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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	Copy of the water audit report has been prepared by PHD Chambers of Commerce and Industries, New Delhi (an institution nominated by Central Ground Water Authority, Government of India).	156-221
17.	**ANNEXURE 16** Copy of the Impact Assessment Report prepared by Shri Veeksha Pugazhendi (representative nominated by Central Ground Water Authority, Government of India).	222-309
18.	**ANNEXURE 17** Copy of (CTO) from Uttar Pradesh Pollution Control Board.	310-316
19.	**ANNEXURE 18** Copy of the Ground Water Assessment Report -2023	317-321
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Respondent No.-3
(Director, Ground Water Department /Member Secretary,
State Ground Water Management
and Regulatory Authority,
Uttar Pradesh)
Through

Gigi C. George Advocate
Standing Counsel (UOI)
Ch. No. 457, Lawyers Block,
DHC, New Delhi
Gigicgeorge.adv42@yahoo.in
M-9810625315

Date : 03.08.2025
Place : New Delhi

INDIA NON JUDICIAL 5443

IN-UP67285600740711X

Government of Uttar Pradesh

e-Stamp

Certificate No.	:	**IN-UP67285600740711X**
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Property Description	:	Not Applicable
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NOTARY
Sanjay Singh
Advocate
CIVIL COURT
Lakhimpur-Kher (U.P.)
Reg. No.-3914
Dt. 14-03-2007
up to 13-03-2027
GOVT. OF INDIA

NOTARY
Sanjay Singh
Advocate
CIVIL COURT
Lakhimpur-Kheri (U.P.)
Reg. No.-3914
Dt. 14-03-2007
up to 13-03-2027
GOVT. OF INDIA

ATTESTED

Sanjay Singh
NOTARY Advocate
Civil Court Lakhimpur-Kheri

Affidavit

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2. The onus of checking the legitimacy is on the users of the certificate.
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Shyam Sundar Yadav

मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली में योजित ओ0ए0 सं0 691/2022 रमाशंकर अवस्थी बनाम स्टेट ऑफ यू0पी0 व अन्य में मा0 अधिकरण के आदेश दिनांक 07.11.2024 के अनुपालन में विपक्षी पार्टी संख्या–03 की ओर से अनुपालन आख्या।

1–यह है कि मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली में योजित ओ0ए0 सं0 691/2022 रमाशंकर अवस्थी बनाम स्टेट ऑफ यू0पी0 व अन्य में मा0 अधिकरण का आदेश दिनांक 07.11.2024 पारित किया गया, जिसका प्रभावी अंश निम्नवत् है :–

"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."

2– यह कि मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली द्वारा सुनवाई हेतु अगामी तिथि दिनांक 24.02.2025 नियत की गयी है।

3– यह कि प्रदेश में भूगर्भ जल के संसाधनों के संरक्षण, सुरक्षा तथा प्रबंधन, नियंत्रण और विनियमन किये जाने के दृष्टिगत "उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) अधिनियम, 2019" दिनांक 02 अक्टूबर, 2019 से लागू किया गया है। **(संलग्नक–1)**

4– यह कि प्रदेश में उ0प्र0 भूगर्भ जल (प्रबंधन और विनियमन) अधिनियम, 2019 के अन्तर्गत लघु सिंचाई एवं भूगर्भ जल अनुभाग–1 की अधिसूचना संख्या 1320/62–1–2019–10जीडब्लू–2014, दिनांक 13.11.2019 **(संलग्नक–2)** द्वारा प्रदेश में "उत्तर प्रदेश राज्य भूगर्भ जल प्रबन्धन विनियामक प्राधिकरण" के गठन किये जाने की अधिसूचना निर्गत की गयी।

5– यह कि प्रदेश में उ0प्र0 भूगर्भ जल (प्रबंधन और विनियमन) अधिनियम, 2019 के अन्तर्गत नमामि गंगे एवं ग्रामीण जलापूर्ति अनुभाग–3 की अधिसूचना संख्या 58/76–3–2020/10जीडब्लू/2014, दिनांक 21.01.2020 **(संलग्नक–3)** द्वारा प्रदेश के समस्त जनपदों में जिलाधिकारी की अध्यक्षता में "जिला भूगर्भ जल प्रबंधन परिषद" के गठन किये जाने की अधिसूचना निर्गत की गयी।

6– यह कि अधिसूचना दिनांक 21.01.2020 के अनुपालन में जिलाधिकारी लखीमपुर खीरी के अनुमोदन के क्रम में जिला विकास अधिकारी के पत्र संख्या 425/ल0सि0/भू0ज0प्र0प0/2020–21, दिनांक 03.10.2020 **(संलग्नक–4)** द्वारा जनपद लखीमपुर खीरी में "जिला भूगर्भ जल प्रबंधन परिषद" का गठन किया गया। जनपद स्तर पर जिलाधिकारी की अध्यक्षता में गठित "जिला भूगर्भ जल प्रबंधन परिषद" के द्वारा भूगर्भ जल उपयोक्ताओं के पंजीकरण, अनापत्ति प्रमाण–पत्र निर्गमन/नवीनीकरण, शिकायतों के निवारण आदि कार्य किया जाता हैं।

7– यह कि उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) अधिनियम, 2019 में निहित सेवाओं यथा कृषि एवं घरेलू उपभोक्ताओं, वाणिज्यिक, औद्योगिक, अवसंरचनात्मक एवं सामूहिक भूगर्भ जल उपयोक्ताओं के

पंजीकरण, अनापत्ति प्रमाण–पत्र निर्गमन/नवीनीकरण आदि कार्यों के पारदर्शितापूर्ण क्रियान्वयन हेतु विकसित वेब पोर्टल (upgwdonline.in) के संचालन हेतु उत्तर प्रदेश के समस्त 75 जनपदों में जनपद स्तर पर जनपदवार नोडल अधिकारी नामित किये गये है।

8– यह कि अधिनियम–2019 के सुचारु रुप से संचालन हेतु विकसित वेब पोर्टल (**upgwdonline.in**) के माध्यम से कूपों के पंजीकरण एवं अनापत्ति प्रमाण पत्र (NOC) आदि सम्बन्धित आवेदनों के निस्तारण से पूर्व स्थलीय सत्यापन किये जाने हेतु निदेशक, भूगर्भ जल विभाग/सदस्य सचिव, राज्य भूगर्भ जल प्रबन्धन एवं नियामक प्राधिकरण, उ0प्र0 के पत्रांक संख्या 23/यू0पी0रा0भू0ज0प्र0वि0प्रा0, दिनांक 25.02.2021 **(संलग्नक–5)** द्वारा प्रदेश के समस्त जनपदों को उक्त आदेशों के अनुपालन में 'टास्क फोर्स' के गठन किये जाने के आदेश निर्गत गये हैं।

9– यह की उक्त आदेशों के अनुपालन में जिलाधिकारी, जनपद लखीमपुर खीरी के आदेश संख्या 39/ल0सिं0/भू0ज0प्र0प0/2020–21 दिनांक 06.05.2021 के द्वारा जनपद स्तर पर आवेदनों के निस्तारण से पूर्व स्थलीय सत्यापन किये जाने हेतु "टास्फ फोर्स" का गठन **(संलग्नक–6)** किया गया है।

10– यह कि मा0 अधिकरण के उक्त पारित आदेश दिनांक 07.11.2024 के अनुपालन में निदेशक, भूगर्भ जल विभाग, उ0प्र0 के पत्र संख्या 1316/भू0ज0वि0/एस–26 (एन0जी0टी0), दिनांक 05.12.2024 **(संलग्नक–7)** के द्वारा विपक्षी पार्टी संख्या–3 की ओर से विभागीय अनुपालन आख्या तैयार किये जाने, प्रकरण की जॉच हेतु जनपद लखीमपुर खीरी में चलित फर्मो के संबंध में विभाग का प्रतिनिधित्व किये जाने एवं वाद में वांछित मंतव्य/शपथ पत्र दाखिल किये जाने हेतु नोडल अधिकारी, जिला भूगर्भ जल प्रबन्ध परिषद, जनपद लखीमपुर खीरी को नामित किया गया है।

11– यह कि निदेशक, भूगर्भ जल विभाग, उ0प्र0 के पत्र संख्या 1316/भू0ज0वि0/एस–26 (एन0जी0टी0), दिनांक 05.12.2024 के अनुपालन में एवं ओ0ए0 सं0 691/2022 के क्रम में मा0 अधिकरण द्वारा वांछित तथ्यों की जॉच किये जाने हेतु जनपद में गठित टास्क फोर्स द्वारा दिनांक 19.02.2025 को मैसर्स बजाज हिन्दुस्तान शुगर लिमिटेड एवं बजाज एनर्जी लिमिटेड ,ग्राम खम्भारखेड़ा विकासखण्ड फूलबेहड़, जनपद लखीमपुर खीरी के स्थलों का स्थलीय निरीक्षण/सत्यापन किया गया।

12– यह कि गठित टास्क फोर्स द्वारा दिनांक 19.02.2025 को जनपद लखीमपुर खीरी में चालित फर्म मैसर्स बजाज हिन्दुस्तान शुगर लि0 एवं बजाज एनर्जी लि0 को भूजल निष्कर्षण हेतु निर्गत अनापत्ति पत्र पर अंकित शर्तो का अनुपालन फर्म द्वारा किया जा रहा है अथवा नही, की जॉच हेतु स्थलीय निरीक्षण/भौतिक सत्यापन किया गया, जिसकी सत्यापन आख्या निम्नवत् है :–

12 (1)(क)–<u>फर्म मैसर्स बजाज हिन्दुस्तान शुगर लि0 को भूजल निष्कर्षण हेतु निर्गत अनापत्ति प्रमाणपत्र की स्थिति–</u>

- मैसर्स बजाज हिन्दुस्तान शुगर लि0, ग्राम खम्भारखेड़ा, विकासखण्ड फूलबेहड़, लखीमपुर खीरी द्वारा 03 बोरवेल के माध्यम से भूजल निष्कर्षण किया जा रहा है, जिसके सापेक्ष जिला भूगर्भ जल प्रबन्धन परिषद, जनपद लखीमपुर खीरी द्वारा फर्म को भूजल निष्कर्षण हेतु अनापत्तियां (एन0ओ0सी0) (संलग्नक–8.1, 8.2, 8.3) निर्गत की गयी है जिनका विवरण निम्नवत् है:–

Shyam Sunder Yadav

क्र0सं0	एन0ओ0सी0 संख्या	एन0ओ0सी0 की वैधता	अधिकतम भूजल निष्कर्षण की मात्रा
1	NOC043004	दिनांक 22.06.2021 से दिनांक 21.06.2026	72000 घनमीटर प्रति वर्ष
2	NOC033242	दिनांक 22.06.2021 से दिनांक 21.06.2026	72000 घनमीटर प्रति वर्ष
3	NOC028922	दिनांक 22.06.2021 से दिनांक 21.06.2026	72000 घनमीटर प्रति वर्ष
03 बोरवेल के माध्यम से कुल भूजल निष्कर्षण की मात्रा			216000 घनमीटर प्रति वर्ष

12(1)(ख)–फर्म को निर्गत अनापत्ति के सापेक्ष शर्तो का अनुपालन– फर्म को भूजल निष्कर्षण हेतु मात्र 03 निर्गत अनापत्ति प्रमाण पत्रों पर अंकित शर्तो के अनुपालन कराये जाने की जॉच में निम्नलिखित तथ्य दर्शित हुएः–

- फर्म मैसर्स बजाज हिन्दुस्तान शुगर लि0, ग्राम खम्भारखेड़ा, विकासखण्ड–फूलबेहड़, जनपद–लखीमपुर खीरी में स्थित है।
- फर्म में कुल 03 बोरवेल स्थापित है, जिसमें प्रत्येक बोरवेल की गहराई लगभग 91.46 मीटर, 96.00 मीटर एवं 140.35 मीटर व चालित तीनो मोटर की क्षमता 60–60 HP है।
- फर्म में जॉच के दौरान तीनो बोरवेल द्वारा कमशः 170.60 घनमीटर प्रति घण्टा, 117.10 घनमीटर प्रति घण्टा, 76.43 घनमीटर प्रति घण्टा का डिस्जार्च पाया गया।
- ग्राम खम्भारखेड़ा विकासखण्ड फूलबेहड़, जनपद लखीमपुर खीरी में किसी भी प्रकार से पाइप लाइन शुद्ध जल/शोधित जलापूर्ति नही की जा रही है।
- फर्म द्वारा कुल 03 बोरवेल के माध्यम से भूगर्भ जल के सापेक्ष वर्षा जल संचयन की प्रणाली की स्थापना की गयी है।
- फर्म के परिक्षेत्र में रेनवाटर हार्वेस्टिंग प्रणाली की स्थापना की गयी है, जिसके माध्यम से उपलब्ध कराये गये अभिलेखो के अनुसार कुल लगभग 6016.50 घनमीटर प्रतिवर्ष भूजल संचयन का कार्य किया जा रहा है एवं स्थलीय सत्यापन के समय वर्षा जल संचयन प्रणाली क्रियाशील अवस्था में पायी गयी।
- फर्म के प्रतिनिधि श्री अमित सिंह, (पर्यावरण विशेषज्ञ) द्वारा यह भी अवगत कराया गया कि फर्म द्वारा भूजल संचयन हेतु ग्राम खम्भारखेड़ा के आस–पास के क्षेत्र में दो तालाबो को गोद लिया गया है, जिसके द्वारा लगभग 2.19 हेक्टयर क्षेत्रफल आच्छादित है, जिसके माध्यम से उपलब्ध कराये गये अभिलेखो के अनुसार लगभग 118416 घनमीटर प्रति वर्ष भूजल का संचयन का कार्य किया जा रहा है। **(संलग्नक–09 : तालाब के अधिग्रहण सम्बन्धित साक्ष्य)**

NOTARY Sanjay Singh Advocate CIVIL COURT Lakhimpur-Kheri Reg. No.-3914 Dt. 14-03-2007 up to 13-03-2027 GOVT. OF INDIA

ATTESTED

- अतएव फर्म द्वारा कुल भूजल निष्कर्षण के सापेक्ष वांछित भूजल संचयन की स्थिति–

फर्म को 03 बोरवेल के माध्यम से कुल 216000 घनमीटर प्रति वर्ष भूजल निष्कर्षण की अनुमति प्रदान की गयी है। जिसके सापेक्ष फर्म द्वारा कुल 148973 घनमीटर प्रति वर्ष की मात्रा का ही भूजल निकाला

Sanjay Singh NOTARY Advocate Civil Court Lakhimpur-Kheri

Shyam Sunder Yadav

जा रहा है। फर्म द्वारा 02 रुफटाप रेनवाटर हार्वेस्टिंग प्रणाली एवं 02 तालाब के माध्यम से कुल 124432.51 घनमीटर प्रतिवर्ष रिचार्ज किया जा रहा है।

- फर्म द्वारा 02 पीजोमीटर (डी0डब्लू0एल0आर0 युक्त) स्थापित किये गये है, जॉच के समय फर्म में स्थापित पीजोमीटर के आकंड़े निम्नवत् है –

पीजोमीटर–1 भूजल स्तर 2025 पोस्ट मानसून 2.52 मीटर

पीजोमीटर–2 भूजल स्तर 2025 पोस्ट मानसून 2.26 मीटर

- भूगर्भ जल विभाग द्वारा भूजल स्तर मापन हेतु स्थापित विभागीय पीजोमीटर (मॉनीटरिंग वेल) के माध्यम से जनपद लखीमपुर खीरी के विकासखण्ड फूलबेहड़ में प्री एवं पोस्ट मानसून के भूजल स्तर की वर्षवार औसतन भूजल स्तर का आकलन भी किया गया, जिसमें वर्ष 2021 से वर्ष 2023 में दर्ज औसतन भूजल स्तर का विवरण **तालिका–01** पर निम्नवत् है :–

तालिका–01

वर्ष	प्री–मानसून (मीटर में)	पोस्ट मानसून (मीटर में)
2021	3.20	2.40
2022	3.35	2.05
2023	3.43	2.95

- फर्म को प्राप्त अनापत्ति प्रमाण पत्र में निहित शर्तो के अनुपालन में **वाटर ऑडिट रिपोर्ट**, रिसोर्स कन्जर्वेसन एण्ड मैनेजमेन्ट डिवीजन, फेडरेशन आफ इण्डियन चैम्बर्स आफ कामर्स एण्ड इण्डस्ट्री फेडरेशन हाउस, तानसेन मार्ग नई दिल्ली (केन्द्रीय भूमि जल प्राधिकरण, भारत सरकार द्वारा नामित संस्था) द्वारा तैयार करायी गयी है एवं समिति द्वारा वाटर आडिट रिपोर्ट के परीक्षण उपरान्त पाया गया कि निर्गत रिपोर्ट CGWA, MoJS, GOI के मानकों के अन्तर्गत तैयार की गयी है। **(संलग्नक–10)**

- फर्म को प्राप्त अनापत्ति प्रमाणपत्र में निहित शर्तो के अनुपालन में **प्रभाव आंकलन रिपोर्ट** डा0 राजीव साइंटिस्ट / टीम लीडर डायरेक्ट्रेट आफ रिसर्च चन्द्र शेखर आजाद यूनीवर्सिटी आफ एग्रीकल्चर एण्ड टेक्नोलोजी कानपुर (केन्द्रीय भूमि जल प्राधिकरण, भारत सरकार द्वारा नामित प्रतिनिधि) द्वारा तैयार करायी गयी है एवं समिति द्वारा प्रभाव आंकलन रिपोर्ट के परीक्षण उपरान्त पाया गया कि निर्गत रिपोर्ट CGWA, MoJS, GOI के मानकों के अन्तर्गत तैयार की गयी है। **(संलग्नक–11)**

- फर्म द्वारा अपशिष्ट जल हेतु 1260 KLD क्षमता का 01 ई0टी0पी0 (Effluent Treatment Plant) स्थापित है। साथ ही 100 KLD क्षमता के 01 एस0टी0पी0 (Sewage Treatment Plant) स्थापित किया गया है।

- फर्म द्वारा उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड द्वारा अनापत्ति (CTO) प्रमाण पत्र प्राप्त किया गया है। जिसकी वैधता दिनांक 01.01.2024 से दिनांक 31.12.2025 तक है। **(संलग्नक–12)**

टिप्पणी– उक्त से स्पष्ट है कि फर्म द्वारा मैसर्स बजाज हिन्दुस्तान शुगर लि0, ग्राम खम्भारखेड़ा, विकासखण्ड फूलबेहड़, लखीमपुर खीरी को 03 बोरवेल के माध्यम से वर्तमान समय मे किये जा रहे

Shyam Sundar Yadav

148973 घनमीटर भूजल निष्कर्षण के सापेक्ष आवश्यक 50 प्रतिशत से अधिक 124432.51 घनमीटर भूजल का रिचार्ज करते हुए अनापत्ति प्रमाण पत्रों में अंकित शर्तो का पालन किया जा रहा है।

11 (2)(क)–फर्म मैसर्स बजाज एनर्जी लि0 को भूजल निष्कर्षण हेतु निर्गत अनापत्ति प्रमाणपत्र की स्थिति–मैसर्स बजाज एनर्जी लि0, विकासखण्ड फूलबेहड़, ग्राम खम्भारखेड़ा, लखीमपुर खीरी द्वारा 03 बोरवेल के माध्यम से भूजल निष्कर्षण किया जा रहा है, जिसके सापेक्ष जिला परिषद, जनपद लखीमपुर खीरी द्वारा फर्म को अनापत्तियां (एन0ओ0सी0) (संलग्नक–13.1, 13.2, व 13.3) निर्गत की गयी है। फर्म को निर्गत अनापत्तियों का विवरण निम्नवत् है:–

क्रं0सं0	एन0ओ0सी0 संख्या	एन0ओ0सी0 की वैधता	एन0ओ0सी0 द्वारा अधिकतम भूजल निष्कर्षण की मात्रा
1	NOC020026	दिनांक 25.07.2021 से दिनांक 24.07.2026	378000 घनमीटर प्रति वर्ष
2	REG045173	दिनांक 25.07.2021 से दिनांक 24.07.2026	972000 घनमीटर प्रति वर्ष
3	REG012934	दिनांक 25.07.2021 से दिनांक 24.07.2026	756000 घनमीटर प्रति वर्ष
03 बोरववेल के माध्यम से कुल भूजल निष्कर्षण की मात्रा			2106000 घनमीटर प्रति वर्ष

11(2)(ख)–फर्म को निर्गत अनापत्ति के सापेक्ष शर्तो का अनुपालन– फर्म को भूजल निष्कर्षण हेतु निर्गत अनापत्ति प्रमाण पत्रों पर अंकित शर्तो के अनुपालन कराये जाने की जॉच में निम्नलिखित तथ्य दर्शित हुए:–

- फर्म मैसर्स बजाज एनर्जी लि0, ग्राम खम्भारखेड़ा, विकासखण्ड–फूलबेहड़, जनपद–लखीमपुर खीरी में स्थित है।
- फर्म द्वारा कुल 03 बोरवेल स्थापित है, जिसमें प्रत्येक बोरवेल की गहराई लगभग 110 मीटर व चालित तीनो मोटर की क्षमता 25–25 HP है।
- फर्म में जॉच के दौरान तीनों बोरवेल द्वारा 117 घनमीटर प्रति घण्टा, 171 घनमीटर प्रति घण्टा एवं 142 घनमीटर प्रति घण्टा का डिस्जार्च पाया गया।
- ग्राम खम्भारखेड़ा विकासखण्ड फूलबेहड, जनपद लखीमपुर खीरी में किसी भी प्रकार से पाइप लाइन द्वारा जल/शोधित जलापूर्ति नही की जा रही है।
- फर्म द्वारा कुल 03 बोरवेल के माध्यम से भूगर्भ जल के सापेक्ष वर्षा जल संचयन की प्रणाली की स्थापना की गयी है।
- फर्म के परिक्षेत्र में 03 रुफटाप रेनवाटर हार्वेस्टिंग प्रणाली की स्थापना की गयी है, जिसके माध्यम से उपलब्ध कराये गये अभिलेखो के अनुसार कुल 67067 घनमीटर प्रतिवर्ष भूजल संचयन का कार्य किया जा रहा है एवं स्थलीय सत्यापन के समय वर्षा जल संचयन प्रणाली क्रियाशील अवस्था में पायी गयी।
- फर्म के प्रतिनिधि श्री अमित सिंह, (पर्यावरण विशेषज्ञ) द्वारा यह भी अवगत कराया गया कि फर्म द्वारा भूजल संचयन हेतु आस–पास के क्षेत्र में 07 तालाब को गोद लिया गया है, जिसके द्वारा लगभग 27.019 हेक्टयर क्षेत्रफल आच्छादित किया गया है, जिसके माध्यम से उपलब्ध कराये गये अभिलेखो के

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Sanjay Singh Advocate

अनुसार कुल 486342 घनमीटर प्रति वर्ष भूजल का संचयन का कार्य किया जा रहा है। **(संलग्नक–14 तालाबों के अधिग्रहण सम्बन्धित साक्ष्य)**

- अतएव फर्म द्वारा कुल भूजल निष्कर्षण के सापेक्ष वांछित भूजल संचयन की स्थिति– फर्म को 03 बोरवेल के माध्यम से कुल 2106000 घनमीटर प्रति वर्ष भूजल निष्कर्षण की अनुमति प्रदान की गयी है। जिसके सापेक्ष फर्म द्वारा उपलब्ध अभिलेखो के अनुसार कुल 1035984 घनमीटर प्रति वर्ष भूजल निकाला जा रहा है। फर्म द्वारा 03 रुफटाप रेनवाटर हार्वेस्टिंग प्रणाली एवं 07 तालाब के माध्यम से कुल 553409 घनमीटर प्रतिवर्ष रिचार्ज किया जा रहा है।
- फर्म द्वारा 02 पीजोमीटर (डी0डब्लू0एल0आर0 युक्त) स्थापित किये गये है, जॉच के समय फर्म में स्थापित पीजोमीटर के आकंड़े निम्नवत् है –

  पीजोमीटर–1 भूजल स्तर 2025 पोस्ट मानसून 3.83 मीटर

  पीजोमीटर–2 भूजल स्तर 2025 पोस्ट मानसून 3.75 मीटर

- भूगर्भ जल विभाग द्वारा भूजल स्तर मापन हेतु स्थापित विभागीय पीजोमीटर (मॉनीटरिंग वेल) के माध्यम से जनपद लखीमपुर खीरी के विकासखण्ड फूलबेहड़ में प्री एवं पोस्ट मानसून के भूजल स्तर की वर्षवार औसतन भूजल स्तर का आकलन भी किया गया, जिसमें वर्ष 2021 से वर्ष 2023 में दर्ज औसतन भूजल स्तर का विवरण **तालिका–02** पर निम्नवत् है :–

तालिका–02

वर्ष	प्री–मानसून (मीटर में)	पोस्ट मानसून (मीटर में)
2021	3.20	2.40
2022	3.35	2.05
2023	3.43	2.95

- फर्म को प्राप्त अनापत्ति प्रमाण पत्र में निहित शर्तो के अनुपालन में **वाटर ऑडिट रिपोर्ट**, पी0एच0डी0 चैम्बर्स आफ कामर्स एण्ड इण्डस्ट्री पी0एच0डी0 हाउस, 4/2 सिरी इन्स्टीटयूटनल एरिया अगस्त क्रान्ति मार्ग,नई दिल्ली (केन्द्रीय भूमि जल प्राधिकरण, भारत सरकार द्वारा नामित संस्था) द्वारा तैयार करायी गयी है एवं समिति द्वारा वाटर आडिट रिपोर्ट के परीक्षण उपरान्त पाया गया कि निर्गत रिपोर्ट CGWA, MoJS, GOI के मानकों के अन्तर्गत तैयार की गयी है। **(संलग्नक–15)**
- फर्म को प्राप्त अनापत्ति प्रमाणपत्र में निहित शर्तो के अनुपालन में **प्रभाव आंकलन रिपोर्ट** श्री राजपाल सिंह (केन्द्रीय भूमि जल प्राधिकरण, भारत सरकार द्वारा नामित प्रतिनिधि) द्वारा तैयार करायी गयी है एवं समिति द्वारा प्रभाव आंकलन रिपोर्ट के परीक्षण उपरान्त पाया गया कि निर्गत रिपोर्ट CGWA, MoJS, GOI के मानकों के अन्तर्गत तैयार की गयी है। **(संलग्नक–16)**
- फर्म द्वारा अपशिष्ट जल हेतु 980 KLD क्षमता का 01 ई0टी0पी0 (Effluent Treatment Plant) स्थापित है। साथ ही 100 KLD छमता के 01 एस0टी0पी0 (Sewage Treatment Plant) स्थापित किया गया है।
- फर्म द्वारा उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड द्वारा अनापत्ति (CTO) प्रमाण पत्र प्राप्त किया गया है, जिसकी वैधता दिनांक 01.01.2024 से दिनांक 31.12.2025 तक है। **(संलग्नक–17)**

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टिप्पणी– उक्त से स्पष्ट है कि फर्म द्वारा मैसर्स बजाज एनर्जी लि0, ग्राम खम्मारखेड़ा, विकासखण्ड फूलबेहड़, लखीमपुर खीरी को 03 बोरवेल के माध्यम से वर्तमान समय मे किये जा रहे 1035984 घनमीटर भूजल निष्कर्षण के सापेक्ष आवश्यक 50 प्रतिशत से अधिक 553409 घन मीटर भूजल का रिचार्ज करते हुए अनापत्ति प्रमाण पत्रों में अंकित शर्तो का पालन किया जा रहा है।

16– यह कि टास्क फोर्स द्वारा स्थलीय सत्यापन उपरान्त भारत सरकार द्वारा अनुमोदित एवं विभाग द्वारा तैयार की गयी भूजल आंकलन रिपोर्ट–2023 (संलग्नक–18) के आंकडों का अध्ययन किया गया जिसमें जनपद लखीमपुर खीरी में भूजल संसाधन की स्थिति निम्नानुसार है :–

उपलब्ध भूजल संसाधन की कुल मात्रा	–210029.82 हे0मी0
सभी स्रोतों से भूजल निष्कर्षण योग्य भूजल की मात्रा	–127682.08 हे0मी0
सिचांई कार्य में भूजल निष्कर्षण	–115315.84 हे0मी0
औद्योगिक क्षेत्र में भूजल निष्कर्षण	–225.55 हे0मी0
घरेलू क्षेत्र में भूजल निष्कर्षण	–12140.68 हे0मी0

- उपलब्ध भूजल संसाधन आकडों से स्पष्ट है कि जनपद लखीमपुर खीरी में सभी स्रोतों से भूजल निष्कर्षण की कुल मात्रा 210029.82 हे0मी0 है। कुल भूजल निष्कर्षण में सिचांई कार्य हेतु भूजल निष्कर्षण 115315.84 हे0मी0 तथा औद्योगिक क्षेत्र में भूजल निष्कर्षण 225.55 हे0मी0 है। स्पष्ट है कि जनपद में कृषि क्षेत्र में कुल उपयोग में लाये जाने वाले भूजल के सापेक्ष औद्योगिक क्षेत्रों में भूजल संसाधन की कुल उपयोगिता अत्यन्त अल्प है।
- जनपद लखीमपुर खीरी के अन्तर्गत कुल 15 विकासखण्ड स्थित है। (संलग्क–19) भूजल संसाधन आकलन–2023 की रिपोर्ट के अनुसार विकासखण्ड फूलबेहड़ एवं अन्य समस्त विकासखण्ड सुरक्षित श्रेणी में वर्गीकृत किये गये है। यह भी सूचनीय है वर्ष 2021 व 2022 (संलग्नक–20) के वाटर लेवल के अनुसार भी विकासखण्ड फूलबेहड़ सुरक्षित श्रेणी में ही वर्गीकृत था।

17– यह है कि ओ0ए0 सं0 691/2022 रमाशंकर अवस्थी बनाम स्टेट आफ यू0पी0 की याचिका के क्रम में मा0 राष्ट्रीय हरित अधिकरण के आदेश दिनांक 07.11.2024 के अनुपालन में मैसर्स बजाज हिन्दुस्तान शुगर लि0 व मैसर्स बजाज एनर्जी लि0 की जनपद लखीमपुर खीरी में संचालित इकाईयों के संबंध में पार्टी संख्या 03 की ओर से वांछित सम्बन्धित अनुपालन आख्या संस्तुति सहित सूचनार्थ एवं अग्रेत्तर कार्यवाही किये जाने हेतु प्रस्तुत है।

Shyam Sunder Yadav

विपक्षी पार्टी संख्या–03 की ओर से
(निदेशक, भूगर्भ जल विभाग/सदस्य सचिव,
राज्य भूगर्भ जल प्रबन्धन एवं नियामक
प्राधिकरण, उ0प्र0।)

NOTARY Sanjay Singh Advocate CIVIL COURT Lakhimpur-Kheri Reg. No.-3514 Dt. 14-03-2007 up to 13-03-2027 GOVT. OF I.

ATTESTED

Sanjay Singh
Advocate

सत्यापन

मै श्याम सुन्दर शपथ लेता हूँ कि मेरे द्वारा प्रस्तुत उपरोक्त कथन पूर्णतः सत्य है और इसमे कोई भी तथ्य छुपया नही गया है। यदि उपरोक्त में से कोई कथन असत्य पाया जाता है तो मेरे विरूद्ध नियमानुसार कार्यवाही करने हेतु विभाग को पूर्ण अधिकार होगा।

NOTARY
Sanjay Singh
Advocate
CIVIL COURT
Lakhimpur-Kheri (U.P.)
Reg. No.-3914
Dt. 14-03-2007
up to 13-03-2027
GOVT. OF INDIA

दिनांक

हस्ताक्षर शपथकर्ता

Certified that Sri..... who is identified by Sri..... to day at..... on oath that he has stated in the affidavit are true and correct and nothing is false I have under stood the matter of affidavit

I Know & Identify to Above Person has Sign /L T I before me

ATTESTED
Sanjay Singh
NOTARY Advocate
Civil Court Lakhimpur-Kheri

संलग्नक-10

Annexure 1

क्रम-संख्या—186 (क)

रजिस्ट्रेशन नम्बर—एस०एस०पी० / एल—
डब्लू / 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, 11 सितम्बर, 2019

भाद्रपद 20, 1941 शक सम्वत्

उत्तर प्रदेश शासन

लघु सिंचाई एवं भूगर्भ जल अनुभाग—1

संख्या 1036 / 62-1—2019-10जी०डब्ल्यू-2014

लखनऊ, 11 सितम्बर, 2019

अधिसूचना

प०आ०—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.

[illegible] 270 राजपत्र—2019—(771)—599 प्रतियां (कम्प्यूटर / टी० / ऑफसेट)।
[illegible]—2019—(772)—300 प्रतियां [illegible]

संलग्न-2 11

Annexure 2

क्रम-संख्या-216(क)

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

लाइसेन्स टू पोस्ट ऐट कन्सेशनल रेट

सरकारी गजट, उत्तर प्रदेश

उत्तर प्रदेशीय सरकार द्वारा प्रकाशित

असाधारण

विधायी परिशिष्ट

भाग-4, खण्ड (ख)

(परिनियत आदेश)

लखनऊ, बुधवार, 13 नवम्बर, 2019

कार्तिक 22, 1941 शक सम्वत्

उत्तर प्रदेश सरकार

लघु सिंचाई एवं भूगर्भ जल अनुभाग-1

संख्या 1320/62-1-2019-10 जीडब्लू-2014

लखनऊ, 13 नवम्बर, 2019

अधिसूचना

प0आ0-344

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

आज्ञा से,
अनीता सिंह,
प्रमुख सचिव।

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

No. 1320/LXII-1-2019-10gw-2014

Dated Lcknow, November 13, 2019

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

By order,
ANITA SINGH,
Pramukh Sachiv.

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

क्रम-संख्या -19

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

सरकारी गजट, उत्तर प्रदेश

उत्तर प्रदेशीय सरकार द्वारा प्रकाशित

असाधारण

विधायी परिशिष्ट

भाग–4, खण्ड (ख)

(परिनियत आदेश)

लखनऊ, मंगलवार, 21 जनवरी, 2020

माघ 1, 1941 शक सम्वत्

उत्तर प्रदेश शासन

नमामि गंगे एवं ग्रामीण जलापूर्ति अनुभाग–3

संख्या 58/76-3-2020/10जीडब्लू/2014

लखनऊ, 21 जनवरी, 2020

अधिसूचना

प०आ०–19

उत्तर प्रदेश भूगर्भ जल (प्रबन्धन और विनियमन) अधिनियम, 2019 (उत्तर प्रदेश अधिनियम संख्या 13 सन् 2019) की धारा 6 की उप–धारा (1) के अधीन शक्तियों का प्रयोग करके राज्यपाल, राज्य भूगर्भ जल प्रबन्धन और विनियामक प्राधिकरण को उक्त धारा के उपबंधो के अनुसार अध्यक्ष और सदस्यों से समाविष्ट राज्य के प्रत्येक जिले 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

के०एस०यू०पी०-एन०पी०-575-राजपत्र (हि०)-(1399)-2020-599 प्रतियां-(कम्प्यूटर/आफसेट)
डी०एस०यू०पी०-एन०पी०-4 सा० भूगर्भ जल-(1400)-1000 प्रतियां-(कम्प्यूटर/आफसेट)।

राज्य भूगर्भ जल प्रबन्धन और विनियामक प्राधिकरण,

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

संख्या /यूपीराभूजप्रविप्रा

लखनऊः दिनांक : 05 जून, 2020

–: कार्यालय ज्ञाप :–

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

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

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

राजेन्द्र कुमार तिवारी
मुख्य सचिव/अध्यक्ष

पत्रांकः 0। /यूपीराभूजप्रविप्रा/तद्दिनांक।

प्रतिलिपि निम्नलिखित को सूचनार्थ एवम् आवश्यक कार्यवाही हेतु प्रेषित हैः-

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

आज्ञा से,

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

पत्रांकः _____/यूपीराभूजप्रविप्रा/तद्दिनांक।

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

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

आज्ञा से,

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

सहायक 15

Annexure 4

कार्यालय आदेश

जिलाधिकारी महोदय खीरी के अनुमोदन दिनांक 01.10.2020 के क्रम में उ0प्र0 शासन लघु सिंचाई एवं भूगर्भ जल अनुभाग–1 की अधिसूचना संख्या 1036/62–1–2019–10 जी0डब्लू0/2014, लखनऊ दिनांक 11 सितम्बर 2019 के क्रम में जनपद स्तर पर जिला भूगर्भ जल प्रबन्धन परिषद का गठन निम्नवत् किया जाता है–

1 जिला मजिस्ट्रेट, खीरी	–	अध्यक्ष
2 जिला विकास अधिकारी, खीरी	–	सदस्य सचिव
3 सहायक अभियन्ता लघु सिंचाई	–	सदस्य सह सचिव
4 सहायक अभियन्ता भूगर्भ जल विभाग	–	सदस्य
5 क्षेत्रीय अधिकारी उ0प्र0 प्रदूषण नियंत्रण बोर्ड	–	सदस्य
6 जिला कृषि अधिकारी	–	सदस्य
7 अधिशासी अभियन्ता लघु सिंचाई सीतापुर	–	सदस्य
8 अधिशासी अभियन्ता उ0प्र0 जल निगम, खीरी।	–	सदस्य
9 समस्त अधिशासी अधिकारी नगर पालिका परिषद/नगर पंचायत जनपद–खीरी	–	सदस्य
10 अधिशासी अभियन्ता सिंचाई एवं जल संसाधन विभाग, खीरी।	–	सदस्य
11 उपायुक्त जिला उद्योग केन्द्र खीरी।	–	सदस्य
12 प्रभागीय वनाधिकारी, उत्तर/दक्षिण खीरी।	–	सदस्य
13 जिला उद्यान अधिकारी, खीरी।	–	सदस्य
14 सम्बन्धित खण्ड पंचायत भूगर्भ जल प्रबन्धन समिति/नगर पालिका भूगर्भ जल प्रबन्धन समिति प्रत्येक मे से एक प्रतिनिधि(आमंत्रित के रूप में)	–	सदस्य

3.10.2020

(अरविन्द कुमार)
जिला विकास अधिकारी
खीरी।

कार्यालय जिला विकास अधिकारी, खीरी

पत्रांक 425/ल0सिं0/भू0ज0प्र0प0/2020–21 दिनांक 03/10/2020

प्रतिलिपिः–निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1. जिलाधिकारी महोदय खीरी को अवलोकनार्थ
2. मुख्य विकास अधिकारी महोदय खीरी को अवलोकनार्थ।
3. समस्त सदस्य/सदस्य सह सचिव को उक्त अधिनियम 2019 की छायाप्रति।
4. समस्त अधिशासी अधिकारी नगर पालिका परिषद/नगर पंचायत एवं समस्त खण्ड विकास अधिकारी जनपद–खीरी को उपरोक्त अधिनियम 2019 की छायाप्रति इस निर्देश के साथ प्रेषित कि वह अपने स्तर से नगर पालिका जल प्रबन्धन समिति/खण्ड पंचायत भूगर्भ जल प्रबन्धनसमिति एवं ग्राम पंचायत भूगर्भ जल उप समिति का गठन करें एवं विहित प्राविधानों का अनुपालन करें।

3.10.2020

जिला विकास अधिकारी
खीरी।

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 है:–

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 आदेश

अवगत कराना है कि उत्तर प्रदेश भू–गर्भ 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 ऑनलाइन **वेब पोर्टल (upgwdonline.in)** भी विकसित किया गया है जिसके संचालन के लिए जनपद खीरी में उत्तर प्रदेश शासन नमामि गंगे तथा ग्रामीण जलापूर्ति अनुभाग–3 के द्वारा लघु सिंचाई विभाग के सहायक अभियन्ता को नोडल अधिकारी नामित किया गया है। निदेशक भूगर्भ जल विभाग/सदस्य सचिव राज्य भूगर्भ जल प्रबन्धन एवं नियामक प्राधिकरण उत्तर प्रदेश लखनऊ के पत्र संख्या 24/यूपीराभूजप्रविप्रा दिनांक 03.03.2021 के क्रम में उक्त वेब पोर्टल के माध्यम से प्राप्त आवेदन पत्रों के नियमानुसार निस्तारण हेतु कतिपय शर्तों तथा रेनवाटर हार्वेस्टिंग प्रणाली की स्थापना, इफ्लुएन्ट ट्रीटमेन्ट प्लान्ट (Effluent Treatment Plant for industries) फ्लोमीटर, बोर की साइज पम्प का प्रकार एवं क्षमता इत्यादि की आवश्यकतानुसार स्थलीय सत्यापन हेतु जनपद में तकनीकी अधिकारियों को सम्मिलित करते हुए जनपदीय समिति/टास्क फोर्स का निम्नानुसार गठन किया जाता है–

1– **नामित नोडल अधिकारी/सहायक अभियन्ता लघु सिंचाई खीरी।**
2– **अधिशासी अभियन्ता उ0प्र0 जल निगम खीरी।**
3– **क्षेत्रीय अधिकारी उत्तर प्रदेश प्रदूषण नियंत्रण बोर्ड।**

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

जिला भूगर्भ जल प्रबन्धन परिषद को प्राप्त होने वाले आवेदन पत्रों को निस्तारित किये जाने हेतु आवश्यक दिशा–निर्देश संलग्न कर जनपदीय टास्क फोर्स को इस आशय के साथ प्रेषित है कि निर्धारित गाइड–लाइन के अनुसार स्थलीय सत्यापन करते हुये प्राप्त आवेदनों का समयबद्ध रूप से निस्तारण कराया जाना सुनिश्चित करें।

संलग्न–उपरोक्तानुसार।

(शैलेन्द्र कुमार सिंह)
जिलाधिकारी/
अध्यक्ष जिला भूगर्भ जल प्रबन्धन
परिषद खीरी।

कार्यालय जिलाधिकारी, खीरी।

पत्रांक 39 /ल0सिं0/भू0ज0प्र0प0/2020–21 **दिनांक 06-5-2021**

प्रतिलिपिः– निम्न को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1 निदेशक भूगर्भ जल विभाग/सदस्य सचिव राज्य भूगर्भ जल प्रबन्धन एवं नियामक प्राधिकरण उ0प्र0 लखनऊ।
2 मुख्य विकास अधिकारी खीरी।
3 जिला विकास अधिकारी खीरी।
4 समस्त सदस्य जिला भूगर्भ जल प्रबन्धन परिषद खीरी को संलग्नकों सहित।
5 जनपदीय समिति/नामित टास्क फोर्स से सम्बन्धित अधिकारियों को अनुपालनार्थ।

जिलाधिकारी/
अध्यक्ष जिला भूगर्भ जल प्रबन्धन
परिषद खीरी।

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

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

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

विषय– **मा0 राष्ट्रीय हरित अधिकरण (एनजीटी), नई दिल्ली में विचारधीन ओ0ए0 संख्या–691/2022 Rama Shanker Awasthi Vs State of Uttar Pradesh & Ors. में पारित आदेश दिनांक 07.11.2024 के अनुपालन के सम्बन्ध में।**

नोडल अधिकारी, जिला भूगर्भ जल प्रबन्धन परिषद्, जनपद–पीलीभीत/शाहजहाँपुर/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, शाहजहाँपुर, 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 अश 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 जाँच 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 दिनाक 07.11.2024 के साथ संलग्न मूल प्रत्यावेदन में की गयी शिकायत के क्रम में मूल आवेदन में वादी द्वारा लगाये गये आरोपो/तथ्यो की जाँच करते हुए सम्बन्धित वाद के सापेक्ष जनपदवार व प्रस्तरवार विभागीय मंतव्य/पैरावाईस रिप्लाई/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 हो 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)।

संलग्नम-8·1

GROUND WATER DEPARTMENT

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

Form 8 (C)

[See Rule 8(1)]

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

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

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC043004

VALID FROM 22/06/2021 TO 21/06/2026

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

Registration No.: 202105000101

Name of the Owner	RAVINDRA KUMAR TEWARI		
Designation पद	Asstt. Vice President (Sugar Division)	**Company Name** कंपनी का नाम	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT KHAMBARKHERA
Company Address कंपनी का पता	Sharda Nagar Road, Khambhar Khera, Lakhimpur Khiri	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	SHARDA NAGAR ROAD KHAMBHARKHERA, Lakhimpur Khiri	**Application Form Serial No.**	LMPK0521NIN0018
Date of Submission	07/05/2021	**Specimen Signature**	

Location Particulars

District	Lakhimpur Kheri	**Block**	FULBEHAD
Plot No./Khasra No.	Existing premises khasra detail attached	**Municipality/Corporation**	NA
Ward No./Holding No.			NA

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	06/07/2006		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	140.35
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	60.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	200.00
Date of Energization (In Case of Electric Pump)		06/07/2006	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	200.00	**Maximum Allowable Running Hours Per Day:**	2.00
Maximum Allowable Annual Extraction of Ground Water:			72000

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

GENERAL CONDITIONS:

- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization.
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters.
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands.
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration.
- In case, any of the particulars / information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage, this registration is liable for cancellation.
- The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- 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 / information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
-
- **SPECIFIC CONDITIONS:**
- **(A) For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no 10 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 :**31/10/2021**
Place:**Lakhimpur Kheri**

This certificate is electronically generated and does not require digital signature

संलग्नक - 8.2

GROUND WATER DEPARTMENT

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

Form 8 (C)

[See Rule 8(1)]

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

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

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC033242

VALID FROM 22/06/2021 TO 21/06/2026

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

Registration No.: 202105000100

Name of the Owner	RAVINDRA KUMAR TEWARI		
Designation पद	Asstt. Vice President (Sugar Division)	**Company Name** कंपनी का नाम	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT KHAMBARKHERA
Company Address कंपनी का पता	Sharda Nagar Road, Khambhar Khera, Lakhimpur Khiri	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	SHARDA NAGAR ROAD KHAMBHARKHERA, Lakhimpur Khiri	**Application Form Serial No.**	LMPK0521NIN0017
Date of Submission	07/05/2021	**Specimen Signature**	

Location Particulars

District	Lakhimpur Kheri	**Block**	FULBEHAD
Plot No./Khasra No.	Existing premises khasra detail attached	**Municipality/Corporation**	NA
Ward No./Holding No.			NA

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	06/07/2006		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	96.00
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	60.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	200.00
Date of Energization (In Case of Electric Pump)		06/07/2006	

imum Allowable Rate Withdrawal (m^3/hr.): 200.00

Maximum Allowable Running Hours Per Day: 2.00

Maximum Allowable Annual Extraction of Ground Water: 72000

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

GENERAL CONDITIONS:

- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration
- In case, any of the particulars 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) 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 :**10/12/2021**

Place:**Lakhimpur Kheri**

This certificate is electronically generated and does not require digital signature

संलग्नक-8.3

Annexure 8.3

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

Form 8 (C)

[See Rule 8(1)]

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

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

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC028922

VALID FROM 22/06/2021 TO 21/06/2026

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

Registration No.: 202105000099

Name of the Owner	RAVINDRA KUMAR TEWARI		
Designation पद	Asstt. Vice President (Sugar Division)	**Company Name** कंपनी का नाम	BAJAJ HINDUSTHAN SUGAR LTD SUGAR UNIT KHAMBARKHERA
Company Address कंपनी का पता	Sharda Nagar Road, Khambhar Khera, Lakhimpur Khiri	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	SHARDA NAGAR ROAD KHAMBHARKHERA, Lakhimpur Khiri	**Application Form Serial No.**	LMPK0521NIN0016
Date of Submission	07/05/2021	**Specimen Signature**	

Location Particulars

District	Lakhimpur Kheri	**Block**	PALIBHAD
Plot No /Khasra No	Existing premises Khasra detail attached	**Municipality/Corporation**	NA
Ward No /Holding No			NA

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	06/07/2006		
Type of Well	Tube Well/Boring	**Depth of the Well (In meter)**	91.46
Purpose of well	Industrial	**Assembly Size(For Tube Well)**	
Strainer Position (For Tube Well)			
Type of Pump Used	Submersible	**H.P. of the Pump**	60.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	200.00
Date of Energization (In Case of Electric Pump)		06/07/2006	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	200.00	**Maximum Allowable Running Hours Per Day:**	2.00
Maximum Allowable Annual Extraction of Ground Water:		72000	

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

GENERAL CONDITIONS:

- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization.
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters.
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands.
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration.
- In case, any of the particulars / information furnished by the applicant in his application for issuance of this registration is found to be incorrect during verification at any subsequent stage, this registration is liable for cancellation.
- The Certificate of Authorization/ NOC shall be valid for a period of five years from the date of issue. The applicant shall have to apply for renewal through a fresh application, at least ninety days prior to expiry of its validity.
- 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".
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3	50- 500	1	0	1
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- 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.
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- 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.
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- Any other site specific requirement regarding safety and access for measurement may be taken care of.

- Any other condition(s) that may be imposed by the concerned Authority.
- In case, any of the particulars / information furnished by the applicant in his application for issuance of this permit is found to be incorrect during verification at any subsequent stage, this permit is liable for cancellation.
-
- **SPECIFIC CONDITIONS:**
- **(A) For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
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- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to Ground Water Department Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 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 :**31/10/2021**
Place:**Lakhimpur Kheri**

This certificate is electronically generated and does not require digital signature

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

22 DEC 2017

भारत INDIA

INDIA NON JUDICIAL

उत्तर प्रदेश UTTAR PRADESH DP 820141

अनापत्ति प्रमाण-पत्र

मैं पूनम सरपंच ग्राम–खम्भारखेड़ा ब्लाक–फूलबेहड़ जिला–लखीमपुर खीरी (उत्तर प्रदेश) तसदीक करती हूँ, कि पंचायत की सहमति से लिये गये निर्णय के अनुसार हमारे ग्राम में गाटा संख्या–981 में स्थित तालाब जिसका क्षेत्रफल–1.1409 हे0 है, को बजाज हिन्दुस्थान शुगर लिमिटेड खम्भारखेड़ा को रेनवाटर हॉर्वेस्टिंग व रिंचार्ज के लिये अधिग्रहित करता है। तो इस गाँव की पंचायत को कोई आपत्ति नहीं है।

Poonam

हस्ताक्षर व मुहर

33

5475

उद्धरण खतौनी

उद्धरण क्रमांक : 136447201712171

ग्राम क्रमांक : 136447 ग्राम का नाम / परगना : खम्भारखेडा(श्रीनगर) तहसील : लखीमपुर खीरी जनपद : खीरी फसली वर्ष : 1422-1427 भाग : 1

खाता खतौनी क्रम संख्या	खातेदार का नाम / पिता पति संरक्षक का नाम / निवास स्थान	भौमिक अधिकार प्रारम्भ होने का वर्ष	खाते के प्रत्येक गाटे की खसरा संख्या	प्रत्येक गाटे का क्षेत्रफल (हे.)	खातेदार द्वारा देय मालगुजारी या लगान	परिवर्तन सम्बन्धी आज्ञा या उसका सारांश उनकी संख्या तथा दिनाँक सहित और आज्ञा देने वाले अधिकारी का पद	टिप्पणी
1	2	3	4	5	6	7-12	13
श्रेणी : 6-1 / अकृषिक भूमि - जलमग्न भूमि ।							
01101	तालाब / /		36	0.5300			
			256	0.6030			
			419	0.6360			
			592क	0.2550			
			631	1.6550			
			725	0.4130			
			780	0.0570			
			981	1.1490			
			1177	0.2180			
			1234	0.5350			
			10	6.0510	₹ 0.00	0	0

कुल गाटे- एक शून्य कुल क्षेत्रफल- छः दशमलव शून्य पाँच एक शून्य (हेक्टेयर) कुल भू-राजस्व - शून्य दशमलव शून्य शून्य रुपये

Data Digitally Signed by: HARI KISHOR

उपरोक्त उद्धरण खतौनी का वेरीफिकेशन http://upbhulekh.gov.in Website पर जाकर किया जा सकता है।

30 DEC 2017

तहसील—लखीमपुर—खीरी

सक्षम अधिकारी: VIRENDRA KUMAR MISRA

तहसील: लखीमपुर खीरी जनपद: खीरी

दिनांक एवं समय: 30-12-2017 04:13:18

यह उद्धरण खतौनी इलेक्ट्रोनिक डिलीवरी सिस्टम द्वारा तैयार की गयी है तथा यह डिजीटल हस्ताक्षर द्वारा हस्ताक्षरित है।

उत्तर प्रदेश UTTAR PRADESH ET 367010

अनापत्ति प्रमाण पत्र

मैं राम स्नेही सरपंच ग्राम चहमलपुर परगना श्रीनगर जिला– लखीमपुर खीरी (उत्तर प्रदेश) तसदीक करता हूँ । कि पंचयात की सहमित से लिए गये निर्णय के अनुसार हमारे ग्राम में गाटा संख्या– 740 में स्थित तालाब जिसका क्षेत्रफल– 1.0520 हेक्टेयर है, को बजाज हिन्दुस्थान शुगर लिमिटेड खंभार खेड़ा को रेन वाटर हार्वेस्टिंग व रिचार्ज के लिए अधिग्रहीत करता है । तो इस गावं की पंचायत को कोई आपत्ति नहीं है ।

मैं यह भी तसदीक करता हूँ की यह सभी तालाब किसी अन्य व्यक्ति या कंपनी को अधिग्रहित नहीं किया गया है एवं न ही भविष्य में किया जायेगा ।

प्रधान

उद्दरण खतौनी

उद्दरण क्रमांक : 13647020190528

ग्राम क्रमांक : 136470 ग्राम का नाम / परगना : चहमलपुर(श्रीनगर) तहसील : लखीमपुर खीरी जनपद : खीरी फसली वर्ष : 1422-1427 भाग : 1

खाता खतौनी क्रम संख्या	खातेदार का नाम / पिता पति संरक्षक का नाम / निवास स्थान	भौमिक अधिकार प्रारम्भ होने का वर्ष	खाते के प्रत्येक गाटे की खसरा संख्या	प्रत्येक गाटे का क्षेत्रफल (हे.)	खातेदार द्वारा देय मालगुजारी या लगान	परिवर्तन सम्बन्धी आज्ञा या उसका सारांश उनकी संख्या तथा दिनांक सहित और आज्ञा देने वाले अधिकारी का पद	टिप्पणी
	2	3	4	5	6	7-12	13
श्रेणी : 6-1 / अकृषिक भूमि - जलमग्न भूमि ।							
0624	तालाब / /		33	0.0450			
			70	0.2020			
			73	0.1660			
			83	0.3010			
			163	0.1820			
			217	0.0890			
			402	0.1680			
			477	0.4620			
			483	0.1500			
			485	0.2060			
			671	0.5430			
			690	0.2100			
			709	0.0360			
			740	1.0520			
			14	3.8120	0.00	0	0

गाटे- एक चार कुल क्षेत्रफल- तीन दशमलव आठ एक दो शून्य (हेक्टेयर) कुल भू-राजस्व - शून्य दशमलव शून्य शून्य रुपये

Data Digitally Signed by: HARI KISHOR

सक्षम अधिकारी ...RA KUMAR MISRA
तहसील: लखीमपुर खीरी, जनपद: खीरी
दिनांक एवं समय: 28-05-2019 01:38:07

रजिस्ट्रार कानूनगो
28 MAY 2019
तहसील–लखीमपुर–खीरी

प्रस्तुत उद्दरण खतौनी का सत्यापन http://upbhulekh.gov.in Website पर जाकर किया जा सकता है।

उद्दरण खतौनी इलेक्ट्रॉनिक डिजिटल सिस्टम द्वारा तैयार की गयी है तथा द्वारा डिजिटल हस्ताक्षर द्वारा हस्ताक्षरित है।

28-05-2019, 13:41

Annexure 10

REPORT

On

Water Audit Study

At

Bajaj Hindusthan Sugar Limited,

Unit Sugar Khabharkhera, (U.P.)

by

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

(January 2023)

Federation of
Indian Chambers
of Commerce and Industry

Federation House
Tansen Marg
New Delhi 110001
T +91 11 23738760 (11 Lines)
F +91 11 23320714 / 23721504
E ficci@ficci.com
www.ficci.com

ACKNOWLEDGEMENT

Federation of Indian Chambers of Commerce & Industry (FICCI) places on record its sincere thanks to **Bajaj Hindusthan Sugar Limited-Sugar Unit, Khambhar Khera** for entrusting the task of conducting Resource Audit for " Water Audit Study" at **Bajaj Hindusthan Sugar Limited-Sugar Unit, Khambhar Khera (U.P.)** during January -2023.

We hereby express our sincere thanks to **Mr. Pankaj Kumar Awasthi (EHS-Head**) and their team, from **Bajaj Hindusthan Sugar Limited-Sugar Unit, Khambhar Khera (U. P.)** for their proactive support and courtesy extended to the FICCI team during f ield study. We also thank other officials from **Bajaj Hindusthan Sugar Limited-Sugar Unit, Khambhar Khera (U. P.)** 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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ABBREVIATIONS

ETP	:	Effluent Treatment Plant
kW	:	Kilo Watt
kWh	:	Kilo Watt hour
lpcd	:	litres per capita per day
lpm	:	litres per minute
OHT	:	Overhead Tank
RWH	:	Rainwater Harvesting
RO	:	Reverse Osmosis
SWC	:	Specific Water Consumption
CPU	:	Condensate Polishing Unit
MEE	:	Multi Effect Evaporation
UPGWA:		UP Ground Water Authority

EXECUTIVE SUMMARY

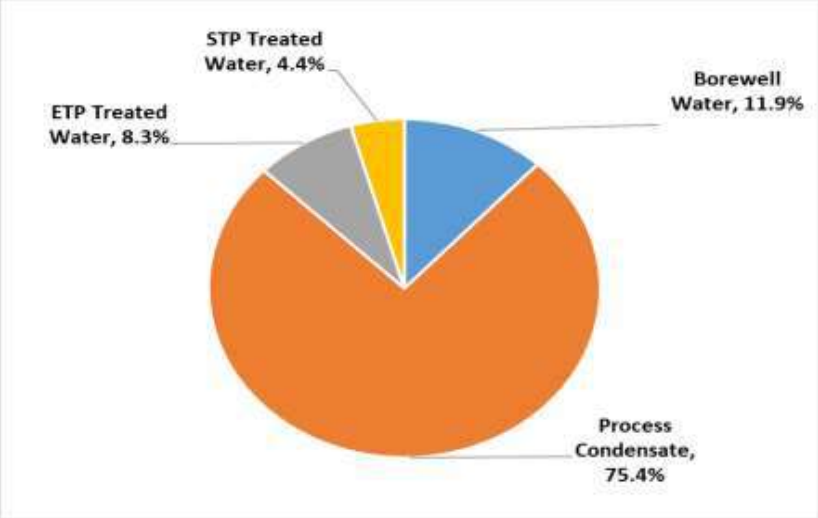
FICCI has conducted a detailed Water Audit Study of the Bajaj Hindusthan Sugar Limited- Sugar Unit, Khambhar Khera (U.P.) during January 2023. The study estimated that the total Water use by the plant is about 8105.3 m^3/day out of which about 11.9% (965.1 m^3/day) is freshwater, 75.4% (6107.8 m^3/day) is Evaporator and Pan Condensate, 8.3% (672.8 m^3/day) is ETP Treated Water, 4.4% (359.6 m^3/day) is STP Treated water. The main source of freshwater is supplied from groundwater by borewells. The plant consumes about 114000 m^3 of groundwater as per FY 2021-22. The main water sources and their uses are given in Table below.

Table A: Total water Requirement by Plant

Type of water	m^3/day	Water Quality	Major Usage Area	Water Use (%)
Bore well Water	965.1	Fresh Water	Plant & Colony Domestic (Drinking/Hand wash/Cooking/Washing/Flushing), CT Makeup & Equipment's cleaning.	11.9%
Process Condensate	6107.8	Recycled	Boiler, imbibition, Process, Lime preparation, CT makeup, Magma & Vacuum Filter	75.4%
ETP Treated Water	672.8	Recycled	Irrigation, Horticulture & Lagoons	8.3%
STP Treated Water	359.6	Recycled	Irrigation, Horticulture	4.4%
Total	**8105.3**			**100%**

The water is mainly used in Plant & colony Domestic (Drinking/Hand wash/Cooking/Washing), Lab (Testing/Handwashing/Flushing/Drinking), making DM water, Boiler make-up , CT makeup, Imbibition, , pan movement, centrifugal, Lime preparation, cleaning (evaporator, pan, juice heater), mill & process equipment cooling , Lagoon , irrigation, horticulture cold UGR makeup etc. Following diagram shows the different type of water uses and their share

Figure 1 :Total water Requirement by Plant



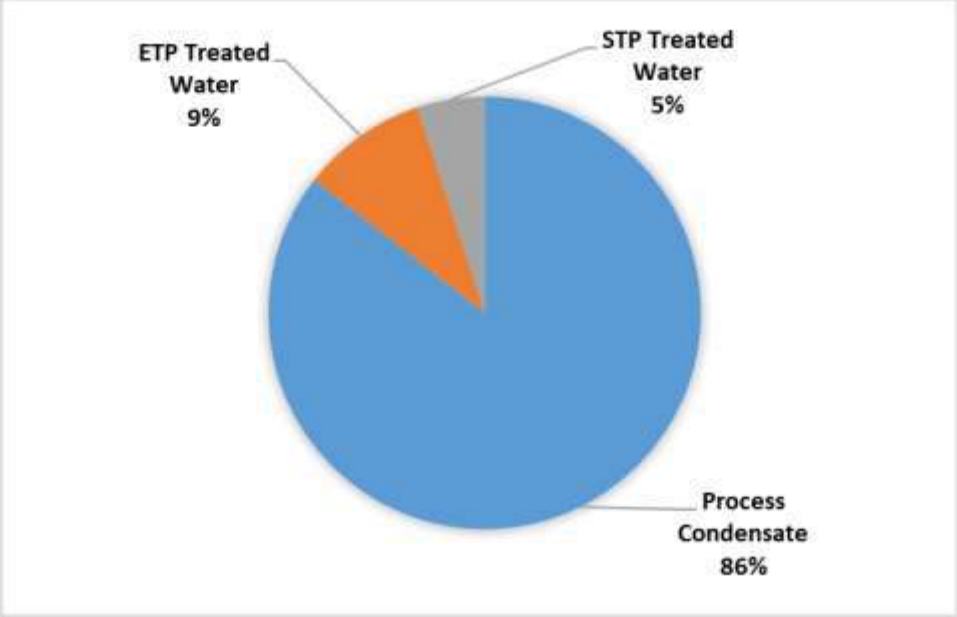
The total wastewater generation in the plant is about 7140.2 m^3/day, out of which about 86% (6107.8 m^3/day) wastewater generated from cane crushing & obtained in the form of process condensate, 9% (672 m^3/day)

Wastewater generated by Plant domestic and washing CT Blow down is treated ETP, 5% (359.6 m^3/day) is generated by domestic activities in colonies & plant which is treated in STP. Process condensate & the treated water is being fed to cooling tower for makeup. ETP treated water is used in irrigation, Lagoons, Horticulture and STP treated water is used in Horticulture.

Table B: Major Wastewater generating areas

S. No.	Major Sections	Recycled/Discharge	Wastewater Generation (m^3/day)	Percentage
1	Process Condensate	Recycled	6107.8	86%
2	ETP Treated Water	Recycled	672.8	9%
3	STP Treated Water	Recycled	359.6	5%
		Total	**7140.2**	**100%**

Figure 2 : Waste water generation & consumption



Water Management Summary Graph

Table 1 :Bajaj Hindusthan Sugar Limited. Unit Khambhar Khera (U.P.)

Plant Name and Location	Bajaj Hindusthan Sugar Limited, Unit Sugar Khambhar Khera (U.P.)
Plant zone	Safe Zone
Depth of ground water table	1.85 metres
Type of products	Sugar
No. of working days/year	113
Annual Production	Product: Sugar; Unit: tons; 2019-20: 170222.8; 2020-21: 101039; 2021-22: 83398.4; 2022-23(till Nov: 37355
Major Water Usage Area in the Plant	Domestic (Drinking/Hand wash/Cooking/Washing), making DM water for boiler, Backwash (DM plant), Cold UGR makeup, Cooling Tower Makeup, Imbibition, pan movement, centrifugal, Chemical preparation, cleaning (evaporator pan juice heater), mill & process equipment cooling, , Irrigation/horticulture, process
Main Source of Freshwater and sourcing cost (Rs/m^3)	Borewell- 965.1 m^3/day & water cost rate Rs 0.80/m3 (UP GWA Charge)
Total annual Fresh Water consumption	Unit: KL; 2019-20: 361594; 2020-21: 315585; 2021-22: 114000
Total Water Use (Freshwater, Recycled RO Reject Water, CPU Treated Water) for Plant	• Fresh Borewell water – 965.1 **(m^3/day)** • Process Condensate – 6107.8 **(m^3/day)** • ETP Treated Water– 672.8 **(m^3/day)** • STP Treated Water– 359.6 **(m^3/day)**
Cost of Water at various water use areas	• Average Rate of abstraction of borewell water- Rs 0.80/ m3 • Cost of DM water – Rs 10 / m^3 • Cost of SRS Treated water- Rs 13.2 /m^3 • Cost of ETP Treated water- Rs 7.50/ m^3 • Cost of STP Treated Water- Rs 8.58/m^3
Average Effluent Generation in the ETP & Reuse (m^3/day)	768 m^3/day of industrial wastewater is treated and reused in irrigation, Horticulture, Lagoons. 42 m^3/ day of domestic sewage is treated in STP & used in Horticulture

The water audit study of the plant has identified various water & cost saving opportunities which are discussed in the report. The summary of recommendations is given in table below. **It is estimated that by implementing FICCI suggested low & medium cost schemes; the plant can reduce its freshwater consumption up to 15 -20 %.**

SUMMARY OF RECOMMENDATIONS

Section/Area	Key Observations	Recommendations	Annual water savings (m^3)/ Energy saving	Annual monetary savings (Rs. lakhs)	Investment (Rs. Lakhs)	Pay-back period (Years)
A HIGH COST SCHEMES						
Optimise water flow in hand washing and other taps	It was observed that the flow rates of water was very high.	It is suggested to use water efficient taps for hand washing, the water efficient hand washing taps use 2-3 lpm only.				
Install Drip Irrigation in the garden/horticulture area for efficient water use in landscaping/gardening	It has been observed that open flexible pipe are being used for irrigation which is in general not efficient	It is suggested that the plant should install Drip Irrigation system which is water efficient for gardening/horticulture. **The drip irrigation system will save 30-50% of water.**	60000	145200	3,10,096	2.14
B. LOW OR NO COST SCHEMES (up to 1 Lakh INR)						
Arresting water leakages at Plant in different location.	Leakages have been detected at various points in the pump glands & valves and there were many points of leakage in plant areas that constitutes to water losses.	It is suggested to arrest these leakages which will help to reduce the consumption of water or help in cost of water extraction.			Minimum	Immediate
Optimize ground water consumption in colonies & Plant to save fresh water	Excess consumption of water in plant & Colony domestic.	It is recommended that plant should take measures to ensure that the raw ground water in not used for activities other than domestic use.	156705	379227	Minimum	Immediate
Regularly calibrate & maintain existing water flow meters	It was observed that the existing Borewell meter are installed and calibrated	It is suggested to continue to calibrate and maintain the existing flow meters.				
Maintain logbook of	It was observed that the	The proposed digital flow				

Section/Area	Key Observations	Recommendations	Annual water savings (m^3)/ Energy saving	Annual monetary savings (Rs. lakhs)	Investment (Rs. Lakhs)	Pay-back period (Years)
daily groundwater abstraction	plant is maintaining data of daily groundwater abstraction	meter with telemetry will be equipped with online data recording facility				
Enhance Training and Awareness of the Employees at all Levels and Placing 'Water Saving 'posters/Slogans at various Locations	Plant is regularly conducting Training and Awareness of the Employees, events to promote water conservation like celebration of world water day, world environment day" and Placing 'Water Saving' Posters/Slogans at various Locations	Maintain the system and suggested to keep continue the water conservation activities and promotion in the plant				
Periodically conduct 'Water & Wastewater Audit'	Plant has formed a cell for assessment of potential for water & wastewater management in the plant for water saving & wastewater management.	Conduct periodic 'Water Audit' at least once in 2-3 years either by an experienced external Audit Team to assess the efficiency of water usage in processes; reduce water losses in the system and optimize costs & energy Consumption.				
Regular payment of applicable groundwater abstraction charges	It was observed that plant team is regularly paying the applicable ground water charges to concern authority	It is suggested to maintain the same				
Ensure to comply with the NOC conditions to avoid any penalty	It was observed that plant team is meeting all applicable compliance	It is suggested to maintain the same				

CHAPTER: 1 : INTRODUCTION

1.1 About the Plant: General Plant Details

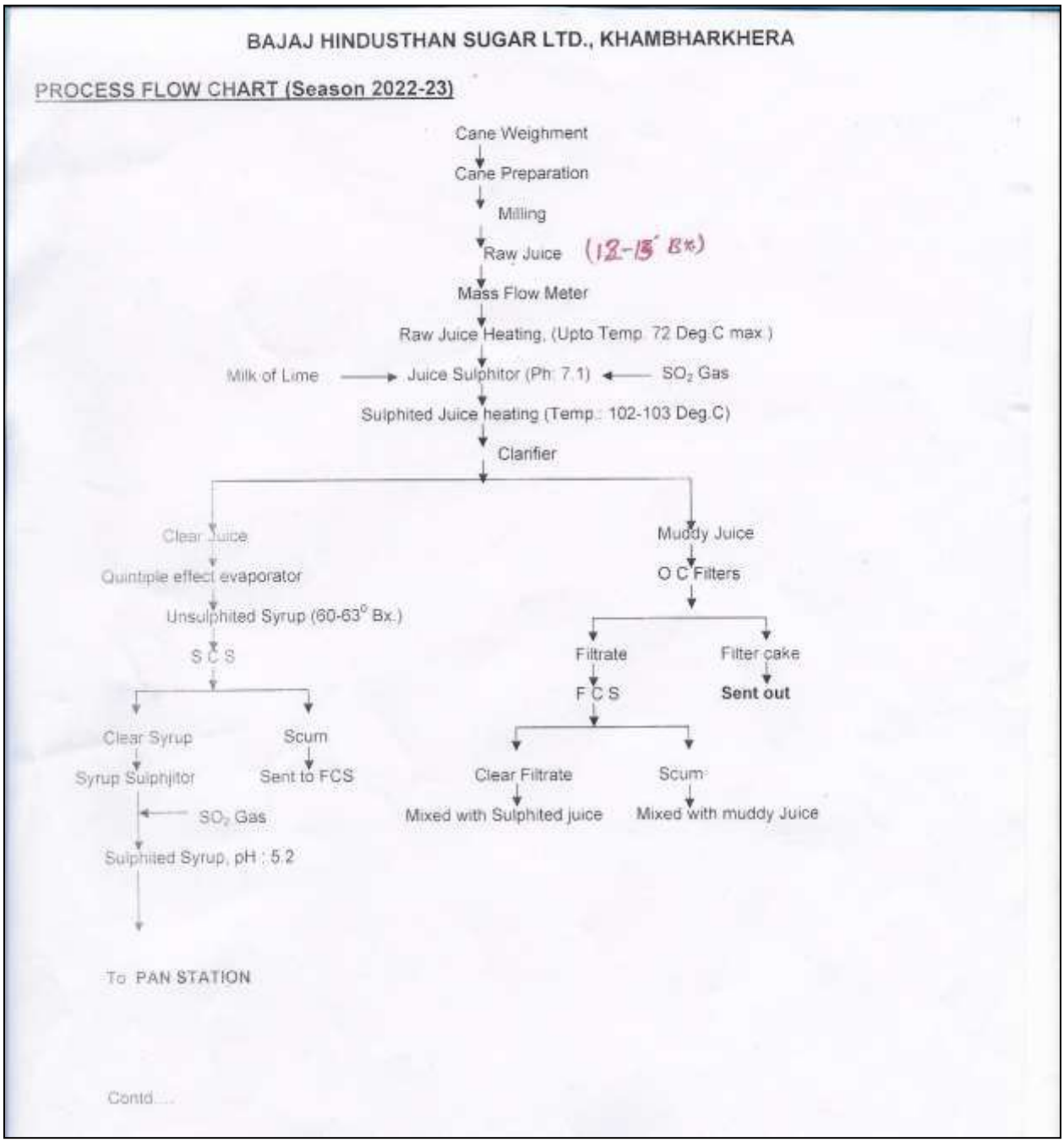
Bajaj Hindusthan Sugar Limited. Unit Khambhar Khera, Sarda Nagar Road, Khambhar Khera, Lakhimpur Kheri - 261506, Uttar Pradesh. Is one of the largest sugar manufacturing company in India with a significant strength in the manufacture of downstream products like power (co-generation) and ethanol. The company possesses a cane crushing capacity of 10000 tons per day.

