calculated in 3 ways:

Unit Draft Method: Formula for Unit Draft Method is:

GE_{IRR} = Unit Draft * Wells

Where,

Unit Draft = Unit Draft per well

Wells = Number of Wells used for irrigation purpose

Crop Water Requirement Method: Formula for Crop Water Requirement Method is:

GE_{IRR} = (Crop Water Requirement * Crop Area) / 1000

Power Consumption Method: Formula for Power Consumption Method is:

GE_{IRR} = Extraction * Power Units

Where,

Extraction = Extraction per unit power consumption

Power Units = Number of units of power consumed for agricultural pump

3.5.3 Extraction for Industrial Use

Most industries, especially in the manufacturing field require a significant amount of water to produce goods. Due to the continuous flow of water, ground water provides ongoing functioning of the industries for a sustainable production.

Data Elements Used

Component	Parameter	Unit
Ground Water Extraction	Well Census	Number
	Number of days	Number
	Number of Industrial Units	Number

Data computation methodology

Ground Water Extraction for Industrial Use can be calculated in 2 ways:

Unit Draft Method: Formula for Unit Draft Method is:

GE_{IND} = Unit Draft * Wells

Where,

Unit Draft = Unit Draft per well

Wells = Number of Wells used for industrial purpose

Consumptive Use Method: Formula for Consumptive Use Method is:

GE_{IND} = Number of industrial units * Unit Water Consumption * Lg Where,

Lg = Fractional Load on Ground Water for Domestic Water Supply

3.6 Stage of Ground Water Extraction (%)

To define a particular area in terms of Ground Water, we use stage of extraction. It defines the amount of water extracted from total extractable ground water resources and is expressed in percentage.

Data computation methodology

The stage of ground water extraction is calculated as follows:

Stage of Extraction (%) = (GE)/(AEGR)*100 Where,

GE = Existing Gross Ground Water Extraction from all uses AEGR = Annual Extractable Ground Water Resources

3.7 Categorization of the Assessment Unit

Based on Stage of Extraction we categorize the area into 4 categories SAFE, SEMI-CRITICAL, CRITICAL and OVER-EXPLOITED. The purpose of this categorization is to find out over exploited and non-exploited areas for planning actions regarding ground water resources.

Data computation methodology

Based on Stage of Ground Water Extraction, assessment units into 4 categories:

- SAFE
- SEMI-CRITICAL
- CRITICAL
- OVER-EXPLOITED

The criteria for categorization of Assessment units will be:

Stage of Extraction (%)	Categorization
0 to <= 70	SAFE
>70 to <=90	SEMI-CRITICAL
>90 to <= 100	CRITICAL
>100	OVER-EXPLOITED

3.8 Allocation of Ground Water Resource for Utilization

The Annual Extractable Ground Water Resources are to be apportioned between domestic, industrial and irrigation uses. This requirement has to be based on population as projected for the year 2025, per capita requirement of water for domestic use, and relative load on ground water for urban and rural water supply.

Data computation methodology

The Annual Extractable Ground Water Resources follow the following empirical relation:

Alloc = 22 X N X Lg (mm/year)

Where,

Alloc = Allocation for domestic water requirement

N = population density in the unit in thousands per sq.km.

Lg = fractional load on ground water for domestic water supply (<1.0) It is assumed that the requirement of water for domestic use is 60 lpcd per head.

3.9 Net Annual Ground Water Availability

Thewateravailableforfutureuseisobtainedbydeductingtheallocationfordomesticuseand currentextractionforIrrigationandIndustrialusefromtheAnnualExtractableGroundWaterRecharge. The resulting ground water potential is termed as the Net Annual Ground Water Availability for future use.

Data computation methodology

Net Annual Ground Water Availability is computed as:

Net Annual Ground Water Availability = Total Annual Ground Water Recharge – Unaccounted Natural Discharges

3.10 In-Storage Unconfined Ground Water Resources

Static Ground Water Resources of an area are the resources which remain available below the dynamic zone of water table fluctuation. This is not replenished every year and extracting this water is called ground water mining.

Data Elements Used

Component	Parameter	Unit
In Storage Resources of Unconfined Aquifer	Area	Hectares
	Bottom of Dynamic Zone	Meters
	Bottom of unconfined Aquifer	Meters

Data computation methodology

In-Storage Ground Water Resources can be expressed as follows:

SGWR = A * (Z2 - Z1) * SY

Where,

SGWR = Static or In-Storage Ground Water Resources
A = Area of the Assessment Unit

Z2 = Bottom of Unconfined
Aquifer Z1 = Pre-monsoon water
level

SY = Specific Yield in the Zone of static ground water resources

3.11 In-Storage Confined Aquifer Water Resources

Confined aquifers consist of an impermeable dirt/rock layer which prevents water from seeping into the aquifer from the ground surface located above. Instead, water seeps into confined aquifers from place where the impermeable layer does not exist. Assessment of ground water resources for confined aquifers assumes crucial importance since over-exploitation of these aquifers may lead to far more detrimental consequences than to those of shallow unconfined aquifers.

Data Elements Used

Component	Parameter	Unit
In Storage Resources of Confined Aquifer	Area	Hectares
	Pre monsoon Piezometric head	Meters
	Post monsoon Piezometric head	Meters
	Bottom of Top Confining Layer	Meters

Data computation methodology

Confined Aquifer Water Resources can be expressed as follows:

$Q_{Confined} = A * S * \Delta h = A * S * (h_{PRE} – h0)$

Where,

$Q_{Confined}$ = In storage Ground Water Resource of Confined Aquifer

A = Areal extent of the confined aquifer

S = Storativity

Δh = Change in Piezometric head

h_0 = Bottom level of the top confining layer

h_{PRE} = Piezometric head during pre-monsoon period

If the confined aquifer is not being exploited for any purpose, the dynamic and static resources of the confined aquifer need not be estimated separately. Instead, the in storage of the aquifer can be computed using the following formula.

$$QConfined = A * S * \Delta h = A * S * (h_{POST} – h_0)$$

Where,

QConfined = In storage Ground Water Resource of Confined Aquifer A = Areal extent of the confined aquifer

S = Storativity

Δh = Change in Piezometric head

h_{POST} = Piezometric head during post-monsoon period

h_0 = Bottom of the Top Confining Layer

3.12 Dynamic Confined Aquifer Water Resources

Data Elements Used

Component	Parameter	Unit
Dynamic Resources of Confined Aquifer	Area	Hectares
	Pre monsoon Piezometric head	Meters
	Post monsoon Piezometric head	Meters

Data computation methodology

Confined Aquifer Water Resources can be expressed as follows:

$$Q_{Confined} = A * S * \Delta h = A * S * (h_{POST} - h_{PRE})$$ Where,

$Q_{Confined}$ = Dynamic Ground Water Resource of Confined Aquifer A = Areal extent of the confined aquifer

S = Storativity

Δh = Change in Piezometric head

h_{POST} =Piezometric head during post-monsoon period

h_{PRE} = Piezometric head during pre-monsoon period

3.13 In-Storage Semi-Confined Aquifer Water Resources

An aquifer which is partially confined by soil layers of low permeability through which recharge and discharge can still occur. Unless and until, it is well studied that the recharge to this is not computed either in the over lying unconfined aquifer or underlying/overlying semi confined aquifers, it should not be assessed separately.

Data Elements Used

Component	Parameter	Unit
In Storage Resources of Semi-Confined Aquifer	Area	Hectares
	Pre monsoon Piezometric head	Meters
	Post monsoon Piezometric head	Meters
	Bottom of Top Confining Layer	Meters

Data computation methodology

Semi-Confined Aquifer Water Resources can be expressed using the same formula as in Confined Aquifer Water Resources:

$Q_{Semi - Confined} = A * S * \Delta h = A * S * (ht – h0)$

Where,

$Q_{Semi - Confined}$ = In storage Ground Water Resource of Semi – ConfinedAquifer

A = Areal extent of the semi-confined aquifer

S = Storativity

Δh = Change in Piezometric head

h_0 = Bottom level of the top confining layer

h_{PRE} = Piezometric head at any particular time

3.14 Dynamic Semi-Confined Aquifer Water Resources

Data Elements Used

Component	Parameter	Unit
Dynamic Resourcesof Semi-ConfinedAquifer	Area	Hectares

	Pre monsoon Piezometric head	Meters
	Post monsoon Piezometric head	Meters

Data computation methodology

Semi-Confined Aquifer Water Resources can be expressed as follows: $Q_{Semi - Confined} = A * S * \Delta h = A * S * (h_{POST} – h_{PRE})$

Where,

$Q_{Semi - Confined}$ = Dynamic Ground Water Resource of Semi – Confined Aquifer

A = Areal extent of the semi-confined aquifer

S = Storativity

Δh = Change in Piezometric head

h_{POST} = Piezometric head during post-monsoon period

h_{PRE} = Piezometric head during pre-monsoon period

3.15 Quality Tagging

Quality assessment of ground water is equally important as the quantity assessment. The major sources of quality concern are salinity, fluoride, and arsenic. It can vary depending on the area also. If the particular parameter is influencing an area in mappable units, then the parameter should be tagged to the assessment subunit. Apart from salinity, fluoride and arsenic, if there is any other parameter, that is also captured in this.

3.16 Additional Potential Resource

Spring Discharge

Spring discharge constitutes an additional source of ground water in hilly areas which emerges at the places where ground water level cuts the surface topography.

Data computation methodology

Potential ground water resource due to springs can be expressed as follows: Potential Resources (Springs) = Q * No of days Where,

Q = Spring Discharge

No of days = Number of days spring yields

Waterlogged areas and shallow water table

Inthe areawherethegroundwaterlevelislessthan5mbelowgroundlevelorinwaterlogged areas, the resources up to 5 m below ground level are potential and are used in addition to the annual recharge in the area.

Data Elements Used

Component	Parameter	Unit
Waterlogged and shallow water table	Depth to water table below ground surface	Meters
	Area of shallow water table zone	Hectares
	Specific Yield	Fraction

Data computation methodology

Potential ground water resource in shallow water table areas can be expressed as follows:

Potential Resources (Waterlogged/Shallow Water Table) = (5-D) *A* S_Y

Where,

D = Depth to water table below ground surface in pre-monsoon period in shallow aquifers

A = Area of shallow water table zone

SY = Specific Yield

Flood Prone

Groundwaterrechargefromafloodplainiscalculatedconsideringareaextentoffloodplain, Retention period of flood and Type of sub-soil strata and silt charge in the river water which gets deposited and control seepage.

Data Elements Used

Component	Parameter	Unit
Flood Prone	Number of Days	Number
	Flood Prone Area	Hectare

Data computation methodology

Potential ground water resource in flood prone areas can be expressed as follows:

Potential Resources (Flood Prone) = 1.4 * N * A/1000

Where,

N = No of Days Water is Retained in the Area

A = Flood Prone Area

3.17 Coastal Areas

Data computation methodology

Coastal Area resources can be expressed as follows:

$\Delta S = A * (Post_{WT} - Pre_{WT}) * SY$

Where,

ΔS = Change in Ground Water Storage
A = Area of Coastal Zones

Pre_{WT} = Water table during Pre-monsoon = RL of GL – water level during pre-monsoon season in mbgl

$Post_{WT}$ = Water table during post-monsoon = RL of GL – water level during post-monsoon season in mbgl

SY = Specific Yield

In-storage Coastal Area resources can be expressed as follows:

In-Storage Resources = A * (PreWT – Bottom of Aquifer) * SY Where,

A = Area of Coastal Zones

PreWT = Water table during Pre-monsoon = RL of GL – water level during pre-monsoon season in mbgl

Bottom of the Aquifer is to be limited to 40*(pre monsoon water table above mean sea level)

3.18 Water Depletion Zones

Data computation methodology

Water Depletion zone resources can be expressed as follows:

$\Delta S = A * (Pre - Post) * SY$

Where,

ΔS = Change in Ground Water Storage

A = Area of Water Depletion Zones

Pre = Pre - monsoon Ground water level

Post = Post - monsoon Ground water level

SY = Specific Yield

3.19 Validation using GW trend

Ground Water assessment is based on the Stage of Extraction which has inherent uncertainties. The estimation of ground water extraction is based on indirect assessment using factors such as electricity consumption, well census and area irrigated from ground water. Thus, it is very important to validate the 'Stage of Ground Water Extraction' with long term trend of ground water levels. Long term water level trends are needed for a minimum period of 5 years for both pre-monsoon and post-monsoon period. This data will help in getting the Trend of Ground Water over the years. Following table is used for validation:

Stageof Extraction	Ground Water Level Trend Observed	Remarks
<= 70%	Significant decline in trend in both pre-monsoon and post-monsoon	Not acceptableand needs reassessment
>100%	No significant decline in both pre-monsoons and post-monsoon long term trend	Not acceptableand needs reassessment

4.0 PROCEDURE AND ASSUMPTIONS OF PRESENT ASSESSMENT

4.1 Data Source for Each of the Data Element and How the Data Was Used in the Computation (Constraint in the Database If Any)

The present assessment was conducted online via INGRES portal. The rainfall data being one of the primary components of ground water recharge are collected from Indian Meteorological Department Lucknow and IMD website Fifty-one years data from 1971 to 2021 are considered for normal rainfall. Density of CGWB monitoring wells (1050 numbers) was not sufficient for water level fluctuation computation and trend analysis; hence data of representative permanent observation wells of Ground Water Department (MW-10,000 numbers) are used for the assessment. Ground Water Draft for domestic water supply has been computed on the basis of block wise/urban population for the base year. The population is collected from National Census for the census year 2011 and decadal growth rate between 2001 and 2011. The irrigation data for bore/tube wells and dug wells are collected from Census of Minor Irrigation Department Govt. of U.P. The data pertaining to surface water irrigation, canal, tanks ponds etc are also collected from Water Resources Department (Irrigation) whereas data of conservation structures like percolation tanks, stop dams and check dams are taken from District Development offices. Changes, if any, applied in the Original Methodology Proposed by GEC 15 is provided along with Justification

All the data provided by the state departments has been computerized and Estimation of ground water resources has been carried out based on the methodology recommended by the Ground Water Estimation Committee (GEC-2015) for estimation of recharge, extraction, natural discharge, stage of extraction etc.

4.2 Various Norms Used in the Computation

4.2.1 Norms Used in Rainfall Recharge:

Ground water recharge from monsoon and non-monsoon rainfall has been computed separately. For computations of recharge from monsoon rainfall both methods i.e., water level fluctuation method and rainfall infiltration factor method (deduction threshold value of 10%) have been used. For comparison of figures obtained from these two methods, percent deviation is calculated and figures of recharge have been accepted as recommended in this

methodology. For computation of non-monsoon rainfall recharge rainfall infiltration factor method is adopted when ratio of normal non-monsoon rainfall to normal annual rainfall is more than 10% as suggested in the methodology. For Uttar Pradesh especially in western part, this component of recharge is zero as said ratio is less than 10%. The specific yield and rainfall infiltration factor of the formations for calculating the recharge for rainfall are used recommended by subcommittee in accordance with GEC 2015.

Table 2: Norms Recommended For The Rainfall Infiltration Factor

NORMS RECOMMENDED FOR THE RAINFALL INFILTRATION FACTOR							
Sl. No	Principal Aquifer	Major Aquifers		Age	Recommended(%)	Minimum (%)	Maximum (%)
		Code	Name				
1	Alluvium	AL01	Younger Alluvium (Clay/Silt/Sand/Calcareous	Quaternary	22	20	24
2	Alluvium	AL02	Pebble / Gravel/ Bazada/	Quaternary	22	20	24
3	Alluvium	AL03	Older Alluvium (Silt/Sand/Gravel)	Quaternary	22	20	24
4	Alluvium	AL04	Aeolian Alluvium (Silt/	Quaternary	22	20	24
5	Alluvium	AL05	Coastal Alluvium (Sand/Silt/Clay) -East		16	14	18
5	Alluvium	AL05	Coastal Alluvium (Sand/Silt/Clay) - West	Quaternary	10	8	12
6	Alluvium	AL06	Valley Fills	Quaternary	22	20	24
7	Alluvium	AL07	Glacial Deposits	Quaternary	22	20	24
8	Laterite	LT01	Laterite / Ferruginous concretions	Quaternary	7	6	8
9	Basalt	BS01	Basic Rocks (Basalt) Vesicular or Jointed	Mesozoic to Cenozoic	13	12	14
9	Basalt	BS01	Basic Rocks (Basalt) - Weathered	Mesozoic to Cenozoic	7	6	8
10	Basalt	BS01	Basic Rocks (Basalt) - Massive	Mesozoic to Cenozoic	2	1	3
11	Basalt	BS02	Ultra Basic – Vesicular orJointed	Mesozoic to Cenozoic	13	12	14
11	Basalt	BS02	Ultra Basic - Weathered	Mesozoic to Cenozoic	7	6	8
12	Basalt	BS02	Ultra Basic - Massive Poorly	Mesozoic to Cenozoic	2	1	3
13	Sandstone	ST01	Sandstone/Conglomerat	UpperPalaeozoic	12	10	14
14	Sandstone	ST02	Sandstone with Shale	Upper Palaeozoic	12	10	14
15	Sandstone	ST03	Sandstone with shale/coal beds	Upper Palaeozoic	12	10	14
16	Sandstone	ST04	Sandstone with Clay	Upper Palaeozoic	12	10	14
17	Sandstone	ST05	Sandstone/Conglomerat	Proterozoic toCenozoic	6	5	7

NORMS RECOMMENDED FOR THE RAINFALL INFILTRATION FACTOR							
Sl. No	Principal Aquifer	Major Aquifers		Age	Recommended(%)	Minimum (%)	Maximum (%)
		Code	Name				
18	Sandstone	ST06	Sandstone with Shale	Proterozoic to Cenozoic	6	5	7
19	Shale	SH01	Shale with limestone	Upper Palaeozoic	4	3	5
20	Shale	SH02	Shale with Sandstone	Upper Palaeozoic	4	3	5
21	Shale	SH03	Shale, limestone and sandstone	Upper Palaeozoic	4	3	5
22	Shale	SH04	Shale	Upper Palaeozoic	4	3	5
23	Shale	SH05	Shale/Shale with Sandstone	Proterozoic to Cenozoic	4	3	5
24	Shale	SH06	Shale with Limestone	Proterozoic to Cenozoic	4	3	5
25	Limestone	LS01	Miliolitic Limestone	Quarternary	6	5	7
27	Limestone	LS02	Limestone / Dolomite	Upper Palaeozoic	6	5	7
28	Limestone	LS03	KarstifiedLimestone / Dolomite	Upper Palaeozoic to Cenozoic	10	5	15
29	Limestone	LS03	Limestone/Dolomite	Proterozoic	6	5	7
30	Limestone	LS03	KarstifiedLimestone/Dolomite	Proterozoic	10	5	15
31	Limestone	LS04	Limestone with Shale	Proterozoic	6	5	7
32	Limestone	LS04	KarstifiedLimestone with Shale	Proterozoic	10	5	15
33	Limestone	LS05	Marble	Azoic to Proterozoic	6	5	7
34	Limestone	LS05	KarstifiedMarble	Azoic to Proterozoic	10	5	15
35	Granite	GR01	Acidic Rocks (Granite,Syenite, Rhyolite Weathered,Jointed	Mesozoic to Cenozoic	7	5	9
36	Granite	GR01	Acidic Rocks (Granite,Syenite, Rhyolite etc.)-Massive	Mesozoic to Cenozoic	2	1	3
37	Granite	GR02	Acidic Rocks (Pegmatite, Granite,Syenite,Rhyolite Weathered,Jointed	Proterozoic to Cenozoic	11	10	12
38	Granite	GR02	Acidic Rocks (Pegmatite, Granite, Syenite,Rhyolite etc.) - Massive,Poorly Fractured	Proterozoic to Cenozoic	2	1	3
39	Schist	SC01	Schist - Weathered, Jointed	Azoic to Proterozoic	7	5	9
40	Schist	SC01	Schist - Massive, Poorly Fractured	Azoic to Proterozoic	2	1	3
41	Schist	SC02	Phyllite	Azoic to Proterozoic	4	3	5

NORMS RECOMMENDED FOR THE RAINFALL INFILTRATION FACTOR							
Sl. No	Principal Aquifer	Major Aquifers		Age	Recommended(%)	Minimum (%)	Maximum (%)
		Code	Name				
42	Schist	SC03	Slate	Azoic to Proterozoic	4	3	5
43	Quartzite	QZ01	Quartzite - Weathered, Jointed	Proterozoic toCenozoic	6	5	7
44	Quartzite	QZ01	Quartzite - Massive, Poorly	Proterozoic toCenozoic	2	1	3
45	Quartzite	QZ02	Quartzite - Weathered, Jointed	Azoic to Proterozoic	6	5	7
46	Quartzite	QZ02	Quartzite- Massive,Poorly Fractured	Azoic to Proterozoic	2	1	3
47	Charnockite	CK01	CharnockiteWeathered, Jointed	Azoic	5	4	6
48	Charnockite	CK01	Charnockite - Massive, Poorly	Azoic	2	1	3
49	Khondalite	KH01	Khondalites, Granulites Weathered, Jointed	Azoic	7	5	9
50	Khondalite	KH01	Khondalites,Granulites Mssive, PoorlyFractured	Azoic	2	1	3
51	Banded Gneissic Complex	BG01	Banded Gneissic Complex Weathered, Jointed	Azoic	7	5	9
52	Banded Gneissic Complex	BG01	BandedGneissicComplex Massive,PoorlyFractured	Azoic	2	1	3
53	Gneiss	GN01	Undifferentiated metasedimentaries/ Undifferentiated metamorphic - Weathered,	Azoic to Proterozoic	7	5	9
54	Gneiss	GN01	Undifferentiated metasedimentaries/ Undifferentiated metamorphic - Massive, Poorly Fractured	Azoic to Proterozoic	2	1	3
55	Gneiss	GN02	Gneiss -Weathered, Jointed	Azoic to Proterozoic	11	10	12
56	Gneiss	GN02	Gneiss-Massive, Poorly Fractured	Azoic to Proterozoic	2	1	3
57	Gneiss	GN03	Migmatitic Gneiss-Weathered,Jointed	Azoic	7	5	9
58	Gneiss	GN03	Migmatitic Gneiss - Massive,	Azoic	2	1	3
59	Intrusive	IN01	Basic Rocks (Dolerite, Anorthosite etc.) - Weathered, Jointed	Proterozoic to Cenozoic	7	6	8
60	Intrusive	IN01	Basic Rocks (Dolerite, Anorthosite etc.) - Massive, Poorly Fractured	Proterozoic to Cenozoic	2	1	3

NORMS RECOMMENDED FOR THE RAINFALL INFILTRATION FACTOR							
Sl. No	Principal Aquifer	Major Aquifers		Age	Recommended(%)	Minimum (%)	Maximum (%)
		Code	Name				
61	Intrusive	IN02	Ulrta Basics (Epidiorite, Granophyre etc.) - Weathered, Jointed	Proterozoic to Cenozoic	7	6	8
62	Intrusive	IN02	Ulrta Basics (Epidiorite, Granophyre etc.) - Massive, Poorly Fractured	Proterozoic to Cenozoic	2	1	3

4.2.2 Norms Used in Recharge from Other Sources:

As per recommendations of methodology, recharge from other sources has been calculated separately for monsoon and non-monsoon periods. The factors for calculation of return flow from irrigation, canal seepage, recharge from Tanks and Ponds and water conservation structures have been taken as those recommended by GEC '15. The canals in Uttar Pradesh by and large run during non-monsoon period, as major part of the area is falling under non-paddy crops especially in western part of U.P.

4.2.3 Norms Used in Ground Water Extraction for Domestic and Industrial Water Supply

Ground Water Draft for domestic and industrial water supply has been computed on the basis of block wise population for the base year. The population figures were available for the year 2011 and same was projected for March-2017 and 2025, considering decadal growth rate between 2001-2011. The average per capita consumption has been considered 60 litres per day. Population getting water supply from surface water has been not considered for ground water draft calculation. Extraction during monsoon and non-monsoon periods has been calculated separately taking 4 months as monsoon period and 8 months as non-monsoon period.

Table 3: Norms recommended for the Specific Field

NORMS RECOMMENDED FOR THE SPECIFIC YIELD							
Sr. No	Principal Aquifer	Major Aquifers		Age	Recommended (%)	Minimum (%)	Maximum (%)
		Code	Name				
1	Alluvium	AL01	Younger Alluvium (Clay/Silt/Sand/ Calcareous concretions)	Quaternary	10	8	12
2	Alluvium	AL02	Pebble / Gravel/Bazada/ Kandi	Quaternary	16	12	20

NORMS RECOMMENDED FOR THE SPECIFIC YIELD							
Sr. No	Principal Aquifer	Major Aquifers		Age	Recommended (%)	Minimum (%)	Maximum (%)
		Code	Name				
3	Alluvium	AL03	Older Alluvium (Silt/Sand/Gravel/Lithomargic clay)	Quaternary	6	4	8
4	Alluvium	AL04	Aeolian Alluvium (Silt/Sand)	Quaternary	16	12	20
5	Alluvium	AL05	Coastal Alluvium (Sand/Silt/Clay)	Quaternary	10	8	12
6	Alluvium	AL06	Valley Fills	Quaternary	16	12	20
7	Alluvium	AL07	Glacial Deposits	Quaternary	16	12	20
8	Laterite	LT01	Laterite / Ferruginous concretions	Quaternary	2.5	2	3
9	Basalt	BS01	Basic Rocks (Basalt) - Weathered, Vesicular or Jointed	Mesozoic to Cenozoic	2	1	3
10	Basalt	BS01	Basic Rocks (Basalt) - Massive Poorly Jointed	Mesozoic to Cenozoic	0.35	0.2	0.5
11	Basalt	BS02	Ultra Basic -Weathered, Vesicular or Jointed	Mesozoic to Cenozoic	2	1	3
12	Basalt	BS02	Ultra Basic - Massive Poorly Jointed	Mesozoic to Cenozoic	0.35	0.2	0.5
13	Sandstone	ST01	Sandstone/Conglomerate	Upper Palaeozoic to Cenozoic	3	1	5
14	Sandstone	ST02	Sandstone with Shale	Upper Palaeozoic to Cenozoic	3	1	5
15	Sandstone	ST03	Sandstone with shale/coal beds	Upper Palaeozoic to Cenozoic	3	1	5
16	Sandstone	ST04	Sandstone with Clay	Upper Palaeozoic to Cenozoic	3	1	5
17	Sandstone	ST05	Sandstone/Conglomerate	Proterozoic toCenozoic	3	1	5
18	Sandstone	ST06	Sandstone with Shale	Proterozoic toCenozoic	3	1	5
19	Shale	SH01	Shale with limestone	Upper Palaeozoic to Cenozoic	1.5	1	2
20	Shale	SH02	Shale with Sandstone	Upper Palaeozoic to Cenozoic	1.5	1	2
21	Shale	SH03	Shale, limestone and sandstone	Upper Palaeozoic to Cenozoic	1.5	1	2
22	Shale	SH04	Shale	Upper Palaeozoic to Cenozoic	1.5	1	2

NORMS RECOMMENDED FOR THE SPECIFIC YIELD							
Sr. No	Principal Aquifer	Major Aquifers		Age	Recommended (%)	Minimum (%)	Maximum (%)
		Code	Name				
23	Shale	SH05	Shale/Shale with Sandstone	Upper Palaeozoic to Cenozoic	1.5	1	2
24	Shale	SH06	Shale with Limestone	Upper Palaeozoic to Cenozoic	1.5	1	2
25	Limestone	LS01	Miliolitic Limestone	Quarternary	2	1	3
26	Limestone	LS01	KarstifiedMiliolitic Limestone	Quarternary	10	5	15
27	Limestone	LS02	Limestone / Dolomite	Upper Palaeozoic to Cenozoic	2	1	3
28	Limestone	LS02	KarstifiedLimestone /Dolomite	Upper Palaeozoicto Cenozoic	10	5	15
29	Limestone	LS03	Limestone/Dolomite	Proterozoic	2	1	3
30	Limestone	LS03	Karstified Limestone/Dolomite	Proterozoic	10	5	15
31	Limestone	LS04	Limestone with Shale	Proterozoic	2	1	3
32	Limestone	LS04	Karstified Limestone with Shale	Proterozoic	10	5	15
33	Limestone	LS05	Marble	Azoic to Proterozoic	2	1	3
34	Limestone	LS05	Karstified Marble	Azoic to Proterozoic	10	5	15
35	Granite	GR01	Acidic Rocks (Granite,Syenite, Rhyoliteetc.) Weathered ,Jointed	Mesozoic to Cenozoic	1.5	1	2
36	Granite	GR01	Acidic Rocks (Granite,Syenite, Rhyoliteetc.)-Massive or Poorly Fractured	Mesozoic to Cenozoic	0.35	0.2	0.5
37	Granite	GR02	Acidic Rocks Weathered, Jointed	Proterozoic to Cenozoic	3	2	4
38	Granite	GR02	Acidic Rocks Massive, Poorly Fractured	Proterozoic to Cenozoic	0.35	0.2	0.5
39	Schist	SC01	Schist - Weathered, Jointed	Azoic to Proterozoic	1.5	1	2
40	Schist	SC01	Schist - Massive, Poorly Fractured	Azoic to Proterozoic	0.35	0.2	0.5
41	Schist	SC02	Phyllite	Azoic to Proterozoic	1.5	1	2
42	Schist	SC03	Slate	Azoic to Proterozoic	1.5	1	2

NORMS RECOMMENDED FOR THE SPECIFIC YIELD							
Sr. No	Principal Aquifer	Major Aquifers		Age	Recommended (%)	Minimum (%)	Maximum (%)
		Code	Name				
43	Quartzite	QZ01	Quartzite –Weathered, Jointed	Proterozoic to Cenozoic	1.5	1	2
44	Quartzite	QZ01	Quartzite - Massive, Poorly Fractured	Proterozoic to Cenozoic	0.3	0.2	0.4
45	Quartzite	QZ02	Quartzite - Weathered, Jointed	Azoic to Proterozoic	1.5	1	2
46	Quartzite	QZ02	Quartzite- Massive, Poorly Fractured	Azoic to Proterozoic	0.3	0.2	0.4
47	Charnockite	CK01	Charnockite - Weathered, Jointed	Azoic	3	2	4
48	Charnockite	CK01	Charnockite - Massive, Poorly Fractured	Azoic	0.3	0.2	0.4
49	Khondalite	KH01	Khondalites, Granulites - Weathered, Jointed	Azoic	1.5	1	2
50	Khondalite	KH01	Khondalites, Granulites - Mssive, Poorly Fractured	Azoic	0.3	0.2	0.4
51	Banded Gneissic Complex	BG01	Banded Gneissic Complex - Weathered,Jointed	Azoic	1.5	1	2
52	Banded Gneissic Complex	BG01	BandedGneissic Complex - Massive, PoorlyFractured	Azoic	0.3	0.2	0.4
			Undifferentiated				
53	Gneiss	GN01	Undifferentiated metasedimentaries/ Undifferentiated metamorphic - Weathered, Jointed	Azoic to Proterozoic	1.5	1	2
54	Gneiss	GN01	Undifferentiated metasedimentaries/ Undifferentiated metamorphic - Massive, Poorly Fractured	Azoic to Proterozoic	0.3	0.2	0.4
55	Gneiss	GN02	Gneiss -Weathered, Jointed	Azoic to Proterozoic	3	2	4
56	Gneiss	GN02	Gneiss-Massive, Poorly Fractured	Azoic to Proterozoic	0.3	0.2	0.4
57	Gneiss	GN03	Migmatitic Gneiss-Weathered,Jointed	Azoic	1.5	1	2
58	Gneiss	GN03	Migmatitic Gneiss - Massive, Poorly Fractured	Azoic	0.3	0.2	0.4
59	Intrusive	IN01	Basic Rocks (Dolerite, Anorthosite etc.) - Weathered, Jointed	Proterozoic to Cenozoic	2	1	3

NORMS RECOMMENDED FOR THE SPECIFIC YIELD							
Sr. No	**Principal Aquifer**	**Major Aquifers**		**Age**	**Recommended (%)**	**Minimum (%)**	**Maximum (%)**
		Code	**Name**				
60	Intrusive	IN01	Basic Rocks (Dolerite, Anorthosite etc.) - Massive, Poorly Fractured	Proterozoic to Cenozoic	0.35	0.2	0.5
61	Intrusive	IN02	Ultrabasics (Epidiorite, Granophyre etc.)- Weathered,Jointed	Proterozoic to Cenozoic	2	1	3
62	Intrusive	IN02	Ultrabasics (Epidiorite, Granophyre etc.) - Massive, Poorly Fractured	Proterozoic to Cenozoic	0.35	0.2	0.5

NORMS RECOMMENDED FOR WATER CONSERVATION STRUCTURE
40% of Gross Storage 20% during Monsoon and 20% During Non-Monsoon

NORMS RECOMMENDED FOR THE TANKS AND PONDS
As the data on the field studies for computing recharge from Tanks & Ponds are very limited, it is recommended to follow the same norm as followed in GEC 1997in future assessments also. Hence the norm recommended by GEC-2015 for Seepage from Tanks & Ponds is 1.4 mm / day.

4.2.4 Norms Used in Ground Water Extraction for Irrigation Uses

Block wise ground water extortion for irrigation has been calculated based on the number of ground water structures and the unit draft of different types of structures. Number of ground water structures data was obtained from census of Minor Irrigation -2014, for the year, 2015, 2016 and 2017. The unit draft of different ground water abstraction structures in each assessment unit for irrigation was determined in the field considering discharge of the well, pumping hours, number of running hours, days during monsoon and non-monsoon seasons.

The unit draft is also validated with the delta factor of crop water requirement and irrigated area. Private Shallow Tube well (P.S.), Private Deep Tubewells (P.T.W.) State Tube wells (S.T.W) are main abstraction structures, which are used for irrigation in the State.

Table 4: Norms recommended for the Recharge from Irrigation

NORMS RECOMMENDED FOR THE RECHARGE FROM IRRIGATION				
DTW (m bgl)	Ground Water		Surface Water	
	Paddy	Non-Paddy	Paddy	Non-Paddy
<=10	45	25	50	30
11	43.3	23.7	48.3	28.7
12	41.7	22.3	46.7	27.3
13	40	21	45	26
14	38.3	19.7	43.3	24.7
15	36.7	18.3	41.7	23.3
16	35	17	40	22
17	33.3	15.7	38.3	20.7
18	31.7	14.3	36.7	19.3
19	30	13	35	18
20	28.3	11.7	33.3	16.7
21	26.7	10.3	31.7	15.3
22	25	9	30	14
23	23.3	7.7	28.3	12.7

NORMS RECOMMENDED FOR THE RECHARGE FROM IRRIGATION				
DTW (m bgl)	Ground Water		Surface Water	
	Paddy	Non-Paddy	Paddy	Non-Paddy
24	21.7	6.3	26.7	11.3
>=25	20	5	25	10

Table 5: Norms recommended for the Recharge due to canals

NORMS RECOMMENDED FOR THE RECHARGE DUE TO CANALS			
Formation	Canal Seepage factor ham/day/million square meters of wetted Area		
	Recommended	Minimum	Maximum
Unlined canals in normal soils with some clay content along with sand	17.5	15	20
Unlined canals in sandy soil with some silt content	27.5	25	30
Lined canals in normal soils with some clay content along with sand	3.5	3	4
Lined canals in sandy soil with some silt content	5.5	5	6
All canals in hard rock area	3.5	3	4

5.0 COMPUTATION OF GROUND WATER RESOURCES IN UTTAR PRADESH

5.1 Salient features of the dynamic ground water resource assessment and Year of assessment

Estimation of ground water resources has been carried out based on the methodology recommended by the Ground Water Estimation Committee (GEC 2015). The base year for the assessment of ground water resources is 2022-23 and data of rainfall, ground water structures, canal, tanks ponds etc. are collected as on 31.03.2023. The water level data are used from 2018 to 2022.

Assessment Unit

The administrative block has been considered as a unit of assessment. The unit is further considered command area due to lack of non-command area. The ground water resources have been computed for all 836 assessment units (826 blocks and 10 Urban area having more than ten lakhs population) of the State.

5.2 Sub-Unit-Wise Method Adopted for Computing Rainfall

Recharge in the following sub-units is taken into account for the computation of various parameters

(a) Hilly Area

Area having more than 20% slope has been excluded for ground water recharge computation.

(b) Poor Ground Water Quality Area

There is no clear-cut demarcated area of poor quality in the State for computation of ground water resources. Apart from this, statistical data of ground water structure is also not available. Hence, this unit has not been considered for resource estimation.

(c) Command and Non-Command Area

In the methodology, it is recommended that dynamic ground water resources estimation should be carried out for command and non-command area. As data of non-command area is not available hence, the entire assessment unit is considered as Command area. Block-

wise/Urban area, total geographical areas, hilly area, command area, non-command area and area worthy for ground recharge are given in Annexure, whereas district-wise geographical areas, hilly area, command area, and area worthy for ground recharge are shown below.

Table 6: District-wise recharge worthy area of Uttar Pradesh under different categories

S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
1	**LALITPUR**	3819.42	-	-	3819.42	100	-	-	-	-	3819.42	-
2	**AGRA**	3947.17	-	-	1427.26	36.16	279.46	7.08	2240.45	56.76	3947.17	-
3	**ALIGARH**	3808.43	1471.8	38.65	1932.29	50.74	246.37	6.47	157.97	4.15	3808.43	1471.8
4	**AMBEDKAR NAGAR**	2458.98	2158.67	87.79	300.31	12.21	-	-	-	-	2458.98	2158.67
5	**AMETHI**	2329.92	2228.16	95.63	101.76	4.37	-	-	-	-	2329.92	2228.16
6	**AMROHA**	2149.03	-	-	1078.66	50.19	720.65	33.53	349.72	16.27	2149.03	-
7	**AURAIYA**	2094.27	2094.27	100	-	-	-	-	-	-	2094.27	2094.27
8	**AYODHYA**	2522.01	2522.01	100	-	-	-	-	-	-	2522.01	2522.01
9	**AZAMGARH**	4171.19	4171.19	100	-	-	-	-	-	-	4171.19	4171.19
10	**BAGPAT**	1351.39	-	-	692.82	51.27	-	-	658.57	48.73	1351.39	-
11	**BAHRAICH**	4387.25	4387.25	100	-	-	-	-	-	-	4387.25	4387.25
12	**BALLIA**	2927	2927	100	-	-	-	-	-	-	2927	2927
13	**BALRAMPUR**	3348.57	3348.57	100	-	-	-	-	-	-	3348.57	3348.57
14	**BANDA**	4404.6	2159.49	49.03	2245.11	50.97	-	-	-	-	4404.6	2159.49
15	**BARABANKI**	3891.32	3891.32	100	-	-	-	-	-	-	3891.32	3891.32
16	**BAREILLY**	4120	3244.34	78.75	742.83	18.03	-	-	132.83	3.22	4120	3244.34
17	**BASTI**	2938.07	2938.07	100	-	-	-	-	-	-	2938.07	2938.07
18	**BIJNOR**	4589.03	2809.11	61.21	1398.84	30.48	381.08	8.3	-	-	4589.03	2809.11
19	**BUDAUN**	4237.88	1372.45	32.39	1854.39	43.76	489.02	11.54	522.02	12.32	4237.88	1372.45
20	**BULANDSHAHAR**	3609.47	152.46	4.22	1258.17	34.86	1002.49	27.77	1196.35	33.14	3609.47	152.46
21	**CHANDAULI**	1884.69	1884.69	100	-	-	-	-	-	-	1884.69	1884.69
22	**CHITRAKOOT**	3006.65	1041.84	34.65	1410.8	46.92	554.01	18.43	-	-	3006.65	1041.84
23	**DEORIA**	2538	2538	100	-	-	-	-	-	-	2538	2538

S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
24	**ETAH**	2427.57	869.07	35.8	1558.5	64.2	-	-	-	-	2427.57	869.07
25	**ETAWAH**	2403.01	2403.01	100	-	-	-	-	-	-	2403.01	2403.01
26	**FARRUKHABAD**	2206.23	1063.82	48.22	1142.41	51.78	-	-	-	-	2206.23	1063.82
27	**FATEHPUR**	4252.55	2270.83	53.4	1637.54	38.51	-	-	344.18	8.09	4252.55	2270.83
28	**FIROZABAD**	2419.53	-	-	891.92	36.86	202.61	8.37	1325	54.76	2419.53	-
29	**G.B.NAGAR**	1442.73	-	-	473.82	32.84	636.66	44.13	332.25	23.03	1442.73	-
30	**GHAZIABAD**	1169.14	-	-	228.16	19.52	-	-	940.98	80.48	1169.14	-
31	**GHAZIPUR**	3300.52	3082.02	93.38	218.5	6.62	-	-	-	-	3300.52	3082.02
32	**GONDA**	3996.09	3996.09	100	-	-	-	-	-	-	3996.09	3996.09
33	**GORAKHPUR**	3210.87	3210.87	100	-	-	-	-	-	-	3210.87	3210.87
34	**HAMIRPUR**	3815.4	2718.29	71.25	1097.11	28.75	-	-	-	-	3815.4	2718.29
35	**HAPUR**	1144.81	-	-	238.01	20.79	560.55	48.96	346.25	30.25	1144.81	-
36	**HARDOI**	5948.43	5948.43	100	-	-	-	-	-	-	5948.43	5948.43
37	**HATHRAS**	1837.99	327.4	17.81	556.14	30.26	272.77	14.84	681.68	37.09	1837.99	327.4
38	**JALAUN**	4565.83	4565.83	100	-	-	-	-	-	-	4565.83	4565.83
39	**JAUNPUR**	3990.94	2522.77	63.21	1072.14	26.86	396.03	9.92	-	-	3990.94	2522.77
40	**JHANSI**	4619.37	2644.95	57.26	1974.42	42.74	-	-	-	-	4619.37	2644.95
41	**KANNAUJ**	2143.46	996.35	46.48	468.08	21.84	305.17	14.24	373.86	17.44	2143.46	996.35
42	**KANPUR DEHAT**	3237.37	943.68	29.15	2293.69	70.85	-	-	-	-	3237.37	943.68
43	**KANPUR NAGAR**	3094.83	695.86	22.48	1905.53	61.57	493.44	15.94	-	-	3094.83	695.86
44	**KASGANJ**	1993.88	1342.45	67.33	651.43	32.67	-	-	-	-	1993.88	1342.45
45	**KAUSHAMBI**	1780.01	484.65	27.23	1015.97	57.08	-	-	279.39	15.7	1780.01	484.65
46	**KUSHI NAGAR**	2873.78	2873.78	100	-	-	-	-	-	-	2873.78	2873.78
47	**LAKHIMPUR KHERI**	6555.05	6555.05	100	-	-	-	-	-	-	6555.05	6555.05
48	**LUCKNOW**	2452.86	2142.76	87.36	-	-	-	-	310.1	12.64	2452.86	2142.76

S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
49	**MAHOBA**	2293.41	-	-	1417.74	61.82	-	-	875.67	38.18	2293.41	-
50	**MAHRAJGANJ**	2477.6	2477.6	100	-	-	-	-	-	-	2477.6	2477.6
51	**MAINPURI**	2760.72	1944.47	70.43	605.9	21.95	-	-	210.35	7.62	2760.72	1944.47
52	**MATHURA**	3360.78	2345.15	69.78	-	-	674.24	20.06	341.39	10.16	3360.78	2345.15
53	**MAUNATH BHANJAN**	1716.24	1716.24	100	-	-	-	-	-	-	1716.24	1716.24
54	**MEERUT**	2810.49	726.68	25.86	1457.45	51.86	381.47	13.57	244.89	8.71	2810.49	726.68
55	**MIRZAPUR**	2954.37	2137.01	72.33	603.47	20.43	117.19	3.97	96.7	3.27	2954.37	2137.01
56	**MORADABAD**	2249.44	317.95	14.13	1585.16	70.47	269.08	11.96	77.25	3.43	2249.44	317.95
57	**MUZAFFARNAGAR**	2756.66	1469.32	53.3	468.39	16.99	580.22	21.05	238.73	8.66	2756.66	1469.32
58	**PILIBHIT**	3369.59	3369.59	100	-	-	-	-	-	-	3369.59	3369.59
59	**PRATAPGARH**	3717.43	976.01	26.25	1782.15	47.94	959.27	25.8	-	-	3717.43	976.01
60	**PRAYAGRAJ**	4996.3	3144.72	62.94	1365.85	27.34	313.9	6.28	171.83	3.44	4996.3	3144.72
61	**RAIBARELI**	3924.58	3924.58	100	-	-	-	-	-	-	3924.58	3924.58
62	**RAMPUR**	2297.9	522.51	22.74	1775.39	77.26	-	-	-	-	2297.9	522.51
63	**SAHARANPUR**	3689.41	260.96	7.07	2067.9	56.05	-	-	1360.55	36.88	3689.41	260.96
64	**SAMBHAL**	2415.2	304.73	12.62	868.27	35.95	1242.2	51.43	-	-	2415.2	304.73
65	**SANT KABIR NAGAR**	1646.99	1646.99	100	-	-	-	-	-	-	1646.99	1646.99
66	**SANT RAVIDAS NAGAR**	983.05	-	-	983.05	100	-	-	-	-	983.05	-
67	**SHAHJAHANPUR**	4581.31	4581.31	100	-	-	-	-	-	-	4581.31	4581.31
68	**SHAMLI**	1361.26	-	-	234.4	17.22	503.29	36.97	623.57	45.81	1361.26	-
69	**SHRAWASTI**	1857.82	1857.82	100	-	-	-	-	-	-	1857.82	1857.82
70	**SIDDHARTH NAGAR**	2895.03	2895.03	100	-	-	-	-	-	-	2895.03	2895.03

S.No	Name of District	Total Recharge Worthy Area of Assessed Units (in sq.km)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%	Recharge Worthy Area of Assessed Units (in sq.km)	%
71	**SITAPUR**	5746.95	5746.95	100	-	-	-	-	-	-	5746.95	5746.95
72	**SONBHADRA**	2414.59	2231.52	92.42	183.07	7.58	-	-	-	-	2414.59	2231.52
73	**SULTANPUR**	2653.81	2653.81	100	-	-	-	-	-	-	2653.81	2653.81
74	**UNNAO**	4602.34	4602.34	100	-	-	-	-	-	-	4602.34	4602.34
75	**VARANASI**	1605.32	353.7	22.03	536.03	33.39	195.99	12.21	519.6	32.37	1605.32	353.7
	Total	229555.18	151205	65.87	51620	22.49	11777	5.13	14952	6.51	229555.18	151205

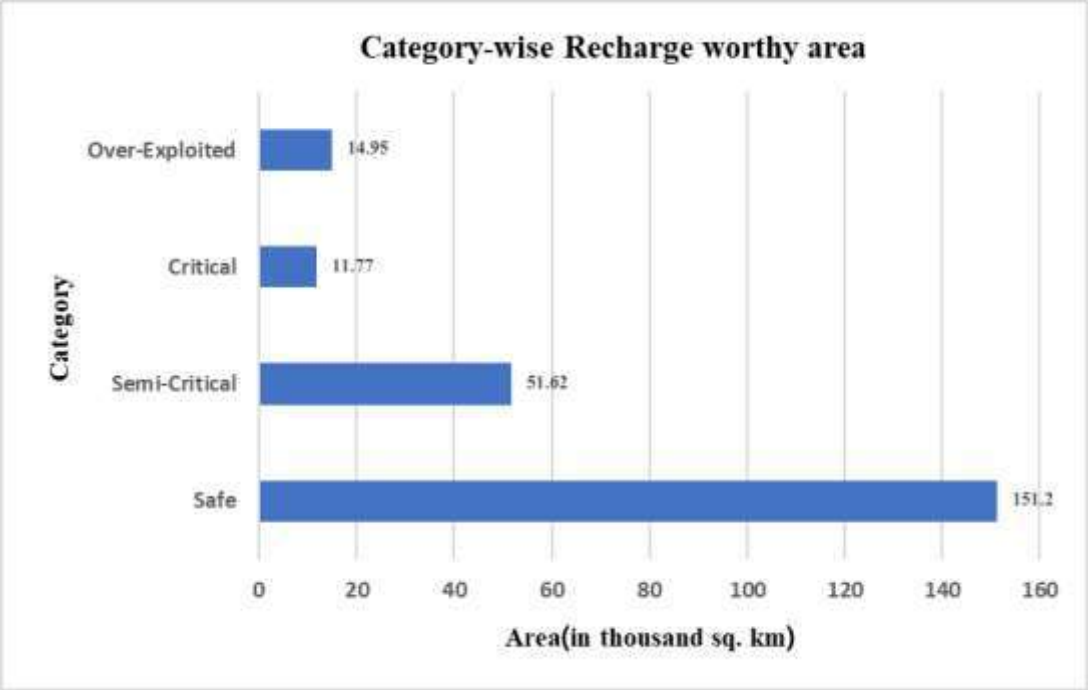


Figure 6: Recharge worthy area of state under different categories

5.3 Dynamic Ground Water Resources of Uttar Pradesh

Dynamic Groundwater resources of Uttar Pradesh have been computed according to methodology and norms described in Chapter-5. The Assessment unit (Block/Urban) wise details have been provided in Annexures. The salient features of the computations are given below.

5.3.1 Recharge from Rainfall

Recharge from rainfall is mainly a function of geographical area of the district, normal monsoon rainfall and lithology of the area. Recharge from rainfall has been computed separately for monsoon and non-monsoon periods. The recharge from rainfall during monsoon season has been computed using mainly Water Level Fluctuation Method and Rainfall Infiltration Factor Method, whereas recharge from rainfall during non-monsoon period has been computed using Rainfall Infiltration Factor Method. Details of the assessment unit wise monsoon rainfall recharge and non-monsoon rainfall recharge have been given in Annexure IV. District-wise recharge from rainfall is given in Table-1 by adding up assessment wise figures of the respective districts. Total recharge from Rainfall in the state is of the order of 3650463 Ham with Lakhimpur district having the highest recharge of 142854 Ham and Mahoba district has minimum recharge of the order of 9564.34 Ham.

5.3.2 Recharge from Other Sources

Total Recharge to ground water has several components, rainfall being the major one. The other component include seepage from canals, return flow from surface water irrigation, return flow from ground water irrigation, seepage from Tanks and Ponds. Recharge of assessment units from other sources has been given in Annexure. Total Ground Water Recharge from other sources estimated as 3532466 ham.

5.3.3 Recharge from All Sources

Total replenishable ground water resources including rainfall recharge and recharge from other sources have been computed on assessment unit wise and by adding up assessment unit figures of the respective districts which is presented in Annexures.

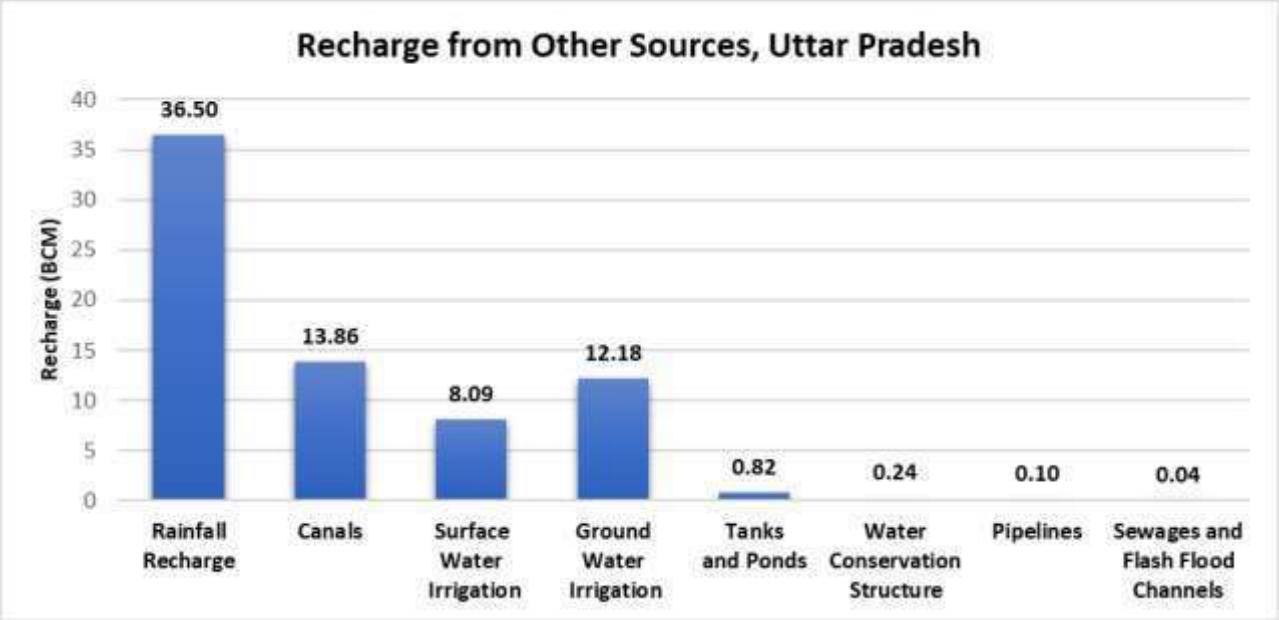


Figure 7: Ground Water Recharge from Different Sources, Uttar Pradesh

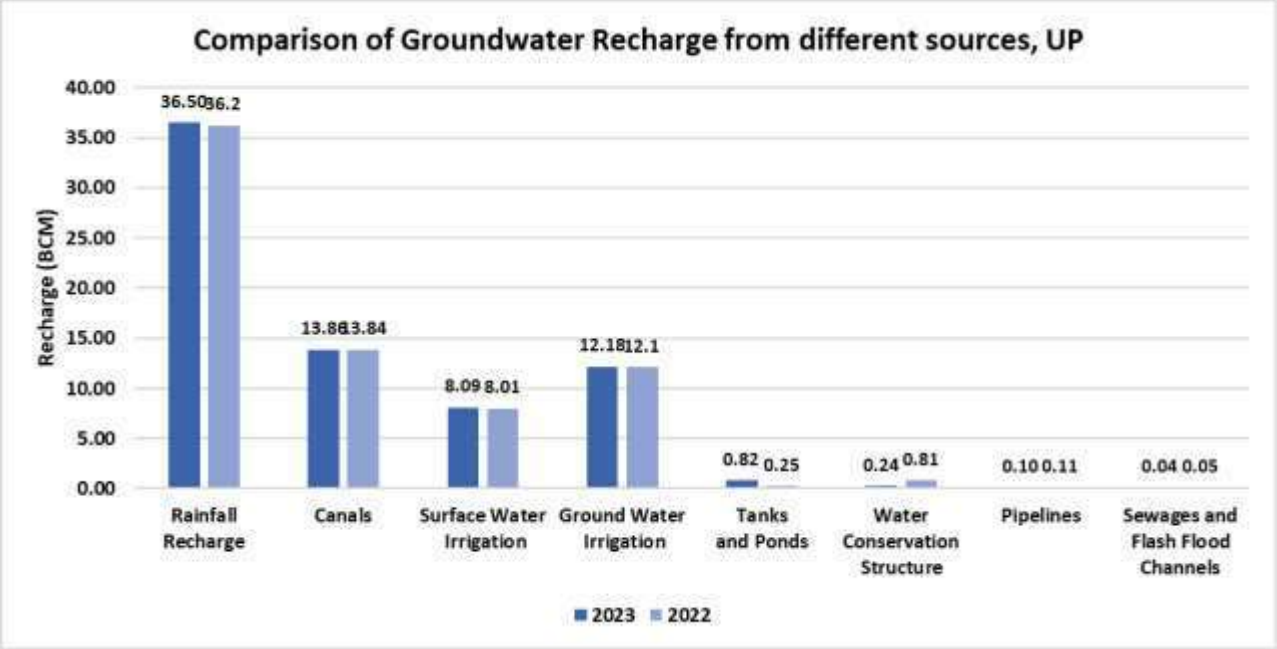
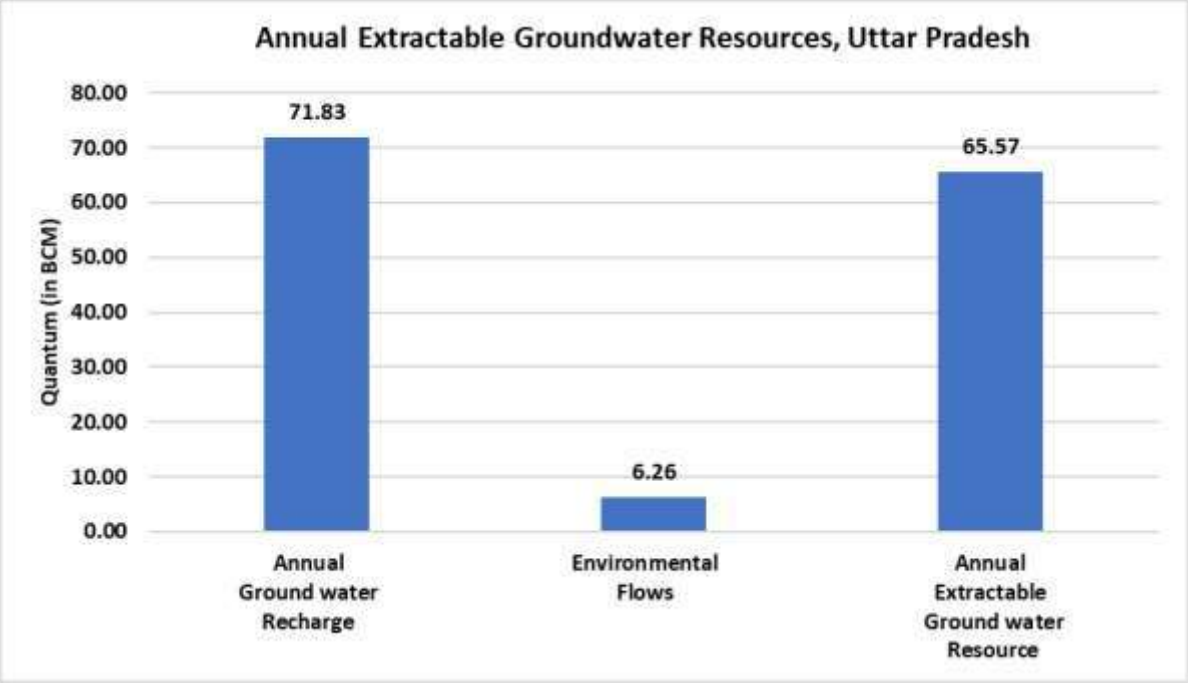


Figure 8: Comparison of GW Recharge from Different Sources in GWRE-2022 and GWRE-2023

5.3.4 Unaccounted Natural Discharge and Annual Extractable Ground Water Resources

The total annual ground water recharge of the area is the sum of monsoon and non-monsoon recharge. An allowance of 5% to 10% of total annual ground water recharge has been kept for natural discharge in the non-monsoon season respectively. Because WLF and RIF method are employed to compute rainfall recharge during monsoon season. The balance ground water available accounts for existing net ground water availability for various uses and potential for future development. Assessment unit wise unaccounted natural discharge and net ground water availability is given in Annexures whereas district wise unaccounted natural discharge and net ground water availability is given in Table.



