AJEMA GLOBAL RESEARCH NETWORK

AMERICAN Journal of Engineering, Mechanics and Architecture
Volume 01, Issue 04, 2023 ISSN (E): 2993-2637

THE ANALYSIS OF WASTEWATER FROM CAR WASHING STATIONS AND ITS IMPACT ON THE ENVIRONMENT

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Annotation: The main pollutants in the wastewater after the plant are mainly suspended solids, surfactants and petroleum products. Given that the latter are substances that are difficult to oxidase in municipal sewage treatment plants, there is a need to treat the polluted water directly at the plant itself before discharge to the municipal sewage system. This article deals with the analysis of wastewater from car wash stations and its impact on the environment.

Keywords: wastewater treatment, suspended solids, surfactants, petroleum products, car wash machine station.

Nowadays, one of the current environmental problems in the city is related to the development of small industrial enterprises and their increasing contribution to pollution. The number of cars owned by individuals in Uzbekistan was 3 million at the beginning of 2021. This is 40% more than in 2015. The number of car companies is steadily increasing and the seemingly insignificant impact from a small local source turns into a severe global problem of stormwater pollution from a large number of the number of car wash companies is growing steadily.

Car washes are the source of 80-85% of industrial wastewater from the automotive industry. The water legislation prohibits the discharge of untreated rainwater, meltwater and sprinkler water into water bodies formed on the territory of residential areas and sites that may not be discharged into water bodies.

The water balance of the car wash area is formed as a result of the interaction of its constituent indicators, etc, the volume of stormwater runoff, infiltration volume and evaporation values, which affect changes in moisture storage in the watershed.

Wastewater pollution is classified according to its physical state into insoluble, colloidal, soluble and mineral in terms of its composition mineral (clay, mineral salts, sand, acids, alkalis etc.), organic (petrochemicals, surfactants etc.) and (oil products, surfactants, etc.).

Wastewater treatment for oil products, heavy metals and surfactants uses mechanical, physicochemical, chemical and biological methods. The choice of water treatment method in each specific case is determined by the source and nature of pollution, the pollution area, the amount of pollutants, etc. Of mechanical methods, sedimentation, centrifugation and filtration are of practical importance; physical and mechanical - flotation, sorption; chemical - ozonation.

Natural sorbents are the most promising for cleaning wastewater from petroleum products. For a biosorption filter, we choose activated carbon, shungite and sawdust. Carbon present in shungite allows sorbing oil products dissolved in water with the same efficiency as activated carbon.

Characteristics of a car wash as a local source of environmental pollution by wastewater.

Different types of machine washing have a different impact on the environment.

Car washes are divided according to the way in which the vehicles are serviced into Car washes where the car is handled by a car wash attendant. staff and self-service. They are also divided into contact and non-contact carwashes.

In terms of technical performance, there are types such as manual hand washing, gantry washing, tunnel washing, and washing with high-pressure devices. The classification is independent, i.e. gantry and pressure washers can be either contact or non-contact, or even combined, depending on their construction.

The mechanical tools are used to clean the surface of the machine in a contact wash. The advantage of contact washing is that all kinds of detergents can be used, or in the case of low levels of soiling only water can be used. The main pollutants used in this type of wash are surfactants because it assumes a high foaming capacity of the detergents to not damage the surface of the vehicle body and simplifies the process of removing the dirt, to ensure hand protection. From an environmental point of view, it is not a good wash choice as it requires a lot of water and washes away the car's paintwork. Paintwork materials are highly toxic because their composition is multi-component. It usually contains stabilizers, dyes, film-forming components, and hardeners; there are also heavy metals, which in their turn have a toxic impact.

Washing station water analysis

№	Determinable Indicators	Units of measurement	Hygiene normative	Results of the study
1	Colour	Degree	20	15±25
2	Turbidity	EFM	2.6	1.6
3	Hydrogen indicator	pH	6.0-9.0	7.2±0.2
4	Stiffness	Mg/l	7.0	5.3±0.8
5	SURFACTANT	Mg/l	0.5	5
6	Oil products	Mg/l	0.1	20

The results of the conducted analyses showed that the concentration of water pollutants does not comply with sanitary norms. At the same time, of all pollutants formed during vehicle maintenance and washing, the most hazardous in wastewater pollution are suspended solids and oil products[1].

The ingress of oil and its components into the environment causes changes in the physical chemical and biological properties and characteristics of the natural environment and disrupts natural biochemical processes. Any of the classes of petroleum products can become harmful impurity that contaminates water.

Heavy metals are chemical elements with a high density and an atomic weight greater than 50. This group includes Pb, Sn, Cd, Hg, Cr, Si, Zn, Ni, V, Co, Mo, etc. Sometimes metalloid elements As, Sb, Se, and Te not related to metals are included. Of the pollutant metals Hg, Pb, Sb, Se, T, etc. are given priority. Hg, Pb, Cd, Sn, Si, Mo, Cr, Ni, Co, Mn.

As a result of human economic activity, heavy metals enter the environment in quantities comparable to those of metals that take part in natural cycling processes, resulting in pollution. The most significant sources of environmental pollution are ore regions, industrial effluents and gases, wear and corrosion of equipment, and transport.

In conclusion, it can be noted that wastewater from car washing stations contains such pollutants as surfactants, oil products and heavy metals, which in turn have a detrimental effect on the environment. Efficient and inexpensive wastewater treatment with subsequent reuse in car washes is one of the priorities in the protection of the environment and water resources.

List of literature

1. Kutmina S.V., Zabolotskikh V.V., "Development of a local oil-contaminated wastewater treatment system for small car enterprises on the example of a car wash"/ Togliatti 2016/ 98 p.
2. Murtazayev, F. A., and M. Mirzayev. "ANALYSIS OF WASTEWATER AERATION METHODS IN AERATION TANKS." *Journal of new century innovations* 17.2 (2022): 136-141.
3. Kulsky, L. A., O. P. Smirnov, and K. A. Yakubov. "Determination of an optimum coagulant dose with the phase-dispersed state of impurities." *KHIM. & TEKH. VODY*. 5.2 (1983): 258-261.