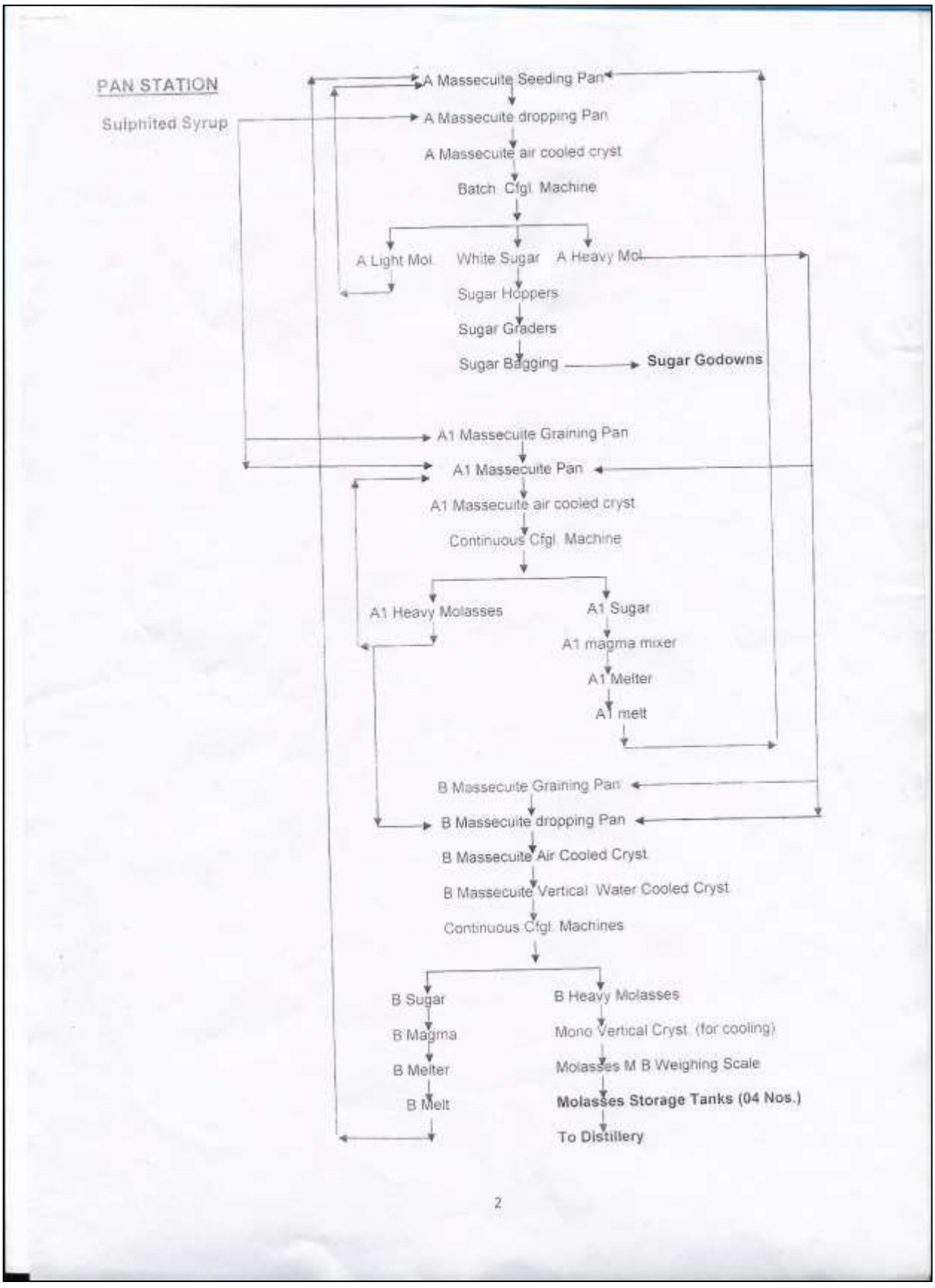
Picture 1:Plant Location

1.2 Process Description

1.2.1 Product flow diagram of Sugar Cane

Picture 2:Process Flow Diagram




PAN STATION
Sulphited Syrup
A Massecuite Seeding Pan
A Massecuite dropping Pan
A Massecuite air cooled cryst
Batch Cfgl. Machine
A Light Mol.
White Sugar
A Heavy Mol.
Sugar Hoppers
Sugar Graders
Sugar Bagging
Sugar Godowns
A1 Massecuite Graining Pan
A1 Massecuite Pan
A1 Massecuite air cooled cryst
Continuous Cfgl. Machine
A1 Heavy Molasses
A1 Sugar
A1 magma mixer
A1 Melter
A1 melt
B Massecuite Graining Pan
B Massecuite dropping Pan
B Massecuite Air Cooled Cryst.
B Massecuite Vertical Water Cooled Cryst.
Continuous Cfgl. Machines
B Sugar
B Magma
B Melter
B Melt
B Heavy Molasses
Mono Vertical Cryst. (for cooling)
Molasses M B Weighing Scale
Molasses Storage Tanks (04 Nos.)
To Distillery
2

1.2.2 SUGAR MANUFACTURING PROCESS: -

Below follow double sulphatation 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 fibrizer 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 vapours 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 stage 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 spraying facility.

1.3 Water Conservation Initiatives taken by Plant.

Table 2: Water Conservation Initiatives taken up by plant

S.N.	WATER CONSERVATION MEASURE TAKEN
1	Reuse of pans, evaporator trial & testing water.
2	ETP treated water is used in irrigation, Horticulture, Lagoons
3	STP treated water is used in Horticulture
4	Rain Water Harvesting Pits

CHAPTER: 2 : SCOPE OF WORK

2.1 Scope of Water Audit Study

The main objective of the study is to identify the water uses & water saving opportunities. Scope of work of the study includes the following:

- 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 when compared 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 audit study

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

- Analyse 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 options with Cost Benefit Analysis

Step 6: Water Audit Report Finalization and Submission

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

3.1 Methodology Adopted for Performance Evaluation of Pumps

The Plant has installed number of pumps in various sections to transfer/ circulate the water for different applications. During the audit, flow measurements were conducted at various pumps and performance evaluation of all the major pumps were conducted to estimate their present operating efficiency & cost of pumping. The estimated efficiency is based on operating head, measured flow rate & power consumption of the pumps.

- **Water Flow Measurement**

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

a. A suitable location for measurement 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 pipe thickness was measured by digital thickness gauge or by measurement of spare pipe.
c. The parameter like pipe diameter, type of pipe, water temperature, pipe thickness, roughness etc are input in the ultrasonic flow meter
d. Based on above input values, the flow meter reflects the distance between the traducers to be positioned 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 flow meter
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's of bore wells. The plant sources about 965.1 m^3/day of freshwater from bore wells. The freshwater is mainly used for Domestic (Drinking/Hand wash/Cooking/Washing) in colony & plant, lab testing, cooling tower makeup, Making DM water for boiler makeup & cold UGR makeup, boiling house etc.

Bore wells and location: The bore wells are located near boiling house, Dispensary & colony. The flows concurred with the measurements done by FICCI team using ultrasonic flow meter. The rated yield of bore well is 200 m3/hr and rated power is 60 HP. Logbook for flow is maintained by the plant team members.

Table 3: Details of borewells

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	Colony	96.45	Submersible	60	200	641
2	Boiler	96.45	Submersible	60	200	596
3	Dispensary	96.45	Submersible	60	200	598

Picture 3: Photos of Borewells taken during the audit.

The Piezometer is used to measure pressure via the rise of fluid column. There are 1 piezo meters installedin the plant & they are 25 feet deep and at a distance of 55 m from the bore wells.

Table 4: Details of piezometer wells (observation well)

Piezometer	Location of piezometer	Depth of piezometer (feet)	Distance from the existing borewell (meter)	Total Dissolved Solids (mg/l)
1	Gunny bag area	25	55	640

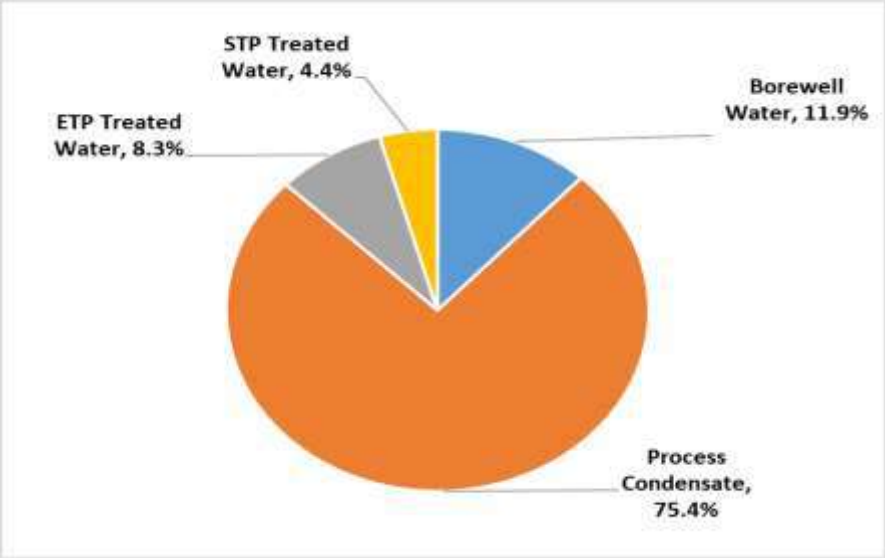
Picture 4: Pictures of Piezometers

The total freshwater consumption is 965.1m3/day and equally the water is pumped out from 1 to 3 no. of bore well. The other sources of water are recycled water from Evaporator condensate, Pan Condensate, ETP and STP treated water. The groundwater is mainly used for Domestic applications of Colony & plant. Other requirements like plant process, cooling the various process utilities, Boiler House, Imbibition, Cleaning, Lime preparation, CT makeup, Horticulture, Irrigation etc. in the plant are met with recycled water (Evaporator & Pan Condensates) mentioned in below table and figure:

Table 5: Total Water requirement by plant

Type of water	m^3/day	Water Quality	Major Usage Area	Water Use (%)
Bore well Water	965.1	Fresh Water	Plant & Colony Domestic (Drinking/Hand wash/Cooking/Washing/Flushing), CT Makeup & Equipment's cleaning.	11.9%
Process Condensate	6107.8	Recycled	Boiler, imbibition, Process, Lime preparation, CT makeup, Magma & Vacuum Filter	75.4%
ETP Treated Water	672.8	Recycled	Irrigation, Horticulture & Lagoons	8.3%
STP Treated Water	359.6	Recycled	Irrigation, Horticulture	4.4%
Total	**8105.3**			**100%**

Figure 3: Total Water requirement by plant (Freshwater, treated water and recycled water)



Out of the 8105.3 m^3/day of water, about 12% water is freshwater, 88% is recycled water as shown in below.

Table 6: Percentages of Freshwater and recycled water

Type of water	m^3/day	*Major Usage Area*	Water Use (%)
Freshwater	965.1	Plant & Colony Domestic (Drinking/Hand wash/Cooking/Washing/Flushing), CT Makeup & Equipment's,Cleaning.	12%
Recycled Water	7140.2	Boiler House, Imbibition, Cleaning, Process, Lime preparation, CT makeup, Irrigation, Horticulture & Lagoons	88%
	8105.3		**100%**

Figure 4: Type of Water Use (%)

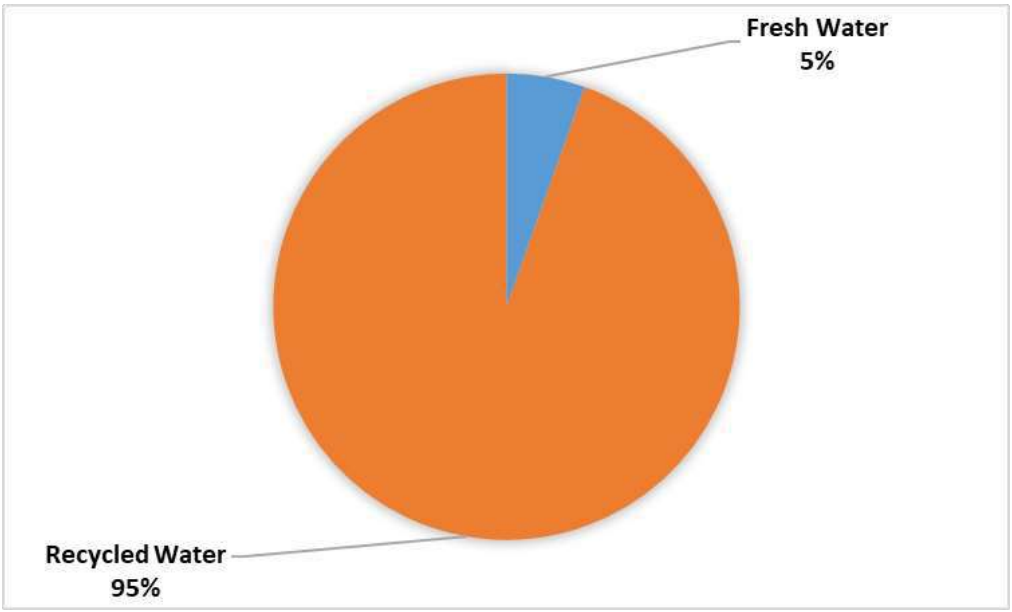
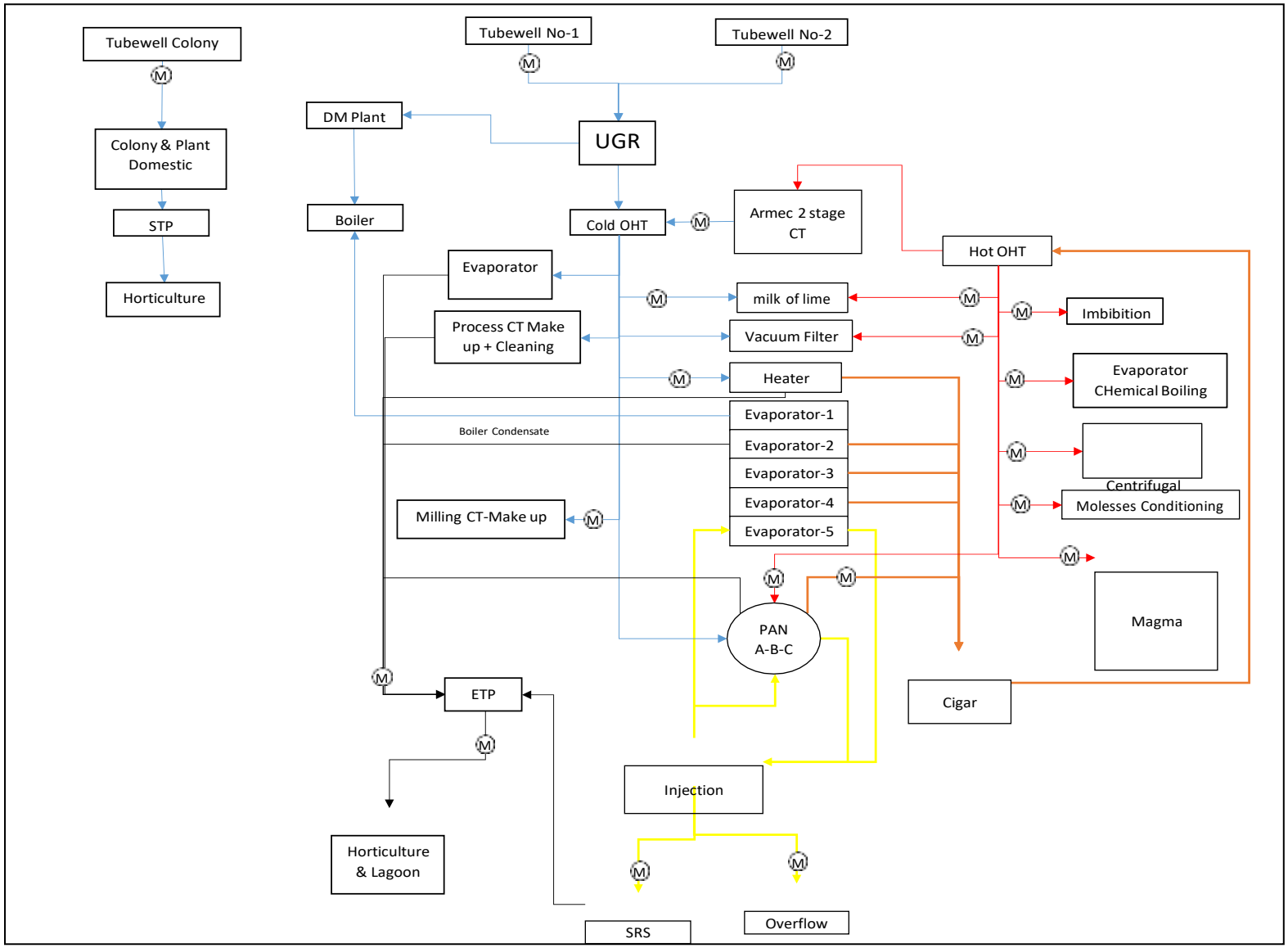


Figure 5: Existing water circuit diagram of the plant



4.2 Borewell Water Quality

The plant regularly checks the water quality of the Groundwater. Detail of test report is mentioned below and water test report is mentioned in annexure.

Table 7: Groundwater quality report

Parameters for borewell water	Unit	BOREWELL
		Result
Colour	Hazen	<1.00
Odour	-	Agreeable
Taste	-	Agreeable
Turbidity	NTU	<1.00
pH value	-	7.56
Total Dissolved Solids	mg/l	382.0
Aluminium	mg/l	<0.01
Total Ammonia	mg/l	<0.10
Anionic detergents (MBAS)	mg/l	<0.10
Barium	mg/l	<0.10
Boron	mg/l	<0.10
calcium	mg/l	46.25
Chloramines	mg/l	<1.00
chloride	mg/l	38.6
Copper	mg/l	<0.05
fluoride	mg/l	0.38
free residual chlorine	mg/l	BDL
iron	mg/l	0.136
magnesium	mg/l	8.5
Manganese	mg/l	<0.10
Mineral oil	mg/l	<0.50
nitrate	mg/l	4.23
Selenium	mg/l	<0.01
Silver	mg/l	<0.05
sulphate	mg/l	46.8
sulphide	mg/l	<0.05
alkalinity	mg/l	198
total hardness	mg/l	162
zinc	mg/l	0.124
cadmium	mg/l	<0.001
Cyanide	mg/l	<0.01
lead	mg/l	<0.01
mercury	mg/l	<0.001
molybdenum	mg/l	<0.05

Parameters for borewell water	Unit	BOREWELL
		Result
nickel	mg/l	<0.01
poly nuclear Aromatic Hydro Carbon	mg/l	<0.0001
poly chlorinated biphenyl	mg/l	<0.0001
total arsenic	mg/l	<0.01
total chromium	mg/l	<0.05

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 UP GWA notification.

Table 8: List of Water Storage Tanks in the Plant

S.N.	Type of Storage System (Over Head Tank, Underground Tanks, Reservoir etc.)	Location	Storage Capacity (m^3)
1	Underground Tank	-	-
2	Overhead Tank Cold water	-	-
3	Overhead Tank Hot Water	-	-

As per the measurements conducted by FICCI team, water distribution and water balance were prepared for the plant. The plant abstracts about 965.1 m^3/day of groundwater from 3 no's of bore wells. Instantaneous water flow was measured using ultrasonic flow meters. The measured flow of bore wells is in between 105-125 m^3/hr. The bore wells have 60 HP motors that run for about 1-4 hours daily.

Table 9: Bore well measured flow

Borewell No.	Measured Flow (m3/hr)
Borewell Pump (Colony)	125
Borewell Pump (Boiler)	114
Borewell Pump (Dispensary)	90

Abstracted bore well water from borewell 1 & 2 is pumped to cold UGR for Boiler house, boiling House, Mill House DM plant for boiler make-up Cooling tower and Process cooling and cleaning applications. Bore well 3 is colony as well as Plant Domestic activities and Colony domestic activities. The major consumption of water is for process, cooling tower, DM plant and plant and colony domestic. The Plant consumption is 451.4 m^3/day of fresh water., 513.7 m^3/day of raw water is used for plant and colony domestic activities.

The water balance is prepared according to the water consumption pattern in FY 2021-22 seasons.The details of water flow & balance in different sections of the plant are mentioned in.

Table 10: Water Consumption Details

Key Water Usage Section	Type of water used	Water Consuming activities	Quantity Used (m3/day)	Percentage (%)
Colony Domestic	Fresh Water	Plant & Colony Domestic	513.7	6.3%
Plant consumption	Fresh Water	Cleaning & CT Make Up.	451.4	5.6%
Process	Recycled Water	Chemical Preparation, centrifugal & vacuum pumps.	1280.7	15.8%
Magma Melter	Recycled Water	Magma Melting	103.0	1.3%
Milk of Lime	Recycled Water	Lime Preparation	59.5	0.7%
Mill House	Recycled Water	Imbibition	3777.1	46.6%
Cold UGR	Recycled Water	Overflow	430.5	5.3%
Pan	Recycled Water	Pan A, B & C	457.0	5.6%
ETP	Recycled Water	Irrigation, Horticulture, Lagoons	672.8	8.3%
STP	Recycled Water	Horticulture & lagoons	359.6	4.4%
		Total	**8105.3**	**100%**

Figure 6: Existing water circuit diagram of the plant

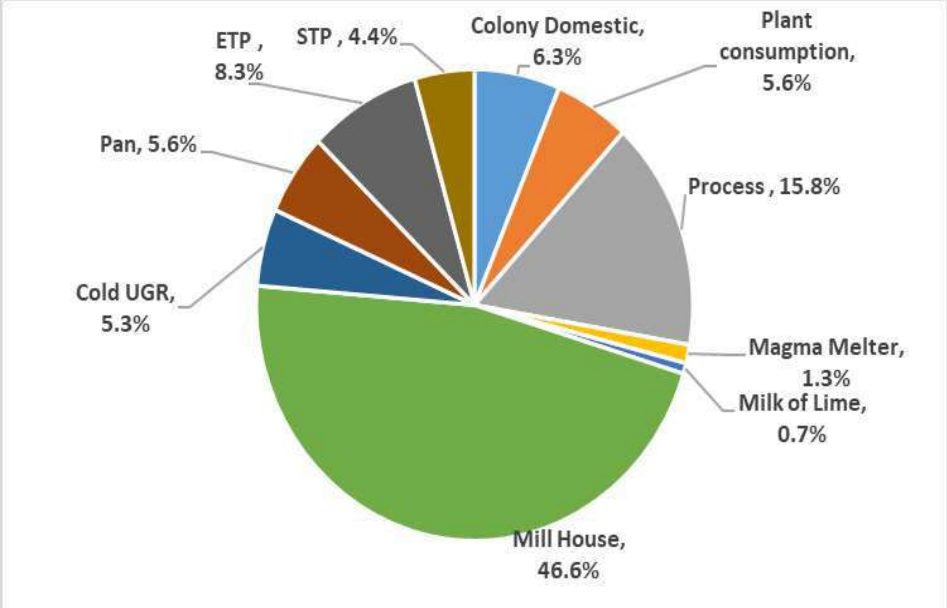
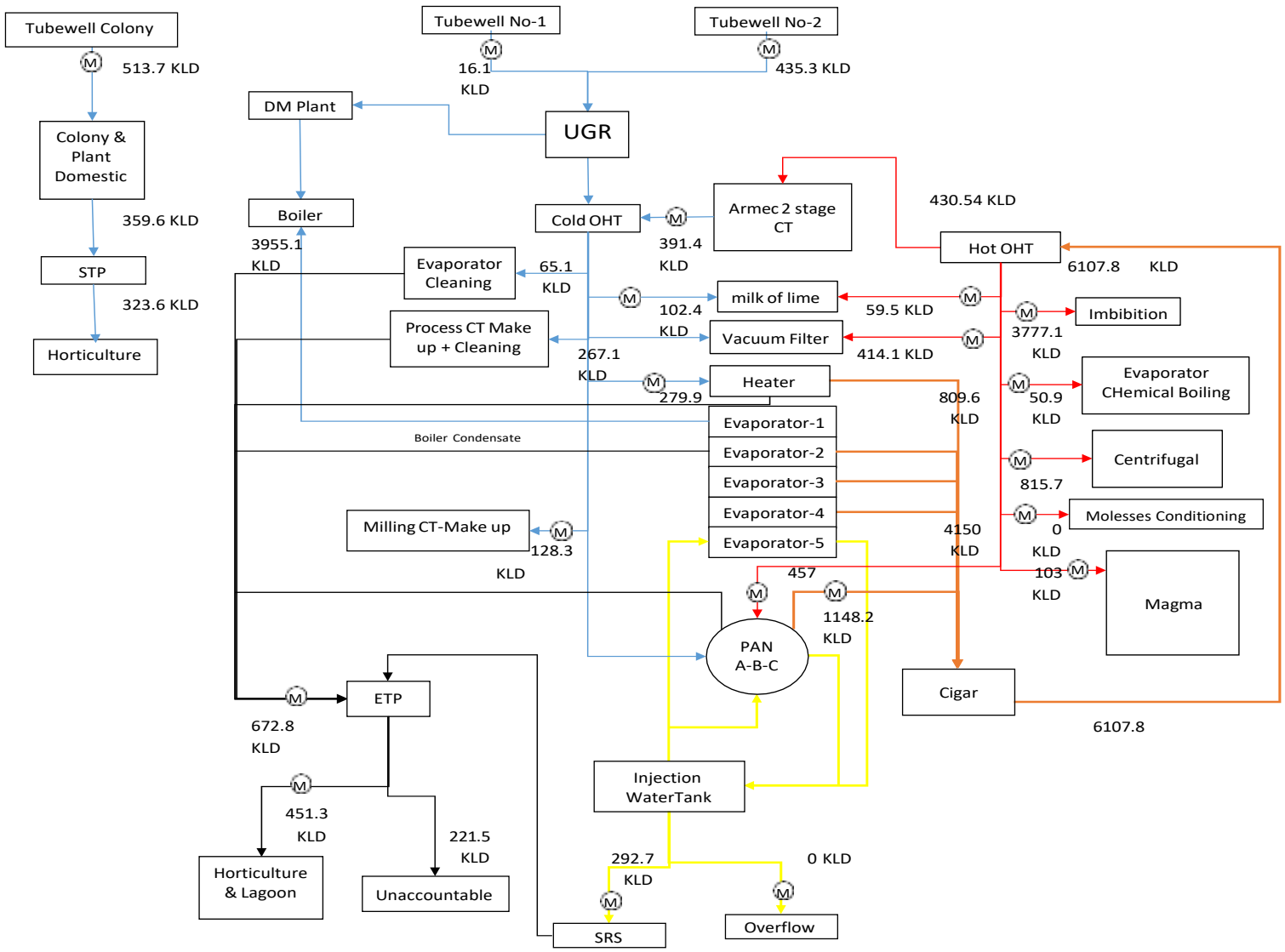


Figure 7: Depicts the existing water and wastewater balance diagram of plant



4.4 Water Metering System

There are several meters and sub-meters installed inside the plant. All meters are Electric and electromagnetic flow meters. The meter readings are recorded regularly & most of them are calibrated. Some of the meters are mentioned in the below table.

Table 11: Location of Identified Water Meters

Meter Number	Meter Location	Regular Recorded (Yes/No)	Calibrated (Yes/No)
FT01	ETP I/L(6")	Yes	No
FT02	ETP Lagoon(2")	Yes	No
FT03	Mill H/W O/H (6")	Yes	No
FT04	Mill C/W O/H (4")	Yes	No
FT05	Pan Condensate (4")	Yes	No
FT06	Vacuum Pump (4")	Yes	No
FT07	Evap Chemical Boiling (4")	Yes	No
FT08	Evap & Juice Heater (6")	Yes	No
FT09	Cake Wash (4")	Yes	No
FT10	Turbine C/W O/H (6")	Yes	No
FT11	Lime H/W (2")	Yes	No
FT12	Lime C/W (2")	Yes	No
FT13	C/F Station (2")	Yes	No
FT14	SHWW (4")	Yes	No
FT15	Armec CT (2")	Yes	No
FT16	Pan C/W (6")	Yes	No
FT17	Pan H/W (4")	Yes	No
FT18	Molasses Conditioner C/W (4")	Yes	No
FT19	A Pan H/W (4")	Yes	No
FT20	Armec CT Over Flow (4")	Yes	No
FT21	Evap Condensate	Yes	No
FT22	Injection Water O/L	Yes	No
FT23	Tubewell No1 (6") plant	Yes	No
FT24	Tubewell No2 Dispensary(6")	Yes	No
FT25	Colony Tubewell No (4")	Yes	No
FT26	SRS Flow Meter (4")	Yes	No

4.5 Water Use Baseline Data as provided by the Plant

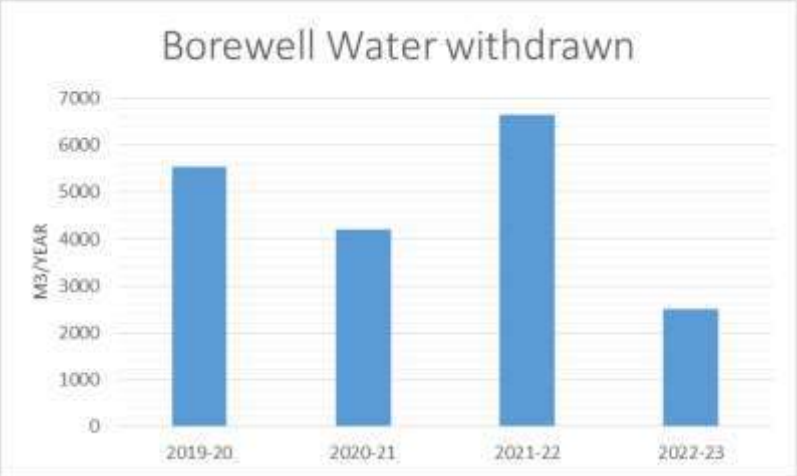
4.5.1 Bore well water

The month-wise meter readings were provided by the plant for the quantity of water drawn from the bore wells. Table 12 below depicts the Total groundwater intakes for FY 2019-2020, FY 2020-2021 & FY2021-22.

Table 12: Monthly water abstraction from bore wells (FY 2019-20, FY 2020-21 & FY 2021-22)

Bore well Water withdrawn				
Months	**2019-20**	**2020-21**	**2021-22**	**2022-23**
Apr	286	840	450	730
May	246	540	320	340
Jun	296	320	410	248
Jul	310	280	279	389
Aug	364	240	301	258
Sep	322	285	246	246
Oct	294	245	299	294
Nov	1239	246	548	-
Dec	498	310	730	-
Jan	437	305	904	-
Feb	869	289	1026	-
Mar	384	310	1146	-
Total	**5545**	**4210**	**6659**	**2505**

Figure 8: Borewell water extraction trend (FY 2019-20, FY 2020-21 & FY 2021-22)



4.6 Water Costing

Water and wastewater cost at plant includes cost of pumping, cost of raw water treatment, cost of SRS treatment, cost of STP treatment, cost of ETP treatment. **The actual weighted average cost of abstraction bore well water is estimated to be Rs 0.80 /m^3, cost of Bore well Pumping water supply is Rs 1.62/m^3, cost of SRS treated water is Rs 12.3 /m^3 , the cost of STP treated water is Rs 7.73 /m^3 & the cost of ETP treatment is estimated to be about Rs 11.3 /m^3 , as discussed below.** The water and wastewater costing for various user points is shown in Figure 9**.**

4.6.1 Cost of abstraction of Bore well Water

Rates of ground water abstraction charges for other industries and infrastructure projects in safe, semi-critical and critical assessment units is given in table below. Since BHSL Khambarkhera is in safe Zone therefore the cost of groundwater abstraction is **Rs 0.80/m^3 as per**

Table 13: Cost of borewell water abstraction

Sr. No.	Category of area ↓ / Ground water use →	Quantum of ground water withdrawal			
		< 500 m^3/day	500 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Safe	0.70	0.80	0.90	1.0
2.	Semi-critical	0.80	0.90	1.0	1.10
3.	Critical	0.90	1.0	1.10	1.20
4.	Over exploited	1.0	1.1	1.20	1.30

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 measurements. *Error! R reference source not found.* Below summaries 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**.**

Table 14: Cost of pumping system at BHSL, Unit Khambhar Khera (U.P)

S. No	Pump name	Total Flow	Power Consumption	Sp. Power Consumption	Cost of Pumping	Daily Run hours	Daily flow	Daily Pumping Cost
	Electricity Charges @ 6.00 Rs/kWh	**m^3/h**	**kW**	**kWh/m^3**	**Rs/m^3**	**h/day**	**m^3/day**	**Rs/day**
1	Borewell Pump (Colony)	125	35	0.280	1.680	4	500	840
2	Borewell Pump (Boiler)	114	29	0.250	1.501	2	228	342
3	Borewell Pump (Dispensary)	90	25	0.278	1.667	2	180	300
4	ETP to horticulturePump	95	22	0.232	1.389	5	475	660
5	Cold UGR To OHT PumpNo-1	110	28	0.255	1.527	2	220	336
6	Hot OHT TO CT	75	15	0.200	1.200	2	150	180
7	CT Pump To Cold UGR	55	18	0.327	1.964	8	440	864

4.6.3 Cost of Treatment

Cost of STP Treated Water

About 359.6 m^3/day water is treated daily at the STP Plant. The cost of chemical treatment is Rs 0.13/m^3 And Electrical Cost is Rs 7.51/m^3. Total cost of treatment at STP Plant is Rs 7.64/m^3 as shown in table below

Table 15: Cost of STP treated water at BHSL Unit Sugar Khambhar Khera (U.P.)

	STP			
Average Quantity of treated water (m^3/day)	360			
Chemical Cost				
Name of Chemical/s	**Quantity kg/month**	**Rate Rs/Kg**	**Rs/month**	**Rs/day**
Chemical used	60	24	1440	48
Total Chemical Cost (Rs/Day)				48
Total Cost of chemical treatment (Rs/m^3)				**0.13**
Electricity Cost				
Power Consumption (Units/day)				450
Specific Power Consumption (kWh/m^3)				1.25
Cost per unit (Rs/kWh)				6
Electrical cost (Rs/day)				**2700**
Electrical cost (Rs/m^3)				**7.51**
Total Cost of treatment (Rs/m^3)				**7.64**
Total Cost of treatment (Rs/day)				**2748**

Cost of ETP Treated Water

About 672.8 m^3/Day water is treated daily at the ETP. The cost of chemical treatment is Rs 1.4/m^3 and Electrical Cost is Rs 9.81/m^3. The total cost of Effluent Treated water is Rs 11.19/m^3 as shown in table below

Table 16: Cost of ETP treated water BHSL Unit Khambhar Khera (U.P.)

	ETP			
Average Quantity of treated water (m^3/day)	673			
Chemical Cost				
Name of Chemical/s	**Quantity kg/month**	**Rate Rs/Kg**	**Rs/month**	**Rs/day**
Lime	2100	9	18900	630
Floculant	60	150	9000	300

Total Chemical Cost (Rs/Day)				930
Total Cost of chemical treatment (Rs/m^3)				**1.4**
Electricity Cost				
Power Consumption (Units/day)				1100
Specific Power Consumption (kWh/m^3)				2
Cost per unit (Rs/kWh)				6
Electrical cost (Rs/day)				**6600**
Electrical cost (Rs/m^3)				**9.81**
Total Cost of treatment (Rs/m^3)				**11.19**
Total Cost of treatment (Rs/day)				**7530**

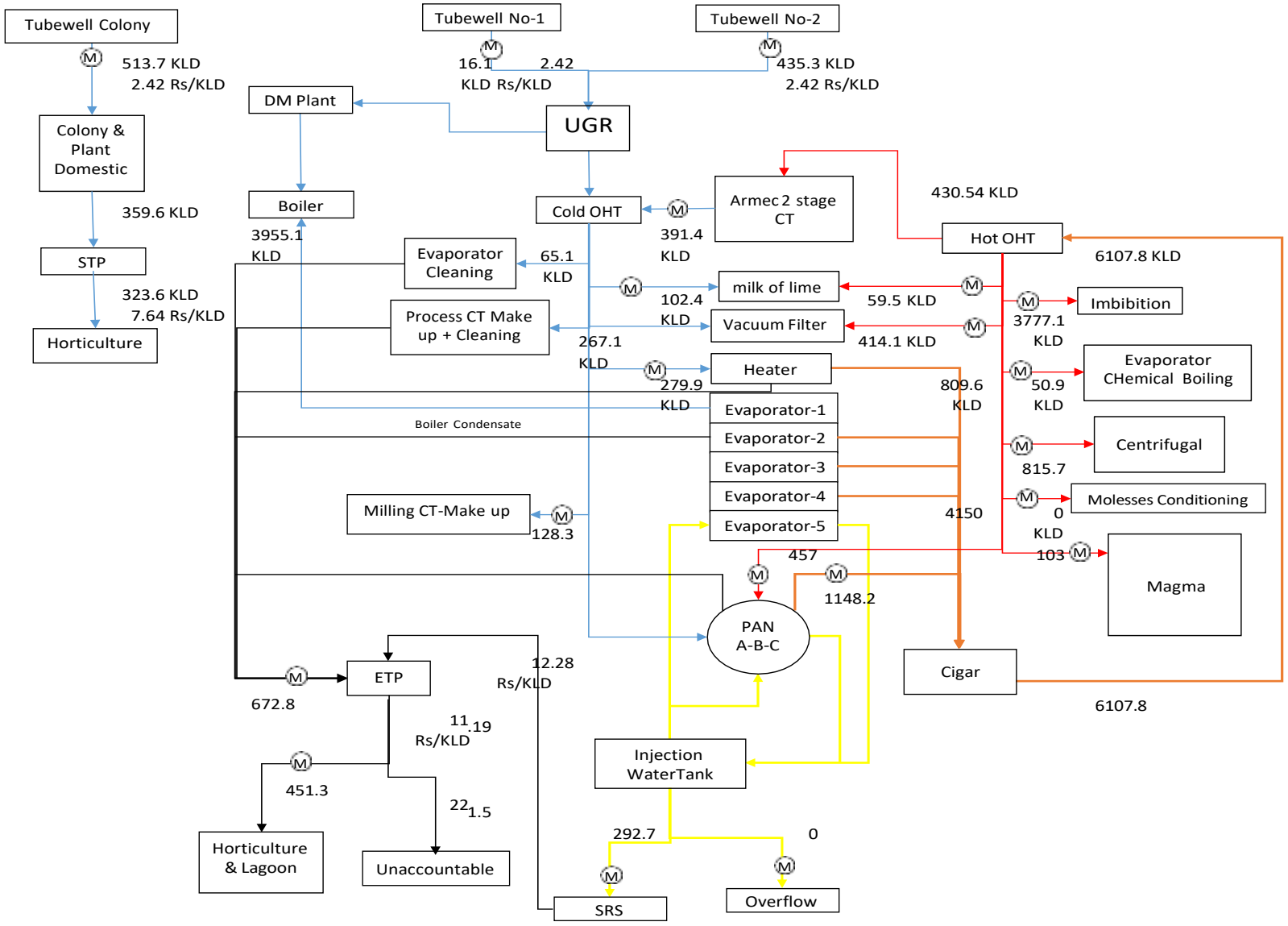
Cost of SRS System

About 293 m^3/Day water is treated daily at the SRS. The cost of chemical treatment is Rs 10.7/m^3 and Electrical Cost is Rs 1.54/m^3. The total cost of SRS system is Rs 12.28/m^3 as shown in table below

Table 17: Cost of SRS system at BHSL, Khambarkhera

	SRS			
Average Quantity of treated water (m^3/day)	293			
Chemical Cost				
Name of Chemical/s	**Quantity kg/month**	**Rate Rs/Kg**	**Rs/month**	**Rs/day**
Lime	6500	9	58500	1950
Poly	60	210	12600	420
PAC	750	31	23250	775
Total Chemical Cost (Rs/Day)				3145
Total Cost of chemical treatment (Rs/m^3)				**10.7**
Electricity Cost				
Power Consumption (Units/day)				75
Specific Power Consumption (kWh/m^3)				0.256
Cost per unit (Rs/kWh)				6
Electrical cost (Rs/day)				**450**
Electrical cost (Rs/m^3)				**1.54**
Total Cost of treatment (Rs/m^3)				**12.28**
Total Cost of treatment (Rs/day)				**3595**

Figure 9: Existing water cost at user location accounting water pumping and treatment cost at plant



4.7 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 and Wastewater Treatment cost as mentioned in the previous part.

Table 18: Total Annual Water Cost of BHSL, Khambarkhera (U.P.)

S. No.			Total cost	Total Annual Cost	Water Consumption
		Rs/m^3	(Rs/day)	(Rs/year)	(m^3/day)
1	**Cost of Bore well abstraction**	0.80	772	**281809**	**965**
2	**Pumping Cost**			**569246**	
	Energy	1.62	1560	569246	**965**
3	**Effluent Treatment Plant**			**2748450**	
	ETP Unit				
	Cost of Chemical treatment at ETP	1.4	930	339450	**673**
	Cost of Electrical treatment at ETP	9.8	6600	2409000	
4	**Sewage Treatment Plant**			**1003020**	
	STP				
	Cost of chemical treatment at STP	0.13	48	17520	**360**
	Cost of Electrical treatment at STP	7.51	2700	985500	
5	**Sulpher Removal System**			**406235**	
	SRS				
	Cost of chemical treatment at SRS	11	3145	355385	293
	Cost of Electrical treatment at SRS	2	450	50850	

CHAPTER: 5 : WATER & WASTEWATER TREATMENT & RECYCLING PRACTICES

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

- SRS Plant
- ETP
- STP

5.1 STP (Sewage Treatment Plant)

Plant treats Domestic Sewage in well-designed existing sewage treatment plant (Total Capacity 100 KLD). In STP the major input from is from colony Domestic sewage. As per data observation, approx. 42 KLD water is treated in the facility. The Description installed STP is given below.

UNIT DESCRIPTION

SETTLING CHAMBER

A sedimentation tank in wastewater treatment removes particles from the water. The accumulated solids, or sludge, form at the bottom of the sedimentation tank and are removed periodically. Coagulants are typically added to the water before sedimentation to aid in the settling process. Sedimentation is a physical water treatment process using gravity to remove suspended solids from water. Solid particles entrained by the turbulence of moving water may be removed naturally by sedimentation in the still water of lakes and oceans.

OIL AND GREASE TRAP

The oil and grease trap is placed at the discharge point of the settling tank itself to arrest solid and fatty matter at source or it is placed after screen chamber so as prevent the fatty matter to enter Equalisation 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. The use of skimmers in industrial applications is often required to remove oils, grease and fats prior to further treatment for environmental discharge compliance. By removing the top layer of oils, water stagnation, smell and unsightly surface scum can be reduced. Placed before an oil water treatment system an oil skimmer may give greater overall oil separation efficiency for improved discharge wastewater quality. It should be noted that all oil skimmers will pick up a percentage of water with the oil which will need to be decanted to obtain concentrated oil. Separating grease from the wastewater at source ensures that the contact time between solids and wastewater is kept to a minimum, so that the wastewater does not absorb additional organic pollutant loads (starch, carbohydrates, proteins) due to leaching of these substances from the solids. (Rather than building a larger STP to digest this extra organic matter, it is far more economical to prevent the organic matter from entering the STP.)

EQUALIZATION TANK

The sewage from the bar screen chamber and oil, grease and grit trap then enters in the equalization tank. The equalization tank is the first collection tank in an STP. Its main function is to act as buffer: To collect

The incoming raw sewage that comes at widely. Equalization tank is used only for buffering the daily fluctuations in the sewage 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.

AERATION TANK

The biological treatment of the wastewater takes place in the aeration tank. Before the wastewater gets to this tank, it is mixed with activated sludge. This contains countless microorganisms, such as bacteria, that are able to break down the colloidal, organic contaminants dissolved in the wastewater. 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. The oxidized sewage overflows into the secondary settling 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.

CHLORINE CONTACT TANK

Chlorine contact tanks are commonly used to disinfect drinking water prior to distribution. These tanks are usually open chambers split by a series of baffles. Sub-dividing the chambers helps to control the flow of water through the tanks and improves the chlorine disinfection process.

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 STP 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), colour and odour.

5.2 ETP (Effluent Treatment Plant)

During the production of sugar, the industry generates about 768 KL/day effluent. The industry has full-fledged Effluent Treatment Plant to treat the generated effluent as per norms of UP Pollution Control Board. The industry has also enhanced their treatment capacity as per direction of State Pollution Control Board. The complete treatment unit is based on an advanced environmental technology.

The industry has installed well advanced Primary and Secondary Effluent Treatment System based on maximum generated effluent flow 768 KL/day. The primary effluent plant comprises physical and chemical treatment and secondary effluent treatment plant comprises activated sludge system is biological treatment. So, total three stages of effluent treatment system are capable to treat the total generated effluent and after passing through the three stages of treatment system, the treated effluent achieves the norms of State Pollution Control Board. The effluent treatment plant consists of following equipment

UNIT DESCRIPTION

PLATE TYPE SETTLER

Tube settlers which are also known as plate settlers or lamella clarifiers are used in drinking- and wastewater treatment plants to settle out suspended solids. Depending on the application the TSS (total suspended solids) loading can vary between 50 to 500mg/l. Tube settlers are usually made of PVC plastic and consist of multiple corrugated sheets which are glued together to form rectangular blocks with multiple channels. Plate settlers in comparison usually consist of stainless-steel plates which are assembled into large modules.

OIL & GREASE TRAP

Oil & Grease chamber works for the removal of oil & grease from the influent which may cause damage to pumping unit. The oil and grease trap is 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.

CHEMICAL MIXING TANK/BUFFER TANK

Buffer basins may be used for temporary storage for high – strength waste. Basin provide a place to temporarily hold incoming sewage during plant cleaning / Equipment's cleaning a means of diluting and distributing batch discharge of toxic or high – strength waste which might otherwise inhibit biological secondary treatment.

EQUALIZATION TANK

Equalization basins may be used for temporary storage fo diurnal of wet – weather flow peaks. Basin provide a place to temporarily hold incoming sewage during plant maintenance & a means of diluting and distributing batch discharge of toxic or high – strength waste which might otherwise inhibit biological secondary treatment.

PRIMARY CLARIFIER

Clarifiers are settling tanks built with mechanical means for continuous removal of solids being deposited sedimentation. 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 is the process by which air is circulated through, mixed with or dissolved in a liquid or substances. Hence aeration tank is provided to aerate the waste water by biological treatment. 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

Clarifiers are settling tanks built with mechanical means for continuous removal of solids being deposited sedimentation. 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.

SLUDGE DRYING BED

Sludge drying beds are used for dewater the settled sludge. The excess sludge from the clarifier is discharge to sludge drying bed at an interval so that the concentration of MLSS is maintained in aeration tank.

DECANTER FOR SLUDGE DRYING

Decanter is used for dewatering the sludge. The sludge from the sludge drying bed sent at decanter to dry the sludge & recovery of water.

SAND FILTER

Function of the pressurised 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.

CARBONS 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.

CHAPTER: 6 : DATA ANALYSIS & RESULTS

6.1 Water Consumptive Units and Wastewater Mapping

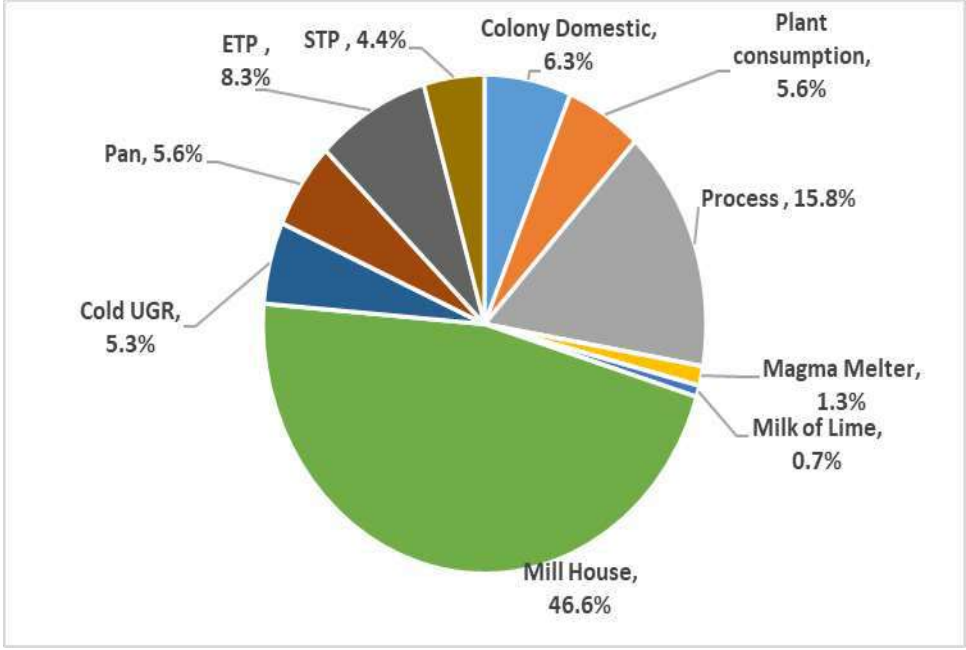
6.1.1 Water consumption pattern

The water consumption pattern shows that out of total water (8105.3 m3/day) about 6.3% (513.7 m^3/day) is used in plant domestic and colony drinking, washing and flushing, 5.6% (451.4 m^3/day) is used for cleaning and CT make-up, 15.8% (1280.7 m^3/day) is used for chemical preparation, centrifugal & Vacuum pumps, 1.3% (103 m^3/day) is used for magma melting, 0.7% (59.5 m^3/day) is used for milk of lime preparations, 46.6% (3777.1 m^3/day) is used for imbibition, 5.3% (430.5 m^3/day) is cold UGR over Flow, 5.6% (457 m^3/day) is pan condensate water, 8.3% (672.8 m^3/day) is ETP treated water which is used for irrigation, 4.4% (359.6 m^3/day) is used for horticulture and irrigation. The tentative breakup of all areas is shown in the below table.

Table 19: Water Utilization Scenario at the plant

Key Water Usage Section	Type of water used	Water Consuming activities	Quantity Used (m3/day)	Percentage (%)
Colony Domestic	Fresh Water	Plant & Colony Domestic	513.7	6.3%
Plant consumption	Fresh Water	Cleaning & CT Make Up.	451.4	5.6%
Process	Recycled Water	Chemical Preparation, centrifugal & vacuum pumps.	1280.7	15.8%
Magma Melter	Recycled Water	Magma Melting	103.0	1.3%
Milk of Lime	Recycled Water	Lime Preparation	59.5	0.7%
Mill House	Recycled Water	Imbibition	3777.1	46.6%
Cold UGR	Recycled Water	Overflow	430.5	5.3%
Pan	Recycled Water	Pan A, B & C	457.0	5.6%
ETP	Recycled Water	Irrigation, Horticulture, Lagoons	672.8	8.3%
STP	Recycled Water	Horticulture & lagoons	359.6	4.4%
		Total	**8105.3**	**100%**

Figure 10: Percentage of total water utilization



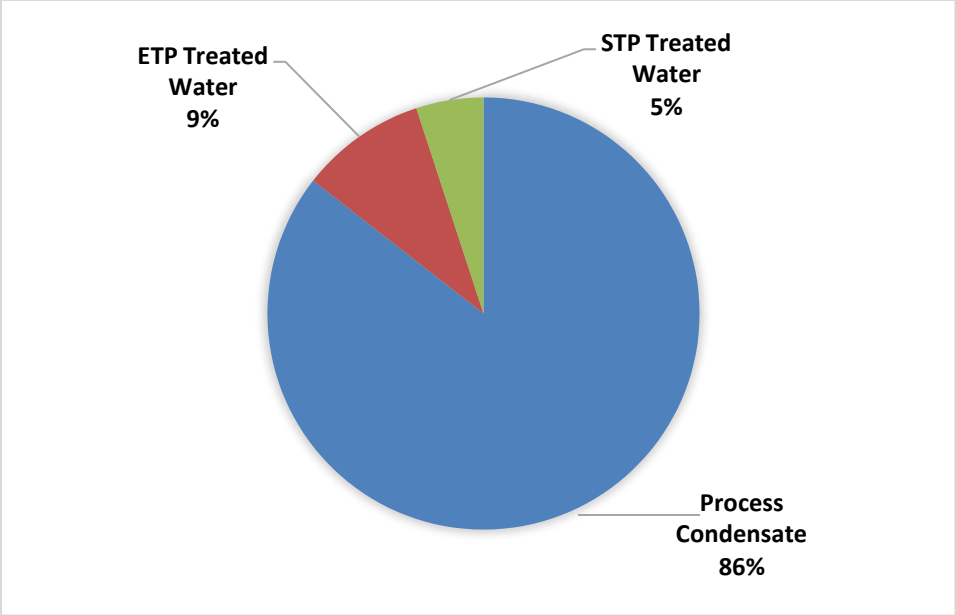
6.1.2 Wastewater generation and mapping

The total wastewater generation in the plant is about 7140.2 m^3/day, out of which about 86% (6107.8 m^3/day) wastewater generated from cane crushing, 9% (672.8 m^3/day) is generated by domestic activities in colony, plant & lab & treated in ETP for using in Irrigation, Horticulture, Lagoons, 5% (359.6 m^3/day) is t generated from plant and domestic Sewage water in treated in STP for using in Horticulture. The breakup of wastewater generation from different sections is provided in below table.

Table 20 : Major Wastewater generating areas at BHSL, Unit Khambhar Khera (U.P)

S. No.	Major Sections	Recycled/Discharge	Wastewater Generation (m^3/day)	Percentage
1	Process Condensate	Recycled	6107.8	86%
2	ETP Treated Water	Recycled	672.8	9%
3	STP Treated Water	Recycled	359.6	5%
		Total	**7140.2**	**100%**

Figure 11: Percentage of wastewater generation at BHSL, Unit Khambhar Khera (U.P)



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

Table 21: Specific Water Consumption of BHSL, Unit Khambarkhera (U.P) - FY 2019-20, 2020-21, 2021-22

Particulars		2019-20	2020-21	2021-22
Sugar Production in tons	Tons/Year	-	-	-
Total Freshwater intake (Bore well)	m^3/year	-	-	-
Specific Water Consumption	**m^3/Ton**	-	-	-

CHAPTER: 7 : WATER CONSERVATION OPPORTUNITIES WITH COST BENEFIT ANALYSIS

7.1 Optimise water flow in hand washing and other taps

Present Scenario: Flow rates in hand washing taps are of 5-6 lpm, the flow is without any fitment of any aerators or flow restrictors, however the pressure from these taps were low. It is suggested to use water efficient taps for hand washing, the water efficient hand washing taps use 2-3 lpm only.

Picture 5: water taps installed at plant at different location.

Proposed Scenario: Retrofit high flow rate hand washing taps with 'aerators and flow restrictors' so as to have 2-3 lpm flow rate in hand washing taps in the buildings ensuring a wider spray area when

opened. An estimated 40% savings can be achieved by using flow restrictors in hand washing taps.

7.2 Arresting water leakages at Plant in different location.

Observation: Leakages have been detected at various points in the pump glands & valves and there were many points of leakage in plant areas that constitutes to water losses.

Picture 6 : Leakage point in the plant

Recommendation: It is suggested to arrest these leakages which will help to reduce the consumption of water or help in cost of water extraction. Arresting the leakages is an in-house maintenance practice which does not require a large amount of investment.

7.3 Optimize ground water consumption in colonies & Plant to save fresh water

Existing Scenario: The plant has colonies for plant officials as residential colonies named as Colony. The colony receives raw water from Bore wells. There is common bore well for plant Colony Domestic activities.The Plan uses about 513.7 m^3/day of raw water for its various domestic uses in Plant & Colony. The wastewater from colony & Plant is treated in STP and the STP treated water is used for gardening and landscaping within the plant premises.

Table 22: Estimated specific water consumption (lphd)

Facility	Water consumption (m3/day)	Services at Colonies	Estimated Population (Nos.)	Specific Water consumption (lphd)
Colony & Plant	513.7	Flats, guest house, hostel, dormitory	625	822

Table 23: Estimation of water requirements for drinking & domestic use in households

1	For communities with populations up to 20,000	
	Water supply through standpost	40 lphd (minimum)
	Water supply through house service connection	70 to 100 lphd

2	For communities with population 20,000 to 100,000 together with full flushing system	100 to135 lphd
3	For communities with population above 100,000 together with full flushing system	150 to 200 lphd

SOURCE: NATIONAL BUILDING CODE 2016, BIS

The estimated specific water consumption in litres per capita per day (lpcd) is higher than the standard norm of 135 lpcd and indicates that water use can be optimized in both the colonies & Plant. The following observations were made during field visit:

- 513.7 m^3/day of water is supplied for only 625 users which means water is consumed at the rate of 0.822 m^3/ day / head, which is very high compared to the standard norms (135 lphd)
- Raw water is used for irrigation/gardening activities other than domestic activities.
- Domestic sewage generated from Colony is collected in collection pit.
- The STP treated water is used only for gardening, about 44 m^3/day.
- Lack of water conservation and saving awareness among users.
- Lack of SOPs and best practices in the laundry.
- High flow rates in the water taps and water is supplied 24x7.
- Lack of water efficient fixtures, Flush tanks are of large capacity using about 8-10 litres per flush.

Recommendation: It is recommended that plant should take measures to ensure that the raw ground water in not used for activities other than domestic use. For irrigation & gardening only treated water must be used. For the reduction for the raw water plant has to fixed the timing of borewell extraction or monitor the borewell extraction data according to the timing given to the colonies, this will help to reduce the raw water consumption because plant will know where water is been used. The raw water can be saved which will reduce the quantum of ground water abstraction.

Table 24: Approximate water requirement for Colony & Plant Domestic

Facility	Recommended Approx. Water consumption (lphd)	Services at Colonies	Estimated Population (Nos.) including visitors & guests staying at the guest houses	Water consumption (m3/day)
Colony	135	Flats, guest house, hostel, dormitory	625	84.37

Table 25: Water & Cost savings

Particulars	Unit	Value
Total Raw Water consumption by Plant & Colony Domestic	m^3/day	513.7
Recommended water consumption (135 lphd for 625 people)	m^3/day	84.37
Saving in Raw water	m^3/day	429.3
Cost of fresh water (Abstraction & pumping cost included)	Rs/m^3	2.42
Water Savings	m^3/year	156705
Monetary Savings	Rs/year	379227

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

Existing Scenario: The plant has huge green belt area (approx. 4.43 acre) where treated water (approx. 600 m^3/day) is being used. It has been observed that open flexible pipe are being used for irrigation which is in general not efficient and hence it is recommended to use efficient drip irrigation system.

Recommendation: It is suggested that the plant should install Drip Irrigation system which is water efficient for gardening/horticulture. **The drip irrigation system will save 30-50% of water.** Installing drip irrigation system will reduce treated water consumption, the requirement of water for greenbelt (horticulture) is 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.

Table 26: Cost of Drip Irrigation System and potential water savings

Particular	Unit	Value
Total Area under gardening/irrigation	m^2	17928
Total Area under gardening/irrigation	Acre	4.43
Direct quantity of water used for Gardening	m3/day	600
With Drip irrigation	m3/day	360
Water saving potential	m3/day	240
Cost of borewell (Extraction & pumping cost included)	Rs/m3	2.4
Annual operational Days	Days/annum	250
Annual Water Savings from Drip irrigation	m3/annum	60000
Annual cost saving potential	Rs/annum	145200
Investment per acre area	Rs.	70,000
Total Investment	Rs.	3,10,096

Particular	Unit	Value
Simple Payback Period	year	2.14

7.5 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.

Table 27: List of meters installed in the plant

Meter Number	Meter Location	Regularly Recorded (Yes/No)	Calibrated (Yes/No)
FT01	ETP I/L(6")	Yes	No
FT02	ETP Laguun(2")	Yes	No
FT03	Mill H/W O/H (6")	Yes	No
FT04	Mill C/W O/H (4")	Yes	No
FT05	Pan Condensate (4")	Yes	No
FT06	Vacuum Pump (4")	Yes	No
FT07	Evap Chemical Boiling (4")	Yes	No
FT08	Evap & Juice Heater (6")	Yes	No
FT09	Cake Wash (4")	Yes	No
FT10	Turbine C/W O/H (6")	Yes	No
FT11	Lime H/W (2")	Yes	No
FT12	Lime C/W (2")	Yes	No
FT13	C/F Station (2")	Yes	No
FT14	SHWW (4")	Yes	No
FT15	Armec CT (2")	Yes	No
FT16	Pan C/W (6")	Yes	No
FT17	Pan H/W (4")	Yes	No
FT18	Molasses Conditioner C/W (4")	Yes	No
FT19	A Pan H/W (4")	Yes	No
FT20	Armec CT Over Flow (4")	Yes	No
FT21	Evap Condensate	Yes	No
FT22	Injection Water O/L	Yes	No
FT23	Tubewell No1 (6") plant	Yes	No
FT24	Tubewell No2 Dispansary(6")	Yes	No
FT25	Colony Tubewell No (4")	Yes	No
FT26	SRS Flow Meter (4")	Yes	No

7.6 Maintain logbook 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 UP GWA periodically. The following format may be used for maintaining and recording the meter data on daily basis:

Table 28: Format for maintaining logbook for water meters

Meter no.	Date DD/MM/YYYY	Initial reading (A)	Final reading (B)	Water quantity used (m^3) [B-A]	Cumulative total (m^3)

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

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 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 hand washing taps; washrooms, reception office etc. This will create awareness & sense of responsibility among staff/employees/visitors.

7.8 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 2-3 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.

7.9 Regular payment of applicable groundwater abstraction charges

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 is Rs 0.80 per m^3 as per the table given below:

Table 29: 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			
		< 500 m^3/day	500 to <1000 m^3/day	1000 to <5000 m^3/day	5000 m^3/day and above
1.	Safe	0.70	0.80	0.90	1.0
2.	Semi-critical	0.80	0.90	1.0	1.10
3.	Critical	0.90	1.0	1.10	1.20
4.	Over exploited	1.0	1.1	1.20	1.30

7.10 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 penalty provisions for non-compliance of NOC are given below:

Table 30: 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

Section/Area	Key Observations	Recommendations	Annual water savings (m^3)/ Energy saving	Annual monetary savings (Rs. lakhs)	Investment (Rs. Lakhs)	Pay-back period (Years)	Implementation plan
A HIGH COST SCHEMES							
Optimise water flow in hand washing and other taps	It was observed that the flow rates of water was very high.	It is suggested to use water efficient taps for hand washing, the water efficient hand washing taps use 2-3 lpm only.					
Install Drip Irrigation in the garden/horticulture area for efficient water use in landscaping/gardening	It has been observed that open flexible pipe are being used for irrigation which is in general not efficient	It is suggested that the plant should install Drip Irrigation system which is water efficient for gardening/horticulture. **The drip irrigation system will save 30-50% of water.**	60000	145200	3,10,096	2.14	
B. LOW OR NO COST SCHEMES (up to 1 Lakh INR)							
Arresting water leakages at Plant in different location.	Leakages have been detected at various points in the pump glands & valves and there were many points of leakage in plant areas that constitutes to water losses.	It is suggested to arrest these leakages which will help to reduce the consumption of water or help in cost of water extraction.			Minimum	Immediate	
Optimize ground water consumption in colonies & Plant to save fresh water	Excess consumption of water in plant & Colony domestic.	It is recommended that plant should take measures to ensure that the raw ground water in not used for activities other than domestic use.	156705	379227	Minimum	Immediate	
Regularly calibrate & maintain existing	It was observed that the existing Borewell meter are	It is suggested to continue to calibrate and maintain the					

Section/Area	Key Observations	Recommendations	Annual water savings (m^3)/ Energy saving	Annual monetary savings (Rs. lakhs)	Investment (Rs. Lakhs)	Pay-back period (Years)	Implementation plan
water flow meters	installed and calibrated	existing flow meters.					
Maintain logbook of daily groundwater abstraction	It was observed that the plant is maintaining data of daily groundwater abstraction	The proposed digital flow meter with telemetry will be equipped with online data recording facility					
Enhance Training and Awareness of the Employees at all Levels and Placing 'Water Saving 'posters/Slogans at various Locations	Plant is regularly conducting Training and Awareness of the Employees, events to promote water conservation like celebration of world water day, world environment day" and Placing 'Water Saving' Posters/Slogans at various Locations	Maintain the system and suggested to keep continue the water conservation activities and promotion in the plant					
Periodically conduct 'Water & Wastewater Audit'	Plant has formed a cell for assessment of potential for water & wastewater management in the plant for water saving & wastewater management.	Conduct periodic 'Water Audit' at least once in 2-3 years either by an experienced external Audit Team to assess the efficiency of water usage in processes; reduce water losses in the system and optimize costs & energy consumption.					
Regular payment of applicable groundwater abstraction charges	It was observed that plant team is regularly paying the applicable ground water charges to concern authority	It is suggested to maintain the same					
Ensure to comply with the NOC conditions to avoid any penalty	It was observed that plant team is meeting all applicable compliance	It is suggested to maintain the same					

CHAPTER: 9 CONCLUSION

1. **Expected Reduction in Specific Water Consumption (SWC) in Industrial Water Use:**

- The plant has already implemented water efficient process technologies which have helped reduce its SWC by implementing several water conservation initiatives like reuse of Pan, evaporator and testing water, ETP treated water reuse in horticulture and lagoons, STP water usage and rain water harvesting Pit.

