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Author: Mr. George Anthony Long
United States, legalparallax@gmail.comTHE OUTER SPACE TREATY AND THE NEED FOR MINIMUM INTERNATIONAL STANDARDS
REGULATING MARTIAN AND LUNAR SETTLEMENTS**Abstract**

Establishing a stable or permanent presence on the Moon and Mars will necessarily confront complex and novel issues involving alien worlds each with its own unique factors. Addressing habitat or settlement related issues should entail compliance with the Space Law Treaty Regime's mandate that the study and exploration of the Moon and Mars should "avoid their harmful contamination."

The Outer Space Treaty does not define the term "harmful contamination." The undefined and unqualified term suggests that "harmful contamination" can apply very broadly to biotic and abiotic contamination. The potential of "harmful contamination" takes on heightened importance since it is now known that water in some form exists on both celestial bodies. This suggests that all resources located on the Moon and/or Mars may not be abiotic. This may be even more so on the Moon because of the Tardigades transported to the lunar surface in 2019. The Tardigades incident raises the possibility that biological contamination already exists on the Moon and greater measures may be necessary to prohibit further contamination and exasperating the existing contamination.

The duty to avoid "harmful contamination" strongly indicates an extensive analysis and evaluation of the potential impact and consequences of any activity that involves the use and consumption of natural resources on the Moon and Mars as well as exposing those alien environments to terrestrial microbes. Such vigilance will necessitate ascertaining and continuously monitoring the potential short and long term effects of: 1) the terrestrial germs and microbes that accompanied humans or machines, 2) generating a human atmosphere, 3) humans exhaling carbon dioxide, 3) growing vegetation from Earth, 4) the disposal of mechanical and other artificial items, the disposal of waste water, and 5) the disposal of human biological waste.

This paper will discuss and examine whether a legal basis exists for requiring international cooperation on adopting minimal standards for establishing and maintaining a continuous human presence on Moon and Mars. Specifically, it will examine whether Outer Space Treaty Article IX's prohibition of "harmful interference" with other space actors can be construed as necessitating the formulation of minimal international standards for Martian and Lunar settlements to avoid "harmful contamination."