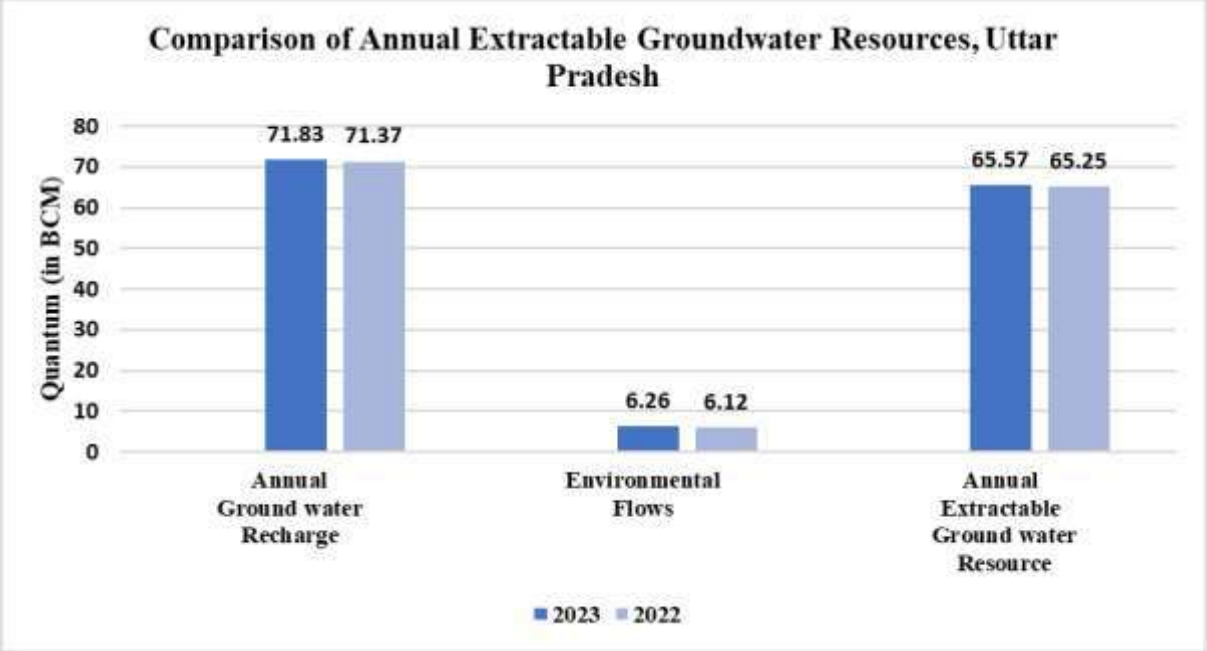


Figure 9: Annual Extractable GW Resource and comparison with GWRE-2022

5.3.5 Ground Water Extraction for Various Uses

Ground water extraction for various uses has been calculated and details of assessment unit wise groundwater are given in Annexure. District-wise ground water extraction figures are also compiled and given in the table below.

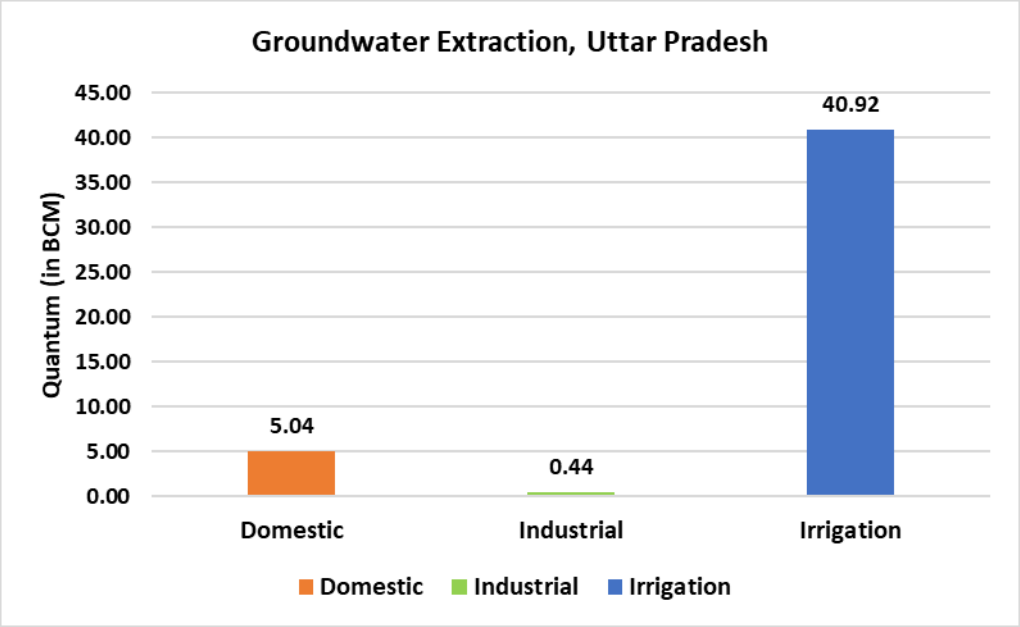


Figure 10: Ground Water Extraction from different sources

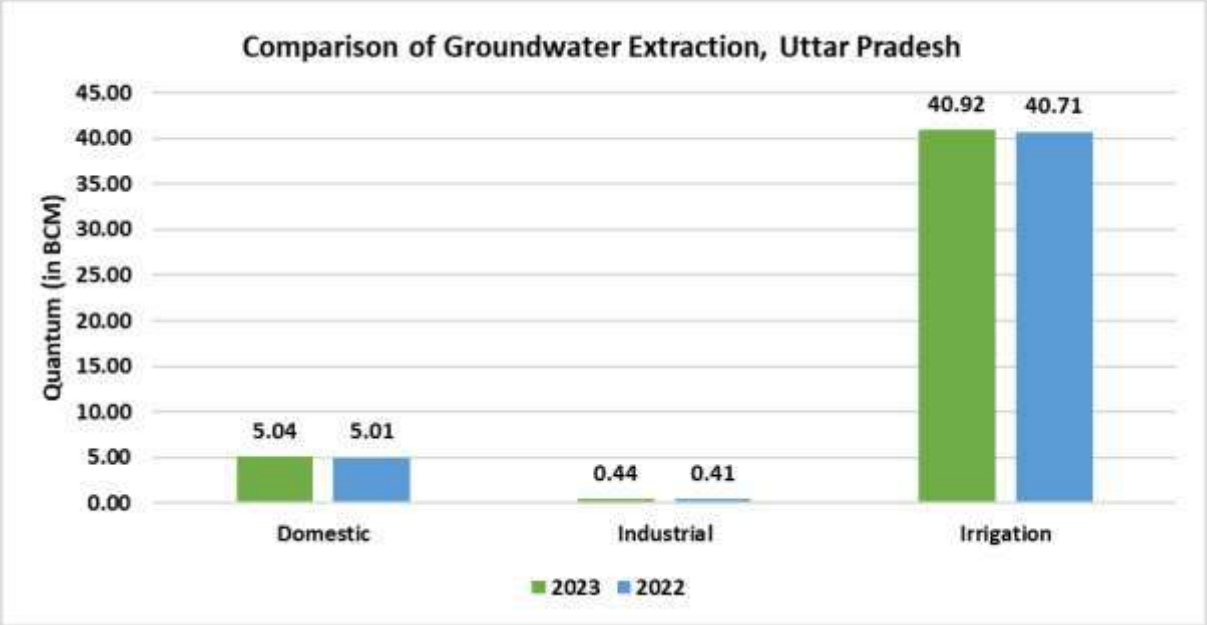


Figure 11: Comparison of Ground Water Extraction between 2022 and 2023

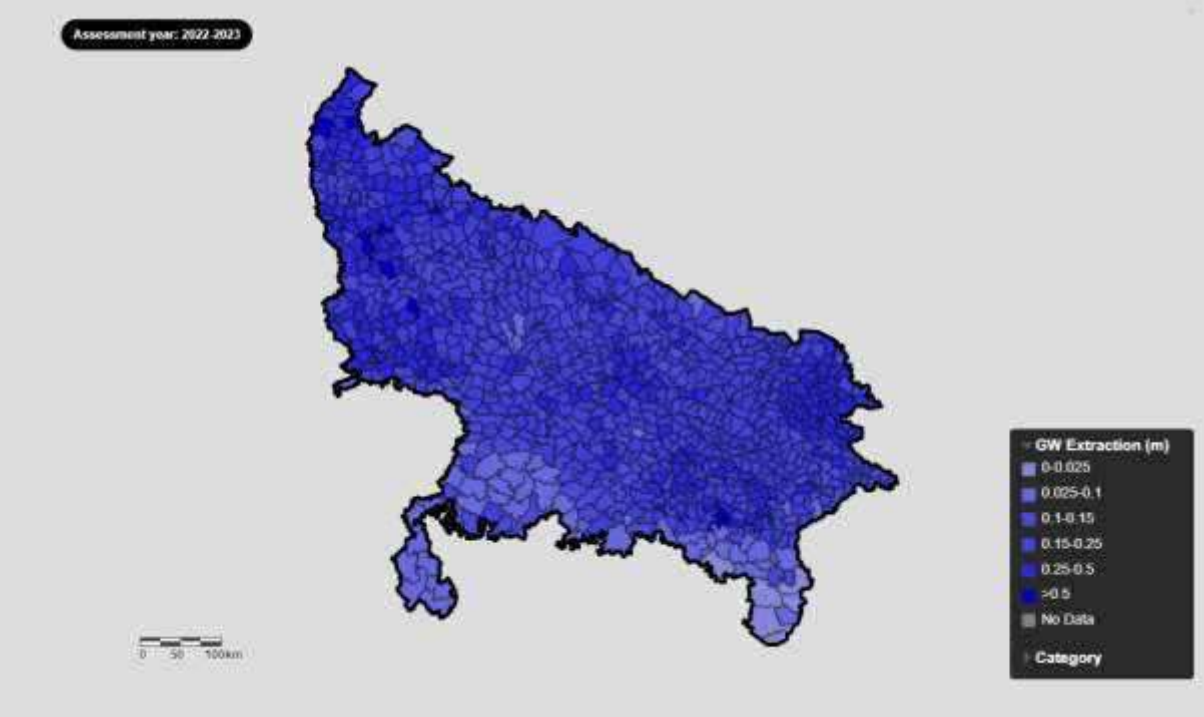


Figure 12: Ground water Extraction (m) (IN-GRES)

Table 7: District- wise Total Annual Extractable resources of Uttar Pradesh under different categories

S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in mcm)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%
1	**LALITPUR**	367.67	-	-	367.67	100	-	-	-	-	367.67	-
2	**AGRA**	809.54	-	-	299.43	36.99	48.8	6.03	461.31	56.98	809.54	-
3	**ALIGARH**	902.25	391.5	43.39	435.77	48.3	56.92	6.31	18.06	2	902.25	391.5
4	**AMBEDKAR NAGAR**	717.95	636.91	88.71	81.04	11.29	-	-	-	-	717.95	636.91
5	**AMETHI**	798.21	763.91	95.7	34.3	4.3	-	-	-	-	798.21	763.91
6	**AMROHA**	733.66	-	-	393.32	53.61	233.85	31.87	106.49	14.51	733.66	-
7	**AURAIYA**	597.85	597.85	100	-	-	-	-	-	-	597.85	597.85
8	**AYODHYA**	844.3	844.3	100	-	-	-	-	-	-	844.3	844.3
9	**AZAMGARH**	1230.33	1230.33	100	-	-	-	-	-	-	1230.33	1230.33
10	**BAGPAT**	335.51	-	-	191.87	57.19	-	-	143.63	42.81	335.51	-
11	**BAHRAICH**	1342.57	1342.57	100	-	-	-	-	-	-	1342.57	1342.57
12	**BALLIA**	835.12	835.12	100	-	-	-	-	-	-	835.12	835.12
13	**BALRAMPUR**	841.12	841.12	100	-	-	-	-	-	-	841.12	841.12
14	**BANDA**	664.36	367.5	55.32	296.86	44.68	-	-	-	-	664.36	367.5
15	**BARABANKI**	1827.65	1827.65	100	-	-	-	-	-	-	1827.65	1827.65
16	**BAREILLY**	1136.15	915.16	80.55	200.96	17.69	-	-	20.03	1.76	1136.15	915.16
17	**BASTI**	754.4	754.4	100	-	-	-	-	-	-	754.4	754.4
18	**BIJNOR**	1334.41	756.92	56.72	463.85	34.76	113.64	8.52	-	-	1334.41	756.92
19	**BUDAUN**	765.99	240.29	31.37	338.45	44.18	94.63	12.35	92.62	12.09	765.99	240.29
20	**BULANDSHAHAR**	1450.63	92.95	6.41	560.49	38.64	343.11	23.65	454.07	31.3	1450.63	92.95
21	**CHANDAULI**	506.75	506.75	100	-	-	-	-	-	-	506.75	506.75
22	**CHITRAKOOT**	402.3	93.95	23.35	201.53	50.1	106.81	26.55	-	-	402.3	93.95
23	**DEORIA**	1336.15	1336.15	100	-	-	-	-	-	-	1336.15	1336.15

S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in mcm)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%
24	**ETAH**	755.18	273.99	36.28	481.19	63.72	-	-	-	-	755.18	273.99
25	**ETAWAH**	646.1	646.1	100	-	-	-	-	-	-	646.1	646.1
26	**FARRUKHABAD**	401.83	195.71	48.71	206.11	51.29	-	-	-	-	401.83	195.71
27	**FATEHPUR**	1039.93	562.84	54.12	361.73	34.78	-	-	115.37	11.09	1039.93	562.84
28	**FIROZABAD**	725.45	-	-	348.7	48.07	57.75	7.96	319	43.97	725.45	-
29	**G.B.NAGAR**	471.78	-	-	100.06	21.21	254.58	53.96	117.15	24.83	471.78	-
30	**GHAZIABAD**	375.08	-	-	119.27	31.8	-	-	255.81	68.2	375.08	-
31	**GHAZIPUR**	949.32	884.13	93.13	65.19	6.87	-	-	-	-	949.32	884.13
32	**GONDA**	1108.72	1108.72	100	-	-	-	-	-	-	1108.72	1108.72
33	**GORAKHPUR**	1553.92	1553.92	100	-	-	-	-	-	-	1553.92	1553.92
34	**HAMIRPUR**	407.54	285.26	70	122.28	30	-	-	-	-	407.54	285.26
35	**HAPUR**	459.56	-	-	83.75	18.22	212.46	46.23	163.35	35.54	459.56	-
36	**HARDOI**	1583.12	1583.12	100	-	-	-	-	-	-	1583.12	1583.12
37	**HATHRAS**	652.61	158.73	24.32	241.6	37.02	76.49	11.72	175.78	26.94	652.61	158.73
38	**JALAUN**	941.87	941.87	100	-	-	-	-	-	-	941.87	941.87
39	**JAUNPUR**	1178.23	755.01	64.08	313.9	26.64	109.32	9.28	-	-	1178.23	755.01
40	**JHANSI**	646.58	405.19	62.67	241.38	37.33	-	-	-	-	646.58	405.19
41	**KANNAUJ**	548.46	330.66	60.29	102.75	18.73	43.71	7.97	71.35	13.01	548.46	330.66
42	**KANPUR DEHAT**	732.12	184.47	25.2	547.65	74.8	-	-	-	-	732.12	184.47
43	**KANPUR NAGAR**	797.91	211.35	26.49	452.58	56.72	133.98	16.79	-	-	797.91	211.35
44	**KASGANJ**	690.42	445.6	64.54	244.81	35.46	-	-	-	-	690.42	445.6
45	**KAUSHAMBI**	447.42	132.95	29.72	249.39	55.74	-	-	65.07	14.54	447.42	132.95
46	**KUSHI NAGAR**	1550.94	1550.94	100	-	-	-	-	-	-	1550.94	1550.94
47	**LAKHIMPUR KHERI**	2100.3	2100.3	100	-	-	-	-	-	-	2100.3	2100.3
48	**LUCKNOW**	734.9	659.43	89.73	-	-	-	-	75.46	10.27	734.9	659.43
49	**MAHOBA**	279.58	-	-	171.45	61.33	-	-	108.13	38.67	279.58	-

S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in mcm)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%
50	**MAHRAJGANJ**	1022.54	1022.54	100	-	-	-	-	-	-	1022.54	1022.54
51	**MAINPURI**	839.33	614.65	73.23	180.39	21.49	-	-	44.29	5.28	839.33	614.65
52	**MATHURA**	1267.6	901.84	71.15	-	-	227.67	17.96	138.08	10.89	1267.6	901.84
53	**MAUNATH BHANJAN**	466.3	466.3	100	-	-	-	-	-	-	466.3	466.3
54	**MEERUT**	754.03	244.68	32.45	409.18	54.27	82.65	10.96	17.52	2.32	754.03	244.68
55	**MIRZAPUR**	557.8	401.46	71.97	111.43	19.98	30.75	5.51	14.16	2.54	557.8	401.46
56	**MORADABAD**	603	98.12	16.27	436.56	72.4	51.76	8.58	16.56	2.75	603	98.12
57	**MUZAFFARNAGAR**	1042.01	644.97	61.9	137.33	13.18	166.64	15.99	93.08	8.93	1042.01	644.97
58	**PILIBHIT**	1036.95	1036.95	100	-	-	-	-	-	-	1036.95	1036.95
59	**PRATAPGARH**	1264.22	381.07	30.14	575.84	45.55	307.31	24.31	-	-	1264.22	381.07
60	**PRAYAGRAJ**	1284.22	766.97	59.72	413.42	32.19	80.48	6.27	23.34	1.82	1284.22	766.97
61	**RAIBARELI**	1118.25	1118.25	100	-	-	-	-	-	-	1118.25	1118.25
62	**RAMPUR**	703.36	231.56	32.92	471.8	67.08	-	-	-	-	703.36	231.56
63	**SAHARANPUR**	1312.72	115.29	8.78	701.72	53.46	-	-	495.71	37.76	1312.72	115.29
64	**SAMBHAL**	432.67	58.9	13.61	157.55	36.41	216.22	49.97	-	-	432.67	58.9
65	**SANT KABIR NAGAR**	490.8	490.8	100	-	-	-	-	-	-	490.8	490.8
66	**SANT RAVIDAS NAGAR**	776.69	-	-	776.69	100	-	-	-	-	776.69	-
67	**SHAHJAHANPUR**	1240.15	1240.15	100	-	-	-	-	-	-	1240.15	1240.15
68	**SHAMLI**	430.35	-	-	76.8	17.85	177.18	41.17	176.38	40.98	430.35	-
69	**SHRAWASTI**	515.19	515.19	100	-	-	-	-	-	-	515.19	515.19
70	**SIDDHARTH NAGAR**	868.77	868.77	100	-	-	-	-	-	-	868.77	868.77
71	**SITAPUR**	1821.94	1821.94	100	-	-	-	-	-	-	1821.94	1821.94
72	**SONBHADRA**	518.51	479.64	92.5	38.87	7.5	-	-	-	-	518.51	479.64

S.No	Name of District	Total Annual Extractable Resource of Assessed Units (in mcm)	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%	Total Annual Extractable Resource (in mcm)	%
73	**SULTANPUR**	848.4	848.4	100	-	-	-	-	-	-	848.4	848.4
74	**UNNAO**	1562.56	1562.56	100	-	-	-	-	-	-	1562.56	1562.56
75	**VARANASI**	479.67	124.37	25.93	170.12	35.47	49.67	10.36	135.51	28.25	479.67	124.37
	Total	65571.79	45401.02	69.24	12977.06	19.79	3276.41	5	3917.31	5.97	65571.79	45401.02

Table 8: District-wise Ground Water Extraction for Various Uses and Stage of Ground water extraction

S.NO	Districts	Ground Water Recharge in Ham					Total Natural Discharges in Ham	Annual Extractable Ground Water Resource in Ham	Current Annual Ground Water Extraction in Ham				Annual GW Allocation for Domestic use as on 2025 in Ham	Net Ground Water Availability for future use in Ham	Stage of Ground Water Extraction(%)
		Monsoon Season		Non-Monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other Sources	Recharge from Rainfall	Recharge from other Sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	AGRA	37965.83	15903.1	547.66	34875.73	89292.32	8337.83	80954.49	83152.89	164.01	10897.89	94214.78	11662.91	4955.08	116.38
2	ALIGARH	47244.28	16203.69	1597.97	33398.48	98444.42	8219.29	90225.13	60372.56	512.92	11667.78	72553.24	12629.69	19961.74	80.41
3	AMBEDKAR NAGAR	51881.73	11826.45	387.87	15293.99	79390.04	7595.04	71795	38897.45	17.7	6304.17	45219.33	6670.83	26209.01	62.98
4	AMETHI	38921.89	20870.39	891.9	26732.36	87416.54	7595.25	79821.29	46499.69	133.04	4942.25	51575	5243.71	27944.83	64.61
5	AMROHA	58557.15	6256.17	2150.33	13712.52	80676.17	7309.67	73366.5	61661.15	836.58	4812.36	67310.1	5188.02	9285.09	91.75
6	AURAIYA	27295.04	12563.11	286.67	26283.36	66428.18	6642.82	59785.36	30632.69	8.14	2912.67	33553.51	3041.69	26102.83	56.12
7	AYODHYA	48690.72	15531.38	447.72	29141.53	93811.35	9381.15	84430.2	45657.59	52.58	7117.68	52827.85	7822.51	30897.51	62.57
8	AZAMGARH	72902.71	24631.24	136.21	36650.35	134320.51	11287.49	123033.02	61649.02	7.1	13572.22	75228.33	14836.82	46540.09	61.14
9	BAGPAT	16395.8	7820.99	945.23	12116.4	37278.42	3727.84	33550.58	30024.02	43.23	2517.99	32585.21	2597.17	3880.84	97.12
10	BAHRAICH	81662.27	21912.34	2945.77	37261.64	143782.02	9524.66	134257.36	70723.9	131.4	9692.09	80547.41	10470.83	52931.19	59.99
11	BALLIA	50141.86	15037.45	1799.62	23585.65	90564.58	7052.25	83512.33	45071.15	9.02	8125.49	53205.63	8772.29	29659.88	63.71
12	BALRAMPUR	58790.79	11405.14	1398.21	19472.38	91066.52	6954.6	84111.92	43674.41	284.68	6157.91	50117.01	6750.02	33402.8	59.58
13	BANDA	49322.1	8712.25	519.8	14079.69	72633.84	6197.71	66436.13	39960.02	0	3962.62	43922.63	4256.96	22219.16	66.11
14	BARABANKI	69830.08	45243.9	1121.58	85684.29	201879.85	19115.12	182764.73	106367.98	40.06	8968.36	115376.4	9670.51	66686.18	63.13
15	BAREILLY	70400.18	20081.26	1401.51	31485.65	123368.6	9753.42	113615.18	67591.02	446.44	13333.52	81371.01	14209.9	33754.48	71.62
16	BASTI	66457.64	4196.25	662.66	11343.53	82660.08	7219.82	75440.26	42819.04	209.08	6484.2	49512.33	6902.14	25509.99	65.63
17	BIJNOR	90559.63	18437.04	3865.7	32456.01	145318.38	11877.85	133440.53	87196.22	790.19	7897.14	95883.56	8345.53	37108.59	71.85
18	BUDAUN	65960.27	6303.44	1631.21	10379.23	84274.15	7675.58	76598.57	55094.37	59.24	8506.12	63659.74	9105.51	14193.96	83.11
19	BULANDSHAHAR	45581.95	43937.2	1160.71	68903.29	159583.15	14520.38	145062.77	131950.57	0	6678.17	138628.73	6972.13	14719.37	95.56
20	CHANDAULI	30753.45	16033.36	285.55	9124.28	56196.64	5521.14	50675.5	23197.45	0	4632.21	27829.66	4896.29	22581.76	54.92
21	CHITRAKOOT	30711.78	5551.8	305.36	7690.59	44259.53	4029.85	40229.68	30537.93	0	2579.95	33117.87	2834.09	6857.67	82.32
22	DEORIA	49519.33	43812.39	1534.42	50540.84	145406.98	11791.72	133615.26	76152.64	0	7127.65	83280.31	7468.53	49994.07	62.33
23	ETAH	27021.27	16466.83	530.17	38333.6	82351.87	6833.9	75517.97	50452.98	25.77	4606.85	55085.61	4840.12	20199.11	72.94

S.NO	Districts	Ground Water Recharge in Ham					Total Natural Discharges in Ham	Annual Extractable Ground Water Resource in Ham	Current Annual Ground Water Extraction in Ham				Annual GW Allocation for Domestic use as on 2025 in Ham	Net Ground Water Availability for future use in Ham	Stage of Ground Water Extraction(%)
		Monsoon Season		Non-Monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other Sources	Recharge from Rainfall	Recharge from other Sources										
24	ETAWAH	27469.38	15078.32	313.59	28277.08	71138.37	6528.27	64610.1	29222.45	160.77	3235.19	32618.39	3431.04	31795.86	50.48
25	FARRUKHABAD	28940.09	3812.64	492.27	11402.25	44647.25	4464.73	40182.52	25807.91	0	3974.18	29782.09	4244.47	10130.14	74.12
26	FATEHPUR	60547.59	21943.4	276.01	32781.18	115548.18	11554.83	103993.35	67962.88	2.02	7339.35	75304.26	7940.09	30474.16	72.41
27	FIROZABAD	31384.29	16069.75	449.69	32702.03	80605.76	8060.59	72545.17	69234.6	0.01	6714.68	75949.29	7151.21	9145.73	104.69
28	G.B.NAGAR	15885.55	14188.32	401.64	21944.93	52420.44	5242.05	47178.39	47888.36	0	1552.14	49440.49	1602.73	2539.6	104.79
29	GHAZIABAD	14514.13	10362.64	539.38	16259.15	41675.3	4167.54	37507.76	36881.78	2246.1	7063.48	46191.34	7937.73	1685.94	123.15
30	GHAZIPUR	57888.25	17539.52	445.32	28777.51	104650.6	9718.46	94932.14	49221.36	54.3	6905.93	56181.55	7362.55	38293.99	59.18
31	GONDA	77715.12	15965.74	1186.83	24866.58	119734.27	8862.72	110871.55	56400.31	488.51	9753.15	66641.95	10644.32	43338.44	60.11
32	GORAKHPUR	69982.06	66123.77	2046.4	31616.39	169768.62	14376.46	155392.16	87020.02	2111.94	9412.26	98544.26	9998.11	56262.05	63.42
33	HAMIRPUR	32528.81	5863.36	84.22	6805.73	45282.12	4528.23	40753.89	25205.23	343.47	2193.8	27742.5	2268.15	12937.05	68.07
34	HAPUR	17763.39	12782.22	647.33	19294.51	50487.45	4531.13	45956.32	45031.95	0	3.39	45035.34	3.56	1638.42	98
35	HARDOI	92431.54	29991.19	2042.14	50035.05	174499.92	16188.22	158311.7	89451.45	76.41	8614	98141.86	9183.18	59600.66	61.99
36	HATHRAS	18853.27	19243.38	442.05	32302.38	70841.08	5580.58	65260.5	57057.7	28.64	4146.14	61232.5	4390.96	8780.51	93.83
37	JALAUN	65650.98	12105.01	513.29	26382.84	104652.12	10465.23	94186.89	47635.33	7.3	4316.04	51958.68	4509.25	42035.01	55.17
38	JAUNPUR	71785.81	20334.77	214.94	37197.96	129533.48	11710.07	117823.41	70450.69	0	13572.02	84022.71	14572.66	32800.07	71.31
39	JHANSI	29482.6	17751.38	0	23923.22	71157.2	6499.53	64657.67	40441.47	40.15	3189.47	43671.07	3439.34	20736.74	67.54
40	KANNAUJ	26050.71	10464.77	675.64	23749.33	60940.45	6094.06	54846.39	36787.93	15.79	4396.49	41200.25	4685.36	18773.43	75.12
41	KANPUR DEHAT	41564.56	12556.86	684.58	25768.47	80574.47	7362.04	73212.43	49810.86	402.82	4049.65	54263.34	4202.93	18795.8	74.12
42	KANPUR NAGAR	42677.77	13990.1	918.52	29910.55	87496.94	7705.5	79791.44	53988.75	385.67	7992.27	62366.66	8284.77	17132.27	78.16
43	KASGANJ	28888.68	13193.69	557.66	32700.42	75340.45	6298.9	69041.55	42702.47	3.65	4000.13	46706.23	4325.08	22010.37	67.65
44	KAUSHAMBI	29840.98	7611.03	271.18	11989.62	49712.81	4971.3	44741.51	32025	0	4540.43	36565.42	4995.9	9145.56	81.73
45	KUSHI NAGAR	46718.28	69136.54	2263.39	54208.55	172326.76	17232.7	155094.06	69450.17	1237.54	8689.64	79377.32	9454.67	74951.72	51.18
46	LAKHIMPUR KHERI	138123.91	33591.43	4730.12	54036.17	230481.63	20451.81	210029.82	115315.84	225.55	12140.68	127682.08	13690.09	80798.32	60.79

S.NO	Districts	Ground Water Recharge in Ham					Total Natural Discharges in Ham	Annual Extractable Ground Water Resource in Ham	Current Annual Ground Water Extraction in Ham				Annual GW Allocation for Domestic use as on 2025 in Ham	Net Ground Water Availability for future use in Ham	Stage of Ground Water Extraction(%)
		Monsoon Season		Non-Monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other Sources	Recharge from Rainfall	Recharge from other Sources										
47	LALITPUR	16090.56	6145.48	0	18616.47	40852.51	4085.27	36767.24	27664.81	0	3456.04	31120.85	3775.9	5326.53	84.64
48	LUCKNOW	37675.7	15965.98	829.93	24735.76	79207.37	5717.83	73489.54	29879.96	6110.33	12469.87	48460.16	13872.83	24854.34	65.94
49	MAHOBA	66689.03	19836.15	1967.16	22902.63	111394.97	9141.22	102253.75	56831.29	7.7	7102.51	63941.51	7698.58	37716.19	62.53
50	MAHRAJGANJ	9564.34	9202.15	0	11988.24	30754.73	2797.19	27957.54	24406.7	2.01	1157.36	25566.08	1212.54	3346.56	91.45
51	MAINPURI	35335.92	20074.09	420.64	36080.26	91910.91	7977.98	83932.93	55422.01	1.06	4972.56	60395.61	5240.74	24930.57	71.96
52	MATHURA	34937.7	34116.1	792.68	68325.58	138172.06	11412.38	126759.68	83916.46	114.23	6498.49	90529.17	6972	37103.44	71.42
53	MAUNATH BHANJAN	30993.97	8763.34	458.75	10907.44	51123.5	4493.58	46629.92	23744.21	7.36	6379.68	30131.23	7033.82	15844.54	64.62
54	MEERUT	42153.18	15451.34	1783.44	23568.23	82956.19	7552.92	75403.27	47442.24	1304.2	9515.72	58262.16	9910.16	19195.23	77.27
55	MIRZAPUR	25556.47	16119.19	57.63	19459.4	61192.69	5412.94	55779.75	28124.47	40.71	6810.43	34975.63	7319.87	20331.2	62.7
56	MORADABAD	36268.75	12052.42	1106.96	16636.63	66064.76	5764.43	60300.33	42545.4	223.21	10682.86	53451.47	11804.71	10027.51	88.64
57	MUZAFFARNAGAR	43675.33	23665.46	3128.13	40398.18	110867.1	6666.32	104200.78	72329.04	341.38	6808.28	79478.72	7363.97	25321.28	76.27
58	PILIBHIT	66500.48	15717.95	1250.07	28423.45	111891.95	8197.07	103694.88	61600	164.68	5411.95	67176.62	5768.94	36161.28	64.78
59	PRATAPGARH	60943.12	31519.43	203.23	45789.96	138455.74	12033.55	126422.19	91157.06	32.85	8210.97	99400.89	8699.65	26560.49	78.63
60	PRAYAGRAJ	73165.81	28765.65	0	39394.2	141325.66	12904.13	128421.53	75451.95	1606.26	17040.33	94098.54	18139.56	35328.78	73.27
61	RAIBARELI	54907.22	26131.73	225.36	41164.23	122428.54	10603.1	111825.44	58540.32	12.01	7101.83	65654.17	7673.42	45599.66	58.71
62	RAMPUR	42713.42	12399.03	1571.16	20126.69	76810.3	6474.1	70336.2	47015.01	299.45	5193.12	52507.57	5579.04	17442.69	74.65
63	SAHARANPUR	42340.85	4018.87	764.46	7062.22	54186.4	5105.99	49080.41	26542.47	172.97	4322.7	31038.17	4631.67	17733.27	63.24
64	SAMBHAL	16773.95	22080.41	184.7	46997	86036.06	8366.84	77669.22	58416.61	80.3	3478.76	61975.68	3648.85	15523.46	79.79
65	SANT KABIR NAGAR	75855.33	21834.81	5463.56	37251.19	140404.89	9132.79	131272.1	123985.56	817.66	7281.19	132084.43	7702.09	15869.83	100.62
66	SANT RAVIDAS NAGAR	86711.32	17662.93	2690.75	25362.56	132427.56	8412.6	124014.96	69274.2	1639.25	8526.36	79439.81	9322.62	43778.9	64.06
67	SHAHJAHANPUR	38075.84	3366.8	929.64	5471.97	47844.25	4577.13	43267.12	31535.6	494.47	5732.43	37762.49	6263.01	5052.96	87.28
68	SHAMLI	21882.42	9051.43	1544.69	13746.32	46224.86	3189.53	43035.33	41103.54	394.47	3033.93	44531.93	3066.96	1000.2	103.48
69	SHRAWASTI	43057.31	4603.41	1187.29	7103.28	55951.29	4432.06	51519.23	26203.57	0	3237.06	29440.62	3632.46	21683.2	57.14

S.NO	Districts	Ground Water Recharge in Ham					Total Natural Discharges in Ham	Annual Extractable Ground Water Resource in Ham	Current Annual Ground Water Extraction in Ham				Annual GW Allocation for Domestic use as on 2025 in Ham	Net Ground Water Availability for future use in Ham	Stage of Ground Water Extraction(%)
		Monsoon Season		Non-Monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other Sources	Recharge from Rainfall	Recharge from other Sources										
70	SIDDHARTH NAGAR	68612.81	10439.92	1324.31	15706.7	96083.74	9207.18	86876.56	47636.17	0.34	7366.84	55003.3	8079.37	31160.72	63.31
71	SITAPUR	95088.42	39901.44	2012.06	63277.31	200279.23	18085.06	182194.17	80780.35	17352.1	11259.84	109392.3	12255.85	71805.87	60.04
72	SONBHADRA	15380.48	30026.53	129.25	11829.78	57366.04	5514.93	51851.11	21249.33	830.19	4315.1	26394.62	4730.88	25040.7	50.9
73	SULTANPUR	47274.06	18704.21	174.63	26405.26	92558.16	7718.02	84840.14	46135.58	5.81	6177.35	52318.77	6567.92	32130.79	61.67
74	UNNAO	62175.05	45294.97	966.14	62790.02	171226.18	14969.77	156256.41	87098.17	74.37	8623.82	95796.34	9372.65	59711.23	61.31
75	VARANASI	28751.27	9512.63	123.08	14607.17	52994.15	5027.04	47967.11	31394.08	114.06	10599.38	42107.54	10946.31	8968.05	87.78
	Total(Ham)	3572405.61	1400860.85	78039.72	2131605.42	7182911.6	625732.28	6557179.32	4091757.41	43845.24	504058.56	4639661.21	541792.72	2003946.54	70.76
	Total(Bcm)	35.72	14.01	0.78	21.32	71.83	6.26	65.57	40.92	0.44	5.04	46.4	5.42	20.04	70.76

6.0 GROUND WATER EXTRACTION AND CATEGORIZATION OF ASSESSMENT

6.1 Stage of Ground Water Extraction and Categorization of assessment

The distributions of various categorized blocks are shown in the Figure-13, in which 172 blocks are falling in semi-critical category, 43 assessment units (42 blocks and 1 urban area) in critical category and 62 assessment unit (53 blocks and 9 urban area) of the state are categorized as over-exploited. List of semi-critical, critical and over- exploited area is given in Table-10. Almost all over-exploited blocks are falling in western part of Uttar Pradesh, where ground water draft has increased manifold during past decades. The stage of ground water extraction of the State is 70.76%.

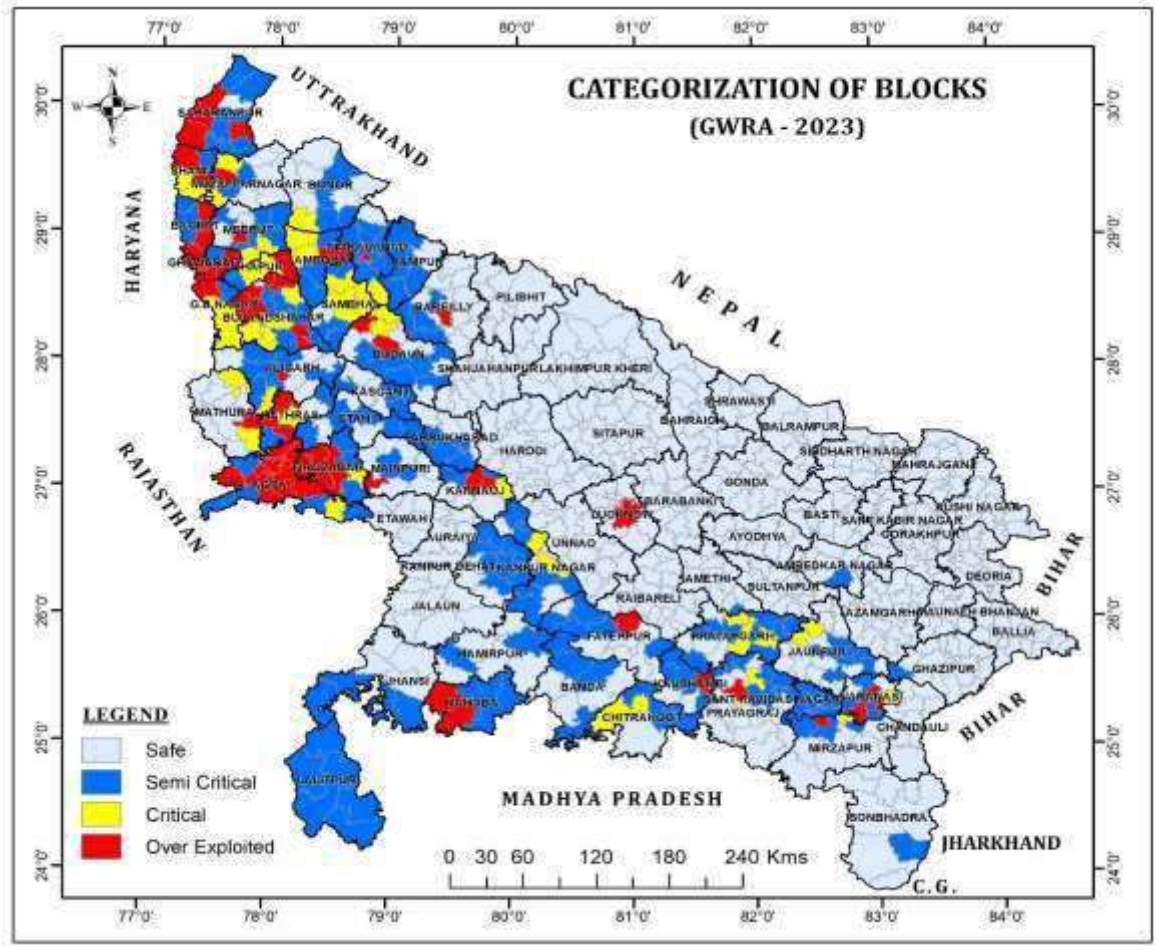


Figure 13: Categorization of Assessment Unit (Block & Urban area) For Ground Water Extraction - As on March 2023

Total recharge from Rainfall in the state is of the order of 36.50 BCM with Lakhimpur district having the highest recharge of 142854 Ham and Mahoba district has minimum recharge of the order of 9564 Ham. Component of recharge from other sources in the state is 35.33 BCM, highest in Barabanki

district 130928 Ham, where maximum canal irrigation facility is available. Lowest value of recharge from other source is recorded in Sambhal is 8839 Ham, where use of ground water as well surface water for irrigation purpose is very low. Total annual recharge from all sources in the State is of the order of 71.83Bcm, with Lakhimpur district having the highest recharge of 230481 Ham and Mahoba district has minimum recharge of the order of 30755 Ham.

Total unaccounted natural discharge in the State is of the order of 6.26 BCM with Sitapur district having the highest discharge of 20452 Ham and Mahoba with lowest of 2797 Ham. The Annual Extractable Ground Water Resources in the state is 65.57 BCM with Lakhimpur district having the highest net ground water availability of 210030 Ham and Mahoba with lowest of 27957 Ham.

Total extraction of ground water for all uses in state is calculated as 46.40 BCM. The maximum ground water withdrawal for all uses is 138629 Ham in Bulandshahar district and minimum extraction of ground water for all uses is 25566 Ham in Mahoba district at Southern part of Uttar Pradesh. Comparison of ground water extraction for various uses reveals that extraction for irrigation accounts for almost 88.2% of total ground water extraction, whereas extraction for domestic purposes is 10.86% and industrial purposes in 0.94%.

After successful upload of data on the online portal of IN-GRES (India Groundwater Resource Estimation System) and computation based on GEC 2015 methodology, 559 blocks are Safe, 172 blocks are falling in semi-critical category, 43 assessment units in critical category and 62 assessment unit of the state are categorized as over-exploited. The ground water resources of the individual block /assessment unit show wide variation in the resource available and stage of ground water extraction. In Uttar Pradesh, the ground water extraction concentrates mainly in the Western Uttar Pradesh, Bundelkhand Region and south eastern part of the of the State. The stage of ground water extraction of the State is 70.76%.

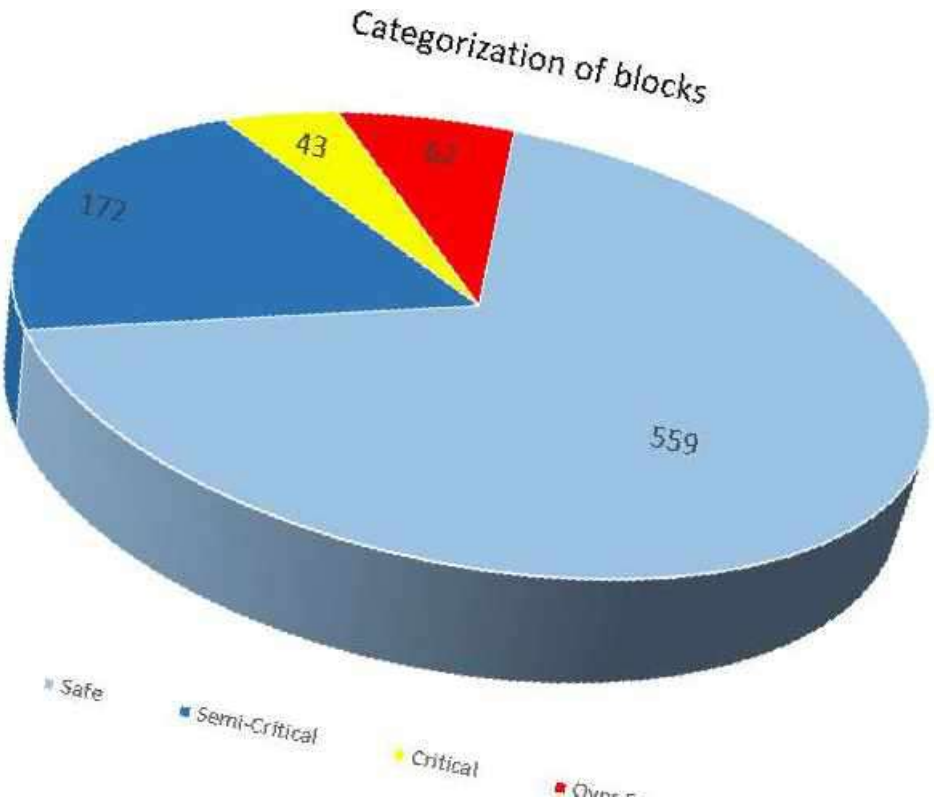


Figure 14: Categorization of Assessment Unites

Category	Nos.	%
Safe	559	66.87
Semi-Critical	172	20.57
Critical	43	5.14
Over-Exploited	62	7.42
Total	**836**	**100**

Table 9: Stage of Ground Water Extraction

Category	Stage of GW Extraction (in %)						
	Minimum	Name	Maximum	Name	Mean	Median	Std. Dev
Assessment Unit Wise (Except City)	24.34	Hallia (Mirzapur)	216.66	Jalalabad (Kannauj)	70.32	65.79	20.46
District Wise	50.48	Itawa	123.15	Ghaziabad	70.76	68.07	15.66
Urban Units	96.97	Kanpur City	313.83	Moradabad City	195.04	214.56	70.72

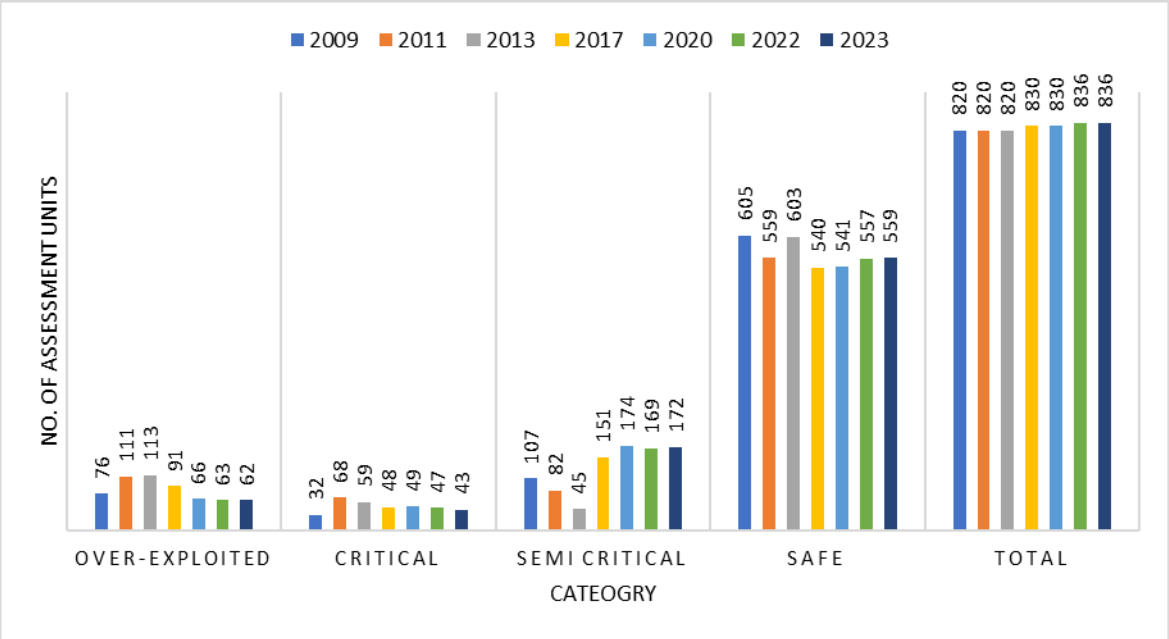


Figure 15: Comparison of Assessment Units in GWRE-2009, 2011, 2013, 2017, 2020, 2022 and 2023

Table 10: Categorisation Of Assessment Unit, 2023

CATEGORISATION OF ASSESSMENT UNIT OF UTTAR PRADESH, 2023							
S.NO	Name of District	S.NO	Name of Semi-Critical Assessment Units	S.NO	Name of Critical Assessment Units	S.NO	Name of Over-Exploited Assessment Units
1	**AGRA**	1	PINAHAT	1	BAH	1	AGRA CITY
		2	ACHHNERA			2	ETMADPUR
		3	KHERAGARH			3	FATEHABAD
		4	JAGNER			4	BICHPURI
		5	JAITPUR KALAN			5	KHANDAULI

CATEGORISATION OF ASSESSMENT UNIT OF UTTAR PRADESH, 2023							
S.NO	**Name of District**	**S.NO**	**Name of Semi-Critical Assessment Units**	**S.NO**	**Name of Critical Assessment Units**	**S.NO**	**Name of Over-Exploited Assessment Units**
						6	SAIYANA
						7	FATEHPUR SIKRI
						8	BARAULI AHIR
						9	AKOLA
						10	SHAMSABAD
2	**ALIGARH**	1	GONDA	1	IGLAS	1	ALIGARH CITY
		2	KHAIR				
		3	LODHA				
		4	CHANDAUS				
		5	GANGIRI				
		6	JAWA SIKANDAIRPUR				
3	**AMBEDKAR NAGAR**	1	JALALPUR				
4	**AMETHI**	1	SANGRAMPUR				
5	**AMROHA**	1	GANGESHWARI	1	DHANAURA	1	JOYA
		2	AMROHA	2	GAJRAULA		
		3	HASANPUR				
6	**BAGPAT**	1	BAGHPAT			1	PILANA
		2	BARAUT			2	BINAULI
		3	CHHAPRAULI			3	KHEKRA
7	**BANDA**	1	BABERU				
		2	TINDWARI				
		3	NARAINI				
		4	JASPURA				
8	**BAREILLY**	1	ALAMPUR			1	BAREILLY CITY

CATEGORISATION OF ASSESSMENT UNIT OF UTTAR PRADESH, 2023							
S.NO	**Name of District**	**S.NO**	**Name of Semi-Critical Assessment Units**	**S.NO**	**Name of Critical Assessment Units**	**S.NO**	**Name of Over-Exploited Assessment Units**
			JAFARABAD				
		2	RAMNAGAR				
		3	MAJHGAWA				
		4	FATEHGANJ				
9	**BIJNOR**	1	SEOHARA (BUDHANPUR)	1	JALEELPUR		
		2	KOTWALI				
		3	NEHTAUR (AAKU)				
		4	NOORPUR				
10	**BUDAUN**	1	SAHASWAN	1	ASAFPUR	1	AMBIAPUR
		2	QUADAR CHOWK	2	BISAULI	2	ISLAMNAGAR
		3	JAGAT				
		4	SAMRER				
		5	MIAON				
		6	UJHANI				
11	**BULANDSHAHAR**	1	PAHASU	1	ARNIA KHURD	1	SIKANDRABAD
		2	DEBAI	2	KHURJA	2	BULANDSHAHAR
		3	ANUP SHAHAR	3	SHIKARPUR	3	SIANA
		4	JAHANGIRABAD	4	UNCHAGAON	4	GULAOTHI
		5	LAKHAOTHI			5	BHAWAN BAHADUR NAGAR
						6	DANPUR
12	**CHITRAKOOT**	1	RAMNAGAR	1	KARWI		
		2	PAHARI				
		3	MAU				
13	**ETAH**	1	NIDHAULI KALAN				

CATEGORISATION OF ASSESSMENT UNIT OF UTTAR PRADESH, 2023							
S.NO	**Name of District**	**S.NO**	**Name of Semi-Critical Assessment Units**	**S.NO**	**Name of Critical Assessment Units**	**S.NO**	**Name of Over-Exploited Assessment Units**
		2	ALIGANJ				
		3	JALESAR				
		4	JAITHARA				
		5	SHITALPUR				
14	**FARRUKHABAD**	1	MOHAMADABAD				
		2	BARHPUR				
		3	NAWABGANJ				
		4	KAMALGANJ				
15	**FATEHPUR**	1	TELYANI			1	BHITAURA
		2	KHAJUHA				
		3	MALAWAN				
		4	AIRAYA				
		5	AMAULI				
16	**FIROZABAD**	1	MADANPUR	1	ARON	1	FIROZABAD
		2	EKA			2	SHIKOHABAD
		3	JASRANA			3	KHAIRGARH(HATHWANT)
						4	NARKHI
						5	TUNDLA
17	**G.B.NAGAR**	1	DADRI	1	JEWAR	1	BISRAKH
18	**GHAZIABAD**	1	MURADNAGAR			1	GAZIABAD CITY
						2	BHOJPUR
						3	RAZAPUR
						4	LONI
19	**GHAZIPUR**	1	SAIDPUR				

