Missile Defense Agency
Wake Island Supplemental Environmental Assessment

Supplemental Environmental Assessment

February 2007

Department of Defense
Missile Defense Agency
7100 Defense Pentagon
Washington, DC 20301-7100

WAKE ISLAND
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

AGENCY: Missile Defense Agency

ACTION: Finding of No Significant Impact

BACKGROUND: The Missile Defense Agency (MDA) prepared this Supplemental Environmental Assessment (SEA) to update the analysis of liquid propellant target (LPT) missile launches and supporting activities at Wake Island contained in the *Wake Island Launch Center (WILC) SEA* (U.S. Army Space and Missile Command, 1999) which is incorporated by reference, and serves as a planning tool to assist MDA in meeting its mission objectives. The WILC SEA analyzes launching up to 20 LPTs over a ten-year period. Radar use, flight tests, and missile intercepts were analyzed in the *Wake Island EA* (U.S. Army Space and Strategic Defense Command (USASSDC), 1994) and the *Supplemental Environmental Impact Statement for Proposed Actions at the U.S. Army Kwajalein Atoll* (USASSDC, 1993). Launching an interceptor missile from a ship to intercept target missiles was analyzed in the *Pacific Missile Range Facility Enhanced Capability Environmental Impact Statement (EIS)*, December 1998. The location and use of mobile sensors was analyzed in the *Mobile Sensors Environmental Assessment* (MDA, 2005), the *Final Airborne Laser Supplemental Environmental Impact Statement* (June 2003), the *Ground Based Midcourse Extended Test Range Environmental Impact Statement* (February 2003), and the *Pacific Missile Range Facility Enhanced Capability EIS* (December 1998). The above NEPA analyses are referenced and their impact determinations are summarized, as appropriate, in this SEA. For further reference, they are available on MDA's website at: http://www.mda.mil/mdalink/html/enviro.html.

This SEA was prepared in accordance with the National Environmental Policy Act (NEPA); the Council on Environmental Quality (CEQ) regulations that implement NEPA (Code of Federal Regulations [CFR], Title 40, Parts 1500-1508); Department of Defense (DoD) Instruction 4715.9 *Environmental Planning and Analysis*; applicable service regulations that implement these laws and regulations; and Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*.

After reviewing and analyzing currently available data and information on existing conditions, project impacts, and measures to mitigate those impacts, MDA has determined that the proposed action is not a Federal action that would significantly affect the quality of the human environment within the meaning of NEPA, as amended. Therefore, the preparation of an Environmental Impact Statement (EIS) is not required and MDA is issuing a Finding of No Significant Impact (FONSI). The MDA made this determination in accordance with all applicable environmental laws.

PURPOSE AND NEED

The MDA has a requirement to develop, test, deploy, and prepare for decommissioning a Ballistic Missile Defense System (BMDS) to provide a defensive capability for the U.S., its deployed forces, friends, and allies from ballistic missile threats. The proposed action would allow MDA to consider and characterize a wider range of threat-representative targets, and conduct more realistic testing of missile defenses.

DESCRIPTION OF THE PROPOSED ACTION

MDA proposes the following actions:

- Use of generic LPTs based on the LPT described in the WILC SEA.
- Construction of two new concrete pads in an existing fuel storage area on which liquid propellant storage containers or general supplies would be placed.
- Expansion of existing sensor suite to include additional air-, land-, and sea-based sensors.

ALTERNATIVES TO THE PROPOSED ACTION

Two alternatives to the proposed action, including the no action alternative, were identified and considered in this SEA.

Alternative 1 – Construction of two concrete storage pads and a concrete fueling pad on Wilkes Island.

No Action Alternative - MDA would not proceed with generic LPT missile testing activities. Flight test information for generic LPT missiles needed for the development of BMDS sensors, interceptors, and technology would not be collected from flight test activities at Wake Island. New concrete storage pads would not be constructed. Previously analyzed flight test activities involving LPT missiles fueled and launched from Wake Island, as documented in the WILC SEA and other applicable environmental documents, would continue as originally planned.

Specific future activities not analyzed in this SEA would need to be evaluated in subsequent NEPA analyses, as appropriate.

ENVIRONMENTAL EFFECTS

Methodology

Because the proposed action is narrowly focused, this SEA only provides analysis of potential changes to the proposed action discussed in the WILC SEA. Thirteen resource areas were initially considered to provide a context for understanding the potential effects of the proposed action and the severity of potential impacts. The resource areas initially considered include: air quality, airspace, biological resources, cultural resources, hazardous materials and hazardous waste, health and safety, infrastructure, land use, physical resources, noise, socioeconomics, transportation, and water resources. MDA determined that six of the thirteen resource areas remain essentially unchanged since the WILC SEA was completed or, as previously discussed, are unlikely to be affected by implementing the proposed action in this SEA.

- Airspace – The proposed changes do not alter previously assessed flight corridors or add more flight tests. No impact is anticipated.

- Infrastructure – Wake Island infrastructure was designed for a much larger population than is currently present or anticipated. The proposed action and alternatives would not require additional personnel or pressure on existing infrastructure. No impact is anticipated.

- Land Use – The proposed action and alternatives are consistent with current land use practices, policies, or controls for Wake Island. No impact is anticipated.

- Physical resources – The proposed construction activities would occur entirely within previously developed/disturbed land. No impact is anticipated.

- Socioeconomic – No additional personnel or changes to the local economy or demographics will result from the proposed action. No impact is anticipated.

- Water – The proposed action will not require increased water usage or cause any changes to ground, surface, or potable water on Wake Atoll. No impact is anticipated.

Environmental Effects

This SEA discusses the following seven resource areas that have the potential for impact resulting from the proposed action: air quality, biological resources, cultural resources, hazardous materials/waste, health and safety, noise, and transportation. Cumulative impacts are those that result when impacts of an action are combined with the impacts of

past, present, and reasonably foreseeable future actions at a location. Cumulative impacts were considered for each resource area and each alternative. Exhibit 1 summarizes the environmental impacts associated with the Proposed Action, Alternative 1, No Action Alternative, and Cumulative Impacts by the seven resources areas.

Exhibit 1: Summary of Environmental Impacts From the Proposed Action and Alternatives

Resource Area	Proposed Action	Alternative 1	No Action Alternative	Cumulative Impacts
Air Quality	A generic LPT maximum propellant budget of approximately 3,400 kilograms (7,500 pounds) kerosene-based fuel, 12,000 kilograms (26,450 pounds) inhibited red fuming nitric acid (IRFNA), and 120 kilograms (270 pounds) initiator fuel would result in expected carbon monoxide (CO) emissions of about 4,000 kilograms. The estimated maximum CO concentration for a 4,000-kilogram release would be 4.81 milligrams per cubic meter (mg/m^3) approximately 3.0 kilometers (1.9 miles) from the point of release, well below the one hour and eight hour NAAQS. Significant impacts to air quality would not be expected. The number of missile fueling events would not increase as a result of the proposed action so no increase in emissions from missile fueling activities would be anticipated. The prevailing winds at Wake Island would quickly sweep away any pollutant emissions. Therefore, no impacts are anticipated. Construction of the concrete storage pads would be expected to take approximately one month. Emissions from construction activities, including equipment combustion emissions and particulate emissions due to soil disturbance, would be very limited due to the small scale and short duration of these proposed activities. Best management practices would be implemented to further reduce the potential for fugitive dust emissions. Construction activities would have a negligible impact on the local air quality.	Alternative 1 would produce slightly higher air emissions than the proposed action because one additional concrete storage pad would be constructed; emissions associated with propellant storage and fueling would be identical.	Emissions from on-going, routine activities associated with the power plant, motor vehicles, aircraft operations, fuel storage tanks, open burning of trash at the base landfill, and incinerator emissions would continue. Air emissions associated with previously analyzed solid and liquid propellant target missile launches from Wake Island would continue; however, these impacts were determined to be not significant.	Cumulative impacts to air quality resulting from the proposed action would be similar to those described in the No Action alternative. Emissions from on-going base support activities and infrequent solid- and liquid-propellant missile launches would continue to be generated but the easterly trade winds that dominate the island throughout the year sweep these emissions away and prevent any accumulation. No cumulative impacts resulting from the proposed action are anticipated.

Exhibit 1: Summary of Environmental Impacts From the Proposed Action and Alternatives

Resource Area	Proposed Action	Alternative 1	No Action Alternative	Cumulative Impacts
Biological Resources	There would be few, if any, impacts to coral reefs resulting from a normal launch of a generic LPT missile. The missile would quickly leave the vicinity of Wake Island and continue on a ballistic trajectory until it is intercepted or until it falls into the broad ocean area. There is little potential to disturb nesting habitat during the minor construction activities that would occur to accommodate continued LPT missile testing at Wake Island because the proposed sites for the storage facilities have been previously disturbed and are situated within the fuel storage area. Although Federally protected, endangered species and designated critical habitat are known to exist at Wake Island, no significant impacts to such resources would occur from implementation of the proposed action.	Potential biological impacts under Alternative 1 would be the same as those analyzed under the Proposed Action. In both instances, there would be only a minor and temporary effect on biological resources.	No potential for impacts from generic LPT launches and, consequently, no changes in potential biological effects from those already analyzed in the WILC SEA.	Potential impacts to biological resources resulting from generic LPT activities would be similar than those documented in previous analyses. Considering the relative infrequency of missile launches from Wake Island, no cumulative impacts to biological resources from generic LPT activities would be expected. MDA would mitigate potential impacts from emissions to birds by hazing the birds prior to a test event. MDA would use hazing methods approved by the U. S. Fish and Wildlife Service for temporarily moving the birds away from launch activities.

Exhibit 1: Summary of Environmental Impacts From the Proposed Action and Alternatives

Resource Area	Proposed Action	Alternative 1	No Action Alternative	Cumulative Impacts
Cultural Resources	The proposed action involves only minor construction, minor trenching, and minimal ground disturbing activities. These activities would not impact the historical resources of the site. The use of equipment and vehicles during concrete pad construction is expected to have no significant impact on the island's cultural resources. This construction is limited in scope and would take place within the Wilkes Island fuel farm, a previously disturbed area. All personnel associated with construction and generic LPT test support activities would be briefed on procedures to follow in the unlikely event a cultural artifact was discovered.	Alternative 1 would have the same potential impacts as the proposed action.	Under the No Action alternative, no activities associated with generic LPT testing would take place. Impacts associated with previously documented missile testing and launching activities would continue. Those impacts were analyzed in previous documents and found to be not significant.	Construction activities associated with the proposed action would be short-term and confined to the Wilkes Island fuel farm area. Launch mishaps have a very low probability of occurrence. Appropriate SOPs would ensure safe mission support activities, no cumulative impacts to cultural resources would be expected.
Hazardous Materials / Waste	The potential increase in inhibited red-fuming nitric acid (IRFNA) at Wake Island would impact hazardous materials operations; however the implementation of hazardous material SOPs would help mitigate any potential adverse impacts. The small quantities of hazardous waste expected to be generated would not represent a significant increase in the amount of hazardous waste currently generated. No significant impacts from hazardous materials or wastes would be expected. All hazardous materials would be stored and handled in accordance with applicable laws and regulations. Any hazardous wastes generated would be shipped off the island for disposal through the current waste management system and in accordance with federal regulatory requirements.	Alternative 1 would have the same potential impacts as the proposed action.	No impacts from hazardous materials/wastes associated with activities supporting generic LPT fueling and launching would occur. Impacts associated with previously documented missile testing and launching activities would continue. Those impacts were analyzed in previous documents and found to be not significant.	The amount of hazardous materials used and/or hazardous wastes generated would be similar to that discussed in the WILC SEA. No new cumulative impacts from hazardous materials or hazardous waste would be expected.

