APPENDIX A

GLOSSARY OF TERMS

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APPENDIX A

GLOSSARY OF TERMS

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

accident initial condition—First launch vehicle system-level event that results in a catastrophic accident.

aeroshell—The protective shell that encapsulates a spacecraft intended to enter a planet's atmosphere.

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

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 the emission source.)

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

backshell—The protective shell on the back half of a spacecraft aeroshell.

biotic—Of or relating to life; caused or produced by living beings.

conditional probability—Within the context of this document, the probability that a release of radioactive material could occur given an initiating accident (*i.e.*, the accident has occurred).

convection—Atmospheric motions that are predominately vertical, resulting in vertical transport and mixing of atmospheric properties.

criteria pollutants—The Clean Air Act required the U.S. Environmental Protection Agency 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, particulate matter equal to or less than 10 microns in diameter, nitrogen dioxide, ozone, and lead.

cruise stage—The system used in the cruise phase of a spacecraft's interplanetary trajectory.

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 (*i.e.*, the number of unstable nuclei that are undergoing transformation in the process of radioactive decay); one curie equals the disintegration of 3.70×10^{10} (37 billion) nuclei per second and is approximately equal to the radioactivity of one gram of radium-226.

decibel (dBA)—A measurement unit that describes a particular sound pressure quantity to a standard reference value (A-weighted).

Delta—A family of launch vehicles manufactured by The Boeing Aerospace Company.

entry vehicle—The spacecraft system that consists of the elements needed to protect a payload during atmospheric entry, and the payload which it encapsulates.

equatorial landing location—A landing site close to the equator (on Mars).

evaporite—A sedimentary rock that originates by evaporation of water in an enclosed basin.

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

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

full stack intact impact (FSII)—For the purpose of this document, a postulated accident scenario in which the entire launch vehicle (*i.e.*, all stages, other elements, and the payload) impacts the ground in an intact configuration due to a malfunction at or very shortly after liftoff.

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

graphite epoxy motor (GEM)—A family of solid rocket motors with graphite-epoxy wound casings containing solid fuel that augment the launch vehicle first stage thrust capabilities.

heatshield (spacecraft)—The forward component of the aeroshell that protects a spacecraft from heat during atmospheric entry.

heatshield (RHU)— The components composed of carbon-graphite fine weave pierced fabric designed to protect a radioisotope heater unit during reentry and to provide mechanical impact protection.

health effects—Within the context of this document, health effects are defined as the number of additional, or excess, latent fatal cancers (above and beyond those that would normally be expected in the exposed population over a 50-year period).

hydrazine (N_2H_4)—A toxic, colorless liquid fuel that is hypergolic (*i.e.*, can burn spontaneously on contact) when mixed with an oxidizer such as nitrogen tetroxide (N_2O_4). Vapors may form explosive mixtures with air.

in situ—From the Latin for *in the original place*; used in planetary exploration to describe those science investigations conducted close to or within the phenomena being observed or measured.

infrared radiation—Electromagnetic radiation of wavelengths that lie in the range from 0.75 micron (the long-wavelength limit of visible red light) to 1,000 microns (the shortest microwaves).

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

interplanetary trajectory—A spacecraft's path around the sun from one planet to another.

isotopes—Forms of the same chemical element that differ only by the number of neutrons in their nucleus. Most elements have more than one naturally occurring isotope. Many isotopes have been produced in reactors and scientific laboratories.

lander—A spacecraft that is designed to land on a planet's surface.

maximally exposed individual—A hypothetical person that would receive the maximum predicted dose.

mean—The outcome (source term; dose; health effects; land contamination) that would be anticipated if an accident were to occur which released radioactive material; the mean is a statistical expression of probability-weighted consequences.

mesosphere—The atmosphere layer between 44-55 kilometers and 80-95 kilometers, extending from the top of the stratosphere to the mesopause; characterized by a temperature change that generally decreases with altitude.

meteorology—The scientific study of atmospheric phenomenon.

micron—A unit of length equal to one-millionth of a meter; also called a micrometer.

mineralogy—The scientific study of minerals, their crystallography, physical and chemical properties, and classification.

morphology—A branch of biology that deals with structure and form of an organism at any state of its life history.

National Ambient Air Quality Standards (NAAQS)—Section 109 of the Clean Air Act requires the U.S. Environmental Protection Agency to set nationwide standards, the NAAQS, for widespread air pollutants. Currently, six pollutants are regulated by primary and secondary NAAQS: carbon monoxide, lead, nitrogen dioxide, ozone, and particulate matter equal to or less than 10 microns in diameter, and sulfur dioxide.

99th percentile case—A statistical expression of an outcome that would occur not more than 1% of the time; the 99th percentile case is derived from the distribution of outcomes on which the mean value is based; *i.e.*, 1% of the outcomes were greater than the 99th percentile level.

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

nitrogen tetroxide (N_2O_4)—A liquid oxidizer that can cause spontaneous ignition with many common materials such as, paper, leather, or wood. It also forms strong acids in combination with water, and contact can cause severe chemical burns. It is a yellow-brown liquid which is easily frozen or vaporized.

offsite—The area outside the property boundaries of Cape Canaveral Air Force Station (CCAFS) and Kennedy Space Center (KSC).

onsite—The area within the property boundaries of CCAFS and KSC.

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.

peak concentration/mean concentration—The peak concentration is the highest reading in a series of samples; the mean concentration is the average of readings in a series of samples over a specified period of time.

radiation—The emitted particles (alpha, beta, neutron) or photons (gamma, X-ray) 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.

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 the atoms in a radioactive substance to decay.

radioisotope heater unit (RHU)—A passive heating device that uses the radioactive decay of plutonium-238 dioxide to produce heat.

Relationship of Short-Term Uses and Long-Term Productivity—The balance or trade-off between short-term uses and long-term productivity need to be defined in relation to the Proposed Action.

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 kilo electron volts (Kev)).

rover—A vehicle that can move freely on a planet's surface.

second stage—The launch vehicle stage that provides thrust during ascent, but not at liftoff.

source term—The quantities of materials released during an accident to air or water pathways and the characteristics of the releases (*e.g.*, particle size distribution, release height and duration); used for determining accident consequences.

sol—One day on a planet other than Earth (*i.e.*, the time it takes the planet to rotate 360º on its polar axis); on Mars, one sol is equal to 24 hours, 37 minutes or 1.026 Earth days.

stratopause—The boundary between the stratosphere and the mesosphere.

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

thermal protection system—A combination of systems that protect a spacecraft from potential heat sources; heatshield.

third stage—The launch vehicle stage that provides the final thrust required to place a launch vehicle's payload into its proper trajectory or orbit.

trajectory—The flight path that a spacecraft will take during a mission.

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 in the tropics to about 10 kilometers 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 above the Earth's surface.

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

upper stage—The launch vehicle stage that provides thrust required to insert a spacecraft into an interplanetary trajectory.

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APPENDIX B

ENVIRONMENTAL JUSTICE ANALYSIS

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APPENDIX B

ENVIRONMENTAL JUSTICE ANALYSIS

B.1 INTRODUCTION

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs Federal agencies to identify and address, as appropriate, the disproportionately high and adverse health or environmental effects of their programs, policies, and activities on minority populations and low-income populations.

The Council on Environmental Quality (CEQ) has oversight responsibility for documentation prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321 *et seq.*). In December 1997, the CEQ released its guidance on environmental justice (CEQ 1997). The CEQ's guidance was adopted as the basis for the information provided in this Draft Environmental Impact Statement (DEIS).

This appendix provides data necessary to assess the potential for disproportionately high and adverse human health or environmental effects that may be associated with implementation of the Mars Exploration Rover–2003 (MER–2003) project. The potentially affected area examined in this DEIS is encompassed by a circle of 100 kilometers (km) (62 miles (mi)) radius centered at the launch site at Cape Canaveral Air Force Station (CCAFS), Florida.

B.2 DEFINITIONS AND APPROACH

B.2.1 Minority Populations

During the Census of 2000, the U.S. Bureau of the Census (USBC) collected population data in compliance with guidance adopted by the Office of Management and Budget (OMB) (62 FR 58782-58790). The OMB published its guidelines on aggregation of multiple race data in March 2000 (OMB 2000). Modifications to the definitions of minority individuals in the CEQ's original definition were made in this analysis to comply with the OMB's guidelines issued in March 2000. The following definitions of minority individuals and population are used in this analysis of environmental justice:

Minority Individuals: Persons who are members of any of the following population groups: Hispanic or Latino of any race, American Indian or Alaska Native, Asian, Black or African-American, Native Hawaiian or Other Pacific Islander, or Multiracial (and at least one race which is a minority race under CEQ guidance (CEQ 1997)).

Minority Population: The total number of minority individuals residing within a potentially affected area.

Persons self-designated as Hispanic or Latino are included in the Hispanic or Latino population regardless of race. For example, Asians self-designated as Hispanic or Latino are included in the Hispanic or Latino population and not in the Asian Population.

Data used to characterize minority populations in the year 2000 were extracted from Table P4 of Standard File 3 published by the USBC on their Internet web site (www.census.gov). Data used for the projection of minority populations in Florida for the year 2003 were extracted from the USBC's Internet web site at:

http://www.census.gov/population/www/projections/stproj.html

Since projections using Census 2000 data are not yet available, 1990 Census data and the USBC's projections following the 1990 Census were used to project population data to the year 2003.