CATEGORISATION OF ASSESSMENT UNIT OF UTTAR PRADESH, 2023							
S.NO	**Name of District**	**S.NO**	**Name of Semi-Critical Assessment Units**	**S.NO**	**Name of Critical Assessment Units**	**S.NO**	**Name of Over-Exploited Assessment Units**
20	**HAMIRPUR**	1	SUMERPUR				
		2	GOHAND				
21	**HAPUR**	1	DHOLANA	1	SIMBHOLI	1	GARH
				2	HAPUR		
22	**HATHRAS**	1	SIKANDRA RAO	1	HATHRAS	1	SAHPAU
		2	SADABAD			2	MURSAN
						3	SASNI
23	**JAUNPUR**	1	KERAKAT	1	BADLAPUR		
		2	SIRKONI	2	MAHARAJGANJ		
		3	RAMNAGAR				
		4	MUFTIGANJ				
		5	KARANJA KALAN				
		6	SIKRARA				
		7	DHARMAPUR				
24	**JHANSI**	1	BARAGAON				
		2	BANGRA				
		3	BABINA				
		4	MAURANIPUR				
25	**KANNAUJ**	1	GOGRAPUR	1	KANNAUJ	1	JALALABAD
		2	CHHIBRAMAU			2	TALGRAM
26	**KANPUR DEHAT**	1	AKBARPUR				
		2	MAITHA				
		3	JHINJHAK				
		4	SARWAN KHERA				

CATEGORISATION OF ASSESSMENT UNIT OF UTTAR PRADESH, 2023							
S.NO	**Name of District**	**S.NO**	**Name of Semi-Critical Assessment Units**	**S.NO**	**Name of Critical Assessment Units**	**S.NO**	**Name of Over-Exploited Assessment Units**
		5	MALSA				
		6	DERAPUR				
		7	RASULABAD				
27	**KANPUR NAGAR**	1	PARARA	1	KANPUR CITY		
		2	SARSOL	2	CHAUBEPUR		
		3	GHATAMPUR				
		4	BIDHNU				
		5	BILHAUR				
		6	SHIVRAJAPUR				
28	**KASGANJ**	1	GANJDUNDWARA				
		2	PATIYALI				
		3	KASGANJ				
29	**KAUSHAMBI**	1	MANJHANPUR			1	CHAIL
		2	KARA			2	MURATGANJ
		3	SIRATHU				
		4	NEWADA				
30	**LALITPUR**	1	TALBEHAT				
		2	BIRDHA				
		3	BAR				
		4	JAKHORA				
		5	MAHRONI				
		6	MANDWARA				
31	**LUCKNOW**					1	LUCKNOW CITY
32	**MAHOBA**	1	KABRAI			1	PANWARI
		2	CHARKHARI			2	JAITPUR

CATEGORISATION OF ASSESSMENT UNIT OF UTTAR PRADESH, 2023							
S.NO	**Name of District**	**S.NO**	**Name of Semi-Critical Assessment Units**	**S.NO**	**Name of Critical Assessment Units**	**S.NO**	**Name of Over-Exploited Assessment Units**
33	**MAINPURI**	1	JAGIR			1	BARNAHAL
		2	MAINPURI				
34	**MATHURA**			1	BALDEO	1	RAYA
				2	NOHJHIL		
35	**MEERUT**	1	RAJPURA	1	MACHHRA	1	MEERUT CITY
		2	MEERUT	2	KHARKHODA		
		3	SARURPUR				
		4	HASTINAPUR				
		5	PARICHHATGARH				
		6	MAWANA KALAN				
36	**MIRZAPUR**	1	CITY	1	MAJHAWAN	1	KON
		2	CHANBEY				
		3	SIKHAR				
37	**MORADABAD**	1	DILARI	1	BILARI	1	MORADABAD City
		2	MORADABAD				
		3	KUNDARKI (DENGAPUR)				
		4	BHAGATPUR				
		5	MUNDAPANDEY				
		6	CHHAJLET				
38	**MUZAFFARNAGAR**	1	SHAHPUR	1	CHARTHAWAL	1	BHAGHARA
		2	MUZAFFARNAGAR	2	BUDHANA		
39	**PRATAPGARH**	1	LALGANJ	1	SHIVGARH		
		2	GAURA	2	SADAR		

CATEGORISATION OF ASSESSMENT UNIT OF UTTAR PRADESH, 2023							
S.NO	**Name of District**	**S.NO**	**Name of Semi-Critical Assessment Units**	**S.NO**	**Name of Critical Assessment Units**	**S.NO**	**Name of Over-Exploited Assessment Units**
		3	BABA BELKHAR NATH	3	MANDHATA		
		4	PATTI	4	SANDWA CHANDIKA		
		5	RAMPUR-SANGRAMGARH				
		6	LAKSHAMANPUR				
		7	ASPUR DEOSARA				
		8	KUNDA				
		9	MANGARAURA				
40	**PRAYAGRAJ**	1	BAHADURPUR	1	CHAKA	1	PRAYAGRAJ CITY
		2	HOLAGARH	2	SAHSON		
		3	SAIDABAD				
		4	MAUAIMA				
		5	PHULPUR				
		6	PRATAPPUR				
		7	SHRINGVERPUR DHAM				
		8	DHANUPUR				
41	**RAMPUR**	1	SAID NAGAR				
		2	CHAMRAUWA				
		3	SHAHABAD				
		4	SAUR				
		5	MILAK				
42	**SAHARANPUR**	1	DEOBAND			1	NAKUR
		2	RAMPUR MANIHARAN			2	SARSAWA
		3	SADHAULI KADEEM			3	GANGOH
		4	BALLIA KHERI			4	NAGAL
		5	NANAUTA				
		6	MUZAFFARABAD				

CATEGORISATION OF ASSESSMENT UNIT OF UTTAR PRADESH, 2023							
S.NO	**Name of District**	**S.NO**	**Name of Semi-Critical Assessment Units**	**S.NO**	**Name of Critical Assessment Units**	**S.NO**	**Name of Over-Exploited Assessment Units**
43	**SAMBHAL**	1	GUNNAUR	1	SAMBHAL		
		2	JANAWAI	2	BAHJOI		
		3	ASMOLI	3	PAWANSA		
				4	BANIAKHERA		
44	**SANT RAVIDAS NAGAR**	1	GYANPUR				
		2	DEEGH				
		3	SURIYAWAN				
		4	ABHAULI				
		5	AURAI				
		6	BHADOHI				
45	**SHAMLI**	1	THANA BHAWAN	1	KAIRANA	1	SHAMLI
				2	KANDHALA	2	UN
46	**SONBHADRA**	1	DUDHI				
47	**VARANASI**	1	SEVAPURI	1	CHIRAIGAON	1	VARANASI City
		2	PINDRA			2	HARAHUA
		3	KASHI VIDYAPITH			3	ARAZILINE

ABSTRACT

Total No. of Assessed Units	**Number of Semicritical Assessment Units**	**Number of Critical Assessment Units**	**Number of Over Exploited Assessment Units**
836	172	43	62

Note: 10 Urban cities (more than 10 lakh population) are also included in the Assessment Unit

Table 11: Total number of Number of Assessment Units under different categories

DYNAMIC GROUND WATER RESOURCES-2023, Uttar Pradesh												
S.No	Name of District	Total No. of Assessed Units	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			No	%	No.	%	No.	%	No.	%	No.	%
1	LALITPUR	6	-	-	6	100	-	-	-	-	-	-
2	SAHARANPUR	11	1	9.09	6	54.55	-	-	4	36.36	-	-
3	BANDA	8	4	50	4	50	-	-	-	-	-	-
4	MATHURA	10	7	70	-	-	2	20	1	10	-	-
5	SHAMLI	5	-	-	1	20	2	40	2	40	-	-
6	CHANDAULI	9	9	100	-	-	-	-	-	-	-	-
7	MIRZAPUR	12	7	58.33	3	25	1	8.33	1	8.33	-	-
8	UNNAO	16	16	100	-	-	-	-	-	-	-	-
9	BAGPAT	6	-	-	3	50	-	-	3	50	-	-
10	KANPUR DEHAT	10	3	30	7	70	-	-	-	-	-	-
11	CHITRAKOOT	5	1	20	3	60	1	20	-	-	-	-
12	SHAHJAHANPUR	15	15	100	-	-	-	-	-	-	-	-
13	PILIBHIT	7	7	100	-	-	-	-	-	-	-	-
14	JAUNPUR	21	12	57.14	7	33.33	2	9.52	-	-	-	-
15	MAHRAJGANJ	12	12	100	-	-	-	-	-	-	-	-
16	AMBEDKAR NAGAR	9	8	88.89	1	11.11	-	-	-	-	-	-
17	MAUNATH BHANJAN	9	9	100	-	-	-	-	-	-	-	-
18	KAUSHAMBI	8	2	25	4	50	-	-	2	25	-	-
19	RAIBARELI	18	18	100	-	-	-	-	-	-	-	-
20	AURAIYA	7	7	100	-	-	-	-	-	-	-	-
21	ETAWAH	8	8	100	-	-	-	-	-	-	-	-
22	MAHOBA	4	-	-	2	50	-	-	2	50	-	-
23	SITAPUR	19	19	100	-	-	-	-	-	-	-	-
24	HATHRAS	7	1	14.29	2	28.57	1	14.29	3	42.86	-	-

DYNAMIC GROUND WATER RESOURCES-2023, Uttar Pradesh												
S.No	Name of District	Total No. of Assessed Units	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
25	BUDAUN	15	5	33.33	6	40	2	13.33	2	13.33	-	-
26	BULANDSHAHAR	16	1	6.25	5	31.25	4	25	6	37.5	-	-
27	AMETHI	13	12	92.31	1	7.69	-	-	-	-	-	-
28	BAREILLY	16	11	68.75	4	25	-	-	1	6.25	-	-
29	GONDA	16	16	100	-	-	-	-	-	-	-	-
30	JHANSI	8	4	50	4	50	-	-	-	-	-	-
31	ALIGARH	13	5	38.46	6	46.15	1	7.69	1	7.69	-	-
32	BIJNOR	11	6	54.55	4	36.36	1	9.09	-	-	-	-
33	G.B.NAGAR	3	-	-	1	33.33	1	33.33	1	33.33	-	-
34	GORAKHPUR	20	20	100	-	-	-	-	-	-	-	-
35	KANNAUJ	8	3	37.5	2	25	1	12.5	2	25	-	-
36	ETAH	8	3	37.5	5	62.5	-	-	-	-	-	-
37	VARANASI	9	2	22.22	3	33.33	1	11.11	3	33.33	-	-
38	LUCKNOW	9	8	88.89	-	-	-	-	1	11.11	-	-
39	FIROZABAD	9	-	-	3	33.33	1	11.11	5	55.56	-	-
40	AZAMGARH	22	22	100	-	-	-	-	-	-	-	-
41	DEORIA	16	16	100	-	-	-	-	-	-	-	-
42	BALRAMPUR	9	9	100	-	-	-	-	-	-	-	-
43	BASTI	14	14	100	-	-	-	-	-	-	-	-
44	AYODHYA	11	11	100	-	-	-	-	-	-	-	-
45	AGRA	16	-	-	5	31.25	1	6.25	10	62.5	-	-
46	HAPUR	4	-	-	1	25	2	50	1	25	-	-
47	PRATAPGARH	17	4	23.53	9	52.94	4	23.53	-	-	-	-
48	BAHRAICH	14	14	100	-	-	-	-	-	-	-	-
49	MAINPURI	9	6	66.67	2	22.22	-	-	1	11.11	-	-
50	KUSHI NAGAR	14	14	100	-	-	-	-	-	-	-	-
51	MEERUT	13	4	30.77	6	46.15	2	15.38	1	7.69	-	-

DYNAMIC GROUND WATER RESOURCES-2023, Uttar Pradesh												
S.No	**Name of District**	**Total No. of Assessed Units**	**Safe**		**Semi-Critical**		**Critical**		**Over-Exploited**		**Saline**	
52	**GHAZIABAD**	5	-	-	1	20	-	-	4	80	-	-
53	**FATEHPUR**	13	7	53.85	5	38.46	-	-	1	7.69	-	-
54	**KASGANJ**	7	4	57.14	3	42.86	-	-	-	-	-	-
55	**MORADABAD**	9	1	11.11	6	66.67	1	11.11	1	11.11	-	-
56	**BARABANKI**	15	15	100	-	-	-	-	-	-	-	-
57	**SAMBHAL**	8	1	12.5	3	37.5	4	50	-	-	-	-
58	**SANT KABIR NAGAR**	9	9	100	-	-	-	-	-	-	-	-
59	**LAKHIMPUR KHERI**	15	15	100	-	-	-	-	-	-	-	-
60	**SANT RAVIDAS NAGAR**	6	-	-	6	100	-	-	-	-	-	-
61	**SHRAWASTI**	5	5	100	-	-	-	-	-	-	-	-
62	**AMROHA**	6	-	-	3	50	2	33.33	1	16.67	-	-
63	**KANPUR NAGAR**	11	3	27.27	6	54.55	2	18.18	-	-	-	-
64	**SIDDHARTH NAGAR**	14	14	100	-	-	-	-	-	-	-	-
65	**GHAZIPUR**	16	15	93.75	1	6.25	-	-	-	-	-	-
66	**SONBHADRA**	10	9	90	1	10	-	-	-	-	-	-
67	**HAMIRPUR**	7	5	71.43	2	28.57	-	-	-	-	-	-
68	**BALLIA**	17	17	100	-	-	-	-	-	-	-	-
69	**FARRUKHABAD**	7	3	42.86	4	57.14	-	-	-	-	-	-
70	**HARDOI**	19	19	100	-	-	-	-	-	-	-	-
71	**JALAUN**	9	9	100	-	-	-	-	-	-	-	-
72	**MUZAFFARNAGAR**	9	4	44.44	2	22.22	2	22.22	1	11.11	-	-
73	**PRAYAGRAJ**	24	13	54.17	8	33.33	2	8.33	1	4.17	-	-
74	**RAMPUR**	6	1	16.67	5	83.33	-	-	-	-	-	-
75	**SULTANPUR**	14	14	100	-	-	-	-	-	-	-	-
	Total	836	559	66.87	172	20.57	43	5.14	62	7.42	-	-

6.2 Reasons for Significant Change in Resources, Extraction, Categorization of Assessment Units

The ground water resources have been assessed in block-wise and Urban area having more than ten lakhs population. The total annual ground water recharge of the state has been estimated as 71.83 BCM and annual extractable groundwater resources are 65.57 BCM. The annual ground water extraction is 46.4 BCM and stage of groundwater extraction is 70.76 %. Out of the 836 (826 blocks and 10 Urban areas) assessment units, 62 have been categorized as Over Exploited, 43 as Critical, 172 as Semi Critical and 559 as Safe. There are no Saline blocks in the state. As compared to 2022, 63 assessment units in Over exploited category has decreased to 62 in the current assessment year whereas 169 blocks in Semi Critical Category has increased to 172 in GWRE-2023. 47 assessment units in the Critical Category has changed to 43 and 557 safe blocks in 2022 has increased to 559 in 2023.

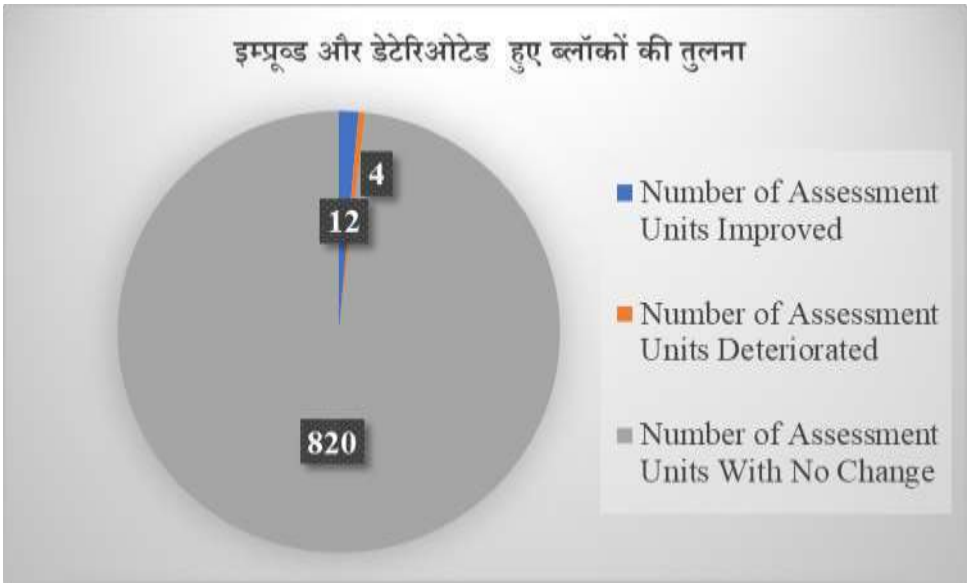


Figure 16: Number of Improved and Deteriorated blocks from 2022 to 2023

STATE-WISE SUMMARY OF ASSESSMENT UNITS IMPROVED AND DETERIORATED FROM 2017 TO 2020	
Name of State	**UTTAR PRADESH**
IMPROVED ASSESSMENT UNITS	**12**
DETERIORATED ASSESSMENT UNITS	**04**
ASSESSMENT UNITS WITH NO CHANGE	**820**

Table 12: Assessment units which improved and deteriorated in GWRE-2023 compared to GWRE-2022

S. N	Name of District	Name of Assessment Unit	GWRE-2022		GWRE-2023		Remark
			Stage of Ground Water Extraction	Categorization	Stage of Ground Water Extraction	Categorization	
1	AGRA	JAITPUR KALAN	95.38	Critical	87.93	Semi Critical	Improved
2	ALIGARH	GONDA	69.90	Safe	72.28	Semi Critical	Deteriorated
3	BAGPAT	BAGHPAT	93.35	Critical	88.34	Semi Critical	Improved
4	BUDAUN	SALARPUR	70.71	Semi Critical	68.32	Safe	Improved
5	BUDAUN	SAMRER	69.99	Safe	72.88	Semi Critical	Deteriorated
6	ETAH	JALESAR	90.36	Critical	88.98	Semi Critical	Improved
7	HAMIRPUR	RATH	71.52	Semi Critical	69.00	Safe	Improved
8	HAMIRPUR	SARILA	73.89	Semi Critical	69.15	Safe	Improved
9	HATHRAS	SIKANDRA RAO	90.35	Critical	89.61	Semi Critical	Improved
10	JAUNPUR	BAKSHA	70.81	Semi Critical	69.22	Safe	Improved
11	MEERUT	SARURPUR	68.39	Safe	70.55	Semi Critical	Deteriorated
12	PRAYAGRAJ	BAHARIA	70.78	Semi Critical	69.84	Safe	Improved
13	RAMPUR	SAID NAGAR	64.23	Safe	79.93	Semi Critical	Deteriorated
14	SHAMLI	KANDHALA	102.13	Over Exploited	99.41	Critical	Improved
15	SONBHADRA	NAGAWA	72.76	Semi Critical	67.28	Safe	Improved
16	VARANASI	PINDRA	90.64	Critical	78.15	Semi Critical	Improved

7.0 DISTRICT WISE DYNAMIC REPORT (GWRE-2023)

1. AGRA

AGRA district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 394717 ha of geographical area, 394717 ha is ground water recharge worthy area. There are 16 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 80954.49 ham and ground water extraction for all uses is 94214.78 ham, making stage of ground water extraction 116.38% as a whole for the district. The highest stage of ground water extraction is 192.86% in SHAMSABAD block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 4955.08 ham in the district. 5 blocks are categorized in semi critical, 1in critical. 10 blocks of the district are categorized in over exploited.

2. ALIGARH

ALIGARH district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 380843 ha of geographical area, 380843 ha is ground water recharge worthy area. There are 13 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 90225.13 ham and ground water extraction for all uses is 72553.24 ham, making stage of ground water extraction 80.41% as a whole for the district. The highest stage of ground water extraction is 249.84% in ALIGARH CITY block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 19961.74 ham in the district. 6 blocks are categorized in semi critical, 1in critical. 1 block of the district are categorized in over exploited. 5 blocks are categorized in Safe.

3. AMBEDKAR NAGAR

AMBEDKAR NAGAR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 245898 ha of geographical area, 245898 ha is ground water recharge worthy area. There are 9 number of assessment units in the district which fall

under command category. The Annual Extractable Ground Water Resources in the district is 71795 ham and ground water extraction for all uses is 45219.33 ham, making stage of ground water extraction 62.98% as a whole for the district. The highest stage of ground water extraction is 75.77% in JALALPUR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 26209.01 ham in the district. 1 block are categorized in semi critical, 8 block are categorized in Safe.

4. AMETHI

AMETHI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 232992 ha of geographical area, 232992 ha is ground water recharge worthy area. There are 13 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 79821.29ham and ground water extraction for all uses is 51575ham, making stage of ground water extraction 64.61% as a whole for the district. The highest stage of ground water extraction is 77.31% in SANGRAMPUR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 2794483ham in the district. 1 block are categorized in semi critical;12 blocks are categorized in Safe.

5. AMROHA

AMROHA district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 214903 ha of geographical area, 214903 ha is ground water recharge worthy area. There are 6 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 73366.5ham and ground water extraction for all uses is 67310.1ham, making stage of ground water extraction 91.75% as a whole for the district. The highest stage of ground water extraction is 133.19% in JOYA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 9285.09ham in the district. 3 blocks are categorized in semi critical, 2in critical. 1 block of the district are categorized in over exploited.

6. AURAIYA

AURAIYA district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 209427 ha of geographical area, 209427 ha is ground water recharge worthy area. There are 7 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 59785.36 ham and ground water extraction for all uses is 33553.51 ham, making stage of ground water extraction 56.12% as a whole for the district. The highest stage of ground water extraction is 63.47% in ERWA KATRA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 26102.83 ham in the district.7 block are categorized in Safe.

7. AYODHYA

AYODHYA district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 252201 ha of geographical area, 252201 ha is ground water recharge worthy area. There are 11 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 84430.2 ham and ground water extraction for all uses is 52827.85 ham, making stage of ground water extraction 62.57% as a whole for the district. The highest stage of ground water extraction is 68.29% in MASODHA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 30897.51 ham in the district. 11 blocks are categorized in Safe.

8. AZAMGARH

AZAMGARH district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 417119 ha of geographical area, 417119 ha is ground water recharge worthy area. There are 22 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 123033.02 ham and ground water extraction for all uses is 75228.33 ham, making stage of ground water extraction 61.14% as a whole for the district. The highest stage of ground water extraction is 69.79% in SATHIYAON block. After allocation of Ground Water Resource for

domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 46540.09 ham in the district. 22 blocks are categorized in Safe.

9. BAGPAT

BAGPAT district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 135138.96 ha of geographical area, 135138.96 ha is ground water recharge worthy area. There are 6 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 33550.58 ham and ground water extraction for all uses is 32585.21 ham, making stage of ground water extraction 97.12% as a whole for the district. The highest stage of ground water extraction is 130.59% in PILANA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 3880.84 ham in the district. 3 blocks are categorized in semi critical, 0 in critical. 3 blocks of the district are categorized in over exploited.

10. BAHRAICH

BAHRAICH district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 438725 ha of geographical area, 438725 ha is ground water recharge worthy area. There are 14 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 134257.36 ham and ground water extraction for all uses is 80547.41 ham, making stage of ground water extraction 59.99% as a whole for the district. The highest stage of ground water extraction is 65.17% in TEJWAPUR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 52931.19 ham in the district. 14 blocks are categorized in Safe.

11. BALLIA

BALLIA district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 292700 ha of geographical area, 292700 ha is ground water recharge

worthy area. There are 17 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 83512.33 ham and ground water extraction for all uses is 53205.63ham, making stage of ground water extraction 63.71% as a whole for the district. The highest stage of ground water extraction is 68.78% in RASRA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 29659.88 ham in the district. 17 blocks are categorized in Safe.

12. BALRAMPUR

BALRAMPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 334857 ha of geographical area, 334857 ha is ground water recharge worthy area. There are 9 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 84111.92 ham and ground water extraction for all uses is 50117.01 ham, making stage of ground water extraction 59.58% as a whole for the district. The highest stage of ground water extraction is 67.33% in REHRA BAZAR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 33402.8 ham in the district. 9 blocks are categorized in Safe.

13. BANDA

BANDA district is underlain by Alluvium of Quaternary age and Bundelkhand Granitic Terrain. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 440460 ha of geographical area, 440460 ha is ground water recharge worthy area. There are 8 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 66436.13 ham and ground water extraction for all uses is 43922.63 ham, making stage of ground water extraction 66.11% as a whole for the district. The highest stage of ground water extraction is 78.84% in TINDWARI block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 22219.16 ham in the district. 4 blocks are categorized in semi critical. 4 blocks are categorized in Safe.

14. BARABANKI

BARABANKI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 389132 ha of geographical area, 389132 ha is ground water recharge worthy area. There are 15 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 182764.73 ham and ground water extraction for all uses is 115376.4 ham, making stage of ground water extraction 63.13% as a whole for the district. The highest stage of ground water extraction is 68.79% in MASAULI block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 66686.18 ham in the district. 15 blocks are categorized in Safe.

15. BAREILLY

BAREILLY district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 412000 ha of geographical area, 412000 ha is ground water recharge worthy area. There are 16 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 113615.18 ham and ground water extraction for all uses is 81371.01 ham, making stage of ground water extraction 71.62% as a whole for the district. The highest stage of ground water extraction is 205.90% in BAREILLY CITY block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 33754.48ham in the district. 4 blocks are categorized in semi critical. 1 block of the district is categorized in over exploited. 11 blocks are categorized in Safe.

16. BASTI

BASTI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 293807 ha of geographical area, 293807 ha is ground water recharge worthy area. There are 14 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 75440.26 ham and ground water extraction for all uses is 49512.33 ham, making stage of ground water extraction 65.63% as a whole for the district. The highest stage of ground water extraction is

69.68% in RUDHAULI block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 25509.99 ham in the district. 14 blocks are categorized in Safe.

17. BIJNOR

BIJNOR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 458903 ha of geographical area, 458903 ha is ground water recharge worthy area. There are 11 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 133440.53 ham and ground water extraction for all uses is 95883.56 ham, making stage of ground water extraction 71.85% as a whole for the district. The highest stage of ground water extraction is 97.28% in JALEELPUR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 37108.59 ham in the district. 4 blocks are categorized in semi critical, 1in critical. 6 blocks are categorized in Safe.

18. BUDAUN

BUDAUN district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 423788 ha of geographical area, 423788 ha is ground water recharge worthy area. There are 15 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 76598.57 ham and ground water extraction for all uses is 63659.74 ham, making stage of ground water extraction 83.11% as a whole for the district. The highest stage of ground water extraction is 123.81% in ISLAMNAGAR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 14193.96 ham in the district. 6 blocks are categorized in semi critical, 2in critical. 2 blocks of the district are categorized in over exploited. 5 blocks are categorized in Safe.

19. BULANDSHAHAR

BULANDSHAHAR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on

block/urban area wise basis. Out of 360947 ha of geographical area, 360947 ha is ground water recharge worthy area. There are 16 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 145062.77 ham and ground water extraction for all uses is 138628.73 ham, making stage of ground water extraction 95.56% as a whole for the district. The highest stage of ground water extraction is 144.46% in BULANDSHAHAR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 14719.37 ham in the district. 5 blocks are categorized in semi critical, 4in critical. 6 blocks of the district are categorized in over exploited. 1 block are categorized in Safe.

20. CHANDAULI

CHANDAULI district is underlain by Alluvium of Quaternary age and Vindyan Sedimentary Rocks. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 188469 ha of geographical area, 188469 ha is ground water recharge worthy area. There are 9 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 50675.5 ham and ground water extraction for all uses is 27829.66 ham, making stage of ground water extraction 54.92% as a whole for the district. The highest stage of ground water extraction is 69.08% in CHAKIA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 22581.76 ham in the district. 9 blocks are categorized in Safe.

21. CHITRAKOOT

CHITRAKOOT district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 300665 ha of geographical area, 300665 ha is ground water recharge worthy area. There are 5 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 40229.68 ham and ground water extraction for all uses is 33117.87 ham, making stage of ground water extraction 82.32% as a whole for the district. The highest stage of ground water extraction is 98.62% in KARWI block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 6857.67 ham in the district. 3 blocks are categorized in semi critical, 1in critical. 0 block of the district are categorized in over exploited. 1 block are categorized in Safe.

22. DEORIA

DEORIA district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 253800 ha of geographical area, 253800 ha is ground water recharge worthy area and 0 ha is hilly area. There are 16 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 133615.26 ham and ground water extraction for all uses is 83280.31ham, making stage of ground water extraction 62.33% as a whole for the district. The highest stage of ground water extraction is 69.27% in BANKATA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 49994.07 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 16 blocks are categorized in Safe.

23. ETAH

ETAH district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 242757 ha of geographical area, 242757 ha is ground water recharge worthy area and 0 ha is hilly area. There are 8 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 75517.97 ham and ground water extraction for all uses is 55085.61 ham, making stage of ground water extraction 72.94% as a whole for the district. The highest stage of ground water extraction is 88.98% in JALESAR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 20199.11 ham in the district. 5 blocks are categorized in semi critical, 1in critical. 0 block of the district are categorized in over exploited. 3 blocks are categorized in Safe.

24. ETAWAH

ETAWAH district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 240301 ha of geographical area, 240301 ha is ground water recharge

worthy area and 0 ha is hilly area. There are 8 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 64610.1 ham and ground water extraction for all uses is 32618.39 ham, making stage of ground water extraction 50.48% as a whole for the district. The highest stage of ground water extraction is 65.63% in BARAHPURA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 31795.86 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 8 blocks are categorized in Safe.

25. FARRUKHABAD

FARRUKHABAD district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 220623 ha of geographical area, 220623 ha is ground water recharge worthy area and 0 ha is hilly area. There are 7 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 40182.52 ham and ground water extraction for all uses is 29782.09 ham, making stage of ground water extraction 74.12% as a whole for the district. The highest stage of ground water extraction is 86.09% in MOHAMADABAD block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 10130.14 ham in the district. 4 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 3 blocks are categorized in Safe.

26. FATEHPUR

FATEHPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 425255 ha of geographical area, 425255 ha is ground water recharge worthy area and 0 ha is hilly area. There are 13 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 103993.35 ham and ground water extraction for all uses is 75304.26 ham, making stage of ground water extraction 72.41% as a whole for the district. The highest stage of ground water extraction is 120.28% in BHITAURA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 30474.16 ham in the district. 5 blocks are categorized in semi

critical, 0in critical. 1 block of the district are categorized in over exploited. 7 blocks are categorized in Safe.

27. FIROZABAD

FIROZABAD district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 241953 ha of geographical area, 241953 ha is ground water recharge worthy area and 0 ha is hilly area. There are 9 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 72545.17 ham and ground water extraction for all uses is 75949.29 ham, making stage of ground water extraction 104.69% as a whole for the district. The highest stage of ground water extraction is 165.07% in FIROZABAD block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 9145.73ham in the district. 3 blocks are categorized in semi critical, 1in critical. 5 blocks of the district are categorized in over exploited. 0 block are categorized in Safe.

28. G.B.NAGAR

G.B.NAGAR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 144273 ha of geographical area, 144273 ha is ground water recharge worthy area and 0 ha is hilly area. There are 3 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 47178.39 ham and ground water extraction for all uses is 49440.49 ham, making stage of ground water extraction 104.79% as a whole for the district. The highest stage of ground water extraction is 141.41% in BISRAKH block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 2539.6 ham in the district. 1 block are categorized in semi critical, 1in critical. 1 block of the district are categorized in over exploited. 0 block are categorized in Safe.

29. GHAZIABAD

GHAZIABAD district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 116914 ha of geographical area, 116914 ha is ground water recharge worthy area and 0 ha is hilly area. There are 5 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 37507.76 ham and ground water extraction for all uses is 46191.34 ham, making stage of ground water extraction 123.15% as a whole for the district. The highest stage of ground water extraction is 230.31% in GHAZIABAD CITY block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 1685.94 ham in the district. 1 block are categorized in semi critical, 0in critical. 4 blocks of the district are categorized in over exploited. 0 block are categorized in Safe.

30. GHAZIPUR

GHAZIPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 330052 ha of geographical area, 330052 ha is ground water recharge worthy area and 0 ha is hilly area. There are 16 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 94932.14 ham and ground water extraction for all uses is 56181.55 ham, making stage of ground water extraction 59.18% as a whole for the district. The highest stage of ground water extraction is 80.53% in SAIDPUR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 38293.99 ham in the district. 1 block are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 15 blocks are categorized in Safe.

31. GONDA

GONDA district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 399609 ha of geographical area, 399609 ha is ground water recharge worthy area and 0 ha is hilly area. There are 16 number of assessment units in the district which fall

under command category. The Annual Extractable Ground Water Resources in the district is 110871.55 ham and ground water extraction for all uses is 66641.95 ham, making stage of ground water extraction 60.11% as a whole for the district. The highest stage of ground water extraction is 65.95% in BABHANJOT block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 42399.61ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 16 blocks are categorized in Safe.

32. GORAKHPUR

GORAKHPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 321087 ha of geographical area, 321087 ha is ground water recharge worthy area and 0 ha is hilly area. There are 20 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 155392.16 ham and ground water extraction for all uses is 98544.26 ham, making stage of ground water extraction 63.42% as a whole for the district. The highest stage of ground water extraction is 69.56% in CAMPIERGANJ block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 56262.05 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 20 blocks are categorized in Safe.

33. HAMIRPUR

HAMIRPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 381540 ha of geographical area, 381540 ha is ground water recharge worthy area and 0 ha is hilly area. There are 7 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 40753.89 ham and ground water extraction for all uses is 27742.5 ham, making stage of ground water extraction 68.07% as a whole for the district. The highest stage of ground water extraction is 69.15% in SARILA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 12937.05 ham in the district. 2 blocks are categorized in semi

critical, 0in critical. 0 block of the district are categorized in over exploited. 4 blocks are categorized in Safe.

34. HAPUR

HAPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 114481 ha of geographical area, 114481 ha is ground water recharge worthy area and 0 ha is hilly area. There are 4 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 45956.32 ham and ground water extraction for all uses is 45035.34 ham, making stage of ground water extraction 98% as a whole for the district. The highest stage of ground water extraction is 104.39% in GARH block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 1638.42 ham in the district. 1 block are categorized in semi critical, 2in critical. 1 block of the district are categorized in over exploited. 0 block are categorized in Safe.

35. HARDOI

HARDOI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 594843 ha of geographical area, 594843 ha is ground water recharge worthy area and 0 ha is hilly area. There are 19 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 158311.7 ham and ground water extraction for all uses is 98141.86 ham, making stage of ground water extraction 61.99% as a whole for the district. The highest stage of ground water extraction is 68.58% in BAWAN block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 59600.66 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 19 blocks are categorized in Safe.

36. HATHRAS

HATHRAS district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban

area wise basis. Out of 183799 ha of geographical area, 183799 ha is ground water recharge worthy area and 0 ha is hilly area. There are 7 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 65260.5 ham and ground water extraction for all uses is 61232.5 ham, making stage of ground water extraction 93.83% as a whole for the district. The highest stage of ground water extraction is 134.38% in SASNI block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 8780.51 ham in the district. 2 blocks are categorized in semi critical, 1in critical. 3 blocks of the district are categorized in over exploited. 1 block are categorized in Safe.

37. JALAUN

JALAUN district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 456583 ha of geographical area, 456583 ha is ground water recharge worthy area and 0 ha is hilly area. There are 9 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 94186.89 ham and ground water extraction for all uses is 51958.68 ham, making stage of ground water extraction 55.17% as a whole for the district. The highest stage of ground water extraction is 66.50% in KONCH block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 42035.01 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 9 blocks are categorized in Safe.

38. JAUNPUR

JAUNPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 399094 ha of geographical area, 399094 ha is ground water recharge worthy area and 0 ha is hilly area. There are 21 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 117823.41 ham and ground water extraction for all uses is 84022.71 ham, making stage of ground water extraction 71.31% as a whole for the district. The highest stage

of ground water extraction is 96.32% in BADLAPUR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 32800.07 ham in the district. 7 blocks are categorized in semi critical, 2in critical. 0 block of the district are categorized in over exploited. 12 blocks are categorized in Safe.

39. JHANSI

JHANSI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 502400 ha of geographical area, 461937 ha is ground water recharge worthy area and 40463.00 ha is hilly area. There are 8 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 64657.67 ham and ground water extraction for all uses is 43671.07 ham, making stage of ground water extraction 67.54% as a whole for the district. The highest stage of ground water extraction is 87.33% in BABINA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 20736.74 ham in the district. 4 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 4 blocks are categorized in Safe.

40. KANNAUJ

KANNAUJ district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 214346 ha of geographical area, 214346 ha is ground water recharge worthy area and 0 ha is hilly area. There are 8 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 54846.39 ham and ground water extraction for all uses is 41200.25 ham, making stage of ground water extraction 75.12% as a whole for the district. The highest stage of ground water extraction is 216.66% in JALALABAD block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 18773.43 ham in the district. 2 blocks are categorized in semi critical, 1in critical. 2block of the district are categorized in over exploited. 3 blocks are categorized in Safe.

41. KANPUR DEHAT

KANPUR DEHAT district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 323737 ha of geographical area, 323737 ha is ground water recharge worthy area and 0 ha is hilly area. There are 10 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 73212.43 ham and ground water extraction for all uses is 54263.34 ham, making stage of ground water extraction 74.12 % as a whole for the district. The highest stage of ground water extraction is 85.49% in RASULABAD block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 18795.8 ham in the district. 7 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 3 blocks are categorized in Safe.

42. KANPUR NAGAR

KANPUR NAGAR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 309483 ha of geographical area, 309483 ha is ground water recharge worthy area and 0 ha is hilly area. There are 11 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 79791.44 ham and ground water extraction for all uses is 62366.66 ham, making stage of ground water extraction 78.16% as a whole for the district. The highest stage of ground water extraction is 97.06% in CHAUBEPUR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 17132.27ham in the district. 6 blocks are categorized in semi critical, 2in critical. 0 block of the district are categorized in over exploited. 3 blocks are categorized in Safe.

43. KASGANJ

KASGANJ district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 199388 ha of geographical area, 199388 ha is ground water recharge worthy area and 0 ha is hilly area. There are 7 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 69041.55 ham and ground water extraction for all uses is 46706.23 ham,

making stage of ground water extraction 67.65% as a whole for the district. The highest stage of ground water extraction is 85.96% in KASGANJ block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 22010.37 ham in the district. 3 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 4 blocks are categorized in Safe.

44. KAUSHAMBI

KAUSHAMBI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 178001 ha of geographical area, 178001 ha is ground water recharge worthy area and 0 ha is hilly area. There are 8 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 44741.51 ham and ground water extraction for all uses is 36565.42 ham, making stage of ground water extraction 81.73% as a whole for the district. The highest stage of ground water extraction is 147.53% in CHAIL block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 9145.56 ham in the district. 4 blocks are categorized in semi critical, 0in critical. 2 blocks of the district are categorized in over exploited. 2 blocks are categorized in Safe.

45. KUSHI NAGAR

KUSHI NAGAR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 287378 ha of geographical area, 287378 ha is ground water recharge worthy area and 0 ha is hilly area. There are 14 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 155094.06 ham and ground water extraction for all uses is 79377.32 ham, making stage of ground water extraction 51.18% as a whole for the district. The highest stage of ground water extraction is 61.71% in MOTICHAK block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 74951.72 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 14 blocks are categorized in Safe.

46. LAKHIMPUR KHERI

LAKHIMPUR KHERI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 655505 ha of geographical area, 655505 ha is ground water recharge worthy area and 0 ha is hilly area. There are 15 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 210029.82 ham and ground water extraction for all uses is 127682.08 ham, making stage of ground water extraction 60.79% as a whole for the district. The highest stage of ground water extraction is 64.97% in BIJUA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 80798.32 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 15 blocks are categorized in Safe.

47. LALITPUR

LALITPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 503923 ha of geographical area, 381942 ha is ground water recharge worthy area and 121981 ha is hilly area. There are 6 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 36767.24 ham and ground water extraction for all uses is 31120.85 ham, making stage of ground water extraction 84.64% as a whole for the district. The highest stage of ground water extraction is 86 % in BIRDHA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 5326.53 ham in the district. 6 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 0 block are categorized in Safe.

48. LUCKNOW

LUCKNOW district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 245286 ha of geographical area, 245286 ha is ground water recharge worthy area and 0 ha is hilly area. There are 9 number of assessment units in the district

which fall under command category. The Annual Extractable Ground Water Resources in the district is 73489.54 ham and ground water extraction for all uses is 48460.16 ham, making stage of ground water extraction 65.94% as a whole for the district. The highest stage of ground water extraction is 104.63% in LUCKNOW CITY block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 24854.34 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 1 block of the district are categorized in over exploited. 8 blocks are categorized in Safe.

49. MAHOBA

MAHOBA district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 229341 ha of geographical area, 229341 ha is ground water recharge worthy area and 0 ha is hilly area. There are 4 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 27957.54 ham and ground water extraction for all uses is 25566.08 ham, making stage of ground water extraction 91.45% as a whole for the district. The highest stage of ground water extraction is 109.14% in PANWARI block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 3346.56 ham in the district. 2 blocks are categorized in semi critical, 0in critical. 2 blocks of the district are categorized in over exploited. 0 block are categorized in Safe.

50. MAHRAJGANJ

MAHRAJGANJ district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-223 on block/urban area wise basis. Out of 247760 ha of geographical area, 247760 ha is ground water recharge worthy area and 0 ha is hilly area. There are 12 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 102253.75 ham and ground water extraction for all uses is 63941.51 ham, making stage of ground water extraction 62.53% as a whole for the district. The highest stage of ground water extraction is 66.91% in BRIJMANGANJ block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 37716.19 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 12 blocks are categorized in Safe.

51. MAINPURI

MAINPURI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 276072 ha of geographical area, 276072 ha is ground water recharge worthy area and 0 ha is hilly area. There are 9 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 83932.93 ham and ground water extraction for all uses is 60395.61 ham, making stage of ground water extraction 71.96% as a whole for the district. The highest stage of ground water extraction is 136.99% in BARNAHAL block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 24930.57 ham in the district. 2 blocks are categorized in semi critical, 0in critical. 1 block of the district are categorized in over exploited. 6 blocks are categorized in Safe.

52. MATHURA

MATHURA district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 336078 ha of geographical area, 336078 ha is ground water recharge worthy area and 0 ha is hilly area. There are 10 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 126759.68 ham and ground water extraction for all uses is 90529.17 ham, making stage of ground water extraction 71.42% as a whole for the district. The highest stage of ground water extraction is 109.56% in RAYA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 37103.44 ham in the district. 0 blocks are categorized in semi critical, 2in critical. 1 block of the district are categorized in over exploited. 7 blocks are categorized in Safe.

53. MAUNATH BHANJAN

MAUNATH BHANJAN district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 171624 ha of geographical area, 171624 ha is ground water recharge worthy area and 0 ha is hilly area. There are 9 number of assessment units in

the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 46629.92 ham and ground water extraction for all uses is 30131.23 ham, making stage of ground water extraction 64.62% as a whole for the district. The highest stage of ground water extraction is 69.95% in PARDAHA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 15844.54 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 9 blocks are categorized in Safe.

54. MEERUT

MEERUT district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 281049 ha of geographical area, 281049 ha is ground water recharge worthy area and 0 ha is hilly area. There are 13 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 75403.27 ham and ground water extraction for all uses is 58262.16 ham, making stage of ground water extraction 77.27% as a whole for the district. The highest stage of ground water extraction is 229.75% in MEERUT CITY block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 19195.23 ham in the district. 6 blocks are categorized in semi critical, 2in critical. 1 block of the district are categorized in over exploited. 4 blocks are categorized in Safe.

55. MIRZAPUR

MIRZAPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 452085 ha of geographical area, 295437 ha is ground water recharge worthy area and 156648 ha is hilly area. There are 12 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 55779.75 ham and ground water extraction for all uses is 34975.63 ham, making stage of ground water extraction 62.7% as a whole for the district. The highest stage of ground water extraction is 101.96% in KON block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 20331.2ham in the district. 3 blocks are categorized in semi critical, 1in critical. 1 block of the district are categorized in over exploited. 7 blocks are categorized in Safe.

56. MORADABAD

MORADABAD district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 224944 ha of geographical area, 224944 ha is ground water recharge worthy area and 0 ha is hilly area. There are 9 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 60300.33 ham and ground water extraction for all uses is 53451.47 ham, making stage of ground water extraction 88.64% as a whole for the district. The highest stage of ground water extraction is 313.83% in MORADABAD City block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 10027.51 ham in the district. 6 blocks are categorized in semi critical, 1in critical. 1 block of the district are categorized in over exploited. 1 block are categorized in Safe.

57. MUZAFFARNAGAR

MUZAFFARNAGAR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 275666 ha of geographical area, 275666 ha is ground water recharge worthy area and 0 ha is hilly area. There are 9 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 104200.78 ham and ground water extraction for all uses is 79478.72 ham, making stage of ground water extraction 76.27% as a whole for the district. The highest stage of ground water extraction is 107.86% in BHAGHARA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 25321.28ham in the district. 2 blocks are categorized in semi critical, 2in critical. 1 block of the district are categorized in over exploited. 4 blocks are categorized in Safe.

58. PILIBHIT

PILIBHIT district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 336959 ha of geographical area, 336959 ha is ground water recharge worthy area and 0 ha is hilly area. There are 7 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in

the district is 103694.88 ham and ground water extraction for all uses is 67176.62 ham, making stage of ground water extraction 64.78% as a whole for the district. The highest stage of ground water extraction is 69.29% in LALAURIKHERA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 36161.28 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 7 blocks are categorized in Safe.

59. PRATAPGARH

PRATAPGARH district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 371743 ha of geographical area, 371743 ha is ground water recharge worthy area and 0 ha is hilly area. There are 17 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 126422.19 ham and ground water extraction for all uses is 99400.89 ham, making stage of ground water extraction 78.63% as a whole for the district. The highest stage of ground water extraction is 99.72% in MANDHATA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 26560.49 ham in the district. 9 blocks are categorized in semi critical, 4in critical. 0 block of the district are categorized in over exploited. 4 blocks are categorized in Safe.

60. PRAYAGRAJ

PRAYAGRAJ district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 547000 ha of geographical area, 499630 ha is ground water recharge worthy area and 47370 ha is hilly area. There are 24 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 128421.53 ham and ground water extraction for all uses is 94098.54 ham, making stage of ground water extraction 73.27% as a whole for the district. The highest stage of ground water extraction is 181.97% in PRAYAGRAJ CITY block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 35328.78 ham in the district. 8 blocks are

categorized in semi critical, 2in critical. 1 block of the district are categorized in over exploited. 13 blocks are categorized in Safe.

61. RAIBARELI

RAIBARELI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 392458 ha of geographical area, 392458 ha is ground water recharge worthy area and 0 ha is hilly area. There are 18 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 111825.44 ham and ground water extraction for all uses is 65654.17 ham, making stage of ground water extraction 58.71% as a whole for the district. The highest stage of ground water extraction is 67.88% in SHIVGARH block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 45599.66 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 18 blocks are categorized in Safe.

62. RAMPUR

RAMPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 229790 ha of geographical area, 229790 ha is ground water recharge worthy area and 0 ha is hilly area. There are 6 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 70336.2 ham and ground water extraction for all uses is 52507.57 ham, making stage of ground water extraction 74.65% as a whole for the district. The highest stage of ground water extraction is 87.96% in SAUR block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 17442.69 ham in the district. 5 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 1 block are categorized in Safe.

63. SAHARANPUR

SAHARANPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 368941 ha of geographical area, 368941 ha is ground water recharge worthy area and 0 ha is hilly area. There are 11 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 131272.1 ham and ground water extraction for all uses is 132084.43 ham, making stage of ground water extraction 100.32% as a whole for the district. The highest stage of ground water extraction is 152.35% in GANGOH block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 15869.83 ham in the district. 6 blocks are categorized in semi critical, 0in critical. 4 blocks of the district are categorized in over exploited. 1 block are categorized in Safe.

64. SAMBHAL

SAMBHAL district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 241520 ha of geographical area, 241520 ha is ground water recharge worthy area and 0 ha is hilly area. There are 8 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 43267.12 ham and ground water extraction for all uses is 37762.49 ham, making stage of ground water extraction 87.28% as a whole for the district. The highest stage of ground water extraction is 99.24% in PAWANSA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 5052.96 ham in the district. 3 blocks are categorized in semi critical, 4in critical. 0 block of the district are categorized in over exploited. 1 block are categorized in Safe.

65. SANT KABIR NAGAR

SANT KABIR NAGAR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 164699 ha of geographical area, 164699 ha is ground water recharge worthy area and 0 ha is hilly area. There are 9 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water

Resources in the district is 49080.41ham and ground water extraction for all uses is 31038.17 ham, making stage of ground water extraction 63.24% as a whole for the district. The highest stage of ground water extraction is 69.28% in BAGHAULI block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 17733.27 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 9 blocks are categorized in Safe.

66. SANT RAVIDAS NAGAR

SANT RAVIDAS NAGAR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23 on block/urban area wise basis. Out of 101500 ha of geographical area, 98305 ha is ground water recharge worthy area and 3195 ha is hilly area. There are 6 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 77669.22 ham and ground water extraction for all uses is 61975.68 ham, making stage of ground water extraction 79.79% as a whole for the district. The highest stage of ground water extraction is 88.31% in ABHAULI block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 15523.46 ham in the district. 6 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 0 block are categorized in Safe.

67. SHAHJAHANPUR

SHAHJAHANPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 458131 ha of geographical area, 458131 ha is ground water recharge worthy area and 0 ha is hilly area. There are 15 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 124014.96 ham and ground water extraction for all uses is 79439.81 ham, making stage of ground water extraction 64.06 % as a whole for the district. The highest stage of ground water extraction is 69.89% in KALAN block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 43778.9 ham in the district. 0 blocks are

categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 15 blocks are categorized in Safe.

68. SHAMLI

SHAMLI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 136126 ha of geographical area, 136126 ha is ground water recharge worthy area and 0 ha is hilly area. There are 5 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 43035.33 ham and ground water extraction for all uses is 44531.93 ham, making stage of ground water extraction 103.48% as a whole for the district. The highest stage of ground water extraction is 125.72% in SHAMLI block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 1000.2 ham in the district. 1 block are categorized in semi critical, 2in critical. 2 blocks of the district are categorized in over exploited. 0 block are categorized in Safe.

69. SHRAWASTI

SHRAWASTI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 185782 ha of geographical area, 185782 ha is ground water recharge worthy area and 0 ha is hilly area. There are 5 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 51519.23 ham and ground water extraction for all uses is 29440.62 ham, making stage of ground water extraction 57.14% as a whole for the district. The highest stage of ground water extraction is 62.72% in JAMUNAHA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 21683.2 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 5 blocks are categorized in Safe.

70. SIDDHARTH NAGAR

SIDDHARTH NAGAR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23,

on block/urban area wise basis. Out of 289503 ha of geographical area, 289503 ha is ground water recharge worthy area and 0 ha is hilly area. There are 14 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 86876.56 ham and ground water extraction for all uses is 55003.3 ham, making stage of ground water extraction 63.31% as a whole for the district. The highest stage of ground water extraction is 69.18% in ITWA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 31160.72 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 14 blocks are categorized in Safe.

71. SITAPUR

SITAPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 574695 ha of geographical area, 574695 ha is ground water recharge worthy area and 0 ha is hilly area. There are 19 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 182194.17 ham and ground water extraction for all uses is 109392.3 ham, making stage of ground water extraction 60.04% as a whole for the district. The highest stage of ground water extraction is 69.53% in KHAIRABAD block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 71805.87ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 19 blocks are categorized in Safe.

72. SONBHADRA

SONBHADRA district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 680957.52 ha of geographical area, 241458.89 ha is ground water recharge worthy area and 439498.63 ha is hilly area. There are 10 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 51851.11 ham and ground water extraction for all uses is 26394.62 ham, making stage of ground water extraction 50.9% as a whole for the district. The highest stage of ground water extraction is 76.68% in DUDHI block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 25040.7ham in the district. 1 block are

categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 9 blocks are categorized in Safe.

73. SULTANPUR

SULTANPUR district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 265381 ha of geographical area, 265381 ha is ground water recharge worthy area and 0 ha is hilly area. There are 14 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 84840.14 ham and ground water extraction for all uses is 52318.77 ham, making stage of ground water extraction 61.67% as a whole for the district. The highest stage of ground water extraction is 68.24% in LAMBHUA block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 32130.79 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 14 blocks are categorized in Safe.

74. UNNAO

UNNAO district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 460234 ha of geographical area, 460234 ha is ground water recharge worthy area and 0 ha is hilly area. There are 16 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 156256.41ham and ground water extraction for all uses is 95796.34 ham, making stage of ground water extraction 61.31% as a whole for the district. The highest stage of ground water extraction is 69.70% in HASANGANJ block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 59711.23 ham in the district. 0 blocks are categorized in semi critical, 0in critical. 0 block of the district are categorized in over exploited. 16 blocks are categorized in Safe.

75. VARANASI

VARANASI district is underlain by Alluvium of Quaternary age. Dynamic Ground water resources of the district have been estimated for base year-2022-23, on block/urban area wise basis. Out of 160532 ha of geographical area, 160532 ha is ground water recharge worthy area and 0 ha is hilly area. There are 9 number of assessment units in the district which fall under command category. The Annual Extractable Ground Water Resources in the district is 47967.11 ham and ground water extraction for all uses is 42107.54 ham, making stage of ground water extraction 87.78% as a whole for the district. The highest stage of ground water extraction is 223.23% in VARANASI City block. After allocation of Ground Water Resource for domestic utilization for projected year 2025, the Net Annual Ground Water Availability for future use is 8968.05 ham in the district. 3 blocks are categorized in semi critical, 1in critical. 3 block of the district are categorized in over exploited. 2 block are categorized in Safe.

