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Advanced Systems for Air and Water Quality Monitoring in Long Duration Human Flight[1]

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Any space mission involving extended astronaut travel time must have an accompanying system for monitoring the quality of the onboard air and water. These systems must not only meet the detection criteria for undesirable species, at the detection limits set by NASA and the National Academy of Sciences. They must also meet generic requirements such as having low mass, volume, and power; requiring minimal astronaut assistance, and having minimal need for consumables. We will briefly review the criteria for acceptable air and water contamination levels. We will then review the monitoring methods presently in use, and those being developed. These methods include, for example, GCMS, ion mobility spectrometry, the "electronic nose," infrared absorption, and solid phase extraction with colorimetry.

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[2]This work was carried out in collaboration with Murray R. Darrach