Exhibit 1: Summary of Environmental Impacts From the Proposed Action and Alternatives

Resource Area	Proposed Action	Alternative 1	No Action Alternative	Cumulative Impacts
Health and Safety	No significant health and safety impacts would be expected to occur due to generic LPT activities at Wake Island. Concrete pad construction has the potential for construction-related accidents and injuries to the construction crew. A work site safety plan is required before any work project can begin to reduce potential risks to the health and safety of the construction crew. All employees would be notified of potential hazards associated with their work and they would be trained in proper use of any materials they would be handling. They would also be trained in the proper use of safety equipment and would conduct their activities in accordance with OSHA safety procedures and local guidance. Construction activities associated with the proposed action would be considered routine and no significant risks to health and safety would be anticipated. As a result, no significant impacts to health and safety would be expected due to construction activities.	Alternative 1 would have the same potential impacts to health and safety as the proposed action.	No impacts to health and safety associated with activities supporting generic LPT fueling and launching would occur. Impacts associated with previously documented missile testing and launching activities would continue. Those impacts were analyzed in previous documents and found to be not significant.	With appropriate worker training, SOPs, and oversight, no cumulative impacts to health and safety would be expected.

Exhibit 1: Summary of Environmental Impacts From the Proposed Action and Alternatives

Resource Area	Proposed Action	Alternative 1	No Action Alternative	Cumulative Impacts
Noise	Generic LPT noise levels would be expected to be the same as those used in the 1994 modeling: predicted maximum A-weighted sound pressure levels that would occur during a launch range from 120 decibels (dB) at the launch site to less than 100 dB on the western end of Wilkes and Peale Islands. These noise levels are not expected to adversely affect personnel at Wake Island since all personnel are excluded from the launch area and would be protected from any adverse noise impacts. Consequently, there would be no significant impacts from generic LPT launch noise. Noise associated with the construction of the concrete storage pads would result from the use of vehicles and equipment. With the high ambient noise levels from wind and surf, however, the additional noise generated by construction activities would be negligible.	Alternative 1 would have the same potential impacts from noise as the proposed action.	No impacts from noise associated with activities supporting generic LPT fueling and launching would occur. Impacts associated with previously documented missile testing and launching activities would continue. Those impacts were analyzed in previous documents and found to be not significant.	Noise resulting from construction activities would occur for about 30 days. Vehicles and equipment supporting the construction would be used for only a portion of the 30-day period and the noise level would not be significantly greater than ambient noise levels. No cumulative impacts from construction noise would be expected.
Transportation	The repaved runway can handle the current mix of scheduled and unscheduled flights. No adverse impacts to transportation would be expected from generic LPT missile activities. Runway repaving and rehabilitation of the causeway between Wake Island and Wilkes Island have maintained or improved transportation capabilities.	Alternative 1 would have the same impacts to transportation as the proposed action.	No impacts to transportation from activities supporting generic LPT fueling and launching would occur. Transportation impacts associated with previously documented missile test and launch activities would continue. Those impacts were analyzed in previous documents and found to be not significant.	The number or frequency of missile launches at Wake Island would not change. Previous analyses of these launches indicated no cumulative impacts to transportation were expected. No cumulative impacts to transportation from activities associated with generic LPT launches would be expected.

Cumulative Impacts

No other projects in the region of influence have been identified that would have the potential for incremental, additive cumulative impacts to air quality, biological resources, cultural resources, hazardous materials/waste, health and safety, noise, and transportation resources in the region of influence.

PUBLIC COMMENT: The MDA published a Notice of Availability for public review and comment in the Marshall Islands Journal and the Kwajalein Hourglass on December 15, 2006, initiating a 30-day review period that ended on January 16, 2007. The MDA made copies of the EA and Draft FONSI available in the Majuro Public Library and the Grace Sherwood Library. The MDA also established an e-mail address to receive comments.

POINT OF CONTACT: Requests for a copy of the Wake Island Supplemental Environmental Assessment should be sent to:

Department of Defense
Missile Defense Agency
7100 Defense Pentagon
Washington, DC 20301-7100
Attn: DTR/Environmental

Electronic requests can be sent to EnvGrp@mda.mil.

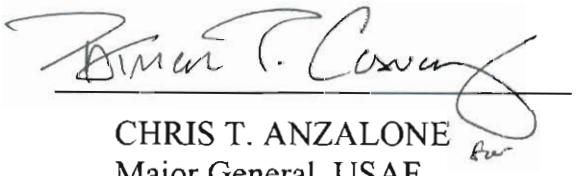
CONCLUSION: The environmental analysis shows that no significant short-term or long-term impacts would occur from the proposed action. After consideration of the facts herein, the undersigned finds that the proposed Federal action is consistent with existing national environmental policies and objectives set forth in Section 101(a) of NEPA and would not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 102(2)(c) of NEPA. Therefore, an Environmental Impact Statement for the proposed action is not required.

WAKE ISLAND
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

AGENCY: Missile Defense Agency

ACTION: Finding of No Significant Impact

APPROVED:



CHRIS T. ANZALONE
Major General, USAF
Deputy for Test, Integration,
and Fielding

Apr 9, 2007

DATE

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List of Exhibits

ABBREVIATIONS & ACRONYMS

ABL	Airborne Laser
ARS	Active Ranging System
BILL	Beacon Illuminator Radar
BMDS	Ballistic Missile Defense System
CARB	California Air Resources Board
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CITES	Convention for the International Trade of Endangered Species
CO	Carbon Monoxide
CONEX	Cargo Container
dB	Decibel
DoD	Department of Defense
DOT	Department of Transportation
EA	Environmental Assessment
EHS	Extremely Hazardous Substance
EIS	Environmental Impact Statement
EO	Executive Order
GBR-P	Ground Based Radar – Prototype
GHLE	Ground Handling and Launch Equipment
HALO	High-Altitude Observatory
IRFNA	Inhibited Red Fuming Nitric Acid
IRST	Infrared Search and Track
LHA	Launch-Hazard Area
LPT	Liquid-Propellant Target
MAB	Missile Assembly Building
MBTA	Migratory Bird Treaty Act
MDA	Missile Defense Agency
MMPA	Marine Mammal Protection Act
NAAQS	National Ambiant Air Quality Standards
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
OSHA	Occupational Safety and Health Administration
SBX	Sea-Based X-Band Radar
SEA	Supplemental Environmental Assessment
SHEL	Surrogate High Energy Laser
SOP	Standard Operating Procedure
TILL	Track Illuminator Laser
TSCREEN	Toxics Screening Model
U.S.C.	United States Code
USAKA	U.S. Army Kwajalein Atoll
USASMDC	U.S. Army Space and Missile Defense Command

USASSDC	U.S. Army Space and Strategic Defense Command
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Services
WILC	Wake Island Launch Center
WWII	World War II

1 INTRODUCTION

The National Environmental Policy Act (NEPA) of 1969, as amended; the Council on Environmental Quality (CEQ) regulations that implement NEPA (Code of Federal Regulations [CFR], Title 40, Parts 1500-1508); Department of Defense (DoD) Instruction 4715.9 *Environmental Planning and Analysis*; applicable Service environmental regulations that implement these laws and regulations; and Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions* (whose implementation is guided by NEPA and the CEQ implementing regulations) direct DoD lead agency officials to consider potential impacts to the environment prior to authorizing or approving Federal actions.

The Missile Defense Agency (MDA) prepared this Supplemental EA (SEA) to update the analysis of liquid propellant target (LPT) missile launches and supporting activities at Wake Island described and analyzed in the *Wake Island Launch Center (WILC) SEA* (U.S. Army Space and Missile Command, 1999) which is incorporated by reference, and serves as a planning tool to assist MDA in meeting its mission objectives. The WILC SEA analyzes launching up to 20 LPTs over a ten-year period. Radar use, flight tests, and missile intercepts were analyzed in the *Wake Island EA* (U.S. Army Space and Strategic Defense Command (USASSDC), 1994) and the *Supplemental Environmental Impact Statement for Proposed Actions at the U.S. Army Kwajalein Atoll* (USASSDC, 1993). Launching an interceptor missile from a ship to intercept target missiles was analyzed in the *Pacific Missile Range Facility Enhanced Capability Environmental Impact Statement*, December 1998. The location and use of mobile sensors was analyzed in the *Mobile Sensors Environmental Assessment* (MDA, 2005), the *Final Airborne Laser Supplemental Environmental Impact Statement* (June 2003), the *Ground Based Midcourse Extended Test Range Environmental Impact Statement* (February 2003), and the Pacific Missile Range Facility Enhanced Capability EIS (December 1998). The above NEPA analyses and their impact determinations are referenced and summarized as appropriate in this document. These documents are available for review on MDA's website at: http://www.mda.mil/mdalink/html/enviro.html.

1.1 Background

Wake Island (also known as Wake Atoll) is a coral atoll in the North Pacific Ocean, located about 3,950 kilometers (or 2,460 miles) west of Hawaii and 2,560 kilometers (1,590 miles) east of Guam. The "V" shaped atoll has approximately 739 hectares (1,826 acres) of dry land mass and 40 kilometers (25 miles) of coast line, and is surrounded by a barrier reef. Wake Island is an unorganized, unincorporated territory of the United States, part of the United States Minor Outlying Islands, administered by the Office of Insular Affairs, U.S. Department of the Interior. Access to the island is restricted and all current activities on the island are managed by the United States Air Force and a civilian base operations and maintenance services company. Wake Island was designated as a

National Historic Landmark because of events which occurred during World War II (WWII).

1.2 Purpose and Need

The MDA has a requirement to develop, test, deploy, and prepare for decommissioning a Ballistic Missile Defense System (BMDS) to provide a defensive capability for the U.S., its deployed forces, friends, and allies from ballistic missile threats. The proposed action would allow Missile Defense Agency (MDA) to consider and characterize a wider range of threat-representative targets, and conduct more realistic testing of missile defenses.

1.3 Scope of Analysis

This SEA analyzes potential changes to the proposed action discussed in the WILC SEA. The present analysis only considers those resource areas that have the potential for impact resulting from the proposed changes. For the reasons discussed below, the following resource areas are not assessed further in this SEA.

- Airspace – This resource was analyzed in Sections 3.2 and 4.1.2 of the WILC SEA, incorporated by reference. The proposed changes do not alter previously assessed flight corridors or add more flight tests. No impact on airspace will result from the proposed action or alternatives.

- Infrastructure – This resource was analyzed in Sections 3.7 and 4.1.7 of the WILC SEA, incorporated by reference. Wake Island infrastructure was designed for a much larger population than is currently present or anticipated. The proposed action and alternatives will not require additional personnel or overburden existing infrastructure. No impact is anticipated.

