APPENDIX A
GLOSSARY OF TERMS

99th percentile—An expression of an outcome that would not occur in more than 1 percent of all statistical samples (that is, 1 percent of the outcomes would be greater than the 99th percentile level); the 99th percentile is derived from the distribution of outcomes on which the mean value is based.

accident environment—Conditions resulting from an accident, such as blast overpressure, fragments, and fire.

affected environment—A description of the existing environment that could be affected by the Proposed Action or its alternatives.

ambient air—The surrounding atmosphere, usually the outside air, as it exists around people, plants, and structures. (It is not the air in the immediate proximity of an emission source.)

astrobiology—The science that studies the question of whether life exists on other planets and encompasses the study of the origin, evolution, distribution, and future of life in the universe.

Atlas—A family of launch vehicles originally developed by the Lockheed Martin Space Systems Company and currently manufactured by the United Launch Alliance, a joint venture between Lockheed Martin and The Boeing Company.

attainment—An area is designated as being in attainment by the U.S. Environmental Protection Agency if it meets the National Ambient Air Quality Standards (NAAQS) for a given criteria pollutant. Non-attainment areas are areas in which any one of the NAAQS have been exceeded, maintenance areas are areas previously designated non-attainment and subsequently re-designated as attainment, and unclassifiable areas are areas that cannot be classified on the basis of available information as meeting or not meeting the NAAQS for any one criteria pollutant.

background radiation—Ionizing radiation present in the environment from cosmic rays, natural sources in the Earth, and artificial sources; background radiation varies considerably with location.

biosignature—Any substance that provides evidence of past or present life. A biosignature may be an element, molecule, or any observable occurrence that provides signs of life.

chromatography—A method of determining the chemical composition of a substance by passing a gas or liquid over a solid or gel and using the different adsorption characteristics between the substance and solid to separate the chemicals in the substance being examined.

conditional probability—Within the context of this Environmental Impact Statement (EIS), the probability that a release of radioactive material could occur given an initiating accident (that is, the accident has occurred).

confidence level—In statistics, the degree of desired trust or assurance in a given result. A confidence level is always associated with some assertion and measures the probability that a given assertion is true.

criteria pollutants—The Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to set air quality standards for common and widespread pollutants after preparing criteria documents summarizing scientific knowledge on their health effects. Currently, there are standards in effect for six criteria pollutants: sulfur dioxide, carbon monoxide (CO), particulate matter equal to or less than 10 microns in diameter (PM_{10}), nitrogen dioxide, ozone, and lead.

cultural resources—The prehistoric and historic districts, sites, buildings, objects, or any other physical activity considered important to a culture, subculture, or a community for scientific, traditional, religious, or any other reason.

cumulative impact—The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes other such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

curie (Ci)—A measure of the radioactivity level of a substance (that is, the number of unstable nuclei that are undergoing transformation in the process of radioactivity decay); one curie equals the disintegration of 3.7×10^{10} (37 billion) nuclei per second and is equal to the radioactivity of one gram of radium-226.

decibel (dB)—A logarithmic measurement unit that describes a particular sound pressure level compared to a standard reference value. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB. A-weighted decibels (dBA) refer to measured decibels whose frequencies have been adjusted to correspond to the highest sensitivity of human hearing, which is typically in the frequency range of 1,000 to 4,000 hertz.

Delta—A family of space launch vehicles originally developed by The Boeing Company and currently manufactured by United Launch Alliance, a joint venture between Lockheed Martin and The Boeing Company.

derived intervention level (DIL)—Guidance levels for radionuclide activity concentration in food established by the U.S. Food and Drug Administration to determine whether food in interstate commerce or offered for import presents a safety concern.

dose—The amount of energy deposited in the body by ionizing radiation per unit body mass.

essential fish habitat—The United States Congress defined essential fish habitat for federally managed fish species as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)). The conservation of essential fish habitat is an important component of building and maintaining sustainable fisheries.

exposure to radiation—The incidence of radiation from either external or internal sources on living or inanimate material by accident or intent.

