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### Original Research Article

## Assessment of the Total Petroleum Hydrocarbons and Heavy Metal Concentrations in Soils around Car Washing Stations in Misurata, Libya

Mohamed Elbagerma<sup>1\*</sup>, Mohamed Alkog<sup>1</sup>, Adel Alajtal<sup>1</sup>, and Howell Edwards<sup>2</sup>

<sup>1</sup>Department of Chemistry, Faculty of Science, University of Misurata, Misurata, Libya

<sup>2</sup>Centre for Astrobiology and Extremophile Research, School of Life Sciences, University of Bradford, Bradford  
BD7 1DP, United Kingdom

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### ABSTRACT

Car washing generates a lot of wastewater which flows into our environment through a wastewater network or drains directly into the soil carrying with it contaminants. This study assessed the heavy metal and total petroleum hydrocarbon concentrations in wastewater from car washing stations and the surrounding soils in Misurata city, Libya. Pollution indices, such as the contamination factor (CF) and geoaccumulation index (Igeo), were used to assess the heavy metal and total petroleum hydrocarbon contamination status and ecological risk in the wastewater and soil from car washing stations. The results obtained in this study show that the average pH of the soil samples inside the stations ranged between 6.6 -8.53, while outside the stations the pH ranged from 5.97-8.63 and in sediments 6.8-8.44. The results for the heavy metal contamination studied indicate that the average cadmium concentration in soil samples inside and outside the washing stations ranged from 0.013-0.018 ppm and 0.013-0.25 ppm, respectively, and the average cadmium concentration in sediment samples ranged between 0.05-0.23 ppm. Also, the concentration of lead in soil samples inside and outside the stations and in the sediments ranged from 0.21-0.85, 0.19-1.06 and 0.21- 1.06 ppm, respectively. The total petroleum hydrocarbon concentration levels obtained in this study were between 389-7000 mg/kg for the soil samples inside the stations, whereas in soil samples outside the stations the concentration ranged from 27000-55000 mg/kg. Some environmental indicators were used to determine the environmental status of the particular washing stations studied.

**Keywords:** Total Petroleum Hydrocarbons, Car Washing Stations, Heavy Metals, Misurata- Libya, Index of Geoaccumulation.