Annexures

Annexure I: Formation of Permanent State Level Committee for GWRE-2023

File No.76-3099/15/2022-3- 49

I/327006/2023

उत्तर प्रदेश शासन

नमामि गंगे तथा ग्रामीण जलापूर्ति अनुभाग-3,

संख्याः-103/76-3-2023-04 आर/2009

लखनऊः दिनांकः 05.6. 2023

कार्यालय-ज्ञाप

उत्तर प्रदेश में वार्षिक रिप्लेनिशेबिल भूजल संसाधन (Annual Replinishable Ground Water Resource) का आंकलन भूगर्भ संसाधन आंकलन समिति-2015 (GEC-2015) द्वारा निर्धारित प्रक्रिया के अनुसार 31 मार्च, 2020 के आंकड़ों के आधार पर किया गया है। इसके दृष्टिगत जल शक्ति मंत्रालय, भारत सरकार के निर्देशानुसार भूजल संसाधनों के आंकलन किये जाने हेतु स्थायी समिति गठित किये जाने के निर्देश दिये गये है।

2- उक्त के क्रम में प्रदेश में भूजल संसाधन आंकलन रिपोर्ट केन्द्रीय भूजल बोर्ड तथा उ0प्र0 भूगर्भ जल विभाग द्वारा संयुक्त रूप से समयबद्ध ढंग से तैयार किये जाने, सम्बन्धित कार्य/गतिविधि का नियमित अनुश्रवण करने तथा उसके अनुमोदन हेतु **"राज्य स्तरीय भूजल आंकलन स्थायी समिति"** का गठन निम्नानुसार किया जाता है:-

(1) प्रमुख सचिव, नमामि गंगे तथा ग्रामीण जलापूर्ति, उ0प्र0 शासन	अध्यक्ष
(2) आयुक्त/अपर आयुक्त मनरेगा, उत्तर प्रदेश	सदस्य
(3) प्रमुख अभियन्ता, सिंचाई एवं जल संसाधन विभाग, उत्तर प्रदेश शासन	सदस्य
(4) निदेशक, कृषि विभाग, उत्तर प्रदेश	सदस्य
(5) मुख्य अभियन्ता, लघु सिंचाई विभाग, उत्तर प्रदेश	सदस्य
(6) सदस्य सचिव, प्रदूषण नियंत्रण बोर्ड, उ0प्र0	सदस्य
(7) निदेशक, भूगर्भ जल विभाग, उ0प्र0	सदस्य
(8) निदेशक, उद्यान विभाग, उ0प्र0	सदस्य

3- उक्त समिति के सदस्य सचिव, क्षेत्रीय निदेशक, केन्द्रीय भूजल परिषद, उत्तरी क्षेत्र, लखनऊ होंगे।

4- उक्त समिति के मुख्य कार्य एवं उत्तरदायित्व निम्नानुसार होंगें:-

(1) (GEC-2015) के अनुसार भूजल संसाधनों की गणना/आंकलन की मेथडोलाजी (Ground Water Estimation Methodology) के अनुसार प्रदेश में वार्षिक रिप्लेनिशेबिल भूजल संसाधन का आंकलन सुनिश्चित कराया जाना।

(2) भूजल आंकलन के प्रणाली विज्ञान (Methodology) में चिन्हित आवश्यक आंकड़ों/सूचनाओं को समयबद्ध ढंग से उपलब्ध कराये जाने की व्यवस्था सम्बन्धित विभागों के स्तर पर सुनिश्चित कराया जाना एवं आवश्यक दिशा-निर्देश निर्गत कराया जाना।

(3) उक्त आंकलन हेतु भूगर्भ जल विभाग, निदेशालय स्तर पर एक "भूजल प्रकोष्ठ" का गठन किया जायेगा जो इसके लिए तकनीकी सहयोग प्रदान करेगा। इस भूजल प्रकोष्ठ में दो अधिकारी भूगर्भ जल विभाग, उ0प्र0 एवं दो अधिकारी क्षेत्रीय निदेशक, केन्द्रीय भूजल परिषद, उ0क्षे0, लखनऊ के द्वारा नामित समर्पित अधिकारी होगे, जो इस आंकलन का नियमित अनुश्रवण एवं मार्ग-निर्देशन प्रदान करेंगे।

(4) समिति द्वारा उक्त आंकलन हेतु भारत सरकार द्वारा समय-समय पर परिचालित प्रक्रिया के अनुसार कार्यवाही सुनिश्चित करायी जायेगी।

दुर्गा शंकर मिश्र
मुख्य सचिव।

2023 G.O. 113

File No.76-3099/15/2022-3- 50

I/327006/2023

संख्या:-103(1)76-3-2023/तद्दिनांक।

प्रतिलिपि निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित है:-

1. समिति के समस्त सदस्यगण।
2. अपर मुख्य सचिव/प्रमुख सचिव/सचिव,
   सिंचाई एवं जल संसाधन/कृषि/नगर विकास/विज्ञान एवं प्रौद्योगिकी/पर्यावरण/आवास एवं शहरी नियोजन/ औद्योगिक विकास/उद्यान /ग्राम्य विकास विभाग, उ0प्र0 शासन।
3. स्टाफ आफिसर, मुख्य सचिव, उ0प्र0 शासन।
4. स्टाफ आफिसर, कृषि उत्पादन आयुक्त, उ0प्र0 शासन।
5. संयुक्त सचिव, जल शक्ति मंत्रालय, भारत सरकार, श्रमशक्ति भवन, रफी मार्ग, नई दिल्ली।
6. अध्यक्ष, केन्द्रीय भूजल बोर्ड, फरीदाबाद।
7. क्षेत्रीय निदेशक, केन्द्रीय भूजल परिषद, उत्तरी क्षेत्र, लखनऊ।
8. गार्ड फाइल।

आज्ञा से

Signed by अनुराग
श्रीवास्तव
Date: 02-05-2023 15:04:30
Reason: Approved

(अनुराग श्रीवास्तव)
प्रमुख सचिव

2023 G.O. 114

Annexure II: Minutes of the 1st SLC Meeting

भारतसरकार
जलशक्तिमंत्रालय
केंद्रीयभूमिजलबोर्ड,उत्तरीक्षेत्र
भूजलभवन
सैक्टर-बी,सीतापुररोडयोजना,अलीगंज
लखनऊ– 226021
दूरभाष: (0522)-2363812
ई मेल: rdnr-cgwb@nic.in

GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
CENTRAL GROUND WATER BOARD,NORTHERN REGION
BHUJAL BHAWAN
SECTOR-B,SITAPUR ROAD YOJANA, ALIGANJ
LUCKNOW-226 021
PHONE : (0522)-2363812
e-mail : rdnr-cgwb@nic.in

आज़ादी का अमृत महोत्सव

No. 4(227)/CGWB/NR/S&I/2023 | 205 (A)
Dated: 19 APR 2023

To,

The Director
Uttar Pradesh Ground Water Department
Rajya Bhujal Suchna Pranali Kendra (Bhujal Bhawan)
Hariharpur Vill., Near DPS
Shahid Path, Lucknow-226002

Sub: Minutes of the Meeting between the Regional Director, CGWB, NR, Lucknow and the Director, UPGWD on 06.04.2023

Sir,

With reference to the above subject, the minutes of the meeting between the Regional Director, CGWB, NR, Lucknow and the Director, UPGWD along with the officers of CGWB and UPGWD was held on 06.04.2023 in the chamber of Director, UPGWD, Indira Bhawan, Lucknow on various issues is attached.

According to the directive of CGWB, CHQ, this meeting can be considered as both the 1st meeting of the Ground Water Resource Assessment Cell and the 1st SLC meeting.

Yours faithfully

Enclosure: As above.

(*S.G. Bhartariya*)
Regional Director

Copy for information:

1. TS to The Member (CGWA), 8/11 Jamnagar House, Mansingh Rd, New Delhi-110011.
2. TS to The Member(South), CGWB, CHQ, NH-IV, Faridabad-121001, Haryana
3. Sh S.K. Swaroop, Scientist-C & TS to The Regional Director, CGWB, NR, Lucknow.
4. Sh Sujatro Ray Chowdhuri, Scientist-B, CGWB, NR, Lucknow.

Minutes of the Meeting between the Regional Director, CGWB, NR, Lucknow, the Director, UPGWD and 1st meeting of GW Resource Assessment Cell on 06.04.2023

A meeting between the Director, UPGWD, Govt of Uttar Pradesh and Regional Director, CGWB, NR, Govt. of India along with other officers of CGWB and UPGWD was held on 06.04.2023 in the Chamber of Director, UPGWD, Indira Bhawan, Lucknow on various issues and following decisions were taken during the meeting.

1. Regional Director, CGWB has conveyed the Minutes of the Meeting between CGWB and JS, MoJS (23.03.2023) and urged Director, UPGWD to pursue the subject with the State Govt. about the formation of a permanent SLC for GWRE, or to form an SLC for GWRE-2023, whichever is more convenient.
   The Director of UPGWD confirmed that the matter is in advanced stage with Principal Secretary Office.
2. The GW Resource Estimation cell has agreed that Basic Data for GWRE-2023 shall be gathered and compiled by April 2023. UPGWD will begin collecting data from other State Government agencies. CGWB will provide a data collection format by April 17, 2023.
3. Both the departments have agreed to convene the 1st State Level Meeting for GWRE-2023 in physical mode on April 30, 2023.
4. The Director, UPGWD informed CGWB that the State Government is in the process of forming an SLNA (Minor Irrigation department) to implement the Master Plan, and UPGWD will give an update on the status of the Check Dam and Ponds. The order will be issued by the office of Principal Secretary.
5. The RD, NR requested The Director, UPGWD for defunct UPGWD wells that may be monitored by CGWB. The Director of UPGWD has confirmed that no such defunct wells exist under UPGWD's control. He also assured CGWB of official communication in this regards.
6. In compliance with the directive of the Principal Secretary, Namami Gange and Rural Water Supply, Government of Uttar Pradesh, CGWB has shared the NAQUIM reports of 30 districts with the District Administration. The Regional Director, CGWB requested the Director of UPGWD for convening the 5th SGWCC to share NAQUIM reports at the state level. Director informed that the 5th SGWCC can be held only after local bodies election i.e. after 13th May 2023.

The meeting ended with thanks to everyone.

(S.G.Bhartariya)
Regional Director

List of Participants

1. Sh. V. K. Upadhyay, Director, UPGWD.
2. Sh Sanjay Gopal Bhartariya, Regional Director, CGWB, NR, Lucknow.
3. ShRavikant Singh, Senior Hydrogeologist, UPGWD.
4. ShKaram Singh, Scientist-C, CGWB, NR, Lucknow.
5. Sh Sujatro Ray Chowdhuri, Scientist-C, CGWB, NR, Lucknow.

File No.76-3099/15/2022-3- 57

I/377877/2023

बैठक दिनांक 13-09-2023 मध्याह्न 12:00 बजे

संख्या-810/76-3-2023/04 आर/2009

प्रेषक,

महेन्द्र कुमार त्रिपाठी,
उप सचिव,
उत्तर प्रदेश शासन ।

सेवा में,

क्षेत्रीय निदेशक,
केन्द्रीय भूमि जल बोर्ड, उ0क्षे0,
लखनऊ।

नमामि गंगे तथा ग्रामीण जलापूर्ति अनुभाग-3, लखनऊ दिनांक: 29 अगस्त, 2023

विषय- "उत्तर प्रदेश के गतिशील भूजल संसाधन मूल्यांकन, 2023" के अनुमोदन हेतु राज्य स्तरीय बैठक के आयोजन के संबंध में।

महोदय,

कृपया उपर्युक्त विषयक आपके पत्र संख्या-4(211-Resource)/CGWB/NR/S&I/2023/430, दिनांक 21 अगस्त, 2023 द्वारा किये गये अनुरोध के क्रम में प्रमुख सचिव महोदय/अध्यक्ष, राज्य स्तरीय समिति द्वारा भूजल संसाधन आंकलन, 2023 के अनुमोदन के सम्बन्ध में बैठक हेतु दिनांक 13-09-2023 को मध्याह्न 12:00 बजे का समय प्रदान किया गया है।

2- अतएव इस संबंध में मुझे यह कहने का निदेश हुआ है कि उक्त बैठक हेतु अपेक्षित आवश्यक कार्यवाही करने का कष्ट करें।

भवदीय,

Signed by महेन्द्र कुमार त्रिपाठी 3
Date: 29-08-2023 16:47:14
Reason: Approved

(महेन्द्र कुमार त्रिपाठी)
उप सचिव।

संख्या-810(1)/76-3-2023/तद्दिनांक।

प्रतिलिपि निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित:-

1- निजी सचिव, प्रमुख सचिव/विशेष सचिव, नमामि गंगे तथा ग्रामीण जलापूर्ति विभाग, उ0प्र0 शासन।
2- निदेशक, भूगर्भ जल विभाग, उ0प्र0 लखनऊ।

आज्ञा से,

(महेन्द्र कुमार त्रिपाठी)
उप सचिव।

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भारत सरकार
जल शक्ति मंत्रालय
केन्द्रीय भूमि जल बोर्ड
उत्तरी क्षेत्र, भूजल भवन
सेक्टर-बी, सीतापुर रोड योजना
अलीगंज, लखनऊ-226021
दूरभाष : (0522)-2363812
ई-मेल : rdnr-cgwb@nic.in

GOVERNMENT OF INIDA
MINISTRY OF JAL SHAKTI
CENTRAL GROUND WATER BOARD
NORTHERN REGION, BHUJAL BHAWAN
SECTOR-B, SITAPUR ROAD YOJANA
ALIGANJ, LUCKNOW-226021
PHONE : (0522)-2363812
EMAIL : rdnr-cgwb@nic.in

आज़ादी का अमृत महोत्सव

पत्र स. 4(211)/के.भू.ज.बो./उ.क्षे./एस&आई/2022-968
दिनांक: 14.09.2023 14 SEP 2023

सेवा में,

1. निजी सचिव (प्रमुख सचिव) नमामि गंगे एवं ग्रामीण जलापूर्ति विभाग, उत्तर प्रदेश, लखनऊ
2. आयुक्त/अपर आयुक्त मनरेगा, उत्तर प्रदेश
3. प्रमुख अभियंता, सिंचाई एवं जल संसाधन विभाग,उत्तर प्रदेश, लखनऊ
4. निदेशक, कृषि विभाग, उत्तर प्रदेश, लखनऊ
5. मुख्य अभियंता, लघु सिंचाई विभाग, उत्तर प्रदेश, लखनऊ
6. सदस्य सचिव, उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड, लखनऊ
7. निदेशक, भूगर्भ जल विभाग, उत्तर प्रदेश
8. निदेशक, उद्यान विभाग, उत्तर प्रदेश

विषय: 13 सितंबर 2023 को आयोजित उत्तर प्रदेश के गतिशील भूजल संसाधन मार्च 2023 के अनुमोदन हेतु राज्य स्तरीय स्थायी समिति (PSLC) की बैठक का कार्यवृत।

संदर्भ: नमामि गंगे तथा ग्रामीण जलापूर्ति अनुभाग-3 के कार्यालय ज्ञाप संख्या 103/76-3-2023-04 आर/ 2009 दिनांक 05 .06 .2023 द्वारा गठित राज्य स्तरीय स्थायी समिति (Permanent State Level Committee).

महोदय,

उपरोक्त पत्रांक के संबंध में प्रमुख सचिव महोदय, नमामि गंगे तथा ग्रामीण जलापूर्ति अनुभाग की अध्यक्षता में दिनांक 13.09.2023 को गतिशील भूजल संसाधन मार्च 2023 (Dynamic Ground Water Resource of Uttar Pradesh as on March 2023) के अनुमोदन हेतु राज्य स्तरीय स्थायी समिति (PSLC) की बैठक का कार्यवृत विनम्र सूचनार्थ हेतु प्रेषित किया जा रहा है।

संलग्नक: राज्य स्तरीय स्थायी समिति (PSLC) के बैठक की कार्यवृत

भवदीय
संजय 14.9.23.
(एस.जी. भरतरिया)
क्षेत्रीय निदेशक एवं सदस्य सचिव

प्रतिलिपि:

1. सदस्य (दक्षिण), केन्द्रीय भूमि जल बोर्ड, भूजल भवन एन एच-4, फरीदाबाद-121001
2. सदस्य (CHQ), केन्द्रीय भूमि जल बोर्ड, भूजल भवन एन एच-4, फरीदाबाद-121001
3. अध्यक्ष के तकनीकी सचिव, केन्द्रीय भूमि जल बोर्ड, भूजल भवन एन एच-4, फरीदाबाद-121001
4. क्षेत्रीय निदेशक के तकनीकी सचिव, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ
5. श्री एबादुर रहमान, वैज्ञानक-सी, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ

राज्य स्तरीय स्थायी समिति की बैठक का कार्यवृत्त

विषय: 13 सितंबर 2023 को आयोजित उत्तर प्रदेश के गतिशील भूजल संसाधन मार्च 2023 के अनुमोदन हेतु राज्य स्तरीय स्थायी समिति (PSLC) की बैठक का कार्यवृत्त।

संदर्भ: नमामि गंगे तथा ग्रामीण जलापूर्ति अनुभाग-3 के कार्यालय ज्ञाप संख्या 103/76-3-2023-04 आर/ 2009 दिनांक 05 .06 .2023 द्वारा गठित राज्य स्तरीय स्थायी समिति (Permanent State Level Committee)

उत्तर प्रदेश के गतिशील भूजल संसाधन आंकलन-(मार्च 2023 तक), के लिए राज्य स्तरीय स्थायी समिति (PSLC) की बैठक 19 सितंबर 2023 को 12.00 बजे प्रमुख सचिव, नमामि गंगे तथा ग्रामीण जलापूर्ति अनुभाग, उत्तर प्रदेश सरकार की अध्यक्षता में ऑनलाइन मोड के माध्यम से आयोजित की गई थी। प्रतिभागियों की सूची संलग्न है।

1. श्री एस.जी. भरतरिया, क्षेत्रीय निदेशक, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ ने समिति के अध्यक्ष एवं सभी सदस्यों का स्वागत किया तथा भूजल संसाधन आकलन-2023 के बारे में संक्षिप्त जानकारी दी।
2. श्री वी.के. उपाध्याय, निदेशक, भूगर्भ जल विभाग, उत्तर प्रदेश सरकार ने भी समिति के सभी सदस्यों का स्वागत करते हुए उत्तर प्रदेश के भूजल संसाधन के आंकलन की महत्वता के बारे में समिति के सदस्यों को अवगत कराया।
3. श्री एबादुर रहमान, वैज्ञानिक-सी, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ ने Power Point Presentation के माध्यम से समिति के समक्ष गतिशील भूजल संसाधन-2023 के आँकलन की विस्तृत जानकारी, "जिसमें गतिशील भूजल संसाधन-2023 समय सीमा के अनुपालन, GEC-2015 कार्य पद्धति (Methodology), INGRES के अनुमोदन hierarchy (India-Groundwater Resource Estimation System), GWRA-2023 के इनपुट पैरामीटर्स, भूजल संसाधन आंकलन-2023 के आंकड़ों, पिछले वर्ष के आंकलन से तुलना एवं भूजल गुणवता आंकड़ों को राज्य स्तरीय रिपोर्ट मे संगलक करना" साझा किया।

श्री अनुराग श्रीवास्तव, प्रमुख सचिव, नमामि गंगे एवं ग्रामीण जलापूर्ति विभाग व राज्य स्तरीय समिति के अध्यक्ष ने भूजल संसाधन आंकलन को समय पर सम्पन्न करने के लिए केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ एवं उत्तर प्रदेश भूगर्भ जल विभाग उत्तर प्रदेश को बधाई दी एवं समिति के अध्यक्ष व सदस्यों ने उत्तर प्रदेश के *गतिशील भूजल संसाधन आंकलन-2023* को अनुमोदित किया।

बैठक अध्यक्ष महोदय की अनुमति के उपरांत धन्यवाद प्रस्ताव के साथ सम्पन्न हुई।

संजय 14.9.23.

(एस.जी. भरतरिया)

क्षेत्रीय निदेशक एवं सदस्य सचिव

13 सितंबर 2023 को आयोजित उत्तर प्रदेश के गतिशील भूजल संसाधन मार्च 2023 के अनुमोदन हेतु राज्य स्तरीय स्थायी समिति (PSLC) की बैठक का कार्यवृत्त।

Online मोड में भाग लेने वाले प्रतिभागियों की सूची

(I) - राज्य स्तरीय स्थायी समिति (PSLC)

1. श्री अनुराग श्रीवास्तव, प्रमुख सचिव, नमामि गंगे एवं ग्रामीण जलापूर्ति विभाग, उत्तर प्रदेश
2. श्री बी.के. उपाध्याय, निदेशक, भूगर्भ जल विभाग, उत्तर प्रदेश, लखनऊ
3. श्री अरुन कुमार सिंह, मनरेगा, उत्तर प्रदेश, लखनऊ.
4. श्री प्रदीप शर्मा, मुख्य पर्यावरण अधिकारी, उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड, लखनऊ.
5. रमाकांत तिरपाठी मुख्य अभियन्ता, लघु सिंचाई विभाग, उत्तर प्रदेश, लखनऊ.
6. श्री शैलेश कुमार, वरिष्ठ तकनीकी सहायक, कृषि विभाग उत्तर प्रदेश लखनऊ.
7. श्री एस.जी. भरतरिया, क्षेत्रीय निदेशक एवं सदस्य सचिव, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ

(II) - भूगर्भ जल विभाग, उत्तर प्रदेश

8. श्री रविकांत सिंह, वरिष्ठ जल-वैज्ञानिक, भूगर्भ जल विभाग, उत्तर प्रदेश, लखनऊ
9. श्री अवधेश कुमार, अधिशासी अभियंता, भूगर्भ जल विभाग, उत्तर प्रदेश, लखनऊ
10. श्री आमोद कुमार, अधिशासी अभियंता, भूगर्भ जल विभाग, उत्तर प्रदेश, लखनऊ
11. श्रीमती, अदिति सिंह, सहायक भूभौतिकीविद, भूगर्भ जल विभाग, उत्तर प्रदेश, लखनऊ
12. श्री पुनीत मौर्या, सहायक भूभौतिकीविद, भूगर्भ जल विभाग, उत्तर प्रदेश, लखनऊ

(III) - केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ

13. श्री एस.के. स्वरूप, वैज्ञानिक-डी व तकनीकी सचिव, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ
14. श्री एबादुर रहमान, वैज्ञानिक-सी, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ
15. *श्री करम सिंह, वैज्ञानिक-सी, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ*
16. डॉ. फखरे आलम, वैज्ञानिक-बी, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ
17. सुश्री अदिति सिंह, सहायक भूवैज्ञानिक, केन्द्रीय भूमि जल बोर्ड, उत्तरी क्षेत्र, लखनऊ

Annexure IV: Assessment Unit Wise Ground Water Recharge and Extractable Resources, Uttar Pradesh-2023

Sl. No	District	Assessment Unit Name (Blocks/Urban)	Recharge Worthy Area (Ha)	Recharge from Rainfall-Monsoon Season	Recharge from Other Sources Monsoon Season	Recharge from Rainfall-Non-Monsoon Season	Recharge from Other Sources-Non-Monsoon Season	Total Annual Ground Water (Ham) Recharge	Total Natural Discharges (Ham)	Annual Extractable Ground Water Resource (Ham)
1	AGRA	ACHHNERA	28212	2617.64	3149.37	36.99	6024.57	11828.57	591.43	11237.14
2	AGRA	AKOLA	17126	1589.92	1152.18	22.46	2547.64	5312.2	531.22	4780.98
3	AGRA	BAH	27946	2594.42	816.71	36.64	1974.59	5422.36	542.23	4880.13
4	AGRA	BARAULI AHIR	23894	2218.24	1042.43	31.33	2450.46	5742.46	574.25	5168.21
5	AGRA	BICHPURI	12074	1120.91	656.22	15.83	1448.95	3241.91	324.19	2917.72
6	AGRA	ETMADPUR	21902	1694.43	718.64	28.72	2329.75	4771.54	477.16	4294.38
7	AGRA	FATEHABAD	34935	3243.25	468.9	45.81	975.9	4733.86	473.39	4260.47
8	AGRA	FATEHPUR SIKRI	29132	3718.72	2071.21	52.52	4212.04	10054.49	1005.45	9049.04
9	AGRA	JAGNER	30393	2351.32	394.94	39.85	1105.14	3891.25	389.13	3502.12
10	AGRA	JAITPUR KALAN	30063	3837.56	340.43	54.2	871.35	5103.54	510.36	4593.18
11	AGRA	KHANDAULI	21522	1998.03	611.38	28.22	1127.6	3765.23	376.52	3388.71
12	AGRA	KHERAGARH	24420	2267.07	1299.85	32.02	3072	6670.94	667.09	6003.85
13	AGRA	PINAHAT	29638	2751.5	675.05	38.86	1653.62	5119.03	511.91	4607.12
14	AGRA	SAIYANA	22849	2121.23	1073.28	29.96	2326.63	5551.1	555.11	4995.99
15	AGRA	SHAMSABAD	26414	2452.19	597.96	34.63	1054.75	4139.53	413.96	3725.57
16	AGRA	AGRA CITY	14197	1389.4	834.55	19.62	1700.74	3944.31	394.43	3549.88
17	ALIGARH	AKRABAD	28675	3309.93	1836.75	123.16	4147.61	9417.45	470.87	8946.58
18	ALIGARH	ATRAULI	27460	3499.78	1236.82	117.94	2856.93	7711.47	385.57	7325.9
19	ALIGARH	BIJAULI	25494	3462.48	1128.86	109.5	2456.72	7157.56	715.75	6441.81
20	ALIGARH	CHANDAUS	32089	4353.34	899.64	137.82	1810.55	7201.35	360.07	6841.28
21	ALIGARH	DHANIPUR	28332	3847.93	1823.35	121.69	3841.82	9634.79	963.48	8671.31
22	ALIGARH	GANGIRI	34304	3882.52	1683.69	147.34	3019.76	8733.31	873.33	7859.98
23	ALIGARH	GONDA	29051	3945.58	1470.53	124.78	2846.36	8387.25	838.72	7548.53

Sl. No	District	Assessment Unit Name (Blocks/Urban)	Recharge Worthy Area (Ha)	Recharge from Rainfall-Monsoon Season	Recharge from Other Sources Monsoon Season	Recharge from Rainfall-Non-Monsoon Season	Recharge from Other Sources-Non-Monsoon Season	Total Annual Ground Water (Ham) Recharge	Total Natural Discharges (Ham)	Annual Extractable Ground Water Resource (Ham)
24	ALIGARH	IGLAS	24637	2788.41	1129.79	105.82	2300.58	6324.6	632.46	5692.14
25	ALIGARH	JAWA SIKANDAIRPUR	30059	4082.48	1201.92	129.11	2249.37	7662.88	766.29	6896.59
26	ALIGARH	KHAIR	34345	4664.59	1663.72	147.51	3318.6	9794.42	979.44	8814.98
27	ALIGARH	LODHA	33381	3778.05	805.24	143.37	1513.28	6239.94	624	5615.94
28	ALIGARH	TAPPAL	37219	4678.35	986.15	159.86	2348.38	8172.74	408.64	7764.1
29	ALIGARH	ALIGARH CITY	15797	950.84	337.23	30.07	688.52	2006.66	200.67	1805.99
30	AMBEDKAR NAGAR	AKBARPUR	41216	8742.58	1218.66	65.01	1799.74	11825.99	1182.6	10643.39
31	AMBEDKAR NAGAR	BASKHARI	20457	4062.05	1204.14	32.27	1580.81	6879.27	343.96	6535.31
32	AMBEDKAR NAGAR	BHITI	20976	4449.35	460.72	33.09	840.39	5783.55	578.36	5205.19
33	AMBEDKAR NAGAR	BHIYAON	21189	4494.53	960.8	33.42	1278.54	6767.29	676.73	6090.56
34	AMBEDKAR NAGAR	JAHANGIRGANI	21944	4654.68	1187.86	34.61	1398.42	7275.57	727.55	6548.02
35	AMBEDKAR NAGAR	JALALPUR	30031	6370.06	1050.84	47.37	1535.79	9004.06	900.41	8103.65
36	AMBEDKAR NAGAR	KATEHARI	25333	5373.54	991.38	39.96	1332.28	7737.16	773.71	6963.45
37	AMBEDKAR NAGAR	RAMNAGAR	32280	6847.11	1792.55	50.92	2356.43	11047.01	1104.71	9942.3
38	AMBEDKAR NAGAR	TANDA	32472	6887.83	2959.5	51.22	3171.59	13070.14	1307.01	11763.13
39	AMETHI	AMETHI	16236	2850.39	1203.04	62.15	1641.39	5756.97	575.69	5181.28
40	AMETHI	BAHADURPUR	15554	2730.66	1373.09	59.54	2082.5	6245.79	624.58	5621.21
41	AMETHI	BHADAR	15921	2621.51	1516.99	60.95	2070.71	6270.16	313.51	5956.65
42	AMETHI	BHETUA	16495	2445.31	1482.52	63.14	1796.85	5787.82	289.39	5498.43
43	AMETHI	GAURIGANJ	20791	3650.07	1972.64	79.59	2292.84	7995.14	799.51	7195.63
44	AMETHI	JAGDISHPUR	21476	3770.33	2497.4	82.21	2223.3	8573.24	857.32	7715.92
45	AMETHI	JAMO	23553	2776.91	3490.02	90.16	4512.84	10869.93	543.5	10326.43
46	AMETHI	MUSAFIRKHANA	18206	3196.25	1773.9	69.69	2346.52	7386.36	738.63	6647.73
47	AMETHI	SANGRAMPUR	10176	1786.5	861.4	38.95	1124.74	3811.59	381.16	3430.43
48	AMETHI	SHAHGARH	12774	2242.6	783.41	48.9	1084.84	4159.75	415.97	3743.78

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49	AMETHI	SHUKUL BAZAR	19176	3366.54	757.65	73.41	1087.36	5284.96	528.5	4756.46
50	AMETHI	SINGHPUR	21261	3732.58	1573.38	81.39	2231.53	7618.88	761.89	6856.99
51	AMETHI	TILOI	21373	3752.24	1584.95	81.82	2236.94	7655.95	765.6	6890.35
52	AMROHA	DHANAURA	40966	10084.38	877.88	409.91	2174.5	13546.67	1354.67	12192
53	AMROHA	GAJRAULA	31099	9569.34	550.57	311.18	2005.57	12436.66	1243.67	11192.99
54	AMROHA	HASANPUR	34389	12207.13	831.67	344.1	1776.43	15159.33	757.97	14401.36
55	AMROHA	JOYA	34972	8608.87	835.77	349.93	2037.74	11832.31	1183.23	10649.08
56	AMROHA	AMROHA	33284	8193.34	2468.12	333.04	4306.16	15300.66	1530.07	13770.59
57	AMROHA	GANGESHWARI	40193	9894.09	692.16	402.17	1412.12	12400.54	1240.06	11160.48
58	AURAIYA	ACHHALDA	28192	3674.32	2548.7	38.59	5305.59	11567.2	1156.72	10410.48
59	AURAIYA	AJITMAL	22120	2882.94	1331.13	30.28	3035.62	7279.97	728	6551.97
60	AURAIYA	AURRAIYA	44465	5795.21	2424.7	60.87	5375.14	13655.92	1365.59	12290.33
61	AURAIYA	BHAGYANAGAR	26802	3493.16	2038.91	36.69	4449.47	10018.23	1001.83	9016.4
62	AURAIYA	BIDHUNA	33971	4427.51	1233.24	46.5	1901.35	7608.6	760.86	6847.74
63	AURAIYA	ERWA KATRA	23958	3122.5	1288.89	32.79	2716.71	7160.89	716.09	6444.8
64	AURAIYA	SAHAR	29919	3899.4	1697.54	40.95	3499.48	9137.37	913.73	8223.64
65	AYODHYA	AMANIGANJ	24750	4927.28	1814.09	43.94	3530.63	10315.94	1031.6	9284.34
66	AYODHYA	BIKAPUR	20497	4080.59	301.66	36.39	514.43	4933.07	493.31	4439.76
67	AYODHYA	HARRINGTANGANJ	21890	3631.59	744.45	38.86	1355.12	5770.02	577	5193.02
68	AYODHYA	MASODHA	20718	4124.58	1604.37	36.78	2822.2	8587.93	858.79	7729.14
69	AYODHYA	MAYA BAZAR	21659	4311.92	1009.67	38.45	1787.33	7147.37	714.74	6432.63
70	AYODHYA	MILKIPUR	21969	4373.64	841.03	39	1474.38	6728.05	672.81	6055.24
71	AYODHYA	PURA BAZAR	23043	4587.45	1463.26	40.91	2715.51	8807.13	880.71	7926.42
72	AYODHYA	SOHAWAL	19822	3946.21	2744.57	35.19	5346.58	12072.55	1207.26	10865.29
73	AYODHYA	TARUN	27103	5395.72	1221.64	48.11	2452.72	9118.19	911.82	8206.37

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74	AYODHYA	MAWAI	23860	3958.42	1581.06	42.36	3089.14	8670.98	867.1	7803.88
75	AYODHYA	RUDAULI	26890	5353.32	2205.58	47.73	4053.49	11660.12	1166.01	10494.11
76	AZAMGARH	AHIRAULA	19602	3719.34	1034.09	6.4	1669.58	6429.41	642.94	5786.47
77	AZAMGARH	ATRAULIA	13502	2561.91	453.42	4.41	684.41	3704.15	370.41	3333.74
78	AZAMGARH	AZAMATGARH	20535	3896.38	1139.66	6.7	1619.54	6662.28	666.22	5996.06
79	AZAMGARH	BILHARIYAGANJ	19927	3781.01	782.03	6.51	1153.8	5723.35	572.33	5151.02
80	AZAMGARH	HARAIYA	26391	5007.51	666.48	8.62	1017.08	6699.69	669.97	6029.72
81	AZAMGARH	JAHANGANJ	18089	3432.26	1108.78	5.91	1640	6186.95	618.69	5568.26
82	AZAMGARH	KOILSA	16539	3138.16	989.63	5.4	1505.73	5638.92	563.89	5075.03
83	AZAMGARH	LALGANJ	21299	3112.68	1350.36	6.95	2129.19	6599.18	329.96	6269.22
84	AZAMGARH	MAHARAJGANJ	24006	4554.97	1003.02	7.84	1538.81	7104.64	710.47	6394.17
85	AZAMGARH	MARTINGANJ	23235	2939.12	2328.37	7.59	3439.56	8714.64	871.47	7843.17
86	AZAMGARH	MEHNAGAR	18719	3130.82	1733.55	6.11	2798.32	7668.8	383.44	7285.36
87	AZAMGARH	MIRZAPUR	16556	3141.39	739.78	5.41	1103.66	4990.24	499.03	4491.21
88	AZAMGARH	MOHAMMADPUR	19192	3034.63	1434.27	6.27	2261.49	6736.66	673.67	6062.99
89	AZAMGARH	PALHANA	14289	2711.24	717.56	4.67	1146.4	4579.87	457.99	4121.88
90	AZAMGARH	PALHANI	12728	2321.47	725.8	4.16	820.19	3871.62	193.58	3678.04
91	AZAMGARH	PAWAI	20699	3927.49	1373.1	6.76	2015	7322.35	732.24	6590.11
92	AZAMGARH	PHULPUR	19120	2889.85	1260.23	6.24	1896.64	6052.96	302.64	5750.32
93	AZAMGARH	RANI KI SARAI	13901	2473.05	1242.29	4.54	1900.85	5620.73	281.04	5339.69
94	AZAMGARH	SATHIYAON	16416	3114.82	293.09	5.36	464.55	3877.82	387.78	3490.04
95	AZAMGARH	TAHBARPUR	17626	2614.08	1276.42	5.75	1888.68	5784.93	289.25	5495.68
96	AZAMGARH	TARWA	21980	4170.55	1360.7	7.18	1519.81	7058.24	705.83	6352.41
97	AZAMGARH	THEKMA	22768	3229.98	1618.61	7.43	2437.06	7293.08	364.65	6928.43
98	BAGPAT	BAGHPAT	21063.32	2824.91	1038.27	147.33	1549.08	5559.59	555.96	5003.63

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99	BAGPAT	BARAUT	27686.1	3094.27	2014.03	193.65	3457.04	8758.99	875.9	7883.09
100	BAGPAT	BINAULI	29106	3252.97	1434.79	203.58	2037.45	6928.79	692.88	6235.91
101	BAGPAT	CHHAPRAULI	20532.13	2294.73	1817	143.61	2745.51	7000.85	700.08	6300.77
102	BAGPAT	KHEKRA	16037.41	2150.86	758.96	112.17	1158.34	4180.33	418.03	3762.3
103	BAGPAT	PILANA	20714	2778.06	757.94	144.89	1168.98	4849.87	484.99	4364.88
104	BAHRAICH	BALHA	30089	6301.32	2064.46	202.03	3414.83	11982.64	599.13	11383.51
105	BAHRAICH	BISHESHWARGANJ	25595	6057.86	2026.07	171.86	3510.29	11766.08	1176.61	10589.47
106	BAHRAICH	CHITTAURA	31701	6552.65	2596.84	212.85	4738.23	14100.57	705.02	13395.55
107	BAHRAICH	FAKHARPUR	34530	6783.86	1038.14	231.85	1671.84	9725.69	486.28	9239.41
108	BAHRAICH	HUZURPUR	24208	4577.93	1601.24	162.54	2720.53	9062.24	453.11	8609.13
109	BAHRAICH	JARWAL	28197	4691.28	1172.96	189.33	1960.17	8013.74	400.69	7613.05
110	BAHRAICH	KAISARGANJ	24103	3917.05	1034.31	161.84	1682.83	6796.03	339.8	6456.23
111	BAHRAICH	MAHASI	37660	5977.36	1103.79	252.86	1793.34	9127.35	456.37	8670.98
112	BAHRAICH	MIHIPURWA	59547	9395.77	1452.25	399.82	2342.19	13590.03	1359	12231.03
113	BAHRAICH	NAWABGANJ	24421	5779.99	1356.57	163.97	2155.04	9455.57	945.56	8510.01
114	BAHRAICH	PAYAGPUR	27158	6427.79	1951.64	182.35	3337.91	11899.69	1189.97	10709.72
115	BAHRAICH	RISIYA	26877	4317.47	2206.15	180.46	3986.52	10690.6	534.53	10156.07
116	BAHRAICH	SHIVPUR	38005	6347.6	1099.52	255.18	1824.51	9526.81	476.34	9050.47
117	BAHRAICH	TEJWAPUR	26634	4534.34	1208.4	178.83	2123.41	8044.98	402.25	7642.73
118	BALLIA	BAIRIA KHERA	15937	2985.87	215.3	97.99	388.93	3688.09	368.81	3319.28
119	BALLIA	BANSDIH	17170	3121.43	781.4	105.57	1146.45	5154.85	257.74	4897.11
120	BALLIA	BELHARI	15787	2957.77	217.73	97.06	392.21	3664.77	366.48	3298.29
121	BALLIA	BERUAR	16056	3008.17	541.04	98.72	857.68	4505.61	450.56	4055.05
122	BALLIA	CHILKAHAR	18870	2865.83	1650.99	116.02	2553.85	7186.69	359.33	6827.36
123	BALLIA	DUBAHAND	15938	2986.06	402.65	97.99	655.77	4142.47	414.25	3728.22

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124	BALLIA	GARWAR	16136	3023.16	950.72	99.21	1539.38	5612.47	561.25	5051.22
125	BALLIA	HANUMANGANJ BRAHMIN	15154	2839.17	646.22	93.17	1014.54	4593.1	459.31	4133.79
126	BALLIA	MANIYAR	17036	2952.17	1136.18	104.74	1933.71	6126.8	306.34	5820.46
127	BALLIA	MURLI CHHAPRA	14332	2685.17	625.64	88.12	873.46	4272.39	427.24	3845.15
128	BALLIA	NAWA NAGAR	18203	3410.42	1045.12	111.92	1646.15	6213.61	621.36	5592.25
129	BALLIA	NEGARA	21378	3021.57	2488.17	131.44	4054.19	9695.37	484.77	9210.6
130	BALLIA	PANDAH	17247	2154.2	1349.91	106.04	2134.64	5744.79	574.48	5170.31
131	BALLIA	RASRA	20493	3535.7	295.65	126	564.64	4521.99	226.1	4295.89
132	BALLIA	REOTI	15123	1888.91	639.24	92.98	716.87	3338	333.81	3004.19
133	BALLIA	SIAR	22302	3795.14	1308.57	137.12	2157.89	7398.72	369.94	7028.78
134	BALLIA	SOHAON	15538	2911.12	742.92	95.53	955.29	4704.86	470.48	4234.38
135	BALRAMPUR	BALRAMPUR	48684	10708.51	1730.41	203.28	3131.16	15773.36	1577.33	14196.03
136	BALRAMPUR	GAINDAS BUZURG	54500	7993.73	1038.89	227.57	1937.38	11197.57	559.88	10637.69
137	BALRAMPUR	GAINSARA	16782	3076.13	1156.74	70.07	1858.64	6161.58	616.16	5545.42
138	BALRAMPUR	HARRAIYA SATGHARWA	59923	9285.13	1481.48	250.21	2298.34	13315.16	665.76	12649.4
139	BALRAMPUR	PACHPERWA	48284	7080.35	1407.4	201.61	2385.05	11074.41	1107.45	9966.96
140	BALRAMPUR	REHRA BAZAR	23709	5215.02	609.34	99	1054.27	6977.63	697.77	6279.86
141	BALRAMPUR	SHRI DATT GANJ	19147	4211.56	1377.21	79.95	2369.5	8038.22	803.82	7234.4
142	BALRAMPUR	TULSIPUR	47761	8543.62	1474.05	199.43	2547.93	12765.03	638.25	12126.78
143	BALRAMPUR	UTRAULA	16067	2676.74	1129.62	67.09	1890.11	5763.56	288.18	5475.38
144	BANDA	BABERU	59041	8166.75	1492.89	80.11	2316.87	12056.62	602.83	11453.79
145	BANDA	BAROKHAR	67162	6635.45	894.86	74.04	1652.77	9257.12	462.86	8794.26
146	BANDA	BISANDA	47476	6800.81	1571.95	64.42	2201.74	10638.92	1063.9	9575.02
147	BANDA	JASPURA	31796	4554.69	434.22	43.14	639.68	5671.73	567.17	5104.56
148	BANDA	KAMASIN	50597	7247.89	1014.72	68.65	1808.38	10139.64	1013.96	9125.68

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149	BANDA	MAHUVA	50714	4843.1	2210.45	68.81	3161.31	10283.67	1028.37	9255.3
150	BANDA	NARAINI	79583	3325.02	261.76	47.24	699.34	4333.36	433.34	3900.02
151	BANDA	TINDWARI	54091	7748.39	831.4	73.39	1599.6	10252.78	1025.28	9227.5
152	BARABANKI	BANI KODAR	28140	5717.41	3366.53	81.11	5473.24	14638.29	1463.83	13174.46
153	BARABANKI	BANKI	22402	4551.58	2219.95	64.57	4406.09	11242.19	1124.22	10117.97
154	BARABANKI	DARIYABAD	24908	3373.83	3456.96	71.79	7044.49	13947.07	1394.71	12552.36
155	BARABANKI	DEWA	26125	5308.01	3674.1	75.3	8002.92	17060.33	1706.03	15354.3
156	BARABANKI	FATEHPUR	29266	5946.19	5244.07	84.35	10626.6	21901.21	2190.13	19711.08
157	BARABANKI	HAIDERGARH	31117	4214.85	2052.69	89.69	4073.03	10430.26	1043.02	9387.24
158	BARABANKI	HARAK	22495	4570.47	2660.15	64.84	5172.49	12467.95	1246.79	11221.16
159	BARABANKI	MASAULI	23260	4725.9	2016.65	67.04	4158.86	10968.45	1096.85	9871.6
160	BARABANKI	NINDAURA	17862	3629.15	4290.73	51.48	7912.88	15884.24	1588.43	14295.81
161	BARABANKI	PURE DALAI	28880	5867.76	1562.74	83.24	2437.98	9951.72	995.17	8956.55
162	BARABANKI	RAMNAGAR	22942	3107.53	3190.99	66.12	5480.14	11844.78	1184.48	10660.3
163	BARABANKI	SIDDHAUR	27246	3690.51	3284.84	78.53	6509.71	13563.59	1356.36	12207.23
164	BARABANKI	SIRAULI GAUSPUR	26490	3796.74	2826.16	76.35	5042.74	11741.99	587.09	11154.9
165	BARABANKI	SURATGANJ	20359	3682.56	2457.92	58.68	3516.23	9715.39	485.77	9229.62
166	BARABANKI	TRIVEDIGANJ	37640	7647.59	2939.42	108.49	5826.89	16522.39	1652.24	14870.15
167	BAREILLY	ALAMPUR JAFARABAD	20268	3673.74	770.21	70.02	1095.24	5609.21	560.92	5048.29
168	BAREILLY	BAHERI	39214	7107.86	2408.25	135.48	4161.43	13813.02	1381.3	12431.72
169	BAREILLY	BHADPURA	23563	4270.99	1233.37	81.41	1927.23	7513	751.3	6761.7
170	BAREILLY	BHOJPURA	31188	5653.08	1273.75	107.75	2017.29	9051.87	905.18	8146.69
171	BAREILLY	BHUTAH	37531	6672.7	1025.39	129.67	1811.12	9638.88	481.94	9156.94
172	BAREILLY	BITHERI CHAINPUR	22890	4118.36	1562.08	79.08	2668.58	8428.1	421.4	8006.7
173	BAREILLY	FARIDPUR	32813	5440.72	1636.37	113.36	2648.64	9839.09	491.95	9347.14

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174	BAREILLY	FATEHGANJ	17508	3173.47	1367.94	60.49	1737.16	6339.06	633.91	5705.15
175	BAREILLY	KYARA	27803	5039.52	431.76	96.06	696.84	6264.18	626.42	5637.76
176	BAREILLY	MAJHGAWA	17201	3117.82	522.6	59.43	708.6	4408.45	440.84	3967.61
177	BAREILLY	MEERGANJ	21167	3836.69	706.56	73.13	886.45	5502.83	550.29	4952.54
178	BAREILLY	NAWABGANJ	34509	4317.55	2114.29	119.22	3038.92	9589.98	479.5	9110.48
179	BAREILLY	RAMNAGAR	19306	3491.36	884.44	66.7	1215.45	5657.95	282.9	5375.05
180	BAREILLY	RICHHA	26620	4825.09	2359.51	91.97	3696.33	10972.9	1097.29	9875.61
181	BAREILLY	SHERGARH	27136	4612.44	1405.62	93.75	2402.75	8514.56	425.73	8088.83
182	BAREILLY	BAREILLY CITY	13283	1048.79	379.12	23.99	773.62	2225.52	222.55	2002.97
183	BASTI	BAHADURPUR	22910	5312.6	537.79	51.67	1313.02	7215.08	721.51	6493.57
184	BASTI	BANKATI	18581	4308.75	263.2	41.91	674	5287.86	528.78	4759.08
185	BASTI	BASTI SADAR	21026	4875.72	334.9	47.42	811.25	6069.29	606.93	5462.36
186	BASTI	DUBAULIYA	13632	3161.13	190.91	30.75	518.82	3901.61	390.16	3511.45
187	BASTI	GAUR	23946	5271.31	310.35	54.01	798.38	6434.05	321.7	6112.35
188	BASTI	HARRAIYA	23105	5357.82	290.49	52.11	853.51	6553.93	655.39	5898.54
189	BASTI	KAPTANGANJ	23505	4554.26	294.18	53.01	828.93	5730.38	286.52	5443.86
190	BASTI	KUDRAHA	13610	3156.03	177.3	30.7	490.16	3854.19	385.42	3468.77
191	BASTI	PARASRAMPUR	21241	4609.05	247.6	47.91	724.77	5629.33	281.46	5347.87
192	BASTI	RAMNAGAR	23480	5444.78	336.28	52.96	935.76	6769.78	676.98	6092.8
193	BASTI	RUDHAULI	11587	2507.97	150.49	26.13	445.23	3129.82	156.49	2973.33
194	BASTI	SALATUA	21690	5029.7	261.97	48.92	751.9	6092.49	609.25	5483.24
195	BASTI	SAUGHAT	19061	4420.06	318.37	42.99	846.71	5628.13	562.81	5065.32
196	BASTI	VIKRAMJOT	36433	8448.46	482.42	82.17	1351.09	10364.14	1036.42	9327.72
197	BIJNOR	AFZALGARH	55573	11803.19	1415.23	468.14	2438.64	16125.2	1612.52	14512.68
198	BIJNOR	DHANPUR (ALHEPUR)	31934	6782.48	763.78	269.01	1319	9134.27	913.43	8220.84

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199	BIJNOR	HALDAUR (KHARI JHALU)	42710	9071.2	2155.95	359.78	3886.42	15473.35	1547.33	13926.02
200	BIJNOR	JALEELPUR	38108	6888.47	1725.2	321.01	3027.72	11962.4	598.12	11364.28
201	BIJNOR	KIRATPUR	27536	5848.39	1371.2	231.96	2470.3	9921.85	992.19	8929.66
202	BIJNOR	KOTWALI	57427	12196.96	3859.59	483.75	6857.4	23397.7	2339.77	21057.93
203	BIJNOR	MOHAMMADPUR DEOMAL	50283	9919.04	1863.28	423.57	3361.99	15567.88	778.4	14789.48
204	BIJNOR	NAJIBABAD	72875	11338.94	1612.76	613.88	2553.36	16118.94	805.95	15312.99
205	BIJNOR	NEHTAUR (AAKU)	23078	4901.55	898.76	194.4	1680.45	7675.16	767.52	6907.64
206	BIJNOR	NOORPUR	33226	7056.89	1140.48	279.89	2033.26	10510.52	1051.06	9459.46
207	BIJNOR	SEOHARA (BUDHANPUR)	26153	4752.52	1630.81	220.31	2827.47	9431.11	471.56	8959.55
208	BUDAUN	AMBIAPUR	29828	3244.8	552.51	114.81	926.94	4839.06	241.96	4597.1
209	BUDAUN	ASAFPUR	23797	3833.12	478.88	91.6	805.35	5208.95	520.9	4688.05
210	BUDAUN	BISAULI	25105	4043.81	430.86	96.63	734	5305.3	530.53	4774.77
211	BUDAUN	DAHGAWAN	35109	5160.18	381.3	135.14	639.86	6316.48	315.82	6000.66
212	BUDAUN	DATAGANJ	25289	4073.45	265.55	97.34	449.58	4885.92	488.59	4397.33
213	BUDAUN	ISLAMNAGAR	22374	3603.91	570.58	86.12	922.25	5182.86	518.29	4664.57
214	BUDAUN	JAGAT	28261	4552.17	346.86	108.78	585.62	5593.43	559.34	5034.09
215	BUDAUN	MIAON	29207	4704.54	418.16	112.42	656.21	5891.33	589.13	5302.2
216	BUDAUN	QUADAR CHOWK	28677	4619.17	464.37	110.38	763.59	5957.51	595.75	5361.76
217	BUDAUN	SAHASWAN	41846	6740.38	628.62	161.07	1034.86	8564.93	856.49	7708.44
218	BUDAUN	SALARPUR	24633	3967.78	314.55	94.82	533.88	4911.03	491.1	4419.93
219	BUDAUN	SAMRER	21567	3473.92	329.53	83.01	563.37	4449.83	444.99	4004.84
220	BUDAUN	UJHANI	35881	5779.56	474.82	138.11	755.75	7148.24	714.83	6433.41
221	BUDAUN	USAWAN	31858	5131.56	338.69	122.63	545.16	6138.04	613.8	5524.24
222	BUDAUN	WAZIRGANJ	20356	3031.92	308.16	78.35	462.81	3881.24	194.06	3687.18
223	BULANDSHAHAR	AGAUTA	15246	2108.62	3233.4	49.03	4936.25	10327.3	1032.73	9294.57

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224	BULANDSHAHAR	ANUP SHAHAR	27892	3267.4	3195.02	89.69	4627.11	11179.22	558.96	10620.26
225	BULANDSHAHAR	ARNIA KHURD	24476	3254.13	2219.3	78.71	3550.58	9102.72	455.13	8647.59
226	BULANDSHAHAR	BHAWAN BAHADUR NAGAR	15374	2126.32	1853.63	49.44	2853.03	6882.42	688.25	6194.17
227	BULANDSHAHAR	BULANDSHAHAR	17000	1567.47	2086.9	54.67	3089.56	6798.6	679.86	6118.74
228	BULANDSHAHAR	DANPUR	22185	3011.38	1888.26	71.34	3506.01	8476.99	423.85	8053.14
229	BULANDSHAHAR	DEBAI	23440	2161.26	2288.82	75.38	3325.2	7850.66	785.07	7065.59
230	BULANDSHAHAR	GULAOTHI	11943	1651.79	1680.81	38.41	2574.18	5945.19	594.52	5350.67
231	BULANDSHAHAR	JAHANGIRABAD	27491	3802.17	3538.44	88.4	6397.65	13826.66	1382.67	12443.99
232	BULANDSHAHAR	KHURJA	34326	4747.5	2255.21	110.38	2854.15	9967.24	996.72	8970.52
233	BULANDSHAHAR	LAKHAOTHI	19420	2238.25	2220.77	62.45	3822.14	8343.61	834.36	7509.25
234	BULANDSHAHAR	PAHASU	27574	3178.05	6849.65	88.67	10339.61	20455.98	2045.6	18410.38
235	BULANDSHAHAR	SHIKARPUR	26610	3066.94	3742.58	85.57	5810.02	12705.11	1270.51	11434.6
236	BULANDSHAHAR	SIANA	17375	2403.07	2575.47	55.87	4036.71	9071.12	907.11	8164.01
237	BULANDSHAHAR	SIKANDRABAD	35758	4945.55	2980.92	114.99	4765.94	12807.4	1280.74	11526.66
238	BULANDSHAHAR	UNCHAGAON	14837	2052.05	1328.02	47.71	2415.15	5842.93	584.3	5258.63
239	CHANDAULI	BARAHANI	23248	4609.7	2303.14	41.81	1214.66	8169.31	816.93	7352.38
240	CHANDAULI	CHAHNIYA	27170	5387.36	1173.51	48.86	913.06	7522.79	752.28	6770.51
241	CHANDAULI	CHAKIA	20724	2054.61	2063.46	18.63	969.53	5106.23	510.63	4595.6
242	CHANDAULI	CHANDAULI	18581	3070.26	2673.7	33.41	1537.08	7314.45	731.45	6583
243	CHANDAULI	DHANAPUR	21119	4187.55	2083.68	37.98	1242.6	7551.81	755.18	6796.63
244	CHANDAULI	NAUGARH	16437	917.99	675.87	9.4	367.34	1970.6	98.53	1872.07
245	CHANDAULI	NIYAMATABAD	22731	4507.18	1575.77	40.88	1075.78	7199.61	719.96	6479.65
246	CHANDAULI	SAKALDIHA	22250	4411.81	1999.88	40.01	1083.13	7534.83	753.48	6781.35
247	CHANDAULI	SHAHABGANJ	16209	1606.99	1484.35	14.57	721.1	3827.01	382.7	3444.31
248	CHITRAKOOT	KARWI	55401	7936.05	1539.17	75.17	2317.46	11867.85	1186.78	10681.07