B.2.2 Low-Income Populations

Poverty thresholds are used to identify "low-income" individuals and populations (CEQ 1997). The following definitions of low-income individuals and population are used in this analysis:

Low-Income Individuals: Persons whose self-reported income is less than the poverty threshold.

Low-Income Population: The total number of low-income individuals residing within a potentially affected area.

Low-income data from Census 2000 is scheduled for publication in mid-2002. Therefore, low-income data from the 1990 Census was used in this analysis. These data were extracted from Table P121 of Standard Tape File 3 (DOC 1992).

B.2.3 Disproportionately High And Adverse Human Health Effects

Disproportionately high and adverse health effects are those that are significant (as employed by NEPA at 40 CFR Part 1580 Subpart 1508.27) or above generally accepted norms, and for which the risk of adverse impacts to minority populations or low-income populations appreciably exceeds the risk to the general population.

B.2.4 Disproportionately High And Adverse Environmental Effects

Disproportionately high and adverse environmental effects are those that are significant (as employed by NEPA), and that would adversely impact minority populations or low-income populations appreciably more than the general population.

B.3 METHODOLOGY

B.3.1 Spatial Resolution

For the purposes of enumeration and analysis, the USBC has defined a variety of areal units (DOC 1992). Areal units of concern in this document include (in order of increasing spatial resolution) states, counties, census tracts, block groups, and blocks. The block is the smallest of these entities and offers the finest spatial resolution. This term refers to a relatively small geographical area bounded on all sides by visible features such as streets and streams or by invisible boundaries such as city limits and property lines. During the 1990 census, the USBC subdivided the United States and its territories into 7,017,425 blocks. For comparison, the 1990 census used 3,248

counties, 62,276 census tracts, and 229,192 block groups. In the analysis below, block-level spatial resolution is used in the analysis of minority impacts.

B.3.2 Projections of Populations

Population estimates used in this DEIS were projected to 2003. Projections of the total population for individual states are available from both the USBC and various state agencies (Campbell 1996). The USBC also projects state populations by age, sex, race, and Hispanic origin for the years from 1995 to 2025. In order to project minority populations in potentially affected areas, minority populations determined from the 1990 census data were taken as a baseline. Then it was assumed that percentage changes in the minority population of each block group for a given year (compared to the 1990 baseline data) will be the same as percentage changes in the state minority population projected for the same year. An advantage to this assumption is that the projected populations are obtained with consistent method regardless of the state and associated block group involved in the calculation. A disadvantage is that the method is insensitive to localized demographic changes that could alter projections in a specific area.

The USBC uses the cohort-component method to estimate future populations for each state (Campbell 1996). The set of cohorts is comprised of (1) age groups from 1 year or less to 85 years or more, (2) male and female populations in each age group, and (3) racial and ethnic groups in each age group and sex (Hispanic, Asian, Black, Native American, and White). Components of the population change used in the demographic accounting system are births, deaths, net state-to-state migration, and net international migration. If P(t) denotes the number of individuals in a given cohort at time "t", then:

$$\mathbf{P(t) = P(t_0) + B - D + DIM - DOM + IIM - IOM} \qquad \textbf{(Eq. 1)}$$

where:

$P(t_0)$ = Cohort population at time $t_0 \leq t$ (for this analysis, t_0 denotes the year 1990);

B = Births expected during the period from t_0 to t;

D = Deaths expected during the period from t_0 to t;

DIM = Domestic migration expected into the state during the period from t_0 to t;

DOM = Domestic migration expected out of the state during the period from t_0 to t;

IIM = International migration expected into the state during the period from t_0 to t; and

IOM = International migration expected out of the state during the period from t_0 to t.

Estimated values for the components shown on the right side of Equation 1 are based on past data and various assumptions regarding changes in the rates for birth, mortality, and migration (Campbell 1996). It should be noted that the USBC does not project populations of individuals who identified themselves as "Other Race" (and non-Hispanic). This population group is less than 2% of the total population in each of the states. However, in order to project total populations in the environmental justice analysis, population projections for the "Other Race" group were made under the assumption that the growth rate for the "Other Race" population will be identical to the growth rate for the combined minority and White populations.

B.3.3 Environmental Justice Assessment

The purpose of this analysis is to (1) identify minority populations and low-income populations residing in the area that would be potentially affected by implementation of the Proposed Action or alternatives, and (2) determine if implementation of the Proposed Action or alternatives would result in disproportionately high and adverse effects on these populations. Figure B-1 shows the potentially affected area within a radius of 100 km (62 mi) of the CCAFS launch site in Florida.

B.4 CHARACTERIZATION OF POTENTIALLY AFFECTED POPULATIONS

Figure B-2 shows majority and minority populations residing in the potentially affected area surrounding CCAFS during the decennial census of 2000. For further detail, Figure B-3 shows similar information for majority and minority populations residing within 30 km (19 mi) of the launch site. As indicated in Figure B-2, both the majority and minority populations begin to increase noticeably at the outskirts of the City of Orlando. The City of Merritt Island is the population center closest to the launch site. As seen in Figure B-3, both majority and minority populations show significant increases at the outskirts of Merritt Island. Figures B-4 and B-5 show analogous information for majority and minority populations expressed as a percentage of the total minority and majority populations, respectively. As indicated in Figure B-4, 10% of the minority population in the potentially affected area reside within approximately 50 km (31 mi) of the launch site, while one-half of the minority population resides within 85 km (53 mi) of CCAFS. Figure B-5 presents the same information as Figure B-4 to a finer scale. Less than 5% of the minority population resides within 30 km (19 mi) of the launch facility.

Figures B-6 and B-7 show resident minority populations residing within 100 km (62 mi) and 30 km (19 mi) of the launch facility, respectively. In addition to the minority groups shown in these figures, approximately 1,300 residents in the potentially affected area designated themselves as Native Hawaiian or Other Pacific Islander during the 2000 Census. As indicated in the figures, Hispanic or Latino and Black or African-American American populations comprise most of the minority population residing within the potentially affected area. Figures B-6 and B-7 show that as the distance from the launch facility, Blacks or African-Americans are the most numerous resident minority until approximately the outskirts of the City of Orlando. Due to the relatively large concentration of Hispanics or Latinos in Orlando, Hispanics or Latinos comprise the largest group of minority residents in the potentially affected area. Minorities comprised approximately 29% of the resident population in the potentially affected area in 2000. By the year 2003, it is reasonable to expect that the minority population would exceed 30% of the resident population.

During the 1990 Census, 10.1% of the residents within 100 km (62 mi) of CCAFS reported incomes below the 1990 poverty threshold. By comparison, the corresponding percentage for the State of Florida was 12.6%. Within 20 km (12 mi) about 8% of the population reported income below the 1990 poverty threshold, and within 10 km (6 mi) about 12.5% of the population was below the 1990 threshold.

B.5 IMPACTS ON MINORITY AND LOW-INCOME POPULATIONS

As discussed in Chapter 4 of this DEIS, accidents during the MER–A or MER–B missions could result in human exposure to radioactive and other hazardous materials. Plutonium-238, cobalt-57 and curium-244 are the primary radioactive materials of concern. Potential radiological releases could affect populations residing both within and beyond 100 km (62 mi) of the launch site. As shown in Table 4-7 of Chapter 4, if the Proposed Action were implemented, and if an accidental release of radioactive material were to occur during any mission phase, no latent cancer facilities or other health impacts would be expected to occur. The largest potential radiological consequences estimated to occur during pre-launch and early launch mission phases are 0.16 latent cancer fatality (99th percentile) for the MER–A mission and 0.12 latent cancer fatality (99th percentile) for the MER–B mission. Potential radiological consequences for the later mission phases are less than 0.004 latent cancer fatality for each mission.

Mission risks (consequences that would occur in the event of a radioactive release multiplied by the probability of a release) are also small. As shown in Table 2-4 of Chapter 2, the likelihood of an accident resulting in a release of radioactive material during pre-launch is approximately 1 in 16,000 and no more than approximately 1 in 1,100 during early launch. The corresponding risk to the local population (persons residing within 100 km (62 mi) of the launch facilities at CCAFS) of a latent cancer fatality resulting from an accident in pre-launch or early launch is approximately 1 in 106,000 (see Section 2.4.4.4). The risk to the global population of a latent cancer fatality resulting from an accident during the MER–A and MER–B missions is approximately 1 in 37,000 (see Section 2.4.4.4).

As discussed in Section 4.1.3, non-radiological accidents also pose no significant risks to the public. Prevailing winds during the MER–A and MER–B launch opportunities would generally be from the east and east-southeast (see Section 3.1.2.1). However, toxic effects that could result from a liquid propellant spill during fueling operations would not extend beyond the immediate vicinity of the launch pad. Members of the public are excluded from the area at risk during fueling operations. A fuel explosion on the launch pad or during the first few seconds of flight could temporarily increase carbon monoxide, hydrochloric acid, and aluminum oxide levels near the CCAFS boundary. One-hour average concentrations of hazardous emissions from such an explosion are less than the emergency response guidelines recommended by the American Industrial Hygiene Association and the National Research Council for the Department of Defense.

Thus, implementation of the Proposed Action would pose no significant radiological or non-radiological risks to the public, including minority and low-income groups within the total potentially affected population.