Falcon—A family of space launch vehicles manufactured by SpaceX.

first stage—The launch vehicle stage that provides thrust at lift-off.

full stack intact impact (FSII)—For the purpose of this Environmental Impact Statement, a postulated accident in which the entire launch vehicle (that is, all stages, other vehicle elements, and the payload) impacts the ground in an intact configuration due to a failure at or very shortly after lift-off.

General Conformity Rule—The General Conformity Rule is applicable to non-attainment or maintenance areas (see **attainment**) as designated by the EPA, and ensures that federal actions conform to each State Implementation Plan for air quality. These plans, approved by the EPA, are each State's individual plan to achieve the NAAQS as required by the Clean Air Act. The EPA is required to promulgate a Federal Implementation Plan if a state defaults on its implementation plan. A conformity requirement determination for the action is made from influencing factors, including, but not limited to, non-attainment or maintenance status of the area, types of emissions and emission levels resulting from the action, and local impacts on air quality.

General Purpose Heat Source (GPHS)—A passive device that produces heat from the radioactive decay of plutonium (in a ceramic form of plutonium dioxide consisting mostly of plutonium-238, a non-weapons grade isotope). This heat can then be converted into usable electrical power.

geology—The study or science of the Earth (or any solid celestial body), its history, and its life as recorded in the rocks.

health effects—Within the context of this EIS, health effects are defined as the number of additional latent cancer fatalities due to a radioactive release (that is, the number of cancer fatalities resulting from this release that are in excess of those cancer fatalities which the general population would normally experience from other causes).

hydrazine—A toxic, colorless liquid fuel that is hypergolic (able to burn spontaneously on contact) when mixed with an oxidizer such as nitrogen tetroxide (N_2O_4) or placed in contact with a catalyst. Vapors may form explosive mixtures with air.

initiating probability—The probability that an identified accident and associated adverse conditions (accident environments) will occur.

ionosphere—An upper atmospheric region where ionization of atmospheric gases occurs.

isotope—Any of two or more species of atoms of a chemical element with the same atomic number and nearly identical chemical behavior, but with different atomic mass (due to different number of neutrons) or mass number and different nuclear properties.

latent cancer fatalities—Estimation of latent cancer fatalities assumes that 1) exposures to the radioactive material released to the environment occur over a 50-year period, and 2) the internal dose resulting from such exposure are 50-year committed doses, meaning that following inhalation or ingestion of the radioactive material, the resulting internal doses are based on tracking the material in the body for a 50-year period. The time period over which latent cancer fatalities occur is undefined, and could occur well after 50 years following the release.

launch azimuth—The initial angle, measured clockwise from North, which a launch vehicle takes as it begins to ascend.

Light Weight Radioisotope Heater Unit (LWRHU)— A radioactive heat source that provides heat for temperature-sensitive spacecraft components. Each LWRHU provides about one (1) watt of heat derived from the radioactive decay of about 2.7 grams (0.1 ounce) of plutonium dioxide, having approximately 33.2 curies of activity.

mass spectrometry—An analytical technique for the identification of the chemical composition of a substance. Using an electrical or magnetic field the mass spectrometer creates gaseous ions from the substance being examined and sorts and identifies the ions.

maximally exposed individual (MEI)—A hypothetical person that would receive the maximum predicted dose following an accident with a release of radioactive material.

mean—The outcome (source term, dose, health effects, or land contamination as used in this EIS) that would be anticipated if an accident which released radioactive material were to occur; the mean is a statistical expression of probability-weighted values (source terms or radiological consequences).

Multi-Mission Radioisotope Thermoelectric Generator (MMRTG)—An evolutionary power source derived from the GPHS-RTG that converts the heat from the radioactive decay of plutonium (in a ceramic form of plutonium dioxide consisting mostly of plutonium-238, a non-weapons grade isotope) contained in eight GPHS modules into usable electrical energy.

