Investigating Concentrates of Uranium and Other Hazardous Metals/Metalloids in the Surrounding Environments of Uranium Contaminated Waters on the Navajo Nation

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This Environmental Science project brings to light the real issues the Navajo People face from health concerns to pollution on their sacred lands in a unique and resourceful way. It investigates the chemical contaminants of Uranium and other Heavy Metal/Metalloids in Carbon Rod, Soil, and Stick samples. I chose three sample sites to collect data from based on their proximity to abandoned and active uranium mines, processing's, and disposals. Sample Site-1 was within the Black Mesa Mining District, in Northern Arizona. Sample Site-2 was near the Mexican Hat Uranium Disposal Cell, as well abandoned Monument Valley Uranium Mines, in Northern Arizona. Finally, Sample Site-3 was near the Sunshine Uranium Mine and the White Mesa Uranium Mill, in Utah. Uranium is mined in the form of crystal salts, which are soluble in water. Consequences of Uranium mining include contamination of the Navajo Nation's water supply, resulting in end-stage renal (kidney) disease more than three times the national average. An Oxford ED-2000 bulk X-Ray Fluorescence machine using Geologic Majors + Traces software identified 10 major metal and metalloid analytes from the 3 sample sites, as measured in weight percent for high concentrations and parts per million for trace concentrations. Highly toxic Arsenic, Mercury, Lead, Cobalt; less toxic Barium, Bismuth; as well as radioactive Uranium and Thorium were detected. Many of which surpassed thousand times more the Environmental Protection Agency's Maximum Contaminant Level.

Awards Won:
Fourth Award of $500
University of Arizona: Renewal Tuition Scholarship
Arizona State University: Arizona State University ISEF Scholarship (valued at up to $58,000 each)