B.6 REFERENCES FOR APPENDIX B

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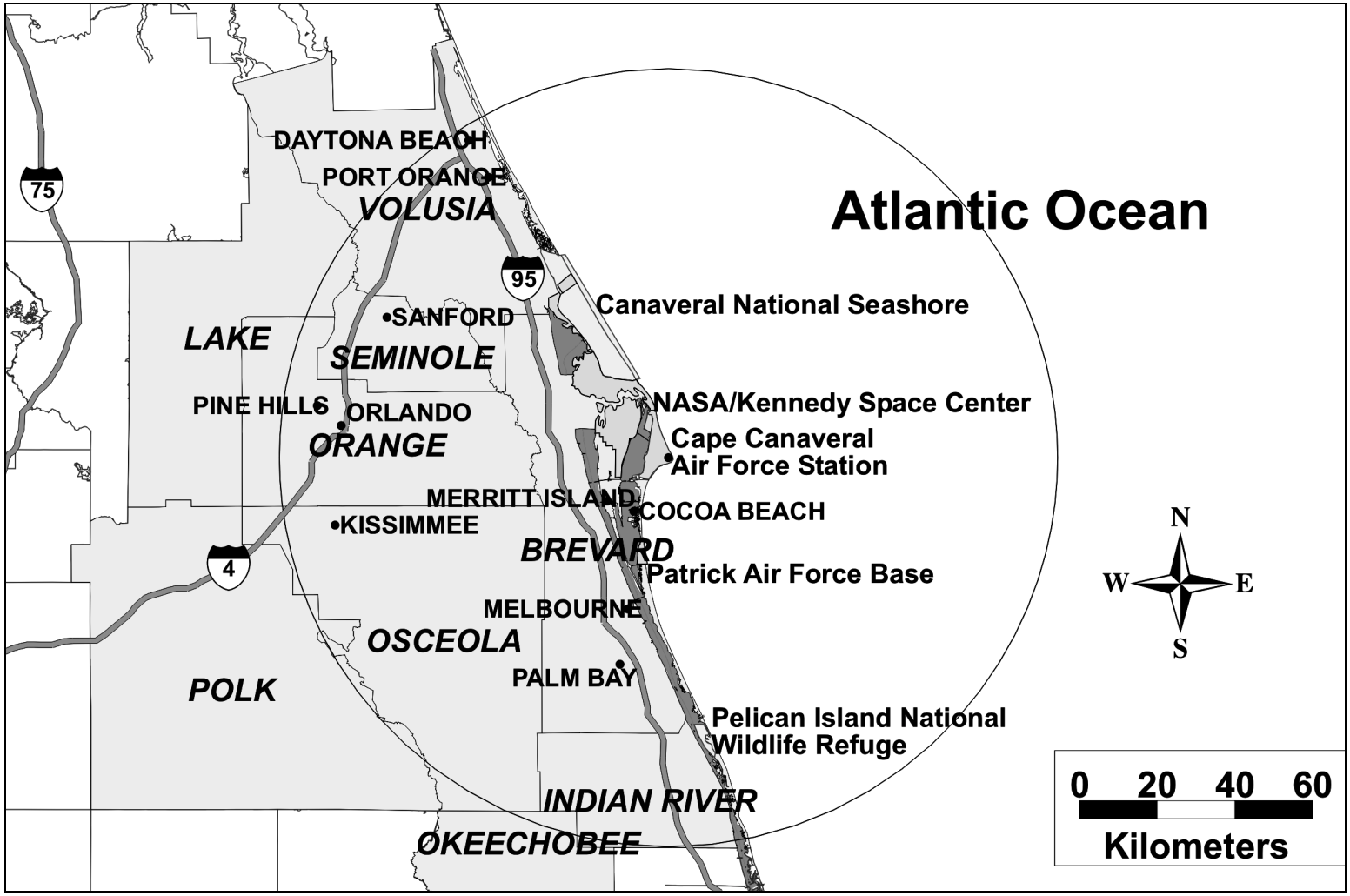

Figure B-1. Potentially Affected Area Surrounding Cape Canaveral Air Force Station

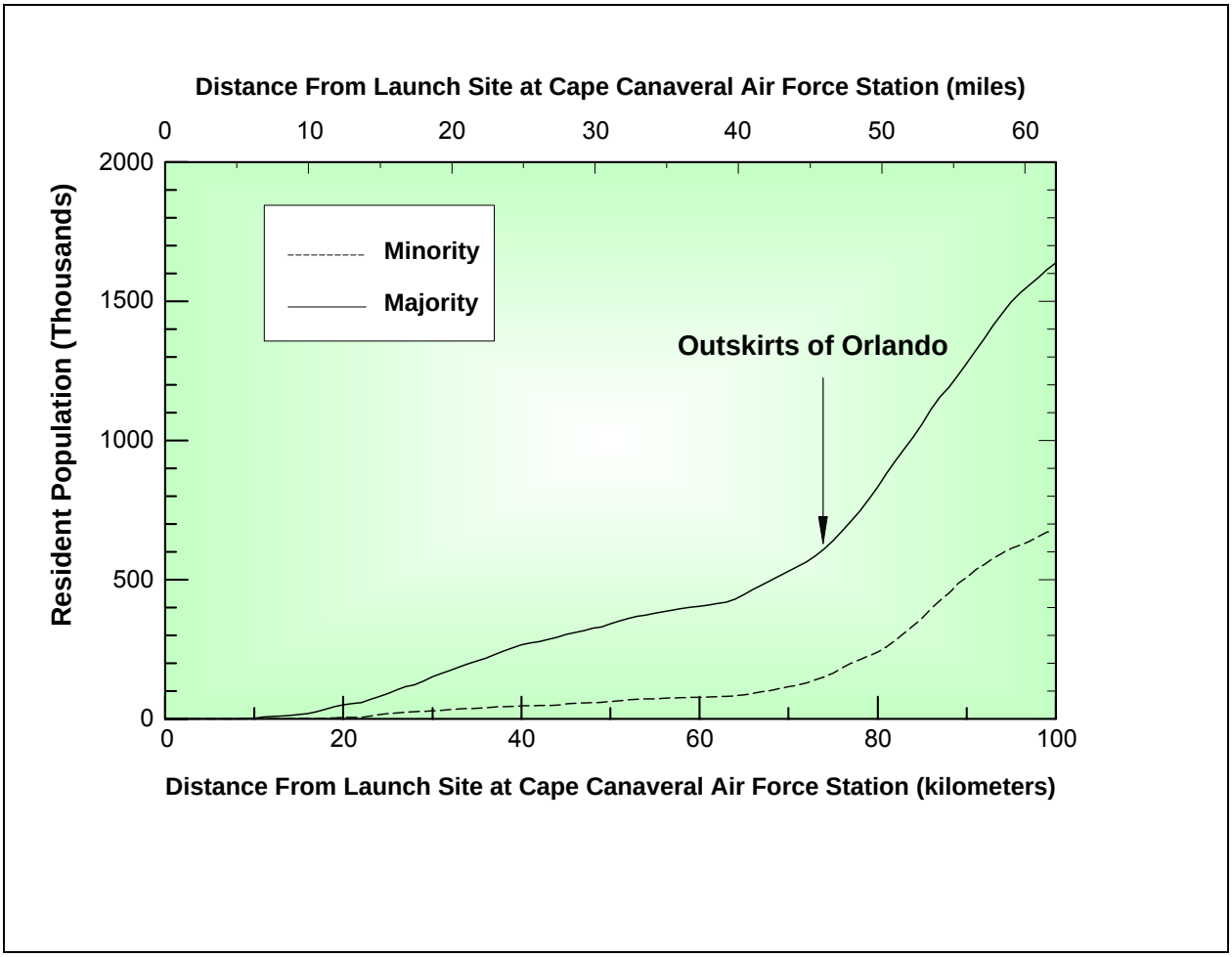

Figure B-2. Majority and Minority Populations Residing Within the Potentially Affected Area in 2000