Table 1: Reduction in SWC of the Unit

Particulars		**2020-21**	**2021-22**
Production in Tons of Sugar	MT/Year	101039	83398.4
Total Freshwater intake (Bore well)	m^3/year	315585	114000
Specific Water Consumption	**m3 of fresh water/Ton of Sugar**	**3.1**	**1.4**

CHAPTER: 10 ANNEXURES

10.1 Annexure: Ground Water Quality Test Report

NOIDA TESTING LABORATORIES

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

TEST CERTIFICATE

Issued To: M/s Bajaj Hindusthan Sugar Ltd.

Address: Unit – Khambarkhera (Sugar Division), Sarda Nagar Road Khambarkhera, District-Lakhimpur kheri (U.P)-261502 India.

Report Code : W-191122-057
ULR No. : TC6814220000005680 F
Test Report of : Water
Service Request No : NTL/SRF/11/22-057
Service Request Date : 17/11/2022
Report Issue Date : 21/11/2022

SAMPLING & ANALYSIS DATA

Sample Drawn On : 18/11/2022
Sample Drawn By : NTL Representative
Analysis Duration : 19/11/2022 to 21/11/2022
Sample Quantity : 2.0 lit.+ 5.0 ml.
Sampling Location : Village Khambharkhera
Sample Description : Ground 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)	7.56	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	382	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 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)	46.25	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)	0.38	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)	0.136	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	8.50	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)	4.23	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 I IS: 13428	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO_4)	IS: 3025 (P- 24)	46.80	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)	198.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	162.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P- 49)	0.124	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 involved 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.

Ajjali
CHECKED BY

AUTHORIZED SIGNATORY

Laboratory : GT-20, Sector-117, NOIDA, Gautam Budh Nagar - 201301
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~~10.2~~ Annexure: STP Outlet Water Quality Test Report

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

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TEST CERTIFICATE

Issued To: M/s Bajaj Hindusthan Sugar Ltd.

Address: Unit – Khambarkhera, Sarda Nagar Road Khambarkhera, District-Lakhimpur kheri (U.P)-261502 India.

Report Code : WW-060123-079
ULR No. : TC6814230000000580 F
Test Report of : Waste Water
Service Request No : NTL/SRF/01/23-079
Service Request Date : 05/01/2023
Report Issue Date : 09/01/2023

SAMPLING & ANALYSIS DATA

Sample Drawn On : 06/01/2023
Sample Drawn By : NTL Representative
Sample Description : STP Outlet
Sample Received On : 06/01/2023
Sample Quantity/Packing detail : 2 lt/Plastic Cane
Weather Conditions : Normal
Analysis Duration : 06/01/2023 to 09/01/2023

TEST RESULTS

S.No	Parameter	Test Method	Results	Units	Limits as per CPCB Norms
1.	pH	IS:3025(Part-11):1983	7.24	-	5.0 - 9.0
2.	Total Dissolved Solid	IS:3025(Part-16):1984	520.0	mg/l	----
3.	Total Suspended Solid	IS:3025(Part-17):1984	4.5	mg/l	100.0
4.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	8.0	mg/l	250.0
5.	Biological Oxygen Demand (as O_2) (3 days at 27°C)	IS:3025(Part-44):1993	<2.0	mg/l	30.0
6.	*Faecal Coliform*	IS 1622:1981	60	MPN/ 100 ml	<100

Notes:

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

CHECKED BY **AUTHORIZED SIGNATORY**

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~~10.3~~ Annexure: ETP Inlet Water Quality Test Report

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☎ +91-120-3611642, 8510081921, 7503031145, 8527870572, 7503031146, 9999794369

TEST CERTIFICATE

Issued To: M/s Bajaj Hindusthan Sugar Ltd.	**Report Code : WW-191122-063**
Address: Unit – Khamharkhera (Sugar Division), Sarda Nagar Road Khambarkhera, District-Lakhimpur kheri (U.P)-261502 India.	**ULR No. : TC681422000005686 F**
	Test Report of : Waste Water
	Service Request No : NTL/SRF/11/22-063
	Service Request Date : 17/11/2022
	Report Issue Date : 21/11/2022

SAMPLING & ANALYSIS DATA

Sample Received On	:	18/11/2022
Sample Drawn By	:	NTL Representative
Sample Description	:	ETP Inlet
Sample Drawn On	:	19/11/2022
Sample Quantity/Packing detail	:	2 lt/Plastic Cane
Weather Conditions	:	Normal
Analysis Duration	:	19/11/2022 to 21/11/2022

TEST RESULTS

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11):1983	7.68	-
2.	Total Dissolved Solid	IS:3025(Part-16):1984	1260.0	mg/l
3.	Total Suspended Solid	IS:3025(Part-17):1984	164.0	mg/l
4.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	380.0	mg/l
5.	Biological Oxygen Demand (as O_2) (3 days at 27°C)	IS:3025(Part-44):1993	152.0	mg/l
6.	Oil & grease	IS:3025(Part-19):1984	2.5	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. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

Ajali
CHECKED BY

AUTHORIZED SIGNATORY

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

~~9.5~~9.4 Annexure: ETP Outlet Water Test Report

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-[illegible]2613642, 8510081921, 7303031145, 8527870572, 7503031146, 9999794369

TEST CERTIFICATE

Issued To: M/s Bajaj Hindusthan Sugar Ltd.	
Address:	**Unit – Khambarkhera (Sugar Division), Sarda Nagar Road Khambarkhera, District-Lakhimpur kheri (U.P)-261502 India.**

Report Code	**: WW-191122-064**
ULR No.	**: TC681422000000005687 F**
Test Report of	**: Waste Water**
Service Request No	**: NTL/SRF/11/22-064**
Service Request Date	**: 17/11/2022**
Report Issue Date	**: 21/11/2022**

SAMPLING & ANALYSIS DATA

Sample Received On	:	18/11/2022
Sample Drawn By	:	NTL Representative
Sample Description	:	ETP Outlet
Sample Drawn On	:	19/11/2022
Sample Quantity/Packing detail	:	2 lt/Plastic Cane
Weather Conditions	:	Normal
Analysis Duration	:	19/11/2022 to 21/11/2022

TEST RESULTS

S.No	Parameter	Test Method	Results	Units	Limits as per CPCB Norms
1.	pH	IS:3025(Part-11):1983	7.40	-	5.5 – 8.5
2.	Total Dissolved Solid	IS:3025(Part-16):1984	860.0	mg/l	----
3.	Total Suspended Solid	IS:3025(Part-17):1984	8.50	mg/l	30.0
4.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	136.0	mg/l	250.0
5.	Biological Oxygen Demand (as O_2) (3 days at 27°C)	IS:3025(Part-44):1993	21.0	mg/l	30.0
6.	Oil & grease	IS:3025(Part-19):1984	BDL (<1.0)	mg/l	10.0

BDL- Below Detection Limit

Notes:

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

Arjati
CHECKED BY

AUTHORIZED SIGNATORY

Laboratory : C1/20, Sector-117, NOIDA, Gautam Budh Nagar - 201301
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E.: noida.laboratory@gmail.com, info@noidalabs.com W.: www.noidalabs.com

Technical Report

On

GROUND WATER RECHARGE STUDY

For

Bajaj Hindusthan Sugar Limited
Unit - Khambharkhera
District – Lakhimpur Kheri, Uttar Pradesh

Carried out By

Directorate of Research
C. S. Azad University of Agriculture & Technology,
Kanpur – 208 002 (India)

Technical Report
on
Ground Water Recharge Study

Introduction:

Artificial recharge of groundwater is accomplished through placing surface water in basins, furrows, ditches, or different centres wherein it infiltrates into the soil and actions downward to recharge aquifers. Synthetic recharge is an increasing number of used for short- or lengthy-term underground garage, where it has several blessings over floor storage, and in water reuse. Artificial recharge requires permeable surface soils. In which these are not available, trenches or shafts in the unsaturated sector can be used, or water can be at once injected into aquifers via wells. To design a machine for artificial recharge of groundwater, infiltration rates of the soil have to be determined and the unsaturated area among land floor and the aquifer ought to be checked for good enough permeability and lack of polluted regions.

The artificial recharge to ground water aims at augmentation of ground water reservoir by modifying the natural movement of surface water utilizing suitable civil construction techniques. Artificial recharge is the process by which the ground water is augmented at a rate much higher than those under natural condition of percolation. In most low rainfall areas of the country the availability of utilizable surface water is so low that people have to depend largely on ground water for agriculture and domestic use. So in order to improve the ground water situation it is necessary to artificially recharge the depleted ground water aquifers.

Under these circumstances, the present study was taken up with the following objective (s) namely:

1. To analyze the working of artificial recharge of ground water.
2. To determine the amount of water that would be available from a given catchments and the size of storages.

Methodology:

The study entitled "Ground Water Recharge Study" was conducted during the month of March, 2024 by a team included representatives of the sugar plant. During the course of the study different kind of information were gathered. The appropriate

tools and techniques were used in gathering information. In addition to above, the desired information was also gathered from different places/points.

Brief Description About Company:

Bajaj Hindusthan Sugar Limited (BHSL) was established on 24th November 1931, as 'Hindusthan Sugar Mills Limited.' Founded by the late Shri Jamnalal Bajaj, a respected businessman, freedom fighter, and close confidant of Mahatma Gandhi, the company's inception aimed to address a critical national mission-providing momentum to the industry, given that there were fewer than 30 sugar mills in the country at that time-and advancing inclusive growth. The chosen site for the first plant was in Gola Gokaran Nath in the Lakhimpur Kheri district in the Terai region of present-day Uttar Pradesh (UP). Positioned in an area abundant with sugarcane plantations, the original capacity of the plant was 400 tonnes of cane crushed per day (TCD), which eventually increased to its current 13,000 TCD. The distillery unit of the plant began production in 1944. During World War II, the distillery primarily produced power alcohol, a commodity in short supply at the time. Notably, the unit became the first in the country to supply alcohol-mixed petrol to the army.In 1967, a new company, Sharda Sugar & Industries Limited, emerged as a subsidiary of Hindusthan Sugar Mills Limited. Under this subsidiary, a sugar plant with a cane crushing capacity of 1,400 TCD was established in 1972 at Palia Kalan, a major cane-supplying centre located 70 kilometres north of the Gola Gokaran Nath unit. The Palia Kalan unit's capacity was gradually increased to its current 11,000 TCD.

In 1988, Hindusthan Sugar Mills Limited underwent a name change, becoming Bajaj Hindusthan Sugar Limited (BHSL). Two years later, Sharda Sugar & Industries Limited was amalgamated with the company.

During the 2000s, BHSL initiated an ambitious greenfield expansion from 2003 to 2007, establishing eight plants across the state. This rapid expansion, starting with a plant at Kinauni near Meerut, was notably completed in just 7 months, contrasting with the industry norm of 18-24 months. The total cane crushing capacity of the company surged to 96,000 TCD.

In 2005, BHSL acquired Pratappur Sugar and Industries Limited (PSIL) in UP's Deoria district. Operating since 1903, it was Asia's oldest plant with a crushing

capacity of 3,200 TCD. Post-acquisition, its capacity doubled to 6,000 TCD within a year.

PSIL was subsequently renamed Bajaj Hindusthan Sugar and Industries Limited (BHSIL) and made a subsidiary of BHSL. This acquisition provided BHSL with a strategic foothold in the sugar-deficient region of Eastern UP and reaffirmed the consolidation that took place in the sugar industry. By the end of 2007, the expansion drive not only enhanced BHSL's overall cane crushing capacity but also positioned the company as India's largest ethanol producer, generating 480 kiloliters per day (KLD).While enhancing the capacity of its existing sugar plant at Pratappur, the company concurrently established three additional sugar units in virgin, cane-rich areas of East UP at Rudauli (district: Basti), Kundarkhi (district: Gonda), and Utraula (district: Balrampur). This elevated BHSIL's total crushing capacity to 40,000 TCD. The commissioning of three Bagasse-based power co-generation plants at Kundarkhi, Rudauli, and Utraula contributed to BHSIL's aggregate power generation capacity of 95.8 MW. Coupled with the power generation capacity of 325 MW from BHSL, the company's total generation capacity stands at 420.8 MW, surpassing its energy needs. Notably, the surplus 90 MW of energy is supplied to the UP state grid. In December 2010, the amalgamation of BHSIL with BHSL was completed. BHSL's growth initiative was strategically focused on achieving global manufacturing scale and cost competitiveness. Simultaneously, it created significant developmental opportunities in UP, a state eager for infrastructural growth, youth employment, and overall socioeconomic development in rural communities.

Today, BHSL holds a unique position, towering over local peers and ranking among the world's best in planning and processes. With the company impacting over 5 lakh farmers in UP, it directly contributes to the rural economy, bringing positive change to countless lives in UP and beyond across India.

Detail About the Unit:

The premises of M/S Bajaj Hindusthan Sugar Limited Unit Khambharkhera (sugar plant) is situated in Khambharkhera village of Block Fulbehad in district Pilibhit of Uttar Pradesh well connected with road to major cities. The unit was established in 2006. The sugar production capacity is 12,600 TCD.

Water Requirement and Quality of Groundwater:

The total ground water requirement of plant is 1200 m^3/day or 216000 m^3 /year. Since the area is non-notified and falls in safe category, as per ground water NOC for withdrawal of ground water, adoption of artificial recharge to ground water is required.

The study area theoretically covers within the circle encompassed by 5 km radius around the sugar 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.

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, while post-monsoon depth to water level ranges between 2.5 m bgl to 3.0 m bgl.

A detailed groundwater level monitoring has been carried at about 8 different locations within the buffer zone from existing open wells and bore wells. The physio-chemical quality of groundwater was compared with drinking water standard (IS: 10500- 2012). Some of the parameters of the ground water samples showed values lower than the permissible limit. Thus, can be inferred 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).

Details of Ground Water Abstraction

Artificial recharge has been practiced within the sugar plant premises. Rainwater harvesting practices through roof-top is being carried out and the available run-off from the same is used for green belt or dust suppression etc.

There are three existing bore-well present in the industry premises. The monitoring of ground water abstraction is done on regular basis. Awareness programme about the conservation of ground water resources are also being organised to create the awareness among people.

S.No.	NOC NO./ Certificate NO.	Maximum Allowable Withdrawal (m3/day)	Total Allowable Withdrawal (m3/day)	Maximum Allowable Annual Extraction of Ground Water	Total Allowable Annual Extraction of Ground Water	Validity Start	Validity End	Validity in a Year (No. Of days)
1.	NOC028922	400	1200	72000	180,000	22.06.2021	21.06.2026	150
2.	NOC033242	400		72000				
3.	NOC043004	400		72000				

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 rainwater 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 majority of the areas, 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. There is a need to provide sustainability to these surface storages which are effective in providing additional recharge and sustain the 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 1231.20 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:

Calculation of annual rainfall runoff potential

S. No.	Land use type	Area (sq m)	Coefficient of runoff	Rainfall (m)	Quantity of Rainwater (m^3)
1	Rooftop Area	5750.00	0.85	1.231	6016.51
Total		**5750.00**	**-**	**-**	**6016.51**

From the above computation, it is evident that a total quantum of 6016.51 m^3 /year of rain water is fruitfully harvested & recharged from plant premises annually by constructed suitable recharge structures against the withdrawal of 216000.00 m^3 /year. In order to design the recharge structures, hourly runoff of 30 mm/hr has been taken into account and the details are tabulated below:

Hourly Computation of Runoff – (30 mm/hr)

S. No.	Land use type	Area (sq m)	Coefficient of runoff	Intensity of Rainfall (m)	Quantity of Rainwater (m^3)
1	Rooftop Area	5750.00	0.85	0.030	146.625
Total		**5750.00**	**-**	**-**	**146.625**

Structure Calculation:

- Thus, the total rainwater harvesting capacity of roof top area of the industry is about 146.625 m^3 per hour.
- Assuming retention time of 0.25 hour in the recharge pit, the design volume for the recharge pit is 146.625/4 = 36.66 m^3

- Let us provide recharge pit of 2 m × 2 m in size and 2.5 depth.
- Volume of one pit = 10 m^3
- Capacity of One Bore well recharge: 30 cubic meters
- Average Recharge Capacity of Pit with two well = 10 + 30 + 30 = 70
- Required no. of pits = 36.66/70 = 0.52 (01 appx.)
- The sugar plant provided 01 no. recharge pit of 2 m × 2 m × 2.5 m in size at peak rainfall intensity of 30 mm.

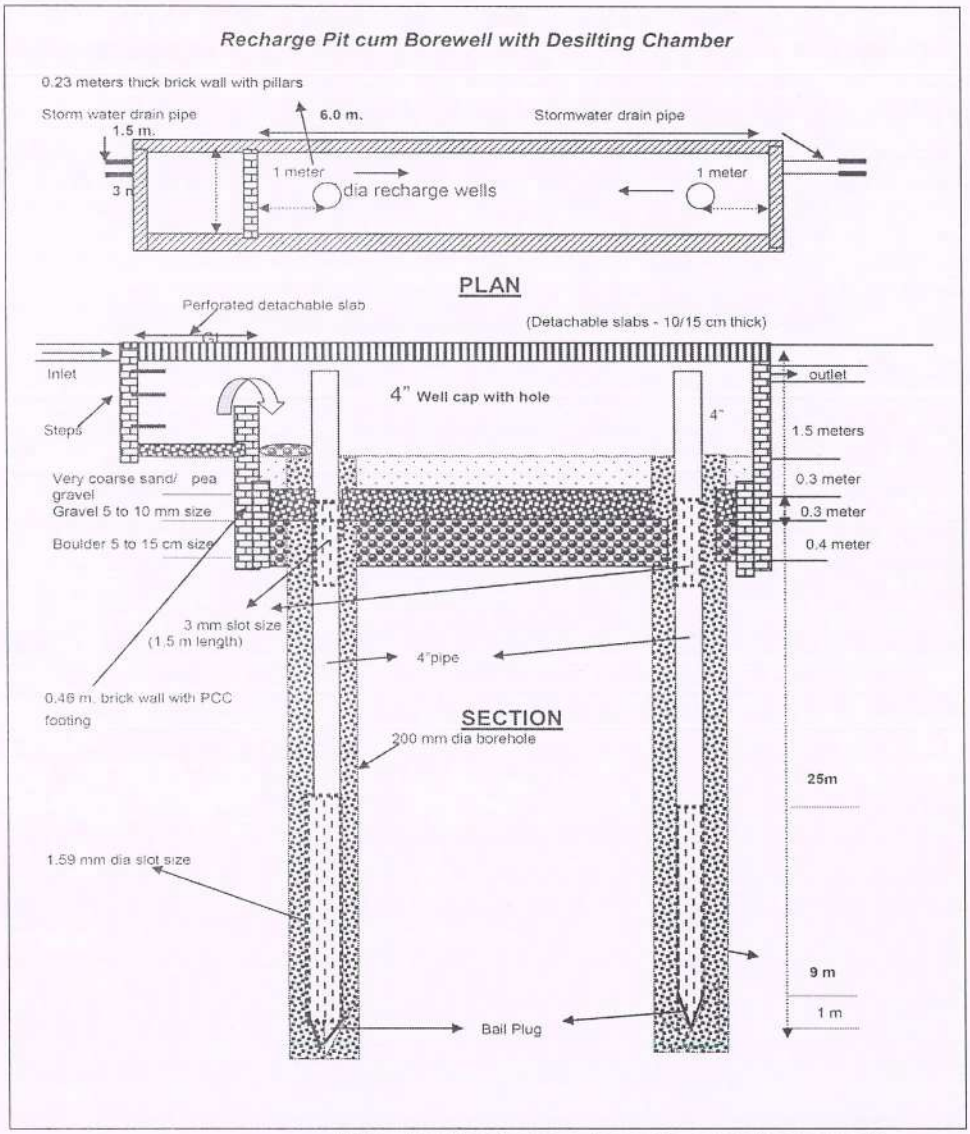


Fig. 1: Recharge trench cum bore well

Designs of Double Bore Recharge Structure:

The location of these sites is located as per the layout of storm water drains and the catch basins that are constructed. Necessary precautions are taken to avoid

any contaminated water entering into the recharge structures. The recharge structures so designed that these are operational only during the monsoon seasons. All the structures are constructed in series and the overflow from one may be accommodated to the next structure. For the plot areas having green belt necessary slopes is given so that the rainfall runoff is channelized and diverted to the recharge shafts. In implementing the recharge structures, the spacing between two consecutive recharge trenches is 50 meters apart. Settling chambers is located at suitable locations before the recharge structures so as to avoid any excess siltation to the recharge trenches (Fig. 1). Provision of Geo-textile mesh/ Johnson cloth on the top of the filter media is preferred to avoid frequent clogging of the filter media. Special care is being 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 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. The recharge wells are tested and slug test also conducted at selected recharge wells so as to ascertain the dissipation rate of the rainfall runoff to the aquifer systems. Such an approach reflected the proper recharge mechanism at the study area.

Therefore, the total annual recharge from rain water harvesting is about 6016.51 m^3 per year against the withdrawal of 216000.00 m^3 per annum of ground water (which is around 3 % only). The balance amount of recharge is made by adopted suitable village ponds in the Fulbehad block and converting them in recharge ponds. Implementation of recharge mechanism in the study area creates a balance between the recharge vis-à-vis discharge relationships of the aquifer system. It is also maintain the ground water quality, which may deteriorate due to prolonged pumping, and the recharge of fresh rainfall runoff shall compensate it. Aquifer systems, exact depth of recharge well and its slot positions ascertained based initial wells and subsequently tested for its intake rate.

Artificial Recharge of Groundwater From the Village Pond:

The industry has adopted 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. The adopted these village ponds to take-up artificial recharge to ground water of the pond water which is overflowing to adjacent areas during monsoon period. According to opinion of the users, the artificial recharge to ground water in the pond areas resulted into rise in water levels in the village tube-wells as wells and increases the supply of water to the lands adjacent for irrigation purposes. Thus, recharge schemes in the ponds is benefit the area.

Recharge Calculation in Ponds

Type	Village Name	Gata No.	Area (Sq m)	Depth of Ponds (M)	Total Storage Capacity (m3)
Pond- 1	Khambharkhera	981	11409	3.0	34227
Pond- 2	Chamalpur	740	10520	3.0	31560
Total			**21929**	**3.0**	**65787**

Pond Recharge Calculations:

Pond- I:

- Now, total storage capacity of pond from above computation is about 65787.00 m^3.
- In approximation, in a year 3 filling will occur. Hence, 65787.00X3 = 197361.00 m3
- Out of 197361.00 m^3 we take 60 % filling on safer side.
- So, the total is 118416.60 m^3

Through Ponds of Villages:

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.

The industry has adopted two ponds located in village Khambharkhera and Chamalpur for artificial rain water harvesting as recharge shaft and natural percolation in ponds which resulted into creation of additional recharge which is sufficient to fulfil the mandatory requirements as per guidelines of the concerned Ministry.

Total pond area is 2.1929 hectares i.e. 21929 m^2.

Recharge Calculation in Ponds

S.No.	Area (ha)	Area (m^2)	Depth after desilting (m)	Total storage capacity	60%	No of filling	Quantity of water recharge	No. of recharge structure (@15 m^3/hr)
1.	2.1929	21929	3.0	65787	39472	3	118416	09 Nos.

- From pond, the total water available recharge is 118416.00 m^3.
- The total amount of recharge including both within premises and outside the premise is 124432.51 m^3 (within premises: 6016.51m^3 + pond outside the premises: 118416.00 m^3) in a year and withdrawal is 216000.00 m^3 per year.

Existing industry is situated in safe block Fulbehad of district LakhimpurKheri and as per Ground Water Dynamic- 2020, hence we will have to recharge 50% of total withdrawal annually.

As per CGWA (Central Ground Water Authority) guidelines total amount of rainwater to recharge for the withdrawal of 216000 m^3/annum is 108000.00 m^3/annum (50% of 216000.00 m^3/annum).

Against requirement of 216000.00 m^3/annum, the company recharge 124432.51 m^3/annum through 09 nos. of recharge structures, which is more than 50%.

Recharge Summary

Total fresh water requirement for sugar project	1200 KLD/216000.00 m^3/year
Source of water for plant activates	Ground water
RHW potential/ artificial recharge required	Maximum up to 50 % recharge criteria (safe zone)- 108000.00 m^3/year
Total artificial rainwater recharge inside the plant	6016.51 m^3/year
Total artificial rainwater recharge outside the plant	118416.00 m^3/year
Total recharge	**124432.51 m^3/year**

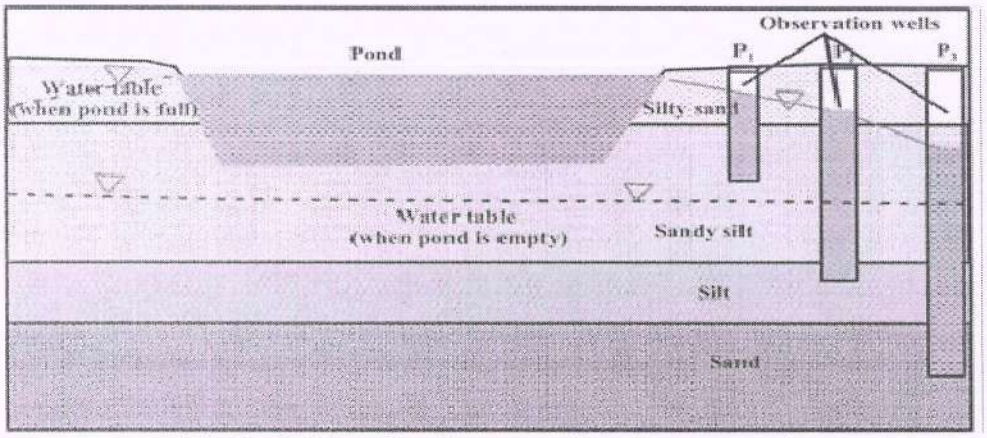


Fig 2: Schematic diagram of recharge pond

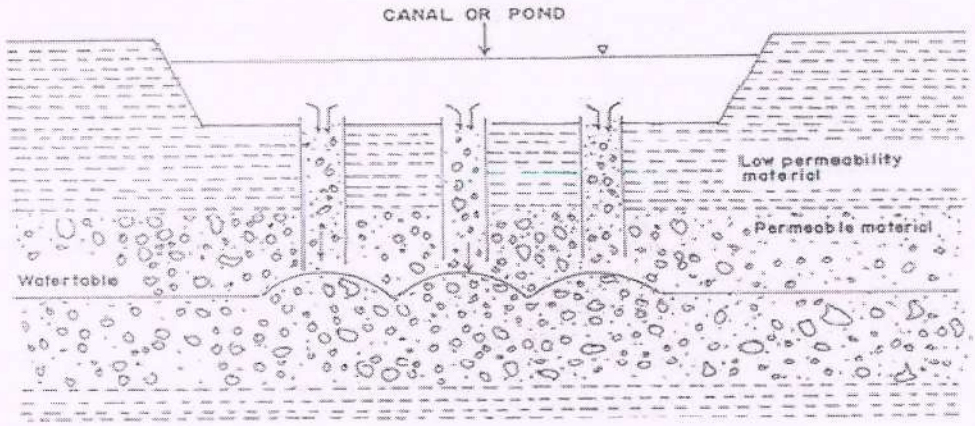


Fig 3: Cross section of pond recharge shaft

OBSERVATIONS AND RECOMMENDATIONS

- To make the people aware, the awareness programme about the conservation of ground water resources should be organized regularly.
- The water level monitoring network needs to be increased in the nearby areas.
- Community efforts and create the spirit of cooperation needed to subsequently manage sustainably ground water as a community resource.
- The BHSL Khambharkhera unit is situated in safe zone as per Ground Water Notification and this unit is doing artificial ground water recharge though in-house roof top rain water harvesting network and also through village ponds adopted outside factory premises .
- BHSL Khambharkhera unit artificial water recharge quantity is more than required quantity as prescribed by UP-Ground Water Deptt.

CONCLUSION

Based on the study, it can be concluded that the BHSL Khambharkhera unit recharges more than 50 % of the required quantity of the water as prescribed by UP-Ground Water Deptt.

Dated: 14.05.2024

14/05/24

Dr. Rajiv
Scientist/ Team Leader
Directorate of Research
Chandra Shekhar Azad University of Agriculture & Technology,
Kanpur- 208 002, Uttar Pradesh, India

Technical Report

On

IMPACT ASSESSMENT STUDY
OF
TREATED WATER UTILIZATION ON AGRICULTURE LAND

For

Bajaj Hindusthan Sugar Limited
Unit - Khambharkhera
District – LakhimpurKheri, Uttar Pradesh

Carried out By

Directorate of Research
C. S. Azad University of Agriculture & Technology,
Kanpur – 208 002 (India)

Technical Report
on
Impact Assessment Study of Treated Water Utilization on Agriculture Land

Introduction:

Water is the most abundant natural resource in the world. The earth surface is covered 70 per cent by water and out of this the saline sea water is 97 per cent. But, the potable or drinking water is about 13 per cent of the residual which is 0.40 per cent of all the world water and the remaining is held either as ice and atmosphere.

The primary competing uses of water is typically agriculture followed by industry, domestic, recreational and more recently environmental preservation. Proper distribution of water among these sectors requires planning and management. Sustainability of water resources and an equitable distribution of available water drive much of this planning. Finding sustainable solutions for water stressed regions is an important focus of water resources planners. For sustainable water management to occur, the allocation of water must be socially fair for both current and future populations.

With the population growing at a higher rate, the need for increased food production is inevitable. Use of treated water in agriculture therefore, could be an important consideration when its disposal is properly planned. The quality of treated effluent will then become very important in terms of its performance to groundwater, soil and plant. For irrigation, the quality of effluent will depend on crops to be irrigated, the soil conditions and the system of effluent distribution adopted besides the output quality of crops grown.

Treated water has high potential for reuse in agriculture; an opportunity for increasing food and environmental security, avoiding direct pollution of rivers, canals, surface water; conserving water and nutrients, thereby reducing the need for chemical fertilizer. Among different sources of treated water, industrial treated water reuse is one of the momentous components of water reuse in agriculture as the source content are known and treatment is done by the industry.

The different socio-environmental and economical benefits resulting from water conservation and reuse included: (a) agriculture benefits such as value of a secure supply of treated water, increased farm production and value of treated water

nutrients, i.e. savings in fertilizer applications; (b) environmental water quality benefits such as reduction in freshwater diversions, reduction in pollutant discharges, reduction of the potential salinity intrusion risk in groundwater aquifers and improvement of the ecosystem and increase of the fauna and flora species and (c) increase of the quality of life of the population.

Under these circumstances, the present study was taken up with the following objectives namely:

1. To identifying the externalities of use of treated water from sugar plant in agriculture.
2. To assess the impact of treated water use in the agriculture in terms of crop productivity, soil fertility, socio economic and environmental factors.

Methodology:

The study entitled "Impact Assessment Study of Treated Water Utilization on Agriculture Land" was conducted during the month of March, 2024 by a team included representatives of the sugar plant. During the course of the study different kind of information *viz.*, soil conditions, farmers perceptions, technology adoption, development activities and farmers knowledge in regard to the treated water of the sugar plant were gathered. The approach used in gathering information included PRA tools and techniques, personal interviews, field visits, etc. In addition to above, the desired information were also gathered from different places like ETP, analytical laboratory, storage tank, water supply system, monitoring system etc.

Brief Description About Company:

Bajaj Hindusthan Sugar Limited (BHSL) was established on 24th November 1931, as 'Hindusthan Sugar Mills Limited.' Founded by the late Shri Jamnalal Bajaj, a respected businessman, freedom fighter, and close confidant of Mahatma Gandhi, the company's inception aimed to address a critical national mission-providing momentum to the industry, given that there were fewer than 30 sugar mills in the country at that time-and advancing inclusive growth. The chosen site for the first plant was in Gola Gokaran Nath in the Lakhimpur Kheri district in the Terai region of present-day Uttar Pradesh (UP). Positioned in an area abundant with sugarcane plantations, the original capacity of the plant was 400 tonnes of cane crushed per day (TCD), which eventually increased to its current 13,000 TCD. The distillery unit

of the plant began production in 1944. During World War II, the distillery primarily produced power alcohol, a commodity in short supply at the time. Notably, the unit became the first in the country to supply alcohol-mixed petrol to the army.In 1967, a new company, Sharda Sugar & Industries Limited, emerged as a subsidiary of Hindusthan Sugar Mills Limited. Under this subsidiary, a sugar plant with a cane crushing capacity of 1,400 TCD was established in 1972 at Palia Kalan, a major cane-supplying centre located 70 kilometres north of the Gola Gokaran Nath unit. The Palia Kalan unit's capacity was gradually increased to its current 11,000 TCD.

In 1988, Hindusthan Sugar Mills Limited underwent a name change, becoming Bajaj Hindusthan Sugar Limited (BHSL). Two years later, Sharda Sugar & Industries Limited was amalgamated with the company.

During the 2000s, BHSL initiated an ambitious greenfield expansion from 2003 to 2007, establishing eight plants across the state. This rapid expansion, starting with a plant at Kinauni near Meerut, was notably completed in just 7 months, contrasting with the industry norm of 18-24 months. The total cane crushing capacity of the company surged to 96,000 TCD.

In 2005, BHSL acquired Pratappur Sugar and Industries Limited (PSIL) in UP's Deoria district. Operating since 1903, it was Asia's oldest plant with a crushing capacity of 3,200 TCD. Post-acquisition, its capacity doubled to 6,000 TCD within a year.

PSIL was subsequently renamed Bajaj Hindusthan Sugar and Industries Limited (BHSIL) and made a subsidiary of BHSL. This acquisition provided BHSL with a strategic foothold in the sugar-deficient region of Eastern UP and reaffirmed the consolidation that took place in the sugar industry. By the end of 2007, the expansion drive not only enhanced BHSL's overall cane crushing capacity but also positioned the company as India's largest ethanol producer, generating 480 kiloliters per day (KLD).While enhancing the capacity of its existing sugar plant at Pratappur, the company concurrently established three additional sugar units in virgin, cane-rich areas of East UP at Rudauli (district: Basti), Kundarkhi (district: Gonda), and Utraula (district: Balrampur). This elevated BHSIL's total crushing capacity to 40,000 TCD. The commissioning of three Bagasse-based power co-generation plants at Kundarkhi, Rudauli, and Utraula contributed to BHSIL's aggregate power generation

capacity of 95.8 MW. Coupled with the power generation capacity of 325 MW from BHSL, the company's total generation capacity stands at 420.8 MW, surpassing its energy needs. Notably, the surplus 90 MW of energy is supplied to the UP state grid. In December 2010, the amalgamation of BHSIL with BHSL was completed. BHSL's growth initiative was strategically focused on achieving global manufacturing scale and cost competitiveness. Simultaneously, it created significant developmental opportunities in UP, a state eager for infrastructural growth, youth employment, and overall socioeconomic development in rural communities.

Today, BHSL holds a unique position, towering over local peers and ranking among the world's best in planning and processes. With the company impacting over 5 lakh farmers in UP, it directly contributes to the rural economy, bringing positive change to countless lives in UP and beyond across India.

Detail About the Unit:

The Bajaj Hindusthan Sugar Limited, Khambharkhera was established in 2006 in district LakhimpurKheri of Uttar Pradesh. At present it is engaged in producing plantation white sugar. The sugar production capacity is 12600 TCD.

Entry Gate of the Khambharkhera (LakhimpurKheri) Unit

Effluent Treatment Plant Description:

a) ETP Layout and Unit Capacity Details:

The details information is given in attached Annexure-1.

b) **ETP Process Description**:

Unit has installed state of art technology ETP for the treatment of effluent from various production processes. ETP is based on activated sludge process comprised with bar screen, oil & grease trap, equalization tank, primary clarifier, aeration tank with air fine bubble diffuses, secondary clarifier followed by sand filer and activated carbon filters at tertiary treatment stage. The system is designed to achieve the standard norms as notified by MOEF & CC Notification dated 14.01.2016. The sulphate removal system has also been installed and is being operated for the treatment of the cooling tower overflow which further treated in activated sludge process ETP with single outlet point.

c) **Details about Analytical Facility at Site:**

Khambharkhera (LakhimpurKheri) unit has a well equipped Environmental Laboratory for environmental monitoring and testing and different parameters like pH, BOD, COD, TSS, TDS, Sulphate etc are being tested. The list of the available lab equipment is attached in Annexure- 2.

d) **Details about Manpower at Site to Monitor ETP & Irrigation Management Plan:**

At site, one Environment Manager along with one lab chemist, four skilled operators and three helpers are working for effective monitoring of ETP and Irrigation Management Plan.

e) **Details about Treated Water Storage Impervious Lagoon:**

The unit has constructed impervious lined storage tank with the **capacity of 17200 KL** for storage of treated effluent during low/no demand, based on the Irrigation Management Plan.

f) **Details about Treated Water Transportation at Farmers Field**:

The Bajaj Hindusthan Sugar limited, Khambharkhera (LakhimpurKheri) has Lagoon with a capacity of 17200 cubic meters and from here the treated water is being supplied to the field of farmers of targeted area through pumping set with the help of underground water supply system which is fully controlled via butter fly valve. The length of the underground water supply system is about 1000 metres which is made up from 4" size of HDPE pipes along with appropriate number of outlets at different location.

Analytical Facility

g) **Details about Treated Water Utilisation**:

The industrial treated effluent is being used in irrigation, in compliance with MOEF&CC notification 2016, as per irrigation management plan developed & approved by NSI, Kanpur. The treated domestic effluent is being utilized in lawn, garden and other horticultural area. The flow meter is installed for the measurement of final treated water used for Irrigation Management Plan.

h) **Physio-Chemical Properties of Treated Effluent:**

The treated effluent is being tested by the sugar unit regularly. During onsite visit of unit, the treated water samples were collected from irrigation line carrying treated effluent at farmer field and analysis of these samples was carried out by NABL and MOEF & CC approved laboratory. In addition, the previous testing reports were also available the sugar unit. The tested values of different parameters of treated effluent for the year of 2023-24 (on site visit) and 2022-23 (previous year) are given as below:

S.No.	Treated Effluent Particulars	Avg. value (2022-23)	Avg. value (2023-24)
1.	pH	7.36	7.52
2.	BOD (mg/l)	23.00	15.5
3.	COD (mg/l)	121.00	64.5
4.	TSS (mg/l)	10.50	11
5.	TDS (mg/l)	912.00	826
6.	Oil & grease (mg/l)	BDL* (< 1.0)	BDL* (< 1.0)

BDL* = Below detection limit

The analysis reports are attached as Annexure -3.

Farmers and Irrigation Areas:

The details information about some progressive farmers and their covered area under irrigation plan is given as below:

S.No.	Name of Farmer	Village /Block	Land covered under Irrigation plan
1	Mahendra Pal Yadav	Dhaurahara	1.681 ha
2	Rameshwar	Dhaurahara	1.693 ha
3	Jokhe	Dhaurahara	0.604 ha
4	Santram	Dhaurahara	0.394 ha
5	Raja Ram	Dhaurahara	0.382 ha
6	Ram Naresh	Dhaurahara	0.634 ha
7	Dharmendra Kumar	Dhaurahara	0.194 ha

Agro-ecological Conditions of Operational Area:

As meeting the prescribed norms is not the only criterion for use of treated water in irrigation, the requirement of water for irrigation be a limiting condition and this depends upon various factors as mentioned below:

1. **Cropping Pattern of Command Area:**

   In command area of M/s Bajaj Hindusthan Sugar Limited, Khambharkhera (LakhimpurKheri), wheat, sugarcane, oilseeds, pulses, fodder, maize and vegetables are main crops. The majority of the area is covered by three crops viz., sugarcane, wheat, and rice. The sugar cane crop is grown as main cash crop.

2. **Climate:**

   The command area has a humid subtropical, dry winter climate. The normal rainfall is 1231.2 mm, of which 86% rainfall is received during monsoon period and 14% during non-monsoon period. The hottest month with maximum temperature upto 32.3^{0}C in May and the coldest month with temperature 15.6 ^{0}C is January. The humidity is lowest in April with 39.5% where as it increases

to about 82.5% in August. The mean monthly wind speed is generally high from March to September reaching maximum 5.2km/hr in May and in December being around 1.4km/hr. The annual potential evapo-transpiration is 1369.1mm. The highest P.E.T. occurs during May and lowest in December.

3. **Irrigation type:**

The majority of the farmers are using flood irrigation method in command area.

4. **Soil Condition of Command Areas:**

There are various soil types such as loam, clay, sandy, clay loam and sandy loam but majority of the land are under the category of sandy loam.

Agreements with the Farmers:

The practice of agreements between sugar plant and farmers in regards to the use of treated water is being adopted. The details are attached as Annexure-4.

Available of Treated Water for Irrigation and Command Area:

In command area, the treated effluent is available from the month of November to May depending upon the duration of crushing season which is generally below 190 days. The treated effluent is utilized for irrigation purpose by sugarcane farmers (occupies plant and ratoon cane crop) on an average of every 15 days interval, while wheat farmers are using treated effluent on an average of every 20-25 days. In Khambharkhera area, intensive agriculture is practiced by majority of the farmers wherein land is not left vacant. This intensive agriculture requires continuous use of water. Under such type of practices, the treated effluent provided to the farmers is a big support for them as it is easily available to the farmers as and when required. The total available farmers command area is 305.98 hectares (sugarcane grown area of 250.59 hectares + wheat grown area of 55.39 hectares) and all command area comes within 1.5 km distance from the sugar unit.

	
Wheat crop grown with treated water	Online treated effluent monitoring system

Crop Grown and Soil Properties:

During the course of intensive study (field/on site visit), it was found that the crop of wheat and sugarcane is grown by majority of the farmers. The crop of the visited fields was in good conditions and farmers are happy with the performance of their crop.

Similar to treated effluent, the soil of the concerned farmers' fields is being tested by the sugar unit regularly. During onsite field visit, the soil samples were also collected from farmers' fields where irrigation is being applied/adopted through treated water and analysis of these samples was carried out by NABL and MOEF & CC approved laboratory. In addition, the previous soil testing reports were also available with the sugar unit and farmers as well. The soil test values of different parameters for the year of 2023-24 (on site visit) and 2022-23 (previous year) are given as below:

S.No.	Soil Samples Particulars	Avg. value (2022-23)	Avg. value (2023-24)
1.	pH (1:2 suspension)	7.05	7.05
2.	Sodium Absorption Ratio (SAR), meq/L	3.78	6.89
3.	Salinity Electrical Conductivity @ 25^0C (mmhos/cm)	246	242
4.	Soil Fertility Ratings		
i	Organic Carbon (% by mass)	0.57	0.59

ii	Available Nitrogen (kg/ha)	330	328
iii	Available Phosphorous (kg/ha)	23.8	23.7
iv	Available Potash (as k-kg/ha)	342	341

The data of the soil analysis revealed that the soil fertility is good which indicated that there is no adverse effect of the treated effluent on soil of the farmers' field. The analysis reports are attached as Annexure -5.


Beneficiary farmer Mr. Vijay Singh


Beneficiary farmer Mr. Rameshwar


Beneficiary farmer Mr. Ramsanehi

Properties of the Ground Water of Borewells:

During onsite field visit, the water sample from borewells of the nearby beneficiary farmers was also collected where irrigation is being applied/adopted through treated water and analysis of the water sample was carried out by NABL and MOEF & CC approved laboratory. In addition, the previous water testing reports was also available with the sugar unit. The values of different physcio-chemical properties of the underground water of borewells for the year of 2023-24 (on site visit) and 2022-23 (previous year) are given as below:

S.No.	Ground Water Parameters (Toxic Substances)	Avg. value (2022-23)	Avg. value (2023-24)
1.	Cadmium (as Cd) (mg/l)	<0.001	<0.001
2.	Cyanide (as Cn) (mg/l)	<0.01	<0.01
3.	Lead (as Pb) (mg/l)	<0.01	<0.01
4.	Mercury (as Hg) (mg/l)	<0.001	<0.001

5.	Molybdenum (Mo) (mg/l)	<0.05	<0.05
6.	Nickel (as Ni) (mg/l)	<0.01	<0.01
7.	Poly Nuclear Aromntic Hydo Carbons (mg/l)	<0.0001	<0.0001
8.	Poly Chlorinated Biphenyl (mg/l)	<0.0001	<0.0001
9.	Total Arsenic (as As) (mg/l)	<0.01	<0.01
10.	Total Chromium (as Cr) (mg/l)	<0.05	<0.05

The data furnished in the above table are indicated that all the toxic substances in under ground water are with in the acceptable limits. The analysis reports are attached as Annexure -6.

Farmers Reaction:

During the course of study (field/on site visit), the interactions were made with the beneficiary farmers to know the impact of the treated water on their crop and soil as well. The farmers are using the treated water since last five-six years and growing various crops suitable for the region. The saving in the amount of chemical fertilizers, vigorous growth of the plants, more greenery of the plants, high yield, good soil health, reduction in cultivation cost and availability as and when required were the common opinion of the beneficiary farmers about the treated water.

Interaction with beneficiary farmers

Farmers Outreach Programmes:

To educate and trained to the farmers about use of treated water and conservation of natural resources, the different kind of farmers promotional

programmes *viz.*, kishan goshthi, group discussion and interaction on various aspects are being organised by cane department of the sugar unit regularly.

Farmers Promotional Programmes

Demonstrations and Field Monitoring: The cane department of the sugar unit is conducted technology demonstrations on farmers' field on various aspects regularly. The demonstration is not restricted to cultivation of the new sugarcane varieties but agro-techniques for good agricultural practices (GAP) also demonstrated during the course of sugarcane cultivation. The large no. of the farmers of the command area is benefited through this transfer of technology practice i.e. demonstrations. In addition, the fields of the farmers are also being monitored at fourth nightly intervals.

Demonstration on treatment of the sugarcane setts before planting

CONCLUSION:

Based on the above said findings of the study entitled "Impact Assessment Study of Treated Water Utilization on Agriculture Land", it can be concluded that ....

1. There is no adverse effect of treated water utilization on agriculture land in terms of crop productivity, soil fertility, socio economic status and environmental factors.
2. Hence, irrigation through treated water of the sugar plant can be continued without any hazardous effects. The proposed system shall be able to cope-up the requirement of the water for irrigation purposes through utilization of the generated effluent.

Dated: 11.05.2024

11/05/24

Dr. Rajiv
Scientist/ Team Leader
Directorate of Research
Chandra Shekhar Azad University of Agriculture & Technology,
Kanpur- 208 002, Uttar Pradesh, India

Annexure -1

Annexure -2

Annexure -3

Annexure -4

Annexure -5

Annexure -6

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

197324/UPPCB/Lucknow(UPPCBRO)/CTO/both/LAKHIMPUR KHIRI/2023 **Date: 04/01/2024**

To,

M/s

BAJAJ HINDUSTHAN SUGAR LIMITED UNIT KHAMBHAR KHERA

Sharda Nagar Road Village- Khambharkhera Distt- Lakhimpur Khiri, Utter Pradesh.,LAKHIMPUR KHIRI,261506

Application Id-23656647

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 UNIT KHAMBHAR KHERA** located at **Sharda Nagar Road Village- Khambharkhera Distt- Lakhimpur Khiri, Utter Pradesh.,LAKHIMPUR KHIRI,261506.** 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 UNIT KHAMBHAR KHERA **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 by crushing sugar cane	12,600 TCD	Metric Tonnes/Day
2	Co-power generation plant	28	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	**70 KLD**	**STP**	**Horticulture**
Industrial	**1260 KLD**	**ETP**	**Irrigation**

(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	TSS	30 mg/l
2	Oil and Grease	10 mg/l
3	pH	5.5-8.5
4	COD	250 mg/l
5	BOD	30 mg/l

(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	BOD (mg/L)	30 mg/l
2	TSS (mg/L)	100 mg/l
3	Fecal Coliform (MPN/100ml)	1000 MPN/100ml
4	pH	6.5-9.0

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	500 KVA DG set	Diesel	1	Particulate Matter	as per norms
2	1010 KVA DG set	Diesel	1	Particulate Matter	as per norms
3	03 nos. Boilers (capacity of 90.0 TPH each with Common Stack) along with wet scrubber	Bagasse	1	Particulate Matter	60 meter from GL
4	1010 KVA DG set	Diesel	1	Particulate Matter	as per norms

Emmission Quality Standards

S No.	Stack no	Parameters	Standards
1	1	Particulate Matter	150 mg/Nm3

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 by crushing sugar cane 12,600 TCD (maximum) and Co-generation of Power-28 Megawatt.

2. This consent is valid for the current products and capacity. In Case of any change in process, capacity enhancement etc. CTE shall be obtained from the Board.

3. The industry shall maintain and operate the ETP and STP properly and the treated effluent/sewage shall be recycled and used for irrigation and shall ensure that no treated effluent is discharged in any surface water body.

4. Operation of ETP shall be started at least one month before starting of cane crushing to achieve desired MLSS, so as to meet the prescribed standards from day one of the operation of mill. The industry shall treat industrial effluent through ETP in such manner, so that quality of treated effluent meets the prescribed standards.

5. The industry shall ensure continuous operation of ETP in non crushing season of sugar unit for treatment of effluent generated from washing of floor and equipment and other maintenance work.

6. The industry shall ensure to operate the online Continuous Effluent Monitoring System regularly and maintain its regular connectivity with the servers of CPCB/SPCB.

7. The industry shall ensure to operate and maintained PTZ webcam.

8. The industry shall maintain the existing STP in such a manner so that it can achieve the standards specified in the notification issued by Ministry of Environment and Forest and Climate change vide GSR 1265 (E) dated 13-10-2017 in the time period as specified in the notification.

9. The treated waste water analysis report conducted by any NABL accredited lab shall be submitted quarterly basis.

10. The industry shall comply the all conditions of NOC issued by UP Ground Water Department.

11. The Order issued by Hon'ble Courts/Hon'ble NGT, MOEF&CC, Central Pollution Control Board, U.P. Pollution Control Board, shall be complied with.

12. Industry shall submit the latest copy of Audited Balance Sheet/C.A. Certificate (Fixed Assets + Current Assets - Current Liabilities) so that the Consent fee payable by the industry may be verified.

13. The industry must ensure to comply to the guidelines/charter issued by CPCB for Sugar industries.

14. The industry shall ensure to establish Miyawaki forest, as per the GO no. 1011/81-7-2021-09(writ)/2016 dated 13.10.2021 of Deptt. of Environment, forest and Climate Change.

15. Conditions for Molasses Storage:
i. The molasses shall be properly collected and stored in steel tank which shall be leak proof. At no stage of handling of molasses, there shall be leakage or spillage.
ii. The capacity of tank for storage of molasses shall be such that it will take care of bumper production of sugar, non-lifting of molasses etc.
iii. All the area on which molasses are stored and handled should be provided with drain for diverting the spills to the treatment plant/molasses tank. Suitable arrangements for accidental discharges of molasses from the tank shall be provided to contain the same within factory premises.
iv. Destruction of molasses and its disposal shall not be done without specific permission in writing from the authorized officer of the Board.
v. The storage tanks shall be kept in good conditions all the year around with adequate maintenance. The tanks size and capacity per cm, height, total capacity in tones shall be displayed prominently near/on the tank.

16. The industry shall ensure polluted water is not discharged in any river so that the quality of river water is not adversely affected.

17. Industry shall maintain flow meter at the Final Outlet of ETP and maintain a logbook to record its readings.

18. Industry shall install separate energy meter to record the consumption of power required for operation of STP.

19. The operation of the unit shall be done in such a manner that there is no adverse impact on the environment and public in surrounding.

20. The industry shall ensure the proper operation and maintenance of the air pollution control system in such a manner so that the emission conforms with the standards prescribed under the E(P) Act, 1986 as amended.

21. Effective operation & maintenance of all installed air pollution control equipments shall be done so that emission meets the norms/standards of CPCB and Industry shall be operated in such a manner that ambient air quality should not be adversely affected.

22. Fly Ash content shall be utilized in a scientific manner and compliance report shall be submitted to the

Board in 3 months.

23. The industry shall follow the directions issued by the Ministry of Environment Forest and Climate Change, Delhi vide Notification no. GSR 35(E) dated 14/01/2016.

24. Arrangements for collection, segregation, storage, handling and disposal of solid Waste including garbage shall be provided and maintained properly.

25. The stack monitoring report conducted by any NABL accredited lab shall be submitted to the Board on quarterly basis.

26. Any source of emission other than that mentioned in the Air consent seeking application will not be permitted by the Board. The unit shall obtain prior consents in the event of any addition of new emission generation sources such as- Boiler/ Furnace/ Heaters/ D.G. Sets or alteration of existing emission sources in accordance with section- 21/22 of air Act 1981 (as amended respectively).

27. Solid waste generated in the unit shall not be allowed for burning in open within the premises or around the unit's area as it is mandatory by the order of NGT.

28. The industry shall ensure that storage lagoon shall be barricaded and logbook shall be maintained for utilization of treated effluent.

29. Neither storm water nor discharge from other premises shall be allowed to mix with the effluents from the factory.

30. Industry to keep minimum number of fresh water taps in the sugar mill to reduce loss of water.

31. All pipe lines and vessels should be properly insulated to reduce steam consumption and water loss.

32. If closure order is issued by CPCB or UPPCB against the unit, then this CTO will remain suspended during the closure period and after ensuring the compliance and after revocation of closure order, the CTO will automatically be effective from the date of issuance of closure order revocation, with additional conditions mentioned in the closure revocation order.

33. The industry shall comply with the provisions of Environment (Protection) Act 1986, Water (Prevention and Control of Pollution) Act, 1974 as amended, Air (Prevention and Control of Pollution) Act, 1981 as amended, Plastic Waste Management Rules 2016, E- Waste (Management) Rules 2016, Solid Waste Management Rules 2016 & Hazardous and other Waste (Management and Transboundary Movement) Rules 2016 (Whichever is applicable).

RAM KARAN
Digitally signed by RAM KARAN
Date: 2024.01.17 19:11:04 +05'30'

Chief Environmental Officer,
Circle-5, UPPCB.

Copy to:

Regional Officer, UPPCB, Lucknow.

RAM KARAN Digitally signed by RAM KARAN Date: 2024.01.17 19:11:24 +05'30'

Chief Environmental Officer,
Circle-5, UPPCB.

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 प्रबंधीकरण करें
- उपयोगी शेष खाद्य सामग्री आपके स्वयं प्रयास अथवा निकटस्थ सक्रिय स्वयं सेवी संस्थाओं की सहायता से समाज के वंचित वर्ग तक पहुंचाई जा सकती है | वहीं अनुपयोगी भोजन /खाद्य सामग्री को कंपोस्ट (वर्मी कम्पोस्ट) करने से 15 अरब टन भोजन को नष्ट होने से बचाया जा सकता है
- ध्यान रखें - उपयुक्त नल और शावर के उपयोग से पानी की खपत को 30 - 40% तक कम किया जा सकता है। एवं उपयोग में न होने पर नलों को बंद रखने मात्र से 9 ट्रिलियन लीटर पानी बचाया जा सकता है
- ट्रैफिक लाइट/रेलवे क्रॉसिंग पर कार/स्कूटर के इंजन बंद करने मात्र से 22.5 बिलियन kWh तक ऊर्जा की बचत हो सकती है
- परम्परागत बल्ब के स्थान पर CFL का उपयोग बिजली की खपत में प्रभावी कमी लाते हैं | उपयोग में न होने पर बिजली उपकरणों को बंद करें | स्टार रेटेड विद्युत उपकरणों के उपयोग को प्राथमिकता दें

हमारे द्वारा अपनी जीवन शैली की प्राथमिकताओं का उचित और पर्यावरण अनुकूल पुनर्निर्धारण समाज और पर्यावरण के प्रति हमारा दायित्व है |

GROUND WATER DEPARTMENT

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

Form 8 (C)

[See Rule 8(1)]

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

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

AUTHORIZATION/ NO-OBJECTION CERTIFICATE NO: NOC020026

VALID FROM 25/07/2021 TO 24/07/2026

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

Registration No.: 202106000500

Name of the Owner	DHARMINDER SINGH		
Designation पद	Unit Head	**Company Name** कंपनी का नाम	Bajaj Energy Limited Unit Khambharkhera
Company Address कंपनी का पता	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DIST:LAKHIMPUR	**Authorization Letter** प्राधिकार पत्र	Download
Address of the Applicant	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khiri	**Application Form Serial No.**	LMPK0621NIN0024
Date of Submission	23/06/2021	**Specimen Signature**	

Location Particulars

District	Lakhimpur Kheri	**Block**	FULBEHAD
Plot No./Khasra No.	1068 , 1069	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Proposed Well and Pumping Device

Date of Construction/Sinking of the Well	15/04/2020		
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**	25.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00

Date of Energization (In Case of Electric Pump)		15/04/2020	
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

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

GENERAL CONDITIONS:

- In case of any change of ownership of the proposed well, fresh authorization has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at SL (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this authorization
- For the purpose of measuring and recording the quantity of ground water extracted, every said user shall affix digital water flow meters (conforming to BIS/ IS standards) having telemetry system in the abstraction structure, which record rate and quantum of extraction, at outlet of pumping devices and it shall be presumed that the quantity recorded by the meter has been extracted by the said user, until the contrary is proved. The rate of extraction of ground water from the well as shown in item 3(k) shall not exceed to the recorded rate from water meters
- The concerned Authority reserves the right to stop extraction of ground water from the well due to quality hazards or any other reasons, if the situation so demands
- In case of any change of ownership of the existing well, fresh registration has to be obtained.
- No change of location, design, rate of withdrawal and pumping device in respect of the existing well as indicated at Sl. (2) and (3) of this certificate shall be made without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this registration
- In case, any of the particulars 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) 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 :**07/04/2022**

Place:**Lakhimpur Kheri**

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

Annexure 13.2

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: REG045173

VALID FROM 25/07/2021 TO 24/07/2026

Registration No.: 202106000284

Name of the Owner	DHARMINDER SINGH		
Address of the Applicant	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khiri	**Application Form Serial No.**	LMPK0621RIN0033
Date of Submission	12/06/2021	**Specimen Signature**	
Company Name	Bajaj Energy Limited Unit Khambharkhera	**Company Address**	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DIST:LAKHIMPUR

Location Particulars

District	Lakhimpur Kheri	**Block**	FULBEHAD
Plot No./Khasra No.	1068 , 1069	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	15/12/2011		
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**	25.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		15/12/2011	
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:			972000.00
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	Validity of Existing NOC from CGWA is going to expire on 28.08.2021		
Against Case			

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (3) for extraction of ground water at a

rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

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) n 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.
- (8) 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.
- (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	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.
- **SPECIFIC CONDITIONS:**
- (A) **For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to Ground Water Department, Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 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 :**07/04/2022**

Place:**Lakhimpur Kheri**

This certificate is electronically generated and does not require digital signature

5580

Borewell-2 संलग्नक 13.3 138

Annexure 13.3

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: REG012934

VALID FROM 25/07/2021 TO 24/07/2026

Registration No.: 202106000377

Name of the Owner	DHARMINDER SINGH		
Address of the Applicant	Sharda Nagar Road, Village-Khambharkhera, Lakhimpur Khiri	**Application Form Serial No.**	LMPK0621RIN0034
Date of Submission	17/06/2021	**Specimen Signature**	
Company Name	Bajaj Energy Limited Unit Khambharkhera	**Company Address**	SHARDA NAGAR ROAD ,KHAMBHARKHERA , DIST:LAKHIMPUR

Location Particulars

District	Lakhimpur Kheri	**Block**	FULBEHAD
Plot No./Khasra No.	1068 , 1069	**Municipality/Corporation**	No
Ward No./Holding No.			N/A

Particular of the Existing Well and Pumping Device

Date of Construction/Sinking of the Well	15/12/2011		
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**	25.00
Operational Device	Electric Motor	**Rate of Withdrawal (m^3/hr.)**	180.00
Date of Energization (In Case of Electric Pump)		15/12/2011	
Maximum Allowable Rate of Withdrawal (m^3/hr.):	180.00	**Maximum Allowable Running Hours Per Day:**	14.00
Maximum Allowable Annual Extraction of Ground Water:			756000.00
Reason for renewal of N.O.C. एन.ओ.सी. के नवीनीकरण का कारण	Validity of Existing NOC from CGWA is going to expire on 28.08.2021		
Against Case			

This No-Objection certificate authorizes the owner applicant (user) to sink a well in the location specified at Sl. (3) for extraction of ground water at a

rate not exceeding that as shown at Sl. (3j), for Running Hours per day as shown at Sl. (3k), and for maximum allowable annual extraction of ground water as shown at Sl. (3k) and is valid subject to the observance of the conditions stated overleaf.