National Ambient Air Quality Standards (NAAQS)—Section 109 of the Clean Air Act requires the EPA to set nationwide standards—the NAAQS—for widespread air pollutants. Currently, six pollutants are regulated by primary and secondary NAAQS (see criteria pollutants).

nominal—In the context of this EIS, default, typical, or planned conditions or operations; functioning normally or acceptably.

oxides of nitrogen (NOx)—Gases formed primarily by fuel combustion, which contribute to the formation of acid rain. Hydrocarbons and oxides of nitrogen combine in the presence of sunlight to form ozone, a major constituent of smog.

parking orbit—A temporary low-altitude Earth orbit in which a spacecraft with its second or third launch vehicle stage waits until it is in the proper position to continue toward its next or final destination.

payload—The element(s) that a launch vehicle or spacecraft carries over and above what is necessary for the operation of the vehicle. For a launch vehicle, the spacecraft being launched is the payload; for a scientific spacecraft, the suite of science instruments is the payload.

payload fairing (PLF)—The protective shell on a launch vehicle that encapsulates the spacecraft through atmospheric ascent.

Prebiotic—occurring or existing before the development of life

pyrolitic graphite— A man-made form of graphite, created by heating graphite and allowing it to cool into a crystalline form. This type of graphite has enhanced thermal conduction properties compared to ordinary graphite.

radiation—The emitted particles (alpha, beta, neutrons) or photons (x-rays, gamma rays) from the nuclei of unstable (radioactive) atoms as a result of radioactive decay. Some elements are naturally radioactive; others are induced to become radioactive by bombardment in a nuclear reactor or other particle accelerator. The characteristics of naturally occurring radiation are indistinguishable from those of induced radiation.

radiation dose—The amount of energy from ionizing radiation deposited within tissues of the body; it is a time-integrated measure of potential damage to tissues from exposure to radiation and, as such, is related to health-based consequences.

radioactive half-life—The time required for one half of the atoms in a radioactive isotope to decay.

rem—The unit dose representing the amount of ionizing radiation needed to produce the same biological effects as one roentgen of high-penetration x-rays (about 200,000 electron volts). The biological effects of 1 rem are presumed to be independent of the type of radiation.

risk—Within the context of this EIS, risk is defined as the expectation of health effects in a statistical sense (that is, the product of total probability times the mean health effects resulting from a release of plutonium dioxide, and then summed over all conditions leading to a release).

second stage—The launch vehicle stage that continues to provide thrust during ascent after the vehicle's first stage has depleted its propellant and been jettisoned.

solar longitude (of Mars)—The apparent longitude of the sun seen on a celestial sphere whose equator is defined by the plane of Mars' orbit about the sun. The transition from winter to spring in the northern hemisphere on Mars defines zero degrees solar longitude.

source term—Typically the quantities of materials released during an accident to air or water pathways and the characteristics of the releases (for example, particle size distribution); used for determining accident consequences. The DOE Nuclear Risk Assessment identifies the quantities of material released that can become airborne as the source term.

spectrometer—A device used to identify the chemical composition of a substance. The mass spectrometer uses an electrical or magnetic field to create gaseous ions from the substance being examined and sorts and identifies the ions.

Strategic Knowledge Gap—Gaps in knowledge or information required to reduce risk, increase effectiveness, and improve the design of robotic and human space exploration missions.

stratosphere—An upper portion of the atmosphere above the troposphere reaching a maximum height of 50 kilometers (31 miles) above the Earth's surface. The temperature is relatively constant in the lower stratosphere and gradually increases with altitude. The stratosphere is the Earth's main ozone producing region.

take—To pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect (50 CFR 10.12).

tropopause—The boundary between the troposphere and stratosphere, usually characterized by an abrupt change of lapse rate; the change is in the direction of increased atmospheric stability from regions below to regions above the tropopause; its height varies from 15 kilometers (9 miles) in the tropics to about 10 kilometers (6 miles) in polar regions.

troposphere—The portion of the atmosphere next to the Earth's surface in which the temperature rapidly decreases with altitude, clouds form, and convection is active. The troposphere begins at ground level and extends to an altitude of 10 to 12 kilometers (6 to 8 miles) above the Earth's surface.

unavoidable adverse effects—Effects that cannot be avoided due to constraints in alternatives. These effects must be disclosed, discussed and mitigated, if practicable.