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249	CHITRAKOOT	MANIKPUR	104184	6529.29	1572.09	61.84	2276.15	10439.37	1043.94	9395.43
250	CHITRAKOOT	MAU	48583	5432.69	1072.01	65.92	1351.53	7922.15	396.11	7526.04
251	CHITRAKOOT	PAHARI	58483	8377.54	929.03	79.35	1130.27	10516.19	1051.62	9464.57
252	CHITRAKOOT	RAMNAGAR	34014	2436.21	439.5	23.08	615.18	3513.97	351.4	3162.57
253	DEORIA	BANKATA	14029	2077.68	2022.23	84.82	2371.49	6556.22	655.62	5900.6
254	DEORIA	BARHAJ	16741	3718.99	2057.8	101.21	2546.09	8424.09	842.41	7581.68
255	DEORIA	BETALPUR	16139	3194.62	3040.46	97.57	3376.15	9708.8	485.44	9223.36
256	DEORIA	BHAGALPUR	14677	3260.47	2406.5	88.73	2560.54	8316.24	831.63	7484.61
257	DEORIA	BHALUANI	20464	4546.04	2008.67	123.72	2429.95	9108.38	910.84	8197.54
258	DEORIA	BHATNI	14678	3260.69	1963.18	88.74	2456.4	7769.01	776.9	6992.11
259	DEORIA	BHATPARANI	13491	2997	2258.86	81.56	2937.96	8275.38	827.54	7447.84
260	DEORIA	DEORIA SADAR	18885	2811.63	3535.71	114.18	3953.72	10415.24	520.77	9894.47
261	DEORIA	DESAHI DEORIA	11076	1640.34	4004.39	66.96	4439	10150.69	1015.07	9135.62
262	DEORIA	GAURI BAZAR	16917	3689.46	2492.33	102.28	2737.65	9021.72	451.09	8570.63
263	DEORIA	LAR	18903	4199.27	3752.54	114.28	4226.55	12292.64	1229.26	11063.38
264	DEORIA	PATHER DEWA	15857	2468.31	3157.07	95.87	3298	9019.25	450.96	8568.29
265	DEORIA	RAMPUR KARHANI	13397	1984.08	2593.61	81	3134.75	7793.44	779.35	7014.09
266	DEORIA	RUDRAPUR	21178	4704.66	3150.43	128.04	3757.66	11740.79	1174.08	10566.71
267	DEORIA	SALEMPUR	17593	3196.53	3090.98	106.36	3612.43	10006.3	500.32	9505.98
268	DEORIA	TARKULWA	9775	1769.56	2277.63	59.1	2702.5	6808.79	340.44	6468.35
269	ETAH	ALIGANJ	33984	4635.33	2080.24	74.22	4546.3	11336.09	1133.61	10202.48
270	ETAH	AWAGARH	29063	3964.12	1952.52	63.47	6071.45	12051.56	1205.15	10846.41
271	ETAH	JAITHARA	30806	3387.31	1526.19	67.28	3664.89	8645.67	432.29	8213.38
272	ETAH	JALESAR	24046	2305.06	912.67	52.52	2774.51	6044.76	302.24	5742.52
273	ETAH	MARHARA	19504	2660.3	1104.94	42.6	3057.97	6865.81	686.58	6179.23

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274	ETAH	NIDHAULI KALAN	34678	3642.46	2905.26	75.73	6712.24	13335.69	666.79	12668.9
275	ETAH	SAKIT	38340	3486.32	3332.53	83.73	4622.93	11525.51	1152.56	10372.95
276	ETAH	SHITALPUR	32336	2940.37	2652.48	70.62	6883.31	12546.78	1254.68	11292.1
277	ETAWAH	BARAHPURA	39194	4801.65	1143.57	51.15	2131.78	8128.15	812.81	7315.34
278	ETAWAH	BASREHAR	27771	2395.73	2952.97	36.24	6326.67	11711.61	585.59	11126.02
279	ETAWAH	BHARTHNA	27558	3376.12	3089.73	35.96	4804.23	11306.04	1130.61	10175.43
280	ETAWAH	CHAKARANAGAR	38148	4673.5	90.25	49.78	223.47	5037	503.71	4533.29
281	ETAWAH	JASWANTNAGAR	26300	2685	1304.74	34.32	2202.75	6226.81	622.68	5604.13
282	ETAWAH	MAHEWA	32597	3993.45	3131.12	42.54	5861.77	13028.88	1302.89	11725.99
283	ETAWAH	SEFAI	20880	2131.67	1708.37	27.25	4156.28	8023.57	802.35	7221.22
284	ETAWAH	TAKHA	27853	3412.26	1657.57	36.35	2570.13	7676.31	767.63	6908.68
285	FARRUKHABAD	BARHPUR	16425	2569.81	292.8	36.65	854.16	3753.42	375.34	3378.08
286	FARRUKHABAD	KAIMGANJ	34723	4527.23	827.37	77.48	3323.29	8755.37	875.54	7879.83
287	FARRUKHABAD	KAMALGANJ	31457	4921.68	440.3	70.19	709.25	6141.42	614.14	5527.28
288	FARRUKHABAD	MOHAMADABAD	41006	5346.41	358.47	91.49	1125.07	6921.44	692.15	6229.29
289	FARRUKHABAD	NAWABGANJ	25353	3305.56	707.69	56.57	2015.55	6085.37	608.54	5476.83
290	FARRUKHABAD	RAJEPUR	41171	4294.34	262.23	91.86	600.69	5249.12	524.91	4724.21
291	FARRUKHABAD	SHAMSABAD	30488	3975.06	923.78	68.03	2774.24	7741.11	774.11	6967
292	FATEHPUR	AIRAYA	32066	3355.52	860.36	20.81	1452.69	5689.38	568.94	5120.44
293	FATEHPUR	AMAULI	34959	4572.83	422.73	22.69	571.07	5589.32	558.94	5030.38
294	FATEHPUR	ASODHAR	41391	6497	1995.71	26.86	2751	11270.57	1127.06	10143.51
295	FATEHPUR	BAHUA	28037	4400.87	1847.61	18.2	2711.89	8978.57	897.86	8080.71
296	FATEHPUR	BHITAURA	34418	5402.47	2862.36	22.34	4531.91	12819.08	1281.91	11537.17
297	FATEHPUR	DEOMAI	26880	3516.05	1559.75	17.45	2134.97	7228.22	722.82	6505.4
298	FATEHPUR	DHATA	28980	4548.89	1588.94	18.81	2394.67	8551.31	855.13	7696.18

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299	FATEHPUR	HASWA	27499	4316.42	1507.86	17.85	2240.23	8082.36	808.24	7274.12
300	FATEHPUR	HATHGAON	38185	4994.8	1586.83	24.78	2631.49	9237.9	923.79	8314.11
301	FATEHPUR	KHAJUHA	33248	4349.02	2306	21.58	3094.26	9770.86	977.08	8793.78
302	FATEHPUR	MALAWAN	39711	5194.41	2303.93	25.77	3560.98	11085.09	1108.51	9976.58
303	FATEHPUR	TELYANI	23770	3731.09	1684.45	15.43	2626.13	8057.1	805.71	7251.39
304	FATEHPUR	VIJAYIPUR	36111	5668.22	1416.87	23.44	2079.89	9188.42	918.84	8269.58
305	FIROZABAD	ARON	20261	2765.85	1274.12	37.66	2339.21	6416.84	641.69	5775.15
306	FIROZABAD	EKA	36151	3290.01	3356.84	67.19	7517.87	14231.91	1423.2	12808.71
307	FIROZABAD	FIROZABAD	26686	3642.94	470.66	49.6	1176.03	5339.23	533.92	4805.31
308	FIROZABAD	KHAIRGARH(HATHWAN)	24172	3299.75	1407.56	44.93	2533.12	7285.36	728.54	6556.82
309	FIROZABAD	JASRANA	22984	3137.57	2820.79	42.72	5450.17	11451.25	1145.13	10306.12
310	FIROZABAD	MADANPUR	30057	4103.12	3393.07	55.86	5509.18	13061.23	1306.12	11755.11
311	FIROZABAD	NARKHI	25393	3466.43	885.27	47.19	2832.25	7231.14	723.11	6508.03
312	FIROZABAD	SHIKOHABAD	24182	3301.11	1066.25	44.94	2394.3	6806.6	680.66	6125.94
313	FIROZABAD	TUNDLA	32067	4377.51	1395.19	59.6	2949.9	8782.2	878.22	7903.98
314	G.B.NAGAR	BISRAKH	33225	3658.32	3583.06	92.49	5682.35	13016.22	1301.62	11714.6
315	G.B.NAGAR	DADRI	47382	5217.12	2183.85	131.91	3584.76	11117.64	1111.77	10005.87
316	G.B.NAGAR	JEWAR	63666	7010.11	8421.41	177.24	12677.82	28286.58	2828.66	25457.92
317	GHAZIABAD	BHOJPUR	26407	3910.47	2120.92	133.25	3324.99	9489.63	948.96	8540.67
318	GHAZIABAD	LONI	27211	4029.53	1433.27	137.31	2242.65	7842.76	784.28	7058.48
319	GHAZIABAD	MURADNAGAR	22816	2815.58	4101.87	115.13	6219.49	13252.07	1325.21	11926.86
320	GHAZIABAD	RAZAPUR	19480	2403.91	2181.36	98.3	3400.52	8084.09	808.41	7275.68
321	GHAZIABAD	GAZIABAD CITY	21000	1354.64	525.22	55.39	1071.5	3006.75	300.68	2706.07
322	GHAZIPUR	BHADAURA	20923	3738.88	1590.63	28.23	2581.07	7938.81	793.88	7144.93
323	GHAZIPUR	BHANWARKOL	25123	4489.41	369.46	33.9	667.15	5559.92	556	5003.92

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324	GHAZIPUR	BIRNO	15407	2753.19	1032.03	20.79	1623.5	5429.51	542.95	4886.56
325	GHAZIPUR	DEOKALI	22119	3952.6	1415.38	29.84	2294.86	7692.68	769.27	6923.41
326	GHAZIPUR	GHAZIPUR	15939	2848.25	522.62	21.51	943.76	4336.14	433.62	3902.52
327	GHAZIPUR	JAKHANIA	20363	3638.81	787.19	27.47	1152.92	5606.39	560.64	5045.75
328	GHAZIPUR	KARANDA	15437	2758.55	567.21	20.83	841.93	4188.52	418.86	3769.66
329	GHAZIPUR	KASIMABAD	22778	4070.36	681.73	30.73	1248.04	6030.86	603.09	5427.77
330	GHAZIPUR	MANIHARI	22400	4002.82	2087.02	30.22	3535.85	9655.91	965.59	8690.32
331	GHAZIPUR	MARADH	18490	3304.11	703.71	24.95	1293.76	5326.53	532.65	4793.88
332	GHAZIPUR	MOHAMMADABAD	17373	3104.5	232.53	23.44	421.78	3782.25	378.22	3404.03
333	GHAZIPUR	REVATIPUR	22713	4058.75	1275.94	30.65	2086.19	7451.53	745.15	6706.38
334	GHAZIPUR	SADAT	22199	2925.29	1792.91	29.95	2939.24	7687.39	384.37	7303.02
335	GHAZIPUR	SAIDPUR	21850	3904.53	1242.5	29.48	2066.58	7243.09	724.31	6518.78
336	GHAZIPUR	VARACHAKWAR	19920	3510.16	1512.24	26.88	2195.59	7244.87	362.24	6882.63
337	GHAZIPUR	ZAMANIA	27018	4828.04	1726.42	36.45	2885.29	9476.2	947.62	8528.58
338	GONDA	BABHANJOT	22466	3258.5	968.73	66.72	1395.43	5689.38	568.94	5120.44
339	GONDA	BELSAR	28434	4930.97	566.4	84.45	1102.63	6684.45	334.22	6350.23
340	GONDA	CHHAPIA	20762	3691.71	934.79	61.66	1446.67	6134.83	306.75	5828.08
341	GONDA	COLONELGANJ	22190	4143.04	563.91	65.9	885.26	5658.11	282.91	5375.2
342	GONDA	HALDHARMAU	17643	3472.32	671.34	52.4	1034.7	5230.76	261.53	4969.23
343	GONDA	ITIA THOK	25062	5452.55	2019.12	74.43	2760.08	10306.18	1030.62	9275.56
344	GONDA	JHANJHRI	23673	5150.35	870.39	70.31	1344.3	7435.35	743.53	6691.82
345	GONDA	KATRA BAZAR	25972	5115.58	757.1	77.14	1254.01	7203.83	360.19	6843.64
346	GONDA	MANKAPUR	29272	5550.35	1162.31	86.94	1867.76	8667.36	433.37	8233.99
347	GONDA	MUJHANA	23085	5022.43	1399.62	68.56	1996.44	8487.05	848.71	7638.34
348	GONDA	NAWABGANJ	32748	6437.52	766.01	97.26	1240.41	8541.2	427.06	8114.14

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349	GONDA	PANDRI KRIPAL	14383	3129.2	1099.69	42.72	1684.39	5956	595.6	5360.4
350	GONDA	PARASPUR	34920	5834.83	768.05	103.71	1309.89	8016.48	400.82	7615.66
351	GONDA	RUPAIDIHA	29282	6370.66	1779.54	86.97	2780.74	11017.91	1101.79	9916.12
352	GONDA	TARABGANJ	27766	6040.84	942.35	82.47	1562.49	8628.15	862.82	7765.33
353	GONDA	WAZIRGANJ	21951	4114.27	696.39	65.19	1201.38	6077.23	303.86	5773.37
354	GORAKHPUR	BANSGAON	15418	3533.3	3467.39	98.27	1590.59	8689.55	868.96	7820.59
355	GORAKHPUR	BARAHALGANJ	21363	3916.56	3694.53	136.15	1194.49	8941.73	894.17	8047.56
356	GORAKHPUR	BELGHAT	22340	4095.68	4140.52	142.38	2519.32	10897.9	1089.79	9808.11
357	GORAKHPUR	BHATAHAT	15457	3728.74	3419.2	98.51	1173.23	8419.68	420.99	7998.69
358	GORAKHPUR	BRAHMPUR	17955	4937.64	3721.61	114.43	2349.85	11123.53	1112.36	10011.17
359	GORAKHPUR	CAMPIERGANJ	19887	3645.96	4527.02	126.75	1565.88	9865.61	986.56	8879.05
360	GORAKHPUR	CHIRGAWAN	14070	2579.51	2320.64	89.67	1410.35	6400.17	640.01	5760.16
361	GORAKHPUR	GAGAHA	15357	2815.46	3179.9	97.88	1611.51	7704.75	770.48	6934.27
362	GORAKHPUR	GOLA	14229	2608.66	3320.9	90.69	2042.66	8062.91	806.3	7256.61
363	GORAKHPUR	JANGAL KAUDIA	11680	2897.11	3879.62	74.44	1457.53	8308.7	415.44	7893.26
364	GORAKHPUR	KAURIRAM	16138	2958.64	3485.07	102.85	1064.8	7611.36	761.14	6850.22
365	GORAKHPUR	KHAJNI	16575	3087.26	3604.16	105.64	1638.12	8435.18	421.76	8013.42
366	GORAKHPUR	KHORABAR	16061	4416.79	2736.31	102.36	1267.9	8523.36	852.34	7671.02
367	GORAKHPUR	PALI	17174	4722.87	3131.41	109.46	1238.06	9201.8	920.18	8281.62
368	GORAKHPUR	PIPRAICH	14853	3705.22	3864.64	94.66	2670.44	10334.96	516.74	9818.22
369	GORAKHPUR	PIPRAULI	15083	2765.23	3044.99	96.13	1102.13	7008.48	700.85	6307.63
370	GORAKHPUR	SAHJANWA	14601	3300.89	3286.85	93.06	1222.59	7903.39	395.17	7508.22
371	GORAKHPUR	SARDAR NAGAR	13262	3647.06	3053.53	84.52	2280.32	9065.43	906.54	8158.89
372	GORAKHPUR	URUA	18111	3464.39	3348.21	115.43	1678.75	8606.78	430.34	8176.44
373	GORAKHPUR	BHAROHIYA	11473	3155.09	897.27	73.12	537.87	4663.35	466.34	4197.01

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374	HAMIRPUR	GOHAND	50714	3572.43	888.67	8.53	1051.84	5521.47	552.15	4969.32
375	HAMIRPUR	KURARA	43214	4058.81	407.88	11.63	497.75	4976.07	497.61	4478.46
376	HAMIRPUR	MAUDAHA	65136	4588.35	1591.02	10.96	2102.62	8292.95	829.3	7463.65
377	HAMIRPUR	MUSKARA	51398	3861.98	606.11	13.83	609.62	5091.54	509.16	4582.38
378	HAMIRPUR	RATH	45013	5073.34	1016.87	12.11	1086.96	7189.28	718.93	6470.35
379	HAMIRPUR	SARILA	67068	4724.45	735.6	11.28	674.41	6145.74	614.57	5531.17
380	HAMIRPUR	SUMERPUR	58997	6649.45	617.21	15.88	782.53	8065.07	806.51	7258.56
381	HAPUR	DHOLANA	23801	2894.38	2540.42	134.58	3736.48	9305.86	930.59	8375.27
382	HAPUR	GARH	34625	6315.99	4782.24	195.79	6856.01	18150.03	1815	16335.03
383	HAPUR	HAPUR	33045	5754.83	1713.36	186.85	2697.37	10352.41	517.62	9834.79
384	HAPUR	SIMBHOLI	23010	2798.19	3746.2	130.11	6004.65	12679.15	1267.92	11411.23
385	HARDOI	AHIRORI	37090	6242	2116.65	127.33	4030.42	12516.4	1251.65	11264.75
386	HARDOI	BAWAN	35760	4012.11	1899.45	122.77	3287	9321.33	932.14	8389.19
387	HARDOI	BHARAWAN	29950	5040.39	1053.74	102.82	1597.43	7794.38	779.44	7014.94
388	HARDOI	BHARKHANI	41406	5400.81	928.65	142.15	1465.97	7937.58	396.88	7540.7
389	HARDOI	BHENDER KALAN	27220	4580.95	1583.19	93.45	2470.95	8728.54	872.85	7855.69
390	HARDOI	BILGRAM	35098	5906.76	885.44	120.49	2862.99	9775.68	977.57	8798.11
391	HARDOI	HARIYAWAN	28740	4368.96	2458	98.67	3097.26	10022.89	501.15	9521.74
392	HARDOI	HARPALPUR	32030	4492.03	280.27	109.96	925.95	5808.21	580.82	5227.39
393	HARDOI	KACHHAUNA	25130	4229.21	1680.09	86.27	2632.76	8628.33	862.83	7765.5
394	HARDOI	KOTHAWAN	30130	5070.68	1699.95	103.44	2798.48	9672.55	967.25	8705.3
395	HARDOI	MADHAVGANJ	30509	4278.72	1229.61	104.74	1690.52	7303.59	730.36	6573.23
396	HARDOI	MALLAWAN	21820	3060.13	1013.36	74.91	2207.53	6355.93	635.59	5720.34
397	HARDOI	PIHANI	33490	5636.15	2650.81	114.97	3877.47	12279.4	1227.94	11051.46
398	HARDOI	SANDI	30307	4721.43	706.94	104.05	1742.94	7275.36	363.77	6911.59

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399	HARDOI	SANDILA	30203	5082.97	1655.52	103.69	2179.83	9022.01	902.2	8119.81
400	HARDOI	SHAHABAD	32580	5483	2237.64	111.85	3862.05	11694.54	1169.45	10525.09
401	HARDOI	SURSA	31730	4449.96	2183.52	108.93	3330.42	10072.83	1007.29	9065.54
402	HARDOI	TADIYAWAN	31370	5279.36	1588.38	107.7	3348.48	10323.92	1032.39	9291.53
403	HARDOI	TODARPUR	30280	5095.92	2139.98	103.95	2626.6	9966.45	996.65	8969.8
404	HATHRAS	HASAYAN	32740	3487.97	5758.05	78.74	8312.21	17636.97	1763.7	15873.27
405	HATHRAS	HATHRAS	27277	2905.97	1994.75	65.6	3532.67	8498.99	849.9	7649.09
406	HATHRAS	MURSAN	23479	2501.35	1472.88	56.47	2696.17	6726.87	672.68	6054.19
407	HATHRAS	SADABAD	29096	3010.81	2040.6	69.98	4249.34	9370.73	468.54	8902.19
408	HATHRAS	SAHPAU	17631	1729.25	787.56	42.4	2080.05	4639.26	231.96	4407.3
409	HATHRAS	SASNI	27058	2882.64	1592.3	65.08	3367.74	7907.76	790.77	7116.99
410	HATHRAS	SIKANDRA RAO	26518	2335.28	5597.24	63.78	8064.2	16060.5	803.03	15257.47
411	JALAUN	DAKOR	94931	13649.9	1779.73	106.72	6442.27	21978.62	2197.86	19780.76
412	JALAUN	JALAUN	43863	6306.96	1058.33	49.31	3901.19	11315.79	1131.58	10184.21
413	JALAUN	KADAURA	69371	9974.69	823.44	77.99	1660.89	12537.01	1253.7	11283.31
414	JALAUN	KONCH	47519	6832.64	1703.57	53.42	4018.46	12608.09	1260.81	11347.28
415	JALAUN	KUTHOND	31256	4494.23	2115.97	35.14	2629.63	9274.97	927.5	8347.47
416	JALAUN	MADHOGANJ	31213	4488.04	1415.01	35.09	2964.09	8902.23	890.23	8012
417	JALAUN	MAHEWA	54858	7887.9	1002.69	61.67	1812.58	10764.84	1076.49	9688.35
418	JALAUN	NADIGAON	56025	8055.7	1408.21	62.98	1721.09	11247.98	1124.8	10123.18
419	JALAUN	RAMPURA	27547	3960.92	798.06	30.97	1232.64	6022.59	602.26	5420.33
420	JAUNPUR	BADLAPUR	21210	4025.59	812.62	11.42	1647.65	6497.28	649.73	5847.55
421	JAUNPUR	BAKSHA	18044	3424.7	742.2	9.72	1104.47	5281.09	528.11	4752.98
422	JAUNPUR	BARSATHI	21701	4118.78	752.86	11.69	1185.61	6068.94	606.89	5462.05
423	JAUNPUR	DHARMAPUR	10003	1898.54	628.65	5.39	1221.37	3753.95	375.4	3378.55

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424	JAUNPUR	DOBHI	14526	2297.49	1214.82	7.82	2820.5	6340.63	634.06	5706.57
425	JAUNPUR	JALALPUR	14970	2841.26	1522.86	8.06	3533.47	7905.65	790.56	7115.09
426	JAUNPUR	KARANJA KALAN	18460	3503.65	1305.34	9.94	2466.79	7285.72	728.57	6557.15
427	JAUNPUR	KERAKAT	16076	2560.05	759.67	8.66	1659.35	4987.73	249.39	4738.34
428	JAUNPUR	KHUTAHAN	19484	3698	882.63	10.49	1887.41	6478.53	647.85	5830.68
429	JAUNPUR	MACHHLISHAHR	27073	3809.25	1506.48	14.58	2444.23	7774.54	388.73	7385.81
430	JAUNPUR	MAHARAJGANJ	18393	3490.94	776.77	9.91	1371.93	5649.55	564.95	5084.6
431	JAUNPUR	MARIAHU	21841	4145.36	1150.18	11.76	1985.64	7292.94	729.29	6563.65
432	JAUNPUR	MUFTIGANJ	13124	1859.19	1338.59	7.07	2327.61	5532.46	276.62	5255.84
433	JAUNPUR	MUNGRA BADSHAHPUR	22240	4221.09	1257.02	11.98	2047.29	7537.38	753.74	6783.64
434	JAUNPUR	RAMNAGAR	18678	3545.03	608.51	10.06	937.31	5100.91	510.09	4590.82
435	JAUNPUR	RAMPUR	20059	3807.14	365.11	10.8	609.45	4792.5	479.26	4313.24
436	JAUNPUR	SHAHGANJ	29149	5532.39	1610.96	15.7	2775.7	9934.75	993.48	8941.27
437	JAUNPUR	SIKRARA	15558	2952.86	359.82	8.38	588.03	3909.09	390.91	3518.18
438	JAUNPUR	SIRKONI	15315	2906.74	309.43	8.25	499.48	3723.9	372.39	3351.51
439	JAUNPUR	SUITHA KALAN	21089	4002.63	1095.02	11.36	2006.28	7115.29	711.52	6403.77
440	JAUNPUR	SUJANGANJ	22101	3145.13	1335.23	11.9	2078.39	6570.65	328.53	6242.12
441	JHANSI	BABINA	46198	1782.55	1496.39	0	3170.19	6449.13	322.46	6126.67
442	JHANSI	BAMAUR	47610	5633.13	2436.43	0	2798.29	10867.85	1086.79	9781.06
443	JHANSI	BANGRA	49225	1758.71	1278.25	0	2837.85	5874.81	293.74	5581.07
444	JHANSI	BARAGAON	52146	1799.53	2299.84	0	2478.49	6577.86	657.79	5920.07
445	JHANSI	CHIRGAON	72033	8522.82	2592.15	0	3541.77	14656.74	1465.68	13191.06
446	JHANSI	GURSARAI	80148	3160.99	1409.05	0	2808.41	7378.45	737.84	6640.61
447	JHANSI	MAURANIPUR	49873	1721.09	1744.03	0	3768.7	7233.82	723.38	6510.44
448	JHANSI	MOTH	64704	5103.78	4495.24	0	2519.52	12118.54	1211.85	10906.69

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449	KANNAUJ	CHHIBRAMAU	34546	4236.06	1536.7	108.89	3153.11	9034.76	903.48	8131.28
450	KANNAUJ	GOGRAPUR	12262	1804.29	198.12	38.65	340.74	2381.8	238.18	2143.62
451	KANNAUJ	HASERAN	22100	2167.94	1478.4	69.66	3219.19	6935.19	693.51	6241.68
452	KANNAUJ	JALALABAD	12220	1498.43	384.23	38.52	397.29	2318.47	231.85	2086.62
453	KANNAUJ	KANNAUJ	30517	3742.02	491.13	96.19	527.56	4856.9	485.69	4371.21
454	KANNAUJ	SAURIKH	24812	2433.98	2100.58	78.21	5458.56	10071.33	1007.14	9064.19
455	KANNAUJ	TALGRAM	25166	3703.05	709.3	79.33	1117.24	5608.92	560.9	5048.02
456	KANNAUJ	UMARDA	52723	6464.94	3566.31	166.19	9535.64	19733.08	1973.31	17759.77
457	KANPUR DEHAT	AKBARPUR	27106	3769	1250.53	57.32	3520.39	8597.24	859.72	7737.52
458	KANPUR DEHAT	AMRAUDHA	36934	5135.55	846.55	78.1	1826.24	7886.44	788.64	7097.8
459	KANPUR DEHAT	DERAPUR	27276	3792.64	1308.38	57.68	2849.69	8008.39	800.84	7207.55
460	KANPUR DEHAT	JHINJHAK	26208	3644.14	1743.23	55.42	3490.72	8933.51	893.35	8040.16
461	KANPUR DEHAT	MAITHA	37479	4442.78	983.43	79.25	1831.93	7337.39	366.87	6970.52
462	KANPUR DEHAT	MALSA	28163	3915.97	897.79	59.55	2032.57	6905.88	690.59	6215.29
463	KANPUR DEHAT	RAJPUR	27429	3813.91	1205.6	58	2211.44	7288.95	728.89	6560.06
464	KANPUR DEHAT	RASULABAD	53199	7397.14	2353.56	112.5	3861.34	13724.54	1372.45	12352.09
465	KANPUR DEHAT	SANDALPUR	30005	2781.4	839.71	63.45	1637.09	5321.65	532.16	4789.49
466	KANPUR DEHAT	SARWAN KHERA	29938	2872.03	1128.08	63.31	2507.06	6570.48	328.53	6241.95
467	KANPUR NAGAR	BHITARGAON	31619	4623.63	1101.44	95.86	2235.42	8056.35	805.64	7250.71
468	KANPUR NAGAR	BIDHNU	29634	4333.37	1455.41	89.84	3243.1	9121.72	912.17	8209.55
469	KANPUR NAGAR	BILHAUR	30933	4523.32	921.67	93.78	1813.25	7352.02	735.2	6616.82
470	KANPUR NAGAR	CHAUBEPUR	21457	2853.78	2136.35	65.05	4708.36	9763.54	488.18	9275.36
471	KANPUR NAGAR	GHATAMPUR	48398	7047.28	1383.57	146.72	2542.76	11120.33	556.01	10564.32
472	KANPUR NAGAR	KAKWAN	16178	2365.7	1158.63	49.05	2747.71	6321.09	632.11	5688.98
473	KANPUR NAGAR	KALYANPUR	21789	3186.2	1740.52	66.06	4113.34	9106.12	910.61	8195.51

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474	KANPUR NAGAR	PARARA	26926	2624.92	739.55	81.63	1679.03	5125.13	512.52	4612.61
475	KANPUR NAGAR	SARSOL	30499	4459.86	1100.34	92.46	2097.28	7749.94	774.99	6974.95
476	KANPUR NAGAR	SHIVRAJAPUR	24163	3533.35	1793.44	73.25	3800.17	9200.21	920.02	8280.19
477	KANPUR NAGAR	KANPUR CITY	27887	3126.36	459.18	64.82	930.13	4580.49	458.05	4122.44
478	KASGANJ	AMANPUR	39796	5907.89	2686.99	111.3	5088.57	13794.75	689.73	13105.02
479	KASGANJ	GANJDUNDWARA	20706	3100	1435.67	57.91	4204.19	8797.77	879.78	7917.99
480	KASGANJ	KASGANJ	23178	3470.1	1279.12	64.83	3942.59	8756.64	875.66	7880.98
481	KASGANJ	PATIYALI	21259	3182.8	1897.2	59.46	4507.31	9646.77	964.68	8682.09
482	KASGANJ	SAHAWAR	24371	3648.71	1969.59	68.16	4646.82	10333.28	1033.33	9299.95
483	KASGANJ	SIDHPURA	40081	6000.73	2391.87	112.1	4598.41	13103.11	1310.31	11792.8
484	KASGANJ	SORON	29997	3578.45	1533.25	83.9	5712.53	10908.13	545.41	10362.72
485	KAUSHAMBI	CHAIL	7048	1247.09	303.92	10.74	504.84	2066.59	206.66	1859.93
486	KAUSHAMBI	KARA	25455	4504.06	1143.17	38.78	1859.31	7545.32	754.53	6790.79
487	KAUSHAMBI	KAUSHAMBI	21883	3226.69	1400.19	33.34	2050.72	6710.94	671.1	6039.84
488	KAUSHAMBI	MANJHANPUR	20016	3541.67	889.2	30.49	1475.41	5936.77	593.68	5343.09
489	KAUSHAMBI	MURATGANJ	20891	3696.5	542.97	31.83	892.26	5163.56	516.36	4647.2
490	KAUSHAMBI	NEWADA	21893	3873.79	1128.94	33.35	1781.7	6817.78	681.77	6136.01
491	KAUSHAMBI	SARSAWAN	26582	4703.47	1315.5	40.5	2001.86	8061.33	806.14	7255.19
492	KAUSHAMBI	SIRATHU	34233	5047.71	887.14	52.15	1423.52	7410.52	741.06	6669.46
493	KUSHI NAGAR	DUDHAHI	22680	3408.1	4354.77	178.63	3905.32	11846.82	1184.68	10662.14
494	KUSHI NAGAR	FAZIL NAGAR	17880	2686.81	3450.76	140.82	2652.61	8931	893.1	8037.9
495	KUSHI NAGAR	HATA	16814	2526.62	4658.33	132.43	3442.26	10759.64	1075.97	9683.67
496	KUSHI NAGAR	KAPTANGANJ	18550	2787.49	5298.37	146.1	3484.34	11716.3	1171.63	10544.67
497	KUSHI NAGAR	KASYA	12030	1807.73	4381.69	94.75	3839.22	10123.39	1012.34	9111.05
498	KUSHI NAGAR	KHADDA	32380	6082.13	5403.37	255.02	4160.64	15901.16	1590.12	14311.04

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499	KUSHI NAGAR	MOTICHAK	16330	2453.89	4380.37	128.62	3255.65	10218.53	1021.86	9196.67
500	KUSHI NAGAR	NEDUA NAURANGIYA	21130	3175.18	5251.48	166.42	5814.57	14407.65	1440.77	12966.88
501	KUSHI NAGAR	PADRAUNA	29534	4438.04	6253.59	232.61	4485.65	15409.89	1540.99	13868.9
502	KUSHI NAGAR	RAMKOLA	18870	4253.36	6258.82	148.62	4003.49	14664.29	1466.43	13197.86
503	KUSHI NAGAR	SIWARHI	23960	4500.55	4203.48	188.71	2543.03	11435.77	1143.57	10292.2
504	KUSHI NAGAR	SUKRAULI	15540	2335.18	4318.38	122.39	3223.44	9999.39	999.94	8999.45
505	KUSHI NAGAR	TAMKUHI RAJ	19910	2991.85	4896.52	156.81	3351.39	11396.57	1139.66	10256.91
506	KUSHI NAGAR	VISHUNPURWA	21770	3271.35	6026.61	171.46	6046.94	15516.36	1551.64	13964.72
507	LAKHIMPUR KHERI	BANKEYGANJ	35010	8052.19	3841.63	252.63	8056.92	20203.37	2020.33	18183.04
508	LAKHIMPUR KHERI	BEHJAM	32619	7502.27	3630.47	235.38	7555.76	18923.88	1892.38	17031.5
509	LAKHIMPUR KHERI	BIJUA	60224	11391.37	4042.7	434.58	8084.31	23952.96	1197.64	22755.32
510	LAKHIMPUR KHERI	DHAURAHARA	32781	7211.02	839.77	236.55	908.57	9195.91	459.8	8736.11
511	LAKHIMPUR KHERI	ISANAGAR	38437	8840.39	1142.01	277.36	1129.55	11389.31	1138.93	10250.38
512	LAKHIMPUR KHERI	KUMBHIGOLA	38746	7426.21	2056.07	279.59	4745.07	14506.94	1450.7	13056.24
513	LAKHIMPUR KHERI	LAKHIMPUR	33317	7662.8	2455.52	240.42	3319.44	13678.18	1367.82	12310.36
514	LAKHIMPUR KHERI	MITAULI	45961	8931.46	2632.36	331.65	6882.74	18778.21	938.91	17839.3
515	LAKHIMPUR KHERI	MOHAMMADI	40585	9334.42	1025.03	292.86	1120.76	11773.07	1177.31	10595.76
516	LAKHIMPUR KHERI	NAKAHA	35618	8192.03	1340.4	257.02	1063.8	10853.25	1085.32	9767.93
517	LAKHIMPUR KHERI	NIGHASAN	68672	15794.34	1909.76	495.54	1962.93	20162.57	2016.26	18146.31
518	LAKHIMPUR KHERI	PALIA	54023	12425.12	2399.79	389.83	1582.12	16796.86	1679.69	15117.17
519	LAKHIMPUR KHERI	PASGAWAN	44783	6866.63	971.03	323.15	847.27	9008.08	900.81	8107.27
520	LAKHIMPUR KHERI	PHULBEHAR	42962	6587.42	3147.44	310.01	4047.73	14092.6	1409.26	12683.34
521	LAKHIMPUR KHERI	RAMIABEHAR	51767	11906.24	2157.45	373.55	2729.2	17166.44	1716.65	15449.79
522	LALITPUR	BAR	45631	1922.36	742.79	0	2373.75	5038.9	503.9	4535
523	LALITPUR	BIRDHA	69004	2907.02	1072.8	0	3354.73	7334.55	733.45	6601.1

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524	LALITPUR	JAKHORA	74677	3146.01	1013.38	0	3365.94	7525.33	752.53	6772.8
525	LALITPUR	MANDWARA	55063	2319.71	936.44	0	2722.94	5979.09	597.91	5381.18
526	LALITPUR	MAHRONI	68848	2900.45	972.01	0	3105.25	6977.71	697.78	6279.93
527	LALITPUR	TALBEHAT	68719	2895.01	1408.06	0	3693.86	7996.93	799.7	7197.23
528	LUCKNOW	BAKSHI KA TALAB	35346	5643.01	2216.25	123.23	3160.37	11142.86	557.14	10585.72
529	LUCKNOW	CHINHAT	13374	2429.21	326.31	46.63	458.06	3260.21	326.02	2934.19
530	LUCKNOW	GOSAIGANJ	27721	3981.64	2729.85	96.64	4211.56	11019.69	550.98	10468.71
531	LUCKNOW	KAKORI	21246	3215.87	1654.92	74.07	2298.96	7243.82	724.38	6519.44
532	LUCKNOW	MAL	24570	3719.01	1450.11	85.66	2167.88	7422.66	742.26	6680.4
533	LUCKNOW	MALIHABAD	22899	3589.61	1155.01	79.83	1797.3	6621.75	331.09	6290.66
534	LUCKNOW	MOHANLALGANJ	38257	6107.52	3522.04	133.38	5510.84	15273.78	763.69	14510.09
535	LUCKNOW	SAROJNI NAGAR	30863	4671.54	1601.81	107.6	2456.87	8837.82	883.79	7954.03
536	LUCKNOW	LUCKNOW CITY	31010	4318.29	1309.68	82.89	2673.92	8384.78	838.48	7546.3
537	MAHOBA	CHARKHARI	71451	3157.26	1083.72	0	1325.02	5566	278.3	5287.7
538	MAHOBA	JAITPUR	51999	1898.67	1536.89	0	2102.27	5537.83	553.79	4984.04
539	MAHOBA	KABRAI	70323	3209.69	4309.78	0	5655.35	13174.82	1317.49	11857.33
540	MAHOBA	PANWARI	35568	1298.72	2271.76	0	2905.6	6476.08	647.61	5828.47
541	MAHRAJGANJ	BRIJMANGANJ	18490	5248.39	679.85	146.81	856.6	6931.65	693.16	6238.49
542	MAHRAJGANJ	DHANI	6300	1788.26	406.12	50.02	403.05	2647.45	264.75	2382.7
543	MAHRAJGANJ	GHUGHULI	18390	4589.42	1587.74	146.01	1569.55	7892.72	394.64	7498.08
544	MAHRAJGANJ	LAKSHMIPUR	22040	6256.06	1200.87	174.99	1608.93	9240.85	924.08	8316.77
545	MAHRAJGANJ	MAHARAJGANJ	22040	5754.31	3253.47	174.99	3751.77	12934.54	646.73	12287.81
546	MAHRAJGANJ	MITHAURA	23040	6539.91	1549.57	182.93	1556.61	9829.02	982.9	8846.12
547	MAHRAJGANJ	NAUTANWA	26800	7607.18	1243.41	212.79	1694.9	10758.28	1075.83	9682.45
548	MAHRAJGANJ	NICHLAUL	32130	9120.11	3142.56	255.11	3217.67	15735.45	1573.55	14161.9

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549	MAHRAJGANJ	PANIARA	21470	6094.26	1430.92	170.47	2298.39	9994.04	999.41	8994.63
550	MAHRAJGANJ	PARTAWAL	20290	4823.5	2361.48	161.1	3261.53	10607.61	530.38	10077.23
551	MAHRAJGANJ	PHARENDA	16530	4692.04	655.22	131.24	813.79	6292.29	629.23	5663.06
552	MAHRAJGANJ	SISWA BAZAR	20240	4175.59	2324.94	160.7	1869.84	8531.07	426.56	8104.51
553	MAINPURI	BARNAHAL	21035	2892.49	791.74	32.05	1205.06	4921.34	492.13	4429.21
554	MAINPURI	BEWAR	29428	4046.6	1598.82	44.84	3504.3	9194.56	919.45	8275.11
555	MAINPURI	GHIROR	34491	3161.87	3022.28	52.55	5825.51	12062.21	1206.22	10855.99
556	MAINPURI	JAGIR	21192	2914.08	1512.95	32.29	2990.87	7450.19	745.02	6705.17
557	MAINPURI	KARHAL	34596	3744.55	4177.89	52.71	6895.02	14870.17	743.51	14126.66
558	MAINPURI	KISHNI	36594	5031.99	2385.91	55.76	4493.68	11967.34	1196.73	10770.61
559	MAINPURI	KURAWALI	28079	3861.1	2038.74	42.78	3517.39	9460.01	946	8514.01
560	MAINPURI	MAINPURI	39398	5417.56	2691.51	60.03	4424.18	12593.28	1259.33	11333.95
561	MAINPURI	SULTANGANJ	31259	4265.68	1854.25	47.63	3224.25	9391.81	469.59	8922.22
562	MATHURA	BALDEO	31686	3637.07	1968.7	74.74	5171.31	10851.82	1085.19	9766.63
563	MATHURA	CHAUMUHAN	30458	2330.74	4016.4	71.84	7333.5	13752.48	1375.24	12377.24
564	MATHURA	CHHATA	42089	3933.88	5594.53	99.27	8203.91	17831.59	891.58	16940.01
565	MATHURA	FARAH	26294	3018.15	2506.57	62.02	6126.2	11712.94	1171.29	10541.65
566	MATHURA	GOVARDHAN	37251	4275.85	3127.02	87.86	7703.01	15193.74	1519.38	13674.36
567	MATHURA	MAT	27464	2627.04	2995.75	64.78	6523.29	12210.86	1221.09	10989.77
568	MATHURA	MATHURA	38223	4387.42	2061.71	90.15	5368.82	11908.1	1190.81	10717.29
569	MATHURA	NANDGAON	32736	2824.3	5241.51	77.21	7587.39	15730.41	786.52	14943.89
570	MATHURA	NOHJHIL	35738	4102.18	3075.41	84.29	7183.51	14445.39	1444.54	13000.85
571	MATHURA	RAYA	34139	3801.07	3528.5	80.52	7124.64	14534.73	726.74	13807.99
572	MAUNATH BHANJAN	BADRAON	17086	3183.16	1052.48	45.67	1311.26	5592.57	559.25	5033.32
573	MAUNATH BHANJAN	DOHRI GHAT	17525	3264.95	1172.51	46.84	1251.41	5735.71	573.58	5162.13

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574	MAUNATH BHANJAN	FATEHPUR MADRAUN	24982	4654.2	1145.1	66.78	1324.15	7190.23	719.02	6471.21
575	MAUNATH BHANJAN	GHOSI	15492	1983.2	2135.41	41.41	2715.54	6875.56	343.78	6531.78
576	MAUNATH BHANJAN	KOPAGANJ	19619	3578.1	848.21	52.44	1021.02	5499.77	274.99	5224.78
577	MAUNATH BHANJAN	MOHAMMADABAD	18341	3416.97	215.37	49.03	384.1	4065.47	406.54	3658.93
578	MAUNATH BHANJAN	PARDAHA	15644	2914.51	209.08	41.82	356.56	3521.97	352.2	3169.77
579	MAUNATH BHANJAN	RANIPUR	22830	4253.28	1396.77	61.02	1646.89	7357.96	735.79	6622.17
580	MAUNATH BHANJAN	RATANPURA	20105	3745.6	588.41	53.74	896.51	5284.26	528.43	4755.83
581	MEERUT	DAURALA	18702	3236.01	885.16	123.83	1450.51	5695.51	569.55	5125.96
582	MEERUT	HASTINAPUR	34328	5528.56	3605.24	227.28	5493.43	14854.51	742.73	14111.78
583	MEERUT	JANI	17902	2581.32	2186.65	118.53	3329.92	8216.42	821.65	7394.77
584	MEERUT	KHARKHODA	19912	2871.14	412	131.84	518.73	3933.71	393.37	3540.34
585	MEERUT	MACHHRA	18235	2103.47	1190.38	120.73	1835.04	5249.62	524.96	4724.66
586	MEERUT	MAWANA KALAN	20358	3522.54	1399.63	134.79	2174.18	7231.14	723.12	6508.02
587	MEERUT	MEERUT	14675	2116.01	658.72	97.16	632.25	3504.14	350.41	3153.73
588	MEERUT	PARICHHATGARH	38103	6592.96	1234.59	252.28	2021.18	10101.01	1010.11	9090.9
589	MEERUT	RAJPURA	19061	3298.12	611.85	126.2	905.4	4941.57	494.16	4447.41
590	MEERUT	ROHTA	17845	3087.72	1251.65	118.15	1882.51	6340.03	634.01	5706.02
591	MEERUT	SARDHANA	18219	3152.43	1365.3	120.63	2296.87	6935.23	693.52	6241.71
592	MEERUT	SARURPUR	19220	2217.09	644.68	127.26	1017.85	4006.88	400.69	3606.19
593	MEERUT	MEERUT CITY	24489	1845.81	5.49	84.76	10.36	1946.42	194.64	1751.78
594	MIRZAPUR	CHANBEY	27123	2169.21	823.34	5.79	958.74	3957.08	197.86	3759.22
595	MIRZAPUR	CITY	21644	2703.8	991.23	5.01	1236.23	4936.27	493.62	4442.65
596	MIRZAPUR	HALLIA	43611	2793.83	1996.88	6.21	2150.1	6947.02	694.7	6252.32
597	MIRZAPUR	JAMALPUR	23332	2998.46	2676.18	6.64	2998.37	8679.65	433.98	8245.67
598	MIRZAPUR	KON	9670	848.66	250.11	2.07	389.32	1490.16	74.51	1415.65

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599	MIRZAPUR	LALGANJ	39392	2018.84	1787.02	5.61	2683.95	6495.42	649.55	5845.87
600	MIRZAPUR	MAJHAWAN	11719	2027.02	555.51	3.75	830.85	3417.13	341.71	3075.42
601	MIRZAPUR	MARIHAN	19474	998.04	1775.75	2.77	2034.35	4810.91	481.09	4329.82
602	MIRZAPUR	NARAYANPUR	22133	3402.94	1408.21	6.3	1656.96	6474.41	647.45	5826.96
603	MIRZAPUR	PAHARI	32590	1670.23	1518.63	4.64	1507.1	4700.6	470.06	4230.54
604	MIRZAPUR	RAJGARH	33169	1699.91	1913.46	4.72	2398.14	6016.23	601.63	5414.6
605	MIRZAPUR	SIKHAR	11580	2225.53	422.87	4.12	615.29	3267.81	326.78	2941.03
606	MORADABAD	BILARI	26908	4139.87	647.6	134.62	829.29	5751.38	575.14	5176.24
607	MORADABAD	CHHAJLET	31167	5527.36	1652.53	155.93	2507.25	9843.07	492.15	9350.92
608	MORADABAD	DILARI	31295	5777.79	1405.46	156.57	1999.76	9339.58	933.96	8405.62
609	MORADABAD	KUNDARKI (DENGAPUR)	28616	5283.18	1839.67	143.17	2524.04	9790.06	979.01	8811.05
610	MORADABAD	MORADABAD	17349	3203.03	1462.2	86.8	2170.94	6922.97	692.29	6230.68
611	MORADABAD	MUNDAPANDEY	27419	4888.33	745.91	137.18	1226.53	6997.95	349.9	6648.05
612	MORADABAD	THAKURDWARA	31795	3913.4	2968.72	159.07	3860.63	10901.82	1090.18	9811.64
613	MORADABAD	BHAGATPUR	22670	2790.27	973.26	113.42	800.53	4677.48	467.75	4209.73
614	MORADABAD	MORADABAD City	7725	745.52	357.07	20.2	717.66	1840.45	184.05	1656.4
615	MUZAFFARNAGAR	BHAGHARA	23873	4205.11	2009.72	270.9	3312.21	9797.94	489.9	9308.04
616	MUZAFFARNAGAR	BUDHANA	30470	5940.64	637.28	345.76	798.62	7722.3	772.23	6950.07
617	MUZAFFARNAGAR	CHARTHAWAL	27552	3591.36	2325.97	312.65	3994.86	10224.84	511.25	9713.59
618	MUZAFFARNAGAR	JANSATH	48218	7027.1	4093.72	547.15	6722.11	18390.08	919.5	17470.58
619	MUZAFFARNAGAR	KHATAULI	30743	5447.66	4073.18	348.86	7435.43	17305.13	865.25	16439.88
620	MUZAFFARNAGAR	MORNA	38769	5039.12	3315.69	439.93	5942.23	14736.97	1473.7	13263.27
621	MUZAFFARNAGAR	MUZAFFARNAGAR	22485	4164.65	1544.94	255.15	2451.05	8415.79	420.79	7995
622	MUZAFFARNAGAR	PURQAJI	29202	4788.4	4749.04	331.37	8365.69	18234.5	911.72	17322.78
623	MUZAFFARNAGAR	SHAHPUR	24354	3471.29	915.92	276.36	1375.98	6039.55	301.98	5737.57

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624	PILIBHIT	AMARIA	39886	8322.65	2227.51	147.97	4236.98	14935.11	746.76	14188.35
625	PILIBHIT	BARKHERA	32075	6919.64	1549.26	118.99	2657.81	11245.7	562.28	10683.42
626	PILIBHIT	BILSANDA	36510	7723.14	2032.57	135.45	3330.53	13221.69	661.09	12560.6
627	PILIBHIT	BISALPUR	27271	6761.13	976.13	101.17	1918.49	9756.92	487.84	9269.08
628	PILIBHIT	LALAURIKHERA	23267	5799.45	1413.11	86.32	2653.87	9952.75	995.28	8957.47
629	PILIBHIT	MARAURI	30194	6421.72	1460.05	112.02	2689.38	10683.17	534.16	10149.01
630	PILIBHIT	PURANPUR	147756	24552.75	6059.32	548.15	10936.39	42096.61	4209.66	37886.95
631	PRATAPGARH	ASPUR DEOSARA	21207	2492.2	1444.94	11.59	2288.98	6237.71	623.77	5613.94
632	PRATAPGARH	BABA BELKHAR NATH	18467	2994.2	798.47	10.1	1198.93	5001.7	250.08	4751.62
633	PRATAPGARH	BABAGANJ	24963	3667	3257.83	13.65	4818.72	11757.2	1175.72	10581.48
634	PRATAPGARH	BIHAR	23509	4144.09	2882.63	12.85	4231.14	11270.71	1127.07	10143.64
635	PRATAPGARH	GAURA	18759	2443.97	1918.88	10.26	2955.46	7328.57	366.43	6962.14
636	PRATAPGARH	KALANKER	29516	5202.98	2725.22	16.14	4071.05	12015.39	1201.54	10813.85
637	PRATAPGARH	KUNDA	19045	2797.66	2999.26	10.41	4434.92	10242.25	1024.22	9218.03
638	PRATAPGARH	LAKSHAMANPUR	18940	2579.26	1863.24	10.35	2574.53	7027.38	351.37	6676.01
639	PRATAPGARH	LALGANJ	22552	3975.39	1449.42	12.33	2027.86	7465	746.5	6718.5
640	PRATAPGARH	MANDHATA	20347	3586.7	2009.04	11.12	2766.15	8373.01	837.3	7535.71
641	PRATAPGARH	MANGARAURA	16534	2914.56	1460.69	9.04	2242.87	6627.16	662.72	5964.44
642	PRATAPGARH	PATTI	21675	3820.8	1099.35	11.85	1669.36	6601.36	660.13	5941.23
643	PRATAPGARH	RAMPUR-SANGRAMGARH	21036	3708.16	1130.84	11.5	1525.26	6375.76	637.58	5738.18
644	PRATAPGARH	SADAR	21576	3780.86	1626.45	11.8	2399.69	7818.8	390.94	7427.86
645	PRATAPGARH	SANDWA CHANDIKA	26513	4531.95	2022.82	14.49	2494.36	9063.62	453.18	8610.44
646	PRATAPGARH	SANGAIPUR	19613	3457.32	1586.12	10.72	2243.59	7297.75	729.77	6567.98
647	PRATAPGARH	SHIVGARH	27491	4846.02	1244.23	15.03	1847.09	7952.37	795.23	7157.14
648	PRAYAGRAJ	BAHADURPUR	22704	3623.99	1288.09	0	1664.16	6576.24	328.81	6247.43

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649	PRAYAGRAJ	BAHARIA	13345	2376.43	1363.97	0	1994.97	5735.37	573.54	5161.83
650	PRAYAGRAJ	CHAKA	13575	2417.38	1004.26	0	1253.6	4675.24	467.52	4207.72
651	PRAYAGRAJ	DHANUPUR	17322	3084.64	1521.02	0	2059.74	6665.4	666.54	5998.86
652	PRAYAGRAJ	HANDIA	17052	3036.56	831.68	0	1131.57	4999.81	499.98	4499.83
653	PRAYAGRAJ	HOLAGARH	11240	1334.38	1404.84	0	2047.03	4786.25	478.62	4307.63
654	PRAYAGRAJ	JASRA	26822	4113.91	1371.98	0	1587.08	7072.97	353.64	6719.33
655	PRAYAGRAJ	KARCHANA	23281	4145.79	1635.41	0	2233.45	8014.65	801.46	7213.19
656	PRAYAGRAJ	KAUDHIYARA	20046	2596.05	1685.66	0	2479.21	6760.92	338.05	6422.87
657	PRAYAGRAJ	KAURIHAR	12976	2120.73	765.52	0	1272.85	4159.1	207.95	3951.15
658	PRAYAGRAJ	KORAON	63842	7234.65	1257.43	0	1779.76	10271.84	1027.19	9244.65
659	PRAYAGRAJ	MANDA	20673	2342.69	1648.83	0	2394.51	6386.03	638.6	5747.43
660	PRAYAGRAJ	MAUAIMA	15560	2770.87	1293.45	0	1880.59	5944.91	594.49	5350.42
661	PRAYAGRAJ	MEJA	34201	3875.7	2087.16	0	2558.59	8521.45	852.15	7669.3
662	PRAYAGRAJ	PHULPUR	17495	3115.44	853.12	0	1339.62	5308.18	530.82	4777.36
663	PRAYAGRAJ	PRATAPPUR	21101	3757.59	1319.85	0	1929.46	7006.9	700.69	6306.21
664	PRAYAGRAJ	SAIDABAD	19142	3408.73	1010.33	0	1464.85	5883.91	588.39	5295.52
665	PRAYAGRAJ	SHANKARGARH	33128	1430.14	2692.44	0	3453.46	7576.04	757.61	6818.43
666	PRAYAGRAJ	SORAON	13245	2358.62	789.33	0	1017.86	4165.81	416.59	3749.22
667	PRAYAGRAJ	URUWAN	16890	3007.71	1243.46	0	1802.75	6053.92	605.4	5448.52
668	PRAYAGRAJ	BHAGWATPUR	18971	3378.28	473.35	0	649.66	4501.29	450.13	4051.16
669	PRAYAGRAJ	SAHSON	17815	3172.43	502.12	0	592.38	4266.93	426.7	3840.23
670	PRAYAGRAJ	SHRINGVERPUR DHAM	12021	2140.65	629.85	0	628.19	3398.69	339.87	3058.82
671	PRAYAGRAJ	PRAYAGRAJ CITY	17183	2322.45	92.5	0	178.86	2593.81	259.39	2334.42
672	RAIBARELI	AMAWAN	19814	3117.77	960.52	11.38	955.58	5045.25	504.53	4540.72
673	RAIBARELI	BACHRAWAN	27162	3074.68	2994.75	15.6	4796.52	10881.55	544.08	10337.47

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674	RAIBARELI	DALMAU	25095	3948.75	1410.18	14.41	2122.57	7495.91	749.59	6746.32
675	RAIBARELI	DEENSAH GAURA	16633	2617.23	1270.79	9.55	1629.03	5526.6	552.66	4973.94
676	RAIBARELI	HARCHANDPUR	21318	2405.93	1533.22	12.24	2141.48	6092.87	304.65	5788.22
677	RAIBARELI	JAGATPUR	12252	1927.88	564.03	7.04	743.46	3242.41	324.24	2918.17
678	RAIBARELI	KHIRON	20791	2360.23	1541.67	11.94	2534.48	6448.32	322.42	6125.9
679	RAIBARELI	LALGANJ	22309	2874.41	2572.01	12.81	3913.69	9372.92	468.65	8904.27
680	RAIBARELI	MAHARAJGANJ	23375	3678.1	1982.34	13.42	3113.07	8786.93	878.69	7908.24
681	RAIBARELI	RAHI	28677	4512.38	1628.64	16.47	2746.45	8903.94	890.39	8013.55
682	RAIBARELI	ROHANIYA	16815	2645.87	424.13	9.66	687.09	3766.75	376.67	3390.08
683	RAIBARELI	SARAINI	26108	2738.76	865.64	14.99	1594.39	5213.78	521.38	4692.4
684	RAIBARELI	SATAWAN	24240	3178.51	1451.36	13.92	2359.44	7003.23	700.33	6302.9
685	RAIBARELI	SHIVGARH	19527	3072.61	1403.08	11.21	2517.54	7004.44	700.45	6303.99
686	RAIBARELI	UNCHAHAR	21862	2293.35	981.01	12.55	1121.7	4408.61	440.87	3967.74
687	RAIBARELI	CHHATOH	17837	2806.69	860.26	10.24	1668.56	5345.75	534.57	4811.18
688	RAIBARELI	DIH	20618	3244.28	1828.67	11.84	3350.84	8435.63	843.57	7592.06
689	RAIBARELI	SALAON	28025	4409.79	1859.43	16.09	3168.34	9453.65	945.36	8508.29
690	RAMPUR	BILASPUR	52251	11176.24	5577.43	357.26	8618.05	25728.98	2572.9	23156.08
691	RAMPUR	CHAMRAUWA	21558	4611.15	1366.42	147.4	2391.52	8516.49	851.65	7664.84
692	RAMPUR	MILAK	41081	5858.02	2386.81	280.89	4094.89	12620.61	1262.06	11358.55
693	RAMPUR	SAID NAGAR	21478	4594.04	425.99	146.85	638.9	5805.78	580.58	5225.2
694	RAMPUR	SAUR	53282	8003.09	2187.79	364.31	3764.76	14319.95	715.99	13603.96
695	RAMPUR	SHAHABAD	40140	8470.88	454.59	274.45	618.57	9818.49	490.92	9327.57
696	SAHARANPUR	BALLIA KHERI	26997	5082	2364.53	399.79	3813.15	11659.47	582.98	11076.49
697	SAHARANPUR	DEOBAND	28398	4673.66	2034.25	420.54	4712.62	11841.07	1184.11	10656.96
698	SAHARANPUR	GANGOH	39823	8550.74	1907.73	589.73	2740.02	13788.22	689.41	13098.81