- Land Use – This resource area was analyzed in Sections 3.8 and 4.1.8 of the WILC SEA, incorporated by reference. Neither the proposed action nor alternatives are inconsistent with current land use practices, policies, or controls for Wake Island. No impacts on current land use patterns would result from the proposed action or alternatives.

- Physical Resources – Potential environmental consequences of activities associated with launching LPTs were discussed in Sections 3.10 and 4.1.10 of the WILC SEA, incorporated by reference. The proposed construction activities would occur entirely within previously developed/disturbed land. No changes to the physical landscape will result from the proposed action.

- Socioeconomic – The potential effects from activities associated with LPT launches were discussed and analyzed in sections 3.11 and 4.11 of the WILC SEA, incorporated by reference. No additional personnel or changes to the local economy or demographics will result from the proposed action. No impact on socioeconomic resources will result.

- Water – Sections 3.12 and 4.1.12 of the WILC SEA, incorporated by reference, discuss and analyze potential impacts on water resources resulting from LPT launch related activities. The proposed action will not require increased water usage or cause any changes to ground, surface or potable water on Wake Atoll. No impact on water resources will result from the proposed action.

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2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

MDA proposes the following actions:

- Use of a generic LPTs based on the LPT described in the WILC SEA. [Section 2.1]

- Construction of two new concrete pads in an existing fuel storage area on which liquid propellant storage containers or general supplies would be placed. [Section 2.2]

- Expansion of existing sensor suite to include additional air-, land-, and sea-based sensors. [Section 2.5]

With the exception of these actions and alternatives further described below, MDA's proposed action is the same as the Description of Proposed Action and Alternatives presented in Section 2 of the WILC SEA.

2.1 Generic LPT Missile

To facilitate realistic test planning and to respond to the evolving ballistic missile threat, MDA proposes using a generic LPT based on the LPT described in the WILC SEA. The generic LPT would be a single-stage, liquid-fueled missile. The most likely payload would be instrumentation to facilitate test data collection.

As discussed in the WILC SEA, liquid propellant target missile emissions contain carbon monoxide (CO), a criteria pollutant under the Clean Air Act for which National Ambient Air Quality Standards (NAAQS), have been established by the U.S. Environmental Protection Agency (USEPA). MDA used a USEPA-developed air quality model to calculate the amount of propellant that would result in CO emissions that would reach the CO limit under the NAAQS. Using conservative assumptions about emissions and the NAAQS emission thresholds, MDA calculated the following generic LPT propellant budget that served as a basis for the analysis of impacts (see Exhibit 2-1). This approach and analysis are detailed in Section 4.1.

Exhibit 2-1. Generic LPT Propellant Budget

Compound	Components	Approximate Weight in kilograms (pounds)
Main Fuel	60 percent coal tar distillate, 40 percent kerosene	3,400 (7,500)
Oxidizer	100 percent inhibited red fuming nitric acid (IRFNA)	12,000 (26,500)
Initiator Fuel	50 percent triethylamine, 50 percent dimethylaniline	120 (270)
	Total:	15,520 (34,270)

Source: MDA emission modeling 2006; adapted from USASMDC, 1999.

2.2 Concrete Storage Pads

MDA proposes to construct two 6.1 meter by 15.2 meter (20 foot by 50 foot) concrete storage pads in previously disturbed areas in the Wilkes Island fuel farm area (see Exhibit 2-2). The pads would be used for temporary storage of liquid propellant to support LPT launch missions and for general storage at other times. Total ground disturbance would be approximately 464 square meters (5,000 square feet) or 0.05 hectares (0.15 acres). The depth of ground disturbance would approach 26 inches for the pads and up to 36 inches for drain lines and grounding wires. All fill material would be used onsite for grading. The concrete surfaces of the storage pads would be coated with several layers of polyester resin primer to provide an impervious surface. The pad design would include

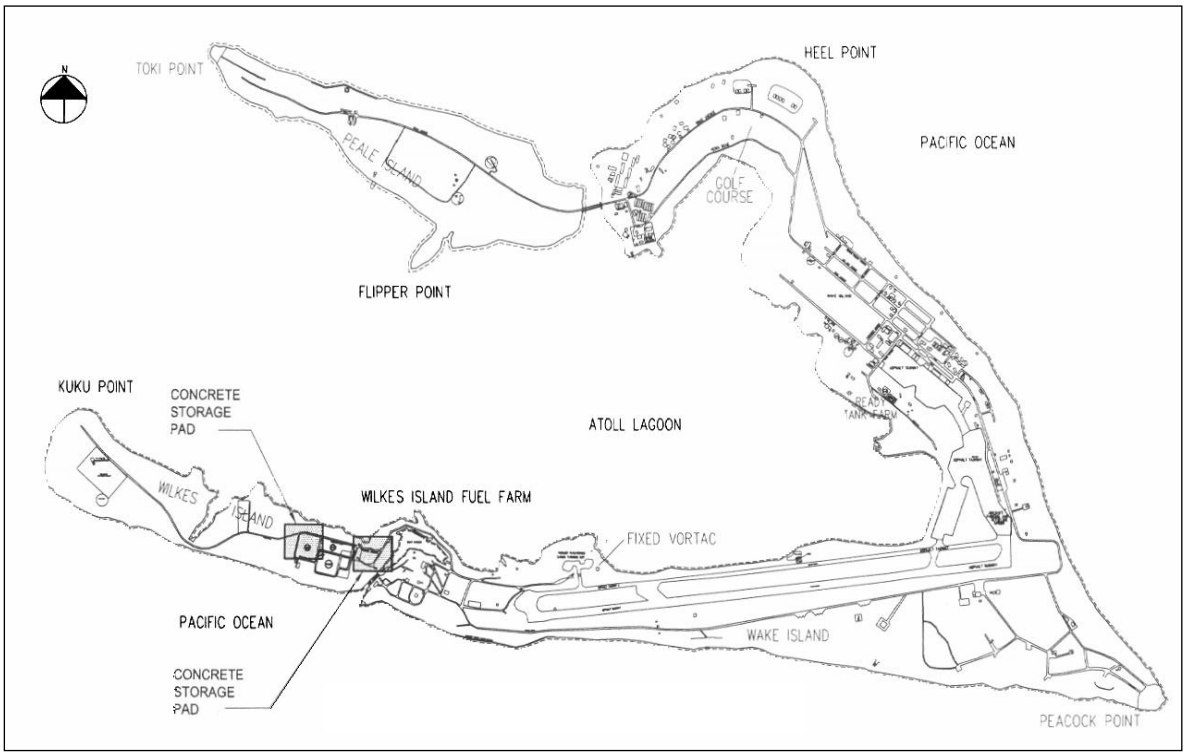


Exhibit 2-2. Proposed Location of Concrete Storage Pads

lighting protection, grounding points, and secondary containment (as well as drain covers that can be bolted into place) to minimize the impacts of leaks or accidental spills and a drain and shut-off valve to manage rainwater. Construction of these pads would eliminate the need to establish temporary liquid propellant storage areas as described in the WILC SEA for future LPT test events.

2.3 Propellant Storage and LPT Fueling Activities

As shown in Exhibit 2-1 above, the generic LPT propellant is composed of a main fuel, an oxidizer, and an initiator fuel. The main fuel and oxidizer would be stored in containers on concrete pads until needed for missile fueling operations. Initiator fuel would be stored in Department of Transportation (DOT)-approved overpack drums with a storage capacity up to 305 liters (80 gallons). The drums would be placed in a single layer in a secured CONEX container with secondary containment.

Exhibit 2-3 shows the preferred locations for propellant storage and fueling activities. The preferred oxidizer storage site is located on Wilkes Island north east of Bldg 1812. This oxidizer storage location would offer easy access by trucks and forklifts and would

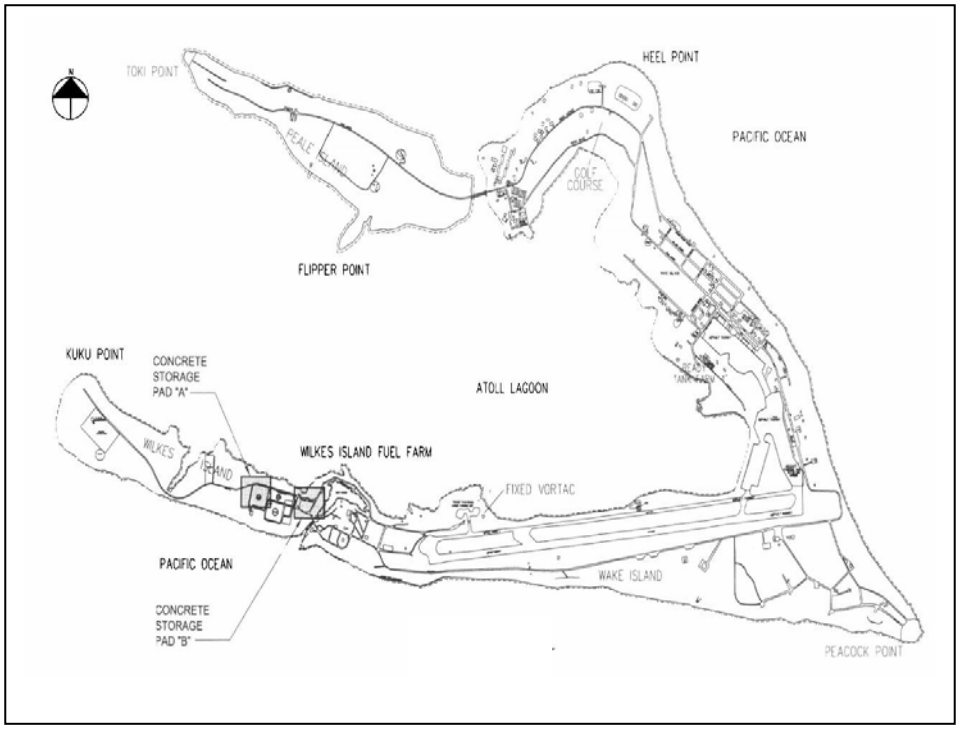
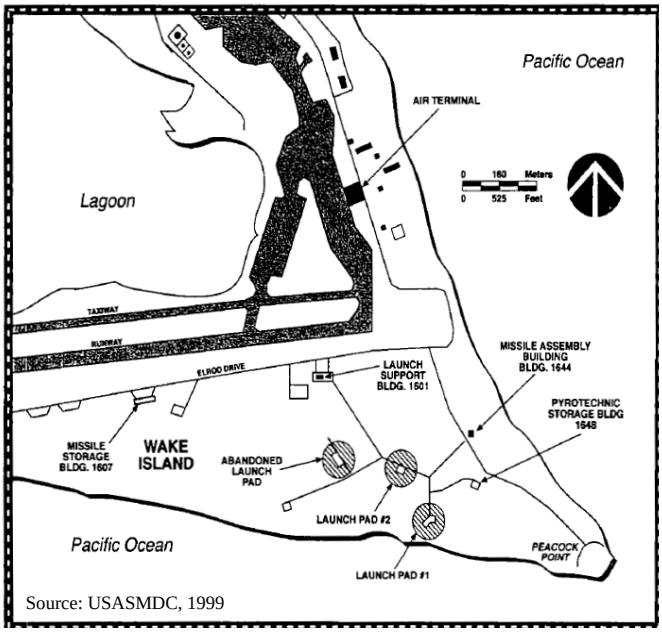


Exhibit 2-3. Preferred Propellant Storage and Fueling Sites

be located on one of the new 6 meter by 15 meter (20 foot by 50 foot) concrete storage pads. Proposed storage sites would be carefully surveyed for any nesting birds prior to any construction activity and work would not begin until a biological specialist provides instruction on how to proceed if a nest was encountered.

