



for the period 06.12.2021 to 05.11.2023

FASILATE UWIMPAYE

the doctoral student at PUT Doctoral School / doktorant Szkoły Doktorskiej PP

discipline of science / dyscyplina naukowa:

environmental engineering, mining and energy / inżynieria środowiska, górnictwo i energetyka

The result of assessment / Wynik oceny

Positive / Pozytywna*	Negative / Negatywna*
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Justification / Uzasadnienie

The work submitted for mid-term evaluation entitled. "Infiltration (bank filtration) as a pre-treatment formembrane filtration for surface water treatment" fits into the scope of environmental engineering, mining and energy dyscyplina. Itcovers important issues related to the process of water treatment using infiltration and membrane processes. According to the presented Gant's diagram presenting the research schedule, the doctoral student completed the research objectives scheduled for the period 01.10.2021-30.09.2023, that is, a literature review on infiltration and membrane filtration. She conducted an analysis of the variability of macro and micropollutant content in water at the intake site and after the treatment process, as well as a microbiological analysis of water taken from the Warta River in 2018-2023. The purpose of these analyses was to propose the selection of a membrane for the water treatment process. She also analyzed hydrogeological parameters in the experimental plot to determine the rate of the infiltration process and the retention time of water in the ground. The PhD student also evaluated the effectiveness of the artificial infiltration process in terms of removing macro- and micropollutants from surface water (intake from the Warta River) in order to develop further research methodology. Currently, the doctoral student is testing the effectiveness of membrane filtration (micro and ultrafiltration) in removing organic substances as part of laboratory research. The main objective of the dissertation is to develop a technological treatment process for the surface water using the infiltration in the ground (infiltration pond) and the application of membrane methods. After the treatment process, the water is expected to meet the requirements of drinking water in accordance with the Regulation on the quality of water for human consumption (Journal of Laws of 2017, item 2294).

The student has excelled in this task and is ready to proceed with the next set of research goals. The presented research schedule for two years is very comprehensive. In the reviewer's opinion, the presented scope of further research is consistent with the Individual Research Plan. The student should complete the demonstrated research within the assumed timeframe.

According to the Individual Research Plan, three research hypotheses were presented:

1. The artificial infiltration at the surface water treatment might serve as a highly effective pre-treatment process for membrane filtration leading to improved membrane filtration parameters in terms of long-term effective performance, fouling and scaling reduction as well as saving, high-quality water production.
2. It is possible to optimize the membrane performance by reducing both reversible and irreversible membrane fouling by increasing the efficiency of pre-treatment.

* delete as appropriate / niepotrzebne skreślić

3. The combination of two processes: artificial infiltration and membrane filtration are the main constituents of a highly effective and robust water treatment system eliminating the macro and micropollutants from water treated for human consumption.


According to the reviewer, the first two research hypotheses have already been proven, while field and laboratory tests still need to be performed to prove the rest.

Conclusion:

Kommission evaluate positively the Individual Research Plan of Ms. Fasilate Uwimpaye's doctoral dissertation. The scope of the research is interesting and deals with current issues related to water management.

On behalf of the Commission / Za Komisje

.....08.11.2023.....
Date


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Legible signature of Head of Commission