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) n 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.
- (8) 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.
- (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	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.
- **SPECIFIC CONDITIONS:**
- (A) **For Industrial User:** No Objection Certificate for ground water extraction by industries shall be granted subject to the following specific conditions:
- i) No Objection Certificate shall be granted only in such cases where local government water supply agencies are not able to supply the desired quantity of water.
- ii) All industries shall be required to adopt latest water efficient technologies so as to reduce dependence on ground water resources.
- iii) All industries abstracting ground water in excess of 100 m^3/d shall be required to undertake annual water audit through Confederation of Indian Industries (CII)/ Federation Indian Chamber of Commerce and Industry (FICCI)/ National Productivity Council (NPC) certified auditors and submit audit reports within three months of completion of the same to Ground Water Department, Uttar Pradesh. All such industries shall be required to reduce their ground water use by at least 20% over the next five years through appropriate means.
- iv) Construction of observation well(s) (piezometer)(s) within the premises and installation of appropriate water level monitoring mechanism as mentioned in General Condition no.10 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 :**07/04/2022**

Place:**Lakhimpur Kheri**

This certificate is electronically generated and does not require digital signature

उत्तर प्रदेश UTTAR PRADESH

FH 404762

अनापत्ति प्रमाण पत्र

मैं पूनम सरपंच ग्राम खंभार खेड़ा परगना श्रीनगर जिला– लखीमपुर खीरी (उत्तर प्रदेश) तसदीक करती हूँ कि पंचयात की सहमित से लिए गये निर्णय के अनुसार हमारे ग्राम में गाटा संख्या– 36, 256, 419, 592क, 631, 725, 780, 981, 1177, 1234 में स्थित तालाबों जिनका क्षेत्रफल– 6.0510 हेक्टेयर है, को बजाज एनर्जी लिमिटेड खंभार खेड़ा को रेन वाटर हार्वेस्टिंग व रिचार्ज के लिए अधिग्रहीत करता है । तो इस गावं की पंचायत को कोई आपत्ति नहीं है ।

मैं यह भी तसदीक करता हूँ की यह सभी तालाब किसी अन्य व्यक्ति या कंपनी को अधिग्रहित नहीं किया गया है एवं न ही भविष्य में किया जायेगा ।

पूनम

Poonam
हस्ताक्षर Poonam
Gram Panchayat-Khambhar Khera
Block-Phoolbehar-Khen

उद्धरण खतौनी

उद्धरण क्रमांक : 13644720200317

ग्राम क्रमांक : 136447 ग्राम का नाम / परगना : खम्भारखेड़ा(श्रीनगर) तहसील : लखीमपुर खीरी जनपद : खीरी फसली वर्ष : 1422-1427 भाग : 1

खाता खतौनी क्रम संख्या	खातेदार का नाम / पिता पति संरक्षक का नाम / निवास स्थान	भौमिक अधिकार प्रारम्भ होने का वर्ष	खाते के प्रत्येक गाटे की खसरा संख्या	प्रत्येक गाटे का क्षेत्रफल (हे.)	खातेदार द्वारा देय मालगुजारी या लगान	परिवर्तन सम्बन्धी आज्ञा या उसका साराश उनकी संख्या तथा दिनांक सहित और आज्ञा देने वाले अधिकारी का पद	टिप्पणी
1	2	3	4	5	6	7-12	13
श्रेणी 6-1 / अकृषिक भूमि - जलमग्न भूमि ।							
01101	तालाब / /		36	0.5300			
			256	0.6030			
			419	0.6360			
			592क	0.2550			
			631	1.6550			
			725	0.4130			
			780	0.0570			
			981	1.1490			
			1177	0.2180			
			1234	0.5350			
			10	6.0510	0.00	0	0

कुल गाटे- एक शून्य कुल क्षेत्रफल- छः दशमलव शून्य पाँच एक शून्य (हेक्टेयर) कुल भू-राजस्व - शून्य दशमलव शून्य शून्य रुपये

Data Digitally Signed by: HARI KISHOR

उद्धरण खतौनी का वेरिफिकेशन http://upbhulekh.gov.in Website पर जाकर किया जा सकता है।

सक्षम अधिकारी: VIRENDRA KUMAR MISRA
तहसील: लखीमपुर खीरी जनपद: खीरी,
दिनांक एवं समय: 12-03-2020 01:11:36
यह इलेक्ट्रानिक डिलीवरी सिस्टम द्वारा तैयार की गयी है तथा डाटा डिजीटल हस्ताक्षर द्वारा हस्ताक्षरित है।

रजिस्ट्रार कानूनगो
12 MAR 2020
तहसील-लखीमपुर-खीरी

उत्तर प्रदेश UTTAR PRADESH FH 404759

अनापत्ति प्रमाण पत्र

मैं आसरा खातून सरपंच ग्राम बसहा माफी परगना श्रीनगर जिला– लखीमपुर खीरी (उत्तर प्रदेश) तसदीक करता हूँ कि पंचयात की सहमित से लिए गये निर्णय के अनुसार हमारे ग्राम में गाटा संख्या– 197, 264, 360ड, 430क, 433क, 468, 572, 982ग, 993, 101ख , 1479, 1493 में स्थित तालाबों जिनका क्षेत्रफल– 4.2330 हेक्टेयर है, को बजाज एनर्जी लिमिटेड खंभार खेड़ा को रेन वाटर हार्वेस्टिंग व रिचार्ज के लिए अधिग्रहीत करता है । तो इस गावं की पंचायत को कोई आपत्ति नहीं है ।

मैं यह भी तसदीक करता हूँ की यह सभी तालाब किसी अन्य व्यक्ति या कंपनी को अधिग्रहित नहीं किया गया है एवं न ही भविष्य में किया जायेंगा ।

आसरा खातून
हस्ताक्षर एवं मोहर

उद्धरण खतौनी

उद्धरण क्रमांक : 136430202003250

ग्राम कमांक : 136430 ग्राम का नाम / परगना : बसहा माफी(श्रीनगर) तहसील : लखीमपुर खीरी जनपद : खीरी फसली वर्ष : 1423-1428 भाग : 1

खाता खतौनी क्रम संख्या	खातेदार का नाम / पिता पति संरक्षक का नाम / निवास स्थान	भौमिक अधिकार प्रारम्भ होने का वर्ष	खाते के प्रत्येक गाटे की खसरा संख्या	प्रत्येक गाटे का क्षेत्रफल (है.)	खातेदार द्वारा देय मालगुजारी या लगान	परिवर्तन सम्बन्धी आज्ञा या उसका सारांश उनकी संख्या तथा दिनाँक सहित और आज्ञा देने वाले अधिकारी का पद	टिप्पणी
1	2	3	4	5	6	7-12	13
श्रेणी : 6-1 / अकृषिक भूमि - जलमग्न भूमि ।							
01265	तालाब / /		197	0.1900			
			264	0.0930			
			360ड	1.9540			
			430क	0.3080			
			433क	0.2020			
			468	0.2350			
			572	0.0930			
			928ग	0.1090			
			993	0.2390			
			1019ख	0.1210			
			1479	0.2230			
			1493	0.4660			
			12	4.2330	8.40	0	0

कुल गाटे- एक दो कुल क्षेत्रफल- चार दशमलव दो तीन तीन शून्य (हेक्टेयर) कुल भू-राजस्व - आठ दशमलव चार शून्य रुपये

Data Digitally Signed by: HARI KISHOR

उक्त उद्धरण खतौनी का वेरिफिकेशन http://upbhulekh.gov.in Website पर जाकर किया जा सकता है।

सक्षम अधिकारी: VIRENDRA KUMAR MISRA
तहसील: लखीमपुर पद: खीरी
दिनांक: 12-03-2020 01:10:30
यह उद्धरण खतौनी इलेक्ट्रॉनिक डिलीवरी सिस्टम द्वारा तैयार की गयी है तथा डाटा डिजीटल हस्ताक्षर द्वारा हस्ताक्षरित है।

रजिस्ट्रार कानूनगो
12 MAR 2020
तहसील–लखीमपुर–खीरी

उत्तर प्रदेश UTTAR PRADESH FH 404760

अनापत्ति प्रमाण पत्र

मैं राजेश कुमार वर्मा सरपंच ग्राम पतरासी परगना श्रीनगर जिला– लखीमपुर खीरी (उत्तर प्रदेश) तसदीक करता हूँ । कि पंचयात की सहमित से लिए गये निर्णय के अनुसार हमारे ग्राम में गाटा संख्या– 29मि, 30, 32मि, 54, 77क, 100, 102, 189, 202क, 207, 213, 251, 395, 651ख, 782क में स्थित तालाबों जिनका क्षेत्रफल– 2.6130 हेक्टेयर है, को बजाज एनर्जी लिमिटेड खंभार खेड़ा को रेन वाटर हार्वेस्टिंग व रिचार्ज के लिए अधिग्रहीत करता है । तो इस गावं की पंचायत को कोई आपत्ति नहीं है ।

मैं यह भी तसदीक करता हूँ की यह सभी तालाब किसी अन्य व्यक्ति या कंपनी को अधिग्रहित नहीं किया गया है एवं न ही भविष्य में किया जायेगा ।

हस्ताक्षर एवं मोहर

उद्धरण खतौनी

उद्धरण क्रमांक : 1364722020035

ग्राम कमांक : 136472 ग्राम का नाम / परगना : पतरासी(श्रीनगर) तहसील : लखीमपुर खीरी जनपद : खीरी फसली वर्ष : 1425-1430 भाग : 1

खाता खतौनी क्रम संख्या	खातेदार का नाम / पिता पति संरक्षक का नाम / निवास स्थान	भौमिक अधिकार प्रारम्भ होने का वर्ष	खाते के प्रत्येक गाटे की खसरा संख्या	प्रत्येक गाटे का क्षेत्रफल (हे.)	खातेदार द्वारा देय मालगुजारी या लगान	परिवर्तन सम्बन्धी आज्ञा या उसका साराश उसकी संख्या तथा दिनांक सहित और आज्ञा देने वाले आधिकारी का पद	टिप्पणी
1	----------2----------	3	4	5	6	7-12	13
श्रेणी : 6-1 / अकृषिक भूमि - जलमग्न भूमि ।							
00437	तालाब / /		29मि	0.1420			
			30	0.0320			
			32मि.	0.1420			
			54	0.0490			
			77क	0.1090			
			100	0.0810			
			102	0.0240			
			189	0.2480			
			202क	0.0570			
			207	0.0610			
			213	0.4700			
			251	0.0730			
			395	0.0280			
			651ख	0.0490			
			782क	1.0480			
			15	2.6130	0.00	0	0

कुल गाटे- एक पाँच कुल क्षेत्रफल- दो दशमलव छः एक तीन शून्य (हेक्टेयर) कुल भू-राजस्व - शून्य दशमलव शून्य शून्य रुपये

Data Digitally Signed by: VIRENDRA KUMAR MISHRA

उक्त उद्धरण खतौनी को वेबसाईट http://upbhulekh.gov.in Website पर जाकर देखा जा सकता है।

VIRENDRA KUMAR MISRA
खीरी जनपद: खीरी
दिनांक एवं समय: 12-03-2020 01:10:47
खतौनी इलेक्ट्रॉनिक डिलिवरी सिस्टम द्वारा तैयार की गयी है तथा डाटा डिजीटल हस्ताक्षर द्वारा हस्ताक्षरित है।

12 MAR 2020
तहसील–लखीमपुर–खीरी

12-Mar-20, 1:10 PM

5588

146

उत्तर प्रदेश UTTAR PRADESH

FH 404757

अनापत्ति प्रमाण पत्र

मैं हरिकृष्णपाल सरपंच ग्राम तेतारपुर परगना श्रीनगर जिला– लखीमपुर खीरी (उत्तर प्रदेश) तसदीक करती हूँ कि पंचयात की सहमित से लिए गये निर्णय के अनुसार हमारे ग्राम में गाटा संख्या– 593, 596, 615, 949ख, 1084, 1326, 1769मि, 1813, 1818, 1818/1, 1769/1 में स्थित तालाबों जिनका क्षेत्रफल– 2.4920 हेक्टेयर है, को बजाज एनर्जी लिमिटेड खंभार खेड़ा को रेन वाटर हार्वेस्टिंग व रिचार्ज के लिए अधिग्रहीत करता है । तो इस गावं की पंचायत को कोई आपत्ति नहीं है ।

मैं यह भी तसदीक करता हूँ की यह सभी तालाब किसी अन्य व्यक्ति या कंपनी को अधिग्रहित नहीं किया गया है एवं न ही भविष्य में किया जायेगा । हरिकिशन पाल

हरिकिशन पाल
प्रधान
ग्राम पंचायत–तेतारपुर
हस्ताक्षर एवं मोहर

उद्धरण खतौनी

उद्धरण क्रमांक : 136444202003498

ग्राम कमांक : 136444 ग्राम का नाम / परगना : तेंदारपुर(श्रीनगर) तहसील : लखीमपुर खीरी जनपद : खीरी फसली वर्ष : 1423-1428 भाग : 1

खाता खतौनी क्रम संख्या	खातेदार का नाम / पिता पति संरक्षक का नाम / निवास स्थान	भौमिक अधिकार प्रारम्भ होने का वर्ष	खाते के प्रत्येक गाटे की खसरा संख्या	प्रत्येक गाटे का क्षेत्रफल (हे.)	खातेदार द्वारा देय मालगुजारी या लगान	परिवर्तन सम्बन्धी आज्ञा या उसका सारांश उनकी संख्या तथा दिनाँक सहित और आज्ञा देने वाले अधिकारी का पद	टिप्पणी
1	2	3	4	5	6	7-12	13
श्रेणी : 6-1 / अकृषिक भूमि - जलमग्न भूमि ।							
01465	तालाब / /		593	0.0400			
			596	0.3720			
			615	0.2750			
			949ख	0.0200			
			1084	0.2430			
			1326	0.2710			
			1769मि	0.2000			
			1813	0.1050			
			1818	0.4570			
			1818/1	0.3040			
			1769/1	0.2050			
			11	2.4920	0.00	0	0

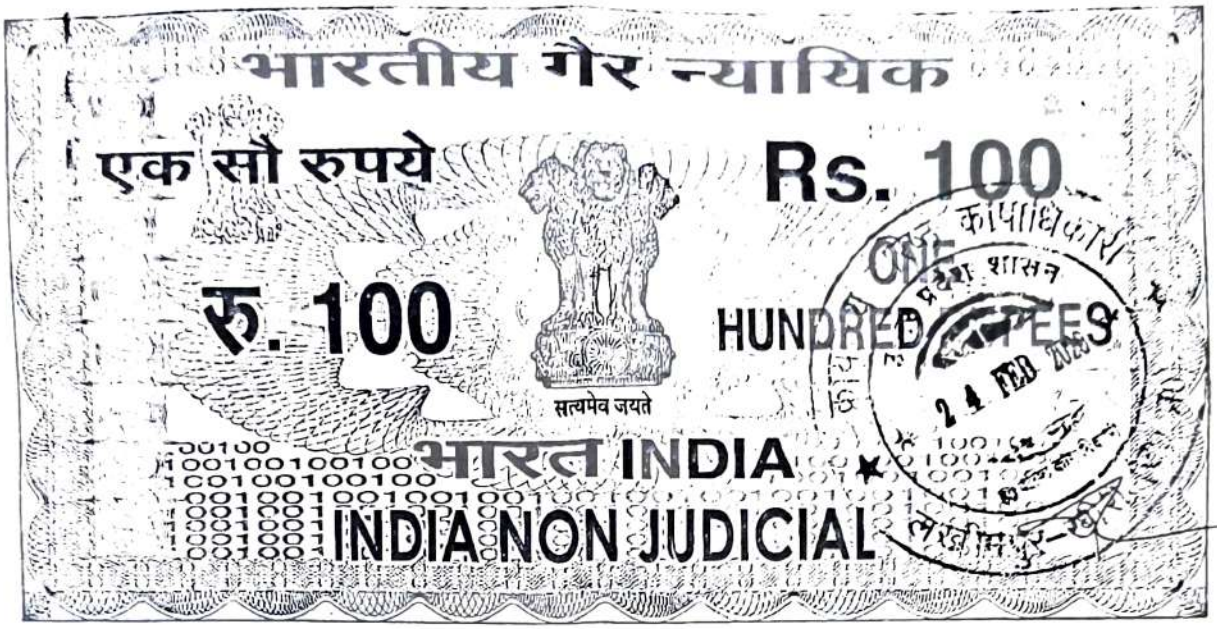
कुल गाटे- एक एक कुल क्षेत्रफल- दो दशमलव चार नौ दो शून्य (हेक्टेयर) कुल भू-राजस्व - शून्य दशमलव शून्य शून्य शून्य रुपये

Data Digitally Signed by: HARI KISHOR

सक्षम अधिकारी: VIRENDRA KUMAR MISRA
तहसील: लखीमपुर खीरी जनपद: खीरी
दिनांक एवं समय: 12-03-2020 01:11:20
यह उद्धरण खतौनी इलेक्ट्रॉनिक डिलीवरी सिस्टम द्वारा तैयार की गयी है तथा डाटा डिजीटल हस्ताक्षर द्वारा हस्ताक्षरित है।

राजस्व कानूनगो
12 MAR
तहसील-लखीमपुर-खीरी

उक्त उद्धरण खतौनी का वेरीफिकेशन http://upbhulekh.gov.in Website पर करके किया जा सकता है।



उत्तर प्रदेश UTTAR PRADESH FH 404761

अनापत्ति प्रमाण पत्र

मैं नगमा बानो सरपंच ग्राम गौरा परगना श्रीनगर जिला– लखीमपुर खीरी (उत्तर प्रदेश) तसदीक करती हूँ । कि पंचयात की सहमित से लिए गये निर्णय के अनुसार हमारे ग्राम में गाटा संख्या– 207ख, 220, 222, 608ख, 825, 838, 844, 847, 949ख, 1262, 1263, 1271, 1404, 1493, 1519, 1528 में स्थित तालाबों जिनका क्षेत्रफल– 3.4860 हेक्टेयर है, को बजाज हिन्दुस्थान एनर्जी खंभार खेड़ा को रेन वाटर हार्वेस्टिंग व रिचार्ज के लिए अधिग्रहीत करता है । तो इस गावं की पंचायत को कोई आपत्ति नहीं है ।

मैं यह भी तसदीक करता हूँ की यह सभी तालाब किसी अन्य व्यक्ति या कंपनी को अधिग्रहित नहीं किया गया है एवं न ही भविष्य में किया जायेगा ।

नगमा बानो
प्रधान
हस्ताक्षर एवं मोहर

उद्धरण खतौनी

उद्धरण क्रमांक : 136425202003341

ग्राम क्रमांक : 136425 ग्राम का नाम / परगना : गौरा(श्रीनगर) तहसील : लखीमपुर खीरी जनपद : खीरी फसली वर्ष : 1427-1432 भाग : 1

खाता खतौनी क्रम संख्या	खातेदार का नाम / पिता पति संरक्षक का नाम / निवास स्थान	भौमिक अधिकार प्रारम्भ होने का वर्ष	खाते के प्रत्येक गाटे की खसरा संख्या	प्रत्येक गाटे का क्षेत्रफल (हे.)	खातेदार द्वारा देय मालगुजारी या लगान	परिवर्तन सम्बन्धी आज्ञा या उसका सारांश उनकी संख्या तथा दिनाँक सहित और आज्ञा देने वाले अधिकारी का पद	टिप्पणी
1	——————————2——————————	3	4	5	6	7-12	13
श्रेणी : 6-1 / अकृषिक भूमि - जलमग्न भूमि ।							
00905	तालाब / /		207ख	0.0650			
			220	0.2180			
			222	0.1820			
			608ख	0.8660			
			825	0.0570			
			838	0.0930			
			844	0.0320			
			847	0.0570			
			949ख	0.0890			
			1262	0.3040			
			1263	0.0080			
			1271	0.0530			
			1404	0.1300			
			1493	1.2710			
			1519	0.0490			
			1528	0.0120			
			16	3.4860	0.00	0	0

कुल गाटे- एक ह. कुल क्षेत्रफल- तीन दशमलव चार आठ छ: शून्य (हेक्टेयर) कुल भू-राजस्व - शून्य दशमलव शून्य शून्य रुपये

Data Digitally Signed by: VIRENDRA KUMAR MISHRA

रजिस्ट्रार कानूनगो
Digitally signed by: VIRENDRA KUMAR MISRA
तहसील: लखीमपुर खीरी जनपद: खीरी
दिनांक एवं समय: 12-03-2020 01:11:05
12 MAR 2020
तहसील–लखीमपुर–खीरी

5592

150

उत्तर प्रदेश UTTAR PRADESH FH 404763

अनापत्ति प्रमाण पत्र

मैं शमशुन निशां सरपंच ग्राम ओदरहना परगना श्रीनगर जिला– लखीमपुर खीरी (उत्तर प्रदेश) तसदीक करती हूँ कि पंचयात की सहमित से लिए गये निर्णय के अनुसार हमारे ग्राम में गाटा संख्या– 10, 98, 278, 471, 534, 602, 690, 705, 709, 843, 1052, 627/1065, में स्थित तालाबों जिनका क्षेत्रफल– 2.990 हेक्टेयर है, को बजाज एनर्जी लिमिटेड खंभार खेड़ा को रेन वाटर हार्वेस्टिंग व रिचार्ज के लिए अधिग्रहीत करता है । तो इस गावं की पंचायत को कोई आपत्ति नहीं है ।

मैं यह भी तसदीक करता हूँ की यह सभी तालाब किसी अन्य व्यक्ति या कंपनी को अधिग्रहित नहीं किया गया है एवं न ही भविष्य में किया जायेगा ।

हस्ताक्षर शमशुन निशां
ग्राम पंचायत–ओदरहना
वि० क्षे० पलवेहट–खीरी

उद्धरण खतौनी

उद्धरण क्रमांक : 136396202003191

ग्राम कथाक : 136396 ग्राम का नाम / परगना : ओदरहना(श्रीनगर) तहसील : लखीमपुर खीरी जनपद : खीरी फसली वर्ष : 1423-1428 भाग : 1

खाता खतौनी क्रम संख्या	खातेदार का नाम / पिता पति संरक्षक का नाम / निवास स्थान	भौमिक अधिकार प्रारम्भ होने का वर्ष	खाते के प्रत्येक गाटे की खसरा संख्या	प्रत्येक गाटे का क्षेत्रफल (हे.)	खातेदार द्वारा देय मालगुजारी या लगान	परिवर्तन सम्बन्धी आज्ञा या उसका माराश उनकी संख्या तथा दिनाँक सहित और आज्ञा देने वाले आधिकारी का पद	टिप्पणी
1	——————————2——————————	3	4	5	6	7-12	13
श्रेणी : 6-1 / अकृषिक भूमि - जलप्लव भूमि ।							
00706	तालाब / /		10	0.1130			
			98	0.0450			
			278	0.1780			
			471	0.4370			
			534	0.2630			
			602	0.3200			
			690	0.1980			
			705	0.5220			
			709	0.6230			
			843	0.1170			
			1052	0.1250			
			627/1065	0.0490			
			12	2.9900	0.00	0	0

कुल गाटे- एक दो कुल क्षेत्रफल- दो दशमलव नौ नौ शून्य शून्य (हेक्टेयर) कुल भू-राजस्व - शून्य दशमलव शून्य शून्य रुपये

Data Digitally Signed by: HARI KISHOR

सक्षम अधिकारी: VIRENDRA KUMAR MISRA
तहसील: लखीमपुर खीरी जनपद: खीरी
दिनांक: 12-03-2020 01:12:16

रजिस्ट्रार कानूनगो
12 MAR
तहसील-लखीमपुर-खीरी

यह उद्धरण खतौनी इलेक्ट्रॉनिक डिलीवरी सिस्टम द्वारा तैयार की गयी है तथा डाटा डिजीटल हस्ताक्षर द्वारा हस्ताक्षरित है।

सत्यापन उद्धरण खतौनी का वेरिफिकेशन http://upbhulekh.gov.in Website पर जाकर किया जा सकता है।

5594

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उत्तर प्रदेश UTTAR PRADESH FH 404758

अनापत्ति प्रमाण पत्र

मैं ~~माधवी~~ अनुजा चौधरी गुप्ता सरपंच ग्राम बडागावं परगना श्रीनगर जिला– लखीमपुर खीरी (उत्तर प्रदेश) तसदीक करती हूँ कि पंचयात की सहमित से लिए गये निर्णय के अनुसार हमारे ग्राम में गाटा संख्या– 627, 1193, 1195, 1361, 2115, 2116ख, 2459, 2483, 2567, 2585,2588, 2591, 2593, 2595, 2601, 2606, 2607, 2645, 2662, 2683, 2715, 2727, 2760, 3128, 3141, 3342, 2572, 2185क में स्थित तालाबों जिनका क्षेत्रफल– 5.1540 हेक्टेयर है, को बजाज एनर्जी लिमिटेड खंभार खेड़ा को रेन वाटर हार्वेस्टिंग व रिचार्ज के लिए अधिग्रहीत करता है । तो इस गावं की पंचायत को कोई आपत्ति नहीं है ।

मैं यह भी तसदीक करता हूँ की यह सभी तालाब किसी अन्य व्यक्ति या कंपनी को अधिग्रहित नहीं किया गया है एवं न ही भविष्य में किया जायेगा ।

अनुजा चौधरी
प्रधान
ग्राम पचायत बडागाँव
विकास खण्ड एकडा-खीरी

उद्धरण खतौनी

उद्धरण क्रमांक : 13647620200352

ग्राम क्रमांक : 136476 ग्राम का नाम / परगना : बड़ागाँव(श्रीनगर) तहसील : लखीमपुर खीरी जनपद : खीरी फसली वर्ष : 1423-1428 भाग : 1

खाता खतौनी क्रम संख्या	खातेदार का नाम / पिता पति संरक्षक का नाम / निवास स्थान	भौमिक अधिकार प्रारम्भ होने का वर्ष	खाते के प्रत्येक गाटे की खसरा संख्या	प्रत्येक गाटे का क्षेत्रफल (हे.)	खातेदार द्वारा देय मालगुजारी या लगान	परिवर्तन सम्बन्धी आज्ञा या उसका सारांश उनकी संख्या तथा दिनांक सहित और आज्ञा देने वाले आधिकारी का पद	टिप्पणी
1	2	3	4	5	6	7-12	13
श्रेणी : 6-1 / अकृषिक भूमि - जलमग्न भूमि ।							
02284	तालाब / /		627	0.3600			
			1193	0.1660			
			1195	0.4130			
			1361	0.0400			
			2115	0.1460			
			2116ख	0.0450			
			2459	0.1540			
			2483	0.3120			
			2567	0.0890			
			2585	0.1130			
			2588	0.2060			
			2591	0.1050			
			2593	0.0890			
			2595	0.0730			
			2601	0.4210			
			2606	0.2310			
			2607	0.1210			
			2645	0.1250			
			2662	0.0650			
			2683	0.0930			
			2715	0.1460			

रजिस्ट्रार कानूनगो
12 MAR
तहसील- लखीमपुर

	2727.	0.0570			
	2760	0.3480			
	3128	0.0490			
	3141	0.0650			
	3342.	0.1010			
	2572	0.3080			
	2185क	0.7130			
	28	5.1540	0.00	0	0

कुल गाटे- दो अठ कुल क्षेत्रफल- पाँच दशमलव एक पाँच चार शून्य (हेक्टेयर) कुल प्र-राजस्व - शून्य दशमलव शून्य शून्य रुपये

Data Digitally Signed by: HARI KISHOR

उपरोक्त अभिलेख खतौनी का वेरीफिकेशन http://upbhulekh.gov.in Website पर जाकर किया जा सकता है।

सक्षम अधिकारी: VIRENDRA KUMAR MISRA
तहसील: लखीमपुर खीरी जनपद: खीरी
दिनांक एवं समय: 12-03-2020 01:11:54
यह अभिलेख खतौनी इलेक्ट्रॉनिक डिलीवरी सिस्टम द्वारा तैयार की गयी है तथा डाटा डिजीटल हस्ताक्षर द्वारा हस्ताक्षरित है।

रजिस्ट्रार कानूनगो
17 MAR 2020
तहसील-लखीमपुर-खीरी

5597

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Annexure 15

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
(Khambharkhera Plant)
Sharda Nagar Road, Khambharkhera
Dist.- Lakhimpur Khiri- 261506, U.P

BY

PHD Chamber of Commerce and Industry
PHD House, 4/2 Siri Institutional Area
August Kranti Marg, New Delhi-110016
Email: sustainability@phdcci.in
Website: www.phdcci.in

Nov' 2023

PHD CHAMBER
OF COMMERCE AND INDUSTRY
VOICE OF INDUSTRY AND TRADE

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LIST OF FIGURES

PHD CHAMBER
OF COMMERCE AND INDUSTRY
VOICE OF INDUSTRY AND TRADE

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, Khambharkhera Unit, Lakhimpur Kheri in line with CGWA Notification dated 24/09/2020.

We are grateful to Dr. Amitosh Verma (Vice President- EHS), Mr. Parag Bajpai (Energy Manager-Khambharkhera), 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)

PHD CHAMBER
OF COMMERCE AND INDUSTRY
VOICE OF INDUSTRY AND TRADE

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, Khambharkhera 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

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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, Khambharkhera 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 31/07/2023 to 01/08/2023.

Project Title:		**PHDCCI Report Number:**
Water Audit at M/s Bajaj Energy Limited, Khambharkhera Unit Sharda Nagar Road, Khambharkhera, Dist.- Lakhimpur Khiri-261506, U.P.		2023-24/PHDCCI/S/W/009
Client:		
M/s Bajaj Energy Limited		
Contact Person:		
Dr. Amitosh Verma (Vice President- EHS)		
Date of Audit:		**Source of Water:**
31/07/2023 to 01/08/2023		Groundwater
Date of this Report:		**Date of Approval:**
06/11/2023		12/01/2024
Work Carried out by: *(Team Composition)*	Mohit Kumar Team Leader Pushpendra Yadav Team Member Rajendra Prasad Varma Team Member Akhilesh Yadav Team Member	No Distribution without permission from the client or responsible organization or unit
Final Report Approved:	 	
	Dr. Ranjeet Mehta **(Executive Director, PHDCCI)**	Date: 12/01/2024

M/s Bajaj Energy Limited (BEL), Khambharkhera Unit has been granted NOC/permission from Ground Water Department (Namami Gange & Rural Water Supply Department), Ministry of Jal Shakti, Govt. of Uttar Pradesh to abstract ground water for industrial purpose through 3 Nos. of Borewells. As per GWD, Govt. of U.P, Borewell 1,2&3 are having rated capacity of 30 HP with discharge capacity of 180m3/hr. the running hrs. of each pump shall not be exceeded by 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 543749m3/year (1812m3/day), 608891m3/year (2030m3/day) & 749858m3/year (2500m3/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 4092m3/day. Out of total, Fresh water through borewells are about 3729m3/day (91%) and ETP Treated Water is about 362m3/day (9%). **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 7.6m3 (0.2%), CT Makeup is around 3687m3 (90.1%), Boiler Makeup is around 17m3 (0.4%), WTP- RO Reject, Backwash & Regeneration is around 17.5m3 (0.4%). The treated water consuming areas are Firefighting of around 25m3 (0.6%), Ash quenching is around 72m3 (1.8%), Horticulture/Gardening is about 25m3 (0.6%), Coal Yard is around 91m3 (2.2%), Road dust suppression/sprinkling is around 54m3 (1.3%) & Balanced ETP treated water is stored in Reservoir or supplied to farmers for irrigation is about 94m3 (2.3%).

As per GWD, U.P NOC, M/s Bajaj Energy Limited (BEL), Khambharkhera 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**. Team also noticed tapping point before flowmeter at Borewell 3. Variation in flowmeter meter reading was also observed in Borewell No 3. Secondly, flowmeter reading of Borewell 1 & Borewell 2 not clearly visible because of moisture. It is recommended that flowmeter has to be installed before any tapping point.** Also, Flowmeter calibration/replacement is being recommended.
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), Khambharkhera 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), Khambharkhera 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. However, Team noticed variation in display system of Piezometer 2 w.r.t measured manual reading. Thus, calibration of 2nd display system is recommended. Additional bore has been noticed which is being used for manual recording. Thus, it is recommended to close all the bores other than piezometer else converted into RWH structure.

As per GWD, U.P NOC, M/s Bajaj Energy Limited (BEL), Khambharkhera Unit, has to install Rooftop Rain water harvesting structures in the premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the plant, if industry likely to pollute ground water.
Presently, Plant has installed 3Nos. of RWH structures within plant premises each with installed capacity of 30m3, 16m3 & 20m3 respectively. Out of 3 RWH structure, 1RWH structure near TG Building is having provision to augment the groundwater recharge through the generated runoff from TG Rooftop area & storm water line. Balance 2 RWH structure connected with storm water line. 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, Plant has adopted and maintained 7 Ponds namely referenced as RWH 1 (Gross storage: 126990m3), RWH 2 (Gross storage: 78390m3), RWH 3 (Gross storage: 74760m3), RWH 4 (Gross storage: 104580m3), RWH 5 (Gross storage: 181530m3), RWH 6 (Gross storage: 89700m3) & RWH 7 (154620m3) respectively; which is used to augment the ground water resources of the area and has also undertake periodic maintenance of recharge structure at their own cost. Thus, groundwater recharge from recharge ponds constructed in the area has been calculated as per GEC-2015 guidelines is about 486342m3/year.

M/s Bajaj Energy Limited (BEL), Khambharkhera Unit, has been granted Consent to Operate (CTO) issued by Uttar Pradesh Pollution Control Board vide Ref No.- 140717/**UPPCB/Lucknow(UPPCBRO)/CTO/water/LAKHIMPUR KHIRI/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 362m3/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), Khambharkhera 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	235542	254314	407768
2	Borewell 2	m3/year	308207	289896	293272
3	Borewell 3	m3/year	0	64681	48818
4	**Total Ground Water Abstraction, A**	**m3/year**	**543749**	**608891**	**749858**
5	**Domestic**	m3/year	**1058**	**1965**	**1762**
6	**Industrial**	m3/year	**542691**	**606926**	**748096**
7	ETP Treated Water, B	m3/year	41335	52933	51383
8	No. of Working days, C	Nos./year	300	300	300
9	**Ground water abstraction per day, D= (A/C)**	**m3/day**	**1812**	**2030**	**2500**
10	**ETP treated water per day, E= (B/C)**	**m3/day**	**138**	**176**	**171**
11	Production (Generation), F	MU/year	188.08	199.934	262.146
12	**Specific Water Consumption (SWC) of Power Generation, G= [A/(F X 1000)]**	**m3/MWh**	**2.89**	**3.05**	**2.86**

**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*

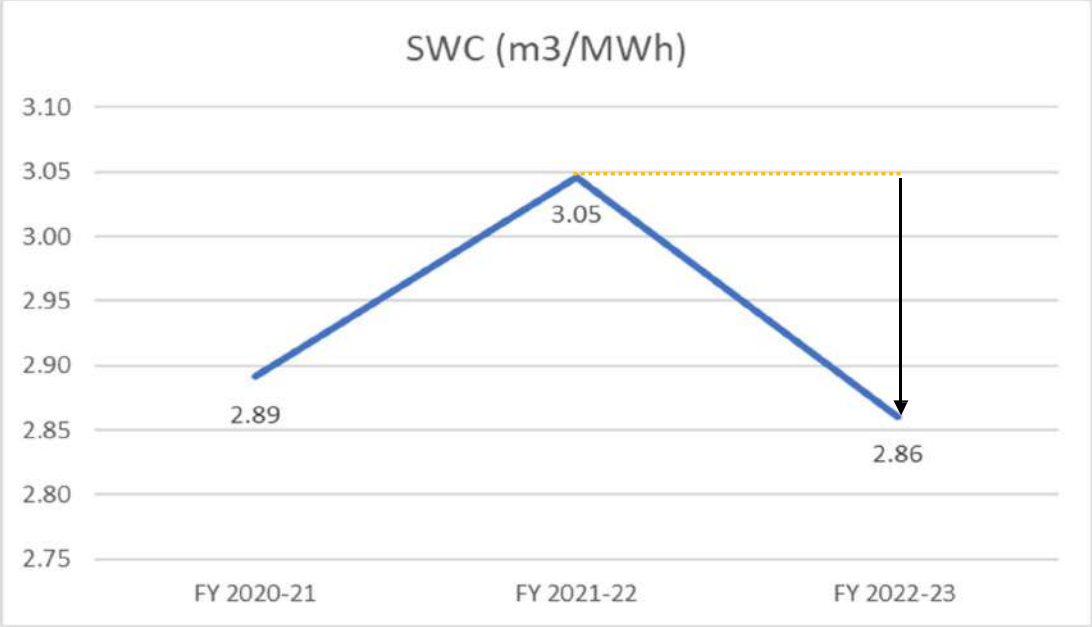


Figure: Specific water consumption per Unit of Power Generation (m3/MWh)

Thus, Specific water consumption of Power Plant are found to be in accordance with guidelines of MoEF i.e. below 3.5 m3/MWh for Power plant for existing system.

In response to growing concern over water shortage and its economic impact on plants, the Ministry of Environment, Forest and Climate Change (MoEF & CC) published the rules listed below on 7 December 2015 (MoEF & CC, 2015):

- All thermal power plants with once-through cooling[5] are expected to install cooling towers and to achieve specific water consumption[6] of 3.5 m^3 per megawatt-hour (MWh) by December 2017 (within two years of notification).
- All existing plants using cooling towers shall reduce specific water consumption down to a maximum of 3.5 m^3/MWh by December 2017 (within a period of two years of notification).
- New plants installed after 1 January 2017 must meet specific water consumption of 2.5 m^3/MWh and achieve zero water discharge.[7]

Following are the initiatives

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 3Nos. of RWH structures within plant premises each with installed capacity of 30m3, 16m3 & 20m3 respectively. Out of 3 RWH structure, 1RWH structure near TG Building is having provision to augment the groundwater recharge through the generated runoff from TG Rooftop area & storm water line. Balance 2 RWH structure connected with storm water line. In addition, Plant has adopted and maintained 7 Ponds namely referenced as RWH 1 (Gross storage: 126990m3), RWH 2 (Gross storage: 78390m3), RWH 3 (Gross storage: 74760m3), RWH 4 (Gross storage: 104580m3), RWH 5 (Gross storage: 181530m3), RWH 6 (Gross storage: 89700m3) & RWH 7 (154620m3) respectively; which is used to augment the ground water resources of the area and has also undertake periodic maintenance of recharge structure at their own cost. Thus, groundwater recharge from recharge ponds constructed in the area has been calculated as per GEC-2015 guidelines is about 486342m3/year. Team noticed; Rooftop, Road/paved area, Open land & green belt runoff available from the plant is about 3140 m3/year, 27144 m3/year & 36783 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.	4.3	1570
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 64m3/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 14m3/day treated water used in backwash of filters & around 10m3/day used nearby area through pipe.	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.	40	12000
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. Variation in flowmeter meter reading was observed in Borewell No 3. Secondly, flowmeter reading of Borewell 1 & Borewell 2 not clearly visible because of moisture.	It is suggested to maintain the system by calibrating DWFM once in a year. It is also recommended to calibrate/replace the flowmeter wherever needed.		
Maintain logbook of daily	It was noticed that the plant is maintaining data of daily groundwater	It is suggested to maintain the system.		

Description	Key Observations	Recommendations	Water savings (m3)/ day	Annual water savings (m3)/ year
groundwater abstraction	abstraction & reuse of recycled water.			
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 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)	During onsite assessment, digital water level recorder was found operational and record of monitoring of piezometer data is maintained by the plant. Team noticed variation in display system of Piezometer 2 w.r.t measured manual reading.	Calibration of Piezometer 2 display system is recommended.		
	Total Water consumed within Plant (Ground water + ETP Treated Water)		**4092 m3/day**	
	Total Ground water abstracted for industrial use		**3729 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		**53% {47% below of withdrawal limit)**	
	Total Fresh water savings potential		44.3 m3/day	
	Thus, Total Fresh water savings in Plant by implementation of measures		1.2%	

Remarks: It is estimated that by implementing suggested schemes, M/s Bajaj Energy Limited (BEL), Khambharkhera Unit can reduce its freshwater water consumption by about 44.3m3/day (1.2%).

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, Khambharkhera 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), Khambharkhera 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, Khambharkhera 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, Khambharkhera 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, Khambharkhera Unit.

1.3 Brief Description about the plant:

M/s Bajaj Energy Limited, Khambharkhera Unit has installed 90 MW (2 X 45MW) Power Plant with Water Cooled condenser for Power Plant. BEL has commissioned Unit #1 in year 15th Dec 2011 & Unit #2 in year 10th March 2012.

Khambharkhera 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 Khambharkhera Unit is shown below;

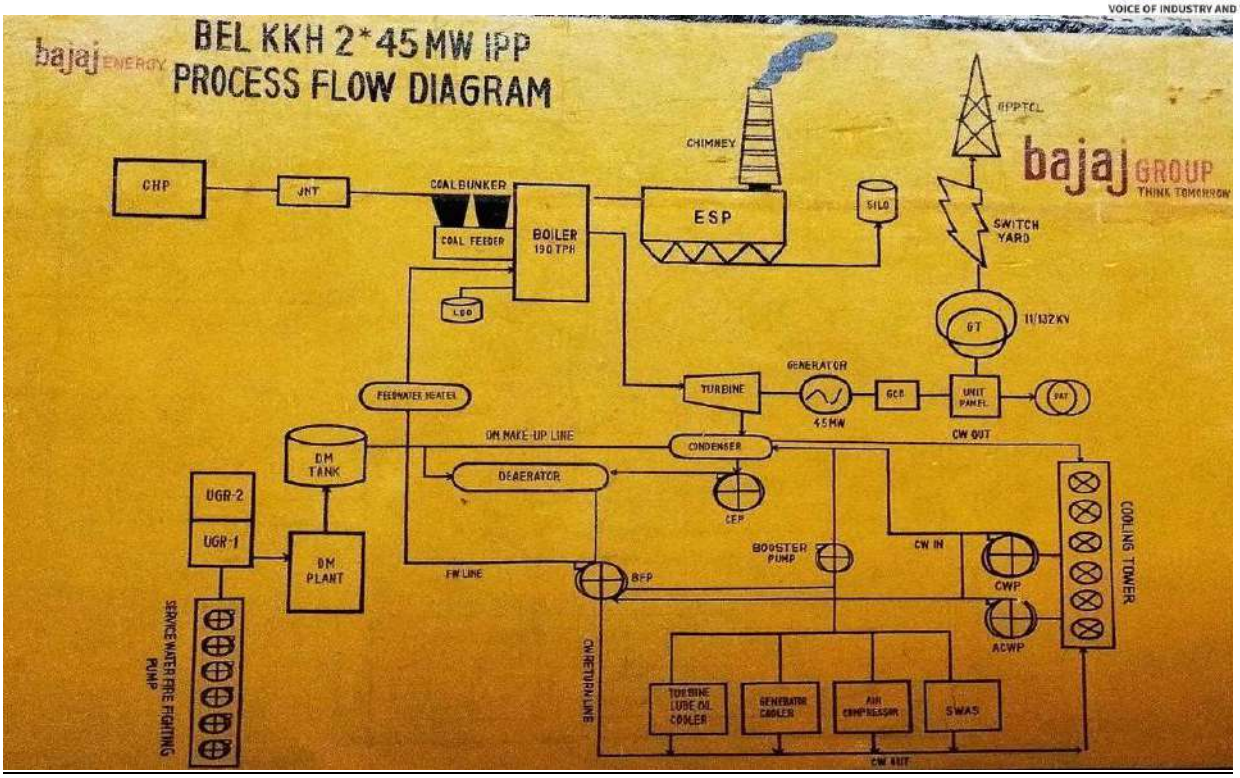


Figure 1: Process Flow chart & Location of Plant

CHAPTER 2

Scope of Work

2. SCOPE OF WORK

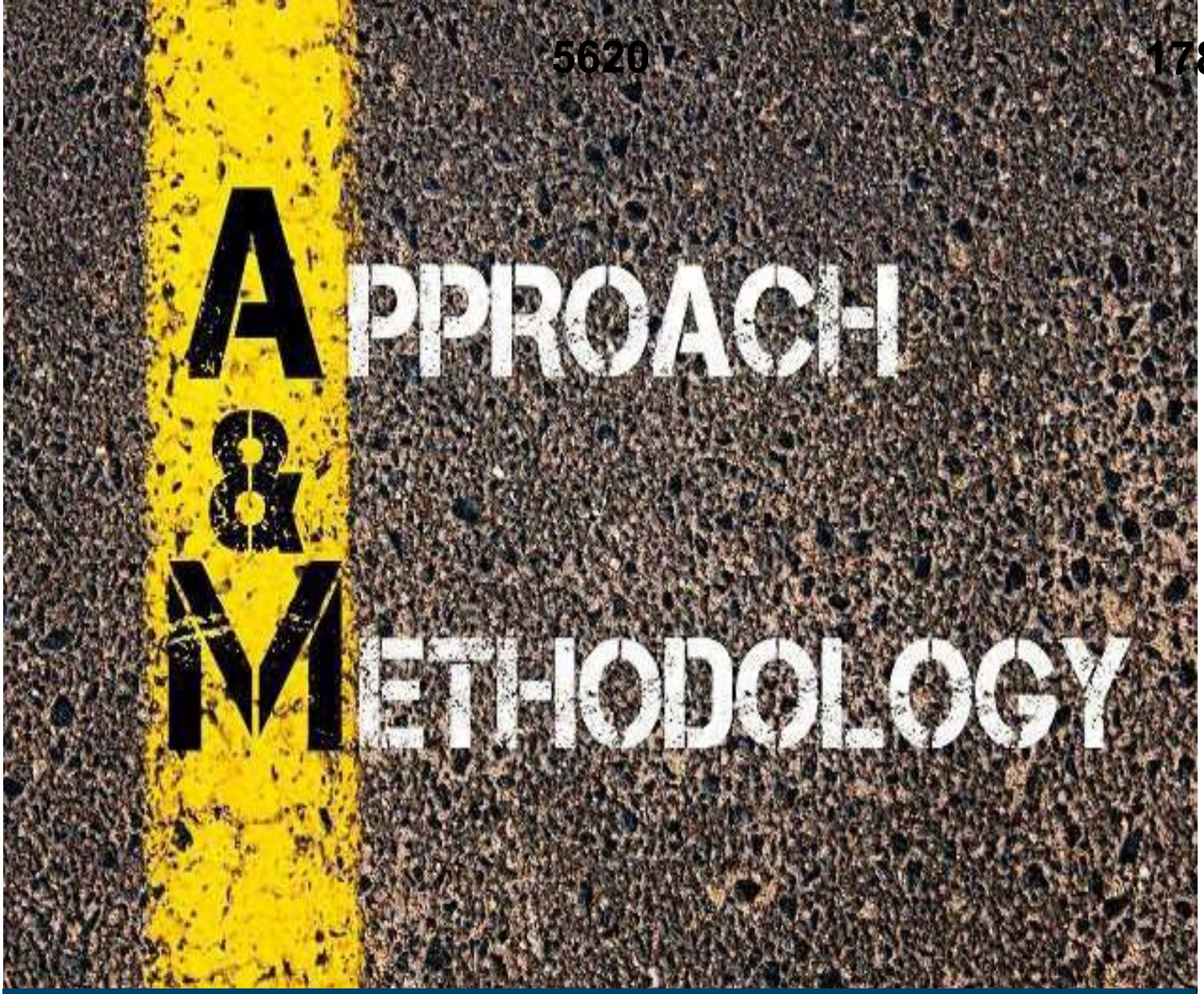
The main objective of the study was to identify the water uses & water saving opportunities and to demonstrate water conservation at BEL, Khambharkhera Unit. Scope of work of the study includes the following:

- 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, Khambharkhera 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, Khambharkhera Unit. PHDCCI team visited plant on 31/07/2023 to 01/08/2023 for the field measurement and conducting the audit. The broad methodology adopted for the Water Audit at BEL, Khambharkhera 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, Khambharkhera Unit is furnished below.

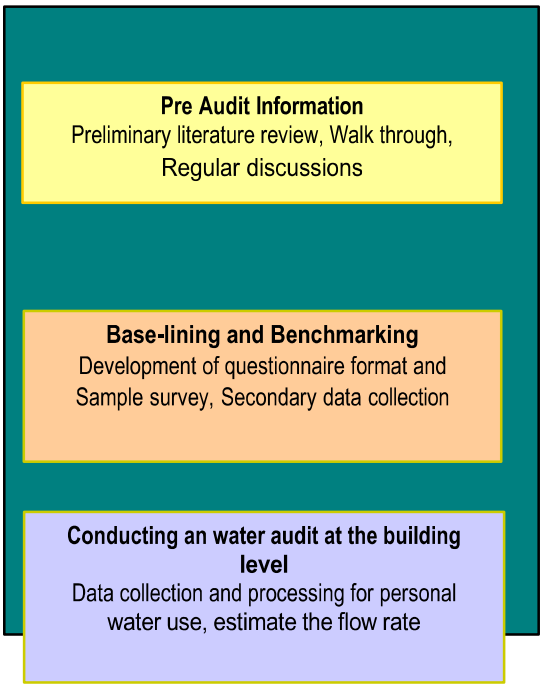
3.1 Pre Audit Information

- 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.
- Last Audit Report

3.2 Establishing baseline and benchmarking

The water audit for Bajaj Energy Limited, Khambharkhera 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 Jagdamba Power 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, Khambharkhera 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), Khambharkhera Unit has been granted NOC/permission from Ground Water Department (Namami Gange & Rural Water Supply Department), Ministry of Jal Shakti, Govt. of Uttar Pradesh to abstract ground water for industrial purpose through 3 Nos. of Borewells. As per GWD, Govt. of U.P, Borewell 1,2&3 are having rated capacity of 30 HP with discharge capacity of 180m3/hr. the running hrs. of each pump shall not be exceeded by 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:

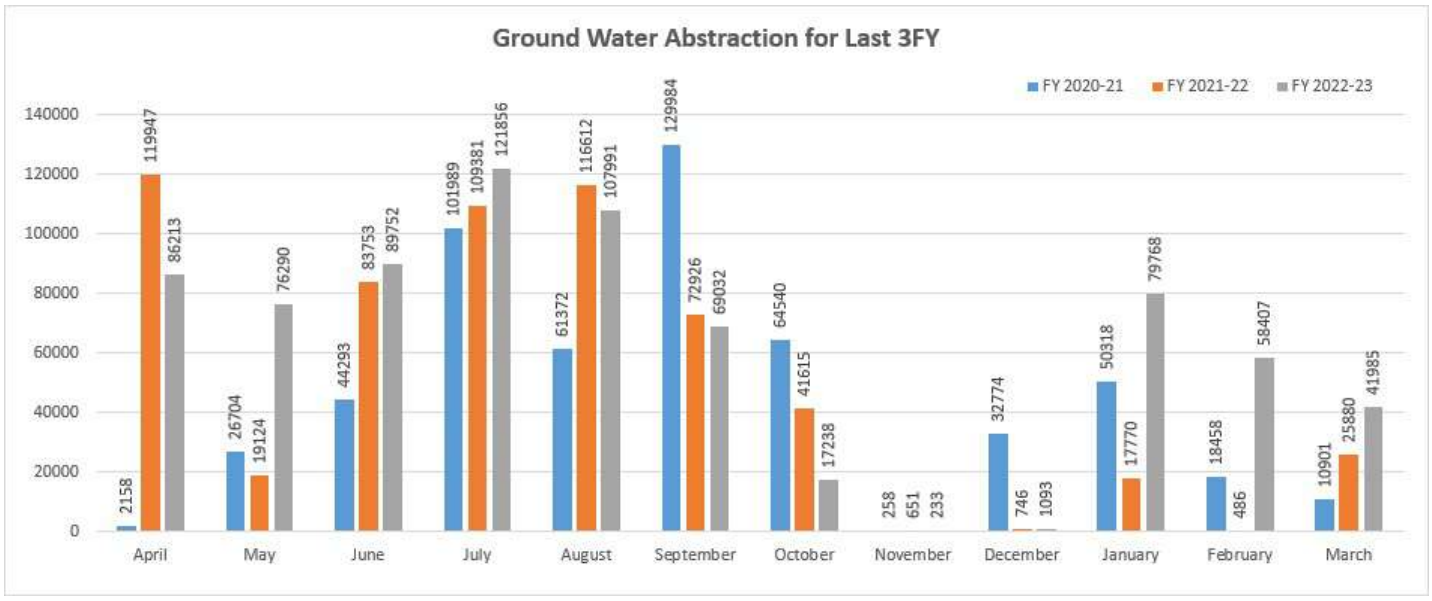
Table 1: Fresh Water Withdrawal Pattern for Last 3 FY

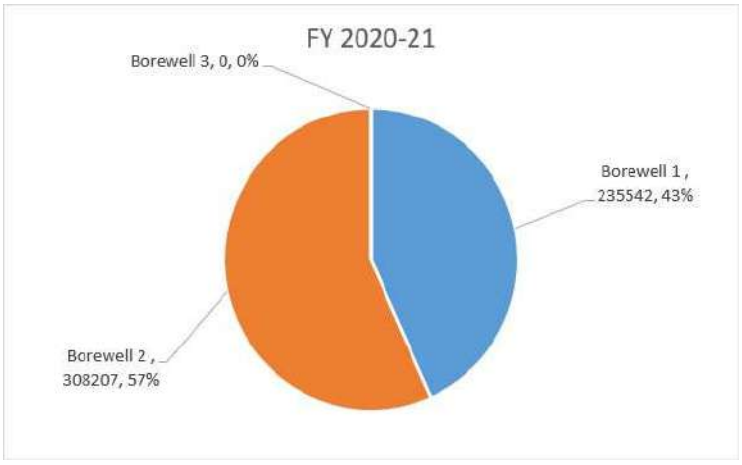
	FY 2020-21					
Year	Borewell- 1 (m3/month)	Borewell- 2 (m3/month)	Borewell- 3 (m3/month)	Total Fresh Water Intake to Plant (m3/month)	Domestic (m3/month)	Industrial (m3/month)
April	1177	981		2158	76	2082
May	8782	17922		26704	72	26632
June	13550	30743		44293	85	44208
July	38788	63201		101989	95	101894
August	23158	38214		61372	73	61299
September	62676	67308		129984	83	129901
October	29087	35453		64540	62	64478
November	258	0		258	120	138
December	16826	15948		32774	89	32685
January	25326	24992		50318	78	50240
February	8653	9805		18458	122	18336
March	7261	3640		10901	103	10798
Total	235542	308207	0	543749	1058	542691

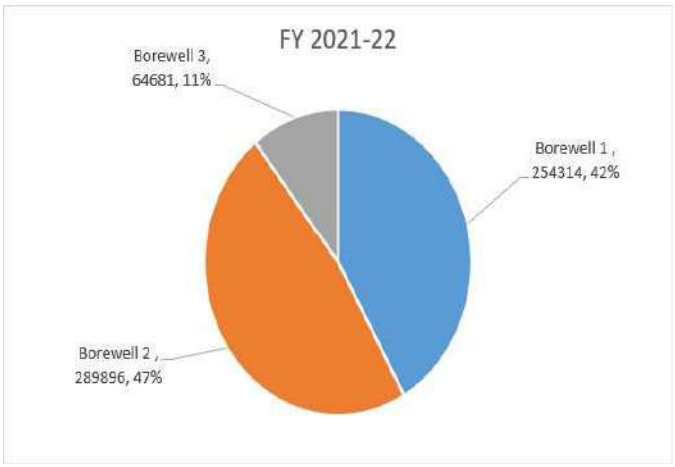
Year	FY 2021-22					
	Borewell- 1 (m3/month)	Borewell- 2 (m3/month)	Borewell- 3 (m3/month)	Total Fresh Water Intake to Plant (m3/month)	Domestic (m3/month)	Industrial (m3/month)
April	57984	61963	0	119947	83	119864
May	7901	11223	0	19124	135	18989
June	29482	42842	11429	83753	147	83606
July	35317	55739	18325	109381	256	109125
August	48926	52106	15580	116612	282	116330
September	36379	29411	7136	72926	271	72655
October	21617	15549	4449	41615	102	41513
November	229	45	377	651	136	515
December	111	0	635	746	132	614
January	6764	8514	2492	17770	157	17613
February	0	0	486	486	136	350
March	9604	12504	3772	25880	128	25752
Total	254314	289896	64681	608891	1965	606926

Year	FY 2022-23					
	Borewell- 1 (m3/month)	Borewell- 2 (m3/month)	Borewell- 3 (m3/month)	Total Fresh Water Intake to Plant (m3/month)	Domestic (m3/month)	Industrial (m3/month)
April	43580	32693	9940	86213	154	86059
May	35885	29679	10726	76290	204	76086
June	47748	37229	4775	89752	135	89617
July	68258	49309	4289	121856	137	121719
August	59639	45491	2861	107991	233	107758
September	40241	26323	2468	69032	143	68889
October	10924	5816	498	17238	105	17133
November	22	0	211	233	76	157
December	15	69	1009	1093	171	922
January	44947	32138	2683	79768	130	79638
February	32478	21901	4028	58407	144	58263
March	24031	12624	5330	41985	130	41855
Total	407768	293272	48818	749858	1762	748096

Note: Information sourced from plant data







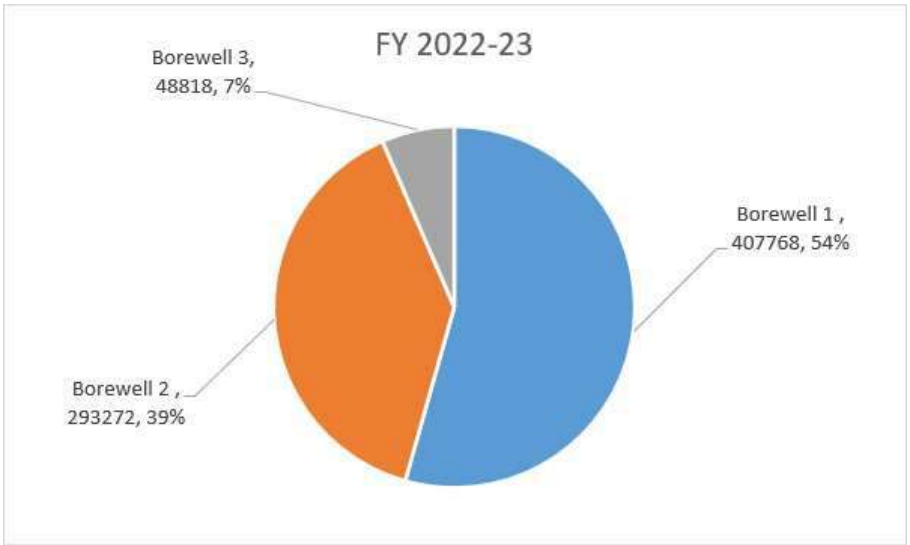


Figure 2: Graphical representation of abstracted ground water for last 3 FY

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 543749m3/year (1812m3/day), 608891m3/year (2030m3/day) & 749858m3/year (2500m3/year) respectively. **Thus, plant is in under compliance for yearly and daily withdrawal as per GWD**.

Power Generation details of the Plant for last 3 Financial Year is shown below;

Table 2: Production Details (MU's) for Last FY

Year	FY 2020-21	FY 2021-22	FY 2022-23
April	0	39.033	26.0
May	7.795	5.769	25.3
June	15.138	27.073	30.0
July	37.733	37.099	43.5
August	21.087	40.02	38.5
September	45.844	23.932	23.8
October	22.577	13.708	6.1
November	0	0	0.0
December	11.766	0	0.0
January	18.616	5.683	31.8
February	6.568	0	21.6
March	0.958	7.617	15.6
Total	188.082	199.934	262.146

Note: Information sourced from plant data

Plant has provided the Generation & ground water abstraction data for last 3 FY. Thus, Audit team calculated specific water consumption (m3) per MWh of Power Generation;

Table 3: Specific Water Consumption (SWC) of Power Generation (m3/MWh) for Last 3 FY

Sr. No.	Description	UOM	FY 2020-21	FY 2021-22	FY 2022-23
1	Borewell 1	m3/year	235542	254314	407768
2	Borewell 2	m3/year	308207	289896	293272
3	Borewell 3	m3/year	0	64681	48818
4	**Total Ground Water Abstraction, A**	**m3/year**	**543749**	**608891**	**749858**
5	**Domestic**	m3/year	**1058**	**1965**	**1762**
6	**Industrial**	m3/year	**542691**	**606926**	**748096**
7	ETP Treated Water, B	m3/year	41335	52933	51383
8	No. of Working days, C	Nos./year	300	300	300
9	**Ground water abstraction per day, D= (A/C)**	**m3/day**	**1812**	**2030**	**2500**
10	**ETP treated water per day, E= (B/C)**	**m3/day**	**138**	**176**	**171**
11	Production (Generation), F	MU/year	188.08	199.934	262.146
12	**Specific Water Consumption (SWC) of Power Generation, G= [A/(F X 1000)]**	**m3/MWh**	**2.89**	**3.05**	**2.86**

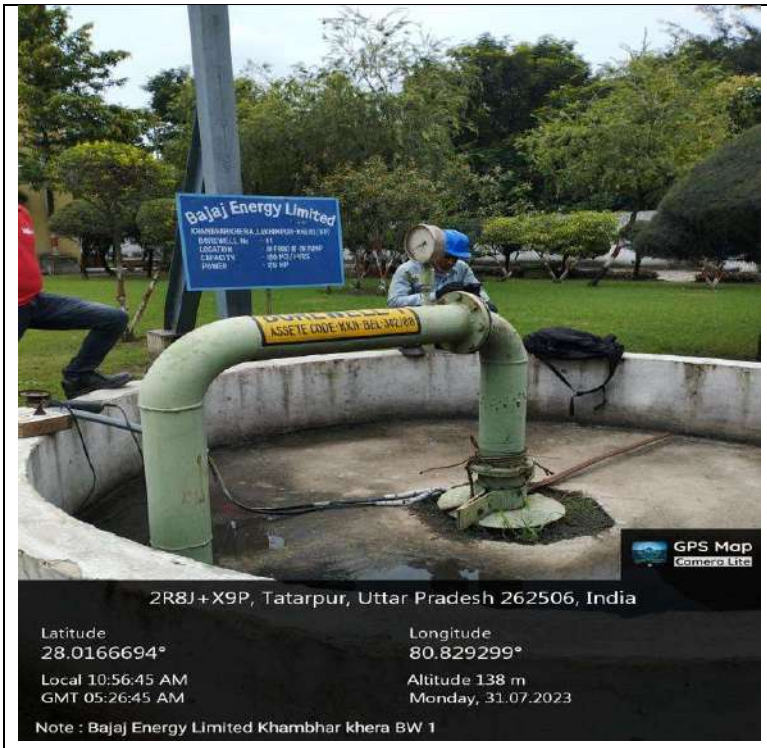
**It is noticed from above table that SWC per unit generation w.r.t Total Fresh water intake in FY 2022-23 has been improved from FY 2021-22.*

4.2 WATER SOURCES

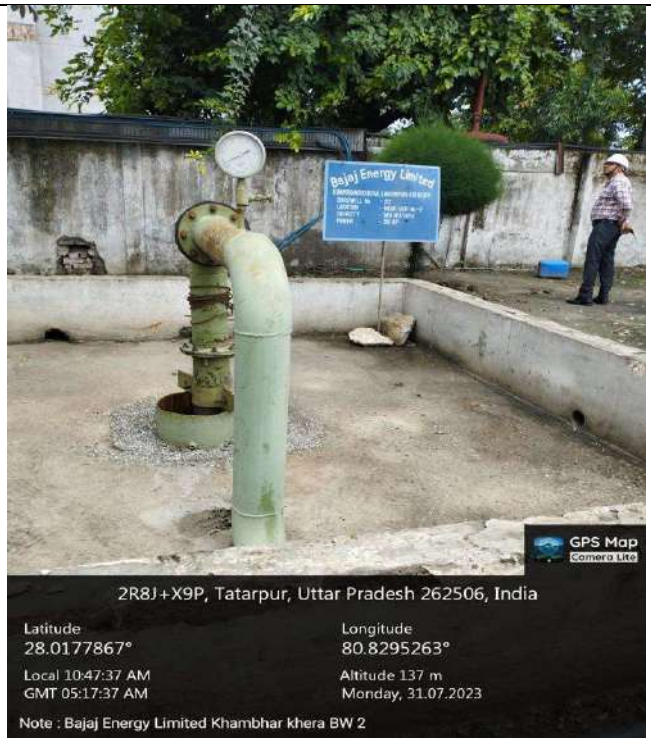
The main source of process and domestic water usage at Bajaj Energy Limited, Khambharkhera Plant is water received from ground water through 3 bore-wells (submersible pump) located in plant area. The details of borewells and their location are mentioned below:

Table 4: Details of Borewells

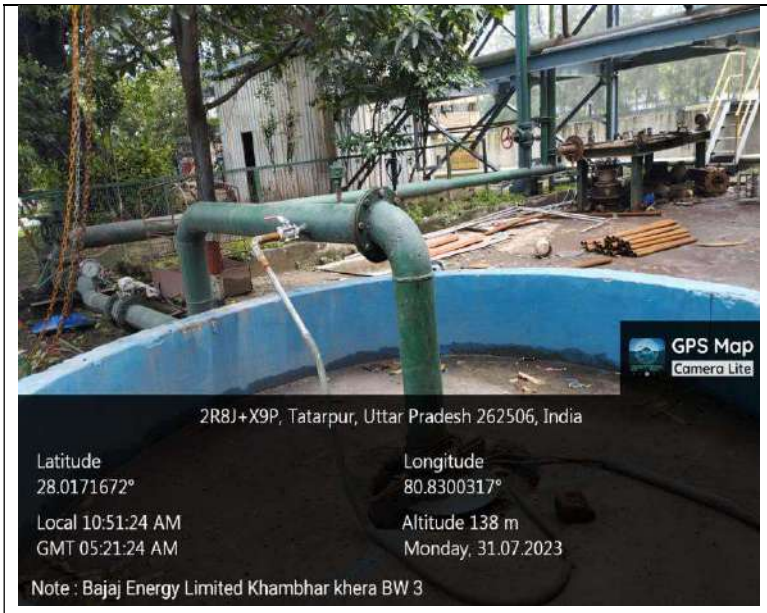
Sr. No.	Type of Structure	Borewell 1	Borewell 2	Borewell 3
1	Location of Structure	Near TG Bldg.	Near CT Cell-6	Near Mech Tool Room
2	Depth (meter)/ Diameter (millimeter)	110 m/254 mm	110 m/254 mm	110 m/254 mm
3	Metered (Yes/No)	Yes	Yes	Yes
4	Meter No	S5L307446-110	S5L307449-110	S5L307443-110
5	Metered Condition (Analog/Digital)	Digital	Digital	Digital
6	TDS (mg/l)	563	417	617
7	Rated Capacity (m3/hr)	180	180	180
8	Rated Pump Power (HP)	25	25	25
9	Rated Running Hrs (Hrs./day)	18	14	7



Borewell-1 (Near TG Bldg.)



Borewell-2 (Near CT Cell-6)



Borewell-3 (Near Mech Tool Room)

Piezometer 1 (Near Silo Aea)

Piezometer 2 (Near Gate No. 2)

Side Stream Filters

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, Khambharkhera, 3 Borewells are the only source which is used to supply entire plant to different location and serves the purpose of water consumption to the process and domestic use. Water received through Borewell after treatment is used for CT makeup & Boiler makeup after treatment. ETP treated water is used in green belt development and other areas like firefighting, Ash Quenching, dust suppression etc.

The water withdrawal from borewells and subsequently supplied in the plant is mentioned in water distribution network of Bajaj Energy Limited, Khambharkhera Unit provided below:

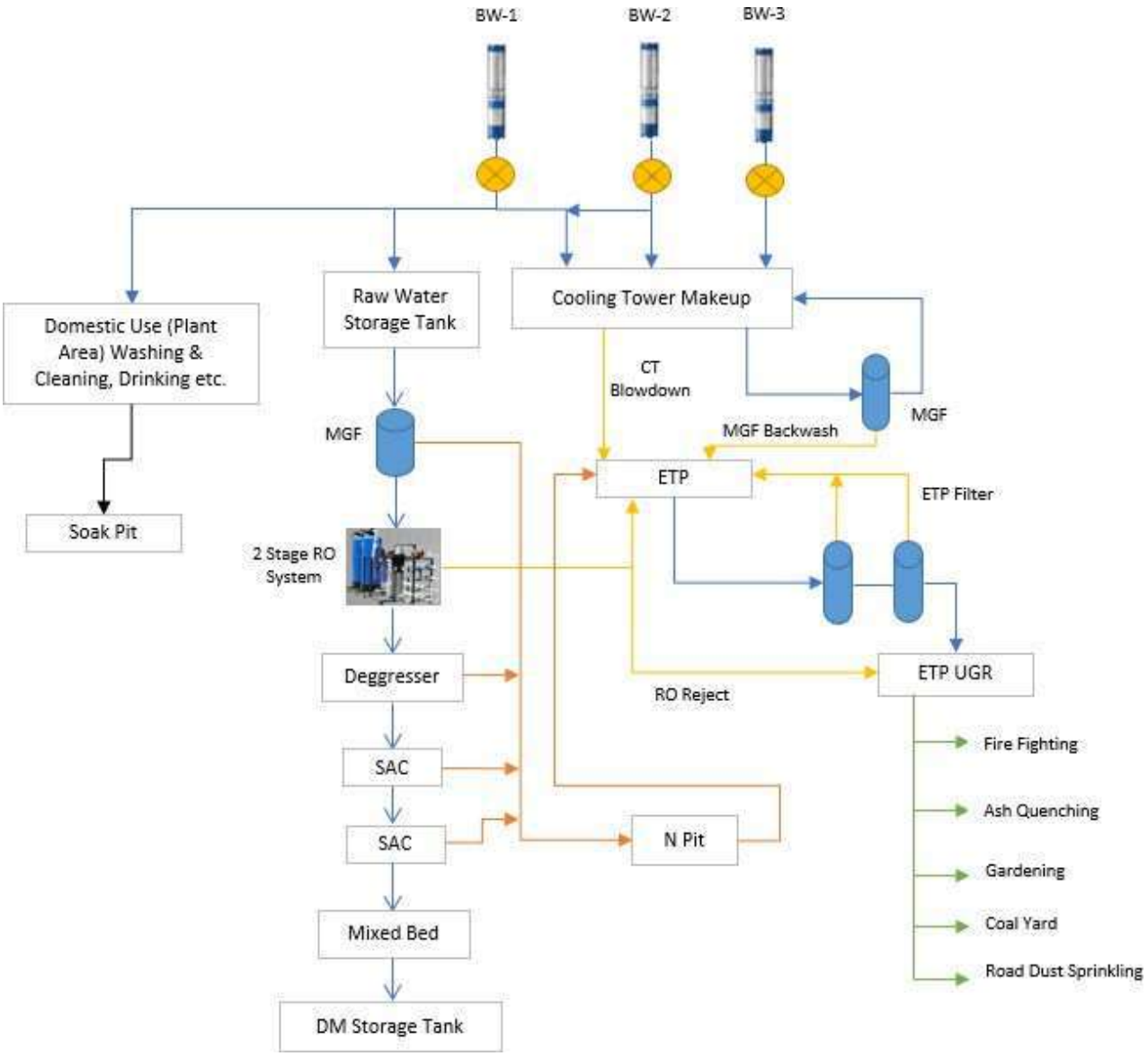


Figure 3: Water Distribution Network of Bajaj Energy Limited, Khambharkhera Unit

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 4092m3/day. Out of total, Fresh water through borewells are about 3729m3/day (91%) and ETP Treated Water is about 362m3/day (9%). **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.

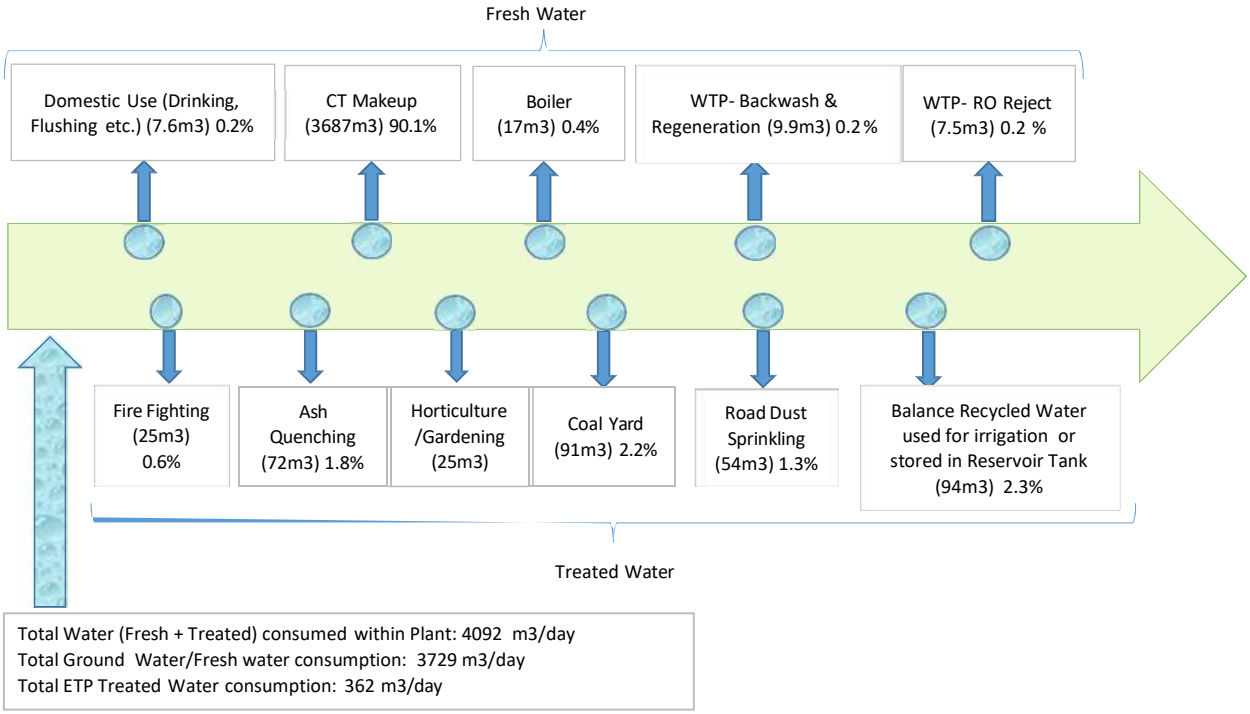


Figure 4: Water Balance Diagram

The Fresh water consuming areas are Domestic Use (TG building, DM Plant, Security area & CHP area) of about 7.6m3 (0.2%), CT Makeup is around 3687m3 (90.1%), Boiler Makeup is around 17m3 (0.4%), WTP- RO Reject, Backwash & Regeneration is around 17.5m3 (0.4%). The treated water consuming areas are Firefighting of around 25m3 (0.6%), Ash quenching is around 72m3 (1.8%), Horticulture/Gardening is about 25m3 (0.6%), Coal Yard is around 91m3 (2.2%), Road dust suppression/sprinkling is around 54m3 (1.3%) & Balanced ETP treated water is stored in Reservoir or supplied to farmers for irrigation is about 94m3 (2.3%).