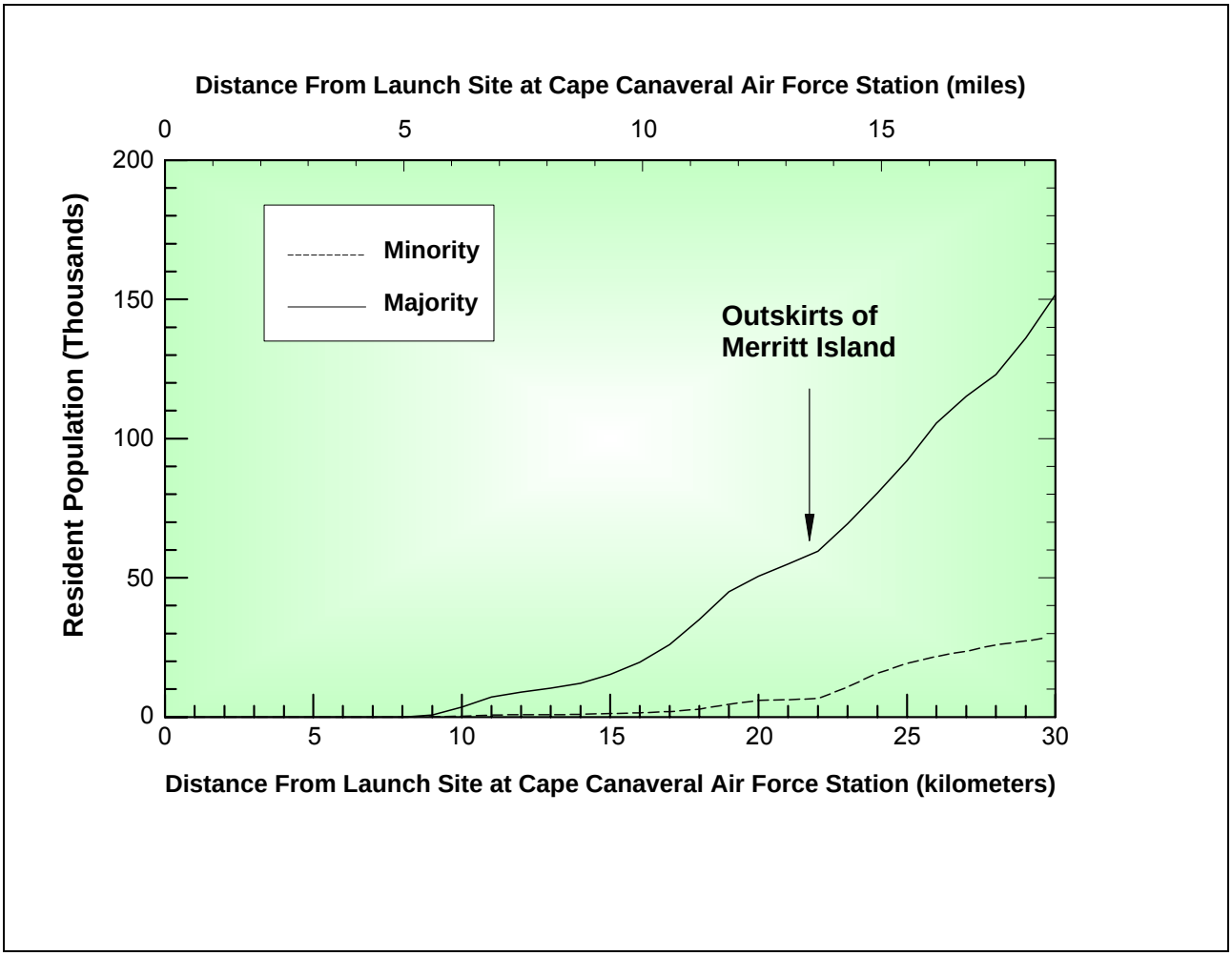

Figure B-3. Majority and Minority Populations Residing Within 30 Kilometers (19 Miles) of CCAFS in 2000

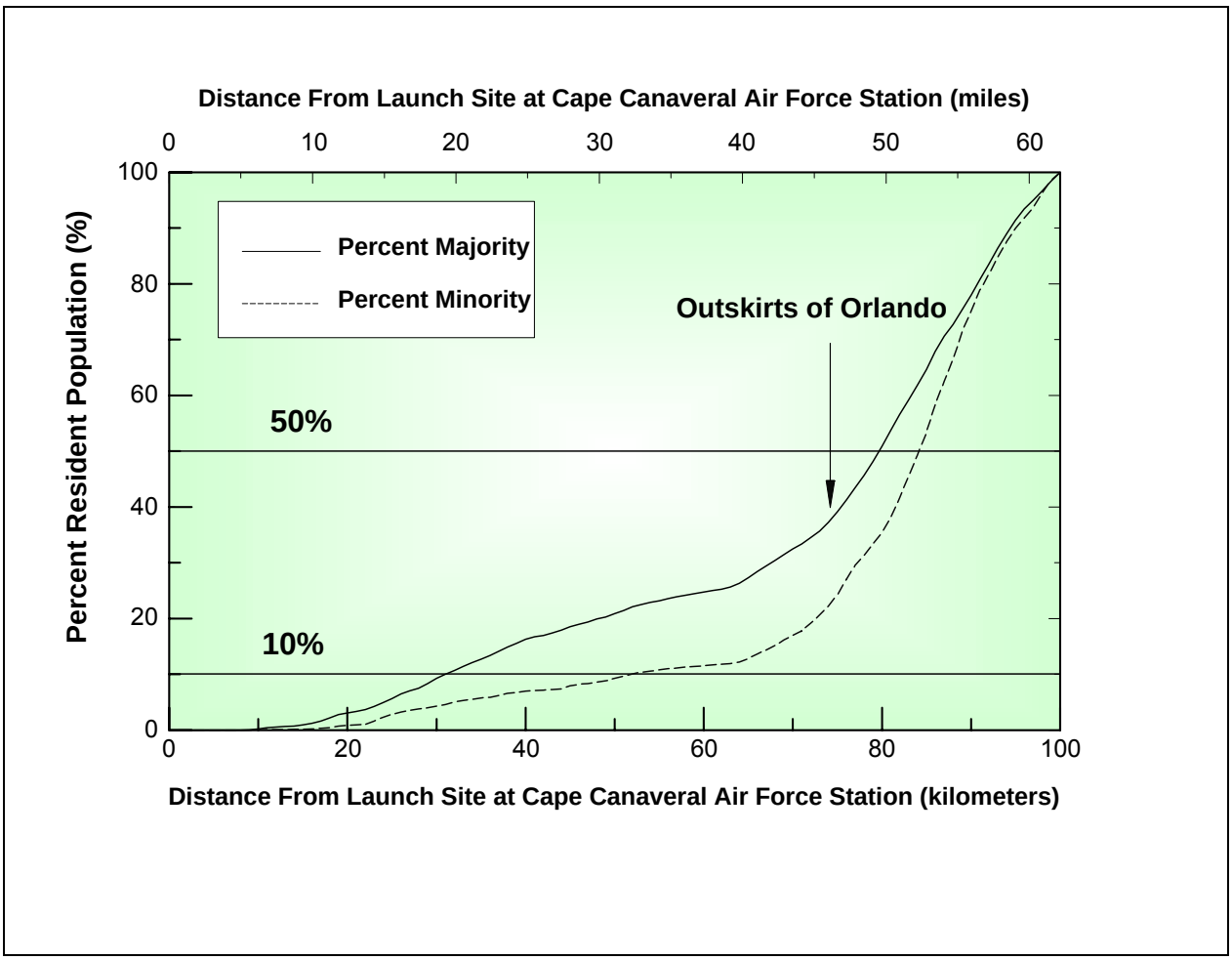

Figure B-4. Percent Majority and Minority Populations Residing Within the Potentially Affected Area in 2000

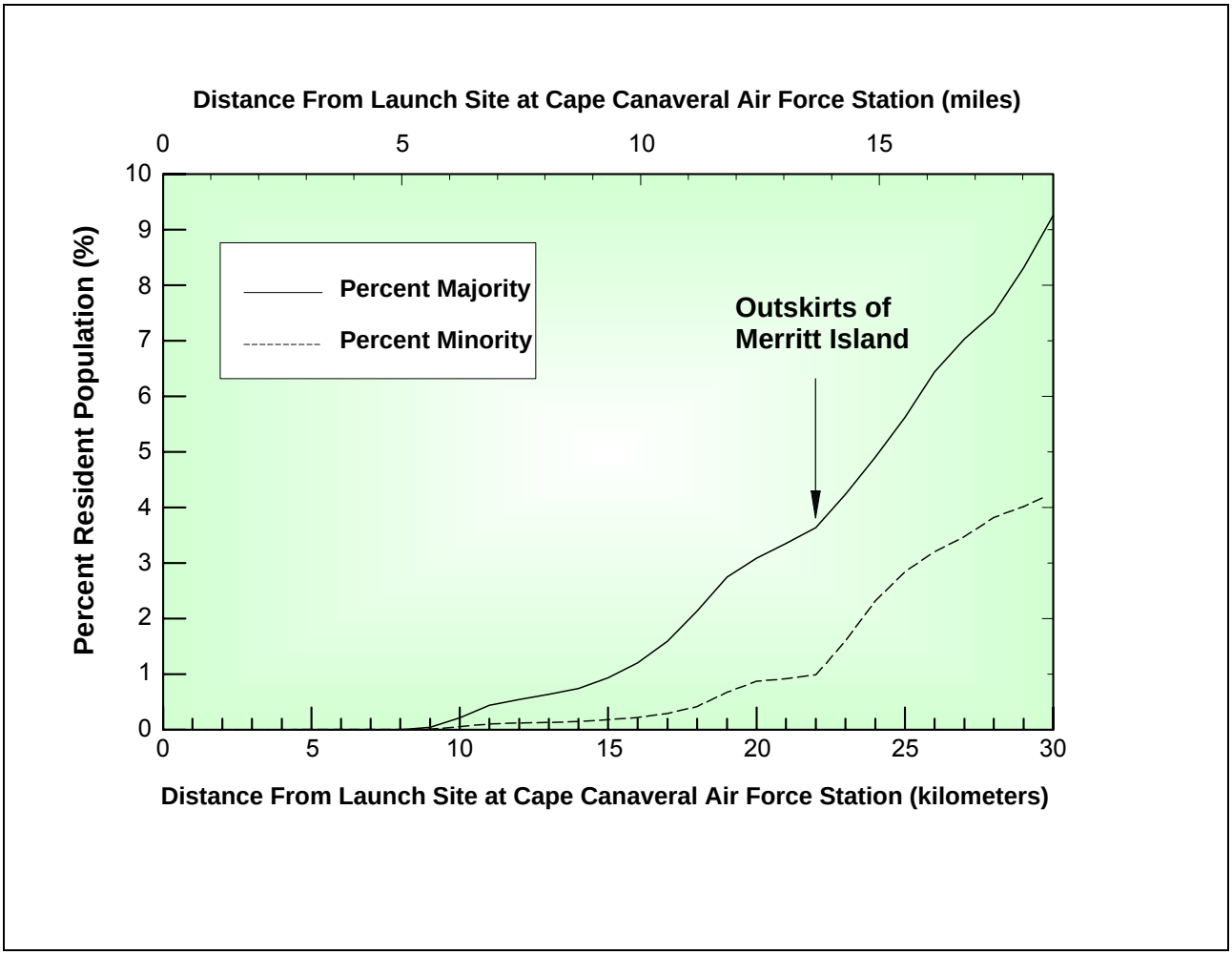

Figure B-5. Percentage of Majority and Minority Populations Residing Within 30 Kilometers (19 Miles) of CCAFS in 2000

