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Selenium Contents in Salts from Natural Pan and Mining Areas in the Salar de Uyun", Central Altiplano, Bolivia.

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The Salar of Uyuni located at 3,653 masl in central Bolivian Altiplano covers 10,000 km^2 and is one of the largest salt pans in the world. The present day salt crust at Uyuni is a remnant of paleolake Tauca. The Uyuni salar is drained by lakes Poopó, Uru-Uru , and Desaguadero river in the north where several mineral (zinc, tin, gold, and silver) extractions and processing may introduce high amount of metals such as selenium (Se) into the environment. Selenium is widely distributed in nature, in relatively small concentrations in rocks, plants, coal, and other fossil fuels. The biological function of selenium shows a dual character because the Se content between toxic and deficient concentrations in living organisms is quite narrow. Selenium is unevenly distributed on the surface of the earth and consequently the Se concentration in different geo-ecosystems varies widely, forming seleniferous and Se-deficient geo-ecosystems. This uneven distribution is likely to affect health of both humans and animals through the food chain. Generally, Se in soil is the primary source of Se in human foods. The Se concentration of most drinking waters and

natural waters is < 10 μg ml^{-1}. We believed that both, salt crusts at Salar of Uyuni deposited $>$ 10,000 years ago, and salts formed due to current mining activities may content medium to high levels of Se due to the nature of rock formation in the study area. The main objective of this study is to determine the selenium contents of salts in the Salar of Uyuni. For this purpose, we collected 21 salt samples from pan at Salar of Uyuni (5), mining districts (12), and selected areas close to the basin of Poopó and Uru-Uru lakes (6). Salt samples will be analyzed for total chemical composition including Se using inductively coupled plasma mass spectrometry. Mineral composition of the salts will be identified using X-ray diffraction technique, scanning electron microscopy and Fourier transform infrared spectroscopy. The results will allow help us understand any anthropic introduction of Se into the Salar of Uyuni. We also would like to elucidate the movement of Se in surface waters to lakes and rivers, and its provenance (natural or anthropic). The information will be useful in the establishment of strategy to decrease the levels of toxic soluble Se oxyanions (SeO_4^{2-}, SeO_3^{2-}) and prevent their biaccumulation. Future mitigation techniques may include reduction of toxic Se oxyanions using bacteria that are native to the study area.