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699	SAHARANPUR	MUZAFFARABAD	62690	10529.08	1503.86	928.36	2460.2	15421.5	771.08	14650.42
700	SAHARANPUR	NAGAL	27219	6719.43	2491.27	403.08	4088.72	13702.5	1370.25	12332.25
701	SAHARANPUR	NAKUR	34063	7576.73	1359.81	504.43	2106.15	11547.12	577.36	10969.76
702	SAHARANPUR	NANAUTA	24013	5286.64	2013.41	355.6	3274.71	10930.36	546.52	10383.84
703	SAHARANPUR	PUNWARKA	26096	5234.38	2508.01	386.45	4007.44	12136.28	606.81	11529.47
704	SAHARANPUR	RAMPUR MANIHARAN	23132	3960.75	1676.13	342.56	2828.82	8808.26	440.41	8367.85
705	SAHARANPUR	SADHAULI KADEEM	41560	10259.73	1949.63	615.45	3882.27	16707.08	1670.71	15036.37
706	SAHARANPUR	SARSAWA	34950	7982.19	2026.18	517.57	3337.09	13863.03	693.15	13169.88
707	SAMBHAL	ASMOLI	26676	4296.86	364.08	102.68	589.94	5353.56	535.35	4818.21
708	SAMBHAL	BAHJOI	25366	3258.64	328.73	97.64	460.63	4145.64	207.28	3938.36
709	SAMBHAL	BANIAKHERA	30197	4864.01	431.11	116.23	705.11	6116.46	611.64	5504.82
710	SAMBHAL	GUNNAUR	30146	4855.79	433.37	116.04	735.08	6140.28	614.03	5526.25
711	SAMBHAL	JANAWAI	30005	4833.08	389.6	115.49	673.21	6011.38	601.14	5410.24
712	SAMBHAL	PAWANSA	33773	5440.02	514.13	130	760.43	6844.58	684.45	6160.13
713	SAMBHAL	RAJPURA	30473	4908.47	554.48	117.29	964.27	6544.51	654.45	5890.06
714	SAMBHAL	SAMBHAL	34884	5618.97	351.3	134.27	583.3	6687.84	668.79	6019.05
715	SANT KABIR NAGAR	BAGHAULI	18753	4503.17	614.11	87.04	1048.74	6253.06	312.65	5940.41
716	SANT KABIR NAGAR	HAISAR BAZAR	22968	5954.64	480.95	106.61	820.85	7363.05	736.31	6626.74
717	SANT KABIR NAGAR	KHALILABAD	17378	4505.39	353.19	80.66	766.89	5706.13	570.61	5135.52
718	SANT KABIR NAGAR	MEHDAWAL	19617	5085.86	430.58	91.05	827.59	6435.08	643.5	5791.58
719	SANT KABIR NAGAR	NATH NAGAR	20801	5392.83	623.06	96.55	1184.12	7296.56	729.66	6566.9
720	SANT KABIR NAGAR	PAULI	13484	3495.84	254.07	62.59	421.51	4234.01	423.4	3810.61
721	SANT KABIR NAGAR	SANTHA	19366	5020.79	376.57	89.89	655.01	6142.26	614.23	5528.03
722	SANT KABIR NAGAR	SEMARIYAWAN	20074	5204.35	627.23	93.17	1016.43	6941.18	694.12	6247.06
723	SANT KABIR NAGAR	VELHAR KALAN	12258	3177.98	259.11	56.9	321.08	3815.07	381.51	3433.56

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724	SANT RAVIDAS NAGAR	ABHAULI	9292	1535.51	2037.25	17.46	2261.78	5852	585.2	5266.8
725	SANT RAVIDAS NAGAR	AURAI	18876	2495.42	2776.12	35.46	3132.14	8439.14	843.91	7595.23
726	SANT RAVIDAS NAGAR	BHADOHI	23220	4604.55	1215	43.63	1819.19	7682.37	768.24	6914.13
727	SANT RAVIDAS NAGAR	DEEGH	21253	4214.49	7577.23	39.93	30613.51	42445.16	4244.51	38200.65
728	SANT RAVIDAS NAGAR	GYANPUR	13980	1848.16	7308.36	26.27	7699.66	16882.45	1688.24	15194.21
729	SANT RAVIDAS NAGAR	SURIYAWAN	11684	2075.82	1166.45	21.95	1470.72	4734.94	236.74	4498.2
730	SHAHJAHANPUR	BANDA	49007	9741.26	1299.86	287.83	1975.68	13304.63	665.24	12639.39
731	SHAHJAHANPUR	BHAWAL KHERA	29242	5742.43	1689.14	171.75	2005.63	9608.95	480.45	9128.5
732	SHAHJAHANPUR	DADROL	31033	6114.31	1015.5	182.27	1444.72	8756.8	437.84	8318.96
733	SHAHJAHANPUR	JAITPUR	23172	4631.91	839.38	136.1	1332.88	6940.27	694.03	6246.24
734	SHAHJAHANPUR	JALALABAD	45863	9167.68	1388.93	269.37	2343.43	13169.41	1316.94	11852.47
735	SHAHJAHANPUR	KALAN	23155	4196.58	421.06	136	772.26	5525.9	276.29	5249.61
736	SHAHJAHANPUR	KANTH	22017	3514.31	1454.99	129.31	1957.64	7056.25	352.82	6703.43
737	SHAHJAHANPUR	KATRA	22612	4407.18	1438.02	132.81	1879.77	7857.78	392.89	7464.89
738	SHAHJAHANPUR	KHUTAR	46982	8157.93	1180.27	275.94	1834.33	11448.47	572.42	10876.05
739	SHAHJAHANPUR	MADANAPUR	27976	5592.2	561.85	164.31	998	7316.36	731.64	6584.72
740	SHAHJAHANPUR	MIRZAPUR	32965	6342.3	980.19	193.61	1426.74	8942.84	447.14	8495.7
741	SHAHJAHANPUR	NIGOHI	30939	5754.67	1731.99	181.71	2454.47	10122.84	506.14	9616.7
742	SHAHJAHANPUR	PUYAWAN	28359	5668.76	1089.24	166.56	1473.56	8398.12	839.81	7558.31
743	SHAHJAHANPUR	SINDHAULI	23552	4261.27	1320.66	138.33	1829.41	7549.67	377.49	7172.18
744	SHAHJAHANPUR	TILHAR	21257	3418.53	1251.85	124.85	1634.04	6429.27	321.46	6107.81
745	SHAMLI	KAIRANA	23878	3879.63	1839.57	270.96	2803.26	8793.42	439.67	8353.75
746	SHAMLI	KANDHALA	26451	4965.73	1820.43	300.15	2770.72	9857.03	492.85	9364.18
747	SHAMLI	SHAMLI	21873	3553.76	2131.08	248.2	3099.66	9032.7	903.27	8129.43
748	SHAMLI	THANA BHAWAN	23440	3046.68	2071.71	265.99	3148.71	8533.09	853.31	7679.78

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749	SHAMLI	UN	40484	6436.62	1188.64	459.39	1923.97	10008.62	500.43	9508.19
750	SHRAWASTI	GILAULA	31676	7516.02	1102.34	202.43	1481.64	10302.43	515.12	9787.31
751	SHRAWASTI	HARIHARPUR RANI	36377	8821.41	755.01	232.48	1293.23	11102.13	1110.21	9991.92
752	SHRAWASTI	IKAUNA	28731	6967.26	1172.2	183.61	1732.15	10055.22	1005.53	9049.69
753	SHRAWASTI	JAMUNAHA	36241	8788.43	971.48	231.61	1541.12	11532.64	1153.26	10379.38
754	SHRAWASTI	SIRSIYA	52757	10964.19	602.38	337.16	1055.14	12958.87	647.94	12310.93
755	SIDDHARTH NAGAR	BANSI	19189	4590.02	699.19	87.78	1015.11	6392.1	639.21	5752.89
756	SIDDHARTH NAGAR	BARHANI	18616	4452.96	487.31	85.16	776.49	5801.92	580.2	5221.72
757	SIDDHARTH NAGAR	BHANWAPUR	30675	7337.48	1162.62	140.32	1634.53	10274.95	1027.5	9247.45
758	SIDDHARTH NAGAR	BIRDPUR	16249	3886.77	1175.64	74.33	1963.19	7099.93	709.99	6389.94
759	SIDDHARTH NAGAR	DOMARIAGANJ	26172	6260.36	1105.07	119.72	1535.68	9020.83	902.08	8118.75
760	SIDDHARTH NAGAR	ITWA	24921	5961.12	867.67	114	1261.74	8204.53	820.45	7384.08
761	SIDDHARTH NAGAR	JOGIYA	20537	4912.46	528.12	93.95	830.84	6365.37	636.54	5728.83
762	SIDDHARTH NAGAR	KHESRHA	21225	5077.03	707.93	97.09	1133.16	7015.21	701.53	6313.68
763	SIDDHARTH NAGAR	KHUNIYAW	28507	6818.89	989.01	130.4	1383.21	9321.51	932.15	8389.36
764	SIDDHARTH NAGAR	LOTAN	12400	2858.04	564.9	56.72	661.51	4141.17	207.06	3934.11
765	SIDDHARTH NAGAR	MITHWAL	22761	5444.45	634.93	104.12	1007.61	7191.11	719.11	6472
766	SIDDHARTH NAGAR	NAUGARH	13962	3339.72	504.11	63.87	818.68	4726.38	472.63	4253.75
767	SIDDHARTH NAGAR	SHOHATGARH	21069	5039.72	589.35	96.38	920.53	6645.98	664.6	5981.38
768	SIDDHARTH NAGAR	USKA BAZAR	13220	2633.79	424.07	60.47	764.42	3882.75	194.13	3688.62
769	SITAPUR	AILIA	25842	3590.14	1394.14	90.47	2114.32	7189.07	359.45	6829.62
770	SITAPUR	BEHTA	36759	7541.21	718.42	128.7	1079.63	9467.96	946.79	8521.17
771	SITAPUR	BISWAN	36006	4924.49	2164.9	126.06	3838.84	11054.29	1105.43	9948.86
772	SITAPUR	GONDLAMAU	32609	6689.83	662.36	114.17	1000.18	8466.54	846.66	7619.88
773	SITAPUR	HARGAON	27962	4780.4	4226.89	97.9	6659.96	15765.15	1576.52	14188.63

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774	SITAPUR	KASMANDA	27658	5674.12	2277.54	96.83	3058.68	11107.17	1110.72	9996.45
775	SITAPUR	KHAIRABAD	26542	3630.11	1881.56	92.93	2795.88	8400.48	840.05	7560.43
776	SITAPUR	LAHARPUR	24388	3335.51	5735.15	85.38	9956.08	19112.12	1911.22	17200.9
777	SITAPUR	MACHHREHTA	27664	3783.57	1548.6	96.85	2406.86	7835.88	783.59	7052.29
778	SITAPUR	MAHMUDABAD	22453	3070.86	1205.86	78.61	1771.73	6127.06	612.7	5514.36
779	SITAPUR	MAHOLI	24003	3282.86	2248.71	84.04	3254.21	8869.82	886.99	7982.83
780	SITAPUR	MISRIKH	30253	4229.77	2048.4	105.92	2842.76	9226.85	461.34	8765.51
781	SITAPUR	PAHALA	28324	4842.29	5468.03	99.16	9802.95	20212.43	2021.24	18191.19
782	SITAPUR	PARSENDI	29062	4404.75	2692.2	101.75	3847.98	11046.68	552.34	10494.34
783	SITAPUR	PISAWAN	40649	5559.5	1781.63	142.32	2760.05	10243.5	1024.35	9219.15
784	SITAPUR	RAMPUR MATHURA	34464	7070.39	741.91	120.66	875.02	8807.98	880.8	7927.18
785	SITAPUR	REWSA	43121	8781.57	889.63	150.97	1572.98	11395.15	569.76	10825.39
786	SITAPUR	SAKRAN	30855	6329.99	548.56	108.03	1002.67	7989.25	798.93	7190.32
787	SITAPUR	SIDHAULI	26081	3567.06	1666.95	91.31	2636.53	7961.85	796.18	7165.67
788	SONBHADRA	BABHANI	20142	994.89	1101.3	10.78	615.94	2722.91	272.29	2450.62
789	SONBHADRA	CHATRA	23296	1527.53	1642.91	12.47	1250.42	4433.33	221.66	4211.67
790	SONBHADRA	CHOPAN	51159.66	3790.47	655.12	27.38	681.26	5154.23	515.42	4638.81
791	SONBHADRA	DUDHI	18306.69	1130.3	2249.68	9.8	929.61	4319.39	431.94	3887.45
792	SONBHADRA	GHORAWAL	26766.29	1652.62	5339.17	14.33	2555.37	9561.49	956.15	8605.34
793	SONBHADRA	MYORPUR	35117	2168.21	2875.86	18.8	1455.72	6518.59	651.86	5866.73
794	SONBHADRA	NAGAWA	9100	561.86	1294.17	4.87	920.22	2781.12	278.11	2503.01
795	SONBHADRA	ROBERTSGANJ	34291.09	2117.22	10430.07	18.36	2122.84	14688.49	1468.85	13219.64
796	SONBHADRA	KARMA	16285.37	1005.5	3475.19	8.72	809.68	5299.09	529.91	4769.18
797	SONBHADRA	KONE	6994.79	431.88	963.06	3.74	488.72	1887.4	188.74	1698.66
798	SULTANPUR	AKHAND NAGAR	22051	4116.25	992.95	14.51	1574.7	6698.41	669.84	6028.57

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799	SULTANPUR	BALDIRAI	22418	4184.75	1098.99	14.75	1632.89	6931.38	693.13	6238.25
800	SULTANPUR	BHADAIYAN	21123	3691.12	717.76	13.9	1195.21	5617.99	280.9	5337.09
801	SULTANPUR	DHANPATGANJ	22520	4003.25	1614.47	14.82	2308.35	7940.89	397.05	7543.84
802	SULTANPUR	DOSTPUR	18392	3433.22	1454.58	12.1	2025.79	6925.69	692.57	6233.12
803	SULTANPUR	DUBEPUR	19228	3589.28	1435.16	12.65	2104.13	7141.22	714.12	6427.1
804	SULTANPUR	JAI SINGHPUR	22575	4088.19	1567.03	14.85	2257.13	7927.2	396.36	7530.84
805	SULTANPUR	KADIPUR	15285	2377.7	1322.1	10.06	1778.55	5488.41	548.84	4939.57
806	SULTANPUR	KUREBHAR	22188	2931.22	2677.31	14.6	3646.74	9269.87	463.5	8806.37
807	SULTANPUR	KURWAR	21407	3996.03	1856.53	14.09	2435.82	8302.47	830.25	7472.22
808	SULTANPUR	LAMBHUA	21487	4010.97	1907.41	14.14	2603.57	8536.09	853.61	7682.48
809	SULTANPUR	MOTIGARPUR	12274	2291.18	648.99	8.08	921.47	3869.72	386.97	3482.75
810	SULTANPUR	P.P. KANNAICHA	13686	2554.76	891.38	9.01	1294.41	4749.56	474.95	4274.61
811	SULTANPUR	KARONDIKALA	10747	2006.14	519.55	7.07	626.5	3159.26	315.93	2843.33
812	UNNAO	ASOHA	29225	4488.29	3053.66	61.35	4000.89	11604.19	580.21	11023.98
813	UNNAO	AURAS	26589	4232.77	3038.39	55.82	4504.03	11831.01	1183.11	10647.9
814	UNNAO	BANGARMAU	25320	2687.17	1917.5	53.15	2776.22	7434.04	743.41	6690.63
815	UNNAO	BICHHIA	33648	3646.7	4600.56	70.64	6528.43	14846.33	742.31	14104.02
816	UNNAO	BIGHAPUR	28998	3077.51	1897.63	60.87	2510.79	7546.8	754.68	6792.12
817	UNNAO	FATEHPUR CHAURASI	27654	2934.87	3051.8	58.05	3913.53	9958.25	995.83	8962.42
818	UNNAO	GANG MURADABAD	24433	3889.55	2221.23	51.29	3095.39	9257.46	925.75	8331.71
819	UNNAO	HASANGANJ	30444	4038.71	3555.02	63.91	5310.39	12968.03	1296.8	11671.23
820	UNNAO	HILAULI	31537	3903.38	1678.13	66.2	2180.37	7828.08	391.41	7436.67
821	UNNAO	MIANGANJ	27395	2907.39	4550.11	57.51	6415.64	13930.65	1393.07	12537.58
822	UNNAO	NAWABGANJ	27571	4389.1	2460.9	57.88	3271.95	10179.83	1017.98	9161.85
823	UNNAO	PURWA	26580	4231.34	3098.81	55.8	4377.43	11763.38	1176.33	10587.05

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824	UNNAO	SAFIPUR	25599	3320.97	2289.78	53.74	3114.27	8778.76	438.94	8339.82
825	UNNAO	SIKANDAR SIRAUSI	34983	5569.03	2788.47	73.44	3480.3	11911.24	1191.12	10720.12
826	UNNAO	SIKANDARPUR KARAN	32580	5186.49	2068.56	68.39	2899.44	10222.88	1022.29	9200.59
827	UNNAO	SUMERPUR	27678	3671.78	3024.42	58.1	4410.95	11165.25	1116.53	10048.72
828	VARANASI	ARAZILINE	21886	4257.81	959.29	17.87	1500.2	6735.17	673.52	6061.65
829	VARANASI	BARAGAON	17433	3391.5	940.86	14.24	1413.58	5760.18	576.02	5184.16
830	VARANASI	CHIRAIGAON	19599	3812.88	657.88	16.01	1032.51	5519.28	551.93	4967.35
831	VARANASI	CHOLAPUR	17937	3489.55	1841.69	14.65	2712.61	8058.5	805.85	7252.65
832	VARANASI	HARAHUA	14117	2178.62	1271.18	11.53	1986.2	5447.53	272.38	5175.15
833	VARANASI	KASHI VIDYAPITH	14340	2789.77	736.75	11.71	1141.93	4680.16	468.01	4212.15
834	VARANASI	PINDRA	22350	4348.08	1419.72	18.25	2162.42	7948.47	794.85	7153.62
835	VARANASI	SEVAPURI	16913	3290.34	1178.86	13.81	1790.33	6273.34	627.33	5646.01
836	VARANASI	VARANASI City	15957	1192.72	506.4	5.01	867.39	2571.52	257.15	2314.37

Annexure V: Assessment Unit Wise GW Extraction and Stage of GW Extraction, Uttar Pradesh-2023

Sl. 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		
1	AGRA	ACHHNERA	8663.38	2.59	500.00	9165.96	81.57	Semi Critical
2	AGRA	AKOLA	4789.60	14.13	422.71	5226.42	109.32	Over Exploited
3	AGRA	BAH	4382.15	0.00	433.26	4815.41	98.67	Critical
4	AGRA	BARAULI AHIR	8254.11	19.98	713.23	8987.33	173.90	Over Exploited
5	AGRA	BICHPURI	4611.84	13.52	346.78	4972.13	170.41	Over Exploited

Sl. 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		
6	AGRA	ETMADPUR	5630.01	18.13	278.32	5926.46	138.01	Over Exploited
7	AGRA	FATEHABAD	6618.52	12.78	621.55	7252.86	170.24	Over Exploited
8	AGRA	FATEHPUR SIKRI	9885.20	0.00	552.62	10437.82	115.35	Over Exploited
9	AGRA	JAGNER	2705.61	0.00	301.97	3007.58	85.88	Semi Critical
10	AGRA	JAITPUR KALAN	3724.65	0.00	314.07	4038.73	87.93	Semi Critical
11	AGRA	KHANDAULI	4365.68	2.24	468.66	4836.57	142.73	Over Exploited
12	AGRA	KHERAGARH	4795.49	0.00	486.20	5281.70	87.97	Semi Critical
13	AGRA	PINAHAT	3005.98	1.39	403.21	3410.58	74.03	Semi Critical
14	AGRA	SAIYANA	5183.90	0.00	441.21	5625.10	112.59	Over Exploited
15	AGRA	SHAMSABAD	6536.77	0.00	648.49	7185.26	192.86	Over Exploited
16	AGRA	AGRA CITY	0.00	79.27	3965.60	4044.87	113.94	Over Exploited
17	ALIGARH	AKRABAD	5313.69	0.00	537.46	5851.15	65.40	Safe
18	ALIGARH	ATRAULI	4181.10	131.77	685.42	4998.29	68.23	Safe
19	ALIGARH	BIJAULI	3729.68	0.00	505.43	4235.11	65.74	Safe
20	ALIGARH	CHANDAUS	5334.70	3.14	484.20	5822.04	85.10	Semi Critical
21	ALIGARH	DHANIPUR	5344.15	2.81	602.77	5949.73	68.61	Safe
22	ALIGARH	GANGIRI	6066.76	0.00	781.23	6847.99	87.12	Semi Critical
23	ALIGARH	GONDA	4986.16	4.67	465.09	5455.91	72.28	Semi Critical
24	ALIGARH	IGLAS	5000.90	4.93	606.13	5611.95	98.59	Critical
25	ALIGARH	JAWA SIKANDAIRPUR	5388.10	220.48	566.34	6174.91	89.54	Semi Critical
26	ALIGARH	KHAIR	6704.20	0.17	623.21	7327.58	83.13	Semi Critical
27	ALIGARH	LODHA	3981.00	143.21	800.92	4925.13	87.70	Semi Critical
28	ALIGARH	TAPPAL	4342.12	0.00	499.23	4841.35	62.36	Safe
29	ALIGARH	ALIGARH CITY	0.00	1.74	4510.36	4512.10	249.84	Over Exploited
30	AMBEDKAR NAGAR	AKBARPUR	5489.60	0.00	1056.94	6546.54	61.51	Safe
31	AMBEDKAR NAGAR	BASKHARI	3892.50	0.00	595.62	4488.12	68.67	Safe
32	AMBEDKAR NAGAR	BHITI	3081.00	16.79	440.17	3537.96	67.97	Safe

Sl. 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		
33	AMBEDKAR NAGAR	BHIYAON	3199.60	0.00	555.92	3755.52	61.66	Safe
34	AMBEDKAR NAGAR	JAHANGIRGANI	3538.00	0.00	558.22	4096.22	62.56	Safe
35	AMBEDKAR NAGAR	JALALPUR	5350.95	0.00	789.05	6140.00	75.77	Semi Critical
36	AMBEDKAR NAGAR	KATEHARI	3672.20	0.00	691.80	4364.00	62.67	Safe
37	AMBEDKAR NAGAR	RAMNAGAR	5056.50	0.00	629.10	5685.61	57.19	Safe
38	AMBEDKAR NAGAR	TANDA	5617.10	0.91	987.35	6605.36	56.15	Safe
39	AMETHI	AMETHI	3220.00	0.82	378.73	3599.55	69.47	Safe
40	AMETHI	BAHADURPUR	3452.80	0.00	356.44	3809.23	67.77	Safe
41	AMETHI	BHADAR	3774.40	22.02	327.16	4123.58	69.23	Safe
42	AMETHI	BHETUA	2863.80	0.00	255.20	3119.00	56.73	Safe
43	AMETHI	GAURIGANJ	4286.70	106.00	375.37	4768.07	66.26	Safe
44	AMETHI	JAGDISHPUR	4667.52	4.22	485.57	5157.31	66.84	Safe
45	AMETHI	JAMO	5798.80	0.00	477.75	6276.55	60.78	Safe
46	AMETHI	MUSAFIRKHANA	3569.00	0.00	440.07	4009.07	60.31	Safe
47	AMETHI	SANGRAMPUR	2444.35	0.00	207.67	2652.03	77.31	Semi Critical
48	AMETHI	SHAHGARH	1942.80	0.00	195.14	2137.94	57.11	Safe
49	AMETHI	SHUKUL BAZAR	2841.60	0.00	435.57	3277.17	68.90	Safe
50	AMETHI	SINGHPUR	3488.32	0.00	560.65	4048.97	59.05	Safe
51	AMETHI	TILOI	4149.60	0.00	446.93	4596.53	66.71	Safe
52	AMROHA	DHANAURA	10597.35	112.86	624.63	11334.83	92.97	Critical
53	AMROHA	GAJRAULA	9183.86	693.50	668.57	10545.94	94.22	Critical
54	AMROHA	HASANPUR	10433.10	10.51	773.90	11217.51	77.89	Semi Critical
55	AMROHA	JOYA	13231.70	4.93	947.29	14183.92	133.19	Over Exploited
56	AMROHA	AMROHA	11102.42	0.18	1111.81	12214.41	88.70	Semi Critical
57	AMROHA	GANGESHWARI	7112.72	14.60	686.16	7813.49	70.01	Semi Critical
58	AURAIYA	ACHHALDA	4860.00	0.00	433.46	5293.46	50.85	Safe
59	AURAIYA	AJITMAL	3265.20	0.00	379.68	3644.89	55.63	Safe

Sl. 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		
60	AURAIYA	AURRAIYA	5963.09	8.03	413.67	6384.79	51.95	Safe
61	AURAIYA	BHAGYANAGAR	4613.60	0.00	455.29	5068.90	56.22	Safe
62	AURAIYA	BIDHUNA	3718.80	0.00	429.49	4148.28	60.58	Safe
63	AURAIYA	ERWA KATRA	3740.40	0.00	350.12	4090.52	63.47	Safe
64	AURAIYA	SAHAR	4471.60	0.11	450.96	4922.67	59.86	Safe
65	AYODHYA	AMANIGANJ	4844.48	0.00	546.55	5391.03	58.07	Safe
66	AYODHYA	BIKAPUR	2404.96	0.00	552.47	2957.44	66.61	Safe
67	AYODHYA	HARRINGTANGANJ	2932.70	0.00	449.44	3382.14	65.13	Safe
68	AYODHYA	MASODHA	4024.32	25.56	1228.02	5277.90	68.29	Safe
69	AYODHYA	MAYA BAZAR	3524.00	0.00	604.19	4128.20	64.18	Safe
70	AYODHYA	MILKIPUR	3518.80	0.00	550.20	4069.00	67.20	Safe
71	AYODHYA	PURA BAZAR	4169.88	20.22	683.32	4873.42	61.48	Safe
72	AYODHYA	SOHAWAL	5516.00	0.18	619.63	6135.80	56.47	Safe
73	AYODHYA	TARUN	4789.12	0.00	583.00	5372.12	65.46	Safe
74	AYODHYA	MAWAI	4238.08	0.00	456.84	4694.93	60.16	Safe
75	AYODHYA	RUDAULI	5695.25	6.61	844.01	6545.87	62.38	Safe
76	AZAMGARH	AHIRAULA	3035.20	0.00	628.36	3663.55	63.31	Safe
77	AZAMGARH	ATRAULIA	1634.00	0.00	612.91	2246.92	67.40	Safe
78	AZAMGARH	AZAMATGARH	3215.04	0.58	438.92	3654.54	60.95	Safe
79	AZAMGARH	BILHARIYAGANJ	2443.04	0.00	597.79	3040.82	59.03	Safe
80	AZAMGARH	HARAIYA	2955.12	0.00	598.98	3554.09	58.94	Safe
81	AZAMGARH	JAHANGANJ	2909.28	0.00	530.52	3439.80	61.78	Safe
82	AZAMGARH	KOILSA	2646.00	0.00	650.96	3296.96	64.96	Safe
83	AZAMGARH	LALGANJ	3063.00	0.00	374.63	3437.64	54.83	Safe
84	AZAMGARH	MAHARAJGANJ	3552.00	0.00	543.30	4095.30	64.05	Safe
85	AZAMGARH	MARTINGANJ	4236.00	0.00	544.25	4780.25	60.95	Safe
86	AZAMGARH	MEHNAGAR	3372.80	0.00	725.15	4097.96	56.25	Safe

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			Irrigation	Industrial	Domestic	Total		
87	AZAMGARH	MIRZAPUR	2066.80	0.00	761.43	2828.23	62.97	Safe
88	AZAMGARH	MOHAMMADPUR	2503.60	0.00	847.66	3351.26	55.27	Safe
89	AZAMGARH	PALHANA	2014.20	0.00	682.45	2696.65	65.42	Safe
90	AZAMGARH	PALHANI	1855.84	0.00	515.96	2371.80	64.49	Safe
91	AZAMGARH	PAWAI	3250.60	0.00	482.34	3732.94	56.64	Safe
92	AZAMGARH	PHULPUR	2604.80	0.00	672.81	3277.61	57.00	Safe
93	AZAMGARH	RANI KI SARAI	2610.40	0.00	708.80	3319.20	62.16	Safe
94	AZAMGARH	SATHIYAON	1910.40	6.52	518.84	2435.76	69.79	Safe
95	AZAMGARH	TAHBARPUR	2838.00	0.00	536.49	3374.49	61.40	Safe
96	AZAMGARH	TARWA	3395.00	0.00	992.14	4387.13	69.06	Safe
97	AZAMGARH	THEKMA	3537.90	0.00	607.53	4145.43	59.83	Safe
98	BAGPAT	BAGHPAT	4049.25	9.02	361.85	4420.10	88.34	Semi Critical
99	BAGPAT	BARAUT	5670.80	0.00	486.54	6157.34	78.11	Semi Critical
100	BAGPAT	BINAULI	6673.00	0.00	391.32	7064.32	113.28	Over Exploited
101	BAGPAT	CHHAPRAULI	4350.45	1.64	336.32	4688.41	74.41	Semi Critical
102	BAGPAT	KHEKRA	3995.12	32.57	527.16	4554.84	121.07	Over Exploited
103	BAGPAT	PILANA	5285.40	0.00	414.80	5700.20	130.59	Over Exploited
104	BAHRAICH	BALHA	4550.20	10.95	777.41	5338.56	46.90	Safe
105	BAHRAICH	BISHESHWARGANJ	6183.60	0.00	599.13	6782.74	64.05	Safe
106	BAHRAICH	CHITTAURA	7396.70	76.65	1163.61	8636.96	64.48	Safe
107	BAHRAICH	FAKHARPUR	4355.28	0.00	534.36	4889.64	52.92	Safe
108	BAHRAICH	HUZURPUR	4837.60	0.00	662.21	5499.81	63.88	Safe
109	BAHRAICH	JARWAL	3791.84	7.30	510.31	4309.45	56.61	Safe
110	BAHRAICH	KAISARGANJ	2934.40	36.50	634.37	3605.27	55.84	Safe
111	BAHRAICH	MAHASI	4156.72	0.00	1074.88	5231.61	60.33	Safe
112	BAHRAICH	MIHIPURWA	7086.08	0.00	537.68	7623.76	62.33	Safe
113	BAHRAICH	NAWABGANJ	4456.00	0.00	548.46	5004.47	58.81	Safe

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			Irrigation	Industrial	Domestic	Total		
114	BAHRAICH	PAYAGPUR	6001.20	0.00	711.71	6712.91	62.68	Safe
115	BAHRAICH	RISIYA	5536.00	0.00	668.34	6204.34	61.09	Safe
116	BAHRAICH	SHIVPUR	5043.68	0.00	683.72	5727.41	63.28	Safe
117	BAHRAICH	TEJWAPUR	4394.60	0.00	585.88	4980.48	65.17	Safe
118	BALLIA	BAIRIA KHERA	1660.10	0.00	484.20	2144.30	64.60	Safe
119	BALLIA	BANSDIH	2314.60	0.00	466.77	2781.37	56.80	Safe
120	BALLIA	BELHARI	1732.16	0.00	347.12	2079.27	63.04	Safe
121	BALLIA	BERUAR	2250.40	0.00	346.46	2596.86	64.04	Safe
122	BALLIA	CHILKAHAR	3958.80	0.00	506.69	4465.49	65.41	Safe
123	BALLIA	DUBAHAND	1905.20	0.00	492.13	2397.34	64.30	Safe
124	BALLIA	GARWAR	2780.40	0.00	470.20	3250.61	64.35	Safe
125	BALLIA	HANUMANGANJ BRAHMIN	2270.40	0.00	309.03	2579.43	62.40	Safe
126	BALLIA	MANIYAR	3455.92	0.00	379.92	3835.83	65.90	Safe
127	BALLIA	MURLI CHHAPRA	1768.80	0.00	401.22	2170.02	56.44	Safe
128	BALLIA	NAWA NAGAR	2935.60	0.00	520.76	3456.36	61.81	Safe
129	BALLIA	NEGARA	5428.40	5.91	765.48	6199.78	67.31	Safe
130	BALLIA	PANDAH	2758.00	0.00	412.09	3170.09	61.31	Safe
131	BALLIA	RASRA	2309.13	0.00	645.68	2954.81	68.78	Safe
132	BALLIA	REOTI	1422.80	0.00	427.48	1850.28	61.59	Safe
133	BALLIA	SIAR	3799.04	3.10	724.53	4526.67	64.40	Safe
134	BALLIA	SOHAON	2321.40	0.00	425.72	2747.12	64.88	Safe
135	BALRAMPUR	BALRAMPUR	7850.55	143.45	1091.59	9085.59	64.00	Safe
136	BALRAMPUR	GAINDAS BUZURG	5340.60	0.00	710.95	6051.55	56.89	Safe
137	BALRAMPUR	GAINSARA	3211.20	0.00	412.07	3623.28	65.34	Safe
138	BALRAMPUR	HARRAIYA SATGHARWA	5967.50	0.00	769.12	6736.62	53.26	Safe
139	BALRAMPUR	PACHPERWA	5226.00	0.00	698.67	5924.67	59.44	Safe

Sl. 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		
140	BALRAMPUR	REHRA BAZAR	3627.84	0.00	600.46	4228.30	67.33	Safe
141	BALRAMPUR	SHRI DATT GANJ	3685.80	64.55	499.61	4249.95	58.75	Safe
142	BALRAMPUR	TULSIPUR	5823.36	76.68	849.64	6749.68	55.66	Safe
143	BALRAMPUR	UTRAULA	2941.56	0.00	525.80	3467.37	63.33	Safe
144	BANDA	BABERU	7748.41	0.00	593.42	8341.83	72.83	Semi Critical
145	BANDA	BAROKHAR	5397.31	0.00	335.10	5732.41	65.18	Safe
146	BANDA	BISANDA	4868.23	0.00	513.38	5381.60	56.20	Safe
147	BANDA	JASPURA	3666.08	0.00	271.70	3937.77	77.14	Semi Critical
148	BANDA	KAMASIN	5299.88	0.00	481.74	5781.62	63.36	Safe
149	BANDA	MAHUVA	4087.01	0.00	565.41	4652.42	50.27	Safe
150	BANDA	NARAINI	2108.90	0.00	711.49	2820.40	72.32	Semi Critical
151	BANDA	TINDWARI	6784.20	0.00	490.38	7274.58	78.84	Semi Critical
152	BARABANKI	BANI KODAR	8232.80	0.00	544.86	8777.66	66.63	Safe
153	BARABANKI	BANKI	5147.79	17.25	686.37	5851.42	57.83	Safe
154	BARABANKI	DARIYABAD	7405.90	0.00	549.86	7955.75	63.38	Safe
155	BARABANKI	DEWA	9181.20	0.62	597.85	9779.67	63.69	Safe
156	BARABANKI	FATEHPUR	11863.76	0.00	758.02	12621.78	64.03	Safe
157	BARABANKI	HAIDERGARH	5301.60	0.30	753.20	6055.11	64.50	Safe
158	BARABANKI	HARAK	6905.50	0.00	663.88	7569.38	67.46	Safe
159	BARABANKI	MASAULI	6287.58	0.18	502.66	6790.42	68.79	Safe
160	BARABANKI	NINDAURA	7590.21	15.47	656.74	8262.41	57.80	Safe
161	BARABANKI	PURE DALAI	4949.60	0.00	361.91	5311.52	59.30	Safe
162	BARABANKI	RAMNAGAR	6677.30	0.04	559.56	7236.90	67.89	Safe
163	BARABANKI	SIDDHAUR	6993.00	0.00	627.75	7620.74	62.43	Safe
164	BARABANKI	SIRAULI GAUSPUR	5813.25	0.18	579.52	6392.95	57.31	Safe
165	BARABANKI	SURATGANJ	5233.28	0.00	645.32	5878.60	63.69	Safe
166	BARABANKI	TRIVEDIGANJ	8785.21	6.02	480.86	9272.09	62.35	Safe

Sl. 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		
167	BAREILLY	ALAMPUR JAFARABAD	3621.25	1.40	591.49	4214.14	83.48	Semi Critical
168	BAREILLY	BAHERI	7295.72	96.15	831.35	8223.22	66.15	Safe
169	BAREILLY	BHADPURA	4122.43	0.00	436.13	4558.57	67.42	Safe
170	BAREILLY	BHOJPURA	4822.80	4.97	651.35	5479.11	67.26	Safe
171	BAREILLY	BHUTAH	5360.58	0.00	583.78	5944.36	64.92	Safe
172	BAREILLY	BITHERI CHAINPUR	4598.18	136.36	460.05	5194.59	64.88	Safe
173	BAREILLY	FARIDPUR	5109.28	60.41	727.70	5897.38	63.09	Safe
174	BAREILLY	FATEHGANJ	4188.09	35.34	572.66	4796.09	84.07	Semi Critical
175	BAREILLY	KYARA	3041.20	38.88	411.75	3491.83	61.94	Safe
176	BAREILLY	MAJHGAWA	2641.90	9.26	797.16	3448.33	86.91	Semi Critical
177	BAREILLY	MEERGANJ	2741.28	23.26	500.26	3264.80	65.92	Safe
178	BAREILLY	NAWABGANJ	5205.41	22.52	831.28	6059.22	66.51	Safe
179	BAREILLY	RAMNAGAR	4017.50	0.00	509.38	4526.88	84.22	Semi Critical
180	BAREILLY	RICHHA	6266.50	0.00	597.53	6864.03	69.50	Safe
181	BAREILLY	SHERGARH	4558.90	0.00	725.48	5284.39	65.33	Safe
182	BAREILLY	BAREILLY CITY	0.00	17.89	4106.18	4124.07	205.90	Over Exploited
183	BASTI	BAHADURPUR	4071.09	0.00	404.96	4476.05	68.93	Safe
184	BASTI	BANKATI	2700.00	17.00	514.48	3231.47	67.90	Safe
185	BASTI	BASTI SADAR	2589.66	83.84	1005.10	3678.59	67.34	Safe
186	BASTI	DUBAULIYA	2197.80	0.00	239.70	2437.51	69.42	Safe
187	BASTI	GAUR	3087.10	0.00	656.78	3743.88	61.25	Safe
188	BASTI	HARRAIYA	3345.11	0.00	449.60	3794.71	64.33	Safe
189	BASTI	KAPTANGANJ	3332.57	0.00	315.25	3647.82	67.01	Safe
190	BASTI	KUDRAHA	2032.39	0.00	372.12	2404.51	69.32	Safe
191	BASTI	PARASRAMPUR	2908.93	0.00	505.55	3414.48	63.85	Safe
192	BASTI	RAMNAGAR	3610.04	0.00	432.72	4042.76	66.35	Safe
193	BASTI	RUDHAULI	1668.60	108.20	294.87	2071.67	69.68	Safe

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194	BASTI	SALATUA	2985.36	0.00	511.97	3497.33	63.78	Safe
195	BASTI	SAUGHAT	3085.76	0.04	438.59	3524.40	69.58	Safe
196	BASTI	VIKRAMJOT	5204.64	0.00	342.51	5547.15	59.47	Safe
197	BIJNOR	AFZALGARH	9210.00	38.69	718.17	9966.86	68.68	Safe
198	BIJNOR	DHANPUR (ALHEPUR)	4854.24	115.08	554.68	5524.01	67.20	Safe
199	BIJNOR	HALDAUR (KHARI JHALU)	7991.82	48.03	653.91	8693.76	62.43	Safe
200	BIJNOR	JALEELPUR	10389.64	21.17	644.12	11054.94	97.28	Critical
201	BIJNOR	KIRATPUR	4926.31	98.55	624.54	5649.40	63.27	Safe
202	BIJNOR	KOTWALI	14582.40	47.45	949.88	15579.73	73.99	Semi Critical
203	BIJNOR	MOHAMMADPUR DEOMAL	7831.62	167.46	699.49	8698.58	58.82	Safe
204	BIJNOR	NAJIBABAD	8863.95	93.62	1219.59	10177.16	66.46	Safe
205	BIJNOR	NEHTAUR (AAKU)	4563.47	0.00	619.67	5183.14	75.03	Semi Critical
206	BIJNOR	NOORPUR	7664.47	0.00	736.91	8401.38	88.81	Semi Critical
207	BIJNOR	SEOHARA (BUDHANPUR)	6318.30	160.13	476.19	6954.60	77.62	Semi Critical
208	BUDAUN	AMBIAPUR	4748.80	0.00	540.01	5288.81	115.05	Over Exploited
209	BUDAUN	ASAFPUR	4064.00	1.46	497.40	4562.86	97.33	Critical
210	BUDAUN	BISAULI	3843.20	38.05	543.08	4424.34	92.66	Critical
211	BUDAUN	DAHGAWAN	3272.80	0.00	532.50	3805.30	63.41	Safe
212	BUDAUN	DATAGANJ	2174.24	12.58	438.21	2625.03	59.70	Safe
213	BUDAUN	ISLAMNAGAR	5306.56	0.00	468.64	5775.20	123.81	Over Exploited
214	BUDAUN	JAGAT	2789.60	0.00	1072.33	3861.94	76.72	Semi Critical
215	BUDAUN	MIAON	4116.88	0.00	608.02	4724.90	89.11	Semi Critical
216	BUDAUN	QUADAR CHOWK	4103.52	0.00	466.19	4569.71	85.23	Semi Critical
217	BUDAUN	SAHASWAN	5739.00	0.00	761.98	6500.97	84.34	Semi Critical
218	BUDAUN	SALARPUR	2539.60	0.00	479.92	3019.52	68.32	Safe
219	BUDAUN	SAMRER	2551.60	0.00	366.97	2918.57	72.88	Semi Critical

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220	BUDAUN	UJHANI	4561.92	7.11	765.53	5334.56	82.92	Semi Critical
221	BUDAUN	USAWAN	3205.80	0.04	475.29	3681.12	66.64	Safe
222	BUDAUN	WAZIRGANJ	2076.85	0.00	490.06	2566.91	69.62	Safe
223	BULANDSHAHAR	AGAUTA	5780.40	0.00	308.00	6088.40	65.50	Safe
224	BULANDSHAHAR	ANUP SHAHAR	7627.25	0.00	462.90	8090.16	76.18	Semi Critical
225	BULANDSHAHAR	ARNIA KHURD	7771.00	0.00	414.19	8185.19	94.65	Critical
226	BULANDSHAHAR	BHAWAN BAHADUR NAGAR	6303.32	0.00	249.66	6552.98	105.79	Over Exploited
227	BULANDSHAHAR	BULANDSHAHAR	8355.35	0.00	483.55	8838.90	144.46	Over Exploited
228	BULANDSHAHAR	DANPUR	7747.20	0.00	465.16	8212.36	101.98	Over Exploited
229	BULANDSHAHAR	DEBAI	5707.50	0.00	477.58	6185.07	87.54	Semi Critical
230	BULANDSHAHAR	GULAOTHI	6439.82	0.00	272.76	6712.57	125.45	Over Exploited
231	BULANDSHAHAR	JAHANGIRABAD	10449.75	0.00	418.32	10868.07	87.34	Semi Critical
232	BULANDSHAHAR	KHURJA	8388.00	0.00	474.82	8862.83	98.80	Critical
233	BULANDSHAHAR	LAKHAOTHI	6000.00	0.00	295.19	6295.19	83.83	Semi Critical
234	BULANDSHAHAR	PAHASU	13476.04	0.00	507.16	13983.20	75.95	Semi Critical
235	BULANDSHAHAR	SHIKARPUR	10713.60	0.00	425.27	11138.86	97.41	Critical
236	BULANDSHAHAR	SIANA	8638.92	0.00	258.64	8897.56	108.99	Over Exploited
237	BULANDSHAHAR	SIKANDRABAD	13860.90	0.00	789.51	14650.40	127.10	Over Exploited
238	BULANDSHAHAR	UNCHAGAON	4691.52	0.00	375.47	5066.99	96.36	Critical
239	CHANDAULI	BARAHANI	3551.90	0.00	485.85	4037.75	54.92	Safe
240	CHANDAULI	CHAHNIYA	2123.83	0.00	571.99	2695.82	39.82	Safe
241	CHANDAULI	CHAKIA	2693.60	0.00	481.18	3174.79	69.08	Safe
242	CHANDAULI	CHANDAULI	3409.20	0.00	520.32	3929.51	59.69	Safe
243	CHANDAULI	DHANAPUR	3716.89	0.00	581.09	4297.98	63.24	Safe
244	CHANDAULI	NAUGARH	911.80	0.00	235.95	1147.75	61.31	Safe
245	CHANDAULI	NIYAMATABAD	2541.43	0.00	679.08	3220.51	49.70	Safe

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246	CHANDAULI	SAKALDIHA	2579.60	0.00	663.94	3243.54	47.83	Safe
247	CHANDAULI	SHAHABGANJ	1669.20	0.00	412.81	2082.01	60.45	Safe
248	CHITRAKOOT	KARWI	9832.90	0.00	701.05	10533.95	98.62	Critical
249	CHITRAKOOT	MANIKPUR	4837.46	0.00	513.16	5350.62	56.95	Safe
250	CHITRAKOOT	MAU	6248.00	0.00	464.21	6712.21	89.19	Semi Critical
251	CHITRAKOOT	PAHARI	7203.97	0.00	594.68	7798.65	82.40	Semi Critical
252	CHITRAKOOT	RAMNAGAR	2415.60	0.00	306.85	2722.44	86.08	Semi Critical
253	DEORIA	BANKATA	3576.70	0.00	510.71	4087.42	69.27	Safe
254	DEORIA	BARHAJ	4859.74	0.00	346.22	5205.97	68.67	Safe
255	DEORIA	BETALPUR	4847.75	0.00	590.33	5438.08	58.96	Safe
256	DEORIA	BHAGALPUR	4358.56	0.00	394.08	4752.64	63.50	Safe
257	DEORIA	BHALUANI	4763.12	0.00	472.16	5235.28	63.86	Safe
258	DEORIA	BHATNI	4023.76	0.00	431.64	4455.40	63.72	Safe
259	DEORIA	BHATPARANI	4219.80	0.00	366.90	4586.69	61.58	Safe
260	DEORIA	DEORIA SADAR	5816.44	0.00	531.23	6347.67	64.15	Safe
261	DEORIA	DESAHI DEORIA	5091.50	0.00	272.63	5364.13	58.72	Safe
262	DEORIA	GAURI BAZAR	4450.90	0.00	559.36	5010.26	58.46	Safe
263	DEORIA	LAR	6095.90	0.00	396.93	6492.83	58.69	Safe
264	DEORIA	PATHER DEWA	4722.40	0.00	481.41	5203.81	60.73	Safe
265	DEORIA	RAMPUR KARHANI	4228.89	0.00	363.18	4592.07	65.47	Safe
266	DEORIA	RUDRAPUR	6548.58	0.00	530.29	7078.87	66.99	Safe
267	DEORIA	SALEMPUR	4976.40	0.00	596.84	5573.24	58.63	Safe
268	DEORIA	TARKULWA	3572.20	0.00	283.74	3855.95	59.61	Safe
269	ETAH	ALIGANJ	7365.90	0.00	734.07	8099.97	79.39	Semi Critical
270	ETAH	AWAGARH	6219.17	0.55	431.99	6651.70	61.33	Safe
271	ETAH	JAITHARA	5270.95	0.00	547.24	5818.20	70.84	Semi Critical
272	ETAH	JALESAR	4617.50	0.00	492.49	5109.98	88.98	Semi Critical

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273	ETAH	MARHARA	3269.50	0.00	433.20	3702.70	59.92	Safe
274	ETAH	NIDHAULI KALAN	9081.60	0.00	528.18	9609.78	75.85	Semi Critical
275	ETAH	SAKIT	6182.20	6.57	534.21	6722.98	64.81	Safe
276	ETAH	SHITALPUR	8446.16	18.65	905.49	9370.30	82.98	Semi Critical
277	ETAWAH	BARAHPURA	4393.26	0.00	407.61	4800.87	65.63	Safe
278	ETAWAH	BASREHAR	5157.08	0.35	451.16	5608.59	50.41	Safe
279	ETAWAH	BHARTHNA	4214.50	0.07	461.76	4676.33	45.96	Safe
280	ETAWAH	CHAKARANAGAR	2304.52	0.00	215.11	2519.63	55.58	Safe
281	ETAWAH	JASWANTNAGAR	3035.76	0.00	445.94	3481.69	62.13	Safe
282	ETAWAH	MAHEWA	4561.33	0.00	583.70	5145.03	43.88	Safe
283	ETAWAH	SEFAI	2424.00	160.34	306.36	2890.71	40.03	Safe
284	ETAWAH	TAKHA	3132.00	0.00	363.55	3495.54	50.60	Safe
285	FARRUKHABAD	BARHPUR	2434.75	0.00	395.78	2830.53	83.79	Semi Critical
286	FARRUKHABAD	KAIMGANJ	4499.93	0.00	617.32	5117.24	64.94	Safe
287	FARRUKHABAD	KAMALGANJ	3614.59	0.00	745.18	4359.77	78.88	Semi Critical
288	FARRUKHABAD	MOHAMADABAD	4680.54	0.00	682.19	5362.73	86.09	Semi Critical
289	FARRUKHABAD	NAWABGANJ	4058.10	0.00	444.32	4502.42	82.21	Semi Critical
290	FARRUKHABAD	RAJEPUR	2394.00	0.00	521.79	2915.80	61.72	Safe
291	FARRUKHABAD	SHAMSABAD	4126.00	0.00	567.60	4693.60	67.37	Safe
292	FATEHPUR	AIRAYA	3416.78	0.00	579.37	3996.15	78.04	Semi Critical
293	FATEHPUR	AMAULI	3537.00	0.00	455.91	3992.91	79.38	Semi Critical
294	FATEHPUR	ASODHAR	4528.80	0.00	465.31	4994.11	49.23	Safe
295	FATEHPUR	BAHUA	4179.66	0.00	498.05	4677.71	57.89	Safe
296	FATEHPUR	BHITAURA	13303.20	0.00	573.20	13876.40	120.28	Over Exploited
297	FATEHPUR	DEOMAI	3709.59	1.53	426.80	4137.92	63.61	Safe
298	FATEHPUR	DHATA	4657.60	0.00	500.00	5157.59	67.01	Safe
299	FATEHPUR	HASWA	4440.80	0.00	553.08	4993.88	68.65	Safe

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300	FATEHPUR	HATHGAON	3631.90	0.00	1123.88	4755.79	57.20	Safe
301	FATEHPUR	KHAJUHA	6638.64	0.00	498.54	7137.18	81.16	Semi Critical
302	FATEHPUR	MALAWAN	7074.71	0.18	709.49	7784.39	78.03	Semi Critical
303	FATEHPUR	TELYANI	4996.20	0.31	413.65	5410.17	74.61	Semi Critical
304	FATEHPUR	VIJAYIPUR	3848.00	0.00	542.06	4390.06	53.09	Safe
305	FIROZABAD	ARON	4982.40	0.00	387.24	5369.64	92.98	Critical
306	FIROZABAD	EKA	8723.90	0.00	547.41	9271.31	72.38	Semi Critical
307	FIROZABAD	FIROZABAD	5634.90	0.00	2297.41	7932.31	165.07	Over Exploited
308	FIROZABAD	KHAIRGARH(HATHWANT)	7538.80	0.01	410.02	7948.82	121.23	Over Exploited
309	FIROZABAD	JASRANA	7292.00	0.00	394.57	7686.57	74.58	Semi Critical
310	FIROZABAD	MADANPUR	8488.70	0.00	573.32	9062.02	77.09	Semi Critical
311	FIROZABAD	NARKHI	8675.50	0.00	541.83	9217.33	141.63	Over Exploited
312	FIROZABAD	SHIKOHABAD	9282.00	0.00	758.68	10040.68	163.90	Over Exploited
313	FIROZABAD	TUNDLA	8616.40	0.01	804.21	9420.61	119.19	Over Exploited
314	G.B.NAGAR	BISRAKH	16353.00	0.00	212.69	16565.68	141.41	Over Exploited
315	G.B.NAGAR	DADRI	8295.36	0.00	483.27	8778.62	87.73	Semi Critical
316	G.B.NAGAR	JEWAR	23240.00	0.00	856.19	24096.19	94.65	Critical
317	GHAZIABAD	BHOJPUR	10969.92	91.59	380.72	11442.23	133.97	Over Exploited
318	GHAZIABAD	LONI	8266.88	1232.12	103.09	9602.09	136.04	Over Exploited
319	GHAZIABAD	MURADNAGAR	9958.74	25.74	256.44	10240.92	85.86	Semi Critical
320	GHAZIABAD	RAZAPUR	7686.24	449.27	538.34	8673.85	119.22	Over Exploited
321	GHAZIABAD	GAZIABAD CITY	0.00	447.38	5784.88	6232.25	230.31	Over Exploited
322	GHAZIPUR	BHADAURA	2300.56	0.00	606.21	2906.76	40.68	Safe
323	GHAZIPUR	BHANWARKOL	2901.12	0.00	503.65	3404.76	68.04	Safe
324	GHAZIPUR	BIRNO	3095.62	0.00	46.64	3142.25	64.30	Safe
325	GHAZIPUR	DEOKALI	3711.28	52.67	600.38	4364.31	63.04	Safe
326	GHAZIPUR	GHAZIPUR	1693.80	1.17	612.72	2307.68	59.13	Safe