Table B-1. Projected Racial and Ethnic Composition of the Population at Varying Distances from CCAFS for 2001 and 2005

	100 km (62 mi)			20 km (12 mi)			10 km (6 mi)		
Population	**1990**	**2001**	**2005**	**1990**	**2001**	**2005**	**1990**	**2001**	**2005**
Asian	26,298	44,444	50,229	572	967	1,093	6	10	11
Black	191,118	246,543	263,743	1,940	2,502	2,667	101	131	140
Native American	5,982	7,179	7,538	305	365	384	47	57	59
Hispanic	116,100	183,438	210,141	1,558	2,462	2,820	140	221	253
Other Race	1,168	1,390	1,471	55	65	69	0	0	0
White	1,448,678	1,608,033	1,651,493	44,136	48,991	50,315	2,492	2,767	2,841
Minority	339,498	481,604	531,651	4,375	6,296	6,964	294	419	463
Total	1,789,344	2,091,027	2,184,615	48,566	55,352	57,348	2,786	3,186	3,304
Percent Minority	19.0%	23.0%	24.3%	9.0%	11.4%	12.1%	10.6%	13.2%	14.0%
Percent Low Income	10.1%	—	—	8.3%	—	—	12.5%	—	—

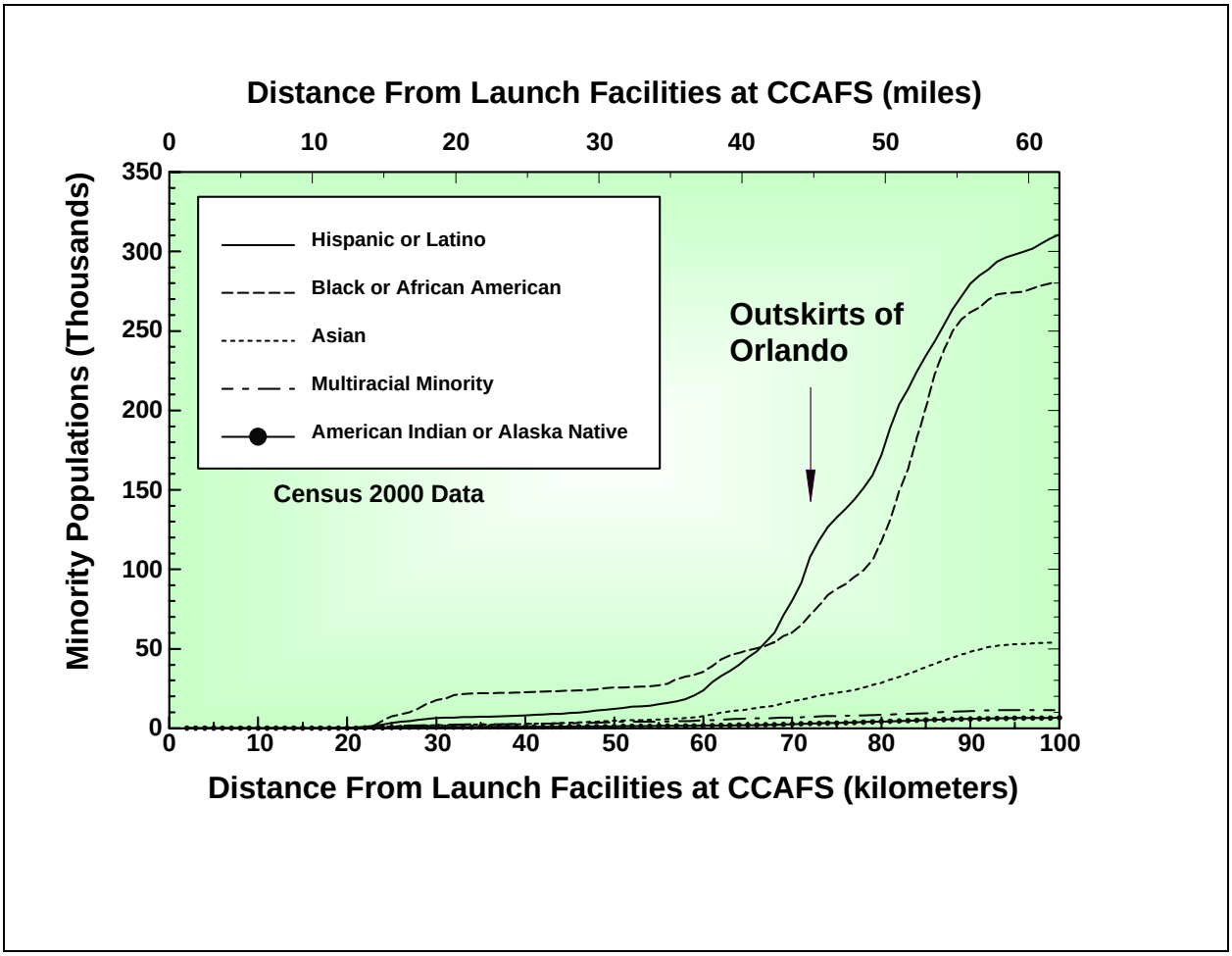

Figure B-6. Minority Populations Residing Within the Potentially Affected Area in 2000

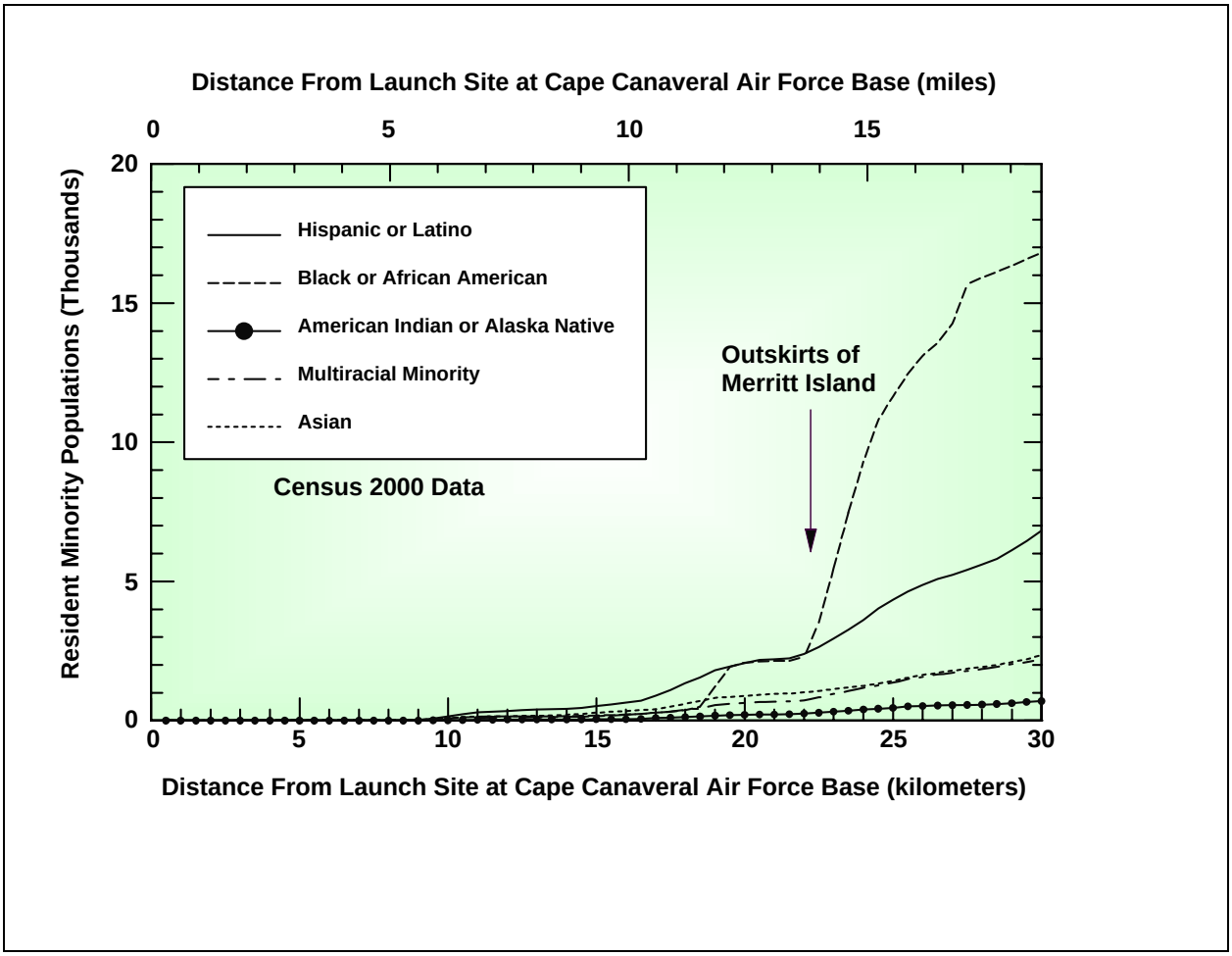

Figure B-7. Minority Population Residing Within 30 Kilometers (19 Miles) of CCAFS in 2000

APPENDIX C

RESPONSES TO PUBLIC REVIEW COMMENTS

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APPENDIX C

RESPONSES TO PUBLIC REVIEW COMMENTS

The U.S. Environmental Protection Agency (EPA) published a Notice of Availability (NOA) for the Draft Environmental Impact (DEIS) for the Mars Exploration Rover–2003 Project in the *Federal Register* on July 26, 2002 (67 FR 48894). The DEIS was mailed by NASA to 79 potentially interested Federal, State and local agencies, organizations and individuals. In addition, the DEIS was publicly available in electronic format from a NASA server on the Internet. The public review and comment period closed on September 9, 2002. A total of six comment letters were received: three from Federal agencies, one from the State of Florida (which consolidated the reviews of several State agencies), and two, via electronic mail, from individuals.

