NASA Advisory Council Recommendation

Resource Exploration
2022-02-04

Name of Committee:	Human Exploration and Operations Committee
Chair of Committee:	Mr. Wayne Hale
Date of Council Public Deliberation:	August 10, 2022
Short Title of Recommendation:	Resource Exploration

Recommendation:
NASA should establish organizational responsibility and a plan for lunar resource exploration (prospecting), with priority given to lunar polar ice deposits.

Major Reasons for the Recommendation:
Aside from a single proof of concept mission, Viper, there is no plan for identifying and characterizing the ice deposits at the poles of the Moon as Reserves to be utilized by processing the ice into rocket propellant. An economically viable source of propellant on the Moon will significantly lower the cost of a sustained lunar presence and enable missions to Mars.

Consequences of No Action on the Recommendation:
Forgoing or delaying the development of lunar water ice resources entails an enormous opportunity cost. A sustained lunar presence and human missions to Mars may not be feasible if all propellant must be brought from Earth.

NASA Response:
NASA concurs that a plan for lunar resource exploration prospecting is a priority and organizational responsibilities are being established. The Science Mission Directorate (SMD), Space Technology Mission Directorate (STMD), and Exploration Systems Development Mission Directorate (ESDMD) are collectively working the science, technology, and mission planning for resource prospecting of the lunar south pole.

SMD's Volatiles Investigating Polar Exploration Rover (VIPER) mission is an important first step in mapping the distribution and concentration of resources near the lunar South Pole. STMD's In-Situ Resource Utilization (ISRU) pilot plant will demonstrate a scalable end-to-end ability to extract and use lunar resources. These two missions, from concept development through flight and implementation will continue to inform options for longer-term prospecting in the lunar architecture.