The preferred fuel storage site is located west of the existing JP-5 storage tanks and near an existing dirt road. This fuel storage location would offer easy access by trucks and forklifts and would be located on the other new 6 meter by 15 meter (20 foot by 50 foot) concrete storage pad described above. The preferred initiator fuel storage site is located near Peacock Point adjacent to Launch Pad 1. The initiator fuel storage site would be located on an existing pad and would require no additional work. Existing lightning protection and grounding points would be checked for compliance before first use.

The preferred fueling site would be at Launch Pad 2. Existing spill response plans and liquid fuel transport and handling plans would be reviewed to ensure personnel are trained in the standard operating procedures (SOPs) and adequate safety and contingency measures are in place for this procedure. Temporary spill containment would be in place for all fueling operations. After propellant loading, the missile would be repositioned and erected at Launch Pad 2 (see Exhibit 2-4).



Source: USASMDC, 1999

Exhibit 2-4. Missile Launch Complex

All personnel involved in these operations would wear appropriate protective clothing and would receive specialized training in SOPs for liquid propellant safety, handling, spill containment, and cleanup procedures prior to handling the materials. Depending on the fueling equipment used, it is anticipated that only very small amounts (approximately 10 grams or 0.4 ounces) of oxidizer vapors would be released to the atmosphere during the oxidizer transfer operation. A negligible amount of fuel vapors would also be released into the atmosphere during fuel transfers.

After completion of the transfer operations, the oxidizer transfer system would be flushed with water. This operation is expected to yield approximately 5 grams (0.2 ounces) of nitric oxide gas that would be released into the atmosphere, and 208 liters (55 gallons) of a mild nitric acid solution (~0.05 percent) that would be collected, packaged, and shipped off site for disposal per applicable regulations. The main fuel and initiator fuel transfer systems would be flushed with 208 liters (55 gallons) of ethyl alcohol, and the waste alcohol (with approximately 40 grams [1.4 ounces] of fuel in solution) would be collected, packaged, and shipped off site for disposal per applicable regulations.

2.4 LPT Launch Activities

After being fueled and repositioned at Launch Pad 2, the target would be elevated for launch. Launch activities would be controlled from the Launch Command Center. The target would most likely follow a flight trajectory from Wake Island in a southerly direction toward Kwajalein Atoll, impacting between Wake Island and Kwajalein Atoll in the broad ocean area.

If a flight test was planned to include a target missile intercept, the interceptor would be launched from a ship or other missile launch platform in the broad ocean area. Target and interceptor trajectories would be planned so that the missile intercept point and allowable debris and impact areas would be in the broad ocean area outside of the territorial waters of the Republic of the Marshall Islands. Target and defensive missile flight azimuths and test profiles would be designed so that no debris exceeding applicable DoD risk standards for debris[1] would fall on Kwajalein or any other land mass as a result of nominal flight tests.

The potential environmental impacts resulting from the operation of the AN/SPY-1 radar and intercept of a target in the broad ocean area were analyzed in the Pacific Missile Range Facility Enhanced Capability EIS. As the operating environments are identical (broad Pacific Ocean) and no significant impacts were found, the proposed operation of the AN/SPY-1 radar and potential intercept of the generic LPT is not discussed further in this document.

2.5 Sensors

MDA proposes to expand the existing suite of sensors previously analyzed in the WILC SEA to include the High Altitude Observatory (HALO), an airborne sensor; the Ground Based Radar-Prototype (GBR-P) at USAKA/RTS; Infrared Search and Track (IRST) sensors aboard the Airborne Laser aircraft; Sea-Based X-Band Radar (SBX); and the AN/SPY-1 radar. Each of these sensors is described below.

2.5.1 HALO

HALO consists of two sensor suites, HALO-I and HALO-II, housed in modified Gulfstream IIB aircraft that operate at altitudes up to 13,716 meters (45,000 feet). HALO-I contains multiple user customizable sensors for collecting radiometric imagery, spectra, and signatures. It collects infrared data for high-speed visible and infrared photo documentation.

The HALO-II system consists of a set of five subsystems that provide integrated data collection that includes pointing, acquisition, tracking, a real-time processor, and

[1] Range Commanders Council Standard 321-02, June 2002.

surveillance processor subsystems. The sensors provide integrated data collections and include six cameras, other equipment that can provide real-time, and surveillance processing in the cabin.

The potential environmental impacts resulting from the operation of HALO (I and II sensor suites) in the broad ocean area were analyzed in the *Mobile Sensors Environmental Assessment and Finding of No Significant Impact* (MDA 2005). As the operating environments are identical (broad Pacific Ocean) and no significant impacts were found, the proposed operation of the HALO to characterize the generic LPT is not considered further in this document.

2.5.2 GBR-P

The Ground Based Radar-Prototype (GBR-P) radar is located at USAKA/RTS and is an X-band, mechanically slewed, single faced phased array radar fire control sensor which provides the precision discrimination and interceptor fire control support to the BMDS. Sources of electromagnetic radiation at RTS and the mechanisms used to ensure the safety of personnel and to prevent interference are described in the *Final Ground-Based Radar (GBR) Family of Radars Environmental Assessment and Finding of No Significant Impact* (U.S. Army Program Executive Office Missile Defense, 1993). Since the operation of GBR in accordance with the mechanisms described in the GBR EA and FONSI was determined to result in no significant impacts to the human environment, the proposed operation of GBR-P to track the generic LPT is not considered further in this document.

2.5.3 Airborne Laser

The Airborne Laser's (ABL) detection, tracking, and communications capability could be used to support testing activities near WILC. The ABL could be used to engage targets of opportunity, using the passive Infrared Search and Track (IRST) system, Active Ranging System laser (ARS), Track Illuminator Laser (TILL), Beacon Illuminator Laser (BILL), or Surrogate High-Energy Laser (SHEL).

The ARS is a lower-power carbon dioxide (CO_2) laser which assesses the range to targets. The TILL is a lower-power, diode-pumped, solid-state device which tracks intended targets. The BILL is a lower-power, diode-pumped, solid-state device. It is part of a laser-beam control system designed to focus the HEL beam on target. The SHEL is a lower-power laser designed to simulate the operating characteristics (wave length) of the High Energy Laser (HEL).

These ABL systems would be used to detect, track, and monitor BMDS testing activities and in addition, the HEL may be used in a test as MDA desires to support BMDS objectives provided that other environmental analysis has been completed. Any laser engagements would occur at altitudes above 35,000 feet; therefore, public exposure to

hazardous levels of direct laser energy would be eliminated. The potential environmental impacts resulting from the operation the ABL sensors systems in the broad ocean area were analyzed in the *Final Airborne Laser Supplemental Environmental Impact Statement* (June 2003). As the operating environments are similar (testing over the Pacific Ocean at altitudes above 35,000 feet) and no mitigation measures were determined to be required in the Supplemental EIS, the proposed operation of the ABL to characterize the generic LPT is not considered further in this document.

2.5.4 Sea-Based X-Band Radar

The Sea-Based X-Band Radar (SBX) is a multifunction radar that would perform tracking, discrimination, and kill assessments of target missiles. The SBX is made up of a seagoing platform on which an XBR has been mounted. The SBX may support WILC testing activities from its home port of Adak, AK or from a mid-Pacific Ocean operating location.

The XBR transmit/receive radiofrequency (RF) emission pattern is a narrow beam (several meters diameter at 25 kilometers [15.5 miles]) with most of the energy contained within the main beam. At no time would the main beam be directed at the ground or water surface. The main beam would have a lower limit of 10 degrees above horizontal for calibration and maintenance testing. The side lobes that reach the ground would be far removed from the main beam and would not contain sufficient energy to present any type of RF emission hazard. The main beam would not remain stationary for any period of time, and software controls would not allow a full power beam to come in contact with any personnel, on the platform or on land. Additionally, before operation of the XBR during individual tests, the FAA would provide notice to affected airports and aircraft through a Notice to Airmen (NOTAM). The potential environmental impacts resulting from the operation of the SBX in the broad ocean area were analyzed in the *Ground Based Midcourse Extended Test Range Environmental Impact Statement* (February 2003). The result of the analysis is that no mitigation measures were proposed for any of the resource areas analyzed. Since the operating environments are identical (broad Pacific Ocean) and no mitigation measures were found to be necessary, the proposed operation of the SBX to detect and track the generic LPT is not considered further in this document.

2.5.5 AN/SPY-1

The AN/SPY-1 is an S-band multi-function phased array radar system that is capable of search, automatic detection, transition to track, tracking of air and surface targets, and missile engagement support.

The potential environmental impacts resulting from the operation of the AN/SPY-1 radar in the broad ocean area were analyzed in the Pacific Missile Range Facility Enhanced Capability EIS. The result of the analysis is that no mitigations measures were proposed for any of the resource areas analyzed. Since the operating environments are identical (broad Pacific Ocean) and no mitigation measures were found to be necessary, the proposed operation of the AN/SPY-1 radar to detect and track the generic LPT and provide missile engagement support for potential test events involving an interceptor missile launched from a ship or other missile launch platform in the broad ocean area is not considered further in this document.

2.6 Alternative to the Proposed Action

An alternative to the proposed action described above would be to temporarily store liquid propellants and perform LPT fueling operations in the main fuel area on Wilkes Island (see general location on Exhibit 2-4). In this alternative, two concrete storage pads and a concrete fueling pad would be constructed on Wilkes Island in an open area to the east of Building 1812 (see Exhibit 2-6). The concrete storage pads would be the same size and have the same features as those described in Section 2.2 above. Main fuel and initiator fuel would be stored on the concrete pad closest to Building 1812 and oxidizer would be stored on the concrete pad further to the east.

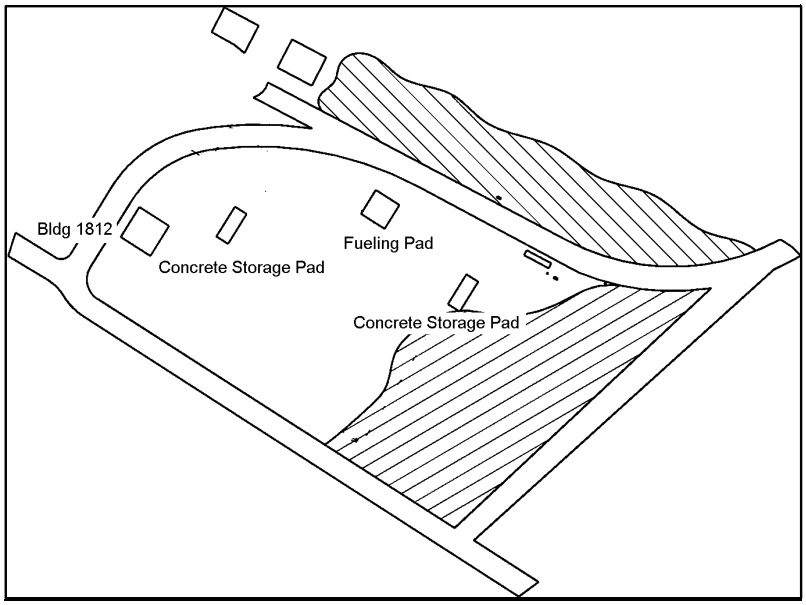


Exhibit 2-5. Alternative Propellant Storage and Fueling Pad Locations

The fueling pad would be a 12.2 meter by 12.2 meter (40 foot by 40 foot) concrete pad. For fueling SOPs, the generic LPT missile would be moved from the MAB to the fueling site. Propellant containers would be moved from the fuel and oxidizer storage sites to the fueling site by truck. Initiator fuel containers would be moved to the fueling site by forklift. Temporary spill containment would be in place for all fueling operations. After

fueling, the missile would be moved to Launch Pad 2. Fuel handling SOPs would be conducted as described in the preferred alternative.