This appendix provides specific responses to the comments received from the agencies and individuals listed in Table C-1. Copies of each letter, including attachments, are presented in the following pages. The relevant comments in each letter are marked and numbered for identification. The comments received included “no comment”, requests to clarify specific points of discussion in the text, and an objection to the use of nuclear material in space. NASA’s response to each identified comment is presented in Table C-2, which follows the letters.

Table C-1. Agencies and Individuals Providing Comments

Commentor Number	Organization	Individual Presenting Comment
1	U.S. Environmental Protection Agency	Anne Norton Miller
2	Federal Aviation Administration	Patricia Grace Smith
3	United States Air Force	Angy Chambers
4	State of Florida	Sally B. Mann
5	–	Norma J. F. Harrison
6	–	Kev

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

SEP - 9 2002

Mr. David Lavery
Mars Exploration Program Office
Office of Space Science (Mail Code SM)
National Aeronautics and Space Administration
Washington, DC 20546-0001

Dear Mr. Lavery:

In accordance with National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the Environmental Protection Agency (EPA) has reviewed the National Aeronautics and Space Administration's (NASA) draft environmental impact statement (EIS) for the Mars Exploration Rover-2003 Project.

The proposed action would consist of two missions to send two identical mobile science laboratories (rovers) to two different sites on the surface of Mars. The first spacecraft would be launched during May or June 2003, with arrival at Mars in January 2004. The second spacecraft wold be launched during June or July 2003, with arrival at Mars in January 2004.

EPA believes that this EIS provides an adequate discussion of the potential environmental impacts of these particular Mars missions. Therefore, EPA has no objection to the proposed actions as discussed in this draft EIS. |– 1-1

We appreciate the opportunity to review this draft EIS. The staff contact for this review is Ken Mittelholtz (202-564-7156).

Sincerely,

Anne Norton Miller
Director
Office of Federal Activities

Internet Address (URL) • http://www.epa.gov
Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 25% Postconsumer)

Comment Letter #1: U.S. Environmental Protection Agency

U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

SEP 9 2002

Mr. David Lavery
Mars Exploration Program Office
Office of Space Science
NASA Headquarters
Washington, DC 20546

Dear Mr. Lavery:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement for the Mars Exploration Rover-2003 Project. I am pleased to submit the following comments for your consideration.

Section 2.1.3. It may also be useful to add that the airspace over SLC-17 would be restricted and would therefore be part of the security measures that are in place for each launch. **|– 2-1**

Section 2.1.5.7. Given the recent concerns with security surrounding launch events and publication of the actual launch dates and times, it may be appropriate to mention that the launch dates listed in the Draft EIS (i.e., May 30, 2003 and June 25, 2003) represent only the opening of the launch window and not necessarily the actual planned date of the launch. The actual dates would be released when appropriate to notify relevant agencies and the public of the planned launch event. **|– 2-2**

Section 2.3.1. As explained in the Draft EIS, a single mission would not allow NASA to meet all mission objectives; however, please clarify what would happen if a spacecraft is lost or if a launch window is missed. In either of these scenarios would NASA propose to continue the project with only one spacecraft or would other arrangements be made? **|– 2-3**

Sections 4.1.4 and 4.1.5. It may be helpful to compare the risk characterized in these sections to risks that people are exposed to every day to provide a context for the reader. **|– 2-3**

Please feel free to contact Michon Washington of my office at (202) 267-9305 if you have any questions.

Sincerely,

Patricia Grace Smith
Associate Administrator for
Commercial Space Transportation

Comment Letter #2: Federal Aviation Administration

ENGINEERING REVIEW COMMENTS			1. DATE: 27-Aug-02
2. Project: Draft Environmental Impact Statement for the Mars Exploration Rover – 2003 Project			
3. Office Symbol of Reviewer: 45 CES/CEV		4. Name and Phone number of Reviewer Multiple Reviewers POC Angy Chambers	
5. ITEM NUMBER	6. DRAWING OR PARAGRAPH NUMBER	7. COMMENTS	
1	Abstract, Paragraph 3, Page iii/iv	Suggest changing second to last sentence to read, "Expected environmental effects would include short-term impacts to air quality, vegetation, wildlife and stratospheric ozone."	|– 3-1
2	Page 2-10, Payload Processing	Although processing of the payload is discussed, a short discussion on transportation of the payload over NASA and AF lands should be included.	|– 3-2
3	Page 2-16, Section 2.3	What about the alternative of launching both rovers on one Delta?	|– 3-3
4	Page 3-17, Section 3.1.6.3, Paragraph 2	Suggest re-wording last sentence of paragraph. Although coastal vervain is a state-listed species and is located on CCAFS/KSC, there are other state-listed species located on both properties, as well.	|– 3-4
5	Page 3-19, Paragraph 1	Removing the sentence that begins "Nighttime lighting near nesting beaches can sometimes result.." This is not entirely accurate. Nest site selection is most heavily influenced by nonvisual cues. It is rare for a nest on CCAFS/KSC to be deposited in the intertidal zone because of lighting. Replace sentence with "Extensive research has demonstrated that artificial lighting deters adult female turtles from emerging from the water and nesting."	|– 3-5
6	Page 3-24, Section 3.1.7.4, Paragraph 2	Cape Canaveral Hospital is located closer to CCAFS/KSC than Wuesthoff; therefore, wouldn't this be another option?	|– 3-6
7	Page 4-28, Paragraph 4	Reword to state that hazardous waste generated in support of this mission will be disposed under either Boeing's or NASA's EPA identification number (depending on agreements between the two organizations). The waste will not be disposed by the Air Force.	|– 3-7
8	Page 4-29, Paragraph 2	What are the established standard practices mentioned here?	|– 3-8
9	General	Measures should be taken to safeguard the payload in case of controlled burns or wildfires on KSC/CCAFS. A pro-active vegetative fuel reduction and habitat restoration program takes place on both KSC and CCAFS. It is recommended that proper filtration systems be at hand to protect the payloads to prevent impacts to these programs.	|– 3-9

Comment Letter #3: United States Air Force

Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard, MS 47
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

September 3, 2002

Mr. David Lavery
Office of Space Science
Code SM
NASA Headquarters
Washington, DC 20546-0001

RE: National Aeronautics and Space Administration - Draft Environmental Impact Statement For Mars Exploration Rover – 2003 Project (MER-2003) – Cape Canaveral, Brevard County, Florida
SAI: FL200207242467C

Dear Mr. Lavery:

The Florida State Clearinghouse, pursuant to Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated the review of the above-referenced Draft Environmental Impact Statement (DEIS).

Based on the information contained in the above-referenced DEIS and the enclosed comments provided by our reviewing agencies, the state has determined that the proposed project is consistent with the Florida Coastal Management Program (FCMP). Thank you for the opportunity to review this project. If you have any questions regarding this letter, please contact Ms. Rosalyn Kilcollins at (850) 922-5438. |– 4-1

Sincerely,

Sally B. Mann

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/rk

Enclosures

Florida State Clearinghouse

"More Protection, Less Process"

Printed on recycled paper.

Comment Letter #4: State of Florida

DIVISIONS OF FLORIDA DEPARTMENT OF STATE
Office of the Secretary
Office of International Relations
Division of Elections
Division of Corporations
Division of Cultural Affairs
Division of Historical Resources
Division of Library and Information Services
Division of Licensing
Division of Administrative Services

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State
DIVISION OF HISTORICAL RESOURCES

MEMBER OF THE FLORIDA CABINET
State Board of Education
Trustees of the Internal Improvement Trust Fund
Administration Commission
Florida Land and Water Adjudicatory Commission
Siting Board
Division of Bond Finance
Department of Revenue
Department of Law Enforcement
Department of Highway Safety and Motor Vehicles
Department of Veterans' Affairs

Ms. Cindy Cranick
Florida State Clearinghouse Coordinator
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, Mail Station 47
Tallahassee, Florida 32399-3000

August 15, 2002

RECEIVED
AUG 21 2002
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RE: DHR No. 2002-07550 / Received by DHR: August 1, 2002
SAI #: 200207242467C
Draft Environmental Impact Statement for the Mars Exploration Rover – 2003 Project
Cape Canaveral, Brevard County

Dear Ms. Cranick:

Our office received and reviewed the above referenced project in accordance with Section 106 of the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended in 1992, and *36 C.F.R., Part 800: Protection of Historic Properties*. The State Historic Preservation Officer is to advise Federal agencies when identifying historic properties (listed or eligible for listing, in the *National Register of Historic Places*), assessing effects upon them, and considering alternatives to avoid or minimize adverse effects.