4.5 WATER METERING & MONITORING SYSTEM

Monitoring is the most important prerequisite for efficient water management. Thus, in the water supply network, it is necessary to have a robust system of monitoring. During the audit, the available flow meters were identified, and their working conditions were checked.

Measurement at source through Ultrasonic Flow meter:

Table 5: Measurement at source through Ultrasonic Flow meter

Sr. No.	Type of Structure/ Year of Construction	Operation Pattern	Mode of lift	Metered (Yes/No)	Metered Condition (Analog/Digital)	Discharge (m3/hr)	Total water Consumed (m3/day)
1	Borewell 1 (Near TG Building)	Working	Submersible Pump	Yes	DWFM	146	2196
2	Borewell 2 (Near CT Cell-6)	Working	Submersible Pump	Yes	DWFM	134	1509
3	Borewell 3 (Near Mech Tool Room)	Working	Submersible Pump	Yes	DWFM	133	24
	Total						3623

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	2196	54%
2	Borewell 2	Fresh Water	1509	37%
3	Borewell 3	Fresh Water	24	1%
4	ETP Treated Water	Recycled Water	362	9%
5	Total Water Consumed within Plant		4092	100%

From above it is observed that the total ground water withdrawal is about 3729 m3/Day which complies with the total daily limit of 7020 m3/Day as per GWD NOC.

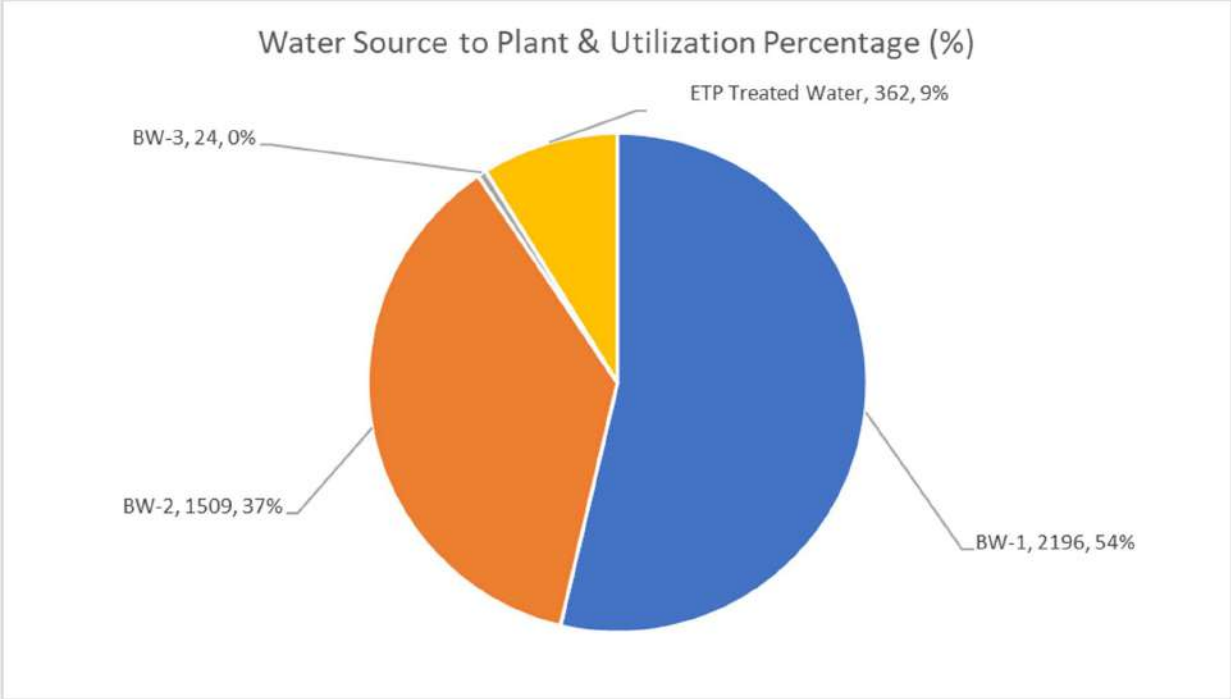


Figure 5: Source of Plant & their utilization percentage

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	7.6	0.2%
2	Cooling Tower Makeup	Fresh Water	3687	90.1%
3	Boiler	Fresh Water	17	0.4%
4	WTP- Backwash & Regeneration	Fresh Water	9.9	0.2%
5	WTP- RO Reject	Fresh Water	7.5	0.2%
6	Fire Fighting	Recycled Water	25	0.6%
7	Ash Quenching	Recycled Water	72	1.8%
8	Horticulture/Gardening	Recycled Water	25	0.6%
9	Coal Yard	Recycled Water	91	2.2%
10	Road Dust Sprinkling	Recycled Water	54	1.3%
11	Balance Recycled Water used for irrigation or stored in Reservoir Tank	Recycled Water	94	2.3%
	Total		4092	100.0%

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

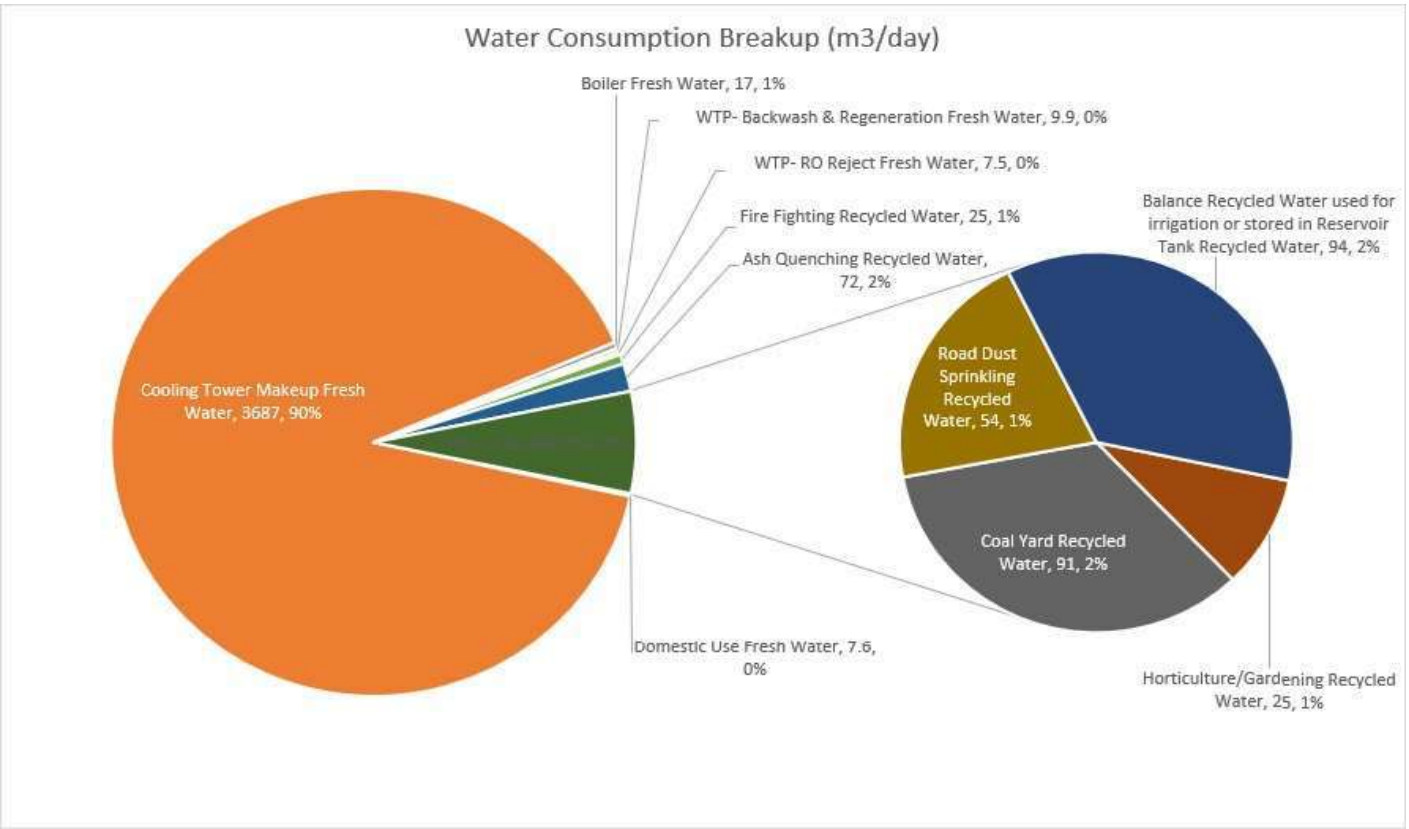


Figure 6: Source of Plant & their utilization percentage

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. 0.34/m3, Rs. 0.41/m3 and Rs. 0.44/m3 respectively. The detail of raw water per m3 cost is provided in below table.

Table 8: Per m3 cost of Raw Water withdrawal

Sr. No.	Description	UOM	Ground Water Abstraction Cost		
			FY 2020-21	FY 2021-22	FY 2022-23
1	Total Ground water	m3	543749	608891	749858
2	Man Power Cost	Rs.	NA (No dedicated man power involved)		
3	Maintenance Cost	Rs.	NA	22,600	52,200
4	Energy Cost (Rs.)	Rs.	1,87,590	2,24,537	2,75,917
5	Ground Water Pumping Cost, A	Rs./m3	0.34	0.41	0.44
6	Ground Water Abstraction Cost, B	Rs./m3	--	--	--

Thus, Total Ground water pumping cost is calculated to be about Rs. 0.44/m3 for FY 2022-23.

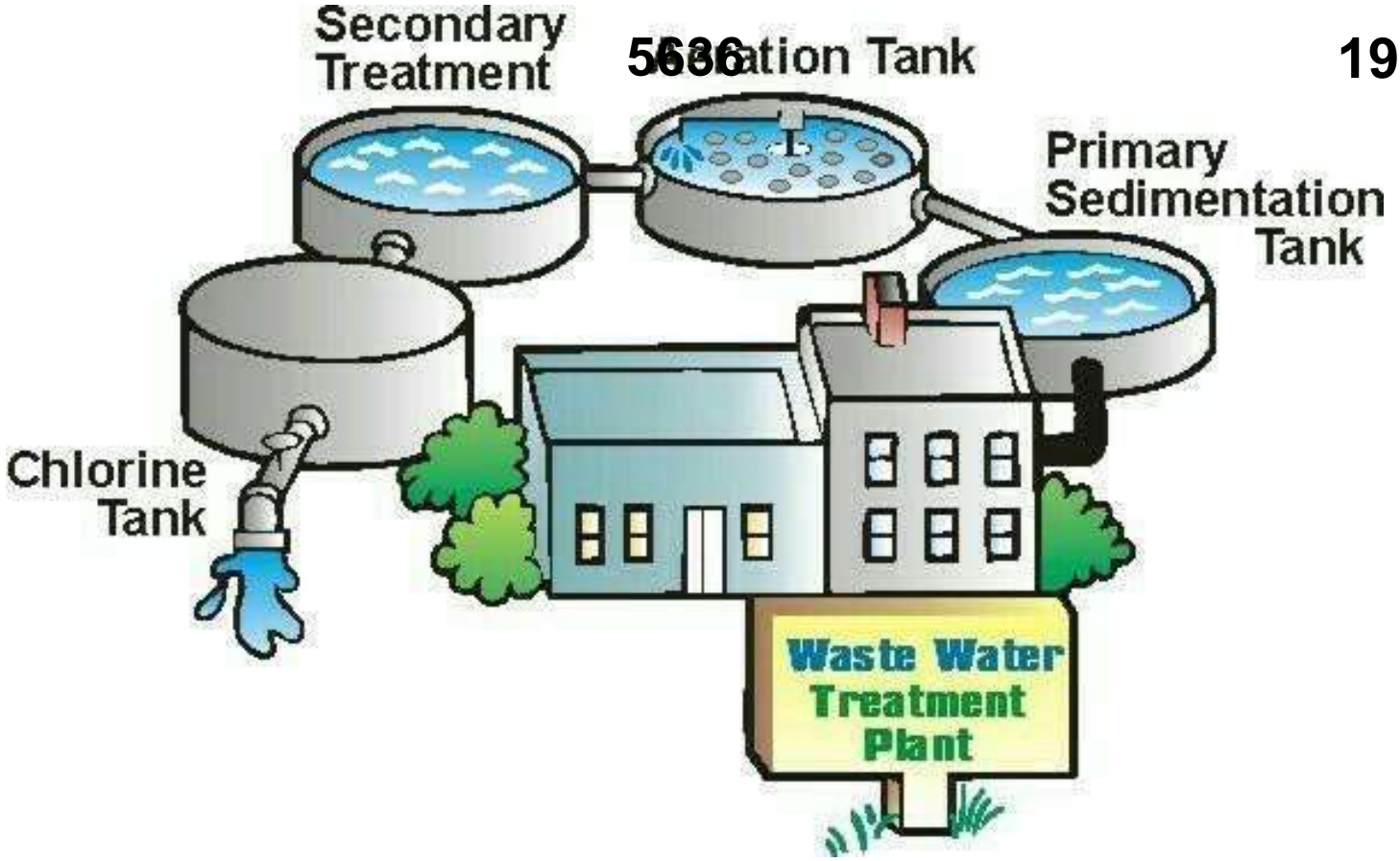
4.7 CALIBRATION CERTIFICATES

The Bajaj Energy Limited (BEL), Khambharkhera 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. Variation in flowmeter meter reading was also observed in Borewell No 3. Secondly, flowmeter reading of Borewell 1 & Borewell 2 not clearly visible because of moisture. It is recommended that flowmeter has to be installed before any tapping point. Also, Flowmeter calibration/replacement is being recommended.

Further, the BEL, Khambharkhera Unit has conducted calibration of all water meters and provided certificates to the audit team. The calibration frequency of the water meters is yearly basis. The water meters details are provided in below table and the copy of calibration certificate of borewells are provided in the Annexure of the report).

Table 9: Calibration Detail of Digital Meters installed on Borewell

Sr. No.	Type of Structure (w.r.t installed flowmeter)	Make & Model	Meter Sr. No/ Id. No.	Calibration Certificate No	Date of Calibration	Due Date of Calibration
1	Borewell No. 1	Yokogawa/AXFA14G	S5L307446-110	220923B/NN-101	23-09-2022	22-09-2023
2	Borewell No. 2	Yokogawa/AXFA14G	S5L307449-110	220923B/NN-102	24-09-2022	23-09-2023
3	Borewell No. 3	Yokogawa/AXFA14G	S5L307443-110	220923B/NN-103	25-09-2022	24-09-2023



CHAPTER 5

Water Treatment Practices

5 WATER TREATMENT PRACTICES

The main source of Process & domestic water usage at M/s Bajaj Energy Limited (BEL), Khambharkhera Unit is meet through fresh water supplied from 3 No. of existing Borewells. N Pit (64m3 capacity) followed with ETP has been installed with installed capacity of 1000KLD to treat generated industrial effluent from Plant thereafter supplied to dust suppression nearby CHP, Ash Silo system, firefighting, gardening etc.

5.1 RAW/FRESH WATER TREATMENT:

M/s BEL Khambharkhera 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.

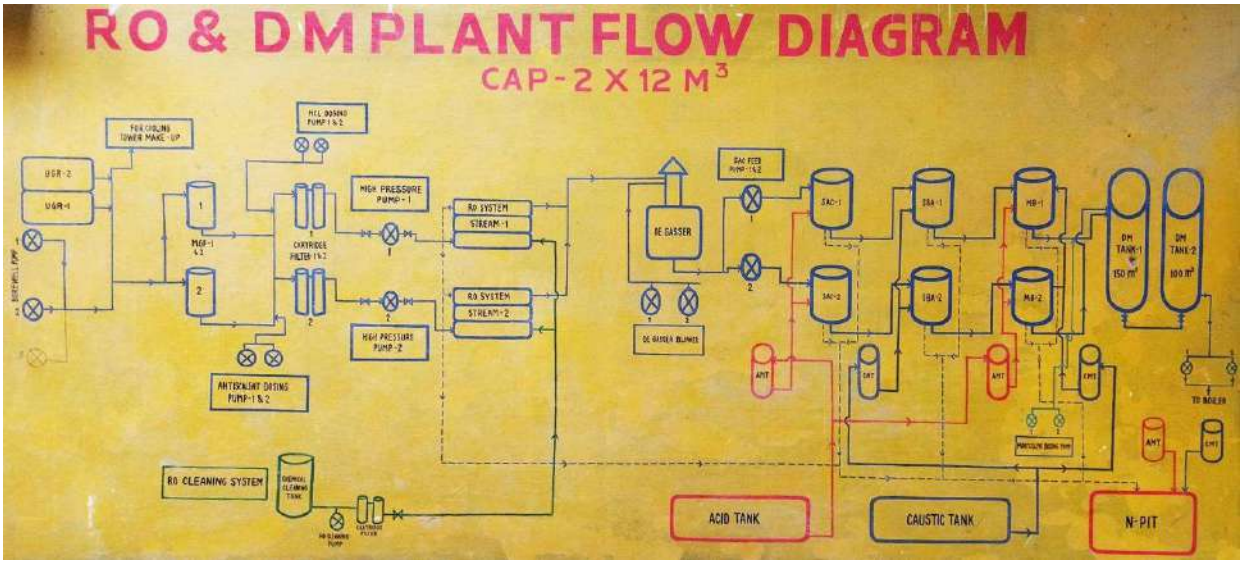


Figure 7: Water Treatment Plant process flow chart

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	42	0	14	28
May	1408	1002	381	25
June	1318	996	297	25
July	1433	984	421	28
August	1578	1133	419	26
September	1465	993	457	15
October	582	434	69	79

	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)
November	100	70	21	9
December	1273	848	345	80
January	947	581	276	90
February	239	161	70	8
March	1216	725	273	218
Total	11601	7927	3043	631

	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	881	542	227	112
May	315	173	52	90
June	1447	978	361	108
July	1143	712	293	138
August	1512	991	376	145
September	1454	966	426	62
October	536	296	154	86
November	85	0	14	71
December	216	124	45	47
January	1134	689	284	161
February	170	75	34	61
March	1293	803	315	175
Total	10186	6349	2581	1256

	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	1452	1029	390	33
May	1391	929	383	79
June	1301	844	394	63
July	1218	795	360	63
August	1383	944	379	60
September	1451	1012	425	14
October	317	203	91	23
November	87	0	24	63
December	489	255	138	96
January	1348	856	415	77
February	1391	858	405	128
March	1004	525	359	120
Total	12832	8250	3763	819

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. 62.4/m3, Rs. 99.2/m3 and Rs. 83.5/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	11601	10186	12832
2	Man Power Cost	Rs.	6,76,104	9,70,342	10,20,695
3	Maintenance Cost	Rs.	NA	NA	NA
4	Chemical Cost	Rs.	43,425	36,003	44,528
5	Energy Cost (Rs.)	Rs.	4,002	4,134	5,615
6	Water Treatment Plant (DM Plant) Cost	Rs./m3	62.4	99.2	83.5

*Calculated WTP treated water cost not accounts Maintenance Cost because of non-availability of data.

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, Khambharkhera 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, Khambharkhera has installed N Pit for treatment of Industrial effluent with capacity of 64m3 further supplied to ETP having 1000KLD capacity for further treatment. ETP Treated Water thereafter stored in lagoon;

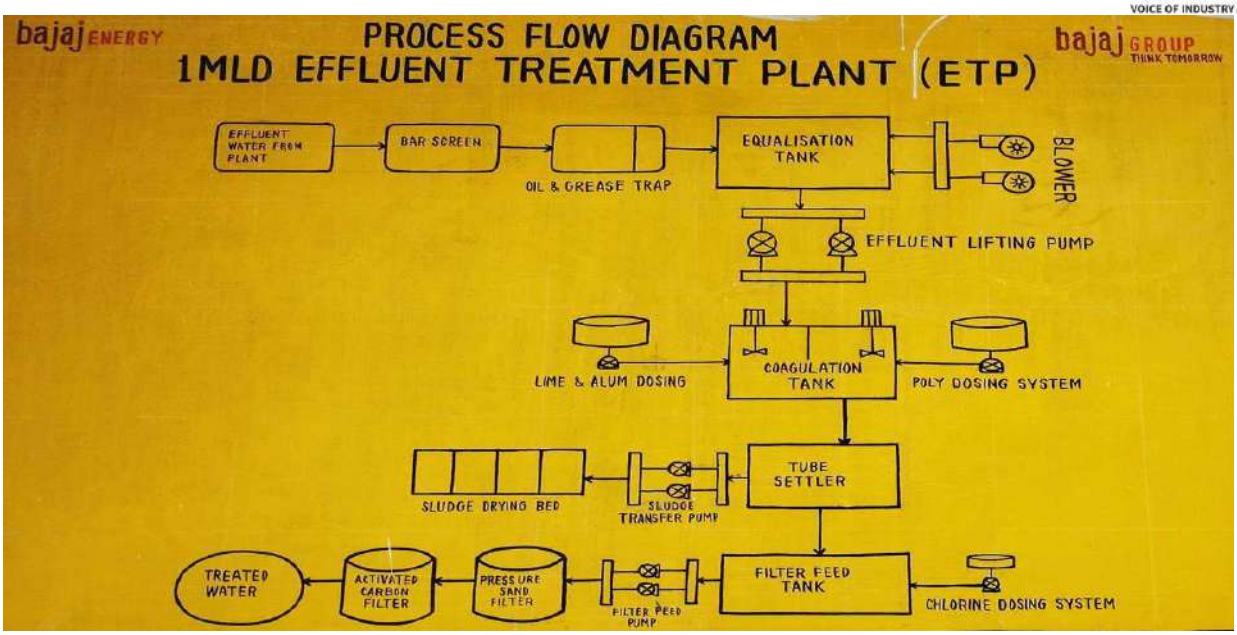
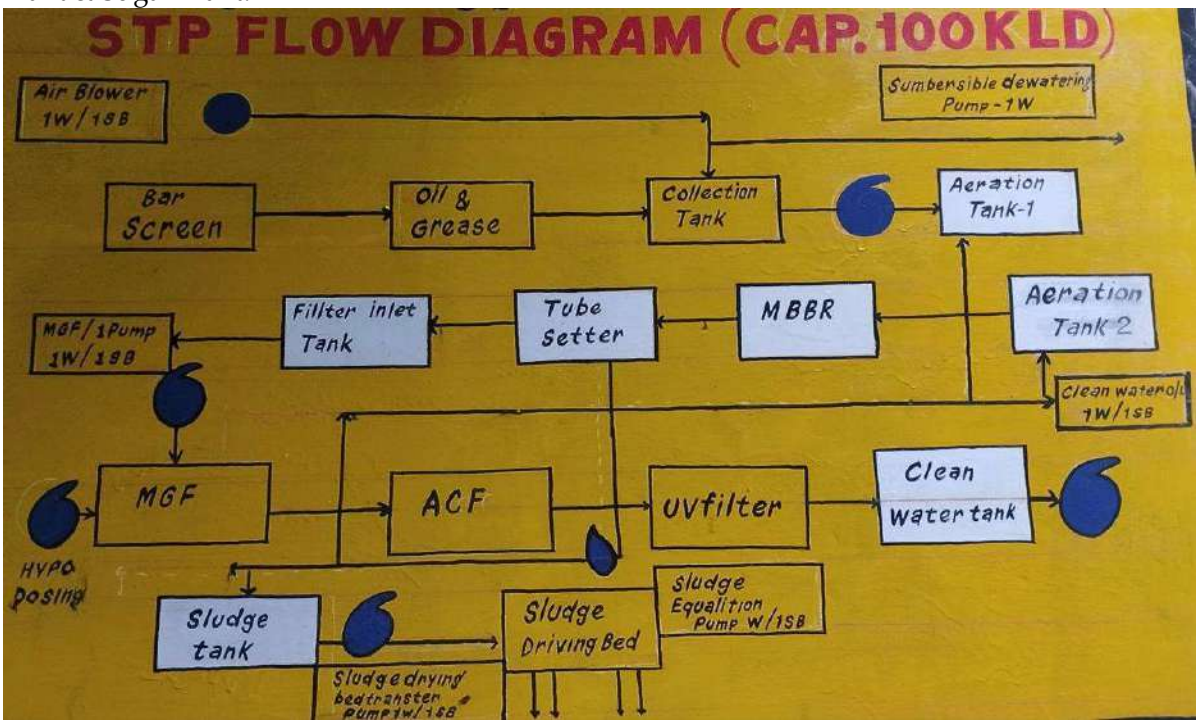


Figure 8: Effluent Treatment Process (ETP)

In addition to ETP, Plant has installed 100KLD STP. However, STP is used for colony of both Power Plant & Sugar Plant.



Note: STP plant having installed capacity of 100KLD is common for Power Plant & Sugar Plant Resedential Block.
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	0	1740	-1740	1900	1900
May	0	2065	-2065	2077	2077
June	1131	4320	-3189	2521	2521
July	3442	3439	3	2698	2698
August	5264	3258	2006	2743	2743
September	13220	8213	5007	2587	2587
October	7289	6283	1006	2492	2492
November	0	1750	-1750	2129	2129
December	2442	2734	-292	2721	2721
January	6278	3769	2509	2610	2610
February	2269	2055	214	1830	1830
March	0	1560	-1560	1844	1844
Total	41335	41186	149	28152	28152

	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	5668	4663	1005	1887	1887
May	1354	3354	-2000	2058	2058
June	5809	5867	-58	2082	2082
July	9961	7957	2004	1853	1853
August	12392	8386	4006	2095	2095
September	9438	6400	3038	1954	1954
October	6782	5845	937	2013	2013
November	20	2105	-2085	1568	1568
December	87	1990	-1903	1549	1549
January	536	1540	-1004	1719	1719
February	0	2178	-2178	1381	1381
March	886	3050	-2164	1809	1809
Total	52933	53335	-402	21968	21968

	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	3162	3659	-497	1524	1524
May	3502	4499	-997	2309	2309
June	6698	7693	-995	2055	2055
July	7680	6281	1399	2225	2225
August	9162	5760	3402	2091	2091

	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)
September	6945	4948	1997	2031	2031
October	2933	2931	2	1965	1965
November	101	2059	-1958	2180	2180
December	12	2126	-2114	2059	2059
January	5186	5292	-106	2106	2106
February	2814	2801	13	2030	2030
March	3188	3170	18	1224	1224
Total	51383	51219	164	23799	23799

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 41335 m3/year, 52933 m3/year & 51383 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. 14.6/m3, Rs. 15.2/m3 and Rs. 10.3/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. 5.4/m3, Rs. 9.9/m3 and Rs. 8.9/m3 respectively. The details of raw water per m3 cost is provided in below table.

Table 13: Per m3 cost of Effluent Treated Water

Sr. No.	Description	UOM	Effluent Treatment Cost		
			FY 2020-21	FY 2021-22	FY 2022-23
A	**Industrial Effluent Treatment Cost (ETP)**				
1	**Capacity of ETP Plant**	KLD	**1000**		
2	Industrial Effluent for Treatment at ETP	m3	41335	52933	51383
4	Man Power Cost	Rs.	4,43,877	6,45,409	4,11,574
5	Maintenance Cost	Rs.	20,000	20,000	20,000
6	Chemical Cost	Rs.	15,527	4,633	6,774
7	Energy Cost	Rs.	1,24,282	1,32,969	91,974
8	Industrial Effluent Treatment Cost	Rs./m3	14.6	15.2	10.3
B	**Domestic Effluent Treatment Cost (STP)**				
1	**Capacity of STP Plant**	KLD	**100**		
2	Domestic Effluent for Treatment at STP	m3	28152	21968	23799
4	Man Power Cost	Rs.	1,47,959	2,15,136	2,05,787
5	Maintenance Cost	Rs.	NA	NA	NA
6	Chemical Cost	Rs.	4,664	2,716	6,305
7	Energy Cost	Rs.	Power supply is under BHSL scope		
8	Domestic Effluent Treatment Cost	Rs./m3	5.4	9.9	8.9

*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.

Conserve Rain Water

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, Khambharkhera Unit

As per GWD, U.P. NOC, M/s Bajaj Energy Limited (BEL), Khambharkhera Unit, has to install Rooftop Rain water harvesting structures in the premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the plant, if industry likely to pollute ground water.

Presently, Plant has installed 3Nos. of RWH structures within plant premises each with installed capacity of 30m3, 16m3 & 20m3 respectively. Out of 3 RWH structure, 1RWH structure near TG Building is having provision to augment the groundwater recharge through the generated runoff from TG Rooftop area & storm water line. Balance 2 RWH structure connected with storm water line. Thus, Bifurcation of drain line and storm water line needs to be done precisely. Presently, Waste water discharge through Washing & Cleaning, handwash & overflow of soak pit has been discharged to drain line further reutilized after treatment.

Photos of Some RWH Structures are shown below;

RWH connected with Rooftop & Storm water line

RWH connected with Storm water line

Figure 9 Photos of RWH Structures

In addition, Plant has adopted and maintained 7 Ponds namely referenced as RWH 1 (Gross storage: 126990m3), RWH 2 (Gross storage: 78390m3), RWH 3 (Gross storage: 74760m3), RWH 4 (Gross storage: 104580m3), RWH 5 (Gross storage: 181530m3), RWH 6 (Gross storage: 89700m3) & RWH 7 (154620m3) respectively; which is used to augment the ground water resources of the area and has also undertake periodic maintenance of recharge structure at their own cost.

Thus, groundwater recharge from recharge ponds constructed in the area has been calculated as per GEC-2015 guidelines is about 486342m3/year.

Table 14: Groundwater recharge measures by Recharge Pond in project area

Sr. No	Pond land details for Bajaj Energy Limited, Khambherkhera Unit						
	Ponds	Present Area (m2)	Average Depth (m)	GSV (m3)	Monsoon recharge (m3/y)*	Non - Monsoon recharge (m3/y)**	Total Recharge Potential (m3/y)
1	RWH Structure 1	42330	3	126990	50796	25398	76194
2	RWH Structure 2	26130	3	78390	31356	15678	47034
3	RWH Structure 3	24920	3	74760	29904	14952	44856
4	RWH Structure 4	34860	3	104580	41832	20916	62748
5	RWH Structure 5	60510	3	181530	72612	36306	108918
6	RWH Structure 6	29900	3	89700	35880	17940	53820
7	RWH Structure 7	51540	3	154620	61848	30924	92772
	Total						486342

** Monsoon Recharge = 20% of the Gross storage volume and 2 times of pond filling during season*
*** Non-Monsoon Recharge = 20% of the Gross storage volume and 1 time of pond filling during season>*
>RWH= Rainwater Harvesting
>GSV= Gross Storage Volume

Audit team also calculated the RWH potential of Plant as per information received from plant officials. RWH potential of Plant is calculated below.

Table 15: 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/	4104	0.9	0.85	3140
2	Road/Paved area	46400	0.9	0.65	27144
3	Open Land	176000	0.9	0.20	31680
4	Green Belt	37800	0.9	0.15	5103
5	Total (sqm)	264304			67067

** Plant has provided the Rooftop area of the building.*
** Rooftop potential is calculated to be about 3140 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), Khambharkhera Unit has been granted NOC/permission from Ground Water Department (Namami Gange & Rural Water Supply Department), Ministry of Jal Shakti, Govt. of Uttar Pradesh to abstract ground water for industrial purpose through 3 Nos. of Borewells. As per GWD, Govt. of U.P, Borewell 1,2&3 are having rated capacity of 30 HP with discharge capacity of 180m3/hr. the running hrs. of each pump shall not be exceeded by 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 543749m3/year (1812m3/day), 608891m3/year (2030m3/day) & 749858m3/year (2500m3/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), Khambharkhera 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**. Team also noticed tapping point before flowmeter at Borewell 3. Variation in flowmeter meter reading was also observed in Borewell No 3. Secondly, flowmeter reading of Borewell 1 & Borewell 2 not clearly visible because of moisture. It is recommended that flowmeter has to be installed before any tapping point.** Also, Flowmeter calibration/replacement is being recommended.
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), Khambharkhera 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), Khambharkhera 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. However, Team noticed variation in display system of Piezometer 2. Thus, calibration of 2nd display system is recommended. In addition, it is recommended to close all the bores other than piezometer else converted into RWH structure.

As per GWD, U.P. NOC, M/s Bajaj Energy Limited (BEL), Khambharkhera Unit, has to install Rooftop Rain water harvesting structures in the premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the plant, if industry likely to pollute ground water.
Presently, Plant has installed 3Nos. of RWH structures within plant premises each with installed capacity of 30m3, 16m3 & 20m3 respectively. Out of 3 RWH structure, 1RWH structure near TG Building is having provision to augment the groundwater recharge through the generated runoff from TG Rooftop area & storm water line. Balance 2 RWH structure connected with storm water line. 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, Plant has adopted and maintained 7 Ponds namely referenced as RWH 1 (Gross storage: 126990m3), RWH 2 (Gross storage: 78390m3), RWH 3 (Gross storage: 74760m3), RWH 4 (Gross storage: 104580m3), RWH 5 (Gross storage: 181530m3), RWH 6 (Gross storage: 89700m3) & RWH 7 (154620m3) respectively; which is used to augment the ground water resources of the area and has also undertake periodic maintenance of recharge structure at their own cost. Thus, groundwater recharge from recharge ponds constructed in the area has been calculated as per GEC- 2015 guidelines is about 486342m3/year.

M/s Bajaj Energy Limited (BEL), Khambharkhera Unit, has been granted Consent to Operate (CTO) issued by Uttar Pradesh Pollution Control Board vide Ref No.- 140717/**UPPCB/Lucknow(UPPCBRO)/CTO/water/LAKHIMPUR KHIRI/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 362m3/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 16: 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	2158	119947	86213
May	26704	19124	76290
June	44293	83753	89752
July	101989	109381	121856
August	61372	116612	107991
September	129984	72926	69032
October	64540	41615	17238
November	258	651	233
December	32774	746	1093
January	50318	17770	79768
February	18458	486	58407
March	10901	25880	41985
Total	543749	608891	749858

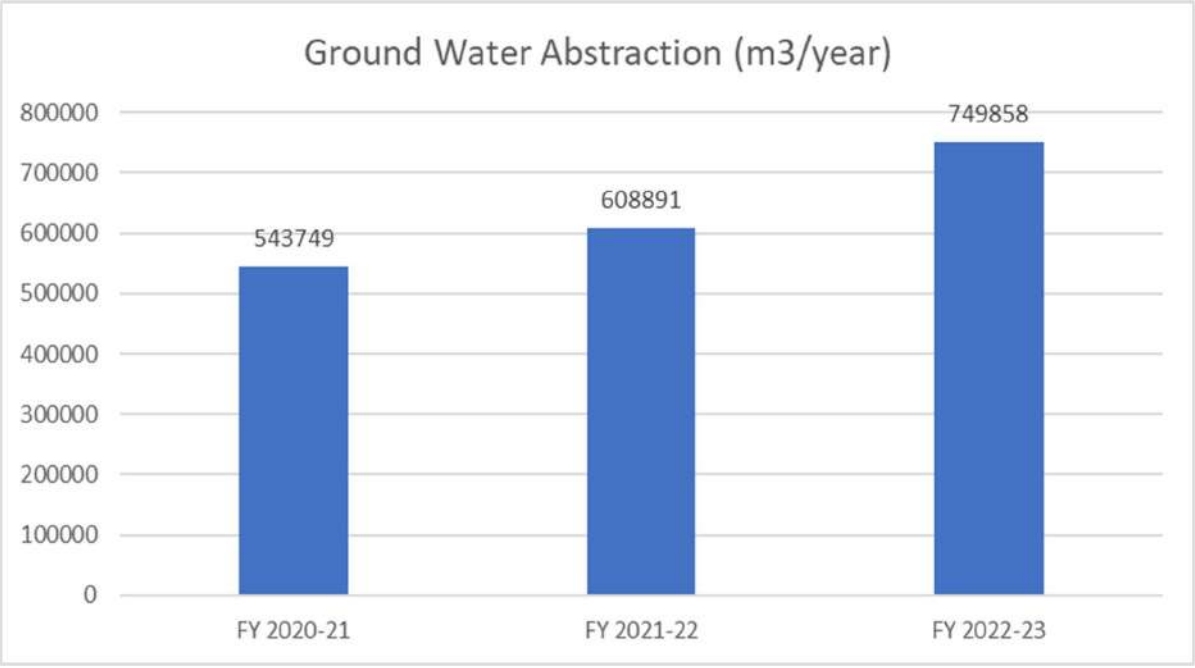
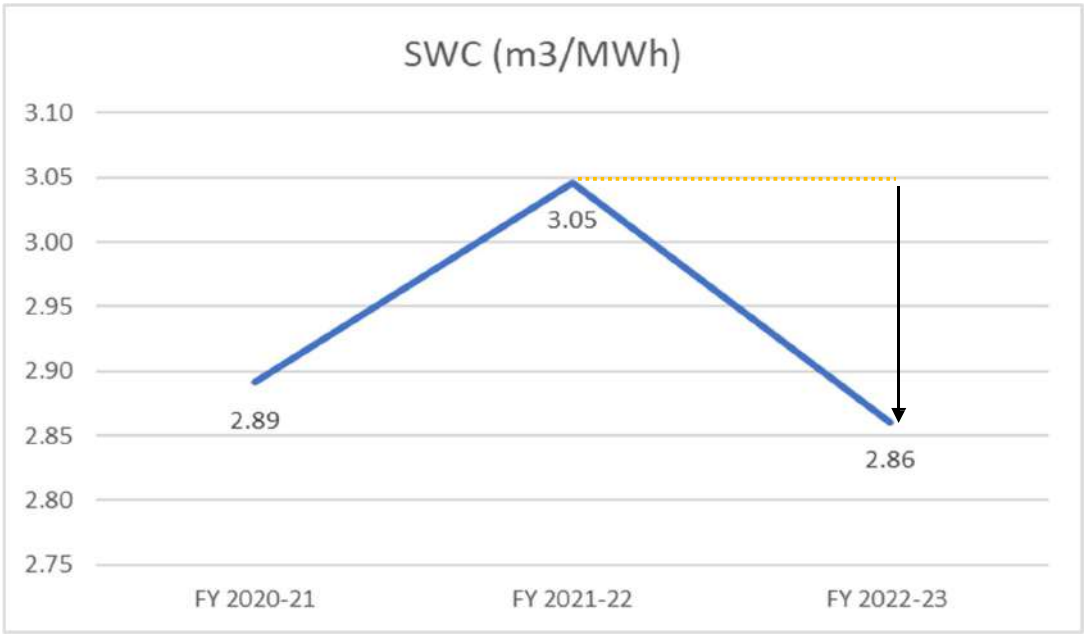


Figure 10: Fresh water consumption in Plant in Last 3 Year

Table 17: Historical Specific water consumption

Sr. No.	Description	UOM	FY 2020-21	FY 2021-22	FY 2022-23
1	Borewell 1	m3/year	235542	254314	407768
2	Borewell 2	m3/year	308207	289896	293272
3	Borewell 3	m3/year	0	64681	48818
4	**Total Ground Water Abstraction, A**	**m3/year**	**543749**	**608891**	**749858**
5	**Domestic**	m3/year	**1058**	**1965**	**1762**
6	**Industrial**	m3/year	**542691**	**606926**	**748096**
7	ETP Treated Water, B	m3/year	41335	52933	51383
8	No. of Working days, C	Nos./year	300	300	300
9	**Ground water abstraction per day, D= (A/C)**	**m3/day**	**1812**	**2030**	**2500**
10	**ETP treated water per day, E= (B/C)**	**m3/day**	**138**	**176**	**171**
11	Production (Generation), F	MU/year	188.08	199.934	262.146
12	**Specific Water Consumption (SWC) of Power Generation, G= [A/(F X 1000)]**	**m3/MWh**	**2.89**	**3.05**	**2.86**

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



CHAPTER 8

Water Conservation Opportunities

8. WATER CONSERVATION OPPORTUNITIES

M/s. Bajaj Energy Limited (BEL), Khambharkhera 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 18: Inventory details

Building name	No. of employees in building	Total no. of washrooms	No. of taps	No. of urinals	No. of showers	No. of Toilet
Office Building Toilet	296	-	6	3	-	1
DM Plant		-	3	1	-	0
Time Office		-	2	1	-	1
Store		-	1	1	-	0
Switchyard		-	2	1	-	1
CHP		-	2	1	-	2
Common toilet		-	3	2	-	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

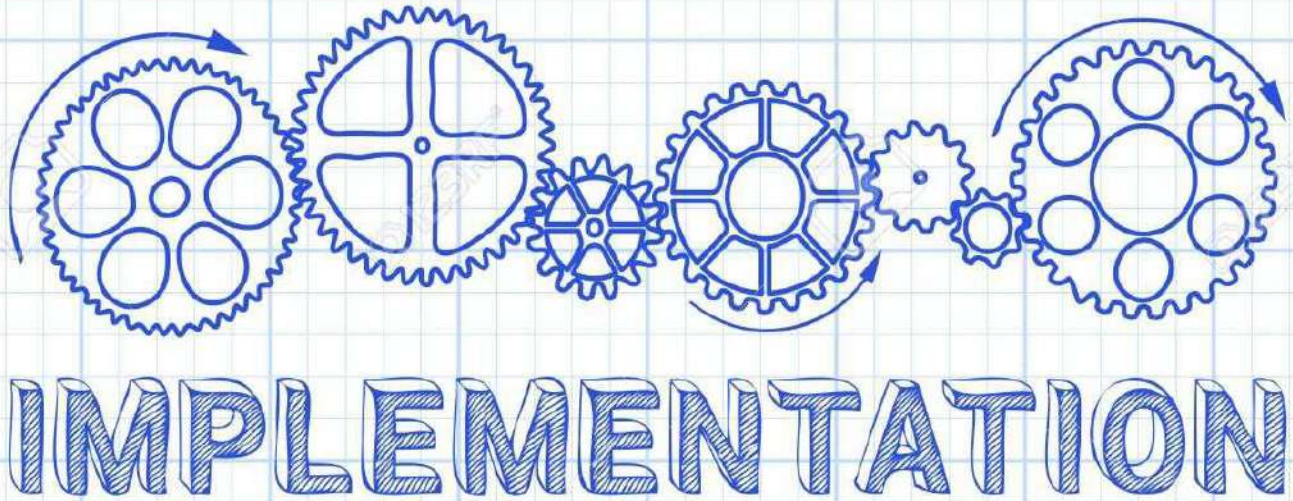
The metering and sub-metering of the Plant's water use is essential to understand the water consumption pattern inside the Plant. The accurate measurements enable management to understand maximum and minimum consumption area in the Plant and improve water efficiency in the Plant. Monitoring the water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

9.1 Effective Utilization Of Roof Top RWH Potential

As per CGWA NOC, M/s BEL, Khambharkhera, has to install Rooftop Rain water harvesting structures in the premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the plant. Thus, it is recommended to utilize the Rooftop RWH potential for industrial use by constructing storage system locally for the rooftop and also divert the rooftop water (TG Building & DM Plant) to the raw water storage tank through closed network/pipeline from nearby rooftop area. Collected Rooftop can be utilized in various activities like flushing, CT makeup & further use after Treatment in WTP plant. In addition, Storm water line needs to be cleaned before pre-monsoon.

Roof Top RWH potential of Plant is calculated below;

Table 19: Fresh Water savings by utilization of RWH potential

Sr. No.	Description	UOM	Value
1	Total Plant Area	m2	264304
2	Rooftop area of building/Shed	m2	4104
3	Road/Paved area	m2	46400
4	Open Land & Green Belt area	m2	213800
5	Average rainfall	mm	900
6	Total Quantum of Runoff Available for RWH Potential	m3/year	67067
7	Total Quantum of Rooftop Runoff Available for RWH Potential	m3/year	3140
8	Considering effective Annual Rooftop Runoff Available for RWH utilization @ 50%	m3/year	1570
9	Yearly RWH potential is extrapolated on a daily basis savings in Fresh water intake	m3/day	4

**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 64m3/day treated STP water was noticed. Out of 64m3/day, around 14m3/day is used in filter backwash & around 10m3/day used nearby area through pipe. Balance around 40m3/day, treated water from STP is discharged to common point. No effective utilization of Treated water is being done. Thus, it is recommended to use of STP treated water for Firefighting, Dust suppression & green belt development after proper treatment.

9.3 Training and awareness programs would be done regularly at all levels i.e., from management to operator level. Posters/slogans should be pasted wherever possible

The plant has a workforce includes (employees + contractual staff) and major water usage in domestic, washing & cleaning activities. It is suggested that the plant employees at all levels should be made aware and trained on 'Water Saving & Conservation' and 'Good Housekeeping Practices'.

Therefore, it is recommended to periodically organize Awareness Programs for office employees including canteen & shop floor workers on Water Conservation. It is also suggested that prominent water saving labels/posters should be placed/located in the plant at noticeable locations like process area; near handwashing taps; washrooms, admin office etc. This will create awareness & sense of responsibility among staff/employees/visitors.

CHAPTER 10

Annexure

10. ANNEXURES (MEASURED DATA)

Sr. No.	Type of Structure/Location	Unit	Borewell 1 (Near TG Building)	Borewell 2 (Near CT Cell-6)	Borewell 3 (Near Mech Tool Room)
	Rated Parameters				
1	Flow	m3/hr	180	180	180
2	Power	HP	25	25	25
	Measured Parameters				
3	Volt	V	416	415	415
4	Current	A	28	27	31
5	PF	pf	0.78	0.71	0.64
6	Power	kW	15.4	13.5	14.3
7	Flow	m3/hr	146	134	133

Sr. No.	Description	Value
1	MGF Service time flow	16.2
2	RO Reject	4.3
3	RO Permeate	11.9
5	MGF backwash flowrate	32
7	ETP outlet	45

11. ANNEXURES (DATA PROVIDED BY PLANT)

A. 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. -
140717/UPPCB/Lucknow(UPPCBRO)/CTO/water/LAKHIMPUR KHIRI/2021

Dated : 15/12/2021

To ,

Shri Dr. A V Singh
M/s BAJAJ ENERGY LIMITED UNIT KHAMBHARKHERA
SHARDA NAGAR ROAD, KHAMBHARKHERA, DISTT LAKHIMPUR KHERI,LAKHIMPUR KHIRI,261506
LAKHIMPUR KHIRI

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 UNIT KHAMBHARKHERA

Reference Application No :13931952

Dated :15/12/2021

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 UNIT KHAMBHARKHERA 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 (Previntion and Controt 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

PRAMOD KUMAR AGRAWAL Digitally signed by PRAMOD KUMAR AGRAWAL Date: 2021.12.15 14:54:50 +05'30'
Chief Environmental Officer, Circle-5, UPPCB.

Enclosed : As above
(condition of consent):

Copy to: Regional Officer, UPPCB, Lucknow.

PRAMOD KUMAR AGRAWAL Digitally signed by PRAMOD KUMAR AGRAWAL
Chief Environmental Officer, Circle-5, UPPCB.

U.P. POLLUTION CONTROL BOARD, LUCKNOW

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

Consent Order No. 13931952/ Water — Dated : 15/12/2021

CONDITIONS OF CONSENT

1. This consent is valid only for the approved production capacity of Electricity generation-90 Megawatt.
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	24.0 KLD	STP
2	Industrial	980.0 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	Oil & Grease	10 mg/l
2	COD	250 mg/l
3	BOD	30 mg/l
4	Total Suspended Solids	100 mg/l

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	Total Suspended Solids	100 mg/l
2	BOD	30 mg/l
3	COD	250 mg/l
4	Oil & Grease	10 mg/l

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.

1. The consent is valid for electricity generation of 90 megawatt.

2. This consent is valid for the current products and capacity. In case of any change in process, capacity enhancement etc. No Objection Certificate shall be obtained from the Board.

3. The industry shall maintain and operate the ETP (capacity of 1000 KLD) properly and the treated effluent/sewage shall be used for flushing, irrigation and gardening and shall ensure that no untreated effluent discharged in any surface water body.

4. The treated waste water shall be utilized for the irrigation purpose, sprinkling at coal yard, ash quenching and make up water in cooling tower and shall dispose of as MoEF and CC regulation.

5. The industry shall ensure to operate and maintain the Online Continuous Effluent Monitoring System regularly.

6. The industry shall operate and maintain STP (capacity of 100 KLD) in such a manner so that it can achieve the stranded specified in the notification issued by Ministry of Environment and Forest and Climate change vide GSR 1265 (E) dated 13-10-2017 in the time period as specified in the notification.

7. The industry shall ensure to submit treated effluent analysis report from outlet of ETP and STP conducted by any NABL accredited lab should be submitted quarterly.

8. Polluted effluent generated from power plant unit must not be disposed outside industry premises without proper treatment.

9. The Order issued by Hon'ble Courts/Hon'ble NGT, MoEF & CC, Central Pollution Control Board, U.P. Pollution Control Board, shall be complied with.

10. The industry shall ensure to install Electro Magnetic Flow meter at the outlet of ETP and maintain the logbook.

11. The industry shall submit the latest copy of Audited Balance Sheet/C.A. Certificate (Fixed Assets+ Current Assets - Current Liabilities) so that the Consent fee payable by the industry may be verified.

12. The industry shall develop green belt as per the Protocol attached with Board's office order H 16405 /220/2018/02 dated 16-2-2018, which is available on the Board's website- www.uppcb.com.

13. Install Electromagnetic Pizo Meter at each point of water supply source and at effluent discharge point and ensure to timely send meter reading to department on monthly basis.

14. The industry shall ensure to submit treated effluent analysis report from STP conducted by any NABL accredited lab within 15 days in the Board issuance this certificate.

15. Generated hazardous waste shall be stored temporarily in the unit premises and disposed off through authorized TSDF after obtaining the authorization from the Board.

16.. The industry shall obtain NOC from UP State Ground Water Department within 03 months and submit it to the Board, failing which this CTO shall be automatically be stand revoked.

17. The industry shall comply with the provisions of, Environment (Protection) Act 1986, Water (Prevention and Control of Pollution) Act, 1974 as amended, Air (Prevention and Control of Pollution) Act, 1981 as amended, Plastic Waste Management Rules 2016, E- Waste (Management) Rules 2016, Solid Waste Management Rules 2016 & Hazardous and other Waste (Management and Transboundary Movement) Rules 2016 (Whichever is applicable)

18. If closure order is issued by CPCB or UPPCB against the unit, then this CTO will remain suspended during the closure period and after ensuring the compliance and after revocation of closure order, the CTO will automatically be effective from the date of issuance of closure order revocation, with additional conditions mentioned in the closure revocation order.

PRAMOD KUMAR AGRAWAL Digitally signed by PRAMOD KUMAR AGRAWAL Date: 2021.12.15 14:55:29 +05'30'

B. Piezometer Data

Sr. No.	Description	Piezometer 1	Piezometer 2
1	Location of piezometer	Silo Area	Main Gate
2	Depth (meter)/ Diameter (millimeter)	76 m/ 110 mm	76 m/ 110 mm
3	Distance from the existing borewell (meter)	150	140

		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	4.16	3.1	3.98	4.29	3.8
2	May	4.3	4.23	3.32	4.11	4.13	4.14
3	June	3.98	4.21	3.53	3.89	3.4	4.46
4	July	3.38	4.06	3.75	3.47	2.6	4.38
5	August	2.5	3.84	3.8	2.53	2.18	2.32
6	September	2.49	2.78	3.64	2.52	2.14	2.07
7	October	2.95	3.32	3.41	2.98	1.7	2.06
8	November	3.04	2.95	3.23	3.03	2.46	2.25
9	December	3.18	2.93	3.08	3.47	2.73	2.58
10	January	3.76	2.9	3.07	3.72	3.38	2.89
11	February	3.66	2.97	3.09	3.65	3.55	3.16
12	March	4.2	3.07	3.16	3.95	3.68	3.12
	Average	3.46	3.45	3.35	3.44	3.02	3.10

Annexure 16

Comprehensive Impact Assessment Report with Groundwater Modeling

for

khambarkhera Plant of Bajaj Energy Limited

at

Lakhimpur-Kheri District, UP

Prepared By:-
Spatial Geotech Private Limited
www.spatialgeotech.com

Contents

Accreditation Board of CGWA

Certificate of Accreditation

Mr. Raj Pal Singh

Has been accredited as a Ground Water Professionals to prepare reports in the Functional Areas of

- *Impact Assessment of Existing / Proposed GW Extraction*
- *GW Modelling*

Valid from : 15.02.2021

Valid thru : 14.02.2026

Certificate No. : CGWA/RGI/032

Dated : 07.07.2021

क्षेत्रीय निदेशक
Regional Director
आरजीएनजीडब्ल्यूटीआरआई
RGNGWT&RI

सदस्य
Member
आरजीएनजीडब्ल्यूटीआरआई
RGNGWT&RI

CHAPTER 1: INTRODUCTION AND LAND FEATURES

BRIEF ABOUT THE PROPOSED PROJECT GIVING LOCATION DETAILS, COORDINATES, GOOGLE AND TOPOSHEETS MAPS ETC. DEMARCATING PROJECT AREA

1.1 INTRODUCTION ABOUT THE COMPANY

Bajaj Energy Limited (BEL) at Khambarkhera is a subsidiary of Bajaj Hindustan Limited. This group is one of the largest power generating companies in India that too in private sector. The company is having a very good track record of developing, financing and operating thermal power plants. It is a coal based thermal power plant with a capacity of 90 MW. It has two units each with 45MW capacity. First unit start operating from December 2011 and the second unit is in operation from March 2012. A sugar unit is also present in the vicinity of this power plant. The power plant is running on Indian coal arranged through CCL linkages from the domestic markets. The company is following zero wastage policy in many of its activities and water is one such commodity which is re cycles and re used in the organization. The organization is actively involved in CSR activities where water is common cause. With all these the company is contributing towards sustainable development of the country,

1.2 PROJECT DESCRIPTION

Spatial Geotech Pvt Ltd has entrusted with the responsibility of groundwater impact assessment by Bajaj Energy Limited for the plant site at Khambarkhera. The envisaged project details are as follows.

- Ground water Impact Assessment study around 5km radius of the plant site along with necessary modeling.
- Brief description about the project area
- Establish ground water situation in and around the project area
- Analysis of the water quality data and to escalate water quality issues if any
- Comprehensive assessment of impact on ground water regime of the area including water levels along with risk posed and proposing of a management strategy of overcome issues if any.
- Assessment of available geophysical data
- Ground water resource assessment of the block in which the plant is situated

- Impact assessment study to know the situation that the plant site is in a ground water sensitive area or not.

1.3 NEED AND PURPOSE OF TRE PROJECT

Any kind of impact assessment study include assessment of a "process" for its implication on environment and people and ecosystem depending that environment. There will be an opportunity to modify or even if require can abandon the process if it found that the process regime is getting affected the aforesaid features of the ecosystem. Here ground water abstraction is a major processes and ground water level depletion and quality deterioration can be a risk involved with the process and the impact assessment will address both these so that the environment and people will have to bear least or nil impact of this activity. This will help in decision making at all levels from plant site operations to following norms set by the controlling agencies here in this case Central Ground Water Authority.

The major impact of ground water withdrawal for the operations of the plant is in social and environmental sector. The objective of this study is to understand the hydrological environment and the possible impact of it due to its withdrawal and also to suggest mitigation measures if any for the comprehensive management of this resource so that impact due to ground water extraction to the environment is very slight or even nil.

The daily ground water requirement for this plat operation is 6984 m^3/day. Permission for the same is already obtained through NO-OBJECTION CERTIFICATE NO: REG045173, REG012934 & NOC020026 Dated- 07/04/2022. The requirement is full filled through three number of bore wells for the purpose. In order to obtain Renewal in NOC, application for which was submitted on online portal "NOCAP" of CGWA (Central Groundwater Authority). As per Gazette Notification of Ministry of Jal Shakti (Department of Water Resources, River Development and Ganga Rejuvenation) (Central Ground Water Authority) dated 24th September, 2020 CGWA guideline dated on 24.09.2020, "All the Plant Site extracting/proposed to extract groundwater in excess of 100m3/day in Over-Exploited, Critical and Semi-Critical areas shall have to mandatorily submit impact assessment report of existing/proposed groundwater withdrawal on the ground water regime and also socio-economic impacts report prepared by accredited consultants

1.4 SCOPE OF WORK

The detailed scope of work as envisaged in this project is as follows.

- Hydrogeological studies as per CGWA norms.
- Establishment of sub surface geology, lithological formation encountered during drilling as well during geophysical studies
- Aquifer characteristics of the area
- Ground Impact Assessment study around 5km radius of the plant site along with necessary modeling.
- Study on ground water levels as well as ground water quality
- Water usage plans
- Long term and short-term ground water trends in and around the plant area
- Groundwater modeling to predict future ground water scenario
- Establishing ground water flow directions of the project area

1.5 METHODOLOGY

In order to execute the above task under discussion following methodology has been followed

- Survey of India toposheets have been collected
- Collection of technical and scientific literature of the area pertaining to geology and hydrogeology of the area.
- Necessary satellite image has been collected
- Climatic data in the form of annual average rainfall has been collected for 100 years
- Thematic maps have been prepared for geology, geomorphology, land use land cover, digital elevation model, contour etc
- All the collected data has been verified in the field through field checks
- Collection of ground water data from field as well as historical data from authentic source of Government departments
- Ground water level data has been analyzed and pre monsoon and post monsoon data has been segregated in this study to know the trends both short and long term.
- Ground water level data has been analyzed for ground water table map preparation and flow direction preparation

- Well inventory data has been collected to know the depth of wells, well lithology and soil strata beneath.
- Concepts of ground water modeling established from basin using Darcy's equation
- Ground water gradient of the area prepared and predicted the ground water level for another 10 years
- An overall impact of pumping for the plant operations has been worked out.

1.6 LOCATION AND ACCESSIBILITY

The power plant is located in Khambarkhera village. Location details are given in Table 1.1 and shown in subsequent figures. A close look at topographic map of the area shows that the study area is bestowed with very good water resources. Kandwa nadi is the major river in the area. This nadi is supported by Junai nadi and Purva chauka Nadi. These rivers are flowing through the area along with several water bodies which are relics of river course in historic times. This indicate that underlying aquifers are alluvial in nature. Area is in general plain with agricultural land and slope is towards South East. Satellite images of the area is also collected from National Remote Sensing Center.

Table 1.1

Location details of the power Plant

Sl.No.	Particulars	Details
1	Village	Khambarkhera
2	Block	Phool Behar
3	Tehsil	Phool Behar
4	District	Lakhimpur Kheri
5	State	Uttar Pradesh
6	SOI toposheet No	62A/13, 62D/16
7	Latitude	28^0 01' 04"
8	Longitude	80^0 49' 18"
9	Seismic zone	IV

Area is approachable at all seasons. Lakhimpur Kheri district head quarter is just 12 kms from the study area. The area is well connected by road and nearest railway station is Lakhimpur.

Sl. No.	Latitude	Longitude
1	28^0 01′ 04″	80^0 49′ 18″
2	28^0 01′ 11″	80^0 49′ 45″
3	28^0 0′ 57″	80^0 50′ 02″
4	28^0 0′ 44″	80^0 49′ 43″

Fig.1.1 High Resolution Satellite Image of the plant area

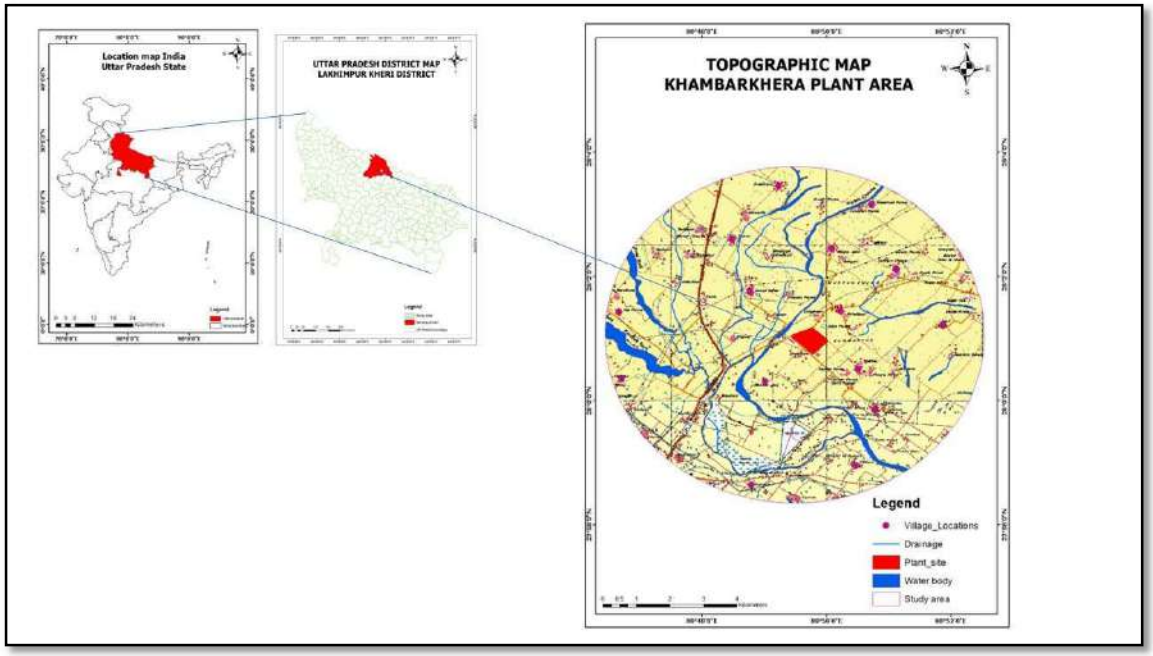


Fig.1.2 Location map

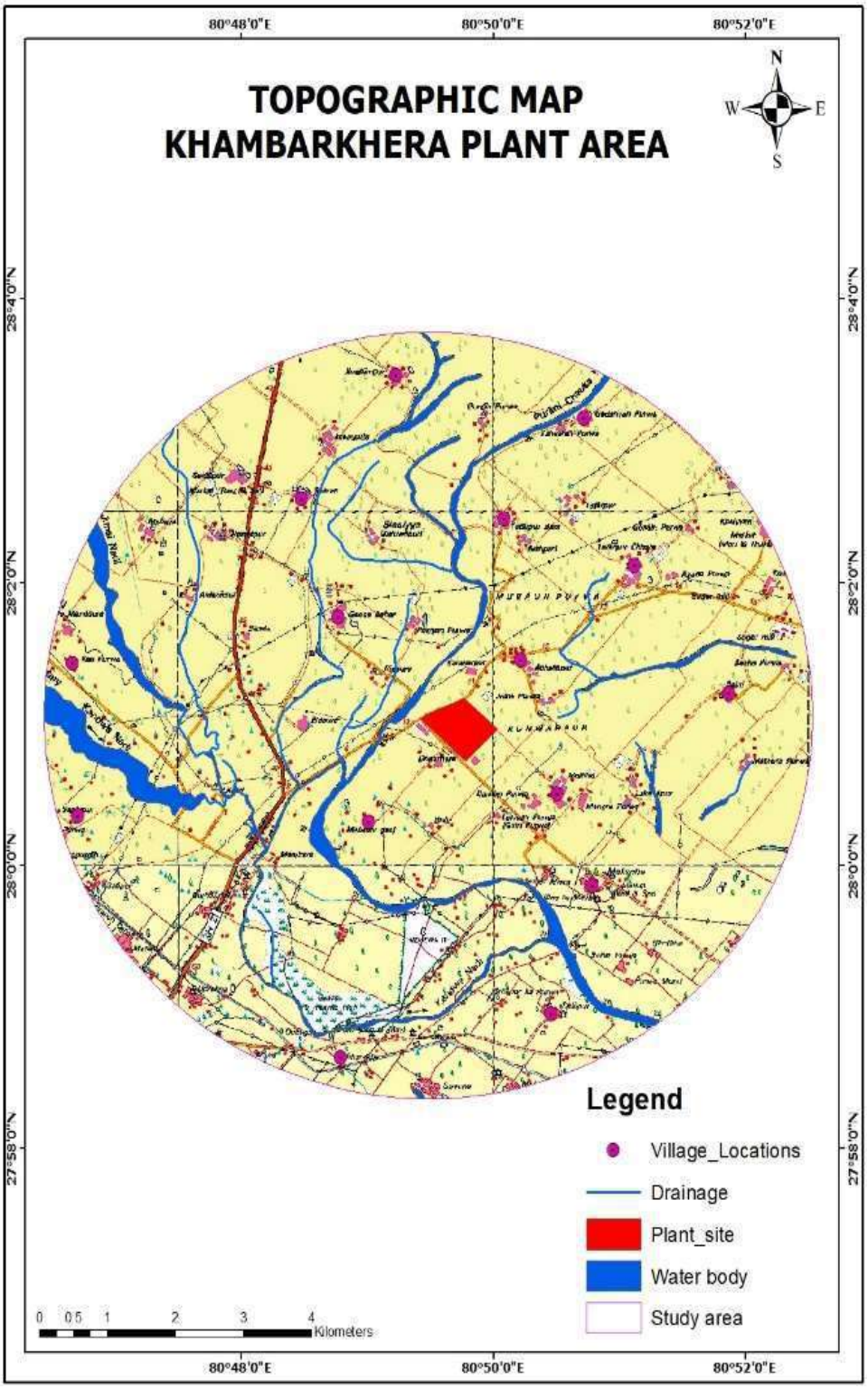


Fig.1.3 Survey of India topographic map of the area

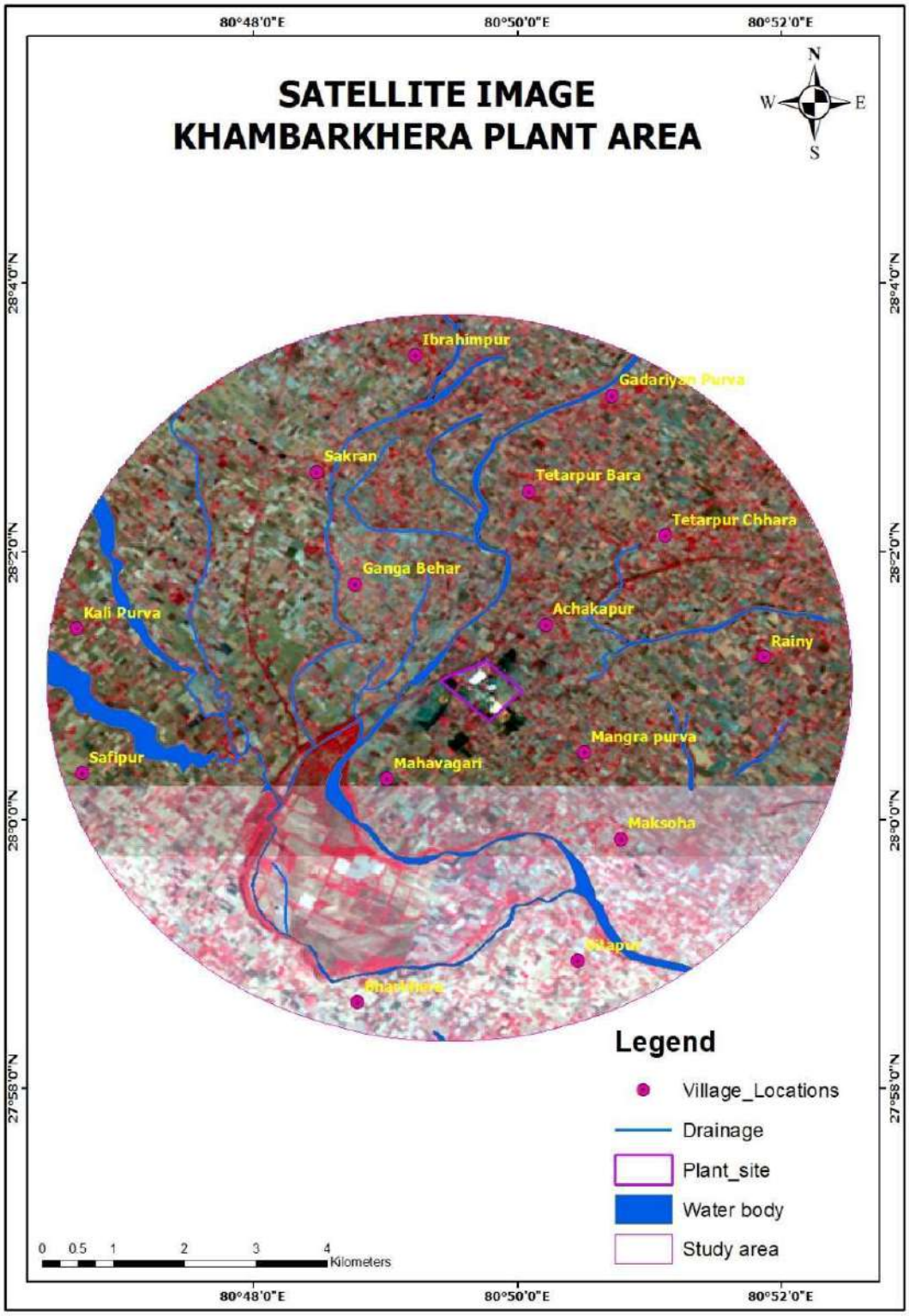


Fig.1.4 Satellite image of the study area

1.7 LAND USE LAND COVER

A land use land cover data has been prepared using Sentinel satellite image data sets. An analysis of the same reveals that agriculture, settlements and waterbodies are the major land use classes of the study area. Area statistics of the study area shows that 85% of the area is with agriculture which is the predominant class and rest of the classes are minor in nature. Fig.1.5 and 1.6 show the land use land cover map of the area.