2.7 No Action Alternative

Under the No Action Alternative, MDA would not proceed with generic LPT missile testing activities. Flight test information for generic LPT missiles needed for the development of BMDS sensors, interceptors, and technology would not be collected from flight test activities at Wake Island. New concrete storage pads would not be constructed. Previously analyzed flight test activities involving LPT missiles fueled and launched from Wake Island, as documented in the WILC SEA and other applicable environmental documents, would continue as originally planned.

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3 AFFECTED ENVIRONMENT

A number of the resource areas discussed in this SEA remain essentially unchanged since the WILC SEA was completed or, as previously discussed, are unlikely to be affected by implementing the proposed action and therefore have not been analyzed further. The affected environment evaluated in this SEA includes: air quality, biological resources, cultural resources, hazardous materials/waste, health and safety, noise, and transportation.

Much of the information in this chapter is drawn from the Affected Environment chapter of the *Wake Island EA* (USASSDC, 1994) and the WILC SEA. Pertinent new information has been added where the affected environment has changed or where updated data were available. Detailed background information presented in the previous assessments has been incorporated by reference and not reproduced here.

3.1 Air Quality

Existing air quality conditions that would be affected by LPT launches were discussed in Section 3.1 of the WILC SEA, incorporated by reference. A review of that discussion showed that it is still accurate and circumstances and conditions have not changed in a manner as to require additional detailed discussion of existing conditions. An abbreviated description of existing conditions is included below and potential impacts from the proposed action are assessed in Section 4 of this SEA.

3.1.1 Climate

The climate at Wake Island affects the dispersion of air pollutants and the resulting air quality. The climate is maritime and chiefly controlled by the easterly trade winds, which dominate the island throughout the year. The winds blow steadily every month of the year with very little variation. The yearly average wind speed is 22.2 kilometers (13.8 miles) per hour.

3.1.2 Existing Conditions

The Wake Atoll is within the jurisdiction of USEPA Region 9. There is no ambient air quality monitoring data for Wake Atoll, and there are no evident air pollution problems because the strong trade winds quickly disperse any local emissions. Furthermore, because there are no other islands within several hundred miles of Wake Atoll, there are no nearby sources from which Wake Atoll would receive air pollutants, and there are no nearby communities that could be affected by air pollutants from emissions generated at Wake Atoll.

The principal pollutant emission sources are the power plant, motor vehicles, aircraft operations, fuel storage tanks, open burning of trash at the base landfill, incinerator

emissions, and infrequent rocket launches. None of the emission sources at Wake Atoll meet the threshold for Title V permitting under the Clean Air Act, and no ambient air quality standards have been exceeded. (*Wake Island Master Plan, Long Range Component*, USASMDC 2000, as cited in the *Theater High Altitude Air Defense Pacific Test Flights Environmental Assessment*, USASMDC, 2002a)

3.2 Biological Resources

The Wake Atoll is a biologically diverse group of islands that includes insects, arthropods, small mammals, marine mammals, over 30 species of birds and over 200 species of plants. A comprehensive review of biological resources is provided in Section 3.0 of the WILC SEA and is not repeated here. A draft terrestrial survey and marine survey, both conducted in 1998 can be found in Appendices B and C, respectively, of the WILC SEA. The remainder of this section provides a summary of biological resources at Wake Island and focuses on threatened and endangered species, pursuant to the Endangered Species Act of 1972.

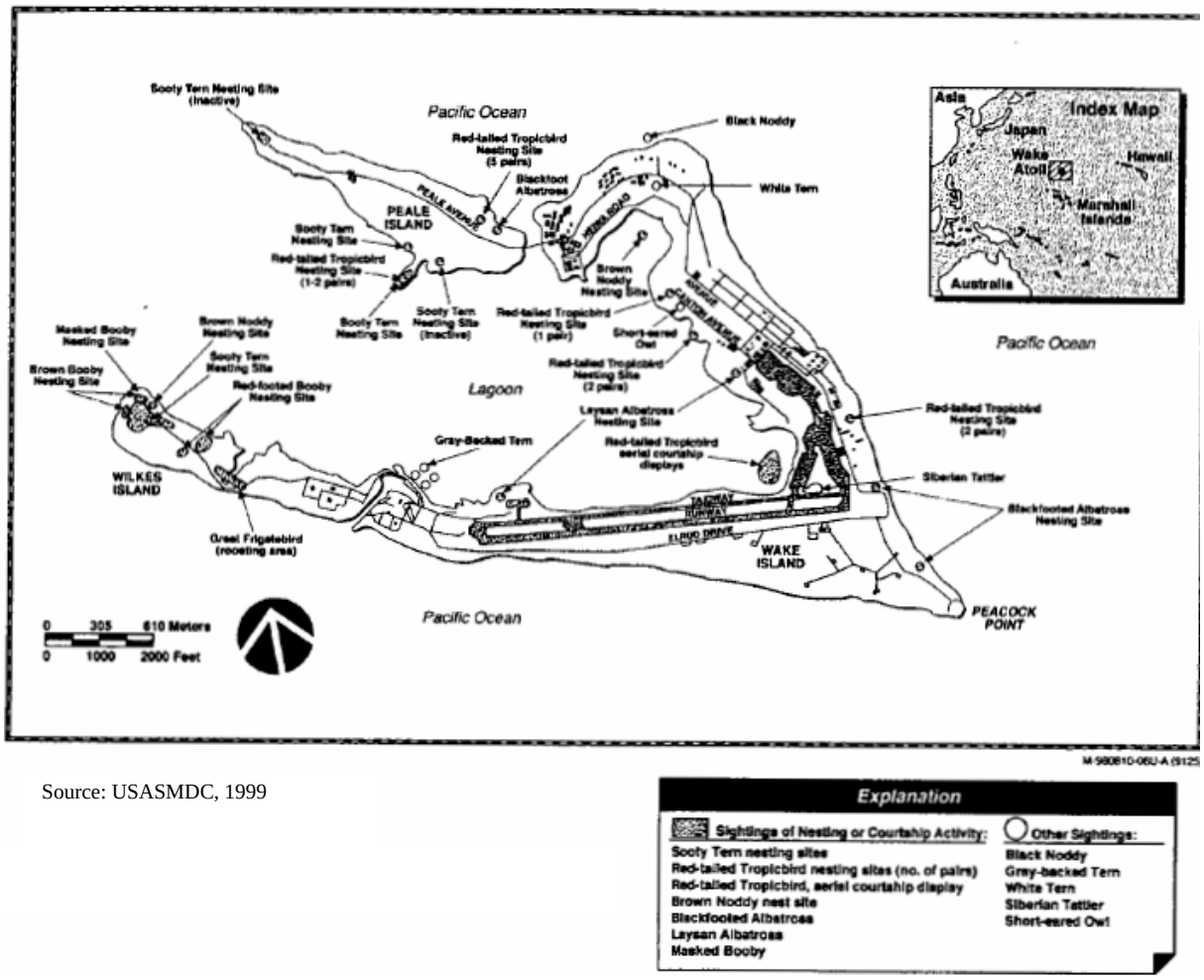
3.2.1 Coral Reefs

Coral reefs off the coast of Wake Island are protected under E.O. 13089, Coral Reef Protection, which requires Federal agencies to "identify their actions that may affect U.S. coral reef ecosystems; utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems."

3.2.2 Wildlife

More than 30 species of birds encountered at Wake Atoll have been described in other reports. Taken together, these accounts include resident species, migrants, visitors, vagrants, accidentals, and exotics. Included among these 32 bird species are 15 species of seabirds, 9 species of shorebirds, 4 species of land birds, and 3 species of waterbirds. Of these 32 species, 30 species are considered indigenous and 2 species (the domestic chicken and the domestic pigeon) are exotic. All seabirds present on the island, except for tropic birds, are conspicuous nesters that lay their eggs in the open, either on bare ground or exposed in shrubs or small trees. Exhibit 3-1 depicts general areas of known bird sitings and nesting areas. A population of albatrosses, either nascent or remnant, returns to Wake Island each year in November for the courtship and nesting season. Over the 1997-98 winter season, five individual black-footed albatross and three individual Laysan albatross over-wintered at Wake Island, nesting and displaying courtship behavior. Atoll residents reported observing several Laysan albatross nests on Wake Island. (Scott Sweistal, pers.comm. 2006)

Exhibit 3-1. Location Map Bird Sitings



Source: USASMDC, 1999

3.2.3 Marine Resources

During the 1998 marine biological survey, a total of 122 species of reef fish, 41 species of corals, 39 species of other macroinvertebrates, and 19 species of macroalgae were recorded at Wake Atoll. Undoubtedly, many more species among all groups are present at the atoll but not yet cataloged. The lagoon supports a large population of fish and the surrounding reefs host a diverse assemblage of reef fish. Nearshore fish important for food and recreational purposes include groupers (*Cephalapholis argus*), porgy *(Monotaxis grandoculis*), and jacks (*Carangidae*). Sharks are abundant.

Marine mammals are protected under the Marine Mammal Protection Act (MMPA) of 1972 and may occur in the open ocean area surrounding Wake Atoll and between Wake and Kwajalein Atolls. Marine mammals that may be present include several species of cetaceans: the Blue whale (*Balaenoptera musculus)*, the Finback whale (*Balaenoptera physalus*), the Humpback whale (*Megaptera novaeangliae*), Cuvier's beaked whale (*Ziphius cavirostris*), and the Sperm whale (*Physeter catodon*). Bottlenose *(Jursiops*

t*runcatus*) and Spinner dolphins (*Stenella longirostris*) may also be present around Wake Atoll. Hawaiian monk seals (*Monachus schauinsland*) have also previously been sighted at Wake Island on occasion.

3.2.4 Federally Protected and Threatened/Endangered Species

Federally listed threatened and endangered species with potential to occur on Wake Island are listed in Exhibit 3-2. This exhibit shows data taken directly from USFWS data updated in August 2005, as well as earlier environmental documents which indicate that sea turtles may be found at Wake Island.

The Federally threatened Green sea turtle (*Chelonia mydas*) was observed multiple times in the near shore ocean and lagoon waters at Wake Atoll during the 1998 terrestrial survey. Shoreline basking and nesting activity, the only terrestrially-based behaviors of this otherwise marine species, were neither observed during the investigation nor reported in the literature as having been observed at Wake Island. It is possible however, that Green sea turtles might haul out along the southern shoreline of the atoll since the slope of the shoreline is not steep and offers limited basking opportunities.