We have reviewed sections 3.1.8 and 4.1.2.11, both dealing with Cultural Resources, of the referenced environmental impact statement. Based on the information provided, it is the opinion of this office that the proposed undertaking will have no effect on historic properties.

If there are any questions concerning our comments or recommendations, please contact Sarah Jalving, Historic Sites Specialist, by electronic mail at sjalving@mail.dos.state.fl.us or at 850-245-6333 or SunCom 205-6333. Thank you for your interest in protecting Florida's historic properties.

Sincerely,

Frederick P. Gaske, Deputy SHPO

for Janet Snyder Matthews, Ph.D., Director, and
State Historic Preservation Officer

500 S. Bronough Street • Tallahassee, FL 32399-0250 • http://www.flheritage.com

☐ Director's Office (850) 245-6300 • FAX: 245-6435
☐ Archaeological Research (850) 245-6444 • FAX: 245-6436
☑ Historic Preservation (850) 245-6333 • FAX: 245-6437
☐ Historical Museums (850) 245-6400 • FAX: 245-6433
☐ Palm Beach Regional Office (561) 279-1475 • FAX: 279-1476
☐ St. Augustine Regional Office (904) 825-5045 • FAX: 825-5044
☐ Tampa Regional Office (813) 272-3843 • FAX: 272-2340

Comment Letter #4 Attachment #1

Lauren

COUNTY: BREVARD

DATE: 7/24/2002
COMMENTS DUE DATE: 8/23/2002
CLEARANCE DUE DATE: 9/5/2002
SAI#: FL200207242467C

Message:

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNITS
AGRICULTURE OTTED COMMUNITY AFFAIRS FISH and WILDLIFE COMMISSION STATE TRANSPORTATION X ENVIRONMENTAL PROTECTION	ST. JOHNS RIVER WMD	ENVIRONMENTAL POLICY UNIT

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AGENCY CONTACT AND COORDINATOR (SCH)
2555 SHUMARD OAK BLVD
TALLAHASSEE, FLORIDA 32399-2100
(850) 414-6580 (SC 994-6580)
(850) 414-0479

EO. 12372/NEPA
- ☐ No Comment
- ☐ Comment Attached
- ☐ Not Applicable

Federal Consistency
- ☑ No Comment/Consistent
- ☐ Consistent/Comments Attached
- ☐ Inconsistent/Comments Attached
- ☐ Not Applicable

From:
Division/Bureau: OS/OIP
Reviewer: R. K. Collins / Mr Higgins
Date: 8/30/02

Comment Letter #4 Attachment #2

COUNTY: BREVARD

DATE: 7/24/2002
COMMENTS DUE DATE: 8/23/2002
CLEARANCE DUE DATE: 9/5/2002
SAI#: FL200207242467C

Message:

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNITS
AGRICULTURE OTTED COMMUNITY AFFAIRS X FISH and WILDLIFE COMMISSION STATE TRANSPORTATION ENVIRONMENTAL PROTECTION	ST. JOHNS RIVER WMD	ENVIRONMENTAL POLICY UNIT

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(850) 414-0479

EO. 12372/NEPA
- [x] No Comment
- [ ] Comment Attached
- [ ] Not Applicable

Federal Consistency
- [x] No Comment/Consistent
- [ ] Consistent/Comments Attached
- [ ] Inconsistent/Comments Attached
- [ ] Not Applicable

From:
Division/Bureau: ENVIRONMENTAL SERVICES
Reviewer: BRIAN BARNETT
Date: 8/2/02

Comment Letter #4 Attachment #3

COUNTY: BREVARD

DATE: 7/24/2002
COMMENTS DUE DATE: 8/23/2002
CLEARANCE DUE DATE: 9/5/2002
SAI#: FL200207242467C

Message:

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNITS
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PLAN PROCESSING TEAM

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(850) 414-6580 (SC 994-6580)
(850) 414-0479

EO. 12372/NEPA
- [x] No Comment
- [ ] Comment Attached
- [ ] Not Applicable

Federal Consistency
- [ ] No Comment/Consistent
- [ ] Consistent/Comments Attached
- [ ] Inconsistent/Comments Attached
- [ ] Not Applicable

From:
Division/Bureau: DCA/DCP
Reviewer:
Date: 8/1/02

Comment Letter #4 Attachment #4

COUNTY: BREVARD

DATE: 7/24
COMMENTS DUE DATE: 8/23
CLEARANCE DUE DATE: 9/5
SAI#: FL2002072424

Message:

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNITS
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(850) 414-6580 (SC 994-6580)
(850) 414-0479

EO. 12372/NEPA
- [x] No Comment
- [ ] Comment Attached
- [ ] Not Applicable

Federal Consistency Mgr Exploration
- [x] No Comment/Consistent
- [ ] Consistent/Comments Attached
- [ ] Inconsistent/Comments Attached
- [ ] Not Applicable

From:
Division/Bureau: FDOT
Reviewer: Sandra Stidmire
Date: 7/31/02

Comment Letter #4 Attachment #5

COUNTY: BREVARD

Rec'd 8/6/02
2205

Message:

DATE: 7/24/2002
COMMENTS DUE DATE: 8/23/2002
CLEARANCE DUE DATE: 9/5/2002
SAI#: FL200207242467C

✓ on-line 8/22

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNITS
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(850) 414-0479

EO. 12372/NEPA

- ☐ No Comment
- ☐ Comment Attached
- ☐ Not Applicable

Federal Consistency

- ☒ No Comment/~~Consistent~~
- ☐ Consistent/Comments Attached
- ☐ Inconsistent/Comments Attached
- ☐ Not Applicable

From:
Division/Bureau: OCGA / SJRWMD
Reviewer: [signature]
Date: 8/22/02

Comment Letter #4 Attachment #6

COUNTY: BREVARD

DATE: 7/24/2002
COMMENTS DUE DATE: 8/23/2002
CLEARANCE DUE DATE: 9/25/2002
SAI#: FL200207241467C

FILE COPY

Message:

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNITS
AGRICULTURE X OTTED COMMUNITY AFFAIRS FISH and WILDLIFE COMMISSION STATE TRANSPORTATION ENVIRONMENTAL PROTECTION	ST. JOHNS RIVER WMD	ENVIRONMENTAL POLICY UNIT

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JUL 31 2002
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ENVIRONMENTAL POLICY UNIT

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TALLAHASSEE, FLORIDA 32399-2100
(850) 414-6580 (SC 994-6580)
(850) 414-0479

EO. 12372/NEPA
- [x] No Comment
- [ ] Comment Attached
- [ ] Not Applicable

Federal Consistency
- [ ] No Comment/Consistent
- [ ] Consistent/Comments Attached
- [ ] Inconsistent/Comments Attached
- [ ] Not Applicable

From:
Division/Bureau: OPB, DRG
Reviewer: M Johnson
Date: 8/23/02

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Comment Letter #4 Attachment #7

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email Governor Jeb Bush
Gov. Bush's E-Newsletter

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New Project
Search Project
DB Maintenance
Help

Public Area

Brochure
Manual

STATE CLEARINGHOUSE

Home > My In-Box > Search Project > **Add Agency Comments**

User: ROSALYN KILCOLLINS, , Clearinghouse

Project Information

Project:	FL200207242467C
Description:	National Aeronautics and Space Aministration - Draft Environmental Impact Statement for the Mars Exploration Rover-2003 Project (MER-2003) - July 2002 - Cape Canaveral, Brevard County, Florida.
Keywords:	NASA - DEIS - MER-2003 - Cape Canaveral, Brevard
Program:	

Review Comments **Page:** GO Page **1/11**

Agency:	AGRICULTURE
Date:	08/23/2002 (mm/dd/yyyy)
Description:	No Comment
Comment Type:	Draft Final

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Comment Letter #4 Attachment #8

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New Project

Search Project

DB Maintenance

Help

Public Area

Brochure

Manual

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Gov. Bush's E-Newsletter

STATE CLEARINGHOUSE

Home > My In-Box > Search Project > **Update Agency Comments**

User: ROSALYN KILCOLLINS, , Clearinghouse

Project Information

Project:	FL200207242467C
Description:	National Aeronautics and Space Aministration - Draft Environmental Impact Statement for the Mars Exploration Rover-2003 Project (MER-2003) - July 2002 - Cape Canaveral, Brevard County, Florida.
Keywords:	NASA - DEIS - MER-2003 - Cape Canaveral, Brevard
Program:	

Review Comments **Page:** GO! Page **10/11**

Agency:	E. CENTRAL FL RPC
Date:	08/13/2002 (mm/dd/yyyy)
Description:	N/C
Comment Type:	○ Draft ◉ Final

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Comment Letter #4 Attachment #9

Date: Tue, 30 Jul 2002 18:19:26 -0700
From: "Norma J. F. Harrison" <normaha@pacbell.net>
Subject: Don't send me your lies, your huge packages,
your expensive trappings designed to smack me in the face and
To: marsnepa@hq.nasa.gov
X-Priority: 3
Status: RO

I told you not to put fission and fusion into outer space. I said you're walking you don't know where. You and your god of
armageddon - being that god, yourselves - proceed apace to blow up as much of the universe as you can reach as much as you can. |– 5-1

I did not address a Mars exploration, and certainly have no use for the thick and lengthy volume our tax money paid to have sent to
me. I know, it costs you little to send it, not that you charge little...