Table 1.2

Land use land cover statistics

Sl.No.	Land use Class	Area (sqkm)	%
1	Agriculture	66.64	85.1
2	Forest	1.64	2.1
3	Land with or without scrub	0.31	0.4
4	Water body	3.07	3.9
5	Settlement	6.62	8.5

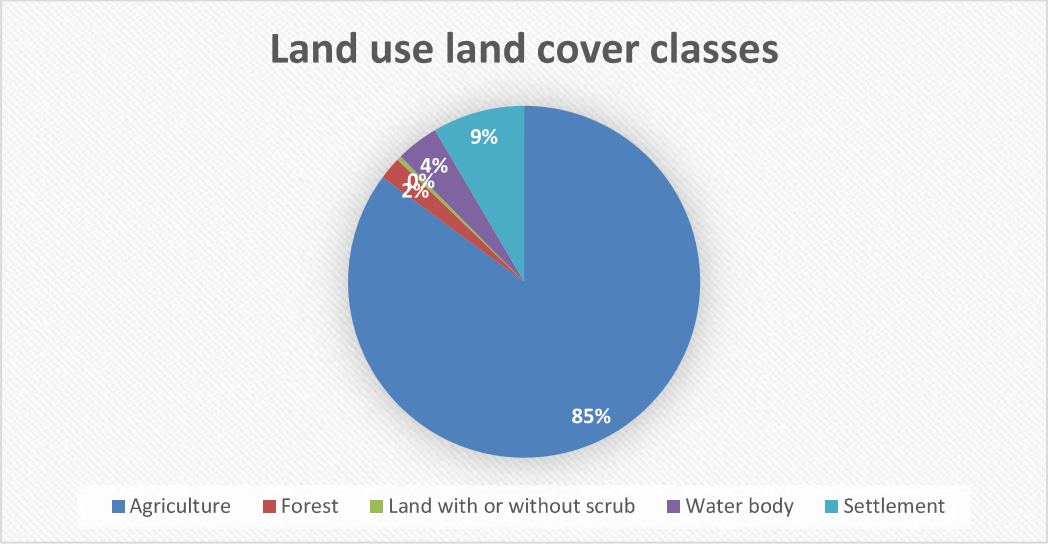


Fig.1.5 Land use land cover area statistics

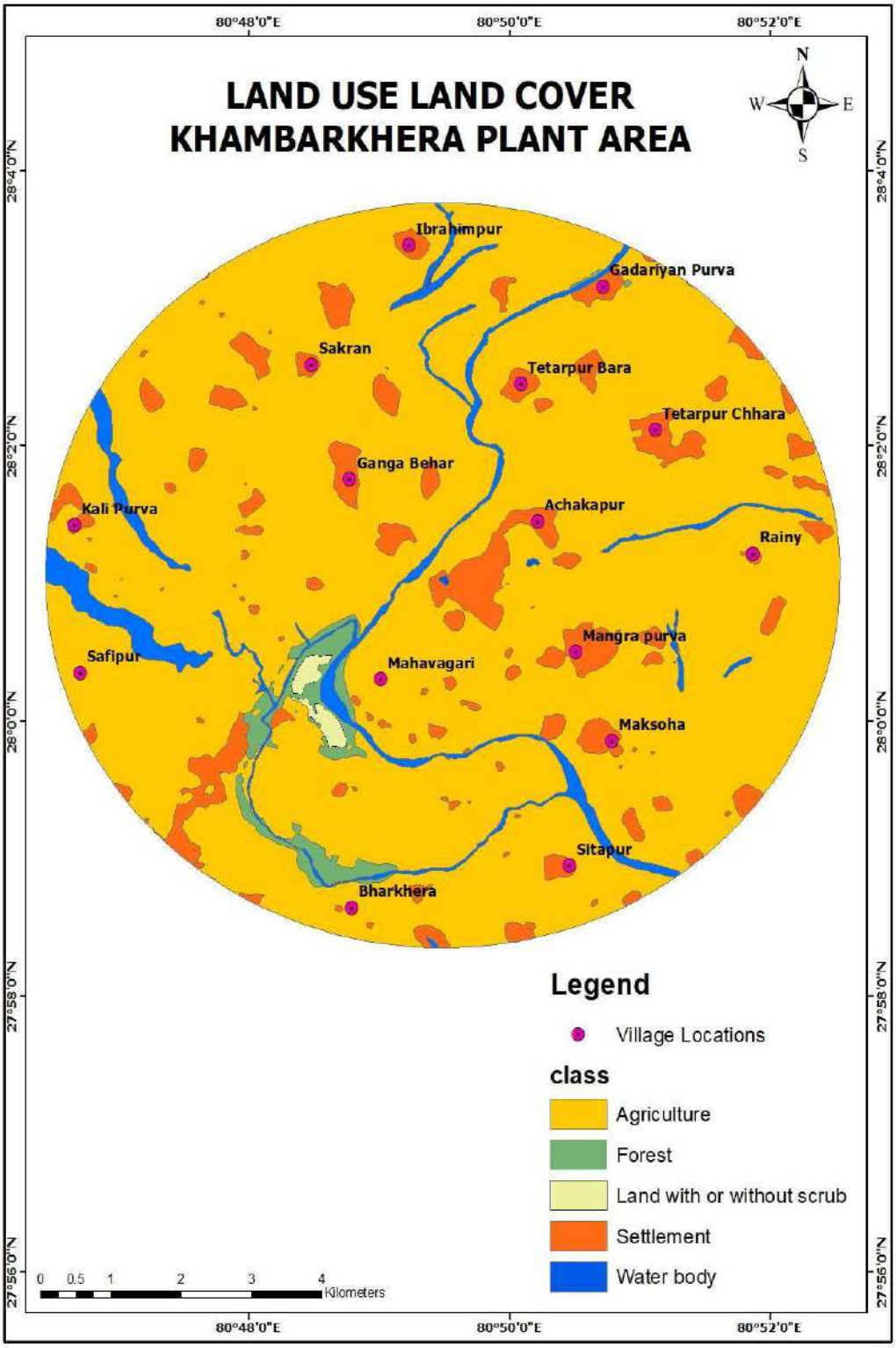


Fig.1.6 Land use land cover map

1.6 CLIMATE AND RAINFALL

The study area experience tropical sub humid climate. In this type of climate there are three distinct seasons. They are winter, summer and monsoon. One season will change to another through transitional periods were effect of both the seasons are visible and ultimately changes to the other season. During summers the average maximum temperature recorded is 37.9^{0}C. The humidity during summers is ranging from 33 to 58%. March, April and May are summer months. June to October is rainy season. August is the peak rainy month. During rainy season humidity increases and reaches to 84%. 85% of the rainfall received during monsoon season. November to February is considered to be winter months. January is the coldest month. Average lowest temperature observed is 8.9^{0}C. A look at the wind speed observations shows that 8 to 10km per hour speed during summer, 4 to 6 during winter seasons.

Average annual rainfall of the 1901 to 2002 has been analyzed to know the long-term trend of the rainfall. Average rainfall is 1156mm. The long-term trend shows a declining trend in rainfall of the area.

Table 1.2

Monthly weather of the plant site

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min. Temp	8.9 °C	11.9 °C	16.2 °C	21.6 °C	25 °C	26.6 °C	25.9 °C	25.6 °C	24.3 °C	19.7 °C	14.6 °C	10.2 °C
Max. Temp	20.8 °C	24.6 °C	30.7 °C	36.7 °C	37.9 °C	36.1 °C	31.7 °C	31.4 °C	31.1 °C	30.3 °C	27 °C	22.5 °C
Rainfall (mm)	23	37	21	16	32	176	362	313	197	33	2	15
Humidity(%)	71%	63%	47%	33%	42%	58%	82%	84%	82%	70%	63%	68%
Rainy days (d)	2	3	2	3	6	11	19	19	14	2	0	1
Avg. Sun hours	7.7	9.4	10.6	11.5	11.7	10.7	8.6	8.5	8.7	9.5	9.4	8.3

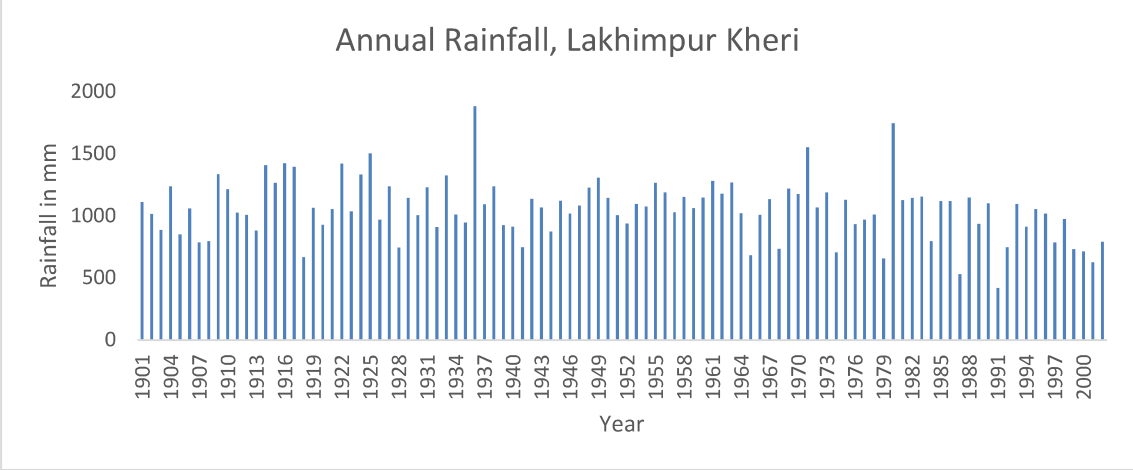


Fig. 1.7 Long term average annual rainfall

An attempt has been made to collect and analyze rainfall data of recent years. Annual rainfall of 2002 to 2021 has been shown in table 2.2 and Fig 1.8. Average annual rainfall is 1105 mm.

Table 1.4

Annual rainfall of the study area

Year	Annual rainfall (mm)
2002	875.01
2003	1645
2004	1261.96
2005	1102.06
2006	929.95
2007	1186.93
2008	1386.67
2009	1229.3
2010	1222.52
2011	363.13
2012	971.64
2013	1270.69
2014	1064.66
2015	910.74
2016	1177.99
2017	978.4
2018	1179.09
2019	787.86
2020	897.3
2021	1663.28

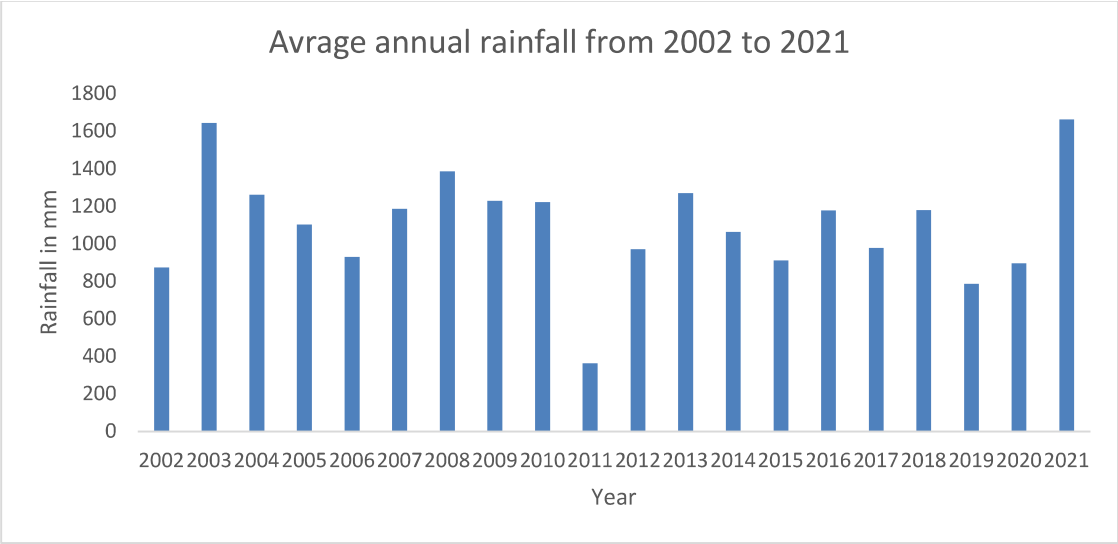


Fig. 1.8 Recent years average annual rainfall

1.7 GEOMORPHOLOGY

The study area forms part of the Central Ganga plains in the upper Ganga sub basin exhibiting monotonous flat terrain with slope towards south. This land form merges in Tarai belt forms marshy and land with thick forest covers. The older alluvial portion of the area is also known as Bhanger surface and active flood plains of the rivers of the area also known as Khadar surface. Older alluvial plains are the oldest formations of the area. Palaeo channels and tals are common in this area.

Geomorphologically the area is part of the vast Indo Gangetic Alluvial Plains. In general, this falls into alluvial plain category. However, a close detailing of the study area shows that geomorphologically the area can be classified in active flood plain, older flood plain and palaeo channels. The areas very close to the rivers constitutes the active flood plains and various relics of drainages in the form of ox bow lakes and small water bodies constitute palaeo channels and rest area constitute the older alluvium plains. The presence of palaeo channels indicates that river has migrated from its original course during the morpho tectonic history.

This kind of landforms are characterized by topographic plain of low relief and numerous fluvial geomorphological features such as abandoned channel, natural levee and meander scars. The presence of different erosional and depositional fluvial features indicates shifting and meandering 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 alluvial plain and carved new meander belts at lower elevation, where younger flood plain deposition took place. Thus, this region presents two distinct subunits, the high land or composite flood plain area and low meander flood plains. The low-lying riparian area occupied by the present-day meander belts forms 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 gave rise to the younger alluvium. The Older alluvium, occupying comparatively high land, covers major part of the Central Alluvial Plain in the study area. A typical characteristic of older alluvium is formation of kankar within itself due to leaching of calcium carbonate under favorable climatic conditions. This unconsolidated zone is porous and permeable with primary inter-granular porosity and has good ground water potential occurring under unconfined, semiconfined and confined conditions.

1.8 PHYSIOGRAPHY AND DRAINAGE

Physiographical scenario shows that the area falls as part of Great Indo Gangetic Plains. It forms Tarai belt immediately after Siwalik Himalayas. There is no hills or ridges available in the study area, which is very plain in nature. The study is showing an elevation range of 46 to 110 m above mean sea level. Much adulations are not observed in the study area.

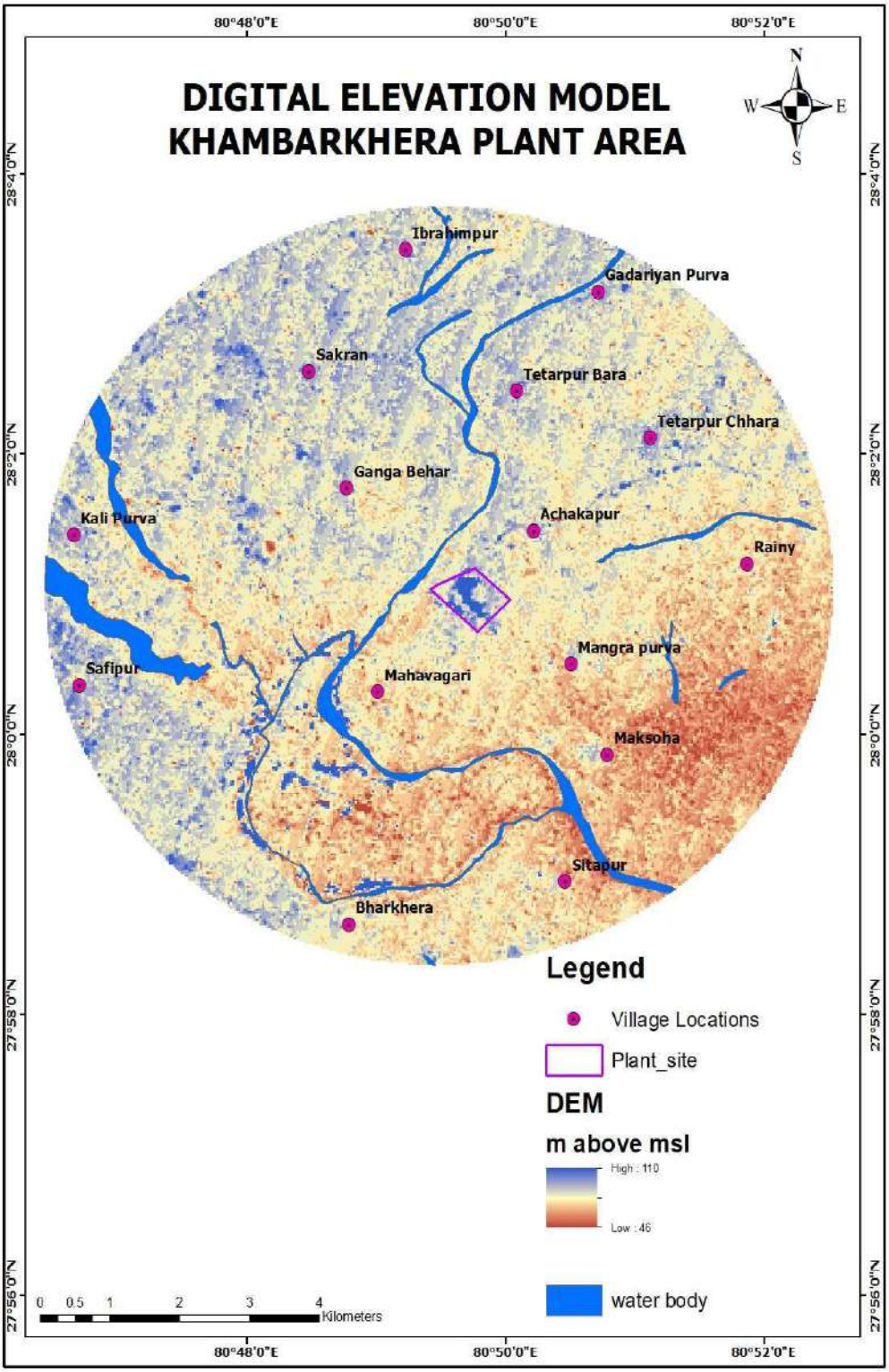


Fig. 1.9 Digital Elevation Model

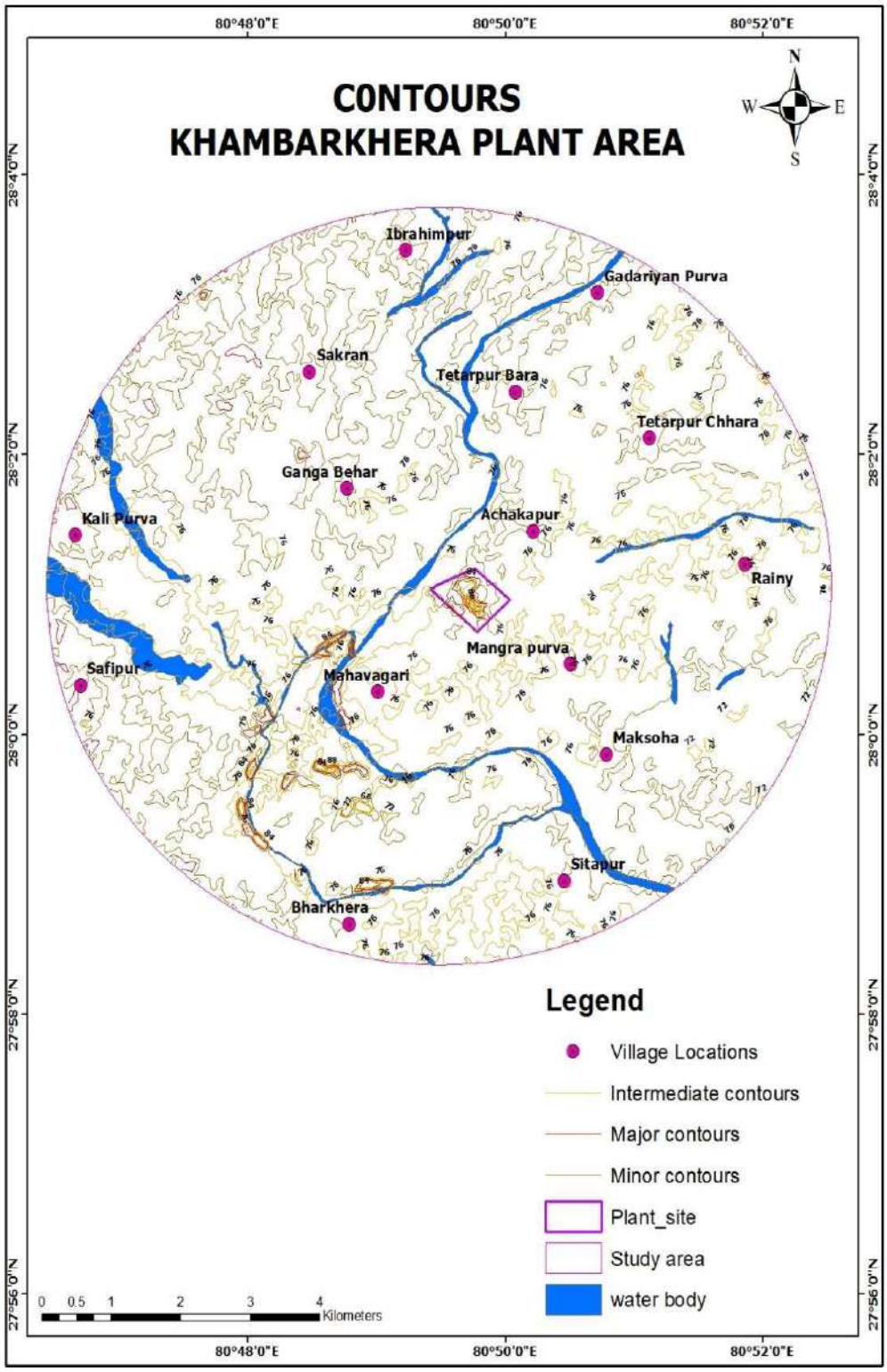


Fig. 1.10 Contour map of the area

The area is drained by Kandwa Nadi and its tributaries Junai nadi and Purva Chauka Nadi and its supporting drainages. The drainage density is very coarse which shows much infiltration and good ground water potential for the area. There are several ox bow lake of different size and shape are available in the area. These are indicating that area is very much water rich. A drainage map of the area is given below.

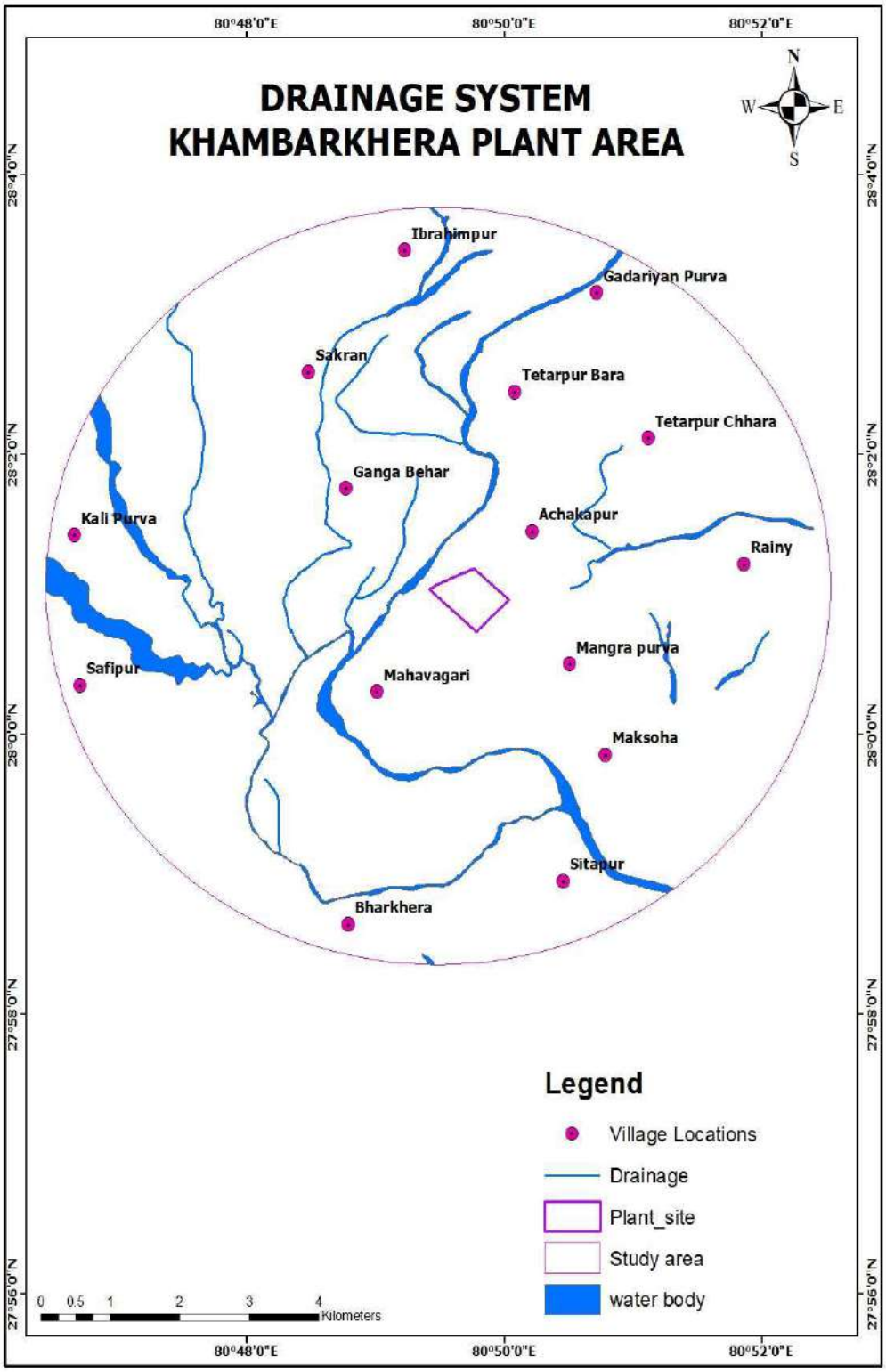


Fig. 1.11 Drainage map of the area

1.9 DETAILS OF WET LAND

A wet land is a different ecosystem usually flooded by river and moisture is prevalent throughout the year. These are either permanently or seasonally water logged. The distinguishing factor of wet lands from other water bodies and land forms are the characteristics aquatic flora and fauna which are uniquely adapted to hydric soils of the area. There is no Ramsar convention listed wet land in the study area. The Kandwa river and its ox bow lakes are the main wet land features of the area. There is a patch of marsh land in the study area. Though these are not designated wet lands in all practical purpose these serves as wet land of the area. Dudhwa Tiger reserve is nearby which is a mayor eco sensitive area. It is a notified area. The study area forms Terai Arc Landscape of the Gangetic plain. Grass land and swamps with ox bow lakes are common in the area. There are many palaeo channels found within the study area.

CHAPTER 2: GROUND WATER SITUATION

GROUND WATER SITUATION IN AND AROUND THE PLANT AREA INCLUDING WATER LEVELS AND QUALITY DATA AND MAPS ALONG WITH QUALITY ISSUES

2.1 BRIEF GEOLOGY OF THE AREA

Regional Geology: The study area and its adjoining region is under by thick pile of Quaternary alluvial deposits which are deposited over Siwalik group of sediments which in turn overlies Vindhyan Supergroup with an unconfirmable boundary. The Newer Alluvium occurs along the courses of major streams forming wedge shaped cover. The formation consists of fine to medium sand, silt with thin clay lenses. Terrace Alluvium of different rivers exhibits different characteristics.

The alluvium in this region is 400-590 m thick and directly overlies upper Siwalik. Sedimentation of Varanasi older alluvium possibly began during Middle Pleistocene in the basin formed over the Siwalik Super group with the rising Himalaya due to post Upper Siwalik upliftment of Himalaya. From the start of Holocene a the change of climate noticed from cold arid to warm humid, which brought about the next cycle of sedimentation represented by Terrace Alluvium. This is also the period of formation of wide erosional terraces. The deposition of third generation of Quaternary sedimentation is still on and represented by point bar and channel bar deposits of recent alluvium. The basement for Quaternary sediments is not exposed in the region. Basement rocks in the area are concealed under thick pile of Quaternary sediments. The Upper Siwaliks consisting of sand/ sandstone and clay/ claystone, form the concealed basement for Quaternary sediments. The lithological distinction between Varanasi Older Alluvium and Siwalik sediments, however, is not very perceptible and the hiatus between the two entities is also not reported. The Siwalik Supergroup, comprising of Upper Siwalik, Middle Siwalik and Lower Siwalik, in turn, rests unconformably over northern sloping basement of Vindhyan Supergroup, encountered in Shahjahanpur. Generalized stratigraphic regional sequence is given in Table 2.1

Table 2.1

Regional geology of the area

Age	Geological units	Lithology	Geomorphological unit	Land forms
Holocene	Newer Alluvium	fine to medium loose micaceous sand with minor silt	Active Flood Plains	Point bar channel bar, lateral bar, sandy flats
	Terrace Alluvium	cyclic sequence of grey to light khaki colored silt, clay and micaceous sand; thinly laminated; occasionally oxidized	Older flood plains with river terraces	Abandoned channels, cut off meanders, sandy flats
Disconformity				
Middle to Upper Pleistocene	Varanasi Older Alluvium	Multiple, polycyclic, fining upward sequence of oxidized silt, clay and sand with subordinate kankar concretions	Older Alluvial Plain	Sandy surface - Sand mounds ridges & flats Silt-clay surface, Palaeo channels, Tals
Disconformity				
Tertiary	Siwalik Super group	fine sand/ sandstone and clay/ claystone	Not exposed in the area	
Unconformity				
Pre Tertiary Basement rocks belonging to Mesozoic/ Precambrian Vindhyan Supergroup			Not exposed in the area	

Geology of the study area: The study area comprised of thick alluvial deposits. Geologically these are younger and older alluvial deposits of Quaternary to Recent age. The area is part of vast Indo Gangetic Alluvium. These alluvial deposits are comprised of sand, clay, gravel and kankar in various proportions. The study area falls under Tarai belt with sand, pebble inter bedded with clay. A close observation of lithology of the area shows that fine sand with clay and kankar is the main sediments. The generic geological sequence is given below.

Table 2.2

General geology of the area

System	Age	Formation	Lithology
Quaternary	Recent to Upper Pleistocene	Younger alluvium	Fine sand, silt, clay gravel
	Upper Pleistocene	Older alluvium	Clay, Kankar, Sand

These alluvial deposits are developed from the materials deposited during Late Pleistocene and recent times on gently sloping outwash plains which occur as a belt below and few kilometers South of Siwalik Himalayan ranges, Deshpande et. al. (1971). The present study area is having the characteristics of Tarai belt with its highly vegetated and Swampy nature. The soil found in this area is slightly low organic content and higher base saturation which facilitates more infiltration and hence ground water potential is fairly large.

In the present study area younger alluvium is criss crossed with various rivers and Kandwa river is the main river with its meandering course indicate that river is in a mature stage of evolution. The younger alluvium is found near to the water bodies and older is much away from the same. Younger alluvial deposits are renewed every year by fresh sediments brought down by the rivers in the region. Sand, Silt, Clay sequences are common in such terrain. The alluvial deposits are placed in a structural trough formed due to upliftment of Himalayas. The deposits are characteristics of fore deep or rift valley type and the structural details of the terrain is exhumed by thick pile of alluvial deposits.

2.2 HYDRO GEOLOGY OF THE AREA

Hydro geologically the area is classed as porous sedimentary formations. It is part of the Indo Gangetic Alluvial Plains. The deepest well found in the area is 331 m bgl. Both younger and older alluvium along with palaeo channels of the water bodies form as potential aquifers for the area. The collected lithologs shows that formation encountered underground are sand of finem, medium and coarse grained, Kankar and Clay. Kankar is the product of leaching from the clay overburden. Clay bands are lenticular in upper portions immediately beneath the soil and at deeper levels these are found as continuous layers spreading large areas.

The study area is falling under a hydrogeological group of unconsolidated sediments. These forms phreatic aquifers under shallow depth and semi to confined aquifers in deeper depths. Dug well, bore well and tube well are common in this terrain. The depth ranges and yield of these wells vary. Table below show the aquifer details.

Table 2.3

Details of the aquifer groups

Type of well	Depth of wells (m bgl)	Water quality	Yield (lpm)
Dug well	4.5-10.9	Good	
Tube well	100-332	Good	250-3480
Bore well	15-35	Good	150-250

Most of the wells are above 100m bgl depth and hence tapping only the upper aquifer. Thus, the aquifers encountered are shallow aquifers. The plant area is also tapping shallow aquifers only. The thick unconsolidated sediments of Indo Gangetic alluviums form the aquifers of the area. Thickness of the deposits are highly variable from few meters to more than 456 m bgl. These are very good repository for ground water. The granular zones composed of sand, silt and Kankar interlayers with clay deposits creating multiple layers of aquifers. These clay layers are the confining layers making deeper aquifers as semi confined to confined. Otherwise, ground water in shallow aquifers is in phreatic conditions.

Lithologs of the study area has been analyzed individually as well as in comparison to other wells. This indicates that Sandy silt form the potential aquifers of the area. Also the analysis reveals that near to the Kandwa river fine sand bed is available at a shallow depth which can form a perched water table conditions in the area.

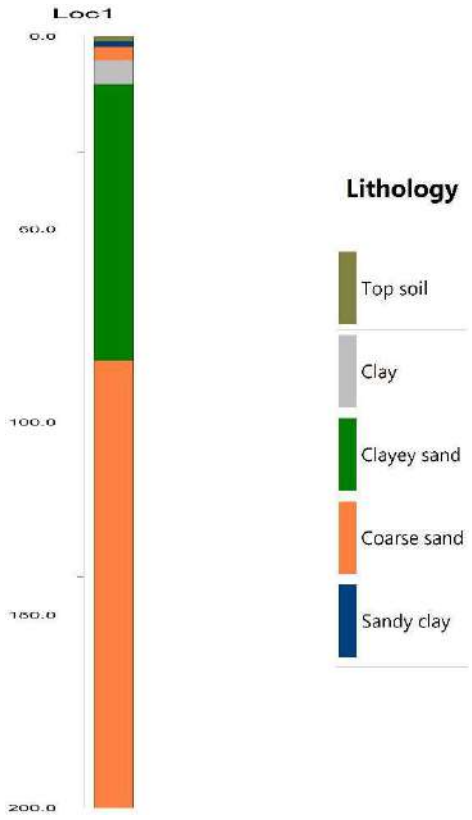


Fig.2.1 Sample lithology of the area

2.2.1 GEOPHYSICAL STUDIES

Very often underground formations are composed of different layers with different materials. Based on the water holding and saturation levels some of them area forms the aquifer material and some and impervious layers which holds the water above or below it. The nature and extent of these layers horizontally and vertically can be ascertained by studying their physical properties. Geophysical studies are important method for getting eh physical properties of the earth material. There are so many methods used to get the different physical properties of the earth material. The basic concept of these properties is a contrast (clear difference in observed parameters) in the same physical property of different material. The physical properties can be

- Specific gravity
- Heat conductivity
- Magnetic properties
- Electrical resistivity/conductivity
- Hardness

- Refractive index
- Light reflectance
- Seismic velocities and
- Gravity

Once the physical property is identified then it is very easy to define the material on the basis of physical property, which act as an indicative index property of that material. Most of these physical properties can be identified and measure in the lab. Some of these physical properties can be measure on ground. Some of these properties necessitate measure in the field itself under natural conditions where the earth material exists. This is because the properties will change if the natural conditions are disturbed. Examples of such properties are seismic velocity, electrical resistivity, load bearing capacity etc. The methods used for determining these properties are applied in the field by using very sophisticated and sensitive instruments helpful for the determination of the particular property with very high levels of accuracies and with the help of these properties earth material can be identified.

In case of hydrogeology, aquifer material and non-aquifer material can be easily distinguished by electrical resistivity method. The contrast in the electrical resistivity is the basic concept behind such identification.

Electrical resistivity survey: This is a common geophysical survey generally done by geologists, geophysicists, earth scientists and hydrogeologists in particular. The underground litho units can be discriminated and delineate using this method. In order to establish aquifer material and depth at which such aquifer occurs can be easily find out with the help of this survey. In some cases, ground water quality can also be ascertained from this.

Electrical resistivity method popularly known as resistivity method is helpful in vertical variation and spatial variation in the lithology of the project area and electric behavior of the underground litho units. In the electrical resistivity method, the vertical and spatial variation of the underground lithology is delineated using various techniques of arraying the potential and current electrodes. When current is passed from surface of the earth at different points then the earth material resist its passage from one place to the other depend on the resistivity of the different material of the earth beath the surface. The measurement of the resistance with very sensitive resistivity meter at different points with the same distance of the current electrodes gives different resistance values depending on the resistivity variation of the earth materials

spatially(horizontal variation) at the same depth. This is the indication of spatial variation of the earth material on the basis of resistance values. Using the electrode spacing and geometric factor for the particular electrode spacing the apparent resistivity of the material at different pseudo depths may be calculated and then the true resistivity can be determined with the the help of field curve matching with mater curves available in the market or by using software designed for this purpose of resistivity survey data interpretation. proprietary software

In a same manner current electrodes are systematically used against the same central point with different distances than the resistance of the earth material at the same point at different depth involved. By using the standard master curve or proprietary software for the which the resistivity meter designed will give necessary interpretation results the vertical variation of the lithological units may be determined with the depth by using different resistivity values of the litho units.

Current electrodes are placed at equal distance from the central point where a potential electrodes are is place and a specific amount of current passed through the electrodes and resistance in the form of potential difference is measured for that distance. The distance between the current electrode is know as AB/2 and distances between the potential electrodes are called MN/2. The resistance measured at a particular AB/2 is noted and then it will be multiplied with K, the geometric factor (constant value depending on the current electrode and potential electrode spacing configuration) to find out the apparent resistivity values ρa at that distance. The graph will be plotted AB/2 half of the distance between two current electrode on X-axis and V/S apparent resistivity ρa in Ωm on Y-axis on log log graph with modules of 62.5mm. A field curve will be matched with standard master curves or using software designed for this purpose available in the market. Hence the thickness and depth of the different resistivity materials may be determined during interpretation of the field data.

The commonly used electrode configurations are

1. Wenner method: It is an equal spacing array of electrode configuration where A and B are placed at a distance 3 times the distance of M and N. The geometric facto K is 2 *π *a where a is the distance between M and N. This arrangement will be same for all

successive increment distances. This will be achieved by keeping AM=NB=MN=a and M and N at equal distance from the bill.

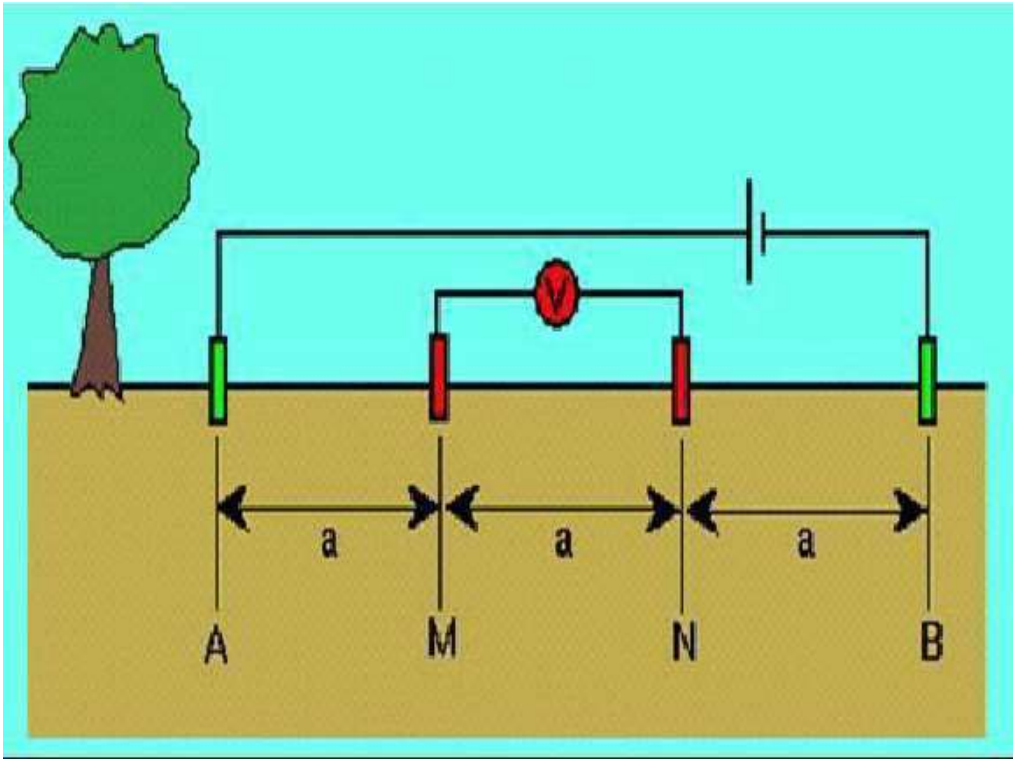


Fig.2.2 Wenner's electrode arra

2. Schlumberger's method: In this configuration of electrodes AB = 5*MN, 10*MN and so on where K = π/4(AB/2-MN/2)/MN

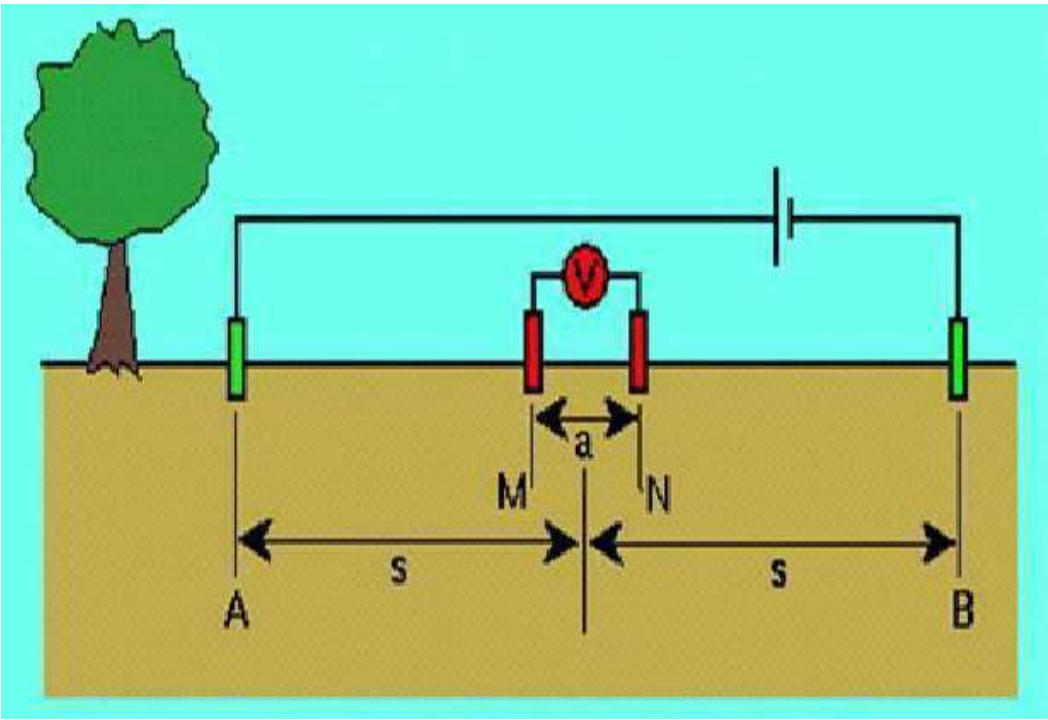


Fig.2.3 Schlumberger's electrode array

Both these methods are capable of identifying the difference earth material horizontally or vertically. Following conditions will be generally done to interpret the results of electrical resistivity survey.

- Finer the material lesser the resistivity
- Compact earth material has more resistivity than the loose material
- Water saturated formation have less resistivity compared to dry formation
- Saline ground water have less resistivity compared to fresh water
- Alluvium has low resistivity compared to rock formations

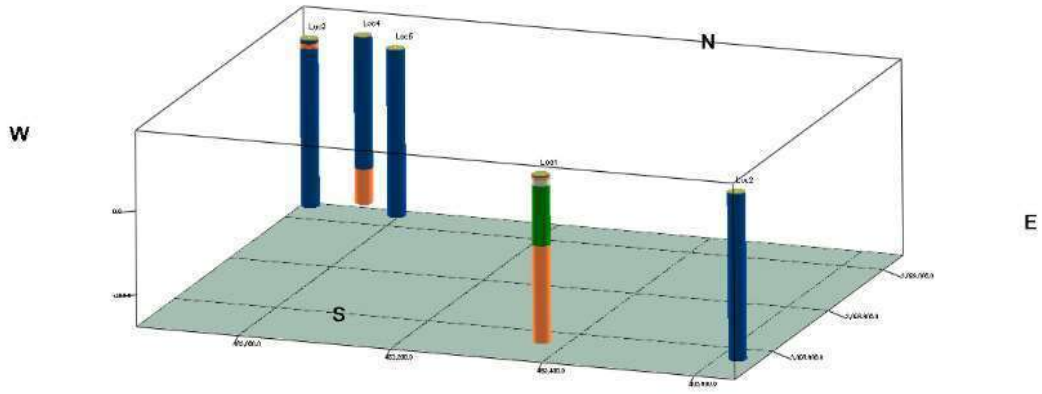


Fig.2.4 Lithologs made out of geophysical interpretations.

2.3 AQUIFER DESCRIPTION

The aquifers of the study area have been deposited through rivers originating from Himalayan Mountains. The primary composition of such sediments is pebble, gravel, sand, silt, clay and kankar. These occupies present and historic flood plains. This unconsolidated zone is porous and permeable with primary intergranular porosity and has good ground water potential. The shallow aquifers are the main source of drinking water through hand pumps and dug wells and is unconfined in nature. The shallow aquifer as a whole which is under unconfined to semi-confined conditions, it is the most potential aquifer group which is the main source of groundwater to meet the drinking water and irrigation needs. The deeper aquifers are confined in nature being exploited to a very limited extent.

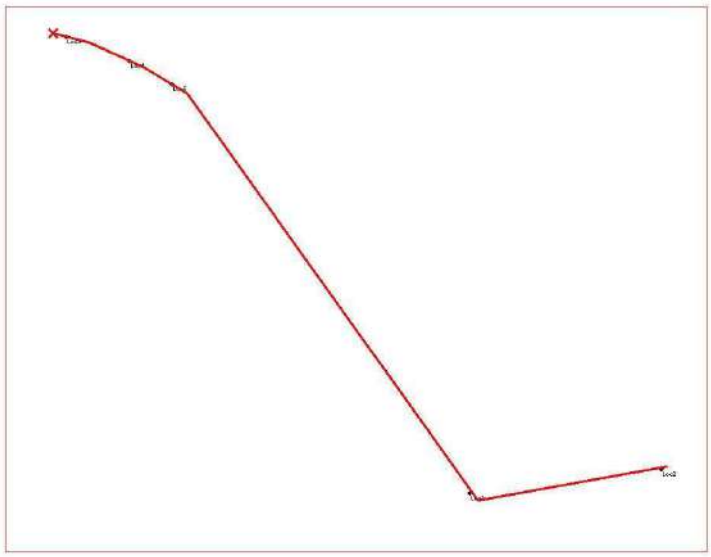


Fig.2.5 Profile lines along with hydrogeological cross section has been prepared

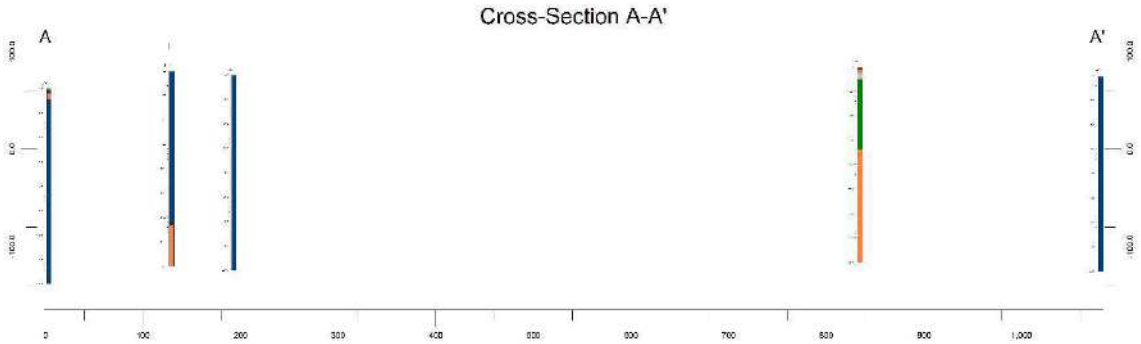


Fig.2.6 Lithologs along the profile lines

Phreatic aquifers are shallow in nature and found to be a depth of about 10.9 m bgl. Intermediate and deeper aquifers are going up to 331m bgl which are confined or semi confined in nature. Static Water Level details and ground water quality details are given in subsequent sections in detail. The aquifer parameters estimated through step drawdown test and long duration aquifer performance test indicates that

Average well depth to tap the aquifer:	227-331m bgl
Yield of wells:	2700-3300 lpm
Drawdown range observed:	5.42-28.92 m

Transmissivity: 3030 m^2/day

Storitivity: 2.05 x 10^{-3}

Water in the shallow aquifers occurs under unconfined condition and is tapped by dig wells and shallow bore wells. These shallow wells will tap water from aquifers having a depth range of 70 to 100 m with varying drill depth so that an average of 40m thick aquifers will be tapped.

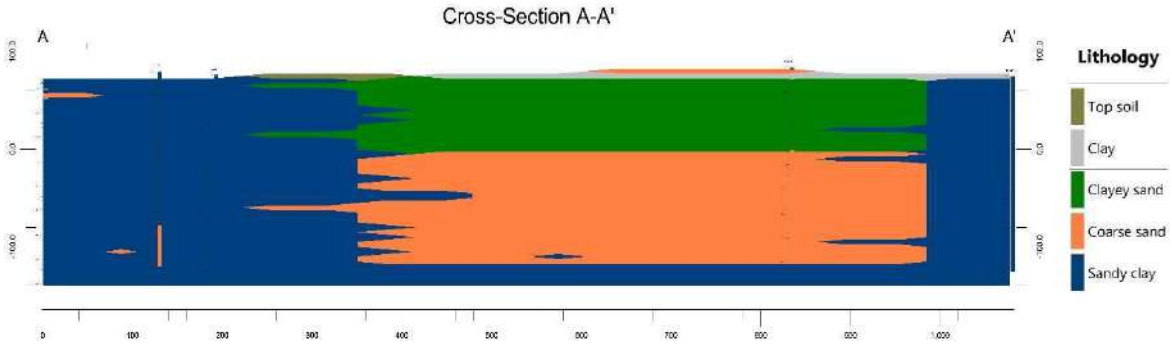


Fig.2.7 Hydrogeological cross section along the profile line

2.4 GROUND WATER MONITORING

The ground water levels has been constantly monitored through 5 piezo meters installed within the plant premises. The summarized monthly data has been presented in Annexure 1. Some of the piezo meters were installed with automatic water level recorders and some are manually measured. Those piezo meters which are within the plant boundary were fitted with automatic water level records with telemetric facility and those outside but close to the plant site is measured manually. The analysis of the ground water levels from these piezometers shows that ground water levels of the area is ranging between 1.84 to 4.25 m bgl. This indicates that ground water is under shallow conditions and well are tapping shallow aquifers.

Further the ground water level data has been arranged for pre monsoon and post monsoon water levels. Average ground water level for the month of April/May has been considered as representative ground water levels of pre monsoon and average water levels of November/December has been considered as representative ground water levels for post monsoon period. Wherever data gaps observed, those were filled with various statistical techniques such as moving average.

Pre monsoon and post monsoon ground water levels from the adjacent villages were collected and analyzed. The results were further classified into one meter interval to know the deepest and shallowest part of the study area. Pre monsoon water levels indicates that plant area falls

in 3 to 4 m deep ground water level portion of the study area. Whereas the analysis of the post monsoon data indicates that plant area falls 2.5 to 3 m bgl in a comparatively shallow ground water zone. This indicates that ground water fluctuations within the plant area is not so considerable enough to make artificial recharges successful. Also, the analysis indicates that study area is prone to be waterlogged not water logged.

Post monsoon water levels are ranging from 1.84 to 2.98 m bgl and pre monsoon water levels are ranging from 3.41 to 4.25 m bgl. These observations are made of piezo meters reading established within the plant area and in close proximity to plant areas. Ground water levels are also taken from the study area outside the plant area as well. The average pre monsoon and post monsoon water levels were used for the analysis. Reduced levels of the well locations were collected from digital elevation model using ARC GIS tools and water table elevations in m above msl s were calculated within the ARC GIS environment. These values were plotted to get the water table maps and ground water level maps.

An analysis of the above shows that on a regional scale ground water table exists at an elevation of 100 to 105 m above mean sea level at the plant area site. The region is having water logging tendency.

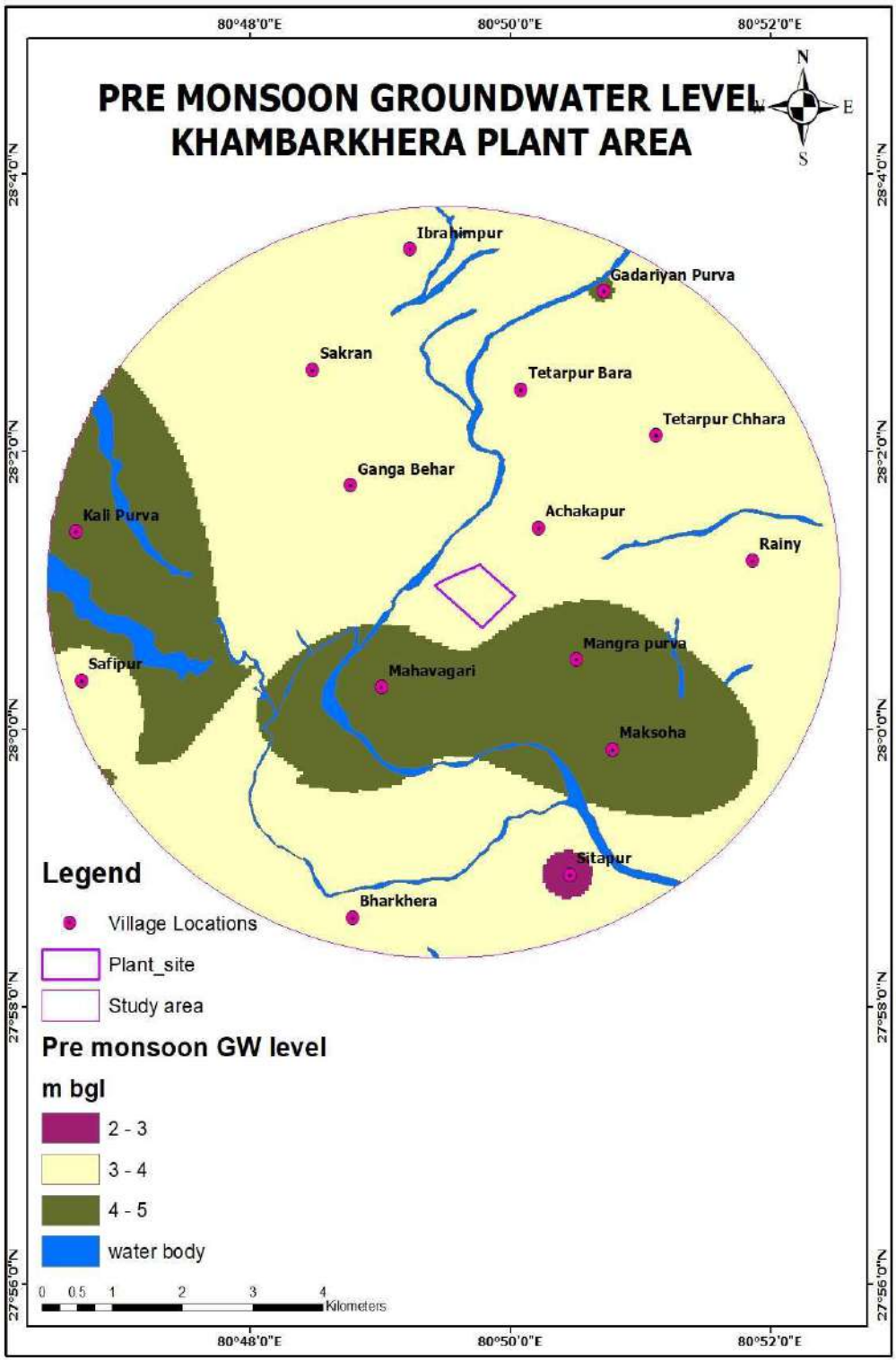


Fig.2.8 Pre monsoon ground water levels of the area

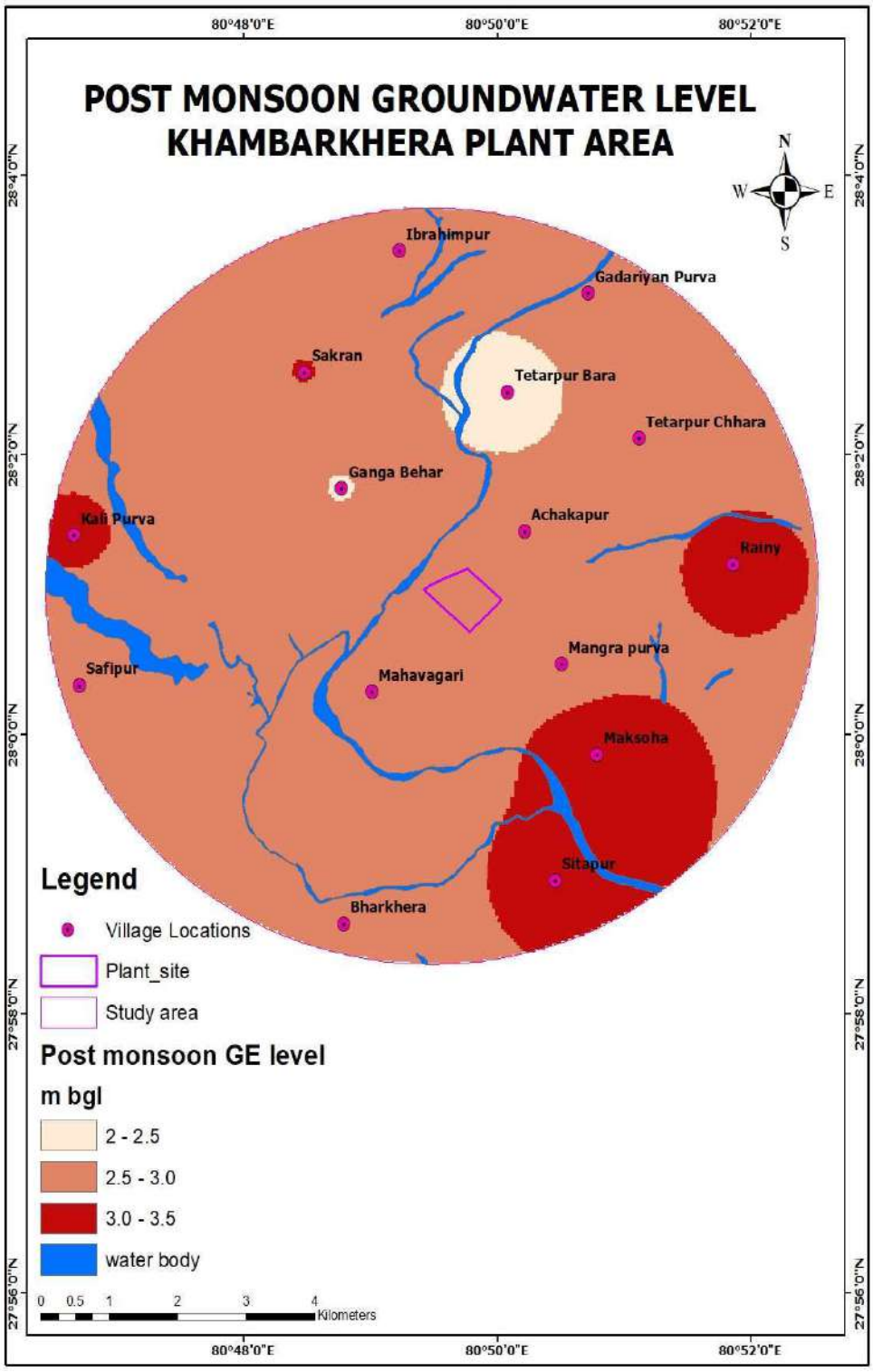


Fig.2.9 Post monsoon ground water levels of the area

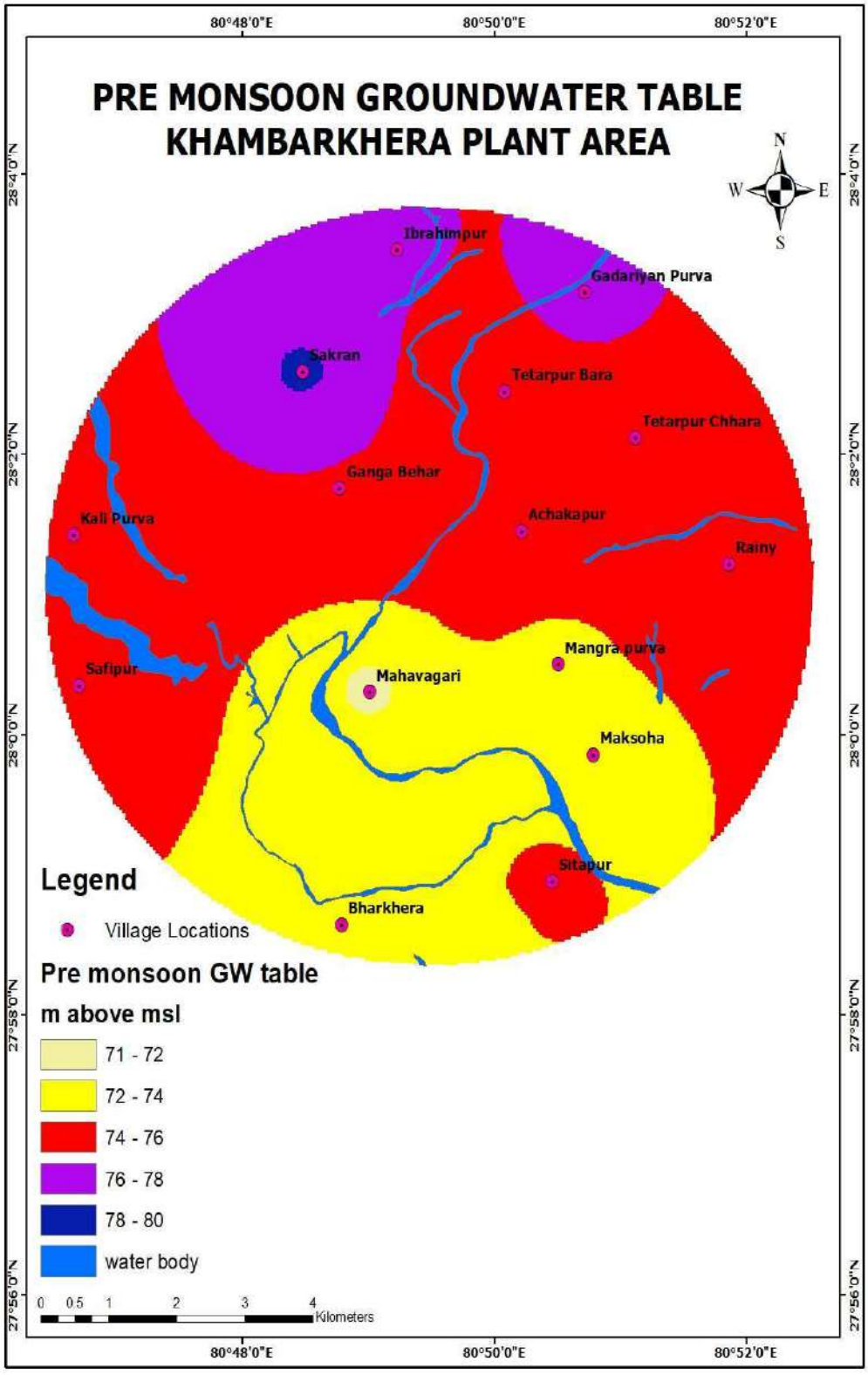


Fig.2.10 Pre monsoon ground water table

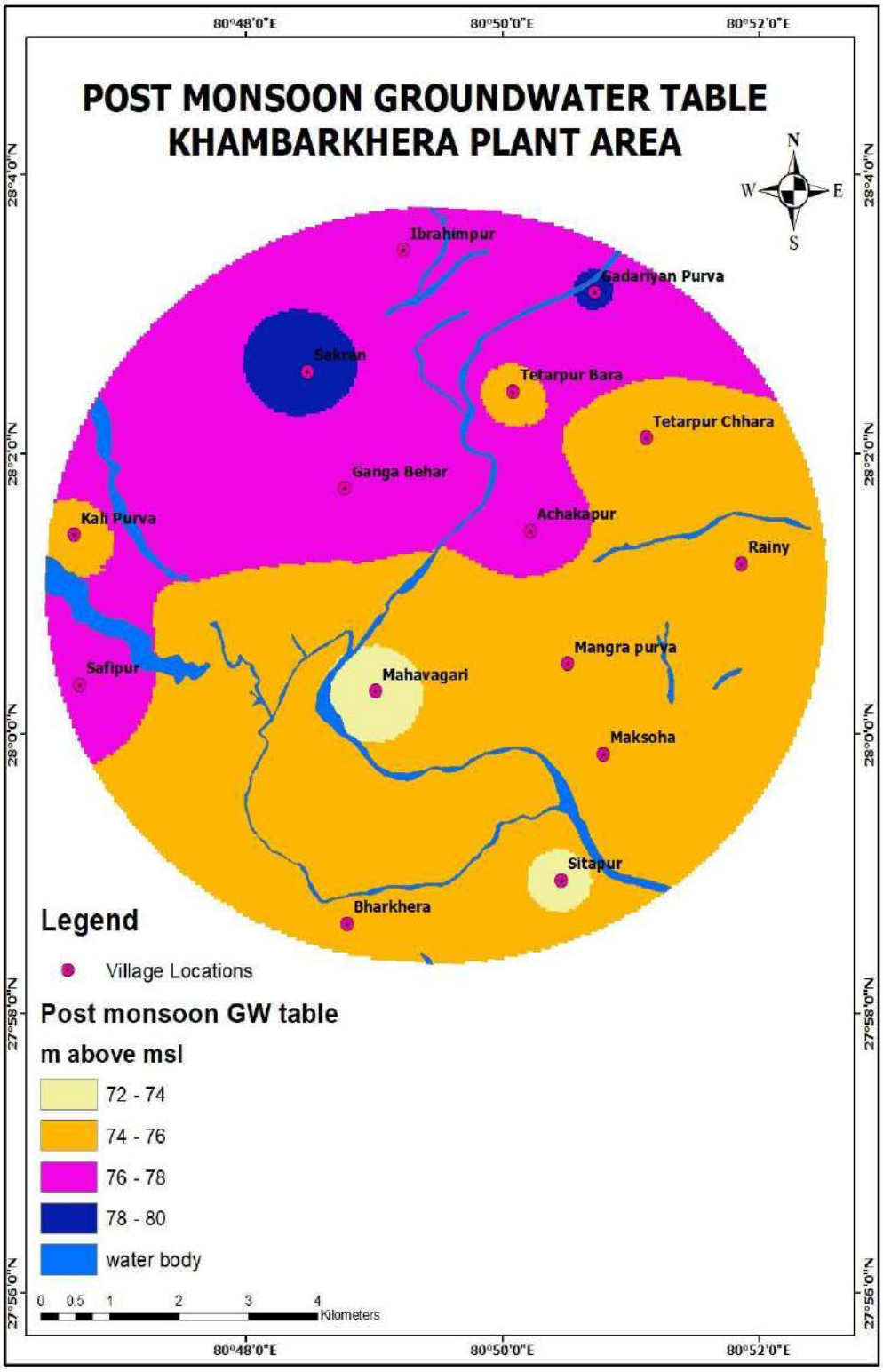


Fig.2.11 Post monsoon ground water table

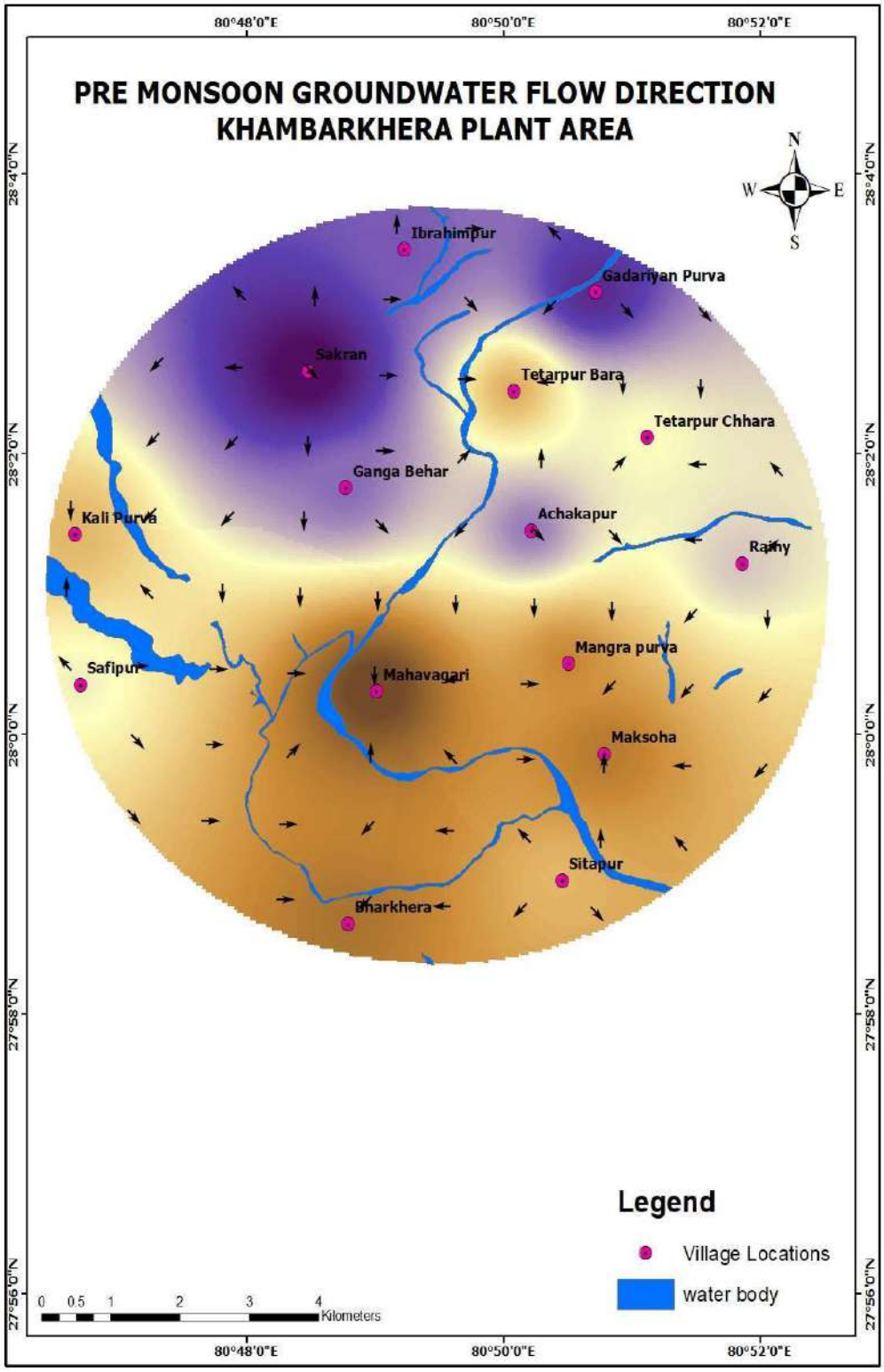


Fig.2.12 Pre monsoon ground water flow direction

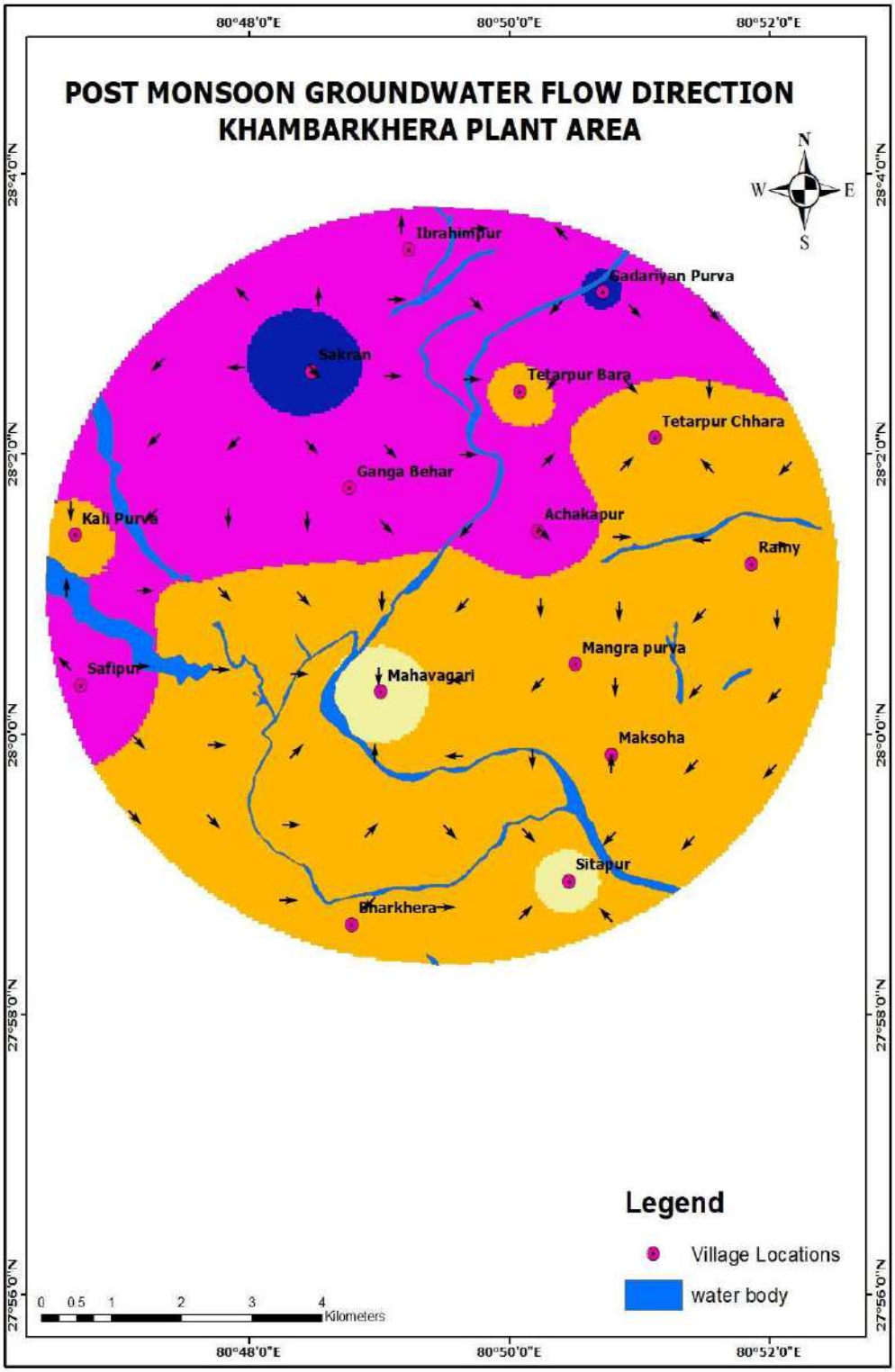


Fig.2.13 Post monsoon ground water flow direction

2.5 GROUNDWATER LEVEL TRENDS

Continuous records of piezometers are available from 2011 to 2021. An analysis of pre monsoon water levels of piezo meter 1 near cooling tower shows that ground water levels are in the range of 1.89 to 4.19 m bgl. The fig. below shows the shows the trend of the ground water levels from 2011 to 2021. The analysis shows that pre monsoon groundwater levels show a constant trend. Post monsoon ground water levels also show a declining trend. This may be due to seasonal fluctuations in ground water levels due to changes in rainfall conditions from year to year. The pre monsoon and post monsoon ground water levels are given in table 2.4 and table 2.5.