The Federally endangered Hawksbill sea turtle (*Eretmochelys irnbricata*) has been suspected to occur at Wake Atoll (*Transfer and Reuse of Wake Island Airfield*, Hickam AFB, HI as cited in USASMDC, 1999); however, no records or accounts of confirmed sightings could be found in the literature reviewed. No observations of Hawksbill sea turtles were recorded at Wake Atoll during the 1998 marine survey, although a joint NMFS and USFWS Recovery Plan for U.S. Pacific populations of the green turtle noted that the unincorporated Pacific islands "all probably provide marine feeding grounds for green and perhaps hawksbill turtles."[2]

[2] National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1998. Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*), National Marine Fisheries Service, Silver Spring, MD, p. 26.

Exhibit 3-2. Federally Listed Threatened and Endangered Species with the Potential to Occur in the Vicinity of Wake Island

Species	Federal Status	Comments
Birds		
Warbler, nightingale reed; Gaga karisu *(Acrocephalus luscinia)*	Endangered	Possibly Extinct on Wake Island
Swiftlet, Guam; Yayaguak *(Collecalia bartschi)*	Endangered	
Crow, Mariana; Aga *(Corvus kubaryi)*	Endangered	(Critical Habitat designated)
Moorhen, Mariana; Pulattat *(Gallinula chloropus guami)*	Endangered	
Kingfisher, Micronesian; Sihek *(Halcyon cinnamomina cinnamomina)*	Endangered	Critical Habitat designated
Turtles		
Green sea turtle (Chelonia Mydas)	Threatened	
Hawksbill sea turtle (*Eretmochelys imbricate)*	Endangered	
Leatherback sea turtle (*Dermochelys coriacea)*	Endangered	
Loggerhead sea turtle *(Caretta caretta)*	Threatened	

Source (Birds): USFWS, Pacific Islands (excluding Hawaii) Plants and Animals: Listed, Proposed, or Candidate Species, as designated under the U.S. Endangered Species Act, updated August 29, 2005
http://www.fws.gov/pacificislands/wesa/pacificislandslisting.pdf
Source (Turtles): Adapted from USASMDC, 2002a

The Giant clam (*Tridacna maxima*) is commonly found in the near shore waters surrounding Wake Atoll. *T. maxima* is currently afforded Federal protection under the Convention for the International Trade of Endangered Species (CITES).

Other Federally protected terrestrial biota at Wake Atoll includes migratory seabirds, shorebirds, and occasional vagrant waterbirds. These birds are identified as "migratory" and are protected under the Migratory Bird Treaty Act (MBTA) of 1916 (16 U.S.C. 703-712). Birds known to occur at Wake Atoll and protected under the MBTA include the Black-footed albatross (*Diomedea nigripes*), Laysan albatross (*Diomedea immutabilis*), Brown booby (Sula leucogaster), Masked booby (*Sula dactylatra*), Red-footed booby (*Sula sula*), Bristle-thighed curlew (Numenius tahitiensis), Great frigatebird (*Fregata minor*), Lesser golden-plover (Pluvialis dominica), Black noddy (*Anous minutus*), Brown noddy (*Anous stolidus*), Sharp-tailed sandpiper (*Calidris acuminate)*, Christmas shearwater (*Puffinus nativitatis*), Wedge-tailed shearwater (*Puffinus pacificus*), Northern shoveler (*Anas clypeata*), Wandering tattler (*Tringa incana*), Gray-tailed tattler (*Heterosceles brevipes*), Sooty tern (*Sterna fuscata*), Gray-backed tern (*Sterna lunata*), White tern (*Gygis alba*), Red-tailed tropicbird (*Phaethon rubricauda*), White-tailed tropic bird (*Phaethon lepturus*), and the Ruddy turnstone (*Arenaria interpres*). There is no exclusively terrestrial biota, including plants and animals, Federally listed as threatened

or endangered under the Endangered Species Act, currently known or reported on Wake Island.

3.3 Cultural Resources

Cultural resources, as discussed in Section 3.4 of the WILC SEA, are prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. For ease of discussion, cultural resources have been divided into three main categories: prehistoric resources, historic structures and resources, and traditional resources.

Prehistoric archaeological resources are defined as physical remnants of human activity that predate the advent of written records in a particular culture and geographic region. They include archaeological sites, structures, artifacts, and other evidence of prehistoric human behavior. No evidence of prehistoric cultural resources has been discovered on Wake Island.

Historic resources consist of physical properties or locations postdating the advent of written records in a particular culture and geographic region. They include archaeological sites, structures, artifacts, documents, and other evidence of human behavior. Historic resources also include locations associated with events that have made a significant contribution to history or that are associated with the lives of historically significant persons.

Wake Island in its entirety was designated a National Historic Landmark in 1985 in order to preserve both the battlefield where important WWII events occurred and Japanese and American structures from that period. The Pan American facilities and the U.S. Naval submarine and aircraft base are included in the historic property. Many of the Japanese structures were actually constructed with American labor. A group of 98 American Prisoners of War were forced to build these defenses until mid-1943, when they were executed by the Japanese. (Urwin, 1983, cited in USASMDC, 1999) These structures include several pillboxes, bunkers, and aircraft revetments. A comprehensive survey of Japanese earthen structures and field fortifications has not been conducted. Unexploded ordnance from WWII was discovered at Wake Island during excavation and replacement of the main runway in 2004. These materials were safely excavated and stored during construction activities and subsequently removed from Wake Island for proper disposal. (Scott Sweistal, pers. comm., 2006)

The remoteness of the island and the lack of fresh water sources other than rainfall, discouraged settlement by native Pacific populations, so there is little potential for prehistoric or traditional resources to be present. No unique paleontological or traditional use resources are known to exist on the island.

3.4 Hazardous Materials/Waste

Hazardous materials and waste management existing conditions were discussed in detail in Section 3.5 of the WILC SEA, incorporated by reference. A review of available documentation indicates that conditions have not changed significantly since the previous assessment and do not warrant additional review. A brief synopsis of existing conditions is included below.

3.4.1 Hazardous Materials Management

Current fuel storage areas at Wake Atoll can accommodate up to 37.8 million liters (10 million gallons) of kerosene-based jet propulsion fuel JP-5. In addition to JP-5, small quantities of lubricants and gasoline are stored in bulk for base operations and infrastructure support. These materials are transported by ship to Wake and transferred to the on site storage facilities.

Distribution is based on need and most of these materials are consumed in ongoing activities. Potential spills are managed and minimized through implementation of existing Spill Prevention Control and Countermeasures Plans.

3.4.2 Hazardous Waste Management

The USEPA identified Wake Island Airfield as a "large quantity generator" of hazardous waste in 1994. However, the installation could qualify for "small quantity generator" status based on actual amounts of hazardous wastes generated since 1994. (USASMDC, 2002a)

There are several satellite accumulation points located around the installation where waste is temporarily stored. All hazardous waste is moved from the satellite accumulation sites to a main hazardous waste accumulation site to await transportation off-site via barge. All liquid wastes are stored on spill pallets. Types of wastes generated include small quantities of used solvents, paints, cleaning fluids, asbestos-containing materials (generated during building maintenance activities) and pesticides. Waste may be placed in DOT-E-9618-approved polyethylene overpack containers for added security until shipment for treatment or disposal. Hazardous waste shipments are normally consigned to the Wake Island supply barge for shipment to Hawaii. (USASMDC, 2002a)

3.5 Health and Safety

Wake Island Launch Center operations are subject to applicable DoD health and safety regulations, which could include AR 385-10, The Army Safety Program; AR 385-64, U.S. Army Explosives Safety Program; and AR 420-90, Fire and Emergency Services.

The primary existing hazards at Wake Island are associated with aircraft refueling and base infrastructure support. Typical hazards include the handling and use of hazardous materials, exposure to noise from aircraft operations, and physical safety associated with the use of heavy equipment and support operations. These hazards are managed and controlled through implementation of safety programs, procedures, and the use of safety equipment. (UDASMDC, 1999)

The missile range extending from Wake Island toward the U.S. Army Kwajalein Atoll (USAKA) is under the jurisdiction of the Ronald Reagan Ballistic Missile Defense Test Site. The USAKA controls all range operations and all procedures are conducted in accordance with the USAKA Range Safety Manual (*Supplemental Environmental Impact Statement, Proposed Actions at U.S. Army Kwajalein Atoll,* U.S. Army Space and Strategic Defense Command, 1993 cited in the *Mobile Launch Platform Environmental Assessment,* MDA 2004) and USAKA policies and procedures. In the event of a catastrophic event (e.g., natural disaster, hazardous materials spill, aircraft or missile mishap), Operations Plan 355-1, Wake Island Disaster Preparedness Plan, would be implemented.

3.6 Noise

Wind and surf contribute to relatively high natural background sound levels on Wake Island. These background levels can mask the approach of vehicles and personnel are not always aware of aircraft landings.

Anthropogenic sources of noise at Wake Island are from airfield operations and base maintenance activities. The most common military aircraft are C-17s. An Air Force C-5 is the noisiest aircraft that typically operates at Wake Island. It is estimated to generate A-weighted sound pressure levels of approximately 84 decibels (dB) at the base dispensary, 69 dB at the midpoint of Peale Island, and 95 dB at the midpoint of Wilkes Island. Hearing protection is required for personnel engaged in aircraft apron operations. Estimates of aircraft noise were developed using DoD Noise Exposure Model Version 6.1. (USASMDC, 1999)

Infrequent missile launches are another noise source on Wake Island. During flight vehicle launches for the Theater Missile Defense Critical Measurements Program, maximum A-weighted sound pressure level contours varied from approximately 115 dB near Launch Pad #2, to less than 95 dB on the western ends of Peale and Wilkes Islands. The 95-dB contour covers almost all of the WILC (USASSDC, 1994). Launch vehicles generate impulse-type noise for a brief period during launch and only a few launches could occur per year. (USASMDC, 1999)

Personnel engaged in missile launch operations work safely inside reinforced concrete shelters and do not require hearing protection. Other island personnel are evacuated

beyond the launch hazard area, where they do not require hearing protection. With the exception of diesel generators, other sources of noise do not exist on the island. (USASMDC, 1999)

3.7 Transportation

Transportation on Wake Island is provided by bus or contractor or government-owned vehicles. The primary road is a two-lane paved road extending the length of Wake Island to the causeway between Wake Island and Wilkes Island. The causeway was rehabilitated in 2003 and is capable of supporting heavy equipment. A bridge connecting Wake and Peale Islands burned down in December 2002.

A combination of paved and coral roads serves the marina area. Paved access to Wilkes Island ends at the petroleum, oil, and lubricants tank farm, where a road constructed of crushed coral provides access to the western point of Wilkes Island. A portion of the road, near the unfinished WWII submarine channel, is flooded nearly every year by high seas. The launch sites are accessed from the main paved road on Wake Island by paved and coral roads. Generally, the road network is suitable for low-speed, light-duty use only.

Wake Island's paved roadway network has been adequately maintained to move materials, services, and personnel from the airfield on the southern end to the personnel support area on the northern end. Modes of transportation include walking, bicycles, light utility carts, standard automobiles, vans, trucks, and larger trucks and equipment.

