

## ***Interactive comment on “Response of soil microorganisms to radioactive oil waste: results from a leaching experiment” by P. Galitskaya et al.***

**Anonymous Referee #5**

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This paper is focused on the impact of oil wastes on the soil microbial community. The authors have used multiple techniques, including metabolic quotient, cellulose activity and microbial community structure analysis, to investigate the influences of oil wastes on the function of soil microorganisms. They found that the pollution of petroleum contaminants and radioactive elements leached from oil disposal caused substantial toxicity, changes in the soil ecological function indexes and community structures. General concerns: 1) Petroleum is very complicated mixture. Specific information about petroleum pollutant composition can be helpful. 2) Although multi-variance statistical analysis has been used, correlation between the index for microbial activity and contamination level is needed to demonstrate the effects of specific pollutants on the soil community. 3) Provided that the focus of the paper is to demonstrate the effects of radioactive oil wastes, more mechanism discussion is helpful for illustrating how the oil

C293

pollutant affect the soil community. For example, how the radionuclides and oil products interact with each other? Are their effects additive? Specific comments: Page 1755 Lines 4-9 Some discussions about the significance of oil products pollution can be helpful. How much soil was contaminated by such pollutants? Page 1756 Lines 23-26: The migration rates were mentioned in the objective, while no relevant analysis and calculation were found in the results. Page 1757 Line 25 How to quantify the total hydrocarbon content from IR analysis? How was standard curve built up given the complicated components? More details need to be given. Page 1758 Lines 9-16 How to separate Ra, Th and K? How were their concentrations determined? Page 1765 Lines 10-13 Is there any correlation between the toxicity data and concentration of pollutants? Page 1766 Lines 1-8 Did authors calculate the fraction of pollutants released to the soil from disposal? Page 1767 Lines 1-12 What is the reason for the differential impacts of petroleum products and radionuclides? Page 1768 Is there any relationship between the structure/community change and the soil functions? More tight connection between different parts of the result need to be addressed. And also for the occurrence of specific strain, is there any culture experiment-based data to support the results from SSCP analysis? Page 1773 Lines 19-21 Too general. Please rephrase this paragraph.

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