Table 2.4

Pre monsoon ground water levels of plant site

PZ No.	Location	Pre monsoon (m bgl)											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average
1	Cooling Tower	-3.7	-3.59	-3.82	-3.7	-3.6	-4.2	-3.9	-3.7	-3.5	-3.8	-3.7	-3.73
2	TG Building	-3.8	-3.6	-3.41	-3.9	-3.7	-4.3	-4	-3.9	-3.4	-3.8	-3.9	-3.79
3	Sio Area	-3.9	-3.8	-3.76	-3.7	-3.7	-4.1	-3.8	-3.9	-3.6	-3.9	-4.1	-3.83
4	Main Gate	-3.8	-3.8	-3.48	-3.8	-3.6	-4.2	-3.7	-3.8	-3.4	-3.9	-4	-3.77
5	CHP	-3.7	-3.8	-3.49	-3.7	-3.6	-4.1	-3.8	-3.9	-3.7	-3.9	-3.9	-3.78

Table 2.5

Post monsoon ground water levels of plant site

PZ No.	Location	Post monsoon (m bgl)											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average
1	Cooling Tower	-1.9	-2.20	-2.53	-2.7	-2.9	-2.4	-2.9	-2.8	-2.5	-2.9	-2.6	-2.56
2	TG Building	-1.8	-2.4	-2.35	-2.5	-2.5	-2.6	-2.6	-2.7	-2.5	-2.6	-2.4	-2.44
3	Sio Area	-2	-2.5	-2.62	-2.7	-2.5	-2.3	-2.6	-2.4	-3	-2.4	-2.6	-2.50
4	Main Gate	-1.9	-2.3	-2.31	-2.4	-2.3	-2.7	-2.4	-2.2	-2.2	-2.2	-2.4	-2.29
5	CHP	-1.9	-2.1	-2.19	-2.5	-2.2	-2.1	-2.1	-2.1	-2.1	-2.2	-2.2	-2.16

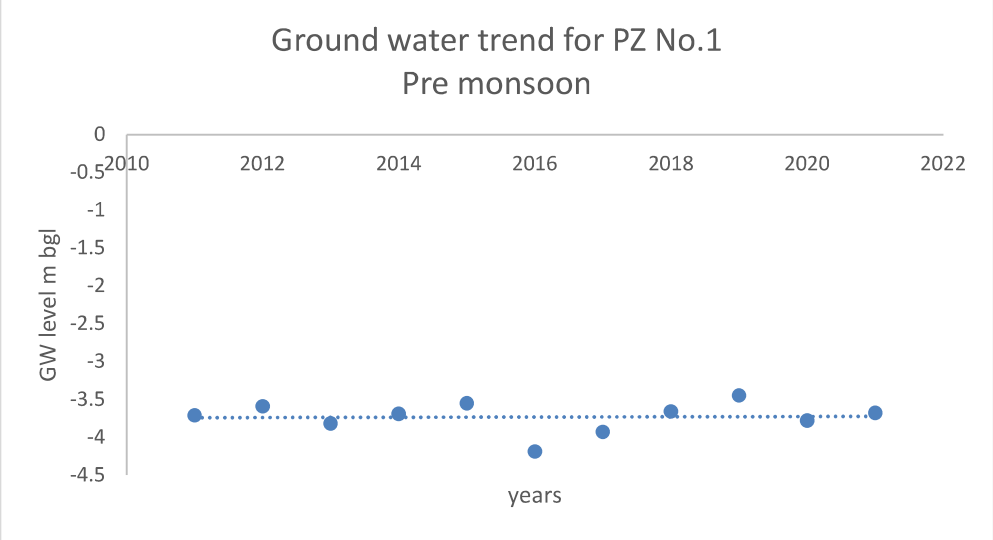


Fig. 2.14 Pre monsoon groundwater levels of piezometer No.1

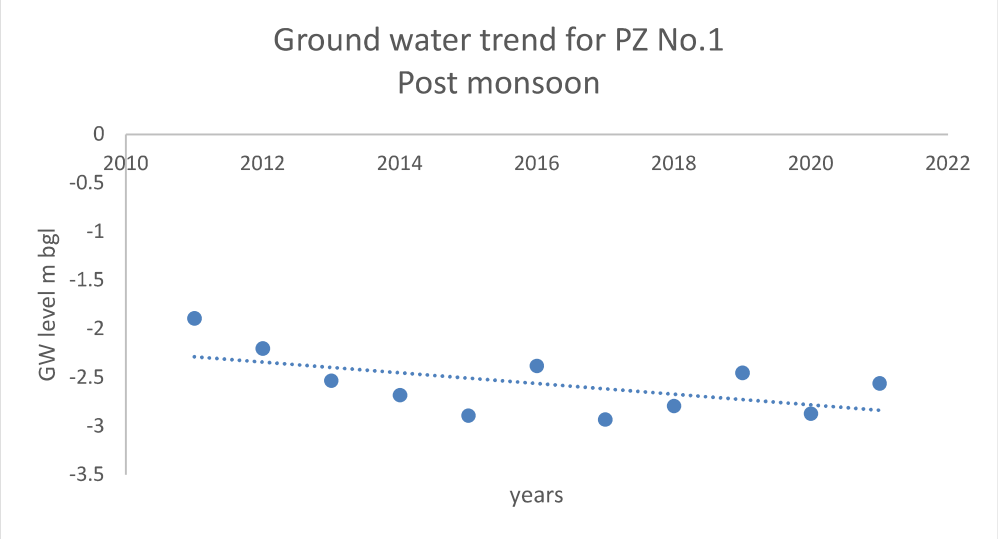


Fig.2.15 Post monsoon groundwater levels of piezometer No.1

Similar analysis has been performed over piezometer 2 and figures below shows the trends in ground water levels for both pre monsoon and post monsoon. The plot of ground water levels of post monsoon period from 2011 to 2021 shows a declining trend. Pre monsoon ground water levels also show a balancing constant trend.

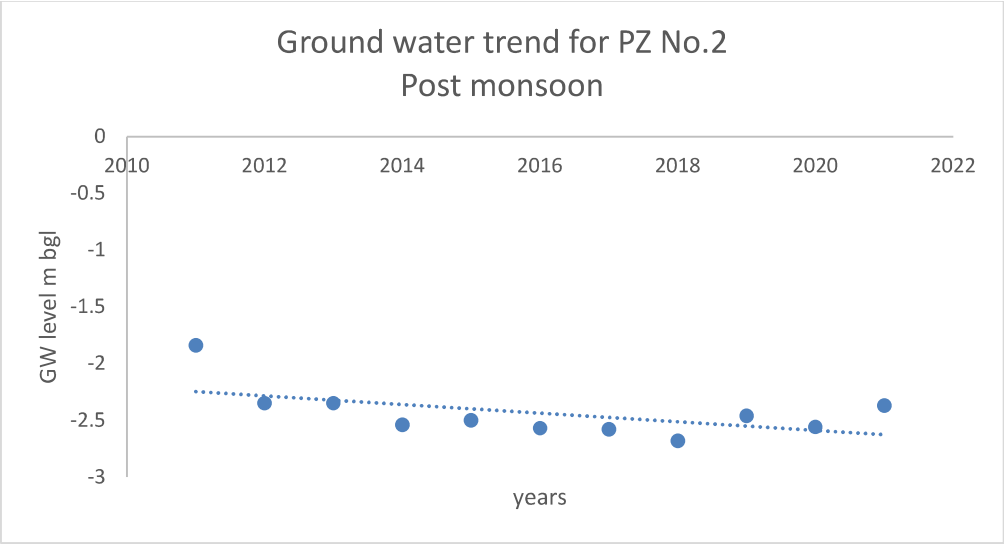


Fig.2.16 Post monsoon groundwater levels of piezometer No.2

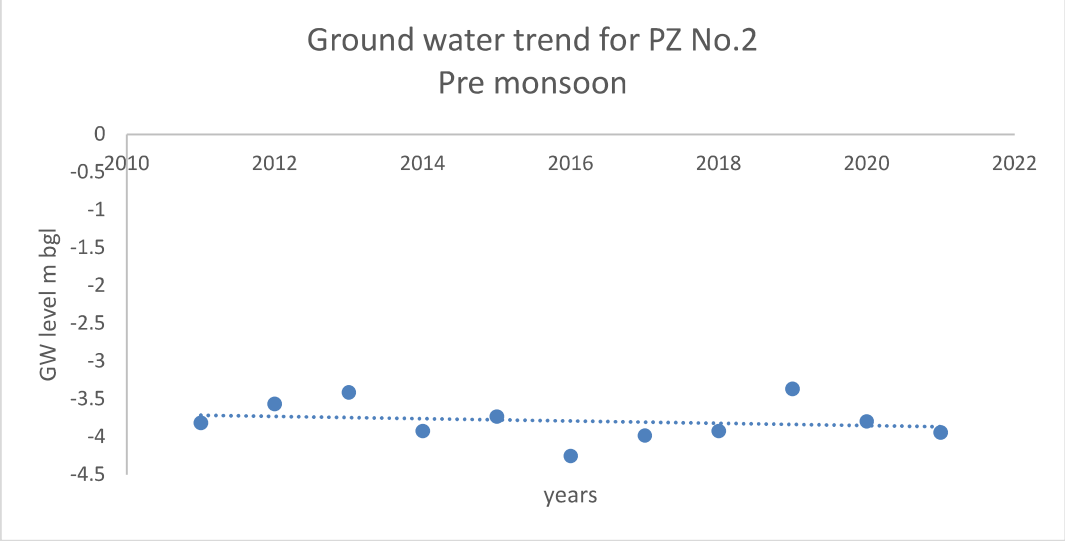


Fig.2.17 Pre monsoon groundwater levels of piezometer No.2

Similar analysis has been performed on piezometer 3 as well. Again, the analysis shows that pre and post monsoon ground water levels shows declining trend. Pre monsoon data shows more fluctuation for this well.

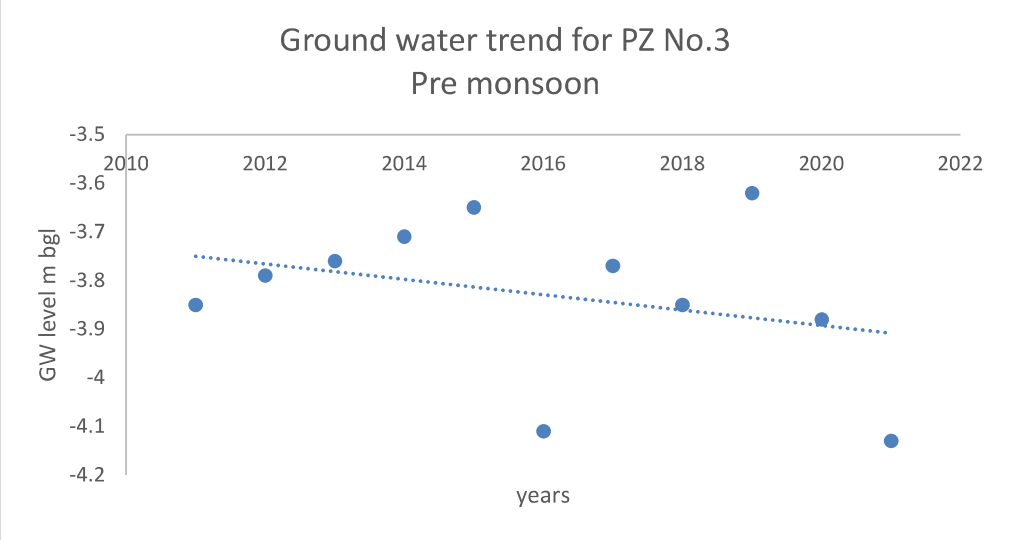


Fig.2.18 Pre monsoon groundwater levels of piezometer No.3

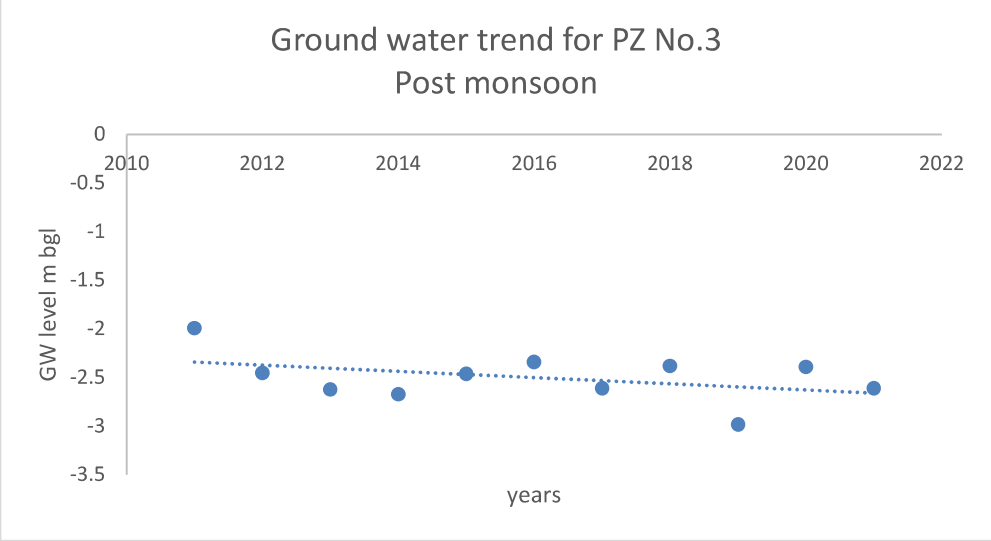


Fig.2.19 Post monsoon groundwater levels of piezometer No.3

Analysis of piezo meter no. 4 shows that both post and pre monsoon periods decline or more or less a constant water level. However, rate decline is small and not so alarming.

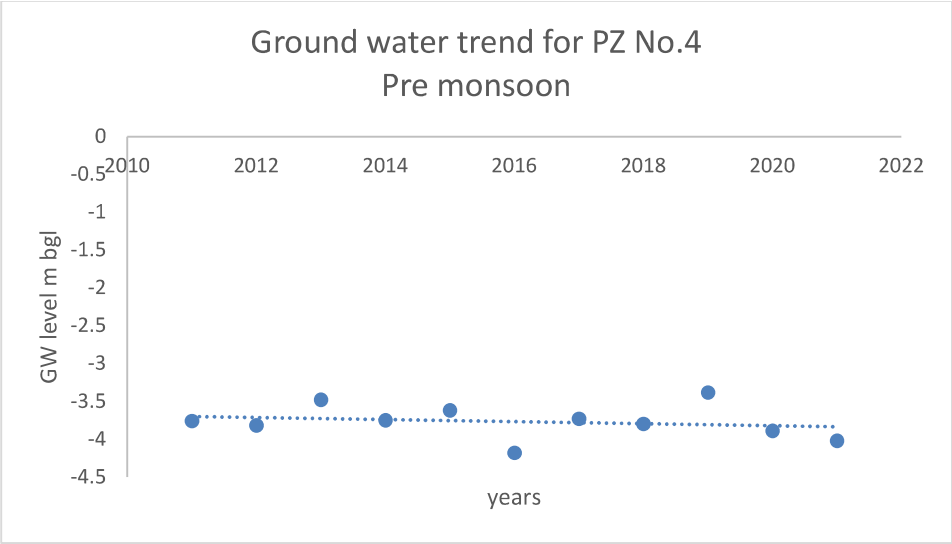


Fig.2.20 Pre monsoon groundwater levels of piezometer No.4

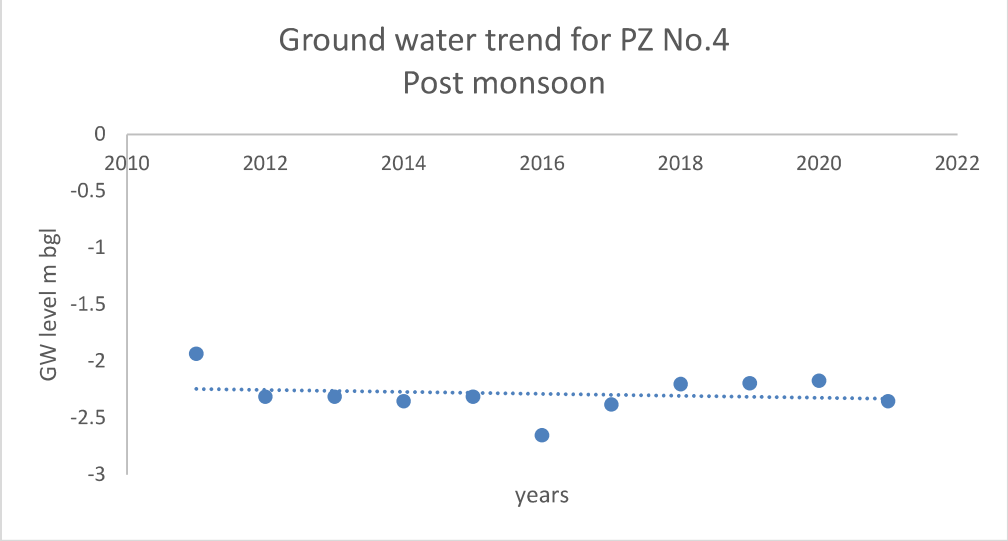


Fig.2.21 Post monsoon groundwater levels of piezometer No.4

Analysis of piezo meter no. 5 also shows near declining trends for the pre monsoon ground water levels. Here water levels are fluctuating year after year. Post monsoon ground water levels shows a constant trend.

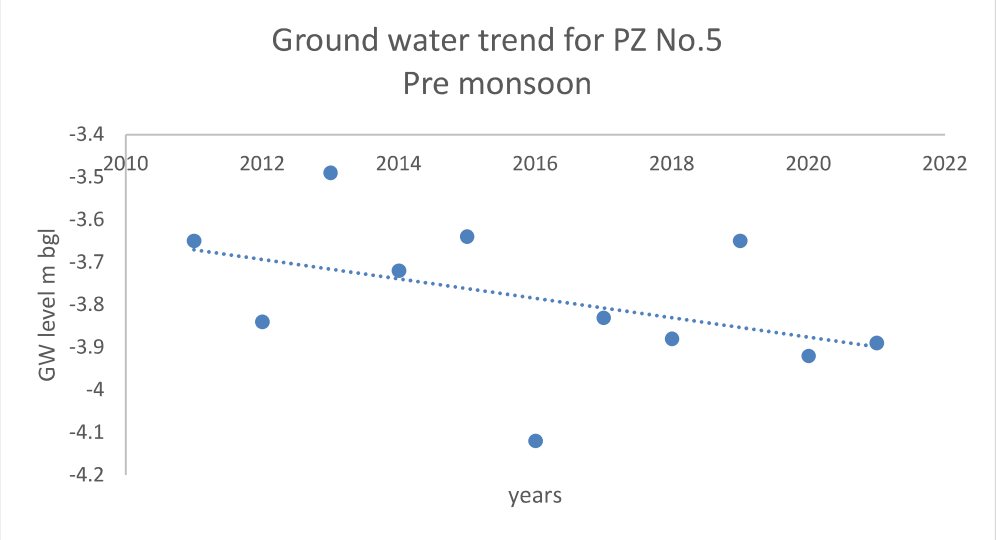


Fig.2.22 Pre monsoon groundwater levels of piezometer No.5

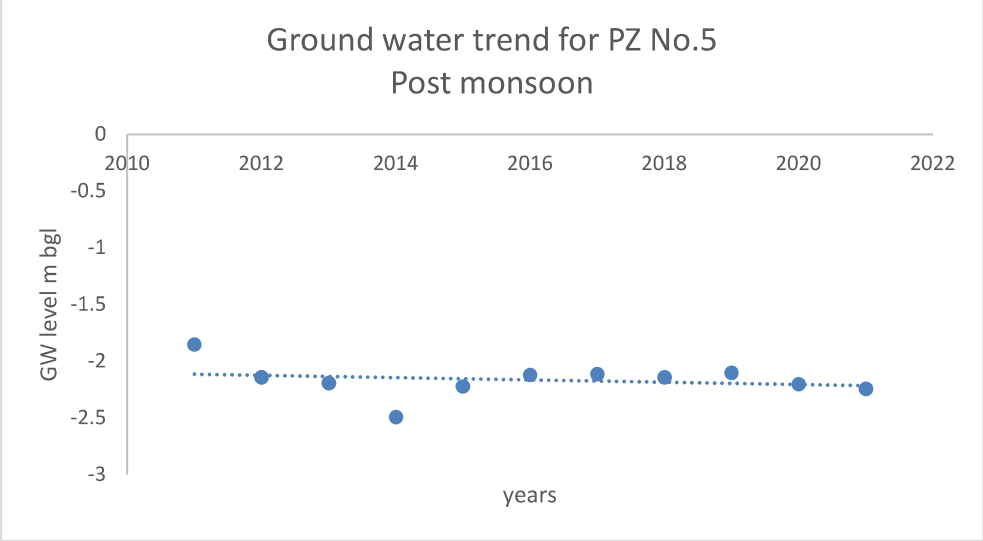


Fig.2.23 Post monsoon groundwater levels of piezometer No.5

2.6 PRE-MONSOON DECADAL WATER LEVELS

Historical ground water level for the area has been collected for the decadal trend analysis. The table 2.1 shows the decadal data and corresponding figure show the graphical representation of the decadal ground water levels of the area. The analysis shows that pre monsoon data shows that there is a slight declining trend as far as decadal ground water levels are considered.

Table 2.6

Average Pre and post monsoon ground water levels of plant site

Year	Ground water levels in m bgl	
	Pre monsoon	Post monsoon
2011	-3.8	-1.9
2012	-3.7	-2.3
2013	-3.6	-2.4
2014	-3.8	-2.5
2015	-3.6	-2.5
2016	-4.2	-2.4
2017	-3.8	-2.5
2018	-3.8	-2.4
2019	-3.5	-2.4
2020	-3.9	-2.4
2021	-3.9	-2.4

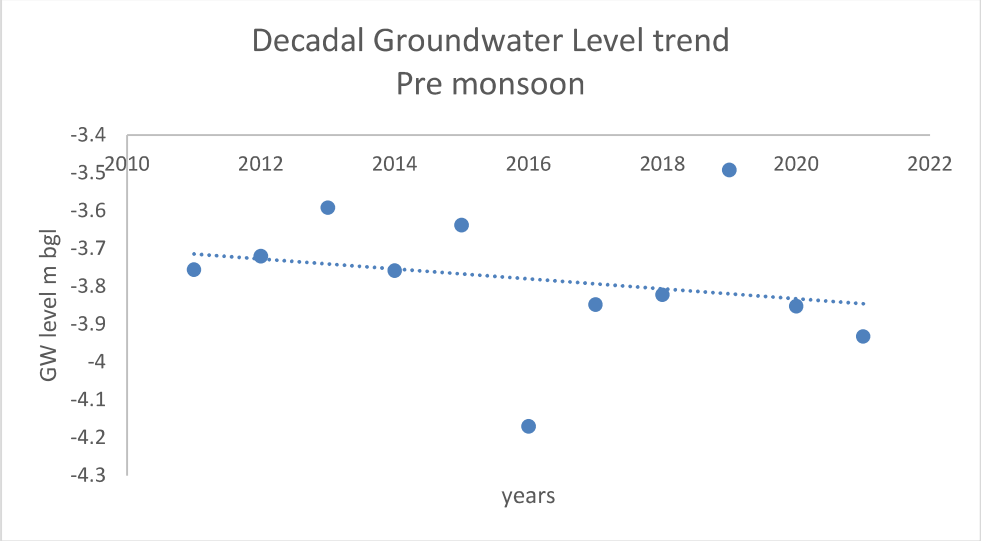


Fig.2.24 Pre monsoon decadal groundwater trends

2.7 POST MONSOON DECADAL WATER LEVELS

Similar exercise has been performed for post monsoon ground water levels as well. The analysis shows that area is showing a slight declining trend for the post monsoon ground water levels.

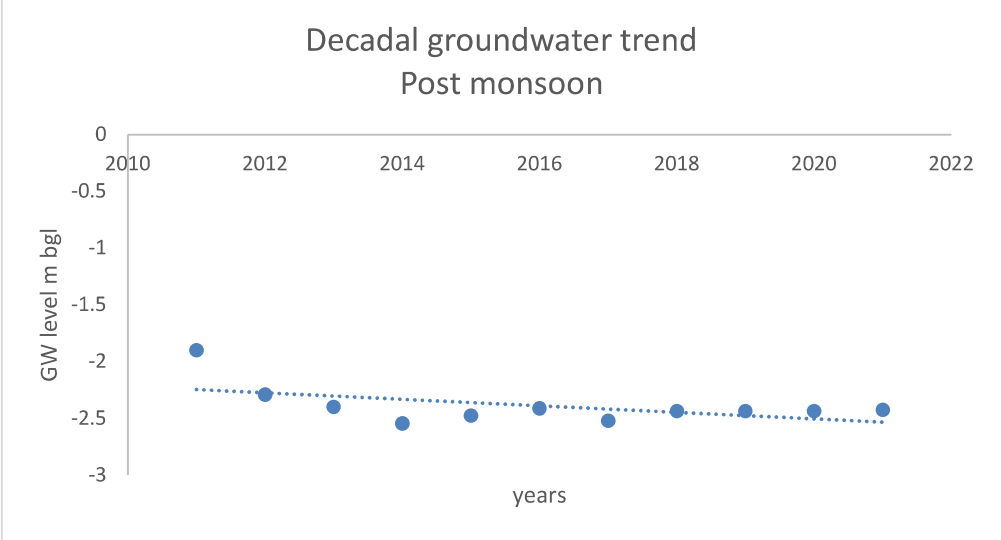


Fig.2.25 Post monsoon decadal groundwater trends

2.8 HYDROGRAPHS OF WATER LEVELS

The automatic and manual observations of the water levels were summarized into fortnightly water level data set and used for the hydrograph plotting which give overall behavior of ground water levels.

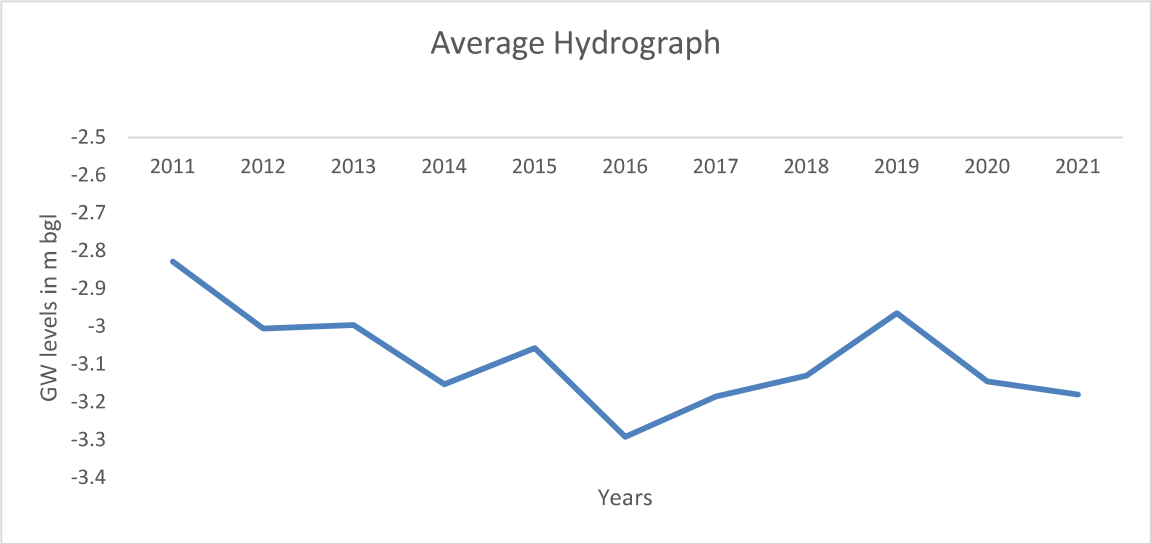


Fig.2.26 Hydrograph of Khambarkhera area

2.9 GROUND WATER QUALITY

Two ground water samples were collected from the bore wells of the plant site. One is collected from a location very near to coal processing unit and other is from a location very near to ash pond. A close look at the ground water quality data reveals that all the physical, chemical and

biological parameters are well within the permissible limits and most of it are under desirable limits. Following table shows ground water quality data.

Groundwater quality data of October 2019

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WATER SAMPLE ANALYSIS REPORT
(ESSENTIAL TEST AS PER IS:10500)

Page 1 Of 1

TEST REPORT NO : NCL/BEPL/3610/061/11/10/2019 DATE OF REPORT : 15/10/2019

Name And Address Of Customer: BAJAJ ENERGY LTD.
SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR ,
,LAKHIMPUR,UTTAR PRADESH, INDIA

SAMPLING DETAILS

Analysis Start Date	11/10/2019	Analysis End Date	15/10/2019
Date of Sampling	10/10/2019	Sampling ID No.	061/11/10/2019
Time of Sampling	13:40		
Sampling Done By	NCL		
Sampling Description	Ground Water		
Sampling Location	ASH POND TOWARDS KHAMBHARKHERA VILLAGE		
Sampling Protocol	IS:3025(Part-I)	Sampling Quantity	TWO Lt
Packing Condition	Sealed	Packed In	PVC Bottle

TEST RESULT

S.No.	Parameter	Unit	Protocol	Result	Drinking Water Standards / Limit (IS :10500)	
					Desirable Limit	Permissible Limit
1	Colour	HZN	APHA-2120 (C)	<5.0	5 max.	15 max.
2	Odour	--	IS:3025 (P-5)	Agreeable	Agreeable	Agreeable
3	Taste	--	IS:3025 (P-8)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	APHA-2130 (B)	<1.0	1 max.	5 max.
5	pH	--	APHA-4500 (H+B)	7.72	6.5-8.5	No Relaxation
6	Iron (Fe)	mg/L	APHA-3111 (B)	0.13	0.3 max.	No Relaxation
7	Chloride (Cl)	mg/L	APHA-4500 (B)	54	250 max.	1000 max.
8	Residual free Chlorine	mg/L	APHA-4500 (B)	<0.2	0.2 min.	1
9	Sulphates (SO4)	mg/L	APHA-4500 (C)	31	200 max.	400 max.
10	Total Alkalinity	mg/L	APHA-2320 (B)	214	200 max.	600 max.
11	Fluoride (F)	mg/L	APHA-4500(F)	0.34	1.0 max.	1.5 max.
12	Total dissolved Solids (TDS)	mg/L	APHA-2540 (C)	410	500 max.	2000 max.
13	Total Coliform	MPN/100ml	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
14	E.coli	/100 mL	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
15	Total Hardness	mg/L	APHA-2340 (C)	202	200 max.	600 max.

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FOR NEWCON CONSULTANTS & LABORATORIES

INTEKHAB KHAN
M.Sc (Env. Science)
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Format no. NCL/QSP-28/TC-DWT/FMT-05 Rev No.1 Date 18.07.2011

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Page 1 Of 1

TEST REPORT NO : NCL/BEPL/3610/062/11/10/2019 DATE OF REPORT : 15/10/2019

Name And Address Of Customer: BAJAJ ENERGY LTD.
SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR, ,LAKHIMPUR,UTTAR PRADESH, INDIA

SAMPLING DETAILS

Analysis Start Date	11/10/2019	Analysis End Date	15/10/2019
Date of Sampling	10/10/2019	Sampling ID No.	062/11/10/2019
Time of Sampling	12:50		
Sampling Done By	NCL		
Sampling Description	Ground Water		
Sampling Location	NEAR COAL STORAGE YARD		
Sampling Protocol	IS:3025(Part-I)	Sampling Quantity	Two Lt
Packing Condition	Sealed	Packed In	PVC Bottle

TEST RESULT

S.No.	Parameter	Unit	Protocol	Result	Drinking Water Standards / Limit (IS :10500) Desirable Limit	Permissible Limit
1	Colour	HZN	APHA-2120 (C)	<5.0	5 max.	15 max.
2	Odour	--	IS:3025 (P-5)	Agreeable	Agreeable	Agreeable
3	Taste	--	IS:3025 (P-8)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	APHA-2130 (B)	<1.0	1 max.	5 max.
5	pH	--	APHA-4500 (H+B)	7.71	6.5-8.5	No Relaxation
6	Iron (Fe)	mg/L	APHA-3111 (B)	0.19	0.3 max.	No Relaxation
7	Chloride (Cl)	mg/L	APHA-4500 (B)	61	250 max.	1000 max.
8	Residual free Chlorine	mg/L	APHA-4500 (B)	<0.2	0.2 min.	1
9	Sulphates (SO4)	mg/L	APHA-4500 (C)	33.0	200 max.	400 max.
10	Total Alkalinity	mg/L	APHA-2320 (B)	186	200 max.	600 max.
11	Fluoride (F)	mg/L	APHA-4500(F)	0.25	1.0 max.	1.5 max.
12	Total dissolved Solids (TDS)	mg/L	APHA-2540 (C)	383	500 max.	2000 max.
13	Total Coliform	MPN/100ml	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
14	E.coli	/100 mL	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
15	Total Hardness	mg/L	APHA-2340 (C)	173	200 max.	600 max.

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Groundwater quality data of June 2020

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WATER SAMPLE ANALYSIS REPORT

(ESSENTIAL TEST AS PER IS:10500)

Page 1 Of 1

TEST REPORT NO : NCL/BEPL/5232/046/17/06-2020 DATE OF REPORT : 24-06-2020

Name And Address Of Customer: BAJAJ ENERGY LTD. SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR , .LAKHIMPUR,UTTAR PRADESH, INDIA

SAMPLING DETAILS

Analysis Start Date	17/06/2020	Analysis End Date	24/06/2020
Date of Sampling	15/06/2020	Sampling ID No.	
Time of Sampling	11:30		
Sampling Done By	NCL		
Sampling Description	Ground Water		
Sampling Location	ASH POND TOWARDS ROAD SIDE		
Sampling Protocol	IS:3025(Part-I)	Sampling Quantity	TWO Lt
Packing Condition	Sealed	Packed In	PVC Bottle

TEST RESULT

S.No.	Parameter	Unit	Protocol	Result	Drinking Water Standards / Limit (IS :10500)	
					Desirable Limit	Permissible Limit
1	Colour	HZN	APHA-2120 (C)	<5.0	5 max.	15 max.
2	Odour	--	IS:3025 (P-5)	Agreeable	Agreeable	Agreeable
3	Taste	--	IS:3025 (P-8)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	APHA-2130 (B)	<1.0	1 max.	5 max.
5	pH	--	APHA-4500 (H+B)	7.32	6.5-8.5	No Relaxation
6	Total Hardness	mg/L	APHA-2340 (C)	138	200 max.	600 max.
7	Iron (Fe)	mg/L	APHA-3111 (B)	0.19	0.3 max.	No Relaxation
8	Chloride (Cl)	mg/L	APHA-4500 (B)	43	250 max.	1000 max.
9	Residual free Chlorine	mg/L	APHA-4500 (B)	<0.2	0.2 min.	1
10	Sulphates (SO4)	mg/L	APHA-4500 (C)	32	200 max.	400 max.
11	Total Alkalinity	mg/L	APHA-2320 (B)	148	200 max.	600 max.
12	Fluoride (F)	mg/L	APHA-4500(F)	0.23	1.0 max.	1.5 max.
13	Total dissolved Solids (TDS)	mg/L	APHA-2540 (C)	367	500 max.	2000 max.
14	Total Coliform	MPN/100ml	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
15	E.coli	/100 mL	IS:1622-1981	Not Detected	Not Detectable	Not Detectable

**** End Of Report****

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(ESSENTIAL TEST AS PER IS:10500)

Page 1 Of 1

TEST REPORT NO : NCL/BEPL/5232/047/17/06-2020 DATE OF REPORT : 24-06-2020

Name And Address Of Customer: BAJAJ ENERGY LTD.
SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR , ,LAKHIMPUR,UTTAR PRADESH, INDIA

SAMPLING DETAILS

Analysis Start Date	17/06/2020	Analysis End Date	24/06/2020
Date of Sampling	15/06/2020	Sampling ID No.	
Time of Sampling	12:00		
Sampling Done By	NCL		
Sampling Description	Ground Water		
Sampling Location	ASH POND TOWARDS KHAMBHARKHERA VILLAGE		
Sampling Protocol	IS:3025(Part-I)	Sampling Quantity	TWO Lt
Packing Condition	Sealed	Packed In	PVC Bottle

TEST RESULT

S.No.	Parameter	Unit	Protocol	Result	Drinking Water Standards / Limit (IS :10500)	
					Desirable Limit	Permissible Limit
1	Colour	HZN	APHA-2120 (C)	<5.0	5 max.	15 max.
2	Odour	--	IS:3025 (P-5)	Agreeable	Agreeable	Agreeable
3	Taste	--	IS:3025 (P-8)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	APHA-2130 (B)	<1.0	1 max.	5 max.
5	pH	--	APHA-4500 (H+B)	7.29	6.5-8.5	No Relaxation
6	Total Hardness	mg/L	APHA-2340 (C)	132	200 max.	600 max.
7	Iron (Fe)	mg/L	APHA-3111 (B)	0.15	0.3 max.	No Relaxation
8	Chloride (Cl)	mg/L	APHA-4500 (B)	39	250 max.	1000 max.
9	Residual free Chlorine	mg/L	APHA-4500 (B)	<0.2	0.2 min.	1
10	Sulphates (SO4)	mg/L	APHA-4500 (C)	36	200 max.	400 max.
11	Total Alkalinity	mg/L	APHA-2320 (B)	139	200 max.	600 max.
12	Fluoride (F)	mg/L	APHA-4500(F)	0.20	1.0 max.	1.5 max.
13	Total dissolved Solids (TDS)	mg/L	APHA-2540 (C)	345	500 max.	2000 max.
14	Total Coliform	MPN/100ml	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
15	E.coli	/100 mL	IS:1622-1981	Not Detected	Not Detectable	Not Detectable

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FOR NEWCON CONSULTANTS & LABORATORIES

INTEKHAB KHAN
M.Sc.(Science)

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E-mail : info@newconlab.in, newconlab@gmail.com, accounts@newconlab.in

Groundwater quality data of January 2021

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WATER SAMPLE ANALYSIS REPORT

(AS PER IS:10500) Page 1 Of 1

TEST REPORT NO : NCL/BEPL/6652/021/29/12-2020 DATE OF REPORT : 04-Jan-2021

Name And Address Of Customer: BAJAJ ENERGY LTD. SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR , ,LAKHIMPUR,UTTAR PRADESH, INDIA

SAMPLING DETAILS

Analysis Start Date	29/12/2020	Analysis End Date	04/01/2021
Date of Sampling	28/12/2020	Sampling ID No.	021/29/12/20
Time of Sampling	11:30		
Sampling Done By	NCL		
Sampling Description	Ground Water		
Sampling Location	ASH POND TOWARDS KHAMBHARKHERA VILLAGE		
Sampling Protocol	IS:3025(Part-I)	Sampling Quantity	TWO Lt
Packing Condition	Sealed	Packed In	PVC Bottle

TEST RESULT

S.No.	Parameter	Unit	Protocol	Result	Drinking Water Standards / Limit (IS :10500)	
					Desirable Limit	Permissible Limit
1	Colour	HZN	APHA-2120 (C)	<5.0	5 max.	15 max.
2	Odour	--	IS:3025 (P-5)	Agreeable	Agreeable	Agreeable
3	Taste	--	IS:3025 (P-8)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	APHA-2130 (B)	<1.0	1 max.	5 max.
5	pH	--	APHA-4500 (H+B)	7.26	6.5-8.5	No Relaxation
6	Total Hardness	mg/L	APHA-2340 (C)	130	200 max.	600 max.
7	Iron (Fe)	mg/L	APHA-3111 (B)	0.17	1.0 max.	No Relaxation
8	Chloride (Cl)	mg/L	APHA-4500 (B)	43	250 max.	1000 max.
9	Residual free Chlorine	mg/L	APHA-4500 (B)	<0.2	0.2 min.	1
10	Sulphates (SO4)	mg/L	APHA-4500 (C)	39	200 max.	400 max.
11	Total Alkalinity	mg/L	APHA-2320 (B)	134	200 max.	600 max.
12	Fluoride (F)	mg/L	APHA-4500(F)	0.25	1.0 max.	1.5 max.
13	Total dissolved Solids (TDS)	mg/L	APHA-2540 (C)	358	500 max.	2000 max.
14	Total Coliform	MPN/100ml	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
15	E.coli	/100 mL	IS:1622-1981	Not Detected	Not Detectable	Not Detectable

**** End Of Report****

FOR NEWCON CONSULTANTS & LABORATORIES

INTEKHAB KHAN (Manager)

CHECKED BY PREPARED BY AUTHORIZED SIGNATORY

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Mobile : 9810430345, 8744051920 | Website : www.newconlab.in

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Website : www.newconlab.in

TEST CERTIFICATE

WATER SAMPLE ANALYSIS REPORT
(AS PER IS:10500)

Page 1 Of 1

TEST REPORT NO : NCL/BEPL/6652/022/29/12-2020 DATE OF REPORT : 04-Jan-2021

Name And Address Of Customer	BAJAJ ENERGY LTD. SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR , ,LAKHIMPUR,UTTAR PRADESH, INDIA

SAMPLING DETAILS

Analysis Start Date	29/12/2020	Analysis End Date	04/01/2021
Date of Sampling	28/12/2020	Sampling ID No.	022/29/12/20
Time of Sampling	12:20		
Sampling Done By	NCL		
Sampling Description	Ground Water		
Sampling Location	NEAR COAL STORAGE YARD		
Sampling Protocol	IS:3025(Part-I)	Sampling Quantity	TWO Lt
Packing Condition	Sealed	Packed In	PVC Bottle

TEST RESULT

S.No.	Parameter	Unit	Protocol	Result	Drinking Water Standards / Limit (IS :10500)	
					Desirable Limit	Permissible Limit
1	Colour	HZN	APHA-2120 (C)	<5.0	5 max.	15 max.
2	Odour	--	IS:3025 (P-5)	Agreeable	Agreeable	Agreeable
3	Taste	--	IS:3025 (P-8)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	APHA-2130 (B)	<1.0	1 max.	5 max.
5	pH	--	APHA-4500 (H+B)	7.24	6.5-8.5	No Relaxation
6	Total Hardness	mg/L	APHA-2340 (C)	124	200 max.	600 max.
7	Iron (Fe)	mg/L	APHA-3111 (B)	0.23	1.0 max.	No Relaxation
8	Chloride (Cl)	mg/L	APHA-4500 (B)	49	250 max.	1000 max.
9	Residual free Chlorine	mg/L	APHA-4500 (B)	<0.2	0.2 min.	1
10	Sulphates (SO4)	mg/L	APHA-4500 (C)	37.5	200 max.	400 max.
11	Total Alkalinity	mg/L	APHA-2320 (B)	140	200 max.	600 max.
12	Fluoride (F)	mg/L	APHA-4500(F)	0.24	1.0 max.	1.5 max.
13	Total dissolved Solids (TDS)	mg/L	APHA-2540 (C)	347	500 max.	2000 max.
14	Total Coliform	MPN/100ml	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
15	E coli	/100 mL	IS:1622-1981	Not Detected	Not Detectable	Not Detectable

**** End Of Report****

FOR NEWCON CONSULTANTS & LABORATORIES

INTEKHAB KHAN
M.Sc.(Env. Sc...ce)

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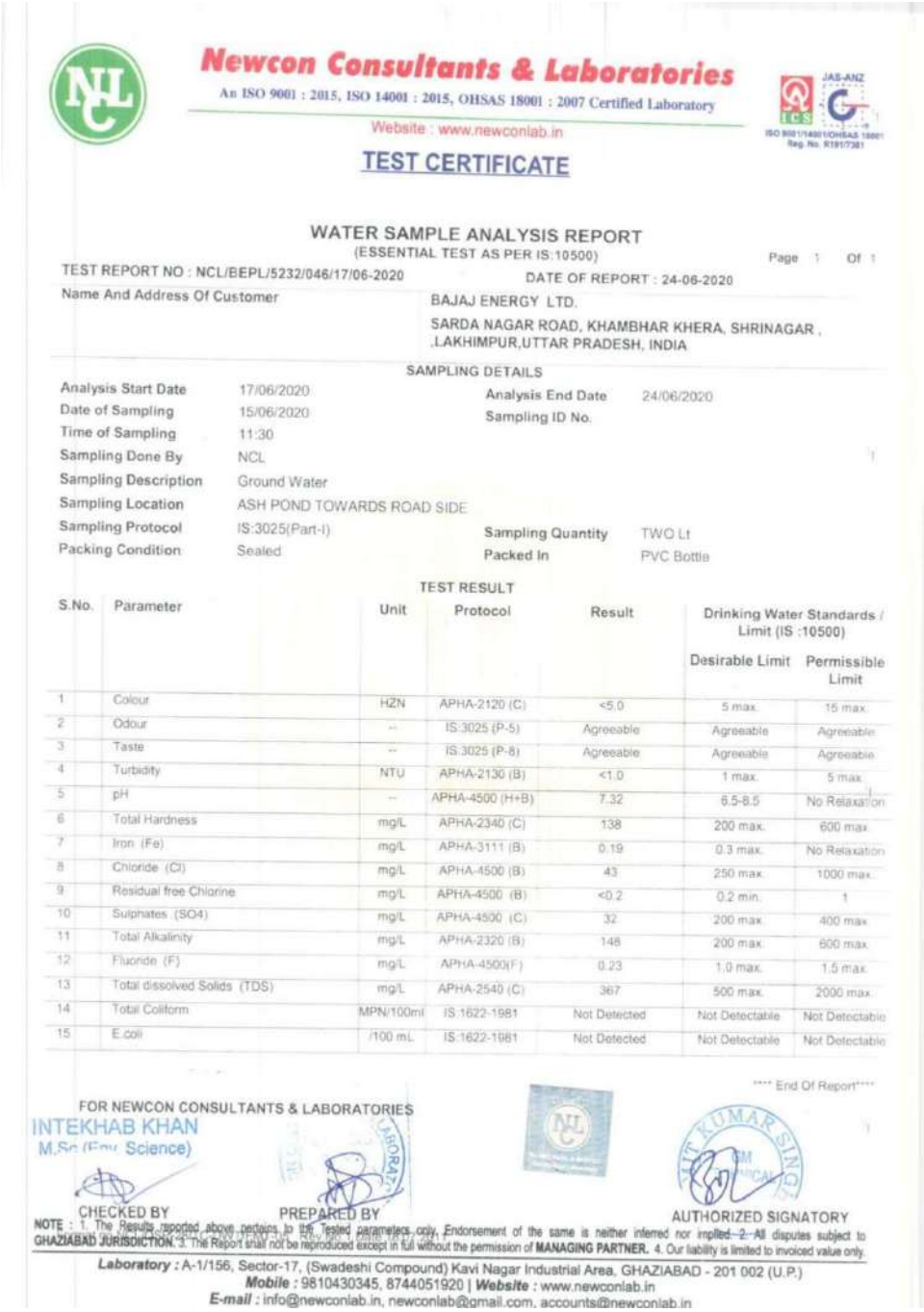
Mobile : 9810430345, 8744051920 | *Website :* www.newconlab.in
E-mail : info@newconlab.in, newconlab@gmail.com, accounts@newconlab.in

Groundwater quality data of June 2021



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WATER SAMPLE ANALYSIS REPORT

(ESSENTIAL TEST AS PER IS:10500) Page 1 Of 1

TEST REPORT NO : NCL/BEPL/5232/046/17/06-2020 DATE OF REPORT : 24-06-2020

Name And Address Of Customer: BAJAJ ENERGY LTD. SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR , .LAKHIMPUR,UTTAR PRADESH, INDIA

SAMPLING DETAILS

Analysis Start Date	17/06/2020	Analysis End Date	24/06/2020
Date of Sampling	15/06/2020	Sampling ID No.	
Time of Sampling	11:30		
Sampling Done By	NCL		
Sampling Description	Ground Water		
Sampling Location	ASH POND TOWARDS ROAD SIDE		
Sampling Protocol	IS:3025(Part-I)	Sampling Quantity	TWO Lt
Packing Condition	Sealed	Packed In	PVC Bottle

TEST RESULT

S.No.	Parameter	Unit	Protocol	Result	Drinking Water Standards / Limit (IS :10500)	
					Desirable Limit	Permissible Limit
1	Colour	HZN	APHA-2120 (C)	<5.0	5 max.	15 max.
2	Odour	--	IS:3025 (P-5)	Agreeable	Agreeable	Agreeable
3	Taste	--	IS:3025 (P-8)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	APHA-2130 (B)	<1.0	1 max.	5 max.
5	pH	--	APHA-4500 (H+B)	7.32	6.5-8.5	No Relaxation
6	Total Hardness	mg/L	APHA-2340 (C)	138	200 max.	600 max.
7	Iron (Fe)	mg/L	APHA-3111 (B)	0.19	0.3 max.	No Relaxation
8	Chloride (Cl)	mg/L	APHA-4500 (B)	43	250 max.	1000 max.
9	Residual free Chlorine	mg/L	APHA-4500 (B)	<0.2	0.2 min.	1
10	Sulphates (SO4)	mg/L	APHA-4500 (C)	32	200 max.	400 max.
11	Total Alkalinity	mg/L	APHA-2320 (B)	148	200 max.	600 max.
12	Fluoride (F)	mg/L	APHA-4500(F)	0.23	1.0 max.	1.5 max.
13	Total dissolved Solids (TDS)	mg/L	APHA-2540 (C)	367	500 max.	2000 max.
14	Total Coliform	MPN/100ml	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
15	E.coli	/100 mL	IS:1622-1981	Not Detected	Not Detectable	Not Detectable

**** End Of Report****

FOR NEWCON CONSULTANTS & LABORATORIES

INTEKHAB KHAN

M.Sc (Env. Science)

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TEST CERTIFICATE

WATER SAMPLE ANALYSIS REPORT

(ESSENTIAL TEST AS PER IS:10500) Page 1 Of 1

TEST REPORT NO : NCL/BEPL/5232/047/17/06-2020 DATE OF REPORT : 24-06-2020

Name And Address Of Customer: BAJAJ ENERGY LTD.
SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR , ,LAKHIMPUR,UTTAR PRADESH, INDIA

SAMPLING DETAILS

Analysis Start Date	17/06/2020	Analysis End Date	24/06/2020
Date of Sampling	15/06/2020	Sampling ID No.	
Time of Sampling	12:00		
Sampling Done By	NCL		
Sampling Description	Ground Water		
Sampling Location	ASH POND TOWARDS KHAMBHARKHERA VILLAGE		
Sampling Protocol	IS:3025(Part-I)	Sampling Quantity	TWO Lt
Packing Condition	Sealed	Packed In	PVC Bottle

TEST RESULT

S.No.	Parameter	Unit	Protocol	Result	Drinking Water Standards / Limit (IS :10500)	
					Desirable Limit	Permissible Limit
1	Colour	HZN	APHA-2120 (C)	<5.0	5 max.	15 max.
2	Odour	--	IS:3025 (P-5)	Agreeable	Agreeable	Agreeable
3	Taste	--	IS:3025 (P-8)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	APHA-2130 (B)	<1.0	1 max.	5 max.
5	pH	--	APHA-4500 (H+B)	7.29	6.5-8.5	No Relaxation
6	Total Hardness	mg/L	APHA-2340 (C)	132	200 max.	600 max.
7	Iron (Fe)	mg/L	APHA-3111 (B)	0.15	0.3 max.	No Relaxation
8	Chloride (Cl)	mg/L	APHA-4500 (B)	39	250 max.	1000 max.
9	Residual free Chlorine	mg/L	APHA-4500 (B)	<0.2	0.2 min.	1
10	Sulphates (SO4)	mg/L	APHA-4500 (C)	36	200 max.	400 max.
11	Total Alkalinity	mg/L	APHA-2320 (B)	139	200 max.	600 max.
12	Fluoride (F)	mg/L	APHA-4500(F)	0.20	1.0 max.	1.5 max.
13	Total dissolved Solids (TDS)	mg/L	APHA-2540 (C)	345	500 max.	2000 max.
14	Total Coliform	MPN/100ml	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
15	E.coli	/100 mL	IS:1622-1981	Not Detected	Not Detectable	Not Detectable

**** End Of Report****

FOR NEWCON CONSULTANTS & LABORATORIES

INTEKHAB KHAN
M.Sc.(Env.Science)

CHECKED BY PREPARED BY AUTHORIZED SIGNATORY

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Groundwater quality data of August 2021

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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	1.0
6.	Calcium (as Ca)	IS: 3025 (P- 40)	46.52	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)	31.81	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)	0.22	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)	0.136	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	30.25	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)	4.56	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)	30.48	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)	256.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	216.0	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 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.

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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
Water	W-170821-034	23/08/2021

Issued To : **M/s Bajaj Energy Ltd.**
Sharda nagar Road, Khambarkhera, Srinagar, District – Lakhimpur Kheri - 261502
Uttar Pradesh, India.

SAMPLING & ANALYSIS DATA

Sample Drawn By : Laboratory (NTL)
Sample Received On : 17/08/2021
Sample Quantity : 2.0 Lt.
Analysis Duration : 17/08/2021 To 23/08/2021
Sample Description : Ground Water Collected from Ash Pond (Towards Road Side)

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	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)	7.32	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	452	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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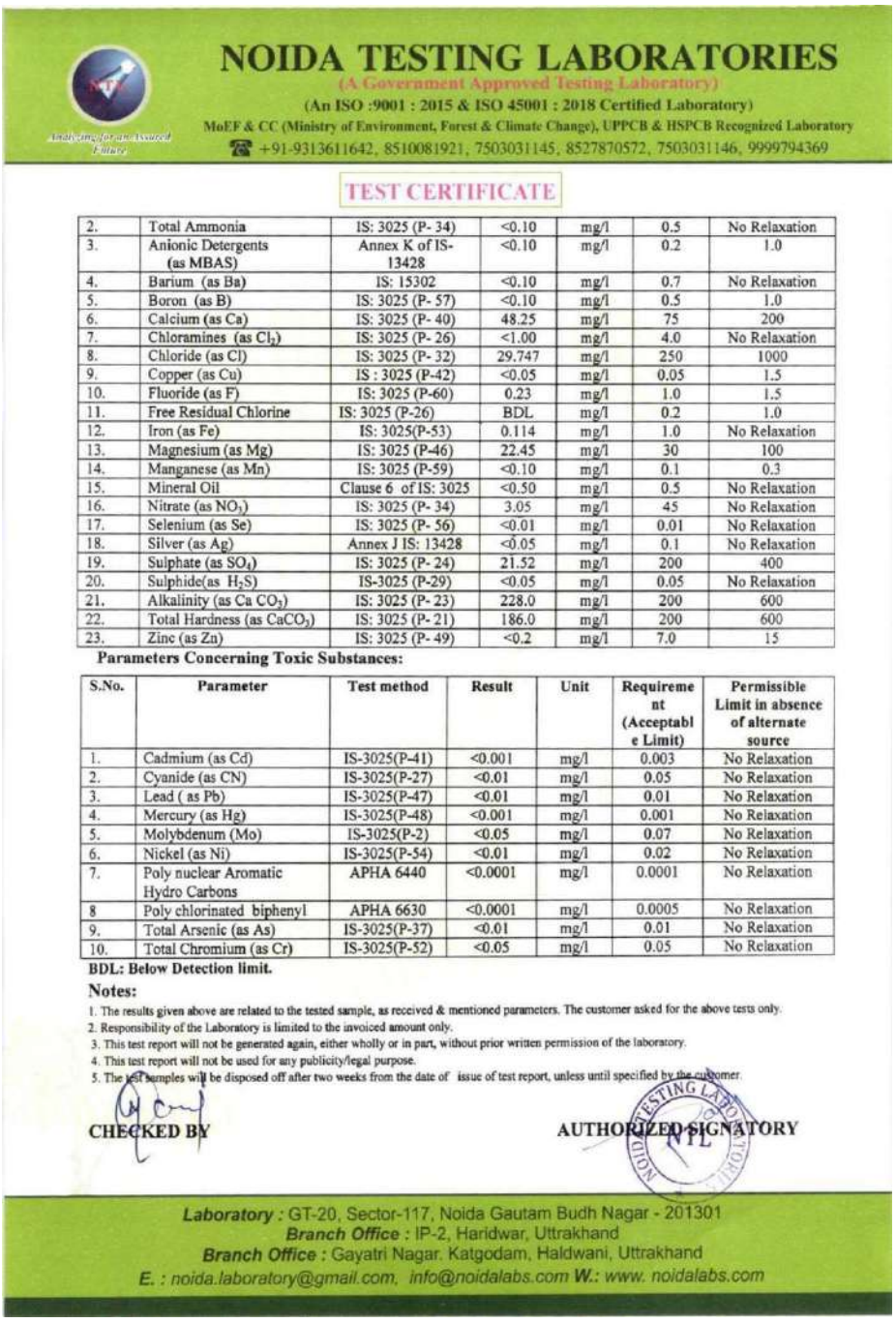

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2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	mg/l	0.5	No Relaxation
3.	Anionic Detergents (as MBAS)	Annex K of IS-13428	<0.10	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	mg/l	0.5	1.0
6.	Calcium (as Ca)	IS: 3025 (P- 40)	48.25	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)	29.747	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)	0.23	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)	0.114	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	22.45	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)	3.05	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)	21.52	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)	228.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	186.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P- 49)	<0.2	mg/l	7.0	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:

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-170821-036	23/08/2021

Issued To : **M/s Bajaj Energy Ltd.**
Sharda nagar Road, Khambarkhera, Srinagar, District – Lakhimpur Kheri - 261502
Uttar Pradesh, India.

SAMPLING & ANALYSIS DATA

Sample Drawn By : Laboratory (NTL)
Sample Received On : 17/08/2021
Sample Quantity : 2.0 Lt.
Analysis Duration : 17/08/2021 To 23/08/2021
Sample Description : Ground Water Collected from Coal Storage Yard

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	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)	7.25	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	431	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	1.0
6.	Calcium (as Ca)	IS: 3025 (P- 40)	41.08	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)	32.17	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)	0.20	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)	0.120	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	27.45	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)	4.14	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)	27.16	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)	243.0	mg/l	200	600
22.	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 21)	210.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P- 49)	<0.2	mg/l	6.0	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:

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-170821-035	23/08/2021

Issued To : **M/s Bajaj Energy Ltd.**
Sharda nagar Road, Khambarkhera, Srinagar, District – Lakhimpur Kheri - 261502
Uttar Pradesh, India.