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327	GHAZIPUR	JAKHANIA	2284.10	0.10	596.60	2880.80	57.09	Safe
328	GHAZIPUR	KARANDA	2073.90	0.00	379.67	2453.57	65.09	Safe
329	GHAZIPUR	KASIMABAD	2422.42	0.37	651.56	3074.34	56.64	Safe
330	GHAZIPUR	MANIHARI	5905.72	0.00	57.41	5963.13	68.62	Safe
331	GHAZIPUR	MARADH	2720.80	0.00	499.28	3220.08	67.17	Safe
332	GHAZIPUR	MOHAMMADABAD	1777.20	0.00	591.82	2369.02	69.59	Safe
333	GHAZIPUR	REVATIPUR	3375.74	0.00	478.86	3854.60	57.48	Safe
334	GHAZIPUR	SADAT	3615.96	0.00	562.30	4178.27	57.21	Safe
335	GHAZIPUR	SAIDPUR	5190.00	0.00	59.34	5249.34	80.53	Semi Critical
336	GHAZIPUR	VARACHAKWAR	3728.98	0.00	584.82	4313.80	62.68	Safe
337	GHAZIPUR	ZAMANIA	2424.16	0.00	74.69	2498.84	29.30	Safe
338	GONDA	BABHANJOT	2774.48	0.00	602.20	3376.68	65.95	Safe
339	GONDA	BELSAR	3343.35	0.15	584.71	3928.20	61.86	Safe
340	GONDA	CHHAPIA	2974.00	100.22	548.53	3622.75	62.16	Safe
341	GONDA	COLONELGANJ	2352.00	0.44	501.10	2853.53	53.09	Safe
342	GONDA	HALDHARMAU	2269.44	20.08	537.86	2827.38	56.90	Safe
343	GONDA	ITIA THOK	4329.60	0.00	1076.52	5406.13	58.28	Safe
344	GONDA	JHANJHRI	3573.16	113.27	583.96	4270.39	63.82	Safe
345	GONDA	KATRA BAZAR	3160.40	0.00	617.14	3777.53	55.20	Safe
346	GONDA	MANKAPUR	4064.60	254.09	658.39	4977.08	60.45	Safe
347	GONDA	MUJHANA	3910.72	0.00	589.72	4500.44	58.92	Safe
348	GONDA	NAWABGANJ	3876.80	0.00	570.41	4447.21	54.81	Safe
349	GONDA	PANDRI KRIPAL	2983.20	0.27	368.46	3351.93	62.53	Safe
350	GONDA	PARASPUR	4116.69	0.00	759.52	4876.20	64.03	Safe
351	GONDA	RUPAIDIHA	5385.60	0.00	735.03	6120.63	61.72	Safe
352	GONDA	TARABGANJ	4168.00	0.00	475.55	4643.54	59.80	Safe
353	GONDA	WAZIRGANJ	3118.27	0.00	544.06	3662.33	63.43	Safe

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354	GORAKHPUR	BANSGAON	3884.76	0.00	482.27	4367.04	55.84	Safe
355	GORAKHPUR	BARAHALGANJ	5011.81	0.00	485.93	5497.74	68.32	Safe
356	GORAKHPUR	BELGHAT	5811.60	0.00	553.15	6364.76	64.89	Safe
357	GORAKHPUR	BHATAHAT	4767.15	0.00	541.69	5308.84	66.37	Safe
358	GORAKHPUR	BRAHMPUR	5587.35	4.15	536.60	6128.11	61.21	Safe
359	GORAKHPUR	CAMPIERGANJ	5594.10	0.00	582.06	6176.16	69.56	Safe
360	GORAKHPUR	CHIRGAWAN	1815.24	1534.63	474.20	3824.08	66.39	Safe
361	GORAKHPUR	GAGAHA	4221.75	0.00	501.28	4723.02	68.11	Safe
362	GORAKHPUR	GOLA	4378.62	0.00	442.49	4821.11	66.44	Safe
363	GORAKHPUR	JANGAL KAUDIA	3697.50	0.00	150.02	3847.52	48.74	Safe
364	GORAKHPUR	KAURIRAM	4280.36	0.27	457.38	4738.01	69.17	Safe
365	GORAKHPUR	KHAJNI	4354.05	0.27	536.46	4890.78	61.03	Safe
366	GORAKHPUR	KHORABAR	4302.30	41.43	526.21	4869.94	63.48	Safe
367	GORAKHPUR	PALI	4368.93	2.71	372.72	4744.37	57.29	Safe
368	GORAKHPUR	PIPRAICH	5424.08	17.00	504.85	5945.93	60.56	Safe
369	GORAKHPUR	PIPRAULI	3818.20	1.04	484.76	4303.99	68.23	Safe
370	GORAKHPUR	SAHJANWA	4032.18	451.86	392.15	4876.20	64.94	Safe
371	GORAKHPUR	SARDAR NAGAR	4716.93	56.76	464.21	5237.90	64.20	Safe
372	GORAKHPUR	URUA	4463.56	1.83	564.97	5030.35	61.52	Safe
373	GORAKHPUR	BHAROHIYA	2489.55	0.00	358.86	2848.41	67.87	Safe
374	HAMIRPUR	GOHAND	3490.20	0.00	461.28	3951.48	79.52	Semi Critical
375	HAMIRPUR	KURARA	2321.20	0.00	422.09	2743.29	61.26	Safe
376	HAMIRPUR	MAUDAHA	3808.60	0.00	335.62	4144.22	55.53	Safe
377	HAMIRPUR	MUSKARA	2750.58	0.00	254.27	3004.84	65.57	Safe
378	HAMIRPUR	RATH	3958.15	295.65	210.82	4464.62	69.00	Safe
379	HAMIRPUR	SARILA	3590.60	0.00	233.92	3824.53	69.15	Safe
380	HAMIRPUR	SUMERPUR	5285.90	47.82	275.81	5609.52	77.28	Semi Critical

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381	HAPUR	DHOLANA	7450.50	0.00	0.74	7451.23	88.97	Semi Critical
382	HAPUR	GARH	17052.00	0.00	0.61	17052.61	104.39	Over Exploited
383	HAPUR	HAPUR	9550.00	0.00	1.56	9551.56	97.12	Critical
384	HAPUR	SIMBHOLI	10979.45	0.00	0.49	10979.94	96.22	Critical
385	HARDOI	AHIRORI	6256.55	0.00	655.62	6912.17	61.36	Safe
386	HARDOI	BAWAN	5195.00	0.00	558.63	5753.63	68.58	Safe
387	HARDOI	BHARAWAN	3111.78	0.00	508.25	3620.02	51.60	Safe
388	HARDOI	BHARKHANI	3570.00	9.71	553.61	4133.32	54.81	Safe
389	HARDOI	BHENDER KALAN	4734.00	4.85	436.66	5175.52	65.88	Safe
390	HARDOI	BILGRAM	5060.64	0.00	588.44	5649.08	64.21	Safe
391	HARDOI	HARIYAWAN	4220.16	26.54	448.17	4694.85	49.31	Safe
392	HARDOI	HARPALPUR	2752.30	0.00	443.12	3195.42	61.13	Safe
393	HARDOI	KACHHAUNA	4121.60	0.28	410.37	4532.25	58.36	Safe
394	HARDOI	KOTHAWAN	4667.80	0.00	423.41	5091.21	58.48	Safe
395	HARDOI	MADHAVGANJ	3348.90	0.00	447.20	3796.11	57.75	Safe
396	HARDOI	MALLAWAN	3343.20	0.00	317.55	3660.75	64.00	Safe
397	HARDOI	PIHANI	7448.00	0.00	59.94	7507.94	67.94	Safe
398	HARDOI	SANDI	4556.00	0.00	43.56	4599.56	66.55	Safe
399	HARDOI	SANDILA	4638.00	35.04	614.74	5287.77	65.12	Safe
400	HARDOI	SHAHABAD	6468.20	0.00	563.74	7031.94	66.81	Safe
401	HARDOI	SURSA	5271.00	0.00	522.60	5793.61	63.91	Safe
402	HARDOI	TADIYAWAN	5513.02	0.00	485.54	5998.56	64.56	Safe
403	HARDOI	TODARPUR	5175.30	0.00	532.85	5708.15	63.64	Safe
404	HATHRAS	HASAYAN	10310.64	1.83	528.73	10841.20	68.30	Safe
405	HATHRAS	HATHRAS	6416.48	5.21	944.68	7366.37	96.30	Critical
406	HATHRAS	MURSAN	6876.48	0.18	548.68	7425.34	122.65	Over Exploited
407	HATHRAS	SADABAD	6244.20	0.05	623.88	6868.13	77.15	Semi Critical

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408	HATHRAS	SAHPAU	5134.24	0.00	361.20	5495.44	124.69	Over Exploited
409	HATHRAS	SASNI	8953.28	20.90	589.37	9563.56	134.38	Over Exploited
410	HATHRAS	SIKANDRA RAO	13122.38	0.47	549.60	13672.46	89.61	Semi Critical
411	JALAUN	DAKOR	8181.90	7.30	990.43	9179.63	46.41	Safe
412	JALAUN	JALAUN	4920.85	0.00	490.14	5410.98	53.13	Safe
413	JALAUN	KADAURA	4906.08	0.00	513.65	5419.73	48.03	Safe
414	JALAUN	KONCH	7061.40	0.00	484.04	7545.44	66.50	Safe
415	JALAUN	KUTHOND	5136.75	0.00	366.26	5503.02	65.92	Safe
416	JALAUN	MADHOGANJ	4075.80	0.00	328.98	4404.78	54.98	Safe
417	JALAUN	MAHEWA	5334.63	0.00	435.10	5769.72	59.55	Safe
418	JALAUN	NADIGAON	4976.83	0.00	442.12	5418.94	53.53	Safe
419	JALAUN	RAMPURA	3041.11	0.00	265.33	3306.44	61.00	Safe
420	JAUNPUR	BADLAPUR	4833.76	0.00	798.50	5632.26	96.32	Critical
421	JAUNPUR	BAKSHA	2895.80	0.00	394.29	3290.09	69.22	Safe
422	JAUNPUR	BARSATHI	2752.80	0.00	740.18	3492.99	63.95	Safe
423	JAUNPUR	DHARMAPUR	2242.12	0.00	646.09	2888.20	85.49	Semi Critical
424	JAUNPUR	DOBHI	3170.00	0.00	592.08	3762.07	65.93	Safe
425	JAUNPUR	JALALPUR	3618.88	0.00	488.42	4107.30	57.73	Safe
426	JAUNPUR	KARANJA KALAN	4347.52	0.00	465.73	4813.25	73.40	Semi Critical
427	JAUNPUR	KERAKAT	3285.00	0.00	753.29	4038.29	85.23	Semi Critical
428	JAUNPUR	KHUTAHAN	3167.93	0.00	771.02	3938.95	67.56	Safe
429	JAUNPUR	MACHHLISHAHR	3784.25	0.00	1125.10	4909.34	66.47	Safe
430	JAUNPUR	MAHARAJGANJ	4316.05	0.00	559.77	4875.81	95.89	Critical
431	JAUNPUR	MARIAHU	3652.13	0.00	920.89	4573.02	69.67	Safe
432	JAUNPUR	MUFTIGANJ	4103.05	0.00	524.13	4627.19	88.04	Semi Critical
433	JAUNPUR	MUNGRA BADSHAHPUR	3038.40	0.00	680.02	3718.42	54.81	Safe
434	JAUNPUR	RAMNAGAR	2759.16	0.00	611.34	3370.50	73.42	Semi Critical

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435	JAUNPUR	RAMPUR	2313.60	0.00	597.17	2910.77	67.48	Safe
436	JAUNPUR	SHAHGANJ	4345.40	0.00	824.37	5169.78	57.82	Safe
437	JAUNPUR	SIKRARA	2257.04	0.00	496.79	2753.83	78.27	Semi Critical
438	JAUNPUR	SIRKONI	2111.92	0.00	567.95	2679.87	79.96	Semi Critical
439	JAUNPUR	SUITHA KALAN	3846.44	0.00	446.95	4293.39	67.04	Safe
440	JAUNPUR	SUJANGANJ	3609.44	0.00	567.95	4177.39	66.92	Safe
441	JHANSI	BABINA	4900.93	0.00	449.46	5350.39	87.33	Semi Critical
442	JHANSI	BAMAUR	5350.00	0.00	334.00	5684.00	58.11	Safe
443	JHANSI	BANGRA	4249.95	0.00	455.50	4705.44	84.31	Semi Critical
444	JHANSI	BARAGAON	4712.05	40.15	302.80	5055.00	85.39	Semi Critical
445	JHANSI	CHIRGAON	7006.90	0.00	388.83	7395.72	56.07	Safe
446	JHANSI	GURSARAI	3545.56	0.00	342.09	3887.65	58.54	Safe
447	JHANSI	MAURANIPUR	4829.20	0.00	471.82	5301.02	81.42	Semi Critical
448	JHANSI	MOTH	5846.88	0.00	444.98	6291.85	57.69	Safe
449	KANNAUJ	CHHIBRAMAU	5870.13	3.07	1085.12	6958.32	85.57	Semi Critical
450	KANNAUJ	GOGRAPUR	1718.00	0.00	190.75	1908.75	89.04	Semi Critical
451	KANNAUJ	HASERAN	3930.62	0.00	319.70	4250.32	68.10	Safe
452	KANNAUJ	JALALABAD	4241.79	0.00	279.07	4520.86	216.66	Over Exploited
453	KANNAUJ	KANNAUJ	3242.20	8.23	800.77	4051.21	92.68	Critical
454	KANNAUJ	SAURIKH	5255.52	0.00	438.89	5694.42	62.82	Safe
455	KANNAUJ	TALGRAM	7442.07	0.00	530.46	7972.53	157.93	Over Exploited
456	KANNAUJ	UMARDA	5087.60	4.50	751.73	5843.84	32.90	Safe
457	KANPUR DEHAT	AKBARPUR	5912.90	17.33	454.85	6385.08	82.52	Semi Critical
458	KANPUR DEHAT	AMRAUDHA	3304.08	5.09	452.90	3762.07	53.00	Safe
459	KANPUR DEHAT	DERAPUR	5424.00	0.04	293.97	5718.01	79.33	Semi Critical
460	KANPUR DEHAT	JHINJHAK	5532.50	0.07	385.79	5918.37	73.61	Semi Critical
461	KANPUR DEHAT	MAITHA	4578.50	52.93	468.74	5100.18	73.17	Semi Critical

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462	KANPUR DEHAT	MALSA	4549.44	0.00	371.05	4920.49	79.17	Semi Critical
463	KANPUR DEHAT	RAJPUR	3388.80	0.00	362.31	3751.10	57.18	Safe
464	KANPUR DEHAT	RASULABAD	10006.20	1.64	552.53	10560.37	85.49	Semi Critical
465	KANPUR DEHAT	SANDALPUR	2573.00	131.40	309.42	3013.82	62.93	Safe
466	KANPUR DEHAT	SARWAN KHERA	4541.44	194.33	398.08	5133.85	82.25	Semi Critical
467	KANPUR NAGAR	BHITARGAON	3656.91	0.00	447.47	4104.38	56.61	Safe
468	KANPUR NAGAR	BIDHNU	6459.78	0.04	454.46	6914.28	84.22	Semi Critical
469	KANPUR NAGAR	BILHAUR	5062.52	0.04	442.29	5504.84	83.19	Semi Critical
470	KANPUR NAGAR	CHAUBEPUR	8652.88	17.42	332.22	9002.52	97.06	Critical
471	KANPUR NAGAR	GHATAMPUR	8553.65	6.57	540.49	9100.70	86.15	Semi Critical
472	KANPUR NAGAR	KAKWAN	3211.44	0.00	165.07	3376.51	59.35	Safe
473	KANPUR NAGAR	KALYANPUR	3780.72	120.09	474.33	4375.14	53.38	Safe
474	KANPUR NAGAR	PARARA	3034.25	0.15	375.30	3409.71	73.92	Semi Critical
475	KANPUR NAGAR	SARSOL	5364.14	94.40	479.74	5938.26	85.14	Semi Critical
476	KANPUR NAGAR	SHIVRAJAPUR	6212.46	124.39	306.07	6642.91	80.23	Semi Critical
477	KANPUR NAGAR	KANPUR CITY	0.00	22.59	3974.82	3997.41	96.97	Critical
478	KASGANJ	AMANPUR	7010.34	0.00	481.51	7491.84	57.17	Safe
479	KASGANJ	GANJDUNDWARA	6276.52	0.00	386.73	6663.24	84.15	Semi Critical
480	KASGANJ	KASGANJ	6307.50	0.00	467.09	6774.59	85.96	Semi Critical
481	KASGANJ	PATIYALI	6082.65	0.00	412.75	6495.40	74.81	Semi Critical
482	KASGANJ	SAHAWAR	4894.92	0.00	956.63	5851.55	62.92	Safe
483	KASGANJ	SIDHPURA	6380.00	0.00	598.35	6978.35	59.17	Safe
484	KASGANJ	SORON	5750.54	3.65	697.07	6451.26	62.25	Safe
485	KAUSHAMBI	CHAIL	2491.00	0.00	252.90	2743.91	147.53	Over Exploited
486	KAUSHAMBI	KARA	5381.20	0.00	603.67	5984.88	88.13	Semi Critical
487	KAUSHAMBI	KAUSHAMBI	3081.59	0.00	507.25	3588.84	59.42	Safe
488	KAUSHAMBI	MANJHANPUR	4208.81	0.00	585.94	4794.75	89.74	Semi Critical

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489	KAUSHAMBI	MURATGANJ	4532.80	0.00	572.28	5105.08	109.85	Over Exploited
490	KAUSHAMBI	NEWADA	4437.20	0.00	574.12	5011.31	81.67	Semi Critical
491	KAUSHAMBI	SARSAWAN	3569.40	0.00	567.25	4136.64	57.02	Safe
492	KAUSHAMBI	SIRATHU	4323.00	0.00	877.02	5200.01	77.97	Semi Critical
493	KUSHI NAGAR	DUDHAHI	2889.94	0.00	883.16	3773.09	35.39	Safe
494	KUSHI NAGAR	FAZIL NAGAR	4376.07	0.00	573.89	4949.95	61.58	Safe
495	KUSHI NAGAR	HATA	3864.98	360.00	187.40	4412.38	45.57	Safe
496	KUSHI NAGAR	KAPTANGANJ	5451.56	95.03	509.94	6056.53	57.44	Safe
497	KUSHI NAGAR	KASYA	4373.40	0.00	75.49	4448.89	48.83	Safe
498	KUSHI NAGAR	KHADDA	4584.25	258.00	734.21	5576.44	38.97	Safe
499	KUSHI NAGAR	MOTICHAK	5155.15	0.00	520.23	5675.39	61.71	Safe
500	KUSHI NAGAR	NEDUA NAURANGIYA	6117.06	0.00	651.51	6768.56	52.20	Safe
501	KUSHI NAGAR	PADRAUNA	5907.50	0.00	1083.64	6991.14	50.41	Safe
502	KUSHI NAGAR	RAMKOLA	5921.61	248.16	680.90	6850.68	51.91	Safe
503	KUSHI NAGAR	SIWARHI	4230.71	276.35	874.37	5381.42	52.29	Safe
504	KUSHI NAGAR	SUKRAULI	4929.24	0.00	446.96	5376.19	59.74	Safe
505	KUSHI NAGAR	TAMKUHI RAJ	4751.70	0.00	756.25	5507.95	53.70	Safe
506	KUSHI NAGAR	VISHUNPURWA	6897.02	0.00	711.70	7608.71	54.49	Safe
507	LAKHIMPUR KHERI	BANKEYGANJ	10962.80	0.80	646.90	11610.50	63.85	Safe
508	LAKHIMPUR KHERI	BEHJAM	9135.50	0.24	599.53	9735.26	57.16	Safe
509	LAKHIMPUR KHERI	BIJUA	14014.79	28.54	741.31	14784.64	64.97	Safe
510	LAKHIMPUR KHERI	DHAURAHARA	5152.24	2.08	586.60	5740.93	65.71	Safe
511	LAKHIMPUR KHERI	ISANAGAR	5727.42	14.89	676.34	6418.66	62.62	Safe
512	LAKHIMPUR KHERI	KUMBHIGOLA	6945.70	50.01	852.87	7848.56	60.11	Safe
513	LAKHIMPUR KHERI	LAKHIMPUR	5728.24	5.88	1584.66	7318.77	59.45	Safe
514	LAKHIMPUR KHERI	MITAULI	10214.21	8.21	731.73	10954.15	61.40	Safe
515	LAKHIMPUR KHERI	MOHAMMADI	5472.79	0.00	904.62	6377.41	60.19	Safe

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516	LAKHIMPUR KHERI	NAKAHA	5208.00	2.08	617.91	5827.99	59.66	Safe
517	LAKHIMPUR KHERI	NIGHASAN	9234.30	2.48	1178.39	10415.18	57.40	Safe
518	LAKHIMPUR KHERI	PALIA	8612.67	32.85	682.92	9328.44	61.71	Safe
519	LAKHIMPUR KHERI	PASGAWAN	4109.30	24.46	792.24	4926.00	60.76	Safe
520	LAKHIMPUR KHERI	PHULBEHAR	6294.60	53.03	744.28	7091.93	55.92	Safe
521	LAKHIMPUR KHERI	RAMIABEHAR	8503.28	0.00	800.37	9303.66	60.22	Safe
522	LALITPUR	BAR	3213.35	0.00	461.76	3675.11	81.04	Semi Critical
523	LALITPUR	BIRDHA	5073.00	0.00	604.14	5677.14	86.00	Semi Critical
524	LALITPUR	JAKHORA	4810.69	0.00	993.92	5804.61	85.70	Semi Critical
525	LALITPUR	MANDWARA	4146.02	0.00	442.61	4588.64	85.27	Semi Critical
526	LALITPUR	MAHRONI	4826.68	0.00	465.90	5292.57	84.28	Semi Critical
527	LALITPUR	TALBEHAT	5595.07	0.00	487.71	6082.78	84.52	Semi Critical
528	LUCKNOW	BAKSHI KA TALAB	3018.65	2341.45	736.51	6096.61	57.59	Safe
529	LUCKNOW	CHINHAT	222.63	1211.32	444.43	1878.36	64.02	Safe
530	LUCKNOW	GOSAIGANJ	5546.08	58.77	580.27	6185.12	59.08	Safe
531	LUCKNOW	KAKORI	2034.80	315.25	472.95	2823.00	43.30	Safe
532	LUCKNOW	MAL	3397.00	0.00	491.63	3888.63	58.21	Safe
533	LUCKNOW	MALIHABAD	3819.00	1.72	511.01	4331.72	68.86	Safe
534	LUCKNOW	MOHANLALGANJ	9223.00	24.64	714.70	9962.34	68.66	Safe
535	LUCKNOW	SAROJNI NAGAR	2618.80	2152.92	626.91	5398.63	67.87	Safe
536	LUCKNOW	LUCKNOW CITY	0.00	4.28	7891.47	7895.75	104.63	Over Exploited
537	MAHOBA	CHARKHARI	3979.00	0.00	216.05	4195.05	79.34	Semi Critical
538	MAHOBA	JAITPUR	5011.35	0.00	415.18	5426.53	108.88	Over Exploited
539	MAHOBA	KABRAI	9346.95	0.00	236.51	9583.47	80.82	Semi Critical
540	MAHOBA	PANWARI	6069.40	2.01	289.62	6361.03	109.14	Over Exploited
541	MAHRAJGANJ	BRIJMANGANJ	3559.20	0.00	614.80	4173.99	66.91	Safe
542	MAHRAJGANJ	DHANI	1126.32	0.00	233.99	1360.31	57.09	Safe

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543	MAHRAJGANJ	GHUGHULI	4096.00	0.00	506.17	4602.17	61.38	Safe
544	MAHRAJGANJ	LAKSHMIPUR	4780.64	1.17	672.21	5454.01	65.58	Safe
545	MAHRAJGANJ	MAHARAJGANJ	6342.24	0.18	618.85	6961.27	56.65	Safe
546	MAHRAJGANJ	MITHAURA	4937.50	0.00	672.72	5610.23	63.42	Safe
547	MAHRAJGANJ	NAUTANWA	5053.32	0.33	638.54	5692.19	58.79	Safe
548	MAHRAJGANJ	NICHLAUL	8780.60	0.00	720.48	9501.08	67.09	Safe
549	MAHRAJGANJ	PANIARA	4956.75	0.00	635.70	5592.45	62.18	Safe
550	MAHRAJGANJ	PARTAWAL	5166.40	0.00	669.82	5836.21	57.91	Safe
551	MAHRAJGANJ	PHARENDA	3276.16	0.18	498.97	3775.32	66.67	Safe
552	MAHRAJGANJ	SISWA BAZAR	4756.16	5.84	620.28	5382.28	66.41	Safe
553	MAINPURI	BARNAHAL	5516.00	0.04	551.71	6067.73	136.99	Over Exploited
554	MAINPURI	BEWAR	5094.28	0.00	295.81	5390.08	65.14	Safe
555	MAINPURI	GHIROR	5563.32	0.00	595.15	6158.48	56.73	Safe
556	MAINPURI	JAGIR	4556.69	0.00	647.00	5203.69	77.61	Semi Critical
557	MAINPURI	KARHAL	8391.70	0.04	492.51	8884.24	62.89	Safe
558	MAINPURI	KISHNI	7030.48	0.00	384.36	7414.85	68.84	Safe
559	MAINPURI	KURAWALI	4838.72	0.00	1052.28	5890.99	69.19	Safe
560	MAINPURI	MAINPURI	8894.32	0.00	459.64	9353.97	82.53	Semi Critical
561	MAINPURI	SULTANGANJ	5536.50	0.99	494.10	6031.58	67.60	Safe
562	MATHURA	BALDEO	8596.62	0.00	502.20	9098.82	93.16	Critical
563	MATHURA	CHAUMUHAN	7370.48	0.00	367.86	7738.34	62.52	Safe
564	MATHURA	CHHATA	9286.40	62.74	855.54	10204.69	60.24	Safe
565	MATHURA	FARAH	6653.75	1.10	430.11	7084.96	67.21	Safe
566	MATHURA	GOVARDHAN	8176.76	0.00	1166.79	9343.55	68.33	Safe
567	MATHURA	MAT	6391.76	0.44	486.03	6878.22	62.59	Safe
568	MATHURA	MATHURA	5466.56	35.64	1166.09	6668.29	62.22	Safe
569	MATHURA	NANDGAON	5707.95	14.31	427.07	6149.32	41.15	Safe

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570	MATHURA	NOHJHIL	11746.00	0.00	489.30	12235.30	94.11	Critical
571	MATHURA	RAYA	14520.18	0.00	607.50	15127.68	109.56	Over Exploited
572	MAUNATH BHANJAN	BADRAON	2405.52	5.40	544.10	2955.02	58.71	Safe
573	MAUNATH BHANJAN	DOHRI GHAT	2962.80	0.00	522.47	3485.27	67.52	Safe
574	MAUNATH BHANJAN	FATEHPUR MADRAUN	3364.00	0.00	625.86	3989.86	61.66	Safe
575	MAUNATH BHANJAN	GHOSI	3882.80	1.68	581.81	4466.29	68.38	Safe
576	MAUNATH BHANJAN	KOPAGANJ	1835.25	0.00	1672.84	3508.09	67.14	Safe
577	MAUNATH BHANJAN	MOHAMMADABAD	1773.28	0.00	748.54	2521.81	68.92	Safe
578	MAUNATH BHANJAN	PARDAHA	1788.36	0.29	428.51	2217.15	69.95	Safe
579	MAUNATH BHANJAN	RANIPUR	3374.80	0.00	679.18	4053.98	61.22	Safe
580	MAUNATH BHANJAN	RATANPURA	2357.40	0.00	576.36	2933.76	61.69	Safe
581	MEERUT	DAURALA	2981.00	101.73	459.49	3542.22	69.10	Safe
582	MEERUT	HASTINAPUR	9528.00	0.00	417.02	9945.02	70.47	Semi Critical
583	MEERUT	JANI	3825.60	74.49	462.35	4362.43	58.99	Safe
584	MEERUT	KHARKHODA	2932.20	2.56	340.52	3275.28	92.51	Critical
585	MEERUT	MACHHRA	4007.60	0.00	468.40	4476.01	94.74	Critical
586	MEERUT	MAWANA KALAN	4428.00	151.96	596.17	5176.13	79.53	Semi Critical
587	MEERUT	MEERUT	1617.86	616.90	602.48	2837.23	89.96	Semi Critical
588	MEERUT	PARICHHATGARH	6684.60	0.66	481.51	7166.77	78.83	Semi Critical
589	MEERUT	RAJPURA	3269.70	205.54	441.73	3916.99	88.07	Semi Critical
590	MEERUT	ROHTA	2853.56	57.61	287.60	3198.77	56.06	Safe
591	MEERUT	SARDHANA	3221.92	69.39	505.02	3796.33	60.82	Safe
592	MEERUT	SARURPUR	2092.20	11.39	440.73	2544.31	70.55	Semi Critical
593	MEERUT	MEERUT CITY	0.00	11.98	4012.69	4024.67	229.75	Over Exploited
594	MIRZAPUR	CHANBEY	1838.07	0.17	793.29	2631.54	70.00	Semi Critical
595	MIRZAPUR	CITY	2462.57	11.31	1331.89	3805.77	85.66	Semi Critical
596	MIRZAPUR	HALLIA	858.50	0.00	663.46	1521.96	24.34	Safe

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597	MIRZAPUR	JAMALPUR	4068.40	2.65	794.89	4865.94	59.01	Safe
598	MIRZAPUR	KON	1146.18	0.00	297.19	1443.37	101.96	Over Exploited
599	MIRZAPUR	LALGANJ	2529.60	0.38	390.69	2920.67	49.96	Safe
600	MIRZAPUR	MAJHAWAN	2440.52	0.00	414.09	2854.61	92.82	Critical
601	MIRZAPUR	MARIHAN	2133.46	0.00	398.72	2532.19	58.48	Safe
602	MIRZAPUR	NARAYANPUR	3136.94	0.30	527.57	3664.81	62.89	Safe
603	MIRZAPUR	PAHARI	2313.62	18.25	359.70	2691.57	63.62	Safe
604	MIRZAPUR	RAJGARH	2889.17	7.65	612.73	3509.56	64.82	Safe
605	MIRZAPUR	SIKHAR	2307.44	0.00	226.20	2533.64	86.15	Semi Critical
606	MORADABAD	BILARI	4297.60	27.01	746.48	5071.09	97.97	Critical
607	MORADABAD	CHHAJLET	6353.90	0.68	618.63	6973.21	74.57	Semi Critical
608	MORADABAD	DILARI	6476.28	0.00	691.74	7168.02	85.28	Semi Critical
609	MORADABAD	KUNDARKI (DENGAPUR)	6608.47	18.98	980.48	7607.93	86.35	Semi Critical
610	MORADABAD	MORADABAD	5022.25	144.79	411.71	5578.75	89.54	Semi Critical
611	MORADABAD	MUNDAPANDEY	5180.88	5.11	724.17	5910.15	88.90	Semi Critical
612	MORADABAD	THAKURDWARA	5860.32	14.24	659.65	6534.21	66.60	Safe
613	MORADABAD	BHAGATPUR	2745.70	0.00	664.19	3409.88	81.00	Semi Critical
614	MORADABAD	MORADABAD City	0.00	12.41	5185.82	5198.23	313.83	Over Exploited
615	MUZAFFARNAGAR	BHAGHARA	9471.60	11.50	556.70	10039.80	107.86	Over Exploited
616	MUZAFFARNAGAR	BUDHANA	5793.68	27.92	1032.69	6854.30	98.62	Critical
617	MUZAFFARNAGAR	CHARTHAWAL	9088.08	14.53	606.86	9709.47	99.96	Critical
618	MUZAFFARNAGAR	JANSATH	9803.04	20.95	766.47	10590.46	60.62	Safe
619	MUZAFFARNAGAR	KHATAULI	8946.00	43.98	756.87	9746.85	59.29	Safe
620	MUZAFFARNAGAR	MORNA	8087.00	0.18	641.27	8728.45	65.81	Safe
621	MUZAFFARNAGAR	MUZAFFARNAGAR	5108.80	202.98	1449.63	6761.40	84.57	Semi Critical
622	MUZAFFARNAGAR	PURQAJI	11411.40	19.35	458.31	11889.07	68.63	Safe
623	MUZAFFARNAGAR	SHAHPUR	4619.44	0.00	539.48	5158.92	89.91	Semi Critical

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624	PILIBHIT	AMARIA	8683.71	7.12	662.09	9352.92	65.92	Safe
625	PILIBHIT	BARKHERA	6846.52	41.90	475.42	7363.85	68.93	Safe
626	PILIBHIT	BILSANDA	7077.72	0.00	545.80	7623.52	60.69	Safe
627	PILIBHIT	BISALPUR	5035.37	28.31	754.14	5817.81	62.77	Safe
628	PILIBHIT	LALAURIKHERA	5657.02	34.35	515.63	6206.99	69.29	Safe
629	PILIBHIT	MARAURI	5658.69	45.30	971.11	6675.09	65.77	Safe
630	PILIBHIT	PURANPUR	22640.97	7.70	1487.77	24136.44	63.71	Safe
631	PRATAPGARH	ASPUR DEOSARA	4120.36	0.00	467.25	4587.61	81.72	Semi Critical
632	PRATAPGARH	BABA BELKHAR NATH	3173.08	0.00	323.74	3496.83	73.59	Semi Critical
633	PRATAPGARH	BABAGANJ	6556.80	0.00	506.84	7063.64	66.75	Safe
634	PRATAPGARH	BIHAR	5086.00	32.85	622.35	5741.20	56.60	Safe
635	PRATAPGARH	GAURA	5294.00	0.00	596.88	5890.89	84.61	Semi Critical
636	PRATAPGARH	KALANKER	6282.80	0.00	457.37	6740.17	62.33	Safe
637	PRATAPGARH	KUNDA	5916.00	0.00	737.58	6653.58	72.18	Semi Critical
638	PRATAPGARH	LAKSHAMANPUR	4905.00	0.00	465.41	5370.41	80.44	Semi Critical
639	PRATAPGARH	LALGANJ	5083.20	0.00	347.63	5430.83	80.83	Semi Critical
640	PRATAPGARH	MANDHATA	7050.70	0.00	463.83	7514.53	99.72	Critical
641	PRATAPGARH	MANGARAURA	4491.60	0.00	582.51	5074.11	85.07	Semi Critical
642	PRATAPGARH	PATTI	4438.72	0.00	326.64	4765.36	80.21	Semi Critical
643	PRATAPGARH	RAMPUR-SANGRAMGARH	3889.60	0.00	550.50	4440.11	77.38	Semi Critical
644	PRATAPGARH	SADAR	6479.60	0.00	391.72	6871.31	92.51	Critical
645	PRATAPGARH	SANDWA CHANDIKA	8118.00	0.00	439.22	8557.22	99.38	Critical
646	PRATAPGARH	SANGAIPUR	4007.20	0.00	479.92	4487.12	68.32	Safe
647	PRATAPGARH	SHIVGARH	6264.40	0.00	451.57	6715.97	93.84	Critical
648	PRAYAGRAJ	BAHADURPUR	3720.00	0.00	902.02	4622.01	73.98	Semi Critical
649	PRAYAGRAJ	BAHARIA	3308.80	0.00	296.07	3604.87	69.84	Safe
650	PRAYAGRAJ	CHAKA	3387.05	8.16	585.50	3980.71	94.60	Critical

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651	PRAYAGRAJ	DHANUPUR	4486.58	0.00	642.26	5128.84	85.50	Semi Critical
652	PRAYAGRAJ	HANDIA	2439.84	0.00	657.07	3096.91	68.82	Safe
653	PRAYAGRAJ	HOLAGARH	2851.73	0.00	244.21	3095.94	71.87	Semi Critical
654	PRAYAGRAJ	JASRA	3487.77	10.93	240.30	3739.00	55.65	Safe
655	PRAYAGRAJ	KARCHANA	4376.64	31.82	636.58	5045.04	69.94	Safe
656	PRAYAGRAJ	KAUDHIYARA	3605.10	12.60	465.70	4083.41	63.58	Safe
657	PRAYAGRAJ	KAURIHAR	2314.20	15.64	404.58	2734.42	69.21	Safe
658	PRAYAGRAJ	KORAON	4874.41	0.00	621.51	5495.92	59.45	Safe
659	PRAYAGRAJ	MANDA	2733.60	1.93	582.67	3318.21	57.73	Safe
660	PRAYAGRAJ	MAUAIMA	3986.15	0.00	557.74	4543.89	84.93	Semi Critical
661	PRAYAGRAJ	MEJA	3275.49	0.00	713.04	3988.53	52.01	Safe
662	PRAYAGRAJ	PHULPUR	2168.56	1506.46	477.12	4152.15	86.91	Semi Critical
663	PRAYAGRAJ	PRATAPPUR	4728.00	0.00	688.70	5416.70	85.89	Semi Critical
664	PRAYAGRAJ	SAIDABAD	3958.00	0.00	515.44	4473.44	84.48	Semi Critical
665	PRAYAGRAJ	SHANKARGARH	3527.10	18.15	557.10	4102.35	60.17	Safe
666	PRAYAGRAJ	SORAON	1979.90	0.39	500.64	2480.91	66.17	Safe
667	PRAYAGRAJ	URUWAN	3083.41	0.00	567.95	3651.36	67.02	Safe
668	PRAYAGRAJ	BHAGWATPUR	2288.00	0.00	386.78	2674.78	66.03	Safe
669	PRAYAGRAJ	SAHSON	2887.62	0.00	797.50	3685.11	95.96	Critical
670	PRAYAGRAJ	SHRINGVERPUR DHAM	1984.00	0.18	752.02	2736.20	89.45	Semi Critical
671	PRAYAGRAJ	PRAYAGRAJ CITY	0.00	0.00	4247.84	4247.84	181.97	Over Exploited
672	RAIBARELI	AMAWAN	1228.65	3.39	312.24	1544.29	34.01	Safe
673	RAIBARELI	BACHRAWAN	5850.00	3.65	550.60	6404.25	61.95	Safe
674	RAIBARELI	DALMAU	3821.50	0.00	589.94	4411.45	65.39	Safe
675	RAIBARELI	DEENSAH GAURA	2653.45	0.00	253.34	2906.78	58.44	Safe
676	RAIBARELI	HARCHANDPUR	3167.20	0.37	335.38	3502.94	60.52	Safe
677	RAIBARELI	JAGATPUR	1307.08	0.00	214.81	1521.89	52.15	Safe

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678	RAIBARELI	KHIRON	3566.28	0.00	372.34	3938.62	64.29	Safe
679	RAIBARELI	LALGANJ	5122.15	1.61	546.09	5669.85	63.68	Safe
680	RAIBARELI	MAHARAJGANJ	4375.20	0.00	505.18	4880.39	61.71	Safe
681	RAIBARELI	RAHI	4727.50	2.99	475.20	5205.69	64.96	Safe
682	RAIBARELI	ROHANIYA	1679.04	0.00	166.38	1845.42	54.44	Safe
683	RAIBARELI	SARAINI	2279.00	0.00	416.79	2695.80	57.45	Safe
684	RAIBARELI	SATAWAN	3039.04	0.00	398.65	3437.69	54.54	Safe
685	RAIBARELI	SHIVGARH	4007.00	0.00	272.40	4279.41	67.88	Safe
686	RAIBARELI	UNCHAHAR	2061.11	0.00	380.79	2441.90	61.54	Safe
687	RAIBARELI	CHHATOH	2535.00	0.00	310.00	2845.00	59.13	Safe
688	RAIBARELI	DIH	3848.12	0.00	379.05	4227.17	55.68	Safe
689	RAIBARELI	SALAON	3273.00	0.00	622.63	3895.63	45.79	Safe
690	RAMPUR	BILASPUR	13537.21	141.37	770.82	14449.40	62.40	Safe
691	RAMPUR	CHAMRAUWA	5628.04	142.13	587.94	6358.12	82.95	Semi Critical
692	RAMPUR	MILAK	7522.72	0.11	902.34	8425.17	74.17	Semi Critical
693	RAMPUR	SAID NAGAR	3527.27	0.37	648.94	4176.58	79.93	Semi Critical
694	RAMPUR	SAUR	10669.04	9.74	1287.67	11966.45	87.96	Semi Critical
695	RAMPUR	SHAHABAD	6130.73	5.73	995.39	7131.85	76.46	Semi Critical
696	SAHARANPUR	BALLIA KHERI	7090.00	668.13	552.67	8310.80	75.03	Semi Critical
697	SAHARANPUR	DEOBAND	8584.80	35.99	772.07	9392.86	88.14	Semi Critical
698	SAHARANPUR	GANGOH	19032.33	3.00	921.23	19956.56	152.35	Over Exploited
699	SAHARANPUR	MUZAFFARABAD	11191.20	0.00	852.43	12043.63	82.21	Semi Critical
700	SAHARANPUR	NAGAL	17473.32	24.09	509.81	18007.22	146.02	Over Exploited
701	SAHARANPUR	NAKUR	11512.40	18.43	629.68	12160.51	110.85	Over Exploited
702	SAHARANPUR	NANAUTA	7637.40	37.92	448.57	8123.90	78.24	Semi Critical
703	SAHARANPUR	PUNWARKA	6573.20	18.58	657.60	7249.39	62.88	Safe
704	SAHARANPUR	RAMPUR MANIHARAN	6688.42	0.73	466.34	7155.49	85.51	Semi Critical

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705	SAHARANPUR	SADHAULI KADEEM	12654.00	0.94	646.14	13301.08	88.46	Semi Critical
706	SAHARANPUR	SARSAWA	15548.49	9.85	824.65	16382.99	124.40	Over Exploited
707	SAMBHAL	ASMOLI	3557.12	22.56	695.77	4275.45	88.74	Semi Critical
708	SAMBHAL	BAHJOI	3283.42	0.00	583.26	3866.68	98.18	Critical
709	SAMBHAL	BANIAKHERA	4557.33	111.91	721.73	5390.97	97.93	Critical
710	SAMBHAL	GUNNAUR	3828.20	98.55	533.51	4460.26	80.71	Semi Critical
711	SAMBHAL	JANAWAI	3495.84	0.00	429.69	3925.53	72.56	Semi Critical
712	SAMBHAL	PAWANSA	5337.32	0.00	775.73	6113.04	99.24	Critical
713	SAMBHAL	RAJPURA	3482.70	53.55	556.99	4093.24	69.49	Safe
714	SAMBHAL	SAMBHAL	3993.67	207.90	1435.75	5637.32	93.66	Critical
715	SANT KABIR NAGAR	BAGHAULI	3642.80	0.00	472.86	4115.66	69.28	Safe
716	SANT KABIR NAGAR	HAISAR BAZAR	3349.74	0.00	580.44	3930.18	59.31	Safe
717	SANT KABIR NAGAR	KHALILABAD	2494.56	134.15	553.00	3181.72	61.96	Safe
718	SANT KABIR NAGAR	MEHDAWAL	3167.20	38.82	453.42	3659.44	63.19	Safe
719	SANT KABIR NAGAR	NATH NAGAR	3679.45	0.00	557.67	4237.12	64.52	Safe
720	SANT KABIR NAGAR	PAULI	2117.12	0.00	261.45	2378.58	62.42	Safe
721	SANT KABIR NAGAR	SANTHA	3275.46	0.00	422.09	3697.55	66.89	Safe
722	SANT KABIR NAGAR	SEMARIYAWAN	3242.34	0.00	640.78	3883.12	62.16	Safe
723	SANT KABIR NAGAR	VELHAR KALAN	1573.80	0.00	380.99	1954.80	56.93	Safe
724	SANT RAVIDAS NAGAR	ABHAULI	3876.04	0.00	774.98	4651.02	88.31	Semi Critical
725	SANT RAVIDAS NAGAR	AURAI	4834.31	65.70	535.15	5435.16	71.56	Semi Critical
726	SANT RAVIDAS NAGAR	BHADOHI	4852.41	14.60	681.83	5548.84	80.25	Semi Critical
727	SANT RAVIDAS NAGAR	DEEGH	28385.41	0.00	827.01	29212.42	76.47	Semi Critical
728	SANT RAVIDAS NAGAR	GYANPUR	12901.77	0.00	349.43	13251.20	87.21	Semi Critical
729	SANT RAVIDAS NAGAR	SURIYAWAN	3566.67	0.00	310.37	3877.04	86.19	Semi Critical
730	SHAHJAHANPUR	BANDA	6422.20	49.73	521.21	6993.14	55.33	Safe
731	SHAHJAHANPUR	BHAWAL KHERA	4333.90	97.89	1826.82	6258.61	68.56	Safe

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732	SHAHJAHANPUR	DADROL	3749.22	1436.02	445.10	5630.33	67.68	Safe
733	SHAHJAHANPUR	JAITPUR	3933.40	0.00	390.34	4323.74	69.22	Safe
734	SHAHJAHANPUR	JALALABAD	7596.88	0.00	685.93	8282.81	69.88	Safe
735	SHAHJAHANPUR	KALAN	3180.50	0.00	488.65	3669.15	69.89	Safe
736	SHAHJAHANPUR	KANTH	3680.40	5.58	449.18	4135.15	61.69	Safe
737	SHAHJAHANPUR	KATRA	3800.64	7.39	502.75	4310.78	57.75	Safe
738	SHAHJAHANPUR	KHUTAR	5516.40	0.63	342.45	5859.49	53.88	Safe
739	SHAHJAHANPUR	MADANAPUR	3897.40	0.63	400.37	4298.40	65.28	Safe
740	SHAHJAHANPUR	MIRZAPUR	5287.28	0.00	414.09	5701.37	67.11	Safe
741	SHAHJAHANPUR	NIGOHI	5662.46	40.27	493.94	6196.67	64.44	Safe
742	SHAHJAHANPUR	PUYAWAN	4717.12	0.47	496.16	5213.76	68.98	Safe
743	SHAHJAHANPUR	SINDHAULI	4088.52	0.00	494.69	4583.21	63.90	Safe
744	SHAHJAHANPUR	TILHAR	3407.88	0.63	574.69	3983.20	65.21	Safe
745	SHAMLI	KAIRANA	7737.92	4.52	597.81	8340.25	99.84	Critical
746	SHAMLI	KANDHALA	8701.84	0.00	607.27	9309.11	99.41	Critical
747	SHAMLI	SHAMLI	9184.50	381.56	653.92	10219.97	125.72	Over Exploited
748	SHAMLI	THANA BHAWAN	6120.60	0.00	612.51	6733.10	87.67	Semi Critical
749	SHAMLI	UN	9358.68	8.40	562.42	9929.50	104.43	Over Exploited
750	SHRAWASTI	GILAULA	5460.09	0.00	597.66	6057.75	61.89	Safe
751	SHRAWASTI	HARIHARPUR RANI	5590.84	0.00	601.58	6192.42	61.97	Safe
752	SHRAWASTI	IKAUNA	4914.65	0.00	651.29	5565.94	61.50	Safe
753	SHRAWASTI	JAMUNAHA	5780.05	0.00	730.24	6510.29	62.72	Safe
754	SHRAWASTI	SIRSIYA	4457.94	0.00	656.28	5114.22	41.54	Safe
755	SIDDHARTH NAGAR	BANSI	3306.04	0.00	559.07	3865.11	67.19	Safe
756	SIDDHARTH NAGAR	BARHANI	2576.45	0.00	452.16	3028.61	58.00	Safe
757	SIDDHARTH NAGAR	BHANWAPUR	5624.32	0.00	610.15	6234.47	67.42	Safe
758	SIDDHARTH NAGAR	BIRDPUR	3166.88	0.00	475.60	3642.48	57.00	Safe

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759	SIDDHARTH NAGAR	DOMARIAGANJ	4321.82	0.07	899.72	5221.61	64.32	Safe
760	SIDDHARTH NAGAR	ITWA	4560.00	0.27	547.69	5107.95	69.18	Safe
761	SIDDHARTH NAGAR	JOGIYA	3019.83	0.00	381.05	3400.88	59.36	Safe
762	SIDDHARTH NAGAR	KHESRHA	3759.34	0.00	535.10	4294.43	68.02	Safe
763	SIDDHARTH NAGAR	KHUNIYAW	5110.24	0.00	626.19	5736.43	68.38	Safe
764	SIDDHARTH NAGAR	LOTAN	2420.89	0.00	280.70	2701.58	68.67	Safe
765	SIDDHARTH NAGAR	MITHWAL	3063.75	0.00	612.38	3676.12	56.80	Safe
766	SIDDHARTH NAGAR	NAUGARH	2191.25	0.00	586.94	2778.18	65.31	Safe
767	SIDDHARTH NAGAR	SHOHATGARH	2700.72	0.00	417.32	3118.04	52.13	Safe
768	SIDDHARTH NAGAR	USKA BAZAR	1814.65	0.00	382.76	2197.41	59.57	Safe
769	SITAPUR	AILIA	2871.90	310.25	529.87	3712.02	54.35	Safe
770	SITAPUR	BEHTA	3911.70	481.80	654.79	5048.29	59.24	Safe
771	SITAPUR	BISWAN	1269.98	4380.00	789.39	6439.37	64.72	Safe
772	SITAPUR	GONDLAMAU	195.33	4380.00	565.46	5140.78	67.47	Safe
773	SITAPUR	HARGAON	7412.80	0.00	593.66	8006.46	56.43	Safe
774	SITAPUR	KASMANDA	5853.20	0.00	563.32	6416.52	64.19	Safe
775	SITAPUR	KHAIRABAD	279.60	4380.00	596.93	5256.53	69.53	Safe
776	SITAPUR	LAHARPUR	9857.70	131.40	483.17	10472.27	60.88	Safe
777	SITAPUR	MACHHREHTA	3332.58	0.00	512.60	3845.19	54.52	Safe
778	SITAPUR	MAHMUDABAD	2998.60	0.00	473.46	3472.06	62.96	Safe
779	SITAPUR	MAHOLI	3855.48	496.40	459.78	4811.66	60.28	Safe
780	SITAPUR	MISRIKH	3423.80	0.00	527.68	3951.47	45.08	Safe
781	SITAPUR	PAHALA	10141.94	0.00	533.49	10675.44	58.68	Safe
782	SITAPUR	PARSENDI	4949.96	0.00	618.49	5568.45	53.06	Safe
783	SITAPUR	PISAWAN	5241.00	0.00	624.16	5865.16	63.62	Safe
784	SITAPUR	RAMPUR MATHURA	4118.40	0.00	668.67	4787.07	60.39	Safe
785	SITAPUR	REWSA	5840.08	0.00	847.32	6687.40	61.78	Safe

Sl. 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		
786	SITAPUR	SAKRAN	3786.40	0.00	589.69	4376.09	60.86	Safe
787	SITAPUR	SIDHAULI	1439.90	2792.25	627.92	4860.07	67.82	Safe
788	SONBHADRA	BABHANI	1069.20	0.00	300.60	1369.81	55.90	Safe
789	SONBHADRA	CHATRA	2411.10	0.00	316.08	2727.18	64.75	Safe
790	SONBHADRA	CHOPAN	1499.39	375.13	603.09	2477.61	53.41	Safe
791	SONBHADRA	DUDHI	2402.30	0.00	578.74	2981.04	76.68	Semi Critical
792	SONBHADRA	GHORAWAL	3821.68	0.00	628.42	4450.10	51.71	Safe
793	SONBHADRA	MYORPUR	1944.00	68.33	884.91	2897.23	49.38	Safe
794	SONBHADRA	NAGAWA	1419.20	0.00	264.86	1684.06	67.28	Safe
795	SONBHADRA	ROBERTSGANJ	4911.46	386.74	81.60	5379.80	40.70	Safe
796	SONBHADRA	KARMA	1258.30	0.00	211.78	1470.07	30.82	Safe
797	SONBHADRA	KONE	512.70	0.00	445.01	957.72	56.38	Safe
798	SULTANPUR	AKHAND NAGAR	3116.76	0.00	439.33	3556.09	58.99	Safe
799	SULTANPUR	BALDIRAI	3324.96	0.30	406.60	3731.86	59.82	Safe
800	SULTANPUR	BHADAIYAN	2740.20	0.00	623.21	3363.41	63.02	Safe
801	SULTANPUR	DHANPATGANJ	4197.12	0.00	423.69	4620.82	61.25	Safe
802	SULTANPUR	DOSTPUR	3315.76	0.00	338.18	3653.94	58.62	Safe
803	SULTANPUR	DUBEPUR	3805.92	0.00	470.81	4276.74	66.54	Safe
804	SULTANPUR	JAI SINGHPUR	4533.12	0.27	412.45	4945.84	65.67	Safe
805	SULTANPUR	KADIPUR	2308.00	0.00	371.99	2679.99	54.26	Safe
806	SULTANPUR	KUREBHAR	4805.50	5.24	397.21	5207.96	59.14	Safe
807	SULTANPUR	KURWAR	4076.40	0.00	492.42	4568.82	61.14	Safe
808	SULTANPUR	LAMBHUA	4815.44	0.00	427.11	5242.55	68.24	Safe
809	SULTANPUR	MOTIGARPUR	1533.12	0.00	667.08	2200.20	63.17	Safe
810	SULTANPUR	P.P. KANNAICHA	2178.00	0.00	442.03	2620.04	61.29	Safe
811	SULTANPUR	KARONDIKALA	1385.28	0.00	265.23	1650.51	58.05	Safe
812	UNNAO	ASOHA	5518.00	0.00	426.47	5944.47	53.92	Safe

Sl. 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		
813	UNNAO	AURAS	6008.88	0.00	419.54	6428.42	60.37	Safe
814	UNNAO	BANGARMAU	3820.60	2.69	458.37	4281.66	63.99	Safe
815	UNNAO	BICHHIA	6875.65	35.97	536.59	7448.19	52.81	Safe
816	UNNAO	BIGHAPUR	4201.20	0.00	392.67	4593.87	67.64	Safe
817	UNNAO	FATEHPUR CHAURASI	4808.34	0.00	417.38	5225.72	58.31	Safe
818	UNNAO	GANG MURADABAD	5114.10	0.00	400.18	5514.28	66.18	Safe
819	UNNAO	HASANGANJ	7481.84	1.80	651.11	8134.75	69.70	Safe
820	UNNAO	HILAULI	4180.51	0.00	512.25	4692.76	63.10	Safe
821	UNNAO	MIANGANJ	7732.76	0.00	463.68	8196.44	65.37	Safe
822	UNNAO	NAWABGANJ	5120.42	2.24	534.00	5656.65	61.74	Safe
823	UNNAO	PURWA	6237.20	0.00	424.06	6661.26	62.92	Safe
824	UNNAO	SAFIPUR	4549.32	0.00	710.99	5260.31	63.07	Safe
825	UNNAO	SIKANDAR SIRAUSI	6110.08	5.64	518.62	6634.35	61.89	Safe
826	UNNAO	SIKANDARPUR KARAN	3336.40	26.03	1342.86	4705.29	51.14	Safe
827	UNNAO	SUMERPUR	6002.88	0.00	415.04	6417.92	63.87	Safe
828	VARANASI	ARAZILINE	5622.00	10.06	808.08	6440.14	106.24	Over Exploited
829	VARANASI	BARAGAON	2906.40	0.00	589.02	3495.42	67.43	Safe
830	VARANASI	CHIRAIGAON	3955.28	0.00	752.40	4707.67	94.77	Critical
831	VARANASI	CHOLAPUR	3454.84	0.00	629.54	4084.38	56.32	Safe
832	VARANASI	HARAHUA	4416.00	3.21	774.11	5193.33	100.35	Over Exploited
833	VARANASI	KASHI VIDYAPITH	2586.16	32.71	570.63	3189.51	75.72	Semi Critical
834	VARANASI	PINDRA	4819.60	54.80	716.25	5590.65	78.15	Semi Critical
835	VARANASI	SEVAPURI	3633.80	3.68	602.57	4240.06	75.10	Semi Critical
836	VARANASI	VARANASI City	0.00	9.60	5156.78	5166.38	223.23	Over Exploited
		Total Ham	**4091757.41**	**43845.24**	**504058.56**	**4639661.21**		
		Total BCM	**40.92**	**0.44**	**5.04**	**46.40**		