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4 ENVIRONMENTAL CONSEQUENCES

4.1 Air Quality

4.1.1 Proposed Action

The generic LPT missiles considered in the proposed action would be similar to the LPT missile described in the WILC SEA. Generic LPT missile propellants would include a kerosene-based main fuel, IRFNA oxidizer, and an initiator fuel that consists of a 50/50 mixture of triethylamine and dimethylaniline. Exhaust components from a generic LPT would include carbon monoxide, carbon dioxide, hydrogen, water vapor, and nitrogen. Of these components, only carbon monoxide is a criteria pollutant regulated under the Clean Air Act.

The short-term air quality impacts resulting from the launch of an individual LPT as described in the WILC SEA were modeled using the TSCREEN (Toxics Screening Model) PUFF computer model. TSCREEN was developed by the USEPA. PUFF is one of three screening dispersion models within TSCREEN. (USEPA, 2006) USEPA notes that screening models are usually applied before using a refined air quality model to determine if refined modeling is needed. The screening estimates generated by TSCREEN PUFF represent the maximum short-term ground level concentration estimates from a meteorological perspective. (EPA, 1992)

TSCREEN PUFF was used to perform air quality modeling on both solid and liquid propellant target missiles during preparation of the *U.S. Army Kwajalein Atoll Temporary Extended Test Range Environmental Assessment*. Appendix E of that document provides a detailed discussion of the methodology used and the specific systems analyzed. As described in the appendix, TSCREEN PUFF requires as inputs the mass of the puff of material released and the elevation of the release. The conservative input assumptions described in the appendix (the mass of the puff of material released during a normal flight equals the total emissions from the target missile; release height of 200 meters [656 feet]) were used for modeling the WILC LPT missile. Since the assumed release height is lower than the 320 meters (1,050 feet) that TSCREEN PUFF uses for the mixing height, all of the material in the puff will affect the calculated ground-level concentrations. TSCREEN also uses a very conservative wind speed of 1 meter/second (3.6 kilometers/hour) which is significantly lower than Wake Island's average wind speed of 22.2 kilometers/hour. The stronger winds commonly seen at Wake Island would tend to disperse pollutants, thereby lowering pollutant concentrations more quickly than might be predicted at lower wind speeds.

TSCREEN PUFF modeling displays maximum concentration for averaging times ranging from instantaneous to one hour. However, the NAAQS for CO specifies limits for one hour and eight hour averaging times. The *USAKA Temporary Extended Test Range EA*

discussed a method for estimating time-mean concentrations for periods longer than one hour. More recently, the California Air Resources Board (CARB) provided recommended factors to convert maximum 1-hour averaging concentrations to other averaging periods. To convert from one hour to eight hour averaging, the CARB factors ranges from 0.5 to 0.9 with a recommended value of 0.7 (California Environmental Protection Agency, 2003). MDA used 0.7 in the calculations for the generic LPT.

Using the expected CO emission from a LPT launch (982 kilograms) and an assumed release height of 200 meters (656 feet), the estimated CO concentration resulting from a WILC SEA LPT launch was determined using TSCREEN PUFF. Based on the estimated CO concentration of the WILC SEA LPT missile, TSCREEN PUFF was then run for CO emissions ranging from 1,000 to 5,000 kilograms. The results are shown in Exhibit 4-1. The relationship among the WILC SEA LPT propellant mass, exhaust component mass, and estimated CO concentration was then extrapolated to estimate a generic LPT maximum propellant budget. A generic LPT maximum propellant budget of approximately 3,400 kilograms (7,500 pounds) kerosene-based fuel, 12,000 kilograms (26,450 pounds) inhibited red fuming nitric acid (IRFNA), and 120 kilograms (270 pounds) initiator fuel would result in expected CO emissions of about 4,000 kilograms (8,800 pounds). The estimated maximum atmospheric CO concentration for a 4,000-kilogram release would be 4.81 mg/m^3 approximately 3.0 kilometers (1.9 miles) from the point of release, which is well below the one hour and eight hour NAAQS. A 4,000 kilogram release was chosen to provide a safety margin for not exceeding the NAAQS standards by 50 percent. Significant impacts to air quality would not be expected to result from a generic LPT launch.

Fueling a generic LPT has the potential to impact air quality. Although total oxidizer and fuel vapor emissions would vary depending on the specific propellant transfer equipment used and how it is assembled, it is anticipated that only very small amounts (approximately 10 grams (0.4 ounces)) of oxidizer vapors would be released to the atmosphere during the oxidizer transfer operation. A negligible amount of fuel vapors would also be released into the atmosphere during fuel transfers. (USASMDC, 2002b)

The number of missile fueling events would not increase as a result of the proposed action so no increase in emissions from missile fueling activities would be anticipated. The prevailing winds at Wake Island would quickly sweep away any pollutant emissions. Therefore, no impacts on air quality would be anticipated from generic LPT fueling.

Construction of the concrete storage pads would be expected to take approximately one month. Emissions from construction activities, including equipment combustion emissions and particulate emissions due to soil disturbance, would be very limited due to the small scale and short duration of these proposed activities. Best management practices would be implemented to further reduce the potential for fugitive dust emissions. Construction activities would have a negligible impact on the air quality.

Exhibit 4-1. Estimated Concentration from Launch of Generic Liquid Propellant Target Missiles (mg/m^3)[1,2]

Pollutant	Release kilograms (pounds)	Guideline Average Period	Guideline Exposure (mg/m^3)	Guideline Term	Distance Downwind kilometers (miles) 1 (0.6)	3 (1.9)	5 (3.1)	7 (4.3)	10 (6.2)
Carbon Monoxide	1,000 (2,205)	8 hours	10	NAAQS	0.48	0.84	0.69	0.50	0.36
		1 hour	40	NAAQS	0.69	1.20	0.98	0.72	0.51
	2,000 (4,409)	8 hours	10	NAAQS	0.97	1.68	1.37	1.01	0.72
		1 hour	40	NAAQS	1.38	2.40	1.96	1.44	1.03
	3,000 (6,614)	8 hours	10	NAAQS	1.44	2.52	2.05	1.51	1.08
		1 hour	40	NAAQS	2.06	3.60	2.93	2.15	1.54
	4,000 (8,818)	8 hours	10	NAAQS	1.93	3.37	2.74	2.01	1.44
		1 hour	40	NAAQS	2.75	4.81	3.91	2.87	2.05
	5,000 (11,020)	8 hours	10	NAAQS	2.41	4.21	3.43	2.51	1.80
		1 hour	40	NAAQS	3.44	6.01	4.60	3.59	2.56

[1] Total emission from generic LPT

[2] Values used in TSCREEN PUFF model (U.S. Environmental Protection Agency, 1992):

- release height = 200 meters (656 feet)
- wind speed = 3.6 kilometers/second (2.3 miles/hour)
- mixing height = 320 meters (1,050 feet)

4.1.2 Alternative 1

Alternative 1 would produce slightly higher air emissions as the proposed action because one additional concrete storage pad would be constructed; emissions associated with propellant storage and fueling would be identical.

4.1.3 No Action Alternative

Under the no action alternative, no generic LPT missile activities would take place at Wake Island. Emissions from on-going, routine activities associated with the power plant, motor vehicles, aircraft operations, fuel storage tanks, open burning of trash at the base landfill, and incinerator emissions would continue. Air emissions associated with previously analyzed solid and liquid propellant target missile launches from Wake Island would continue; however, these impacts were determined to be not significant.

4.1.4 Cumulative Impacts

Cumulative impacts to air quality resulting from the proposed action would be similar to those described in the no action alternative. Emissions from on-going base support activities and infrequent solid- and liquid-propellant target missile launches would continue to be generated but the easterly trade winds that dominate the island throughout the year sweep these emissions away and prevent any accumulation. No cumulative impacts resulting from the proposed action are anticipated.

4.2 Biological Resources

4.2.1 Proposed Action

Analyzing potential environmental effects on biological resources involves evaluating the degree to which the proposed activities could affect the coral reefs, wildlife, threatened or endangered species, and sensitive habitat within the affected area. Impacts are considered significant if they have the potential to result in reduction of the population size of Federally listed threatened or endangered species, degrade biologically important unique habitats, result in substantial long-term loss of vegetation, or reduce the capacity of a habitat to support wildlife.

There would be few, if any, impacts to coral reefs resulting from a normal launch of a generic LPT missile. The missile would quickly leave the vicinity of Wake Island and continue in a ballistic trajectory until it was intercepted or until it falls into the broad ocean area. However, an on-pad catastrophic failure during an attempted launch would have the potential to release IRFNA and/or other propellants to the shallow waters near the shoreline which could adversely affect coral reefs. The magnitude of impact would depend on the quantity of propellant released, wind conditions, and wave action that would disperse contaminants through dilution. The low likelihood of such a release and

the implementation of approved emergency response plans, would limit the potential for adverse effects.

There is little potential to disturb nesting habitat during the minor construction activities that would occur to accommodate continued LPT missile testing at Wake Island because the proposed sites for the storage facilities have been previously disturbed and are situated within an existing fuel storage area. Additionally, the proposed sites for the storage pads are approximately 600 to 700 meters (2,500 feet) from the nearest known bird nesting area. The impacts of launching liquid propellant target missiles would be the same or less harmful to the environment than launching solid propellant missiles (analyzed in the *Wake Island EA*) because the liquid propellant target missiles do not release hydrogen chloride as an exhaust product. However, potential impacts could result from launch-related activities such as launch noise, launch emissions, and sonic booms.

The effects of noise on birds and wildlife have been extensively reviewed (*WILC SEA*). Several studies have shown that intermittent noises (other than those at or near the threshold of pain) have little if any apparent effect on most animals, including birds. Birds acclimate quickly to most non-constant noises in their environment, and after an initial flushing generally return to the nest. Other wildlife typically exhibits a momentary startle effect. Previous environmental analysis (*WILC SEA*) has determined that the noise from missile launches generally causes no significant impacts on birds or other wildlife.

The potential for indirect impacts on birds may result from the presence of people on the island. Human intrusion into seabird colonies can result in abandonment of the colony from repeated or prolonged disturbance. Also, nests exposed when birds are flushed may be susceptible to predation by frigatebirds.

An additional potential impact could arise as a result of contamination in the case of an accidental spill. Generally, hazardous materials contamination would be restricted to small areas near the source of pollution. Local spills of petroleum products such as gasoline, jet fuel, and oil could be harmful if they are allowed to come into contact with or are ingested by birds. Spills into the lagoon may spread over the surface of the waters and result in impacts including death of a small number of seabirds that may drink from or land on the water. However, because of SOPs already in place, the potential for adverse impacts is judged to be not significant.

Another possible impact could occur as a result of an on-pad catastrophic failure or explosion. The Launch Hazard Areas (LHAs) associated with both current testing and with the proposed generic LPT contain some avian nesting sites. Avian species protected under the MBTA that are known to nest within these proposed LHAs include the Red-tailed tropicbird, the Blackfooted albatross, and potentially the Laysan albatross. The LHAs also extend into the ocean area several hundred meters, where the Federally protected Green sea turtle might be found. Due to implementation of launch safety SOPs,

the potential for an on-pad failure or explosion would be remote and therefore, the potential for impact on the above biological resources is considered to be not significant.