SAMPLING & ANALYSIS DATA

Sample Drawn By : Laboratory (NTL)
Sample Received On : 06/08/2021
Sample Quantity : 2.0 Lt.
Analysis Duration : 06/08/2021 To 14/08/2021
Sample Description : Ground Water Collected from Ash Pond Area (Towards Khambarkhera Village)

MICROBIOLOGICAL REQUIREMENT RESULT

S.No.	Parameter	Test Method	Results	Requirements as per IS-10500:2012
1.	*Escherichia coli*	IS-1622	Absent	Absent/100ml
2.	*Coliform Bacteria*	IS-1622	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)	7.38	-	6.5 - 8.5	-
6.	Total dissolve solid (TDS)	IS-3025(P-16)	413	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
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Groundwater quality data of October 2021

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Website : www.newconlab.in

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ISO 9001/14001/OHSAS 18001
Reg. No. R191/7381

TEST CERTIFICATE

WATER SAMPLE ANALYSIS REPORT

(ESSENTIAL TEST AS PER IS:10500)

Page 1 Of 1

TEST REPORT NO : NCL/BEPL/3610/062/11/10/2019 DATE OF REPORT : 15/10/2019

Name And Address Of Customer: BAJAJ ENERGY LTD.
SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR , ,LAKHIMPUR,UTTAR PRADESH, INDIA

SAMPLING DETAILS

Analysis Start Date	11/10/2019	Analysis End Date	15/10/2019
Date of Sampling	10/10/2019	Sampling ID No.	062/11/10/2019
Time of Sampling	12:50		
Sampling Done By	NCL		
Sampling Description	Ground Water		
Sampling Location	NEAR COAL STORAGE YARD		
Sampling Protocol	IS:3025(Part-I)	Sampling Quantity	Two Lt
Packing Condition	Sealed	Packed In	PVC Bottle

TEST RESULT

S.No.	Parameter	Unit	Protocol	Result	Drinking Water Standards / Limit (IS :10500)	
					Desirable Limit	Permissible Limit
1	Colour	HZN	APHA-2120 (C)	<5.0	5 max.	15 max
2	Odour	--	IS:3025 (P-5)	Agreeable	Agreeable	Agreeable
3	Taste	--	IS:3025 (P-8)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	APHA-2130 (B)	<1.0	1 max.	5 max.
5	pH	--	APHA-4500 (H+B)	7.71	6.5-8.5	No Relaxation
6	Iron (Fe)	mg/L	APHA-3111 (B)	0.19	0.3 max.	No Relaxation
7	Chloride (Cl)	mg/L	APHA-4500 (B)	61	250 max.	1000 max
8	Residual free Chlorine	mg/L	APHA-4500 (B)	<0.2	0.2 min.	1
9	Sulphates (SO4)	mg/L	APHA-4500 (C)	33.0	200 max	400 max.
10	Total Alkalinity	mg/L	APHA-2320 (B)	186	200 max.	600 max
11	Fluoride (F)	mg/L	APHA-4500(F)	0.25	1.0 max	1.5 max.
12	Total dissolved Solids (TDS)	mg/L	APHA-2540 (C)	383	500 max	2000 max
13	Total Coliform	MPN/100ml	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
14	E.coli	/100 mL	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
15	Total Hardness	mg/L	APHA-2340 (C)	173	200 max.	600 max.

**** End Of Report****

FOR NEWCON CONSULTANTS & LABORATORIES

INTEKHAB KHAN
M.Sc (Env Science)

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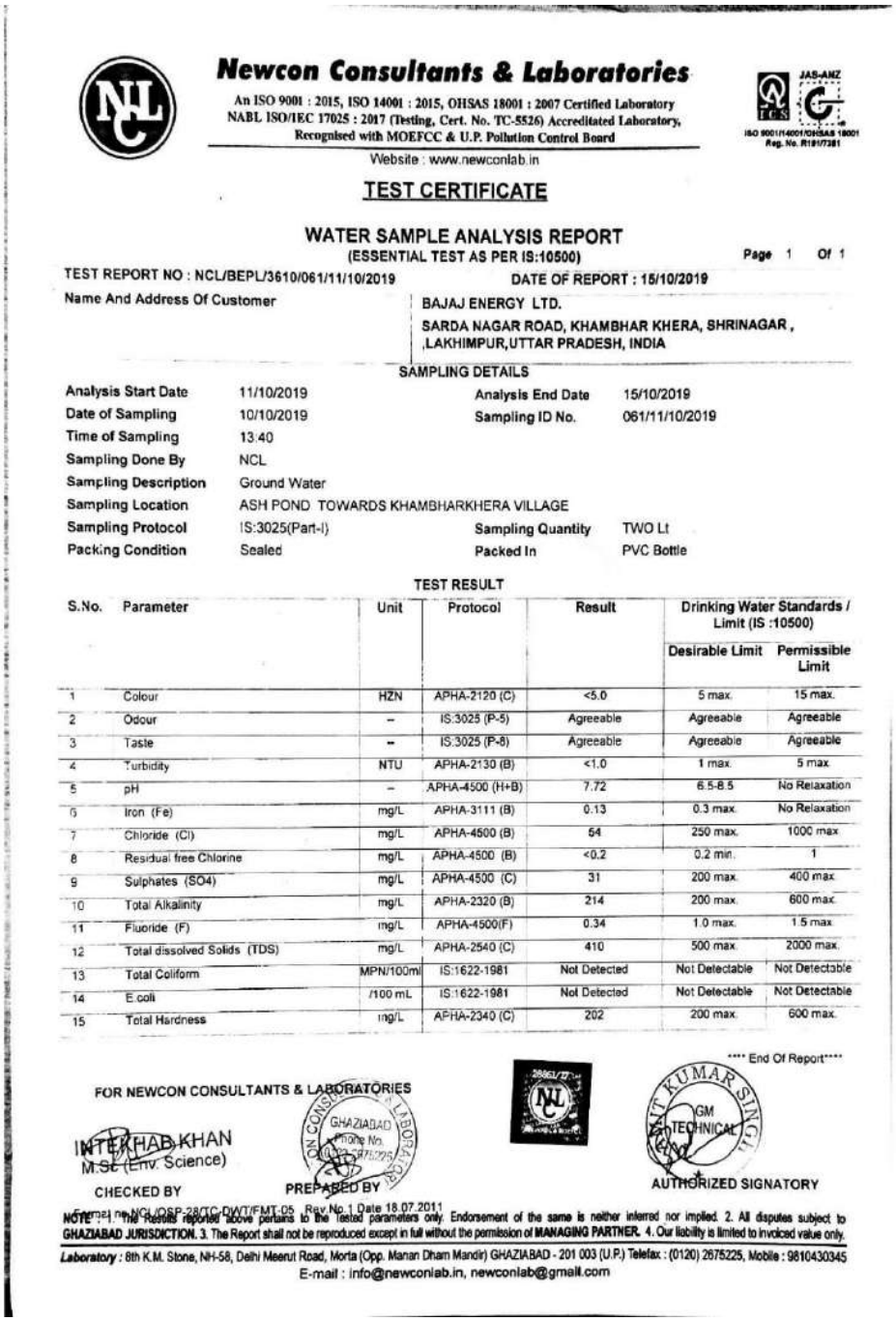

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WATER SAMPLE ANALYSIS REPORT
(ESSENTIAL TEST AS PER IS:10500)

Page 1 Of 1

TEST REPORT NO : NCL/BEPL/3610/061/11/10/2019 DATE OF REPORT : 15/10/2019

Name And Address Of Customer: BAJAJ ENERGY LTD.
SARDA NAGAR ROAD, KHAMBHAR KHERA, SHRINAGAR ,
,LAKHIMPUR,UTTAR PRADESH, INDIA

SAMPLING DETAILS

Analysis Start Date	11/10/2019	Analysis End Date	15/10/2019
Date of Sampling	10/10/2019	Sampling ID No.	061/11/10/2019
Time of Sampling	13:40		
Sampling Done By	NCL		
Sampling Description	Ground Water		
Sampling Location	ASH POND TOWARDS KHAMBHARKHERA VILLAGE		
Sampling Protocol	IS:3025(Part-I)	Sampling Quantity	TWO Lt
Packing Condition	Sealed	Packed In	PVC Bottle

TEST RESULT

S.No.	Parameter	Unit	Protocol	Result	Drinking Water Standards / Limit (IS :10500)	
					Desirable Limit	Permissible Limit
1	Colour	HZN	APHA-2120 (C)	<5.0	5 max.	15 max.
2	Odour	–	IS:3025 (P-5)	Agreeable	Agreeable	Agreeable
3	Taste	–	IS:3025 (P-8)	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	APHA-2130 (B)	<1.0	1 max.	5 max.
5	pH	–	APHA-4500 (H+B)	7.72	6.5-8.5	No Relaxation
6	Iron (Fe)	mg/L	APHA-3111 (B)	0.13	0.3 max.	No Relaxation
7	Chloride (Cl)	mg/L	APHA-4500 (B)	54	250 max.	1000 max.
8	Residual free Chlorine	mg/L	APHA-4500 (B)	<0.2	0.2 min.	1
9	Sulphates (SO4)	mg/L	APHA-4500 (C)	31	200 max.	400 max.
10	Total Alkalinity	mg/L	APHA-2320 (B)	214	200 max.	600 max.
11	Fluoride (F)	mg/L	APHA-4500(F)	0.34	1.0 max.	1.5 max.
12	Total dissolved Solids (TDS)	mg/L	APHA-2540 (C)	410	500 max.	2000 max.
13	Total Coliform	MPN/100ml	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
14	E.coli	/100 mL	IS:1622-1981	Not Detected	Not Detectable	Not Detectable
15	Total Hardness	mg/L	APHA-2340 (C)	202	200 max.	600 max.

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Surface Water	SW-170821-078	23/08/2021

Issued To : **M/s Bajaj Energy Ltd.**
Village - Maqsoodapur, Tehsil – Pawayan, District - Shahjahanpur,
Uttar Pradesh. (242401)

SAMPLING & ANALYSIS DATA

Sample Received On : 17/08/2021
Sample Drawn By : (NTL)
Sample Description : Khannaut River Up Stream
Sample Quantity/Packing detail : 1lt/Plastic Cane
Analysis Duration : 17/08/2021 To 23/08/2021

Surface Water

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11):1983	6.98	-
2.	Total Suspended Solid	IS:3025(Part-17):1984	88.0	mg/l
3.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	70.0	mg/l
4.	Biological Oxygen Demand (as O_2)	IS:3025(Part-44):1993	21.0	mg/l
5.	Oil & grease	IS:3025(Part-39):1984	<1.0	mg/l

Notes:

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Surface Water	SW-170821-079	23/08/2021

Issued To : M/s Bajaj Energy Ltd.
Village - Maqsoodapur, Tehsil – Pawayan, District - Shahjahanpur,
Uttar Pradesh. (242401)

SAMPLING & ANALYSIS DATA

Sample Received On : 17/08/2021
Sample Drawn By : (NTL)
Sample Description : Khannaut River Down Stream
Sample Quantity/Packing detail : 1lt/Plastic Cane
Analysis Duration : 17/08/2021 To 23/08/2021

Surface Water

S.No	Parameter	Test Method	Results	Units
1.	pH	IS:3025(Part-11):1983	7.13	-
2.	Total Suspended Solid	IS:3025(Part-17):1984	94.0	mg/l
3.	Chemical Oxygen Demand (as O_2)	APHA 5220 B:2005	76.0	mg/l
4.	Biological Oxygen Demand (as O_2)	IS:3025(Part-44):1993	23.0	mg/l
5.	Oil & grease	IS:3025(Part-39):1984	<1.0	mg/l

Notes:

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2.10 GROUNDWATER MODELING

Though the study area water level analysis some declining trends and CGWB has reported this block as safe with respect to ground water availability and extraction is considered modeling study is not required in this case. However, a simple model has run to analyses and predict future trends of ground water levels.

2.10.1 OBJECTIVES OF THE MODELING

As mentioned in the earlier chapters the water requirement of the plant is 6984 cum per day. The statutory requirement says that the sites extracting more than 500 cum per day of ground water in over exploited/critical or semi critical areas needs to undertake a ground water modeling study and forecast the groundwater situation through a time series analysis for years to come. Though this is a safe region the objectives of this groundwater modeling study are

- Establish the groundwater availability with the help of observed data
- Forecasting of groundwater scenario for the near future
- Suggestion for remedial measures in case of any adverse impact of extraction

The task undertook to achieve the above objectives were shown below.

- Data collected for running a groundwater model
- Conceptualized the model
- Ground water model has been simulated to know the ground water availability
- The results analyzed statistically to establish relationship between recharge, discharge and availability.
- Ground water situation has been forecasted for coming decade

2.10.2 DATA SETS USED

Following data sets were used to run a groundwater model and further analysis.

- Ground water head data in the form of water levels in units m bgl from 2013 to 2021 for both pre monsoon and post monsoon
- Hydraulic conductivity data
- Transmissivity and storitivity data
- Ground water recharge data
- Ground water draft data
- Digital elevation models
- Contour maps

2.10.3 GROUNDWATER MODEL

The study area encompasses 78.48 sq km. In the present study, being a small area which part of younger and older alluvial formations, no boundary conditions were set fourth for the model preparation. The entire area being considered as part of a larger groundwater basin. At this portion of the basin the study area is considered as an isotropic medium. The purpose of the modeling was to assess how ground water scenario will be for next decade if same abstraction rate and recharging rate continues. Another purpose of the model was to establish the spatial and temporal changes in the ground water regime.

2.10.4 ASSUMPTIONS

- As study area is very small, and a major water body in the form a river is in the middle of the area boundary conditions were not set for the study.
- Aquifer is unconfined and homogenous
- Aquifer is isotropic
- Time unit taken is year
- Ground water flow is in steady state

2.10.5 CONCEPT MODEL

In the present study simple method of basic Darcy's equation is applied to assess the specific discharge of the study area. Darcy's formula states that

$$Q = -K*A*dh/dl$$

Were

Q volume of water flowing through the aquifer

K is the hydraulic gradient in meter per day

A is the area in square meter

Dh/dl is the hydraulic gradient which is dimension less

This equation leads to velocity of flow of ground water in an aquifer which is also known as specific discharge

As V = Q/A

= -K * dh/dl

The negative sign indicates that ground water will flow from high hydraulic gradient to low gradient.

Once the specific discharge for the known values of hydraulic head is established a statistical analysis is performed to establish the correlation between the specific discharge and water levels. Then the specific discharge is forecasted for a decade time through a time series analysis and corresponding head is predicted. This will be further verified with statistical tests.

2.10.6 RUNNING THE MODEL

The model is simulated mostly in ARC GIS software. Some of the intermittent operation has been carried out using QGIS software as well. A mesh size of 25m x 25m is established for the study area. As a first step the hydraulic head is rasterized for years 2011 to 2021. A spatial distribution of hydraulic conductivity has been established and used as a constant layer in the model. A raster multiplication algorithm has been run to get the specific discharge of the aquifer of the area.

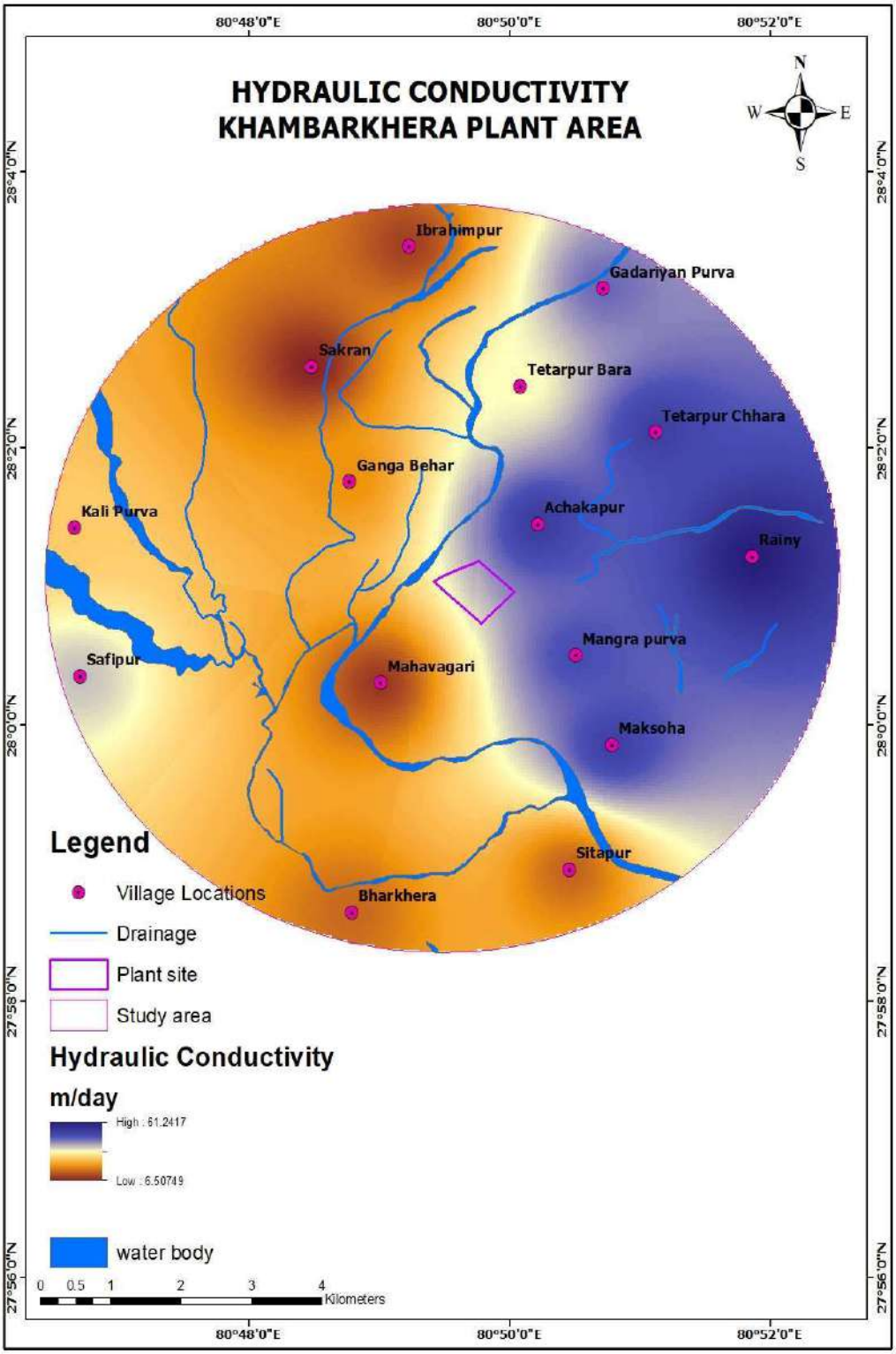

Fig.2.27 Spatial distribution of hydraulic conductivity for the study area

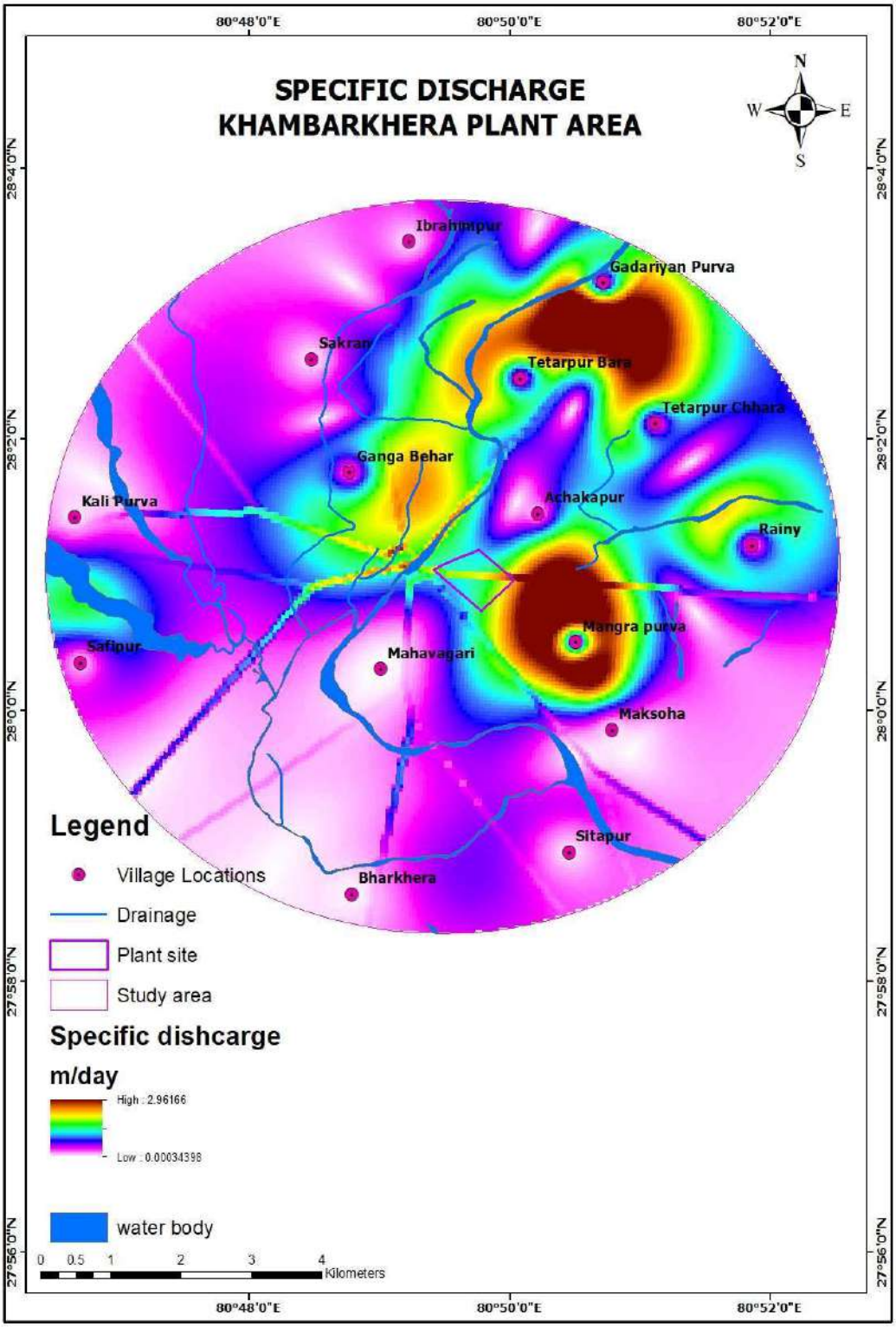

Fig.2.28 Spatial distribution of specific discharge for the sample year 2014

2.10.7 STATISTICAL ANALYUSIS OF SIMULATED OUTPUT

The statistical summary of simulated output of specific discharge is given in table 2.4. The model simulation has been carried out in ARC GIS platform. The derived output in the table is obtained by running a zonal statistic for the study area in ARC GIS platform.

Table 2.7

Statistical summary of specific discharge data

Year	Mean Specific discharge
2011	0.61
2012	0.71
2013	0.73
2014	0.45
2015	0.52
2016	0.48
2017	0.88
2018	0.52
2019	0.44
2020	0.8
2021	0.74

The mean specific discharge data thus derived has been used for a single parameter linear regression to forecast the specific discharge for the coming 11 years. The model has the data for 11 years so prediction has been done for another 11 years. The resultant linear regression outcome has been shown in Fig. 2.29. The equation indicating the relationship between time and specific discharge from the regression analysis is given in equation below. The error in the estimation in the form of Root Mean Square is also shown below.

$$\mathbf{Y = 0.0058x - 11.104}$$

Were

Y is mean specific discharge per day

X is year (1 to 11)

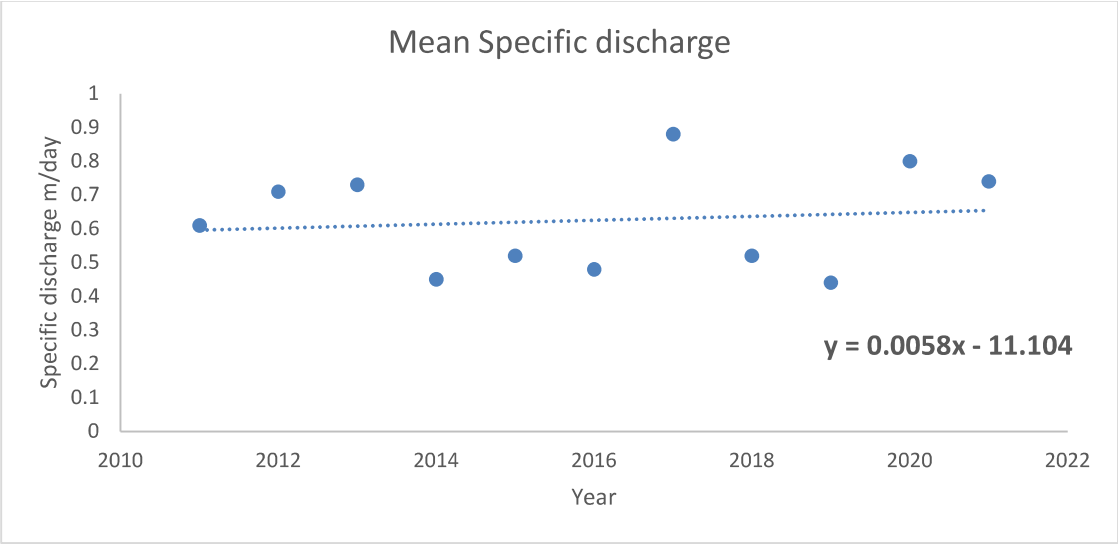

Fig.2.29 Spatial and temporal changes in specific discharge from 2012 to 2021

Using this method specific discharge has been estimated from 2022 to 2031 as shown in table 2.5

Table 2.8

Analyzed and forecasted per day specific discharge for the study area data

Year	No of years	Observed Specific discharge	Year	No of years	Forecasted Specific discharge
2011	1	0.61	2022	12	0.62
2012	2	0.71	2023	13	0.63
2013	3	0.73	2024	14	0.62
2014	4	0.45	2025	15	0.61
2015	5	0.52	2026	16	0.62
2016	6	0.48	2027	17	0.63
2017	7	0.88	2028	18	0.64
2018	8	0.52	2029	19	0.62
2019	9	0.44	2030	20	0.63
2020	10	0.8	2031	21	0.65
2021	11	0.74	2032	22	0.64

In this modeling study an attempt has been also made to know the correlation between observed/analyzed specific discharge and predicted specific discharge. The formula employed is

$$P = S(x, y) / \sigma x * \sigma y$$

Were

P is correlation coefficient

S (x, y) is covariance of x and y

σx * σy is standard deviations of x and y respectively

x is the analyzed/observed specific discharge in m/day

y is the predicted specific discharge in m/day

The statistical analysis shows that

σx	=	0.15
σy	=	0.01
Covrience	=	0.001
Correlation coefficient	=	0.6

The results show the value of correlation coefficient as 0.6 which is an above average correlation. The low value is due to averaging of many of the parameters used for analyzing the specific discharge.

Once a reasonable correlation established between the analyzed and predicted specific discharge, an attempt has been made to analyze the available recharge and discharge data and predict the water level trends for another 10 years.

In order to predict the water levels for another 10 years a relations ship has been established with specific discharge values and water levels. Using this linear regression through a regression analysis water levels were predicted till 2032. Here parameter to be predicted is water levels and correlation parameter is specific discharge. So, a linear regression analysis has been done for these two parameters for the known values and resulting equations were used for predicted water levels.

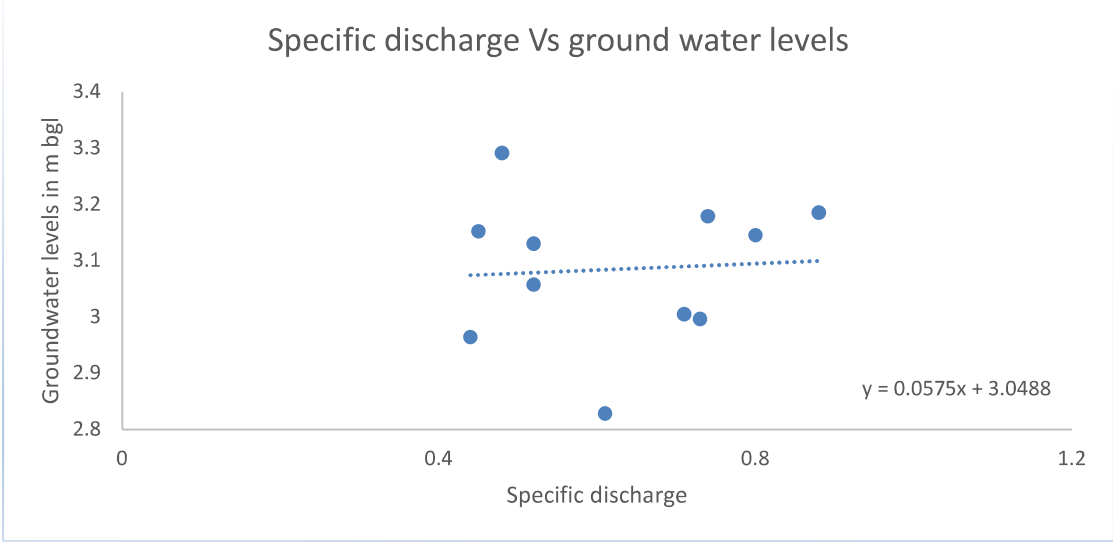

Fig.2.30 Regression analysis for predicting and forecasting water levels

Based on the above results water levels were predicted till 2032 for the analyzed values of specific discharges. Below table shows the observed and predicted water levels and also given in Fig 2.31.

Table 2.9

Observed and predicted water levels

Year	Specific discharge (m/day)	Groundwater level (m bgl)
2011	0.61	2.828
2012	0.71	3.005
2013	0.73	2.996
2014	0.45	3.152
2015	0.52	3.057
2016	0.48	3.291
2017	0.88	3.185
2018	0.52	3.130
2019	0.44	2.964
2020	0.8	3.145
2021	0.74	3.179
2022	0.62	3.086
2023	0.63	3.086
2024	0.62	3.086
2025	0.61	3.085
2026	0.62	3.086
2027	0.63	3.086
2028	0.64	3.087
2029	0.62	3.086

2030	0.63	3.086
2031	0.65	3.087
2032	0.64	3.087

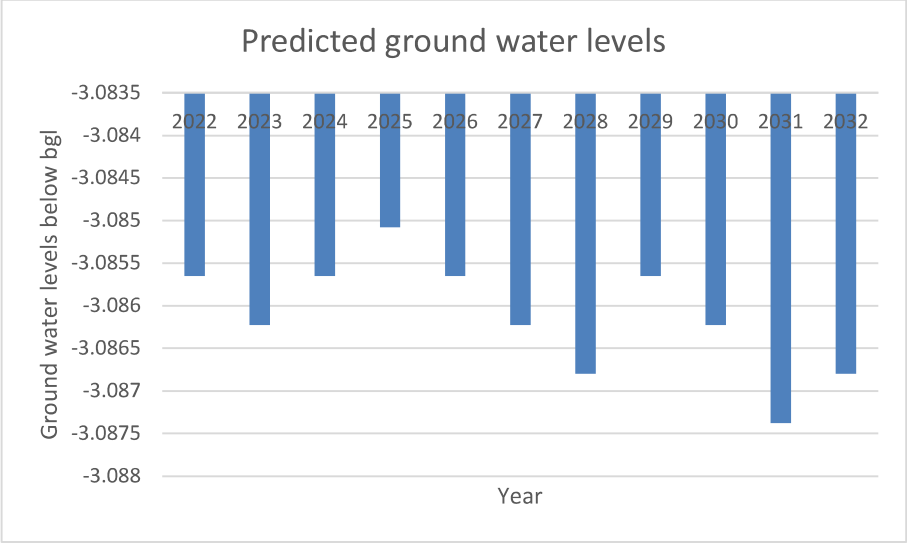

Fig.2.31 Forecasted ground water levels in the study area

2.10.8 CONCLUSIONS

- A mathematical modeling of the hydrogeology of the area has been attempted in the present study on spatial platform
- Most of the data collected through field observations, literature and published reports
- Model has been run on a 25m-by-25m grid system
- Model run on ARC GIS platform
- Basic Darcy's equation of ground water flow has been applied in this model
- Hydraulic gradient and hydraulic conductivity layers were used to estimate specific discharge of the area.
- The statistics of the same has been worked out through zonal statistics methods
- A linear regression has been run on the output to predict specific discharge
- An interrelation ship of recharge, discharge specific discharge and water levels established through inter correlation matrix
- The analysis proved that specific discharge is the parameter closely related to water levels.
- So, the same parameter used to predict water levels for another 11 years
- Results shows if the recharge and discharge keep on in the same trend then water level will improve in the near future.

CHAPTER 3: WATER REQUIREMENT AND ITS UTILIZATION

TOTAL WATER REQUIREMENT OF THE PLANT AND HOW IT IS MDT WITH

3.1 TOTAL WATER REQUIREMENT

The total fresh water requirement of the plant is 6984 m^3/day. This requirement is met with ground water extraction using three numbers of bore wells. All three wells have been fitted with flow meters to quantify the water extraction and the plant is maintaining the records of the same for reference. Water is a key input in power generation process. Water will be employed for colling, heat management, various other consumptive uses. Water is used in every sphere of power generation. The important uses are

- Power cycling make up
- Colling agent
- Air conditioning
- Coal dust suppression
- Service water system
- Drinking water in allied colonies
- Evaporative loses
- Gardening

3.1 TOTAL WATER REQUIREMENT

The inflow to the power station is through three bore wells filled with required pumping sets to extract ground water. The details are depicted in Fig.3.1

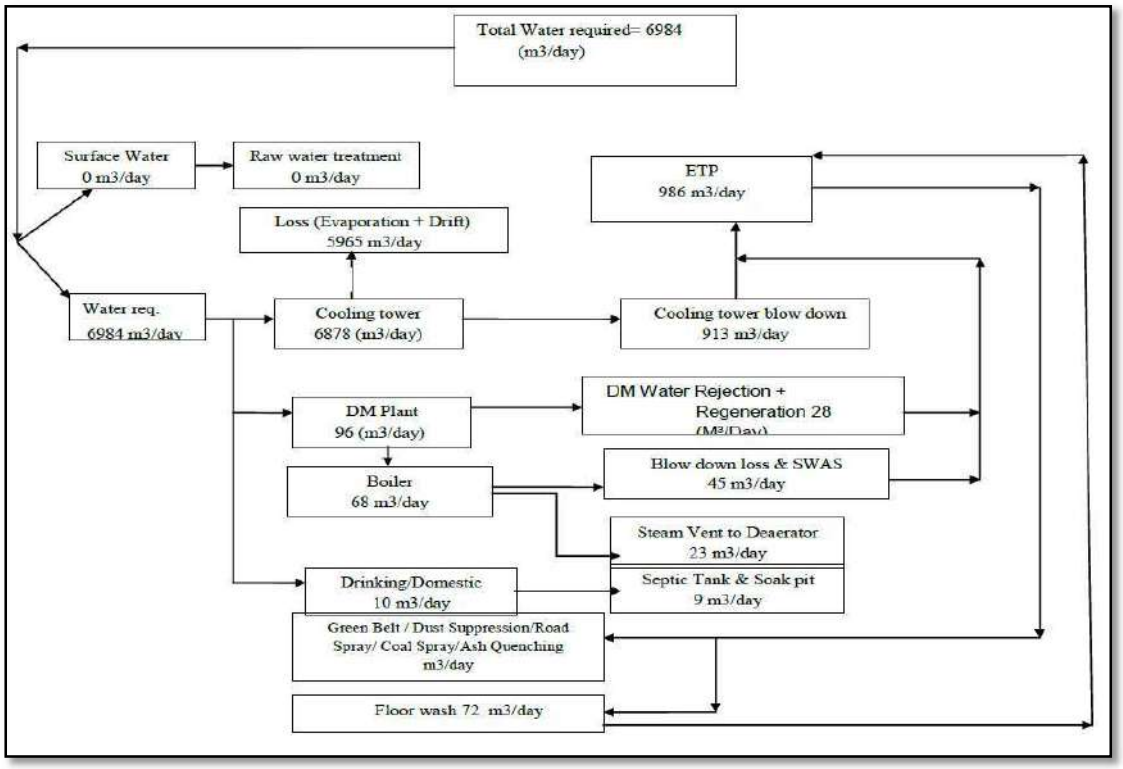

Fig.3.1 Water balance diagram

CHAPTER 4: DEWATERING PLAN

APPROVED DETAILED DEWATERING PLAN IN CASE OF INFRASTRUCTURE DEWATERING PROJECT

This is an industrial project so the above-mentioned point is not applicable

CHAPTER 5: DEWATERING IMPACT ASSESSMENT

APPROVED DETAILED DEWATERING PLAN IN CASE OF INFRASTRUCTURE DEWATERING PROJECT

- Proposed usage of pumped water in case of infrastructure dewatering projects.
- For drinking, irrigation etc.
- Recharge
- Runoff to stream
- Benefitted area

This is an industrial project so the above-mentioned point is not applicable

CHAPTER 6: MEASURES ADOPTED FOR WATER CONSERVATION

VARIOUS WATER CONSERVATION MEASURES, RECYCLING, RESUSE AND TREATMENT OF WATER

The plant premises has been equipped with various water conservation and artificial recharge structures. There are several rainwater harvesting structures available in the premises of the plant. Few of the major rainwater harvesting structure is established in the campus to harvesting storm drainage to recharge ground water. Rainwater harvesting is a traditional way of collecting water and using it in the lean periods. In the premises of the plant water has been harvested systematically to recharge ground water. This may be one of the reasons of a stabilized water level in and around the premises of power plant.

There are total 3 rainwater harvesting structures installed within the plant premises, one near TG building and two in storm water drains to cover the entire plant rechargeable catchment.

The rain water harvesting is calculated for 176000 m2 open land (Runoff coefficient of 0.2), 46400 m2 of paved area (runoff coefficient of 0.65), Greenbelt area of 37800 m2 (Runoff coefficient of 0.15) and rooftop area of 4104 m2 (runoff coefficient of 0.85). Considering the annual rainfall of 0.9 mts,

the rainwater harvesting and ground water recharge potential within plant premises is **67067 m3 / year**.

Additionally, the plant has also adopted and maintained 7 water ponds in the nearby villages to work as potential rainwater harvesting structures. Pond details are as follows:

Rainwater Harvesting Pond Details	Area (Ha)	Area (m2)	Average Depth (m)	Storage Capacity (m3)
Pond 1	4.233	42330	3	126990
Pond 2	2.613	26130	3	78390
Pond 3	2.492	24920	3	74760
Pond 4	3.486	34860	3	104580
Pond 5	6.051	60510	3	181530
Pond 6	2.990	29900	3	89700
Pond 7	5.154	51540	3	154620
Total	**27.019**	**270190**		**810570**

Recommended monsoon recharge is 20% of the gross storage with 2 times filling is expected in monsoon period: **Gross Storage x 20% x 2 = 324228 m3 (A)**

Recommended monsoon recharge is 20% of the gross storage with 1 time filling is expected in monsoon period: **Gross Storage x 20% x 1 = 162114 m3 (B)**

Total recharge by village ponds expected during the year: A + B = 486342 m3 / annum

Total estimated Rainwater Harvesting (With plant + Village pond recharge

= 553407 m3 / Annum

CHAPTER 7: GROUNDWATER RESOURCES

STATUS GROUND WATER DEVELOPMENT THROUGH RECHARGE AND EXTRACTION BALANCE

Using historical data collected from Central Ground water Board, it is found that the block within which the plant resides is safe as far as ground water development is considered. This has further verified for the present scenario through various public domains of Ministry of Jal Shakti and it is verified that as of now the block Phool Behar is categorized as SAFE where extraction rate is slower than the recharge rate. The details for the block of Phool Behar are tabulated below

Table 7.1

Status of ground water resource development

Existing gross ground water draft for all uses	14990 ham
Net ground water availability	16655.72 ham
Stage of ground water development	51.71%
Category of block	SAFE

CHAPTER 8: SUMMARY AND CONCLUSIONS

IMPORTANT INFERENCES COLLECTED THROUGH THIS STUDY

8.1 SUMMARY

Following are the important findings of this study

- Bajaj Energy Limited at Khambarkhera produces 90 MW of electricity using two of its 2X45 MW units.
- Water requirement of the plant is 6984 m^3/day.
- Water requirement is met with Three bore wells constructed in the premises for the same
- The ground water levels are monitored through 5 manual piezowell and 02 online piezometer with telemetry installed in the premises.
- The present study is to do a comprehensive ground water impact studies within and in the periphery composing 5 km radius of the power plant
- Land use land cover analysis shows that the area composed of 85.1% agriculture.
- Average rainfall is 1105 mm
- Geomorphologically the terrain is a mature terrain with many meandering rivers with ox bow lakes and palaeo channels along with younger flood plains and older upland flood plains.
- Analysis of the digital elevation model reveals that area is in general a flat terrain with height varies from 46 to 110 m above mean sea level.
- Geologically the area is with older and younger alluvial plains which is part of the Great Gangetic Plains.
- Hydrogeologically the area is composed of phreatic shallow aquifers. Confined aquifers are also there but not tapped commonly
- Highest observed water level is 1.89 and deepest is 4.19 m bgl
- Water level trends in the all the piezometers are either constant or with a slight declining trend. This indicate that withdrawal of water through bore wells not affecting much on the ground water regime through high rate of recuperations. However slight decline indicate that futuristic uses need to be careful to contain it.
- Both short term and long-term trends shows that slight declining in water levels across the five piezometers.
- Ground water quality shows that all the parameters are within the permission or desired limits.
- This scenario does not demand a ground water modeling; however, an attempt has been made to establish prediction of the ground water levels for the upcoming years.
- Using Darcy's equation specific discharges were modelled in ARC GIS environment.
- A correlation coefficient of 0.6 has been estimated between observed and estimated specific discharge
- So with the help of specific discharge water levels were also predicted.
- Water requirement of the plant has been analyzed along with water balance diagram

- Artificial recharge in the premises were analyzed. The total water recharged is 553409 cum per year.
- Ground water resource estimation data collected from central agencies was found that that Khambarkhera block is safe as far as ground water extraction is considered.

8.2 CONCLUSSION

It is concluded from the above that the ground water extraction from the plant is not depleting ground water levels in the area. The water levels of piezometer, short term and long-term trends, modelled output all shows a slight declining water level. The quality of the ground water also shows that all the parameters are well within the permissible or desired limits. As water table *is very shallow, further artificial recharge is not recommended in the area.*

Annexure 2 Field photos

Field photo 1 Ground water level measurement at Achakpur village

Field photo 2 Observations on ground water level at Badiyanpurba village

Field photo 3 Observations on Borewells of plant

Field photo 4 Observations on manually measured piezometers

Field photo 5 Observations on recharge pit

Field photo 6 Observations on automatic ground water level measurements

Field photo 7 Observations on Lithologs of well cutting sections

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

194905/UPPCB/Lucknow(UPPCBRO)/CTO/both/LAKHIMPUR KHIRI/2023 **Date: 11/12/2023**

To,

M/s

BAJAJ ENERGY LIMITED UNIT KHAMBHARKHERA

SHARDA NAGAR ROAD, KHAMBHARKHERA, DISTT LAKHIMPUR KHERI,LAKHIMPUR KHIRI,261506

Application Id-23192569

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 UNIT KHAMBHARKHERA** located at **SHARDA NAGAR ROAD, KHAMBHARKHERA, DISTT LAKHIMPUR KHERI,LAKHIMPUR KHIRI,261506**. 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 UNIT KHAMBHARKHERA **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	Electricity	90	Megawatt

2. Conditions under Water(Prevention and Control of Pollution) Act -1974 as amended :-

(i) The daily quantity of effluent discharge (KLD) :-

Kind of Effluent	Quantity(KLD)	Treatment facility	Discharge point
Domestic	**25 KLD**	**STP**	**Maximum horticulture and irrigation**
Industrial	**980 KLD**	**ETP**	**Process, Ash Quenching etc.**

(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

Bajaj Energy Ltd. ★ Unit-Khambharkhera ★

S.No.	Parameter	Standard
1	pH	5.5-9.0
2	TSS	100 mg/l
3	BOD	30 mg/l
4	COD	250 mg/l
5	Oil and Grease	10 mg/l

(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	6.5-9.0
2	BOD (mg/L)	30 mg/l
3	TSS (mg/L)	100 mg/l
4	Fecal Coliform (MPN/100ml)	1000 MPN/100ml

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 nos. Boilers (capacities of 190 TPH each) common stack)	Coal	1	Particulate Matter	110 meter from GL
2	250 KVA DG set	Diesel	1	Particulate Matter	as per norms
3	250 KVA DG set	Diesel	1	Particulate Matter	as per norms

Emmission Quality Standards

S No.	Stack no	Parameters	Standards
1	1	Particulate Matter	50 mg/normal cubic meter

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

Unit will not use any type of restricted fuel.
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

ncerned offices. In case of failure of pollution control equipment, the production process connected all be stopped with immediate effect.

he industry shall operate in a manner so that all emissions be emitted through designated chimney/stack ly.

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. The consent is valid for electricity generation of 90 megawatt.

2. This consent is valid for the current products and capacity. In case of any change in process, capacity enhancement etc. No Objection Certificate shall be obtained from the Board.

3. The industry shall maintain and operate the ETP (capacity of 1000 KLD) properly and the treated effluent/sewage shall be used for flushing, irrigation and gardening and shall ensure that no untreated effluent discharged in any surface water body.

4. The treated waste water shall be utilized for the irrigation purpose, sprinkling at coal yard, ash quenching and make up water in cooling tower and shall dispose of as MoEF and CC regulation.

5. The industry shall ensure to operate and maintain the Online Continuous Effluent Monitoring System regularly.

6. The industry shall operate and maintain STP (capacity of 100 KLD) in such a manner so that it can achieve the stranded specified in the notification issued by Ministry of Environment and Forest and Climate change vide GSR 1265 (E) dated 13-10-2017 in the time period as specified in the notification.

7. The industry shall ensure to submit treated effluent analysis report from outlet of ETP and STP conducted by any NABL accredited lab should be submitted quarterly.

8. Polluted effluent generated from power plant unit must not be disposed outside industry premises without proper treatment.

9. The Order issued by Hon'ble Courts/Hon'ble NGT, MoEF & CC, Central Pollution Control Board, U.P. Pollution Control Board, shall be complied with.

10. The industry shall ensure to install Electro Magnetic Flow meter at the outlet of ETP and maintain the logbook.

11. The industry shall submit the latest copy of Audited Balance Sheet/C.A. Certificate (Fixed Assets+ Current Assets - Current Liabilities) so that the Consent fee payable by the industry may be verified.

dustry shall operate and maintain installed APCS (ESP attached with the boilers of capacity 190 TPH) ctively and Stack monitoring report shall be submitted on quarterly basis.

13. The operation of industry shall be in such a manner that no any adverse impact on the environment and public in surrounding.

14. Effective operation and maintenance of all installed air pollution control equipment shall be done so that emission meets the norms/standards of CPCB and industry shall be operated in such a manner that ambient air quality should not be adversely affected.

15. With regards to the use of Pet Coke/Furnace Oil as fuel, the orders passed by the Hon'ble Supreme Court in the Writ petition (Civil) no. 13029/1985 MC Mehta versus Union of India and others will be applicable.

16. Noise and emission level from the DG sets installed of 2X250 KVA capacities shall remain within the prescribed norms and the stacks and acoustic enclosure shall be properly maintained according to the prescribed norms.

17. Air monitoring report conducted by any NABL accredited lab shall be submitted within one month by the PP.

18. The industry shall submit the details of utilization of Fly Ash every month.

19. Ash generated from boilers shall be stored in a safe place and proper arrangement of water sprinkling shall be done to suppress the dust particles.

20. The industry shall ensure the proper management in all 3 Silos located near chimney to control pollution generated due to loading and unloading of bottom at ash and fly as in vehicles/containers.

21. The industry shall follow the directions issued by the Ministry of Environment Forest and Climate Change, Delhi for utilization of fly ash notification S.O. 2804 (E) dated 03.11.2009 as amended time to time.

22. The industry shall be operated in such a manner that it does not adversely affect the environment and the solid waste generated such as ash etc. is disposed in Eco friendly manner.

23. Arrangements for collection, Segregation, Storage, Handling and disposal of Solid Waste including garbage shall be provided and maintained properly.

24. Source Emission Monitoring report and Ambient Air Quality Monitoring report from any EPA recognized/NABL accredited Laboratory must be submitted quarterly basis.

25. The industry shall ensure to establish Miyawaki forest, as per the GO no. 1011/81-7-2021-09(rit)/2016 dated 13.10.2021 of Deptt. of Environment, forest and Climate Change.

26. Install Electromagnetic Pizo Meter at each point of water supply source and at effluent discharge point and ensure to timely send meter reading to department on monthly basis.

industry shall ensure to submit treated effluent analysis report from STP conducted by any NABL ited lab within 15 days in the Board issuance this certificate.

8. Generated hazardous waste shall be stored temporarily in the unit premises and disposed off through authorized TSDF after obtaining the authorization from the Board.

29. The industry shall ensure to comply the conditions mentioned in NOC issued by UP Ground Water Department.

30. The industry shall comply with the provisions of, Environment (Protection) Act 1986, Water (Prevention and Control of Pollution) Act, 1974 as amended, Air (Prevention and Control of Pollution) Act, 1981 as amended, Plastic Waste Management Rules 2016, E- Waste (Management) Rules 2016, Solid Waste Management Rules 2016 & Hazardous and other Waste (Management and Transboundary Movement) Rules 2016 (Whichever is applicable).

31. If closure order is issued by CPCB or UPPCB against the unit, then this CTO will remain suspended during the closure period and after ensuring the compliance and after revocation of closure order, the CTO will automatically be effective from the date of issuance of closure order revocation, with additional conditions mentioned in the closure revocation order.

RAM KARAN
Digitally signed by RAM KARAN
Date: 2023.12.18 17:55:04 +05'30'

Chief Environmental Officer,
Circle-5, UPPCB.

Copy to:

Regional Officer, UPPCB, Lucknwo.

RAM KARAN
Digitally signed by RAM KARAN
Date: 2023.12.18 17:55:29 +05'30'

Chief Environmental Officer,
Circle-5, UPPCB.

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 |

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

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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

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उत्तर प्रदेश																
क्रम	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

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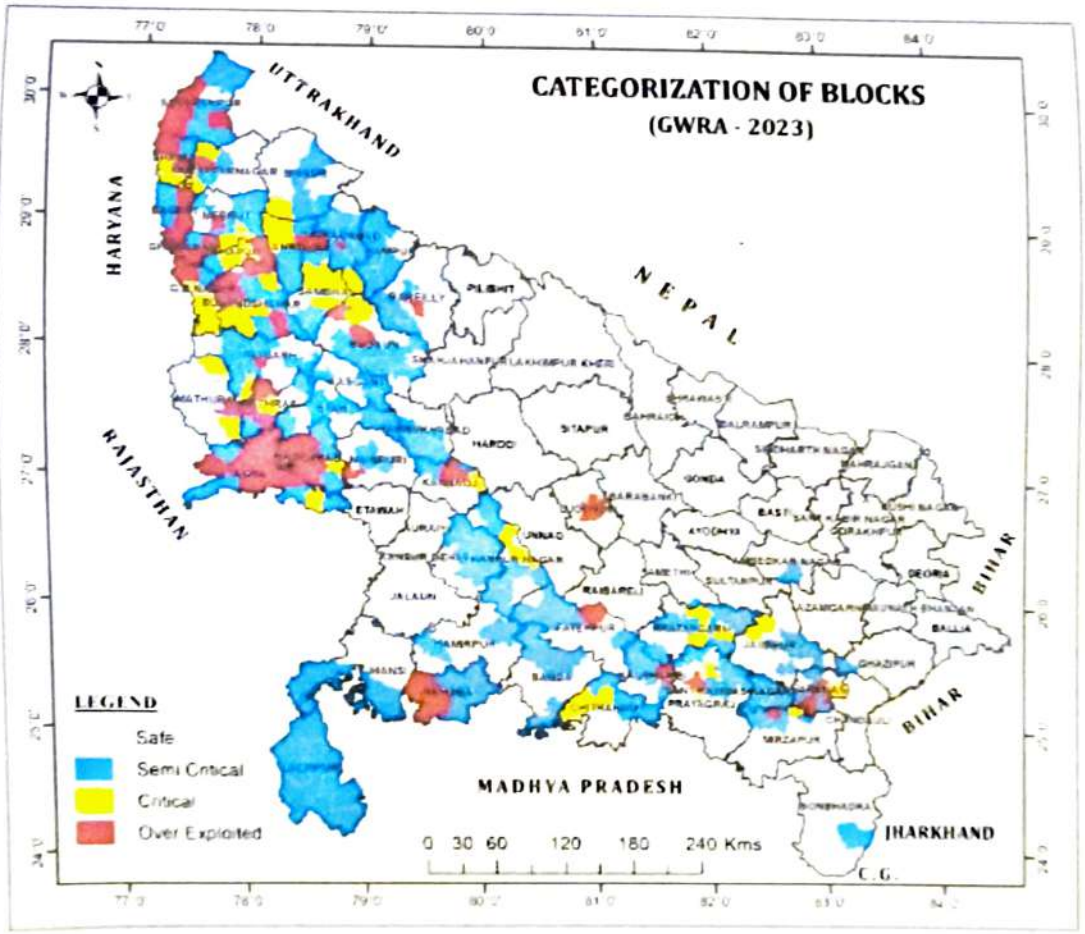
उत्तर प्रदेश																
क्रमां	जिला	भूजल पुनर्भरण					कुल प्राकृतिक निर्वहन	वार्षिक निकालने योग्य भूजल संसाधन	वर्तमान वार्षिक भूजल निकासी				2025 तक घरेलू उपयोग के लिए वार्षिक भूजल आवंटन	भविष्य में उपयोग के लिए शुद्ध भूजल उपलब्धता	भूजल निकासी की स्थिति (%)
		मानसून ऋतु		गैर-मानसून ऋतु		कुल वार्षिक 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

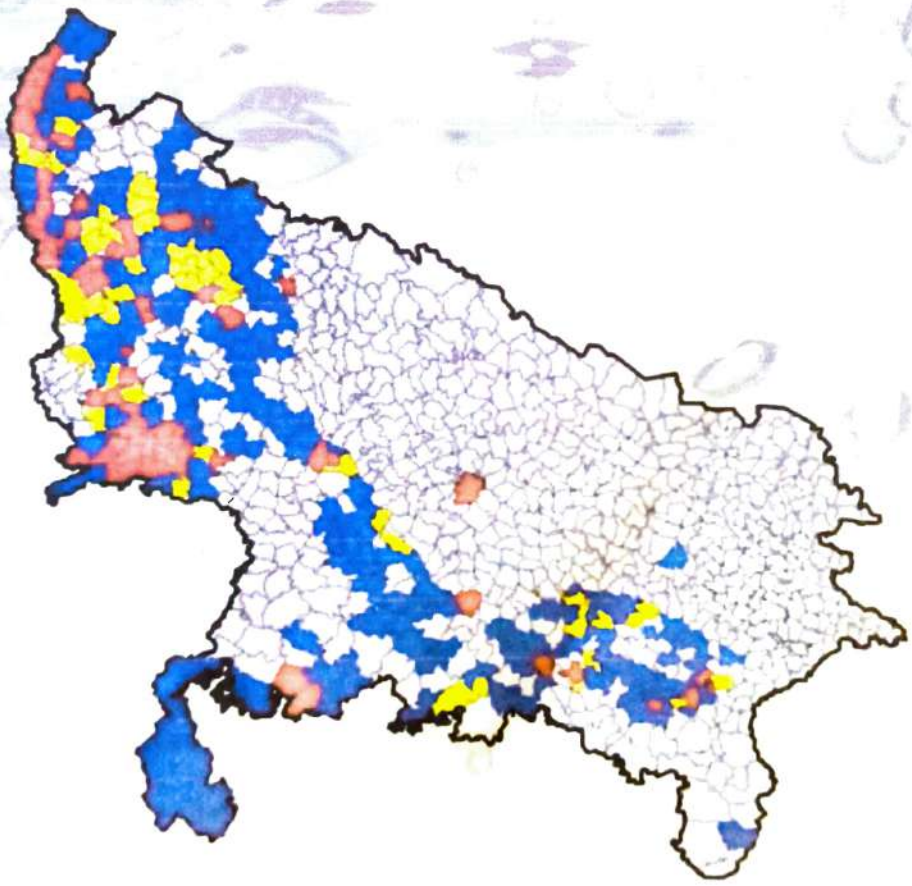
6.1. भूजल निकासी का चरण और मूल्यांकन का वर्गीकरण

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

उत्तर प्रदेश का गतिशील भूजल संसाधन, 2023



लखनऊ

जनवरी, 2024

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

DISTRICT-LAKHIMPUR

BLOCK	HYDROGRAPH_STATION_NAME	PIEZO_WELL	R_U	PRM_18	PTM_18	PRM_19	PTM_19	PRM_20	PTM_20	PRM_21	PTM_21	PRM_22	PTM_22	PRM_23	PTM_23
Bankeyganj	KOTHIPURWA	Piezometer	R	4.30	2.35	4.43	2.50	4.85	2.70	4.50	2.80	4.56	2.65	4.65	2.90
Bankeyganj	ARJUNPUR GRANT-10	Piezometer	R	4.35	1.56	4.47	1.80	4.65	1.90	4.60	2.00	4.69	1.90	4.75	2.10
Behjam	OYAL	Piezometer	R	6.35	3.85	6.60	3.90	6.85	4.25	5.45	4.05	5.70	4.15	5.30	2.45
Behjam	PAILA	Piezometer	R	9.30	4.85	9.55	4.95	9.80	5.10	9.10	4.50	8.30	5.10	8.75	6.50
Behjam	SISWAN KALAN	Piezometer	R	6.25	4.25	6.30	4.40	6.55	4.55	6.45	3.80	6.65	3.90	5.85	4.65
Behjam	TIKAULA	Piezometer	R	7.40	4.10	7.55	4.20	7.80	4.40	6.95	4.25	7.15	5.15	7.10	6.90
Behjam	P.S. PANYORA	Piezometer	R	6.20	4.20	6.40	4.40	6.60	4.85	6.25	4.60	5.75	-	5.85	5.05
Behjam	Bdo Office Near	DWLR	R	-	-	-	-	-	-	-	-	9.15	8.15	2.60	
Behjam	Acchanlya	P/DWLR	R	-	-	-	-	-	-	-	-	-	-	-	
Bijua	ALIAPUR	Well	R	5.35	2.05	5.52	2.45	5.65	2.55	5.35	2.80	5.15	2.90	4.85	4.75
Bijua	BASTAULI	Well	R	4.60	2.35	4.85	2.80	5.05	2.95	4.90	2.30	4.75	2.50	4.60	4.95
Bijua	PADARIA TOLA	Well	R	3.30	2.30	3.45	2.65	3.60	2.90	3.40	3.25	3.80	3.40	3.30	3.95
Bijua	RATANAPUR	Well	R	4.10	2.25	4.30	2.75	4.60	2.85	3.20	2.70	3.30	2.80	3.05	3.05
Bijua	BHANPUR KALAN	Piezometer	R	2.95	2.65	3.15	2.75	3.30	3.00	2.40	2.80	2.45	2.90	2.90	2.95
Bijua	SAHASHPUR	Piezometer	R	5.20	2.80	5.35	3.25	5.55	3.45	3.50	2.60	3.90	2.80	3.85	3.50
Bijua	BAHADURNAGAR	Piezometer	R	4.30	2.95	4.55	3.40	4.70	3.55	3.90	3.40	4.05	3.50	3.05	3.80
Bijua	POOJAGAON	Piezometer	R	4.30	3.25	4.55	3.00	4.70	3.10	4.35	2.95	4.10	3.15	3.90	3.95
Bijua	BASTAULI	Piezometer	R	2.55	2.05	2.65	2.25	2.80	2.35	2.25	2.20	2.40	2.30	2.30	2.30
Dhaurahra	LALJI KA PURWA	Well	R	5.60	2.25	5.65	2.80	5.80	2.95	5.70	3.05	5.30	3.10	4.80	4.40
Dhaurahra	P.S.ICHARBAHIYA	DWLR	R	-	-	-	-	-	-	4.00	3.40	3.70	3.60	2.52	1.56
Dhaurahra	DHAURAHA TEHSIL	DWLR	R	4.00	2.70	4.15	3.15	5.10	3.40	4.00	3.45	3.95	3.55	1.58	2.64
Dhaurahra	SISAYAN KALAN	DWLR	R	-	-	-	-	-	-	4.25	3.15	4.05	4.10	1.62	2.53
Dhaurahra	PV Mahttau Purwa	DWLR	R	-	-	-	-	-	-	-	-	4.70	3.95	3.11	2.63
Gola	AHMAD NAGAR	Piezometer	R	5.55	3.55	5.65	3.65	5.80	3.80	5.05	3.20	5.40	3.30	4.90	4.50
Gola	SEHARUWA	Piezometer	R	6.55	4.55	6.65	4.70	6.85	4.85	6.35	4.50	6.55	4.70	6.10	6.05
Gola	FOREST OFFICE	Piezometer	R	5.45	3.95	5.60	4.05	6.20	4.25	5.80	3.80	5.95	4.75	5.85	5.35
Gola	P.S. SAHBUDDINPUR	P/DWLR	R	5.70	3.40	5.75	3.55	5.95	3.75	5.70	4.05	5.90	4.35	-	1.45
Gola	Primary School Sahabuddinpur	DWLR	R		-	-	-	-	-	-	-	-			1.45
Isanagar	RAIPUR	Well	R	4.75	2.55	4.85	3.05	5.05	3.20	4.80	2.90	4.65	3.25	4.45	4.45
Isanagar	ETAUWA	Well	R	3.05	2.55	3.15	2.80	3.35	2.90	3.15	3.20	3.20	3.25	3.10	3.10
Kheri	JHASIYA	Well	R	9.50	5.30	9.85	5.40	10.10	4.60	9.90	5.80	9.70	5.45	9.10	8.80
Kheri	KALA AAM II	Piezometer	R	6.50	3.95	6.70	4.15	6.85	4.30	3.50	4.10	5.10	4.25	4.90	4.45
Kheri	LALPUR	Piezometer	R	7.80	3.50	8.05	3.55	8.30	3.75	8.05	3.50	8.25	3.80	6.75	6.30
Kheri	MURIYA KHERA	Well	R	11.10	6.25	11.40	6.35	11.55	6.50	11.50	6.30	10.90	6.15	5.90	8.70
Kheri	UDYANPUR	Well	R	9.10	4.75	9.30	4.80	9.60	4.95	9.30	4.25	9.50	4.40	9.10	8.65
Kheri	KASTA	Well	R												
Kheri	GURUNANAK INTER COLLEGE	Piezometer	R	11.85	6.60	12.05	6.65	12.30	6.80	9.30	4.40	9.45	4.60	6.80	6.00
Kheri	GOVT. AASHRAM	Piezometer	R							4.80	4.90	3.25	4.40	4.60	4.15
Kheri	PWD	Piezometer	R	10.45	8.15	10.60	8.25	10.80	8.40	8.45	5.50	8.95	4.95	7.85	6.50
Kheri	SILK DEPTT.	Piezometer	R	8.70	6.60	10.05	6.70	10.25	6.90	7.25	6.10	7.70	6.40	7.50	7.40

Kheri	BDO (VIKASKHAND)	Piezometer	R	12.33	6.95	12.50	7.00	12.75	7.15	11.15	6.05	8.60	9.05	9.05	9.60
Kheri	PNKV EDGAH	Piezometer	R	9.70	5.30	9.85	5.40	10.15	5.55	10.10	5.20	10.25	5.70	9.40	9.10
Kheri	PS SADAR	Piezometer	R	13.00	8.30	13.10	8.35	13.25	8.55	11.05	7.80	11.20	10.45	10.70	10.30
Kheri	KORAIYA FOREST	Piezometer	R	8.80	6.30	8.95	6.40	9.15	6.50	8.25	5.25	8.80	5.80	8.60	8.35
Kheri	PS BANSTALI	Piezometer	R	7.50	4.65	7.70	4.80	7.95	4.95	7.35	4.40	7.55	4.20	6.60	6.30
Kheri	LAGUCHA	Piezometer	R	8.80	5.95	8.90	6.05	9.15	6.25	8.30	5.50	7.40	5.90	7.20	7.10
Mitauli	LOHAGARH	Well	R	5.85	4.50	6.05	4.65	6.30	4.80	5.60	4.50	5.70	4.85	5.55	5.30
Mitauli	JAMUNIYA	Well	R	6.80	5.15	6.85	5.30	6.25	5.55	5.30	5.25	5.90	5.40	6.10	5.30
Mitauli	SANDILWA	Piezometer	R	-	-	-	-	-	-	5.20	5.05	5.30	5.60	4.50	4.35
Mitauli	Primary School Pakaria Jalalpur	DWLR	R	-	-	-	-	-	-	-	-	5.95	4.65	1.11	1.86
Mitauli	Primary School Osari	DWLR	R	-	-	-	-	-	-	-	-	9.45	9.15	-	
Mohammdi	JARIYA	Piezometer	R	5.45	4.65	5.70	4.80	5.90	4.95	5.65	4.75	5.85	4.80	3.65	3.40
Mohammdi	KOIYA MADARPUR	Piezometer	R	5.40	4.90	5.60	5.05	5.85	5.25	10.65	5.10	7.95	5.60	8.40	8.25
Nakaha	TANAZA	Well	R	3.15	2.45	3.40	2.75	3.65	2.80	3.40	2.65	2.90	2.60	2.75	2.70
Nakaha	PS ATKOHNA	Piezometer	R	2.55	1.95	2.65	2.00	2.80	2.20	1.25	2.10	2.40	2.05	2.30	2.40
Nakaha	PS PANGI KALAN	Piezometer	R	5.25	2.55	5.80	4.95	6.70	5.25	9.90	4.85	10.05	5.25	9.90	9.35
Nakaha	KEWALPURWA	DWLR	R	4.75	3.40	4.90	3.35	5.10	3.50	2.15	3.30	4.00	3.40	1.51	2.52
Nakaha	B.D.O.Office	DWLR	R	-	-	-	-	-	-	-	-	3.30	2.00	0.44	1.42
Nighasan	DHARMAPUR	Piezometer	R	5.70	2.16	5.87	2.65	6.35	2.80	5.70	2.90	5.65	3.00	5.85	2.90
Nighasan	SIGARI CITY	Piezometer	R	3.85	2.65	4.07	3.60	4.95	3.60	5.05	3.90	5.15	3.75	5.45	3.65
Nighasan	LUDHAURI	Piezometer	R	4.10	2.85	4.25	2.95	4.45	3.20	4.15	3.35	4.25	2.95	4.35	2.45
Paliya	DUDHWA	Well	R	5.20	4.65	5.35	4.50	5.50	4.80	5.20	4.40	5.10	3.10	4.25	3.20
Paliya	GIRDHARPUR	Well	R	-	-	4.45	3.15	4.80	3.40	4.55	3.10	4.65	2.95	4.75	3.15
Paliya	KAJARIA	Well	R	4.90	3.65	5.15	3.80	5.25	3.90	4.95	3.50	5.05	3.45	5.10	3.65
Paliya	MAJHGAI	Well	R	3.80	2.05	3.95	2.65	4.05	2.75	3.90	2.60	3.95	2.50	4.05	3.60
Paliya	PALIYA KALAN	Well	R	3.30	2.05	3.45	2.25	3.65	2.45	3.55	2.40	3.50	2.30	3.60	3.00
Paliya	SAPURNA NAGAR	Well	R	3.40	2.43	3.55	2.45	3.95	2.65	3.65	2.40	3.69	2.25	3.85	2.90
Pallya	PANCH PEDA	Piezometer	R	3.55	2.55	3.67	2.65	3.85	2.80	3.50	2.60	3.58	2.55	3.65	2.85
Paliya	PV CHANDANPUR Chowki	Piezometer	R	3.30	2.65	3.55	2.75	3.65	2.90	3.60	2.70	3.65	2.60	3.70	3.10
Pallya	NAGALA	Piezometer	R	3.15	2.20	3.37	2.45	3.85	2.60	3.65	2.45	3.76	2.40	3.83	2.85
Pasgawan	MAIGALGANJ	Piezometer	R	-	-	-	-	-	-	10.50	3.55	10.65	3.65	10.50	10.40
Pasgawan	Sisaura Nasir	Piezometer	R	6.35	3.25	6.60	3.35	6.85	3.45	6.50	3.30	-	-	-	
Pasgawan	AURANGABAD	Piezometer	R	6.10	3.60	6.35	3.65	6.55	3.80	10.25	3.60	10.45	3.85	10.30	10.30
Pasgawan	BANKA GAON	DWLR	R	-	-	-	-	-	-	-	3.60	6.90	4.30	-	
Phoolbehar	SUNDARBAL	Piezometer	R	3.65	2.05	3.73	2.95	3.85	3.15	2.95	2.90	3.05	2.80	3.35	2.80
Phoolbehar	MUDIYA KHURD	Piezometer	R	3.75	1.65	3.88	2.50	3.95	2.65	3.50	2.55	3.65	2.35	3.73	3.05
Phoolbehar	GAURA	Piezometer	R	3.35	2.70	3.18	2.35	3.50	2.55	3.20	2.40	3.35	2.05	3.43	2.95
Phoolbehar	PIPRAWAN	Piezometer	R	3.25	1.68	3.47	2.30	4.35	2.50	4.00	2.60	4.15	2.55	4.20	3.00
Ramaiyabehar	PARAURI	Well	R	4.90	1.85	4.95	2.10	5.15	2.35	4.50	2.05	4.65	1.80	4.70	2.40
Ramaiyabehar	MAGHAR	Well	R	3.90	1.95	4.05	2.05	4.35	2.30	4.10	1.95	4.17	1.85	4.30	2.30