ANNEXURE VI: Assessment Unit wise average Water Level 2022

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
1	AGRA	Achhnera	10.26	9.55
2	AGRA	Agra Urban	27.74	27.49
3	AGRA	Akola	20.67	20.04
4	AGRA	Bah	37.20	36.37
5	AGRA	Barauli Ahir	32.89	30.38
6	AGRA	Bichpuri	29.42	29.06
7	AGRA	Etmadpur	32.32	33.45
8	AGRA	Fatehabad	42.87	42.42
9	AGRA	Fatehpur Sikri	15.98	12.03
10	AGRA	Jagner	15.49	15.6
11	AGRA	Jaitpur Kalan	37.45	36.18
12	AGRA	Khandauli	33.03	30.79
13	AGRA	Kheragarh	31.58	31.53
14	AGRA	Pinahat	37.27	36.34
15	AGRA	Saiyana	43.32	42.05
16	AGRA	Shamsabad	45.46	44.52
17	ALIGARH	Akrabad	8.15	7.22
18	ALIGARH	Aligarh Urban	25.61	25.85
19	ALIGARH	Atrauli	14.44	13.46
20	ALIGARH	Bijauli	16.33	15.47
21	ALIGARH	Chandaus	15.81	13.93
22	ALIGARH	Dhanipur	12.34	10.58
23	ALIGARH	Gangiri	16.88	16.20
24	ALIGARH	Gonda	8.71	8.67
25	ALIGARH	Iglas	13.47	14.85
26	ALIGARH	Jawa Sikandairpur	11.50	10.35
27	ALIGARH	Khair	10.62	9.81
28	ALIGARH	Lodha	19.13	19.93
29	ALIGARH	Tappal	13.87	11.24
30	AMBEDKAR NAGAR	Akbarpur	4.96	3.20
31	AMBEDKAR NAGAR	Baskhari	5.00	2.43
32	AMBEDKAR NAGAR	Bhiti	6.45	3.10
33	AMBEDKAR NAGAR	Bhiyaon	4.15	3.06
34	AMBEDKAR NAGAR	Jahangirgani	4.95	2.02
35	AMBEDKAR NAGAR	Jalalpur	5.31	4.26
36	AMBEDKAR NAGAR	Katehari	5.30	3.45
37	AMBEDKAR NAGAR	Ramnagar	4.90	1.48
38	AMBEDKAR NAGAR	Tanda	5.08	2.19
39	AMETHI	Amethi	7.16	6.48
40	AMETHI	Bahadurpur	4.67	3.26
41	AMETHI	Bhadar	5.87	5.44
42	AMETHI	Bhetua	5.42	4.49

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
43	AMETHI	Gauriganj	4.02	2.64
44	AMETHI	Jagdishpur	8.24	7.92
45	AMETHI	Jamo	4.62	2.97
46	AMETHI	Musafirkhana	7.30	6.37
47	AMETHI	Sangrampur	11.29	13.94
48	AMETHI	Shahgarh	5.00	3.36
49	AMETHI	Shukul Bazar	7.20	5.83
50	AMETHI	Singhpur	4.95	3.10
51	AMETHI	Tiloi	4.08	2.80
52	AMROHA	Amroha	12.91	12.61
53	AMROHA	Dhanaura	10.47	9.91
54	AMROHA	Gajraula	12.01	12.36
55	AMROHA	Gangeshwari	10.63	10.14
56	AMROHA	Hasanpur	16.68	15.33
57	AMROHA	Joya	16.41	15.87
58	AURAIYA	Achhalda	7.13	5.02
59	AURAIYA	Ajitmal	16.97	12.63
60	AURAIYA	Aurraiya	21.15	16.37
61	AURAIYA	Bhagyanagar	8.30	4.66
62	AURAIYA	Bidhuna	6.80	5.12
63	AURAIYA	Erwa Katra	9.69	8.61
64	AURAIYA	Sahar	6.97	3.91
65	AYODHYA	Amaniganj	5.80	3.85
66	AYODHYA	Bikapur	6.78	4.17
67	AYODHYA	Harringtanganj	6.65	3.65
68	AYODHYA	Masodha	5.25	2.73
69	AYODHYA	Mawai	7.27	5.37
70	AYODHYA	Maya Bazar	5.52	2.80
71	AYODHYA	Milkipur	5.30	3.18
72	AYODHYA	Pura Bazar	5.40	2.67
73	AYODHYA	Rudauli	6.06	3.59
74	AYODHYA	Sohawal	5.82	3.29
75	AYODHYA	Tarun	6.53	3.93
76	AZAMGARH	Ahiraula	4.90	2.53
77	AZAMGARH	Atraulia	4.29	1.63
78	AZAMGARH	Azamatgarh	5.71	3.16
79	AZAMGARH	Bilhariyaganj	5.52	4.14
80	AZAMGARH	Haraiya	5.70	3.61
81	AZAMGARH	Jahanganj	4.88	2.72
82	AZAMGARH	Koilsa	4.81	1.36
83	AZAMGARH	Lalganj	3.68	1.92
84	AZAMGARH	Maharajganj	4.97	3.14
85	AZAMGARH	Martinganj	3.15	1.50
86	AZAMGARH	Mehnagar	4.05	1.65

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
87	AZAMGARH	Mirzapur	4.50	2.68
88	AZAMGARH	Mohammadpur	3.87	3.50
89	AZAMGARH	Palhana	3.61	3.09
90	AZAMGARH	Palhani	5.39	3.82
91	AZAMGARH	Pawai	5.32	2.99
92	AZAMGARH	Phulpur	3.72	1.45
93	AZAMGARH	Rani ki Sarai	3.75	2.21
94	AZAMGARH	Sathiyaon	4.41	2.48
95	AZAMGARH	Tahbarpur	4.87	2.86
96	AZAMGARH	Tarwa	4.36	3.12
97	AZAMGARH	Thekma	3.47	2.13
98	BAGPAT	Baghpat	16.86	16.20
99	BAGPAT	Baraut	18.71	19.54
100	BAGPAT	Binauli	26.78	27.32
101	BAGPAT	Chhaprauli	17.42	18.40
102	BAGPAT	Khekra	20.42	20.10
103	BAGPAT	Pilana	23.09	22.69
104	BAHRAICH	Balha	4.24	2.70
105	BAHRAICH	Bisheshwarganj	3.54	1.58
106	BAHRAICH	Chittaura	3.88	2.88
107	BAHRAICH	Fakharpur	3.52	1.72
108	BAHRAICH	Huzurpur	2.95	1.16
109	BAHRAICH	Jarwal	3.88	1.82
110	BAHRAICH	Kaisarganj	3.82	1.29
111	BAHRAICH	Mahasi	3.00	1.29
112	BAHRAICH	Mihipurwa	3.17	1.37
113	BAHRAICH	Nawabganj	3.20	1.68
114	BAHRAICH	Payagpur	3.91	1.69
115	BAHRAICH	Risiya	5.01	3.80
116	BAHRAICH	Shivpur	3.79	2.07
117	BAHRAICH	Tejwapur	3.16	1.07
118	BALLIA	Bairia khera	6.00	3.19
119	BALLIA	Bansdih	4.89	2.63
120	BALLIA	Belhari	6.21	3.03
121	BALLIA	Beruar	5.28	2.49
122	BALLIA	Chilkahar	4.25	2.41
123	BALLIA	Dubahand	5.31	3.11
124	BALLIA	Garwar	4.35	2.33
125	BALLIA	Hanumanganj Brahmin	7.29	5.39
126	BALLIA	Maniyar	4.65	2.67
127	BALLIA	Murli chhapra	5.49	3.48
128	BALLIA	Nawa Nagar	3.77	2.32
129	BALLIA	Negara	3.57	1.95
130	BALLIA	Pandah	3.40	1.99

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
131	BALLIA	Rasra	4.72	3.43
132	BALLIA	Reoti	5.01	2.91
133	BALLIA	Siar	4.08	2.82
134	BALLIA	Sohaon	5.55	3.20
135	BALRAMPUR	Balrampur	3.26	4.34
136	BALRAMPUR	Gaindas Buzurg	3.00	1.35
137	BALRAMPUR	Gainsara	3.30	3.47
138	BALRAMPUR	Harraiya Satgharwa	3.59	1.72
139	BALRAMPUR	Pachperwa	3.12	2.56
140	BALRAMPUR	Rehra Bazar	3.43	1.30
141	BALRAMPUR	Shri Datt Ganj	3.02	1.19
142	BALRAMPUR	Tulsipur	3.68	2.47
143	BALRAMPUR	Utraula	3.00	1.04
144	BANDA	Baberu	8.00	7.33
145	BANDA	Barokhar	9.42	7.70
146	BANDA	Bisanda	5.45	2.91
147	BANDA	Jaspura	19.36	19.00
148	BANDA	Kamasin	10.90	8.70
149	BANDA	Mahuva	6.37	4.64
150	BANDA	Naraini	8.21	4.43
151	BANDA	Tindwari	12.35	16.55
152	BARABANKI	Bani Kodar	5.47	4.32
153	BARABANKI	Banki	5.86	3.35
154	BARABANKI	Dariyabad	4.90	3.86
155	BARABANKI	Dewa	5.22	2.22
156	BARABANKI	Fatehpur	5.05	2.74
157	BARABANKI	Haidergarh	5.30	4.21
158	BARABANKI	Harak	6.63	2.98
159	BARABANKI	Masauli	5.59	2.81
160	BARABANKI	Nindaura	6.28	4.02
161	BARABANKI	Pure Dalai	4.53	2.98
162	BARABANKI	Ramnagar	5.87	3.70
163	BARABANKI	Siddhaur	6.29	3.93
164	BARABANKI	Sirauli Gauspur	5.11	3.62
165	BARABANKI	Suratganj	5.21	2.53
166	BARABANKI	Trivediganj	5.05	2.52
167	BAREILLY	Alampur Jafarabad	8.20	9.81
168	BAREILLY	Baheri	4.75	2.46
169	BAREILLY	Bareilly Urban	6.27	7.38
170	BAREILLY	Bhadpura	3.92	2.18
171	BAREILLY	Bhojpura	3.81	4.29
172	BAREILLY	Bhutah	3.91	3.57
173	BAREILLY	Bitheri Chainpur	4.37	4.17
174	BAREILLY	Faridpur	7.28	6.47

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
175	BAREILLY	Fatehganj	5.05	4.95
176	BAREILLY	Kyara	4.97	4.84
177	BAREILLY	Majhgawa	7.23	8.06
178	BAREILLY	Meerganj	5.92	5.44
179	BAREILLY	Nawabganj	3.17	4.12
180	BAREILLY	Ramnagar	12.41	14.74
181	BAREILLY	Richha	3.90	3.29
182	BAREILLY	Shergarh	4.91	4.28
183	BASTI	Bahadurpur	3.60	2.77
184	BASTI	Bankati	3.24	3.00
185	BASTI	Basti Sadar	4.16	2.97
186	BASTI	Dubauliya	4.46	2.49
187	BASTI	Gaur	3.29	2.08
188	BASTI	Harraiya	4.95	2.62
189	BASTI	Kaptanganj	3.33	2.54
190	BASTI	Kudraha	3.78	3.08
191	BASTI	Parasrampur	3.67	1.61
192	BASTI	Ramnagar	3.33	1.23
193	BASTI	Rudhauli	3.00	2.28
194	BASTI	Salatua	3.00	1.56
195	BASTI	Saughat	3.04	2.12
196	BASTI	VikramJot	4.81	2.23
197	BIJNOR	Afzalgarh	5.19	3.37
198	BIJNOR	Dhanpur (Alhepur)	7.62	5.99
199	BIJNOR	Haldaur (Khari Jhalu)	9.12	8.71
200	BIJNOR	Jaleelpur	9.28	8.55
201	BIJNOR	Kiratpur	11.43	10.03
202	BIJNOR	Kotwali	9.32	6.69
203	BIJNOR	Mohammadpur Deomal	8.83	7.18
204	BIJNOR	Najibabad	11.02	8.64
205	BIJNOR	Nehtaur (Aaku)	8.11	7.98
206	BIJNOR	Noorpur	8.48	7.62
207	BIJNOR	Seohara (Budhanpur)	7.67	5.91
208	BUDAUN	Ambiapur	18.37	18.47
209	BUDAUN	Asafpur	16.40	17.42
210	BUDAUN	Bisauli	17.86	18.22
211	BUDAUN	Dahgawan	10.85	12.65
212	BUDAUN	Dataganj	10.72	7.27
213	BUDAUN	Islamnagar	14.42	17.93
214	BUDAUN	Jagat	17.67	17.60
215	BUDAUN	Miaon	14.54	12.87
216	BUDAUN	Quadar Chowk	13.17	11.95
217	BUDAUN	Sahaswan	12.43	11.01
218	BUDAUN	Salarpur	15.54	16.40

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
219	BUDAUN	Samrer	9.64	7.58
220	BUDAUN	Ujhani	12.66	14.63
221	BUDAUN	Usawan	11.72	12.28
222	BUDAUN	Wazirganj	18.15	19.10
223	BULANDSHAHAR	Agauta	11.00	9.57
224	BULANDSHAHAR	Anup shahar	9.78	9.99
225	BULANDSHAHAR	Arnia Khurd	8.68	8.00
226	BULANDSHAHAR	Bhawan Bahadur Nagar	10.08	9.44
227	BULANDSHAHAR	Bulandshahar	9.15	8.05
228	BULANDSHAHAR	Danpur	9.88	12.37
229	BULANDSHAHAR	Debai	12.56	11.08
230	BULANDSHAHAR	Gulaothi	10.72	9.59
231	BULANDSHAHAR	Jahangirabad	11.00	11.14
232	BULANDSHAHAR	Khurja	13.36	11.36
233	BULANDSHAHAR	Lakhaothi	10.70	10.92
234	BULANDSHAHAR	Pahasu	7.19	8.22
235	BULANDSHAHAR	Shikarpur	12.08	12.45
236	BULANDSHAHAR	Siana	13.23	12.29
237	BULANDSHAHAR	Sikandrabad	8.80	7.94
238	BULANDSHAHAR	Unchagaon	12.52	12.10
239	CHANDAULI	Barahani	7.63	3.20
240	CHANDAULI	Chahniya	7.47	5.38
241	CHANDAULI	Chakia	5.62	2.38
242	CHANDAULI	Chandauli	7.12	2.88
243	CHANDAULI	Dhanapur	6.02	3.94
244	CHANDAULI	Naugarh	5.38	4.23
245	CHANDAULI	Niyamatabad	4.81	3.43
246	CHANDAULI	Sakaldiha	5.57	1.94
247	CHANDAULI	Shahabganj	6.59	2.16
248	CHITRAKOOT	Karwi	9.72	6.03
249	CHITRAKOOT	Manikpur	10.78	8.08
250	CHITRAKOOT	Mau	10.59	8.64
251	CHITRAKOOT	Pahari	12.04	9.61
252	CHITRAKOOT	Ramnagar	14.00	9.30
253	DEORIA	Bankata	4.44	4.01
254	DEORIA	Barhaj	5.00	2.47
255	DEORIA	Betalpur	3.17	1.55
256	DEORIA	Bhagalpur	4.52	1.61
257	DEORIA	Bhaluani	4.16	2.77
258	DEORIA	Bhatni	3.00	1.53
259	DEORIA	Bhatparani	3.36	2.59
260	DEORIA	Deoria Sadar	3.12	1.76
261	DEORIA	Desahi Deoria	4.67	2.18
262	DEORIA	Gauri Bazar	3.15	1.15

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
263	DEORIA	Lar	3.37	1.70
264	DEORIA	Pather Dewa	4.00	2.34
265	DEORIA	Rampur Karhani	3.26	1.86
266	DEORIA	Rudrapur	5.42	2.72
267	DEORIA	Salempur	3.13	2.24
268	DEORIA	Tarkulwa	6.10	3.83
269	ETAH	Aliganj	13.45	13.61
270	ETAH	Awagarh	11.40	9.93
271	ETAH	Jaithara	10.07	8.91
272	ETAH	Jalesar	17.61	17.28
273	ETAH	Marhara	10.29	8.80
274	ETAH	Nidhauli Kalan	11.70	10.77
275	ETAH	Sakit	8.43	8.01
276	ETAH	Shitalpur	7.81	7.30
277	ETAWAH	Barahpura	25.87	23.79
278	ETAWAH	Basrehar	7.29	5.88
279	ETAWAH	Bharthna	6.03	4.68
280	ETAWAH	Chakaranagar	34.30	31.18
281	ETAWAH	Jaswantnagar	18.53	18.60
282	ETAWAH	Mahewa	11.00	8.75
283	ETAWAH	Sefai	10.73	10.69
284	ETAWAH	Takha	6.84	5.47
285	FARRUKHABAD	Barhpur	17.47	16.39
286	FARRUKHABAD	Kaimganj	8.43	9.96
287	FARRUKHABAD	Kamalganj	19.60	19.64
288	FARRUKHABAD	Mohamadabad	20.43	20.97
289	FARRUKHABAD	Nawabganj	13.96	15.20
290	FARRUKHABAD	Rajepur	6.48	8.19
291	FARRUKHABAD	Shamsabad	13.72	14.38
292	FATEHPUR	Airaya	11.56	11.46
293	FATEHPUR	Amauli	19.96	22.24
294	FATEHPUR	Asodhar	14.00	10.03
295	FATEHPUR	Bahua	15.79	14.43
296	FATEHPUR	Bhitaura	8.68	5.51
297	FATEHPUR	Deomai	12.60	12.78
298	FATEHPUR	Dhata	18.01	13.87
299	FATEHPUR	Haswa	13.07	9.84
300	FATEHPUR	Hathgaon	12.21	14.06
301	FATEHPUR	Khajuha	16.62	16.85
302	FATEHPUR	Malawan	8.51	8.70
303	FATEHPUR	Telyani	10.88	8.09
304	FATEHPUR	Vijayipur	18.42	11.97
305	FIROZABAD	Aron	24.20	23.53
306	FIROZABAD	Eka	9.91	9.71

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
307	FIROZABAD	Firozabad	41.96	41.37
308	FIROZABAD	Jasrana	11.84	10.70
309	FIROZABAD	Khairgarh (Hathwant)	19.52	19.44
310	FIROZABAD	Madanpur	21.44	20.49
311	FIROZABAD	Narkhi	30.00	29.85
312	FIROZABAD	Shikohabad	24.04	22.58
313	FIROZABAD	Tundla	33.54	32.54
314	G.B.NAGAR	Bisrakh	19.04	18.49
315	G.B.NAGAR	Dadri	6.13	6.10
316	G.B.NAGAR	Jewar	9.63	8.47
317	GHAZIABAD	Bhojpur	13.24	12.76
318	GHAZIABAD	Gaziabad Urban	25.14	26.69
319	GHAZIABAD	Loni	24.22	23.45
320	GHAZIABAD	Muradnagar	8.62	9.18
321	GHAZIABAD	Razapur	16.23	17.81
322	GHAZIPUR	Bhadaura	5.35	3.49
323	GHAZIPUR	Bhanwarkol	4.17	2.63
324	GHAZIPUR	Birno	5.08	3.92
325	GHAZIPUR	Deokali	6.91	5.65
326	GHAZIPUR	Ghazipur	7.04	4.40
327	GHAZIPUR	Jakhania	5.39	4.56
328	GHAZIPUR	Karanda	8.02	6.71
329	GHAZIPUR	Kasimabad	4.53	5.61
330	GHAZIPUR	Manihari	5.51	4.39
331	GHAZIPUR	Maradh	5.12	4.28
332	GHAZIPUR	Mohammadabad	6.33	5.68
333	GHAZIPUR	Revatipur	6.58	3.37
334	GHAZIPUR	Sadat	5.02	4.02
335	GHAZIPUR	Saidpur	8.70	8.06
336	GHAZIPUR	Varachakwar	6.06	5.37
337	GHAZIPUR	Zamania	6.08	4.04
338	GONDA	Babhanjot	3.32	2.48
339	GONDA	Belsar	3.55	2.57
340	GONDA	Chhapia	3.97	1.71
341	GONDA	Colonelganj	3.84	2.14
342	GONDA	Haldharmau	3.13	1.31
343	GONDA	Itia Thok	3.66	1.51
344	GONDA	Jhanjhri	4.20	2.25
345	GONDA	Katra Bazar	3.13	1.89
346	GONDA	Mankapur	4.21	2.67
347	GONDA	Mujhana	3.86	1.41
348	GONDA	Nawabganj	3.46	2.16
349	GONDA	Pandri Kripal	3.50	1.28
350	GONDA	Paraspur	3.14	2.23

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
351	GONDA	Rupaidiha	3.13	1.08
352	GONDA	Tarabganj	4.22	2.15
353	GONDA	Wazirganj	3.56	2.11
354	GORAKHPUR	Bansgaon	4.69	1.75
355	GORAKHPUR	Barahalganj	4.91	1.95
356	GORAKHPUR	Belghat	5.08	2.99
357	GORAKHPUR	Bharohiya	4.62	3.00
358	GORAKHPUR	Bhatahat	3.91	1.66
359	GORAKHPUR	Brahmpur	4.70	2.34
360	GORAKHPUR	Campierganj	3.51	1.63
361	GORAKHPUR	Chirgawan	4.24	2.37
362	GORAKHPUR	Gagaha	5.04	3.37
363	GORAKHPUR	Gola	4.95	2.19
364	GORAKHPUR	Jangal kaudia	5.04	2.47
365	GORAKHPUR	Kauriram	6.15	3.04
366	GORAKHPUR	Khajni	5.04	2.25
367	GORAKHPUR	Khorabar	5.49	3.26
368	GORAKHPUR	Pali	4.95	2.88
369	GORAKHPUR	Pipraich	3.90	1.20
370	GORAKHPUR	Piprauli	5.83	2.82
371	GORAKHPUR	Sahjanwa	4.46	2.57
372	GORAKHPUR	Sardar Nagar	3.12	2.25
373	GORAKHPUR	Urua	4.87	2.00
374	HAMIRPUR	Gohand	19.05	15.09
375	HAMIRPUR	Kurara	11.59	13.33
376	HAMIRPUR	Maudaha	10.82	10.40
377	HAMIRPUR	Muskara	10.18	9.81
378	HAMIRPUR	Rath	16.94	13.94
379	HAMIRPUR	Sarila	19.83	17.06
380	HAMIRPUR	Sumerpur	16.75	14.89
381	HAPUR	Dholana	8.36	6.35
382	HAPUR	Garh	12.38	11.98
383	HAPUR	Hapur	14.61	14.50
384	HAPUR	Simbholi	11.60	10.80
385	HARDOI	Ahirori	4.33	2.91
386	HARDOI	Bawan	5.82	5.02
387	HARDOI	Bharawan	9.24	8.35
388	HARDOI	Bharkhani	8.65	7.44
389	HARDOI	Bhender Kalan	4.70	3.00
390	HARDOI	Bilgram	7.78	6.68
391	HARDOI	Hariyawan	4.48	4.00
392	HARDOI	Harpalpur	6.90	7.49
393	HARDOI	Kachhauna	5.19	3.03
394	HARDOI	Kothawan	5.29	4.24

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
395	HARDOI	Madhavganj	8.35	9.29
396	HARDOI	Mallawan	7.97	8.32
397	HARDOI	Pihani	5.93	4.23
398	HARDOI	Sandi	8.59	6.83
399	HARDOI	Sandila	5.44	3.79
400	HARDOI	Shahabad	7.51	7.11
401	HARDOI	Sursa	5.40	5.50
402	HARDOI	Tadiyawan	4.60	2.97
403	HARDOI	Todarpur	3.84	3.60
404	HATHRAS	Hasayan	14.45	10.42
405	HATHRAS	Hathras	16.44	17.96
406	HATHRAS	Mursan	16.88	19.36
407	HATHRAS	Sadabad	25.29	24.91
408	HATHRAS	Sahpau	23.06	21.92
409	HATHRAS	Sasni	19.76	20.67
410	HATHRAS	Sikandra Rao	13.99	12.84
411	JALAUN	Dakor	12.39	7.75
412	JALAUN	Jalaun	10.51	6.94
413	JALAUN	Kadaura	13.79	11.41
414	JALAUN	Konch	8.25	3.67
415	JALAUN	Kuthond	17.26	15.80
416	JALAUN	Madhoganj	8.83	3.46
417	JALAUN	Mahewa	24.27	16.59
418	JALAUN	Nadigaon	8.14	5.60
419	JALAUN	Rampura	22.03	12.16
420	JAUNPUR	Badlapur	10.49	8.97
421	JAUNPUR	Baksha	10.56	7.88
422	JAUNPUR	Barsathi	4.30	3.23
423	JAUNPUR	Dharmapur	9.58	7.28
424	JAUNPUR	Dobhi	9.68	9.74
425	JAUNPUR	Jalalpur	6.99	5.47
426	JAUNPUR	Karanja Kalan	10.62	9.00
427	JAUNPUR	Kerakat	8.35	7.71
428	JAUNPUR	Khutahan	4.40	3.51
429	JAUNPUR	Machhlishahr	3.48	2.46
430	JAUNPUR	Maharajganj	6.28	3.46
431	JAUNPUR	Mariahu	6.65	4.05
432	JAUNPUR	Muftiganj	7.60	5.86
433	JAUNPUR	Mungra Badshahpur	5.75	3.70
434	JAUNPUR	Ramnagar	6.63	4.86
435	JAUNPUR	Rampur	7.49	6.16
436	JAUNPUR	Shahganj	3.18	1.82
437	JAUNPUR	Sikrara	11.24	9.05
438	JAUNPUR	Sirkoni	15.68	12.14

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
439	JAUNPUR	Suitha kalan	3.04	1.91
440	JAUNPUR	Sujanganj	5.50	3.88
441	JHANSI	Babina	7.61	3.41
442	JHANSI	Bamaur	14.12	8.72
443	JHANSI	Bangra	10.10	5.31
444	JHANSI	Baragaon	5.67	1.85
445	JHANSI	Chirgaon	7.14	4.49
446	JHANSI	Gursarai	13.04	7.62
447	JHANSI	Mauranipur	10.00	4.98
448	JHANSI	Moth	6.87	3.69
449	KANNAUJ	Chhibramau	17.79	18.75
450	KANNAUJ	Gograpur	17.24	12.71
451	KANNAUJ	Haseran	5.37	6.13
452	KANNAUJ	Jalalabad	26.04	26.89
453	KANNAUJ	Kannauj	21.00	21.72
454	KANNAUJ	Saurikh	7.47	7.35
455	KANNAUJ	Talgram	18.33	17.97
456	KANNAUJ	Umarda	10.86	10.95
457	KANPUR DEHAT	Akbarpur	9.05	7.71
458	KANPUR DEHAT	Amraudha	18.01	9.77
459	KANPUR DEHAT	Derapur	12.46	11.21
460	KANPUR DEHAT	Jhinjhak	7.79	6.55
461	KANPUR DEHAT	Maitha	6.15	3.65
462	KANPUR DEHAT	Malsa	18.61	14.02
463	KANPUR DEHAT	Rajpur	21.72	19.90
464	KANPUR DEHAT	Rasulabad	6.08	3.96
465	KANPUR DEHAT	Sandalpur	11.60	10.25
466	KANPUR DEHAT	Sarwan Khera	12.80	11.16
467	KANPUR NAGAR	Bhitargaon	16.14	15.24
468	KANPUR NAGAR	Bidhnu	8.19	7.21
469	KANPUR NAGAR	Bilhaur	11.03	10.75
470	KANPUR NAGAR	Chaubepur	8.13	7.98
471	KANPUR NAGAR	Ghatampur	16.05	15.04
472	KANPUR NAGAR	Kakwan	6.73	4.63
473	KANPUR NAGAR	Kalyanpur	10.82	7.81
474	KANPUR NAGAR	Kanpur Urban	16.47	14.33
475	KANPUR NAGAR	Parara	20.14	18.03
476	KANPUR NAGAR	Sarsol	12.57	13.39
477	KANPUR NAGAR	Shivrajapur	5.28	3.66
478	KASGANJ	Amanpur	6.30	5.60
479	KASGANJ	Ganjdundwara	8.80	7.15
480	KASGANJ	Kasganj	14.06	10.98
481	KASGANJ	Patiyali	9.14	7.52
482	KASGANJ	Sahawar	7.14	6.32

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
483	KASGANJ	Sidhpura	6.15	4.96
484	KASGANJ	Soron	7.76	7.26
485	KAUSHAMBI	Chail	16.42	12.44
486	KAUSHAMBI	Kara	14.86	13.77
487	KAUSHAMBI	Kaushambi	13.10	15.21
488	KAUSHAMBI	Manjhanpur	15.35	15.26
489	KAUSHAMBI	Muratganj	14.44	11.86
490	KAUSHAMBI	Newada	15.51	13.80
491	KAUSHAMBI	Sarsawan	13.26	11.01
492	KAUSHAMBI	Sirathu	15.40	16.53
493	KUSHI NAGAR	Dudhahi	4.12	3.00
494	KUSHI NAGAR	Fazil Nagar	4.84	3.04
495	KUSHI NAGAR	Hata	4.23	1.88
496	KUSHI NAGAR	Kaptanganj	3.84	2.04
497	KUSHI NAGAR	Kasya	4.05	1.56
498	KUSHI NAGAR	Khadda	4.31	1.61
499	KUSHI NAGAR	Motichak	3.90	2.59
500	KUSHI NAGAR	Nedua Naurangiya	3.53	1.80
501	KUSHI NAGAR	Padrauna	3.90	2.70
502	KUSHI NAGAR	Ramkola	4.75	2.66
503	KUSHI NAGAR	Siwarhi	3.00	3.00
504	KUSHI NAGAR	Sukrauli	3.49	2.43
505	KUSHI NAGAR	Tamkuhi Raj	3.79	2.66
506	KUSHI NAGAR	Vishunpurwa	3.86	2.13
507	LAKHIMPUR KHERI	Bankeyganj	4.98	3.26
508	LAKHIMPUR KHERI	Behjam	6.81	5.55
509	LAKHIMPUR KHERI	Bijua	3.74	3.00
510	LAKHIMPUR KHERI	Dhaurahara	4.54	3.15
511	LAKHIMPUR KHERI	Isanagar	4.18	2.80
512	LAKHIMPUR KHERI	Kumbhigola	5.40	4.60
513	LAKHIMPUR KHERI	Lakhimpur	8.19	5.28
514	LAKHIMPUR KHERI	Mitauli	6.11	5.45
515	LAKHIMPUR KHERI	Mohammadi	6.05	4.50
516	LAKHIMPUR KHERI	Nakaha	3.67	3.07
517	LAKHIMPUR KHERI	Nighasan	4.34	2.87
518	LAKHIMPUR KHERI	Palia	4.18	3.21
519	LAKHIMPUR KHERI	Pasgawan	7.21	4.93
520	LAKHIMPUR KHERI	Phulbehar	4.33	3.20
521	LAKHIMPUR KHERI	Ramiabehar	4.29	2.66
522	LALITPUR	Bar	7.98	3.94
523	LALITPUR	Birdha	9.00	4.02
524	LALITPUR	Jakhora	7.79	4.02
525	LALITPUR	Mahroni	8.68	4.49
526	LALITPUR	Mandwara	10.58	4.91

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
527	LALITPUR	Talbehat	7.05	5.14
528	LUCKNOW	Bakshi Ka Talab	13.41	12.79
529	LUCKNOW	Chinhat	13.49	22.15
530	LUCKNOW	Gosaiganj	7.88	6.90
531	LUCKNOW	Kakori	11.31	14.42
532	LUCKNOW	Lucknow Urban	25.69	24.47
533	LUCKNOW	Mal	14.89	16.19
534	LUCKNOW	Malihabad	16.14	15.52
535	LUCKNOW	Mohanlalganj	8.94	7.79
536	LUCKNOW	Sarojni Nagar	13.23	13.66
537	MAHOBA	Charkhari	10.03	7.86
538	MAHOBA	Jaitpur	10.19	8.13
539	MAHOBA	Kabrai	8.24	5.73
540	MAHOBA	Panwari	11.23	7.47
541	MAHRAJGANJ	Brijmanganj	3.46	1.29
542	MAHRAJGANJ	Dhani	4.55	1.22
543	MAHRAJGANJ	Ghughuli	3.88	1.22
544	MAHRAJGANJ	Lakshmipur	4.17	1.86
545	MAHRAJGANJ	Maharajganj	4.34	1.46
546	MAHRAJGANJ	Mithaura	4.49	1.91
547	MAHRAJGANJ	Nautanwa	4.46	2.27
548	MAHRAJGANJ	Nichlaul	3.63	1.28
549	MAHRAJGANJ	Paniara	4.38	2.02
550	MAHRAJGANJ	Partawal	3.26	1.03
551	MAHRAJGANJ	Pharenda	3.44	1.20
552	MAHRAJGANJ	Siswa Bazar	4.80	1.27
553	MAINPURI	Barnahal	20.33	20.60
554	MAINPURI	Bewar	9.93	10.79
555	MAINPURI	Ghiror	10.38	9.91
556	MAINPURI	Jagir	10.31	9.02
557	MAINPURI	Karhal	9.29	7.61
558	MAINPURI	Kishni	9.12	8.45
559	MAINPURI	Kurawali	11.42	10.54
560	MAINPURI	Mainpuri	13.50	12.19
561	MAINPURI	Sultanganj	10.86	9.69
562	MATHURA	Baldeo	16.16	14.55
563	MATHURA	Chaumuhan	8.55	7.99
564	MATHURA	Chhata	5.51	4.87
565	MATHURA	Farah	6.85	5.67
566	MATHURA	Govardhan	4.07	2.08
567	MATHURA	Mat	8.67	8.64
568	MATHURA	Mathura	13.66	10.73
569	MATHURA	Nandgaon	3.57	2.04
570	MATHURA	Nohjhil	9.84	8.98

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
571	MATHURA	Raya	8.03	7.72
572	MAUNATH BHANJAN	Badraon	4.77	3.33
573	MAUNATH BHANJAN	Dohri Ghat	4.84	2.94
574	MAUNATH BHANJAN	Fatehpur Madraun	4.13	2.68
575	MAUNATH BHANJAN	Ghosi	3.25	2.42
576	MAUNATH BHANJAN	Kopaganj	4.21	2.85
577	MAUNATH BHANJAN	Mohammadabad	4.78	1.88
578	MAUNATH BHANJAN	Pardaha	5.84	3.04
579	MAUNATH BHANJAN	Ranipur	5.34	2.50
580	MAUNATH BHANJAN	Ratanpura	2.70	1.64
581	MEERUT	Daurala	12.09	11.92
582	MEERUT	Hastinapur	10.58	9.14
583	MEERUT	Jani	7.59	7.63
584	MEERUT	Kharkhoda	20.57	20.20
585	MEERUT	Machhra	14.10	12.99
586	MEERUT	Mawana Kalan	11.37	10.46
587	MEERUT	Meerut	15.22	15.17
588	MEERUT	Meerut Urban	17.06	17.83
589	MEERUT	Parichhatgarh	12.41	11.69
590	MEERUT	Rajpura	20.00	19.74
591	MEERUT	Rohta	10.26	10.40
592	MEERUT	Sardhana	9.30	9.19
593	MEERUT	Sarurpur	14.21	13.81
594	MIRZAPUR	Chanbey	12.17	10.83
595	MIRZAPUR	City	12.43	10.06
596	MIRZAPUR	Hallia	5.27	3.37
597	MIRZAPUR	Jamalpur	6.66	2.89
598	MIRZAPUR	Kon	11.37	9.04
599	MIRZAPUR	Lalganj	6.78	3.51
600	MIRZAPUR	Majhawan	14.67	11.42
601	MIRZAPUR	Marihan	9.21	5.21
602	MIRZAPUR	Narayanpur	9.26	4.86
603	MIRZAPUR	Pahari	10.02	8.52
604	MIRZAPUR	Rajgarh	7.85	5.27
605	MIRZAPUR	Sikhar	10.73	6.89
606	MORADABAD	Bhagatpur	8.64	5.99
607	MORADABAD	Bilari	15.38	15.86
608	MORADABAD	Chhajlet	10.46	9.29
609	MORADABAD	Dilari	5.59	4.84
610	MORADABAD	Kundarki (Dengapur)	14.58	14.56
611	MORADABAD	Moradabad	8.32	7.55
612	MORADABAD	Moradabad Urban	11.18	9.64
613	MORADABAD	Mundapandey	5.71	4.90
614	MORADABAD	Thakurdwara	7.83	4.08

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
615	MUZAFFARNAGAR	Bhaghara	17.65	14.69
616	MUZAFFARNAGAR	Budhana	26.69	24.97
617	MUZAFFARNAGAR	Charthawal	10.36	9.00
618	MUZAFFARNAGAR	Jansath	9.95	9.27
619	MUZAFFARNAGAR	Khatauli	8.54	7.25
620	MUZAFFARNAGAR	Morna	10.89	10.29
621	MUZAFFARNAGAR	Muzaffarnagar	12.31	12.26
622	MUZAFFARNAGAR	Purqaji	7.58	5.56
623	MUZAFFARNAGAR	Shahpur	19.99	19.50
624	PILIBHIT	Amaria	4.05	3.37
625	PILIBHIT	Barkhera	4.24	2.53
626	PILIBHIT	Bilsanda	5.40	3.87
627	PILIBHIT	Bisalpur	4.73	3.59
628	PILIBHIT	Lalaurikhera	3.39	2.17
629	PILIBHIT	Marauri	3.53	2.36
630	PILIBHIT	Puranpur	3.49	2.97
631	PRATAPGARH	Aspur Deosara	10.04	6.72
632	PRATAPGARH	Baba Belkhar Nath	10.94	9.37
633	PRATAPGARH	Babaganj	6.87	6.75
634	PRATAPGARH	Bihar	6.55	3.69
635	PRATAPGARH	Gaura	6.72	5.97
636	PRATAPGARH	Kalanker	7.36	6.38
637	PRATAPGARH	Kunda	7.77	7.72
638	PRATAPGARH	Lakshamanpur	11.06	10.29
639	PRATAPGARH	Lalganj	8.08	7.54
640	PRATAPGARH	Mandhata	9.05	8.14
641	PRATAPGARH	Mangaraura	8.74	7.72
642	PRATAPGARH	Patti	9.52	7.96
643	PRATAPGARH	Rampur-sangramgarh	6.40	4.04
644	PRATAPGARH	Sadar	14.91	12.82
645	PRATAPGARH	Sandwa Chandika	16.48	16.28
646	PRATAPGARH	Sangaipur	10.07	8.21
647	PRATAPGARH	Shivgarh	8.84	8.44
648	PRAYAGRAJ	Bahadurpur	12.21	10.19
649	PRAYAGRAJ	Baharia	5.56	5.27
650	PRAYAGRAJ	Bhagwatpur	14.77	10.51
651	PRAYAGRAJ	Chaka	14.99	9.22
652	PRAYAGRAJ	Dhanupur	7.21	4.95
653	PRAYAGRAJ	Handia	8.49	5.23
654	PRAYAGRAJ	Holagarh	5.39	2.81
655	PRAYAGRAJ	Jasra	9.65	5.01
656	PRAYAGRAJ	Karchana	13.26	10.46
657	PRAYAGRAJ	Kaudhiyara	8.79	4.87
658	PRAYAGRAJ	Kaurihar	12.28	10.24

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
659	PRAYAGRAJ	Koraon	5.85	2.80
660	PRAYAGRAJ	Manda	5.56	5.50
661	PRAYAGRAJ	Mauaima	5.22	3.45
662	PRAYAGRAJ	Meja	6.68	4.52
663	PRAYAGRAJ	Phulpur	5.30	4.17
664	PRAYAGRAJ	Pratappur	5.73	3.79
665	PRAYAGRAJ	Prayagraj City	14.86	13.66
666	PRAYAGRAJ	Sahson	9.41	8.14
667	PRAYAGRAJ	Saidabad	8.39	5.81
668	PRAYAGRAJ	Shankargarh	6.70	3.46
669	PRAYAGRAJ	Shringverpur Dham	6.21	3.73
670	PRAYAGRAJ	Soraon	11.26	8.18
671	PRAYAGRAJ	Uruwan	15.75	10.28
672	RAIBARELI	Amawan	5.09	3.85
673	RAIBARELI	Bachrawan	4.94	3.79
674	RAIBARELI	Chhatoh	6.82	4.47
675	RAIBARELI	Dalmau	5.64	4.13
676	RAIBARELI	DeenSah Gaura	5.80	4.47
677	RAIBARELI	Dih	5.76	4.93
678	RAIBARELI	Harchandpur	6.39	6.04
679	RAIBARELI	Jagatpur	4.80	3.80
680	RAIBARELI	Khiron	10.18	9.32
681	RAIBARELI	Lalganj	12.22	11.24
682	RAIBARELI	Maharajganj	5.24	3.61
683	RAIBARELI	Rahi	5.37	5.27
684	RAIBARELI	Rohaniya	5.31	3.13
685	RAIBARELI	Salaon	6.41	4.28
686	RAIBARELI	Saraini	15.56	14.74
687	RAIBARELI	Satawan	13.42	13.49
688	RAIBARELI	Shivgarh	4.92	2.57
689	RAIBARELI	Unchahar	7.28	3.86
690	RAMPUR	Bilaspur	6.72	4.31
691	RAMPUR	Chamrauwa	5.84	4.66
692	RAMPUR	Milak	6.75	6.34
693	RAMPUR	Said Nagar	5.91	5.12
694	RAMPUR	Saur	7.98	5.94
695	RAMPUR	Shahabad	9.82	9.71
696	SAHARANPUR	Ballia Kheri	9.82	9.41
697	SAHARANPUR	Deoband	6.53	5.27
698	SAHARANPUR	Gangoh	13.01	12.41
699	SAHARANPUR	Muzaffarabad	9.62	9.17
700	SAHARANPUR	Nagal	11.27	11.28
701	SAHARANPUR	Nakur	11.27	11.12
702	SAHARANPUR	Nanauta	6.43	5.78

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
703	SAHARANPUR	Punwarka	9.06	8.30
704	SAHARANPUR	Rampur Maniharan	7.42	7.06
705	SAHARANPUR	Sadhauli Kadeem	8.68	6.64
706	SAHARANPUR	Sarsawa	6.85	6.26
707	SAMBHAL	Asmoli	19.41	19.33
708	SAMBHAL	Bahjoi	15.09	14.76
709	SAMBHAL	Baniakhera	16.48	16.02
710	SAMBHAL	Gunnaur	8.75	7.11
711	SAMBHAL	Janawai	8.76	10.40
712	SAMBHAL	Pawansa	17.67	16.59
713	SAMBHAL	Rajpura	9.29	7.78
714	SAMBHAL	Sambhal	19.33	19.50
715	SANT KABIR NAGAR	Baghauli	5.00	3.00
716	SANT KABIR NAGAR	Haisar Bazar	4.09	2.91
717	SANT KABIR NAGAR	Khalilabad	3.95	3.44
718	SANT KABIR NAGAR	Mehdawal	4.28	2.92
719	SANT KABIR NAGAR	Nath Nagar	3.73	2.85
720	SANT KABIR NAGAR	Pauli	4.44	2.95
721	SANT KABIR NAGAR	Santha	3.62	2.40
722	SANT KABIR NAGAR	Semariyawan	3.73	2.42
723	SANT KABIR NAGAR	Velhar Kalan	4.69	3.00
724	SANT RAVIDAS NAGAR	Abhauli	7.22	4.76
725	SANT RAVIDAS NAGAR	Aurai	10.93	7.70
726	SANT RAVIDAS NAGAR	Bhadohi	8.00	5.25
727	SANT RAVIDAS NAGAR	Deegh	12.50	9.02
728	SANT RAVIDAS NAGAR	Gyanpur	10.18	6.70
729	SANT RAVIDAS NAGAR	Suriyawan	6.55	3.98
730	SHAHJAHANPUR	Banda	7.48	6.63
731	SHAHJAHANPUR	Bhawal Khera	6.99	5.67
732	SHAHJAHANPUR	Dadrol	6.94	6.40
733	SHAHJAHANPUR	Jaitpur	7.22	5.66
734	SHAHJAHANPUR	Jalalabad	6.77	6.24
735	SHAHJAHANPUR	Kalan	8.11	9.11
736	SHAHJAHANPUR	Kanth	8.36	8.22
737	SHAHJAHANPUR	Katra	4.37	2.86
738	SHAHJAHANPUR	Khutar	5.82	5.36
739	SHAHJAHANPUR	Madanapur	7.03	6.69
740	SHAHJAHANPUR	Mirzapur	5.59	5.37
741	SHAHJAHANPUR	Nigohi	6.09	5.98
742	SHAHJAHANPUR	Puyawan	8.09	7.76
743	SHAHJAHANPUR	Sindhauli	6.54	5.94
744	SHAHJAHANPUR	Tilhar	5.88	5.47
745	SHAMLI	Kairana	18.41	17.90
746	SHAMLI	Kandhala	24.40	23.34

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
747	SHAMLI	Shamli	23.19	22.95
748	SHAMLI	Thana Bhawan	13.90	13.66
749	SHAMLI	Un	16.99	16.22
750	SHRAWASTI	Gilaula	3.14	1.94
751	SHRAWASTI	Hariharpur Rani	3.00	1.74
752	SHRAWASTI	Ikauna	3.00	1.10
753	SHRAWASTI	Jamunaha	3.11	1.80
754	SHRAWASTI	Sirsiya	3.22	2.24
755	SIDDHARTH NAGAR	Bansi	3.09	2.48
756	SIDDHARTH NAGAR	Barhani	3.00	2.97
757	SIDDHARTH NAGAR	Bhanwapur	3.00	1.52
758	SIDDHARTH NAGAR	Birdpur	3.06	2.74
759	SIDDHARTH NAGAR	Domariaganj	3.11	1.27
760	SIDDHARTH NAGAR	Itwa	3.00	2.99
761	SIDDHARTH NAGAR	Jogiya	4.24	3.00
762	SIDDHARTH NAGAR	Khesrha	4.26	2.90
763	SIDDHARTH NAGAR	Khuniyaw	3.06	2.73
764	SIDDHARTH NAGAR	Lotan	3.18	2.85
765	SIDDHARTH NAGAR	Mithwal	3.63	1.97
766	SIDDHARTH NAGAR	Naugarh	4.91	3.84
767	SIDDHARTH NAGAR	Shohatgarh	3.04	3.00
768	SIDDHARTH NAGAR	Uska Bazar	4.59	2.77
769	SITAPUR	Ailia	9.61	8.42
770	SITAPUR	Behta	3.08	2.76
771	SITAPUR	Biswan	6.22	4.44
772	SITAPUR	Gondlamau	9.33	9.33
773	SITAPUR	Hargaon	6.46	4.68
774	SITAPUR	Kasmanda	8.25	6.75
775	SITAPUR	Khairabad	11.96	11.14
776	SITAPUR	Laharpur	4.27	2.96
777	SITAPUR	Machhrehta	11.78	11.23
778	SITAPUR	Mahmudabad	4.79	3.68
779	SITAPUR	Maholi	8.07	7.02
780	SITAPUR	Misrikh	7.82	5.51
781	SITAPUR	Pahala	4.60	4.42
782	SITAPUR	Parsendi	9.86	6.18
783	SITAPUR	Pisawan	8.63	5.85
784	SITAPUR	Rampur Mathura	4.94	3.03
785	SITAPUR	Rewsa	3.71	2.98
786	SITAPUR	Sakran	5.12	3.51
787	SITAPUR	Sidhauli	8.14	7.36
788	SONBHADRA	Babhani	9.58	6.84
789	SONBHADRA	Chatra	8.06	5.79
790	SONBHADRA	Chopan	11.36	7.79

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
791	SONBHADRA	Dudhi	11.55	10.25
792	SONBHADRA	Ghorawal	17.16	4.11
793	SONBHADRA	Karma	12.93	7.66
794	SONBHADRA	Kone	14.16	11.84
795	SONBHADRA	Myorpur	7.70	6.71
796	SONBHADRA	Nagawa	9.04	11.09
797	SONBHADRA	Robertsganj	10.26	4.88
798	SULTANPUR	Akhand Nagar	3.85	1.93
799	SULTANPUR	Baldirai	7.92	6.94
800	SULTANPUR	Bhadaiyan	8.24	6.07
801	SULTANPUR	Dhanpatganj	5.23	3.43
802	SULTANPUR	Dostpur	5.39	5.68
803	SULTANPUR	Dubepur	7.60	6.81
804	SULTANPUR	Jai Singhpur	6.66	5.17
805	SULTANPUR	Kadipur	6.47	6.23
806	SULTANPUR	KARONDIKALA	10.56	8.06
807	SULTANPUR	Kurebhar	4.54	2.50
808	SULTANPUR	Kurwar	5.02	4.33
809	SULTANPUR	Lambhua	6.66	4.64
810	SULTANPUR	Motigarpur	6.08	5.31
811	SULTANPUR	P.P. Kannaicha	10.20	8.40
812	UNNAO	Asoha	6.87	5.45
813	UNNAO	Auras	5.52	3.78
814	UNNAO	Bangarmau	7.47	6.57
815	UNNAO	Bichhia	8.16	6.71
816	UNNAO	Bighapur	6.35	6.86
817	UNNAO	Fatehpur Chaurasi	7.18	6.39
818	UNNAO	Gang Muradabad	7.81	7.43
819	UNNAO	Hasanganj	6.57	5.19
820	UNNAO	Hilauli	6.91	6.57
821	UNNAO	Mianganj	6.57	5.23
822	UNNAO	Nawabganj	6.91	5.55
823	UNNAO	Purwa	4.20	3.09
824	UNNAO	Safipur	7.59	6.75
825	UNNAO	Sikandar Sirausi	9.37	6.68
826	UNNAO	Sikandarpur Karan	10.95	9.09
827	UNNAO	Sumerpur	6.93	6.56
828	VARANASI	Araziline	12.06	9.54
829	VARANASI	Baragaon	8.66	8.40
830	VARANASI	Chiraigaon	10.51	8.43
831	VARANASI	Cholapur	10.99	7.48
832	VARANASI	Harahua	14.25	12.87
833	VARANASI	Kashi Vidyapith	12.83	10.66
834	VARANASI	Pindra	8.67	7.37

S.No.	District	Block	Average Water Level (mbgl)	
			Pre-Monsoon 2022	Post Monsoon 2022
835	VARANASI	Sevapuri	8.99	8.76
836	VARANASI	Varanasi Urban	13.68	12.37

ANNEXURE VIII: Quality Problems in Assessment units, GWRE-2023

QUALITY PROBLEMS IN ASSESSMENT UNITS, UTTAR PRADESH 2023							
S.N	**Name of District**	**S.N**	**Aus affected by Fluoride**	**S.N**	**Aus affected by Arsenic**	**S.N**	**Aus affected by Salinity**
1	Agra	1	Saiyan			1	Achhnera
		2	Etmadpur			2	Akola
		3	Khandauli			3	Kheragarh
						4	Etmadpur
						5	Fatehpur Sikri
						6	Jagner
						7	Saiyan
2	Aligarh	1	Nama			1	Gonda
						2	Khair
3	Ayodhya			1	Bikapur		
				2	Harringtanganj		
4	Azamgarh	1	Palhana	1	Maharajganj		
5	Bahraich			1	Chittaura		
				2	Jarwal		
				3	Mihipurwa		
				4	Mahasi		
				5	Nawabganj		
				6	Payagpur		
				7	Risiya		
6	Ballia			1	Dubahar		
				2	Reoti		
				3	Murali Chhapara		
				4	Belhari		

QUALITY PROBLEMS IN ASSESSMENT UNITS, UTTAR PRADESH 2023							
S.N	**Name of District**	**S.N**	**Aus affected by Fluoride**	**S.N**	**Aus affected by Arsenic**	**S.N**	**Aus affected by Salinity**
7	Balrampur			1	Tulsipur		
				2	Harraiya Satgarhwa		
8	Barabanki			1	Suratganj		
9	Bareilly			1	Meerganj		
10	Basti			1	Bankati		
11	Bijnor			1	Dhampur (Alhepur)		
				2	Noorpur		
				3	Kiratpur		
				4	Nehtaur (Aaku)		
				5	Mohammadpur Deomal		
12	Budaun			1	Dataganj		
13	Bulandashar			1	Amarpur		
14	Deoria			1	Bhaluwani		
				2	Barhaj		
15	Etah					1	Jalesar
16	Fatehpur	1	Malwan			1	Malwan
		2	Teliyani				
17	Farrukhabad	1	Rajepur	1	Amritpur		
18	Firozabad	1	Tundla	1	Aron	1	Firozabad
19	G.B.Nagar	1	Dankaur			1	Bisrakh
						2	Zewar
20	Gonda			1	Belsar		
				2	Katra Bazar		
21	Gorakhpur			1	Gagaha		
22	Hamirpur					1	Sareela
						2	Rath
						3	Maudaha
23	Hapur			1	Simbholi		
24	Hardoi			1	Kacchauana		
				2	Tadiyawan		
25	Hathras	1	Mursan			1	Aharai
		2	Sasni				
26	J. P Nagar (Amroha)	1	Amroha				
27	Kanpur Dehat	1	Akbarpur				
28	Kannauj			1	Talagram		
29	Kushi Nagar			1	Sewarhi		
				2	Dudhai		

QUALITY PROBLEMS IN ASSESSMENT UNITS, UTTAR PRADESH 2023							
S.N	**Name of District**	**S.N**	**Aus affected by Fluoride**	**S.N**	**Aus affected by Arsenic**	**S.N**	**Aus affected by Salinity**
30	Lakhimpur Kheri			1	Nakaha		
				2	Nighasan		
				3	Ishanagasr		
				4	Gola		
31	Lalitpur	1	Bar				
32	Maharajganj			1	Ghughuli		
				2	Maharajganj		
				3	Nichlaul		
33	Mainpuri	1	Kishni				
		2	Katra Saman				
34	Mathura	1	Baldeo			1	Chaumuhan
		2	Chhata			2	Goverdhan
		3	Mant			3	Mant
		4	Raya			4	Nohjhil
		5	Goverdhan			5	Farah
						6	Raya
35	Mirzapur			1	Kon		
36	Moradabad			1	Moondha Pandey		
				2	Chhajlet		
				3	Bhagatpur Tanda		
37	Muzaffarnagar			1	Jansath		
38	Pratapgarh	1	Baba Belkhar Nath				
		2	Gaura				
39	Pilibhit			1	Barkhera		
40	Raibareli	1	Chhatoh	1	Khiron		
		2	Lalganj				
		3	Rohina				
41	Rampur	1	Milak				
		2	Said Nagar				
		3	Shahabad				
		4	Swar				
42	Sant Kabir Nagar			1	Paulli		
43	Shahjahanpur			1	Dadraul		
44	Siddharth Nagar			1	Uskabazar		
				2	Jogiya		
				3	Naugarh		
				4	Shoharatgarh		

QUALITY PROBLEMS IN ASSESSMENT UNITS, UTTAR PRADESH 2023							
S.N	**Name of District**	**S.N**	**Aus affected by Fluoride**	**S.N**	**Aus affected by Arsenic**	**S.N**	**Aus affected by Salinity**
45	Sitapur			1	Rampur Mathura		
46	Unnao					1	Asoha

ABSTRACT			
Total No. of Assessed Units	**Number of Assessment Units affected by Fluoride**	**Number of Assessment Units affected by Arsenic**	**Number of Assessment Units affected by Salinity**
836	**31**	**60**	**25**