And you laugh, in your imperialist robes - you laugh at us all who try to keep grace and beauty...

Don't send me your lies, your huge packages, your expensive trappings designed to smack me in the face and to appear to be
reasonable because they're bound fancily.

Norma J F Harrison
1312 Cornell
Berkeley 94702 Ca
normaha@pacbell.net
510-527-9584 non-business
510-526-3968 Summit Bay Realty/& facs

Comment Letter #5: Norma J. F. Harrison

From: kevcross@webtv.net (+ Kev +)
Date: Fri, 26 Jul 2002 06:23:45 -0400 (EDT)
To: kevcross@webtv.net
Cc: ossplutо@hq.nasa.gov (Mr. Kurt Lindstrom),
roger.launius@hq.nasa.gov (Roger Launius),
steve.garber@hq.nasa.gov (Steve Garber), whill@hq.nasa.gov,
prutledg@hq.nasa.gov, OOSA@unov.un.or.at,
sandra.m.dawson@jpl.nasa.gov (Sandra M. Dawson), Cassini@jpl.nasa.gov,
david.f.doody@jpl.nasa.gov (David F. Doody), history@lists.hq.nasa.gov,
leslie.j.deutsch@jpl.nasa.gov (Leslie J. Deutsch),
info@universetoday.com (Editor, Universe Today),
opa@nrc.gov (Office of Public Affairs/NRC),
osseuropa@hq.nasa.gov (Europa Orbiter comments),
ossplutо@hq.nasa.gov (Pluto-Kuiper Express comments),
comments@www.hq.nasa.gov (NASA comments),
marsnepa@hq.nasa.gov (Mr. David Lavery),
fgregory@hq.nasa.gov (Fred Gregory), rxw@nrc.gov (Russell Wise, NRC),
eec@nrc.gov (Elmo Collins), tpg@nrc.gov (Pat Gwynn),
pac@cpuc.ca.gov (Clanon, Paul), JEA@cpuc.ca.gov (Ajello, Julian E.),
czw@cpuc.ca.gov (Wong, Zee Z.), rwc@cpuc.ca.gov (Clark, Richard W.),
the.secretary@hq.doe.gov (NRC), boba@energy.ca.gov (Bob Aldrich),
BByron@energy.state.ca.us (Barbara Byron),
swoods1@dhs.ca.gov (Steve Woods),
energia@energy.ca.gov (Calif Energy Committee),
webmaster.oria@epa.gov (Webmaster, Yucca Mountain Project)
Subject: Space4Peace.org - KEEP SPACE FOR PEACE

== + ==
http://Antiwar.com.
http://www.Space4Peace.org.
Thank you.
+ Kev +
== + ==
"Seek love in the Pity of other's Woe,
in the gentle relief of another's care,
In the darkness of night and winter's snow,
In the naked and outcast. Seek Love there!"

-- William Blake (in "William Bond")
========== + ==========
Support http://Antiwar.com & the Global Network Against Weapons &
Nuclear Power in Space http://www.Space4Peace.org.
== + ==
STOP STAR WARS - KEEP SPACE FOR PEACE
== + ==
A NEW WAVE OF WEAPONRY:
Directed Energy Weapons (DEWs): A Bibliography - websites
http://web.nps.navy.mil/~library/bibs/dewweb.htm
== + ==
'SPACE WAR LINKS' on U.S. military plans for global control through, in
their words, "full spectrum dominance":

(1) U.S. Space Command's LONG RANGE PLAN:
http://www.spacecom.af.mil/usspace/LRP/cover.htm
(2) http://www.af.mil/vision
(3) http://www.dtic.mil/jv2020
(4) http://www.spacecom.af.mil/usspace

Comment Letter #6: Kev

(5) Report of the Commission to Assess United States National Security Space Management and Organization
http://www.defenselink.mil/pubs/space20010111.html
== + ==
Please help the Plowshares, Catholic Worker & anti-Trident movements & similar progressive peace-justice-faith-spirit groups.

The blessings of love, peace & justice from Kevin, 47; U.S. Navy veteran (Vietnam evacuation-pull-out, 1975), former law school student & newspaper reporter. Pacifist, cyber-info-warrior, gardener, stay-home father-of-4, in Fla. (Tampa Bay) USA.

Repent now, rejoice in all things, endure affliction, make each act a prayer offering to God, pray without ceasing:

"Blessed are the nonviolent peacemakers and the truthtellers. Lord, open and soften our hearts, make us instruments of Your peace. Help us speak truth to power yet love our enemies, to pray for the salvation of those who persecute us, to reconcile with and forgive those who've hurt us, to feed, clothe, house the poor and infirm. Oh gentle, Merciful Jesus Christ, you have already sent us your Holy Spirit, now come quickly in Your Grace and Glory. Come with Your Kingdom beloved Son of God, Lamb of God, Prince of Peace. Amen.

Gratitude to Daniel and Philip Berrigan (& Liz), and to Thich Nhat Hanh, plus the countless, nameless, faceless others. Hats off to Bob Dylan, Bruce Springsteen & the E Street Band, Bob Marley, Joe Strummer and The Clash, Van Morrison and Stevie Wonder. Fervent ongoing prayers for Beverley Britton, Marshall "Eminem" Mathers, Leonard Peltier, Bill Smirnow, Eric Garris, Justin Raimondo, Bruce Gagnon, Bill Sulzman, Karl Grossman, Carol Wolman, Lew Rockwell, the Los Angeles Catholic Worker, Max Obuszewski, Jonah House, Bishop Robert N. Lynch, Rev. William Swengros and Pope John Paul II.

+ Honoring the memory of St. Francis of Assisi ("Brother Sun") & St. Clare of Assisi ("Sister Moon"), St. Anthony of Padua, St. Teresa of Avila, St. John of the Cross, St. Therese of Lisieux ("the Little Flower"), Charles de Foucauld, St. Maximilian Kolbe, Mahatma Gandhi, Peter Maurin, Pope Blessed John XXIII, Thomas Merton, Martin Luther King Jr., St. Padre Pio, Oscar Romero, Father John Hugo, Cesar Chavez, Dorothy Day, Mother Teresa and Our Lady of Lourdes. +

Amen, beloved, in blessedness I say unto you precious friends, empty yourself, renounce and strip yourself of worldy goods ... store up your treasures in heaven (not here below) ... and work out your salvation with diligence. Live in humility like a lamb among the wolves and pray for God's mercy on them. Try to give-give-give, for who can outgive God? Gently redeem your suffering by doing all for God and neighbor with unconditional Love. Serve God by loving His creation. Use whatever freedom and resources you have to pursue righteousness and the truth that works for justice ... and you will find peace. Be grateful for your pain, count it all joy to the end, which is the beginning. In your charity you will know God's Grace. Love without limitation, without judgement. And please: Love and Forgive, love and forgive, love, forgive. Trust the salvific life and death of Christ ... and in His Second Coming. May His Divine Mercy be upon you. Amen.

"Heart-felt work grows purely." "Speak the Gospel at all times; use words if necessary."

Peace be with you (my saintly Magpie).

Comment Letter #6 Page #2

"Blessed is He who comes in the name of the Lord."

"Did you know that I have come?"

+ Kev-Cross of the gardens, grotto and Sacred Heart +

"Resurrection." Deo gratias.
========== + ==========

Comment Letter #6 Page #3

Table C-2. Responses to Comments

Comment Number	Response
1-1	Thank you for your comments.
2-1	The text in Section 2.1.3 Paragraph 2 has been modified. Thank you for your comments.
2-2	Restrictions for public distribution of launch dates and times do not apply to launches of NASA missions on expendable vehicles. The quoted dates are the openings of the launch periods for the MER–A and MER–B missions, respectively, as stated in Sections 2.1.5.7 and 2.1.6.
2-3	NASA cannot, at this time, commit to any decisions regarding continuing with the project or making other arrangements should one of the launch opportunities be missed for any reason. A decision after a loss of a spacecraft would depend on the facts and circumstances regarding such a loss.
2-4	Table 2-7, Calculated Individual Risk of Fatality by Various Causes in the United States, in Section 2.4.4.4 provides the requested information. In Section 4.1.5.2 the reader is referred to this table.
3-1	The text in the noted paragraph on page iv has been modified. Thank you for your comments.
3-2	The text in Section 2.1.4 has been modified.
3-3	A single Delta II would not have the necessary capability to simultaneously launch the combined mass of both MER spacecraft.
3-4	The text in Section 3.1.6.3 Paragraph 2 has been modified.
3-5	The text in the noted paragraph on page 3-19 has been modified.
3-6	The text in Section 3.1.7.4 Paragraph 2 has been modified.
3-7	The text in the noted paragraph on page 4-28 has been modified.
3-8	The text in the noted paragraph on page 4-29 has been modified.
3-9	If needed, charcoal filters can be installed in the air conditioning handler intakes during the entire duration of spacecraft processing activities at both the Payload Hazardous Servicing Facility (PHSF) and the launch pad. Furthermore, if the spacecraft instruments are known to be particularly sensitive to smoke particles, the mission managers can request to become part of the approval process for scheduling controlled burns in the areas surrounding the PHSF and launch pad.
4-1	Thank you for your comments.
5-1	The heat generated by a radioisotope heater unit (RHU) comes from the natural decay of the encapsulated plutonium dioxide. Such decay is neither fission nor fusion.
6	The MER–2003 project is for peaceful scientific purposes.

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