



BATANGAS STATE UNIVERSITY

The National Engineering University

CAN'T SPELL EXTRACT WITHOUT CARE: DEEP WELLS IN BATSTATEU-TNEU PB

Deep well extraction can be sustainable if implemented with careful planning, monitoring, and management. As propelled by that notable principle, **Batangas State University-The National Engineering University Pablo Borbon** considered sustainability measures in the installation of its own deep wells in the vicinity as its main water supply source to sprinkle the most of the institution's daily need for potable water.

Two (2) operational deepwells are hereby drilled in the campus under the national and local regulations governing water use such as the **Presidential Decree No. 1067** or the **Water Code of the Philippines** to conform with the **Target 6.4** and **Target 6.6** of the **Sustainable Development Goal No. 6: Clean Water and Sanitation** which focuses on the enhancement of the efficiency of sustainable water use and protection and restoration of water-related ecosystems such as aquifers, wetlands, rivers and lakes.

1.06 Lps

MAXIMUM DISCHARGE



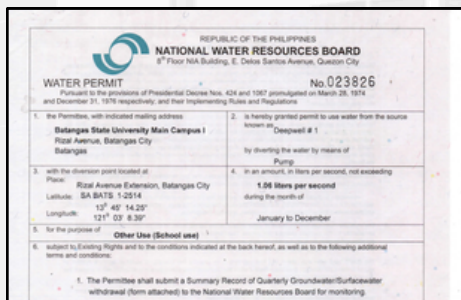
SDG ADDRESSED



DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES
NATIONAL WATER RESOURCES BOARD
WATER PERMITS



Herewith, the aforementioned regulation ensures that no wells are drilled without undertaking legal process such as securing a **registration permit first** and the drilling must be overseen by a **duly licensed well driller** which is assured by the university. In relation to that, this compliance is consolidated by the **National Water Resources Board (NWRB)** as the BatStateU-TNEU Pablo Borbon gets its approved water permits numbered **023826** and **023827** on **July 27, 2016** as shown in Figures 1 and 2.



Figures 3 and 4 **displays** the **two registered deepwells** in the vicinity of BatStateU-TNEU-PB wherein the **Deepwell No. 1** is situated beside the General Services Office (GSO) Building and **Deepwell No. 2** is located at the back of the covered court which both complied with the maximum discharge of **1.06 Lps** granted by the NWRB for environmental protection purposes to also adhere with the **Department of Natural and Environmental Resources (DENR) Administrative Order No. 30, Series of 2003** which focuses on the protection of groundwater resources.



Water Meter of Deep Well No. 1 and Deep Well No. 2 (from left to right)

Source: Environmental Management Unit - PB

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SUSTAINABLE PRACTICES OF DEEPWELL WATER EXTRACTION

Meanwhile, in terms of the presence of **advance technology** in the system, each mentioned deepwells utilize sustainable water extraction technologies as it diverts water by means of **energy-efficient pumps** that uses centrifugal force to deliver water upwards wherein those mentioned deepwells tapped into **four (4) overhead water tanks** and **one (1) elevated water tank**, respectively in order to minimize the use of energy thru utilizing *natural gravity flow*. Also, each system also has **water treatment systems** in order to ensure *water potability* which is certified by conduction of regular water testing procedures as administered by a Department of Health (DOH) accredited laboratory.



Inspection of Deep Well No. 1 and Deep Well No. 2 by NWRB (from left to right)



Furthermore, when it comes to compliance and maintenance of this well, the **National Water Resources Board (NWRB)** recently conducted an **inspection visit** on the two registered deepwells to ensure that its water meters and other components are functioning properly and calibrated to assure that water is extracted accordingly and the amount are recorded properly as shown in the report of consumption that they must submit quarterly (see Figure 4. and Figure 5.)



Aside from those mentioned permits and regulations that are being complied by the **BatStateU-TNEU - Pablo Borbon**, the institution also obtained an **Environmental Compliance Certificate (ECC)** under the reference number of **ECC-R4A-2021-08-0169** as it fulfills the mandatory requirements included in the **PD 1586** or the **Philippine Environmental Impact Statement System**, especially in the installation of deep wells which certifies that this project in all aspects did not cause any significant negative impact on the environment.

On the other hand, the university also promotes sustainable water management as they advocates water conservation as the **Environmental Management Unit-Pablo Borbon (EMU-PB)** drafted resolutions on monitoring and ensuring the proper use of water faucets in the vicinity such as turning it off when not in use and the installation of water closets and urinals that **consumes less water** as the university also has a Sewage Treatment Plant.

Overall, this compliance with the regulatory standards while considering sustainability is a proof that **Batangas State University- The National Engineering University Pablo Borbon Campus** is one of the universities in the world that promotes **sustainability** as they advocate responsible usage and preservation of one of the most important and used resources in the world--the **water**.

Source: Environmental Management Unit - PB



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TECHNOLOGY TRANSFERS



Design and Development of Groundwater Treatment System for Arsenic Removal

February 15, 2023

The project staff led the actual training and presentation. Everything that needed to be known about the groundwater treatment system was covered in detail, including how it operates, how long it will last, and what should and shouldn't be done when maintaining the system. To completely comprehend the groundwater treatment system, a question-and-answer phase was also completed. The recipients were then handed the operations and maintenance manual and the record logbook, which contained the pertinent information and dates for both the system and its component parts.



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SOLAR MOBILE IRRIGATION SYSTEM DEPLOYED IN LOBO, BATANGAS: A SUSTAINABLE APPROACH TO WATER EXTRACTION

A solar-powered irrigation system was delivered to beneficiaries in Brgy. Olo-olo, Lobo, Batangas, through a partnership between the Lobo Municipal Agriculture Office, the Lobo Irrigation Services Association, and Batangas State University (BatStateU). Created and deployed by BatStateU's Electronic Systems Research Center (ESRC), this system addresses the critical need for irrigation facilities in the aftermath of Typhoon Salome in 2017, which had left the area without reliable water access. The system's prototype can produce 4.5 cubic meters of water per hour, offering a sustainable and effective solution for the community's agricultural needs.



Part of the continuous development of the technology is the modification of its design to enhance its performance further. This version utilizes the same pump and power circuit as the prototype. However, a battery had been included in the new setup to allow for irrigation even during the dark.

The entire solar panel deployment mechanism was also changed; in the prototype, easel-like panel stands had to be manually unfolded one by one by the user. On the contrary, this version employs two hand-operated winches and pulley mechanisms to easily unfold and fold the panels.



Funded by the Department of Science and Technology, the PHP 810,350.40 project incorporates a stainless steel submersible pump powered by six 100W solar panels and a linear current booster circuit, which enables the system to operate without batteries. This battery-free design enhances portability and reduces the overall weight. Additionally, the system's components, including six adjustable easel-like stands for the solar panels, are easily transported in a custom cart, maximizing convenience and accessibility for the beneficiaries.

Source: Environmental Management Units