To minimize the potential for adverse effects, MDA would conduct U.S. Fish and Wildlife Service (USFWS) approved procedures for hazing of birds in the vicinity of the launch site prior to launch following USFWS guidance (See Appendix A: Department of Interior, Fish and Wildlife Service letter dated October 11, 2006). These actions would mitigate any adverse effects on nesting and migratory birds.

The open ocean area around Wake Island is very large and little is known of the numbers and distribution of marine biological resources, including marine mammals and sea turtles. Of the internationally protected species, sea turtles and marine mammals would have the greatest risk, although extremely remote, of incidental impact from falling missile debris or propellants in the booster drop area or in the event of an aborted flight. The taking of a protected species would be a significant impact, but the probability of such an occurrence is judged to be extremely remote. Thus, no significant impacts on marine biota are anticipated from implementing the proposed action. Although Federally protected, endangered species, and designated critical habitat are known to exist at Wake Island, no significant impacts on such resources would occur from implementation of the proposed action (See Appendix A: Department of Interior, Fish and Wildlife Service letter dated October 11, 2006).

4.2.2 Alternative 1

Potential biological impacts under Alternative 1 would be the same as those analyzed under the Proposed Action. In both instances, there would be only a minor and temporary effect on biological resources.

4.2.3 No Action Alternative

Under the No Action alternative, activities associated with generic LPT missile launches would not occur. As a result, there would be no potential for impacts from generic LPT launches and, consequently, no changes in potential biological effects from those already analyzed in the WILC SEA.

4.2.4 Cumulative Impacts

Implementing the proposed action would not result in any change to the number or frequency of missile launches from Wake Island. Potential impacts on biological resources resulting from generic LPT activities would not be significantly greater than those documented in previous analyses. Considering the relative infrequency of missile launches from Wake Island, no cumulative impacts to biological resources from generic LPT activities would be expected.

4.3 Cultural Resources

4.3.1 Proposed Action

The proposed action involves no major construction, minor trenching, and minimal ground disturbing activities. These activities would not impact the historic character of the site.

The use of equipment and vehicles during concrete pad construction is expected to have no significant impact on the island's cultural resources. This construction is limited in scope and would take place within the Wilkes Island fuel farm, a previously disturbed area. All personnel associated with construction and generic LPT test support activities would be briefed on procedures to follow in the event a cultural artifact was discovered.

A missile mishap on or near the launch pad has the potential to create debris that could damage cultural resources. However, given the small profile of most existing historic structures on the island and the low probability of a launch mishap, the likelihood of significant impacts is considered extremely remote.

4.3.2 Alternative 1

Alternative 1 would have the same potential impacts as the proposed action.

4.3.3 No Action Alternative

Under the No Action alternative, no activities associated with generic LPT testing would take place. Impacts associated with previously documented missile testing and launching activities would continue. Those impacts were analyzed in previous documents and found to be not significant.

4.3.4 Cumulative Impacts

Construction activities associated with the proposed action would be short-term and confined to the Wilkes Island fuel tank farm area. Missile launch mishaps have a very low probability of occurrence. With appropriate SOPs in place to ensure safe mission support activities, no cumulative impacts to cultural resources would be expected.

4.4 Hazardous Materials/Waste

4.4.1 Proposed Action

Preparation and launch of generic LPT missiles from Wake Island has the potential to increase the amount of hazardous materials used and the quantities of hazardous wastes

generated at Wake Island. The types of hazardous materials used and the types of hazardous wastes generated would be similar to those described in the WILC SEA.

Inhibited red-fuming nitric acid (IRFNA), a hazardous substance, is the generic LPT oxidizer. "Inhibited" refers to the addition of a trace of hydrofluoric acid that reacts with steel to form a fluoride coating which protects the material from corroding. It was the development of IRFNA from RFNA which made RFNA a practical oxidizer by allowing it to be stored in steel or aluminum tanks. A potential increase in the use of hazardous substances at Wake would impact hazardous materials operations; however, the implementation of hazardous material SOPs would mitigate any potential adverse impacts.

Generic LPT launch preparation activities may require small amounts of solvents and cleaning materials. Such materials would be transported to Wake Island, stored, and distributed through the regular normal chain. The small amounts of materials required to support generic LPT launches would not represent a significant increase over quantities already in use.

All storage areas for hazardous materials or wastes would maintain spill containment structures. Existing spill prevention procedures would be observed to further decrease the risk of accidental release of hazardous substances to the environment. The disposal of hazardous wastes would be in accordance with applicable U.S. laws and regulations.

Spill response would be addressed in accordance with the existing facility response/spill plans and any test-specific plans. Spill cleanup materials would be containerized and shipped for disposal in accordance with applicable U.S. laws and regulations. Spill response equipment would be cleaned and decontaminated before being returned to use.

Launch activities would produce small quantities of hazardous wastes such as used or excess solvents and cleaners. These hazardous wastes would be similar to wastes already generated and handled at Wake Island and they would be managed in accordance with applicable regulatory requirements. The small quantities of hazardous waste expected to be generated would not represent a significant increase in the amount of hazardous waste currently generated. No significant impacts from hazardous materials or wastes would be expected.

4.4.2 Alternative 1

Alternative 1 would have the same potential impacts as the proposed action.

4.4.3 No Action Alternative

Under the no action alternative, no impacts from hazardous materials/wastes associated with activities supporting generic LPT fueling and launching would occur. Impacts

associated with previously documented missile testing and launching activities would continue. Those impacts were analyzed in previous documents and found to be not significant.

4.4.4 Cumulative Impacts

Under the proposed action the number and frequency of missile launches from Wake Island would not change. Although potential propellant budgets might be higher, the amount of other hazardous materials used and/or hazardous wastes generated would be similar to that discussed in the WILC SEA. All hazardous materials, including propellants would be stored and handled in accordance with applicable laws and regulations. Any hazardous wastes generated would be shipped off the island for disposal through the current waste management system and in accordance with federal regulatory requirements. No cumulative impacts from hazardous materials or hazardous waste would be expected.

4.5 Health and Safety

4.5.1 Proposed Action

Impacts on health and safety from LPT testing activities are analyzed in Section 4.1.6 of the WILC SEA, incorporated by reference. Adherence to existing safety plans and procedures and strict observance of OSHA and other regulatory requirements would reduce the potential risks of health and safety impacts to acceptable levels. No significant health and safety impacts would be expected to occur from generic LPT activities at Wake Island.

Concrete pad construction has the potential for construction-related accidents and injuries to the construction crew. A work site safety plan is required before any work project can begin to reduce potential risks to the health and safety of the construction crew. As a result, no significant impacts to health and safety would be expected due to construction activities.

4.5.2 Alternative 1

Alternative 1 would have the same potential impacts on health and safety as the proposed action.

4.5.3 No Action Alternative

Under the no action alternative, no impacts to health and safety associated with activities supporting generic LPT fueling and launching would occur. Impacts associated with previously documented missile testing and launching activities would continue. Those impacts were analyzed in previous documents and found to be not significant.

4.5.4 Cumulative Impacts

All employees would be notified of potential hazards associated with their work and they would be trained in proper use of any materials they would be handling. They would also be trained in the proper use of safety equipment and would conduct their activities in accordance with OSHA safety procedures and local guidance. Construction activities associated with the proposed action would be considered routine and no significant risks on health and safety would be anticipated. With appropriate worker training and oversight, no cumulative impacts to health and safety would be expected.

4.6 Noise

4.6.1 Proposed Action

The Wake Island Environmental Assessment contains a detailed discussion of launch vehicle noise predictions that were performed for Theater Missile Defense target and defensive missiles. The predictions were made using a far-field predictor program based on empirical data from both solid- and liquid-fueled rocket motors. (McInerney, 1989 as cited in USASSDC, 1994) The predicted maximum A-weighted sound pressure levels that would occur during a launch range from 120 dB at the launch site to less than 100 dB on the western end of Wilkes and Peale Islands and are of very short duration (e.g., several seconds).

Noise levels for the Falcon vehicle, a two-stage liquid-propellant launch vehicle, were modeled for the *Final Environmental Assessment for the Falcon Launch Vehicle Program* (Space Exploration Technologies Corporation, 2003 as cited in *Proof-of-Principle Space Launches from Omelek Island Environmental Assessment*, U.S. Space and Missile Defense Command, 2004) at Vandenberg Air Force Base. Modeled A-weighted noise levels were 78.9 dB, 62.3 dB, and 50.8 dB at 1.0, 3.0, and 5.0 miles, respectively, from the launch pad.

Generic LPT noise levels would be expected to fall within the range of the 1994 and 2003 modeling but are assumed here to equal the higher levels in the 1994 modeling. These noise levels are not expected to adversely affect personnel at Wake Atoll since all personnel are excluded from the launch area and would be protected from any adverse noise impacts. Consequently, there would be no significant impacts from generic LPT launch noise.

Noise associated with the construction of the concrete storage pads would result from the use of vehicles and equipment. With the high ambient noise levels from wind and surf, however, the additional noise generated by construction activities would be negligible.

4.6.2 Alternative 1

Alternative 1 would have the same potential impacts from noise as the proposed action.

4.6.3 No Action Alternative

Under the no action alternative, no impacts from noise associated with activities supporting generic LPT fueling and launching would occur. Impacts associated with previously documented missile testing and launching activities would continue. Those impacts were analyzed in previous documents and found to be not significant.

4.6.4 Cumulative Impacts

Under the proposed action, noise resulting from construction activities would occur for about 30 days. Vehicles and equipment supporting the construction would be used for only a portion of the 30-day period and the noise level would not be significantly greater than ambient noise levels. No cumulative impacts from construction noise would be expected.

A generic LPT launch is expected to generate noise of similar intensity (approximately 120 dB A-weighted) and duration (approximately 1 minute) as LPT launches documented in the WILC SEA. Considering the short duration of launch noise and the relative infrequency of launch events at Wake Island, no cumulative impacts due to noise would be expected.

4.7 Transportation

4.7.1 Proposed Action

The WILC SEA did not select the alternative to store fuel and conduct fueling operations in the Wilkes Island tank farm area in part due to "…the inherent dangers of hauling heavy equipment across the aging causeway…." Improvements to the causeway between Wake Island and Wilkes Island since 1999 have reduced this earlier danger to an acceptable level. The repaved runway can handle the current mix of scheduled and unscheduled flights. No adverse impacts on transportation would be expected from generic LPT missile activities.

4.7.2 Alternative 1

Alternative 1 would have the same impacts on transportation as the proposed action.

4.7.3 No Action Alternative

Under the no action alternative, no impacts to transportation from activities supporting generic LPT fueling and launching would occur. Transportation impacts associated with previously documented missile test and launch activities would continue. Those impacts were analyzed in previous documents and found to be not significant.

4.7.4 Cumulative Impacts

Implementing the proposed action would not change the number or frequency of missile launches at Wake Island. Previous analyses of these launches indicated no cumulative impacts to transportation were expected. Runway repaving and rehabilitation of the causeway between Wake Island and Wilkes Island have maintained or improved transportation capabilities. No cumulative impacts to transportation from activities associated with generic LPT launches would be expected.

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APPENDIX A – DEPARTMENT OF INTERIOR, FISH AND WILDLIFE SERVICE LETTER